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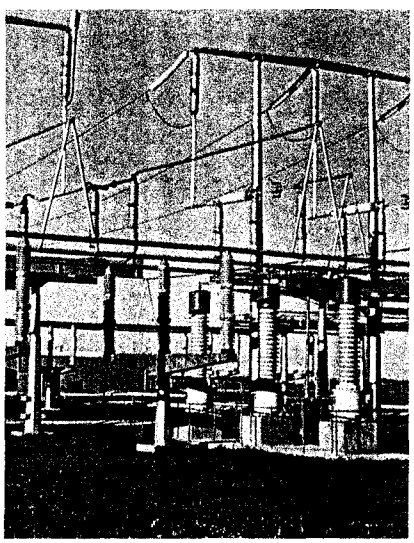



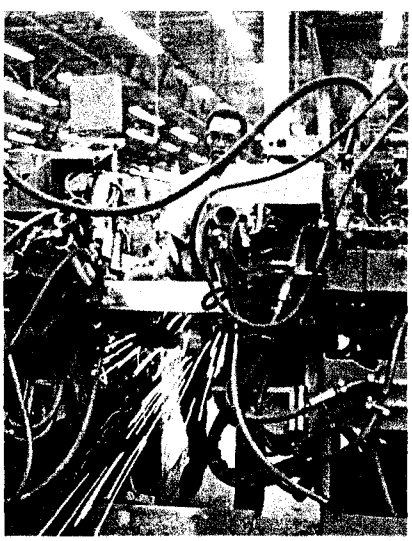

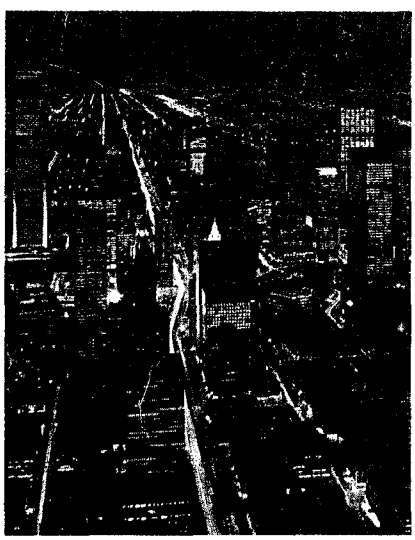

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SQD SLV_000773

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DIGEST 161 HIGHLIGHTS

Page

1 ..... QO load center application page.

10, 12 ..... QO split bus load centers are obsolescent.

17 ..... QO200TR replaces QO260NATR
QO2100NF/S/RB replaced QO2100F/S/RB

18 ..... Class 6610 Type VT-1 is new designation for 5008 Voltage Tester.

20, 25 ..... Note statement concerning use of 10,000 AIC load center circuit breakers with 20 feet of wire and high AIC multi-metering.

30 ..... New Manual Reset High Temperature Limit Protection Baseboard Heaters now available.

31 ..... New Complete Line of Architectural Electric Convection Heaters for Commercial and Industrial Applications.

35 ..... Expanded Line of Propeller Type Electric Unit Heaters to 35KW Capacity.

50 ..... New listing of low voltage power factor correction capacitors.

51 ..... New Mini-HVL Load Interrupter Switches have been added

54 ..... New listing — Power Fuse Holder Kits and Power Distribution Blocks for OEM's.

64 ..... ME 225 and 400 ampere frame Solid State Trip circuit breakers are now available. Test set for ME and PE breakers is now available.

71 ..... NEMA 4 & 5 and NEMA 12 enclosures for the MEL electronic trip circuit breakers will be available September, 1981.

88, 89 ..... 600 ampere main lugs only devices and NEMA 3R/12 enclosures added to merchandise NEHB; 600 ampere main lugs only devices added to factory assembled NEHB.

95, 97, 98 .... ME electronic trip circuit breaker listed for use as branches in Type HCWM and Type HCWA **I-LINE** panelboards.

119-125 ..... 1200 ampere **I-LINE** Busway "new rating" now available in stock.

141-145 ..... List of prices for all A1-3 discount schedules has been increased.

189 ..... New line of 0.25% accuracy Watt, Var, Voltage and Current Transducers.

190 ..... Class 2510 Types F & K — oversized NEMA Type 1 enclosures.

234-261 ..... New Type S NEMA Size 7 Contactors and Starters. New solid state overload for Size 7 Starters.

248, 270 ..... New current limiting module (CLM) information added.

280-282 ..... New EM 24/64 Energy Management System and Remote Switching Devices.

283-288 ..... New **SY/MAX-20** Programmable Controller.

290, 291 ..... New 800 Ampere Automatic Transfer Switch.

341 ..... New Square Type LS miniature multi-function operators and pilot lights.

358 ..... New line of Type Z instrument cam switches.

361 ..... New versions of the Type C turret head limit switch line have been added including neutral position and 2 stage.

379 ..... New line of DC cylindrical proximity switches added.

403 ..... New 9013 FHG small air compressor switch features the 40 year proven **PUMPTROL** mechanism.

420 ..... New Type FS Industrial Solid State Timer.

427 ..... Class 9066 external reset mechanism for NEMA 1 enclosure Sizes 0, 1, 2 & 3.

440 ..... New Class 9421 door mounted mechanism added for Q2L circuit breakers.

441 ..... New Type TD 60 ampere disconnect switches added.

444 ..... New Type D3 and D4 lateral extension added for circuit breakers.

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SQUARE D®

INTERNATIONAL CONTROL PRODUCTS

The Square D Company has the ability to offer world wide distribution of General Industry Control products which meet IEC Standards, VDE Regulations and International Specifications and which are acceptable in the majority of countries of the world.

MANUFACTURING FACILITIES

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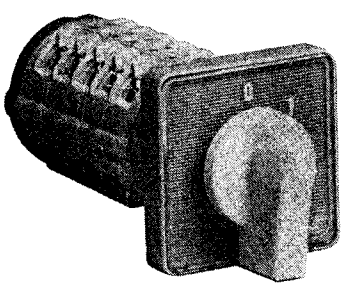
France	Japan	Singapore	United States
Great Britain	Luxembourg	South Africa	West Germany

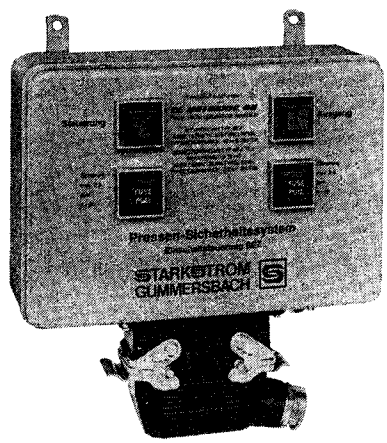
STARKSTROM GUMMERSBACH

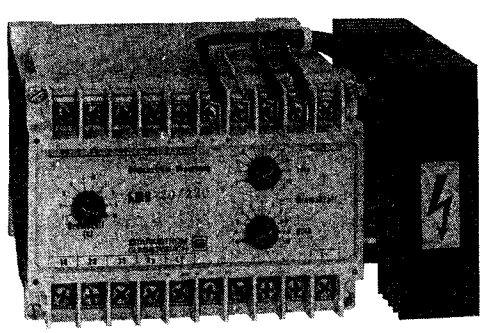
APER

Cam Switches
CLASS 9003



Press Safety System
CLASS 8918





DC Electronic Motor Brake
CLASS 8919

UNITED STATES CANADA SWITZERLAND DENMARK SWEDEN GERMAN LLOYD'S

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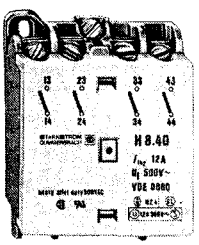
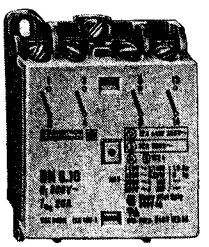
INTERNATIONAL CONTROL PRODUCTS

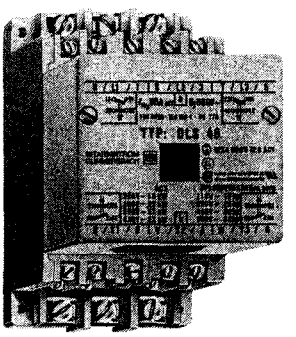
Control Relays
CLASS 8501

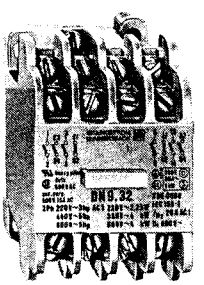




Magnetic Contactors
CLASS 8502

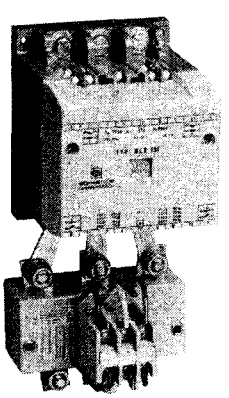


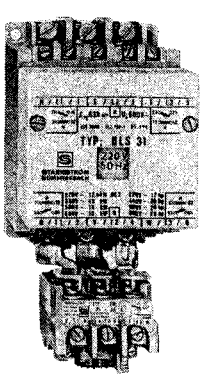




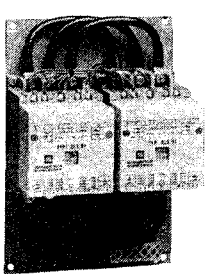


Magnetic Starters
CLASS 8536

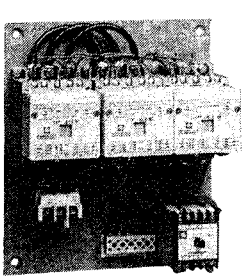




Reversing Contactor
CLASS 8702



Star Delta Starter
CLASS 8630



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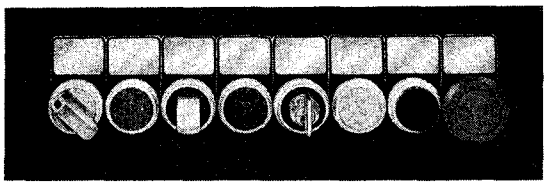
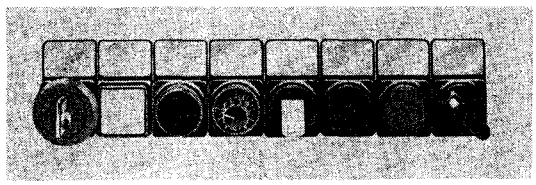
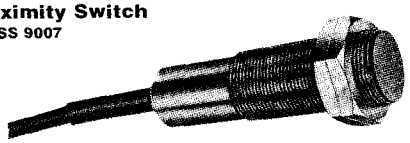
INTERNATIONAL CONTROL PRODUCTS

Control Units
CLASS 9001

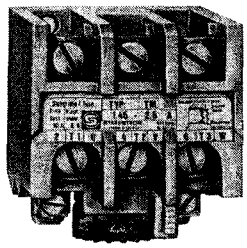




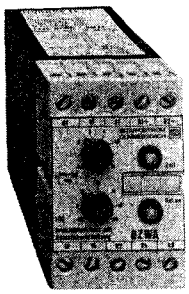
Proximity Switch
CLASS 9007



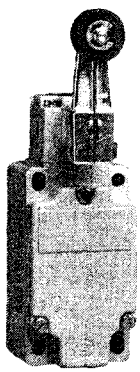
Overload Relay
CLASS 9065



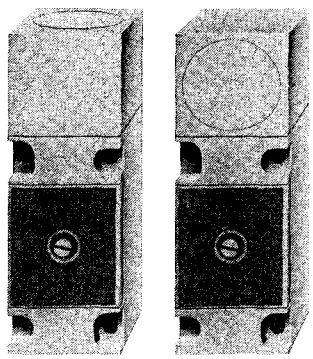
Electronic Relay
CLASSES 8501 and 9050

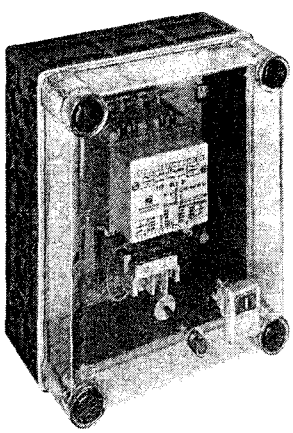


Limit Switch
CLASS 9007



Proximity Switch
CLASS 9007





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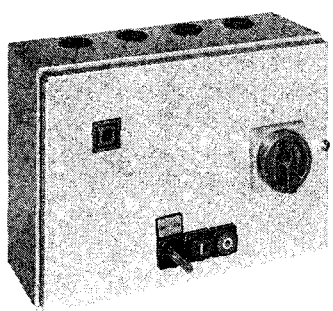

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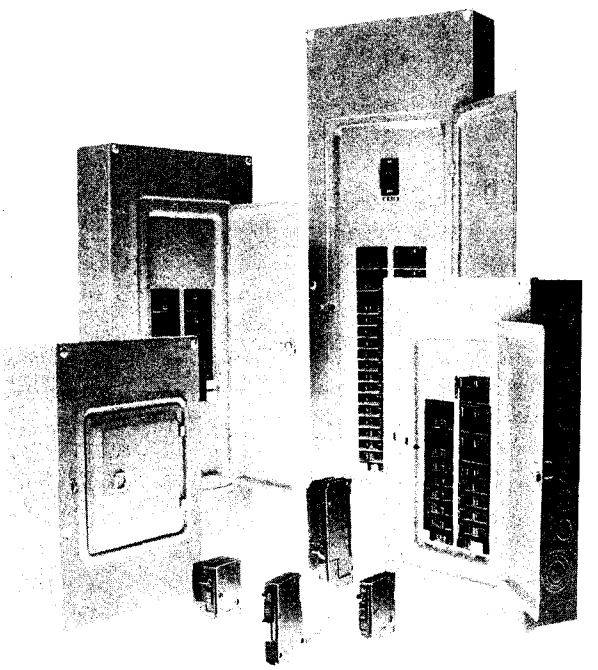
SQD SLV_000778

QO®
Circuit Breaker Load Centers

The Complete Load Center Line

- Main Lugs and Main Breaker devices available through 600 amperes.
- VISI-TRIP indicator on main and branch breakers through 225 amperes.
- 14" wide boxes to fit between studs on 16" centers.
- UL Listed Integrated Equipment Short Circuit ratings from 10,000 to 100,000 AIC.
- 22,000 AIC UL Listed Integrated Equipment Short Circuit rated load centers utilizing QO 10,000 AIC branch circuit breakers.
- Speciality circuit breakers such as GFI, HACR, Key Operated . . .



INDEX AND SELECTION

QO LOAD CENTERS

Load Center Type	System	Integrated Equipment Short Circuit Rating UL Listed RMS Sym. Amps.	Mains Rating (Amperes)								Branch Ratings		Page Number
			Single Main Disconnect							Main Lugs Only	Circuit Breaker Catalog Numer Prefix	Ampere Rating	
			70	100	125	150	200	225	300 & 400	600			
Residential and Commercial	120/240V 1Ø 3W	10,000	. . .	Q1	Q2	Q2	Q2	Q2	LA	MA	70-600	QO, Q1, QOT	15-150A
		22,000	. . .	Q1-VH	. . .	Q2-H	Q2-H	. . .	. . .	. . .	150-600	QO, Q1 QO-VH, Q1-VH QH, Q1H QH	15-150A 15-125A 15-125A 15-30A	4, 6, 10
		22,000	. . .	. . .	. . .	. . .	. . .	. . .	LA	MA				
		42,000	. . .	. . .	. . .	. . .	. . .	. . .	LA	MA				
		65,000	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .				
	120/240V 3Ø 4W	10,000	. . .	. . .	Q2	Q2	Q2	Q2	LA	. . .	60-600	QO, Q1, QOT	15-150A	8
		22,000	. . .	. . .	. . .	. . .	. . .	. . .	LA	. . .	200-600	QO-VH, Q1-VH QH, Q1H QH	15-125A 15-125A 15-30A	
		42,000	. . .	. . .	. . .	. . .	. . .	. . .	LA	. . .				
		65,000	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .				
Mobile Home and Trailer	120V 1Ø 2W	10,000	Q1	. . .	. . .	. . .	. . .	. . .	. . .	. . .	30, 50	QO, QOT	15-30A	16
	120/240V 1Ø 3W	10,000	. . .	Q1	. . .	Q2	Q2	. . .	. . .	. . .	100, 125	QO, Q1, QOT	15-150A	
Fusible Main	120/240V 1Ø 3W	100,000	. . .	Class T Fuses	. . .	. . .	Class T Fuses	. . .	. . .	. . .	. . .	QO, Q1	15-150A	17
Riser	120/240V 1Ø 3W	10,000	. . .								100-400	QO, Q1, QOT	15-150A	12
	120/240V 3Ø 4W	10,000									120, 225	QO, Q1, QOT	15-150A	
Split Bus	120/240V 1Ø 3W	10,000	125 150 200									QO, Q1, QOT	15-150A	10, 12

METERING EQUIPMENT AND LOAD CENTER BRANCH BREAKERS

Available Short Circuit Current RMS Sym. Amps.	EZ METER-PAK Meter Centers	*QO Load Center	METER-PAK Meter Centers	*QO Load Center
	Page Number	Branch Breaker Catalog Number	Page Number	Branch Breaker Catalog Number
10,000	21	QO, Q1, QO-GFI	25	QO, Q1, QO-GFI
22,000	22	QO, Q1, QO-GFI	25	QO, Q1, QO-GFI
42,000	22	QO, Q1, QO-1 Pole GFI Non-Tandem	25	QO, Q1, QO-1 Pole GFI Non-Tandem
65,000	23	QO, Q1, QO-1 Pole GFI Non-Tandem	. .	. . . . .

* Load centers using 10,000 AIC rated non-tandem QO, Q1 and single pole GFI circuit breakers may be installed twenty feet downstream from either a properly applied EZ METER-PAK meter center on systems capable of delivering up to 65,000 amperes short circuit current or a properly applied METER-PAK meter center on systems capable of delivering up to 42,000 amperes short circuit current.

VISI-TRIP and EZ METER-PAK are Registered Trademarks of Square D Company

SQD SLV_000779

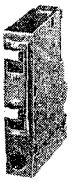
QO® CIRCUIT BREAKERS
FOR QO CIRCUIT BREAKER LOAD CENTERS
PLUG-ON CIRCUIT BREAKERS

QO SINGLE POLE with VISI-TRIP Indicator



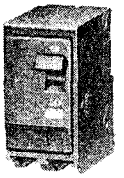
1 Space Required

QOT SINGLE POLE TANDEM



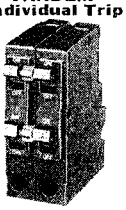
1 Space Required

QO TWO POLE with VISI-TRIP Indicator



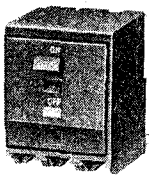
2 Spaces Required

QOT TWO POLE TANDEM Individual Trip



2 Spaces Required

QO THREE POLE with VISI-TRIP Indicator



3 Spaces Required

Q1 TWO POLE with VISI-TRIP Indicator



4 Spaces 35-125A.
8 Spaces 150A.

Q1 THREE POLE with VISI-TRIP Indicator

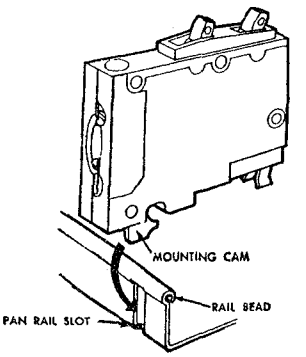


6 Spaces Required

Ampere Raiting	10,000 A.I.C. SINGLE POLE 120/240V. ac Cat. No.	Cat. No.	Price	120/240V. ac Cat. No.	Price	TWO POLE COMMON TRIP 120/240V. ac Cat. No.	Cat. No.	Price	120/240V. ac Cat. No.	Price	240V. ac Cat. No.	Price	THREE POLE COMMON TRIP 240V. ac Cat. No.	Price
15 & 15	.....	.....	.....	■QOT1515	**$16.00**	.....	.....	.....	QOT21515	**$32.00**	.....	.....	.....	.....
15 & 20	.....	.....	.....	■QOT1520	**16.00**	.....	.....	.....	QOT21520	**32.00**	.....	.....	.....	.....
15 & 30	.....	.....	.....	QOT1530	**16.00**	.....	.....	.....	QOT21530	**32.00**	.....	.....	.....	.....
20 & 20	.....	.....	.....	■QOT2020	**16.00**	.....	.....	.....	QOT22020	**32.00**	.....	.....	.....	.....
20 & 30	.....	.....	.....	QOT2030	**16.00**	.....	.....	.....	QOT22030	**32.00**	.....	.....	.....	.....
25 & 25	.....	.....	.....	QOT2525	**16.00**	.....	.....	.....	.....	.....	.....	.....	.....	.....
30 & 30	.....	.....	.....	QOT3030	**16.00**	.....	.....	.....	QOT23030	**32.00**	.....	.....	.....	.....
10	QO110	.....	**$8.00**	.....	.....	QO210	.....	**$18.20**	.....	.....	.....	.....	QO310	**$62.00**
15	▲QO115	▲●QO115HM	**8.00**	.....	.....	◐QO215	.....	**18.20**	.....	.....	✱QO215H	**50.00**	QO315	**62.00**
20	▲QO120	▲●QO120HM	**8.00**	.....	.....	◐QO220	.....	**18.20**	.....	.....	✱QO220H	**50.00**	QO320	**62.00**
25	QO125	.....	**8.00**	.....	.....	◐QO225	.....	**18.20**	.....	.....	✱QO225H	**50.00**	QO325	**62.00**
30	QO130	.....	**8.00**	.....	.....	◐QO230	.....	**18.20**	.....	.....	✱QO230H	**50.00**	QO330	**62.00**
35	QO135	.....	**8.00**	.....	.....	◐QO235	.....	**18.20**	.....	.....	✱Q1235H	**50.00**	QO335	**62.00**
40	QO140	.....	**8.00**	.....	.....	◐QO240	.....	**18.20**	.....	.....	✱Q1240H	**50.00**	QO340	**62.00**
45	QO145	.....	**8.00**	.....	.....	◐QO245	.....	**18.20**	.....	.....	✱Q1245H	**50.00**	QO345	**62.00**
50	QO150	.....	**8.00**	.....	.....	◐QO250	.....	**18.20**	.....	.....	✱Q1250H	**50.00**	QO350	**62.00**
60	QO160	.....	**8.00**	.....	.....	◐QO260	.....	**18.20**	.....	.....	✱Q1260H	**50.00**	QO360	**62.00**
70	QO170	.....	**17.40**	.....	.....	QO270	.....	**37.00**	.....	.....	✱Q1270H	**58.00**	Q1370	**81.00**
80	.....	.....	.....	.....	.....	✣QO280	Q1280	**51.00**	.....	.....	✱Q1280H	**83.00**	Q1380	**94.00**
90	.....	.....	.....	.....	.....	✣QO290	Q1290	**51.00**	.....	.....	✱Q1290H	**83.00**	Q1390	**94.00**
100	.....	.....	.....	.....	.....	✣QO2100	Q12100	**51.00**	.....	.....	✱Q12100H	**83.00**	Q13100	**94.00**
110	.....	.....	.....	.....	.....	.....	Q12110	**110.00**	.....	.....	.....	.....	.....	.....
125	.....	.....	.....	.....	.....	.....	Q12125	**110.00**	.....	.....	.....	.....	.....	.....
150	.....	.....	.....	.....	.....	.....	Q12150	**110.00**	.....	.....	.....	.....	.....	.....

Ampere Rating	22,000 A.I.C. SINGLE POLE 120/240V. ac Cat. No.	Price	TWO POLE COMMON TRIP 120/240V. ac Cat. No.	Price	THREE POLE COMMON TRIP 240V. ac Cat. No.	Price	42,000 A.I.C. TWO POLE COMMON TRIP 120/240V. ac Cat. No.	Price	65,000 A.I.C. Identification—Gray Handle SINGLE POLE 120/240V. ac Cat. No.	Price	TWO POLE COMMON TRIP 120/240V. ac Cat. No.	Price	THREE POLE COMMON TRIP 240V. ac Cat. No.	Price
15	▲QO115VH	**$15.60**	QO215VH	**$37.00**	QO315VH	**$95.00**	.....	....	▲QH115	**$29.00**	QH215	**$74.00**	QH315	**$129.00**
20	▲QO120VH	**15.60**	QO220VH	**37.00**	QO320VH	**95.00**	.....	....	▲QH120	**29.00**	QH220	**74.00**	QH320	**129.00**
25	QO125VH	**18.10**	QO225VH	**37.00**	QO325VH	**95.00**	.....	....	QH125	**29.00**	QH225	**74.00**	QH325	**129.00**
30	QO130VH	**18.10**	QO230VH	**37.00**	QO330VH	**95.00**	.....	....	QH130	**29.00**	QH230	**74.00**	QH330	**129.00**
35	.....	....	◆Q1235VH	**37.00**	◆Q1335VH	**95.00**	Q1H235	**$82.00**	.....	....	.....	....	.....	....
40	.....	....	◆Q1240VH	**37.00**	◆Q1340VH	**95.00**	Q1H240	**82.00**	.....	....	.....	....	.....	....
45	.....	....	◆Q1245VH	**37.00**	◆Q1345VH	**95.00**	Q1H245	**82.00**	.....	....	.....	....	.....	....
50	.....	....	◆Q1250VH	**37.00**	◆Q1350VH	**95.00**	Q1H250	**82.00**	.....	....	.....	....	.....	....
60	.....	....	◆Q1260VH	**37.00**	◆Q1360VH	**95.00**	Q1H260	**82.00**	.....	....	.....	....	.....	....
70	.....	....	◆Q1270VH	**58.00**	◆Q1370VH	**121.00**	Q1H270	**133.00**	.....	....	.....	....	.....	....
80	.....	....	◆Q1280VH	**83.00**	◆Q1380VH	**134.00**	Q1H280	**166.00**	.....	....	.....	....	.....	....
90	.....	....	◆Q1290VH	**83.00**	◆Q1390VH	**134.00**	Q1H290	**166.00**	.....	....	.....	....	.....	....
100	.....	....	◆Q12100VH	**83.00**	◆Q13100VH	**134.00**	Q1H2100	**166.00**	.....	....	.....	....	.....	....
110	.....	....	◆Q12110VH	**267.00**	.....	....	Q1H2110	**354.00**	.....	....	.....	....	.....	....
125	.....	....	◆Q12125VH	**267.00**	.....	....	Q1H2125	**354.00**	.....	....	.....	....	.....	....

✱UL Listed for use on 3 Ø grounded "B" systems (5,000 A.I.C. for this application).
●***High magnetic*** *trip breakers are recommended for area lighting (athletic fields, parking lots, outdoor signs, etc.) when using lamps of inherent high inrush current and individual dimmer applications.*
◆UL listed for use ahead of QO & Q1 10,000 A.I.C. breakers to permit their application at 22,000 amperes fault levels.
▲UL listed as SWD (switching duty) rated. Suitable for switching 120V. ac fluorescent lighting loads.
■Rated 120V. ac.
◐UL listed as HACR Type for use with air conditioning, heating and refrigerating equipment having motor group combinations.
✣May be used only as a **branch breaker** in 14" wide or wider load centers having 150 ampere or greater rating.



CIRCUIT LIMITING QOT TANDEM BREAKERS

QOT Tandem Breakers have a mounting cam as shown. Installation into a QO Load Center can only be made in those positions having a mounting pan rail slot. *Meets Par. 384-15 of N.E.C.* UL Listed as Class CTL.

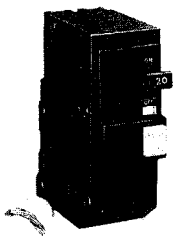
VISI-TRIP is a Registered Trademark of Square D Company.
I-75000 is a Trademark of Square D Company.

SQD SLV_000780

QO® CIRCUIT BREAKERS
FOR QO CIRCUIT BREAKER LOAD CENTERS
PLUG-ON CIRCUIT BREAKERS



Single Pole



Two Pole

Ampere Rating	QWIK-GARD CIRCUIT BREAKER WITH GROUND FAULT CIRCUIT INTERRUPTER					
	SINGLE POLE with VISI-TRIP Indicator 120V. ac				TWO POLE COMMON TRIP with VISI-TRIP Indicator 120/240V. ac	
	10,000 A.I.C.		22,000 A.I.C.		10,000 A.I.C.	
	1 Space Required		1 Space Required		2 Spaces Required	
	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
15	☆QO115GFI	$68.00	☆QO115VHGFI	$136.00	☆QO215GFI	$120.00
20	☆QO120GFI	68.00	☆QO120VHGFI	136.00	☆QO220GFI	120.00
25	☆QO125GFI	68.00	☆QO125VHGFI	136.00	☆QO225GFI	120.00
30	☆QO130GFI	68.00	☆QO130VHGFI	136.00	☆QO230GFI	120.00

☆QWIK-GARD Circuit Breakers provide QO overload and short circuit protection; combined with Class A ground fault protection.

Ampere Rating	SINGLE POLE KEY OPERATED		SWITCH NEUTRAL—COMMON TRIP N.E.C. 514-5				REPLACEMENT TANDEM BREAKERS For Use in Old Style Non-Class CTL QO Load Centers				TWO POLE COMMON TRIP Water Heater	
	QO with VISI-TRIP indicator 120V. ac Key Included		QO with VISI-TRIP indicator 2 Wire 120V. ac		QO with VISI-TRIP indicator 3 Wire 120/240V. ac		QO Single Pole Tandem 120/240V. ac		QO Two Pole Tandem Individual Trip 120/240V. ac		QO with VISI-TRIP indicator 120/240V. ac	
	10,000 A.I.C.		10,000 A.I.C.		10,000 A.I.C.		10,000 A.I.C.		10,000 A.I.C.		10,000 A.I.C.	
	1 Space Required		2 Spaces Required		3 Spaces Required		1 Space Required		2 Spaces Required		2 Spaces Required	
	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
15 & 15	.....	....	.....	....	.....	....	■QO1515	$17.60	QO21515	$35.00	.....	....
15 & 20	.....	....	.....	....	.....	....	■QO1520	17.60	QO21520	35.00	.....	....
30 & 30	.....	....	.....	....	.....	....	■QO2020	17.60	QO22020	35.00	.....	....
30 & 30	.....	....	.....	....	.....	....	QO3030	17.60	QO23030	35.00	.....	....
15	QO115K	$10.40	QO215SWN	$24.40	QO315SWN	$36.00	.....	....	.....	....	QO215WH	$19.40
20	QO120K	10.40	QO220SWN	24.40	QO320SWN	36.00	.....	....	.....	....	QO220WH	19.40
25	QO125K	10.40	.....	....	.....	....	.....	....	.....	....	.....	....
30	QO130K	10.40	QO230SWN	24.40	QO330SWN	36.00	.....	....	.....	....	QO230WH	19.40
40	.....	....	QO240SWN	24.40	.....	....	.....	....	.....	....	.....	....
50	.....	....	QO250SWN	24.40	.....	....	.....	....	.....	....	.....	....
60	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....
70	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....
100	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....

■Rated 120V. ac.

CIRCUIT BREAKER FACTORY INSTALLED ACCESSORIES
Requires Additional Single Pole Space



QO
1, 2 or 3 Pole



Q1
100 A. Max.
3 Pole
125 A. Max.
2 Pole

▲Factory Installed Accessories	Available on Breaker Type	Add Suffix To Breaker Cat. No.	List Price Adder	Accessory Terminal Wire Range
Shunt Trip	QO, Q1	1021 or 1042	$47.00	(2) 14-12CU
Auxiliary Switch "A" Contact	QO, GFI, Q1	1200	33.00	(2) 14-12CU
Auxiliary Switch "B" Contact	QO, GFI	1201	33.00	(2) 14-12CU
Alarm Switch	QO, GFI	2100	33.00	(2) 14-12CU

Shunt Trip—1042 operates on 24V. ac 50/60 Hz. or 12V. dc. Includes coil clearing contacts.

Shunt Trip—1021 operates on 120 to 240V. ac 50/60 Hz. Includes coil clearing contacts.

Auxiliary Switch "A" Contact—One contact only, opens when breaker is OFF or TRIPPED. 5 amps. maximum at 120V. ac 50/60 Hz.

Auxiliary Switch "B" Contact—One contact only, closed when breaker is OFF or TRIPPED. 5 amps. maximum at 120V. ac 50/60 Hz.

Alarm Switch—One contact only, closed when breaker is TRIPPED. 5 amps. maximum at 120V. ac 50/60 Hz.

▲Only one accessory per breaker. UL Listed.

For additional information, refer to page 68.

CIRCUIT BREAKER WIRE SIZES				
QO	QOT	Q1	Aluminum	Copper
★15-30	....	....	(2)#12-8 AWG	(2)#14-8 AWG
40-50	....	....	# 8-4 AWG	# 8-4 AWG
60-70	....	....	# 6-2 AWG	# 6-2 AWG
80-100	....	....	#4-2/0 AWG	#6-2/0 AWG
....	15-30	....	#12-8 AWG	#14-8 AWG
....	....	15-50	#12-4 AWG	#14-4 AWG
....	....	60-125	#4-2/0 AWG	#6-2/0 AWG
....	....	150	#1-4/0 AWG	#1-4/0 AWG

★QWIK-GARD circuit breaker lug will accept one wire only.

QWIK-GARD and VISI-TRIP are Registered Trademarks of Square D Company.

SQD SLV_000781

QO® CIRCUIT BREAKER LOAD CENTERS

MAIN LUGS ONLY

NEW — 14" WIDE DEVICES & COVERS

ORDER QO, QOT AND Q1 CIRCUIT BREAKERS FROM PAGES 2 AND 3.

Mains Rating Amps.	Spaces	▲Max. No. Single Poles	Type of Enclosure	Use With Branch Circuit Breakers	Basic Device— Box & Interior Only		Cover with Door (Order Separately)			Ground Bar Kit (Order Separately)		Main Wire Size AWG/MCM		Box No. See P.14, 15
					Catalog No.	Price	Flush	Surface	Price	Catalog No.	Price	Cu	Al	
1 PHASE—3 WIRE 120/240V. AC—UL LISTED—NO DOOR														
40	2	2	Indoor Indoor Rainproof	QO	QO2S✠ QO2F QO2RB	**$10.60** **13.10** **28.00**	COVER WITHOUT DOOR INCLUDED WITH BASIC DEVICE			PK3GTA-1	**$2.50**	14-6	12-6	1 2 1R
70	2	4	Indoor Rainproof	QO/QOT	QO2-4AF/S ★ QO2-4ARB	**16.70** **33.00**				PK4GTA	**2.60**	14-4	12-2	2 1R
100	6	12	Indoor Rainproof	QO/QOT	QO6-12F/S ★ QO6-12RB	**19.30** **36.00**				PK7GTA PK9GTA	**2.80** **3.20**	10-1	8-1	4 3R
125	8	16	Indoor Rainproof	QO/QOT & Q1	QO8-16F/S ★ QO8-16RB	**33.00** **60.00**				PK9GTA-1	**3.20**	14-2/0	12-2/0	6 4R
1 PHASE—3 WIRE 120/240V. AC—UL LISTED†														
100	6	12	Indoor Rainproof	QO/QOT	QO6-12DF/S ★ QO6-12RB	**23.10** **36.00**	Cover w/Door Included	.....	..	PK7GTA PK9GTA	**2.80** **3.20**	10-1	8-1	5 3R
125	8	16	Indoor Rainproof	QO/QOT & Q1	QO8-16DF/S ★ QO8-16RB	**36.00** **60.00**	Cover w/Door Included	.....	..	PK9GTA-1	**3.20**	14-2/0	12-2/0	6 4R
125	12	24	Indoor Rainproof	QO/QOT & Q1	QO12-24 QO12-24RB	**47.00** **88.00**	QOC12F	QOC12S	**$8.10** ..	PK15GTA	**4.00**	14-2/0	12-2/0	7 5R
125	16	24	Indoor Rainproof	QO/QOT & Q1	QO16-24W QO16-24RB	**63.00** **107.00**	QOC16WF	QOC16WS	**10.20** ..	PK15GTA	**4.00**	6-1		8 6R
125	20	24	Indoor Rainproof	QO/QOT & Q1	QO20-24W QO20-24RB	**83.00** **128.00**	QOC20WF	QOC20WS	**10.20** ..	PK15GTA	**4.00**	6-1		8 6R
150	12	24	Indoor Rainproof	QO/QOT & Q1	QO12-24HW QO12-24HRB	**62.00** **106.00**	QOC12HWF	QOC12HWS	**10.20** ..	PK15GTA	**4.00**	6-3/0		8 7R
150	16	30	Indoor Rainproof	QO/QOT & Q1	QO16-30HW QO16-30HRB	**78.00** **130.00**	QOC20HWF	QOC20HWS	**20.50** ..	PK18GTA	**4.50**	2-300		23 8R
150	20	30	Indoor Rainproof	QO/QOT & Q1	QO20-30HW QO20-30HRB	**81.00** **136.00**	QOC20HWF	QOC20HWS	**20.50** ..	PK18GTA	**4.50**	2-300		23 8R
200✻	8	16	Indoor Rainproof	QO/QOT & Q1	QO8-16HAW QO8-16HARB	**60.00** **102.00**	QOC8HAWF	QOC8HAWS	**10.20** ..	PK9GTA	**3.20**	4-3/0	4-250	8 7R
200	12	24	Indoor Rainproof	QO/QOT & Q1	QO12-24HAW QO12-24HARB	**78.00** **121.00**	QOC12HWF	QOC12HWS	**10.20** ..	PK15GTA	**4.00**	6-3/0	6-4/0	8 7R
200	16	30	Indoor Rainproof	QO/QOT & Q1	QO16-30HAW QO16-30HARB	**82.00** **155.00**	QOC20HWF	QOC20HWS	**20.50** ..	PK18GTA	**4.50**	2-300		23 8R
200	20	40	Indoor Rainproof	QO/QOT & Q1	QO20-40HAW QO20-40HARB	**106.00** **166.00**	QOC20HWF	QOC20HWS	**20.50** ..	PK23GTA	**5.00**	2-300		23 8R
200	30	40	Indoor Rainproof	QO/QOT & Q1	QO30-40W QO30-40RB	**118.00** **180.00**	QOC30WF	QOC30WS	**20.50** ..	PK23GTA	**5.00**	2-4/0		23 8R
225	42	42	Indoor Rainproof	QO/Q1	QO42W QO42RB	**182.00** **334.00**	QOC42WF	QOC42WS	**28.00** ..	PK23GTA	**5.00**	2-4/0		24 9R
400	☆12	12	Rainproof	QO/Q1	QO12KR	**471.00**	.....	.....	..	PK15GTA-6	**13.40**	(2) 2-600		17R
400	☆24	24	Indoor Rainproof	QO/Q1	QON24K ▪MH38 QO24KR	**229.00** **84.00** **529.00**	QOC24KF	QOC24KS	**36.00** ..	△PK27GTA PK15GTA-6	**8.00** **13.40**	(2) 2/0-500		19 11R
400	☆42	42	Indoor Rainproof	QO/Q1	QON42K ▪MH41 QO42KR	**291.00** **90.00** **583.00**	QOC42KF	QOC42KS	**47.00** ..	△PK27GTA PK15GTA-6	**8.00** **13.40**	(2) 2/0-500		20 11R
600	◆ 6	6	Rainproof	◐FA/Q2	HQ2-318-6R	**649.00**	.....	.....	..	PK0GTA-6	**9.40**	(2) 3/0-600		16R
600	☆24	24	Rainproof	QO/Q1	QO24LR	**649.00**	.....	.....	..	PK15GTA-6	**13.40**	(2) 2/0-500		11R
600	☆42	42	Rainproof	QO/Q1	QO42LR	**693.00**	.....	.....	..	PK15GTA-6	**13.40**	(2) 2/0-500		11R

★Cover included with device. Order F for Flush, S for Surface.
✻With 100 ampere sub-feed lugs.
☆Q1 Breakers thru 125A. requires same space as QO Breakers.
◆Two Pole Spaces only. If filler plate is needed order SSICP **$8.00** List.
◐Order FA or Q2 Two pole Breaker from pages 94, 95. Use B-C Phase Breaker for 1∅ 3W.
✠Will not accept QWIK-GARD Circuit Breaker.
Above listings thru 200A. Mains rating meet Federal Specification W-P-115a as Type I, Class 2.
†UL Listed for 3∅ Grounded "B" Systems 240V. ac rated.
△PK27GTA includes a #1 to 1/0 Cu/Al lug.
▲Maximum number of single pole branch circuits utilizing QO and/or QOT circuit breakers.

▪MH ENCLOSURES SOLD UNDER SCHEDULE G1-1 DISCOUNT.

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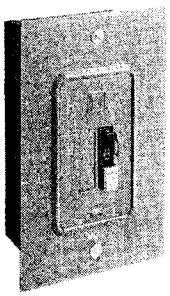
SQD SLV_000782

WIRING DIAGRAMS



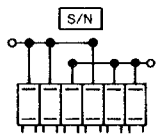
QO2F
with QWIK-GARD
Circuit Breaker Installed



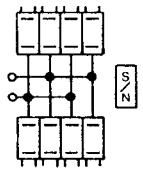
QO2F/S
QO2RB



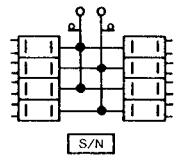
QO2-4AF/S
QO2-4ARB



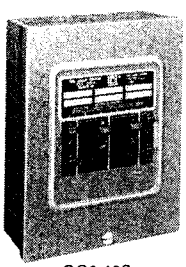
QO6-12F/S
QO6-12DF/S
QO6-12RB



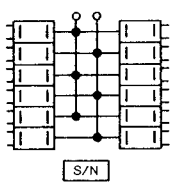
QO8-16F/S
QO8-16DF/S
QO8-16RB



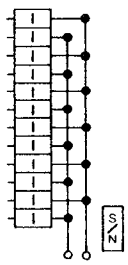
QO8-16HAW
QO8-16HARB



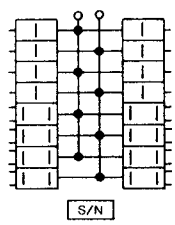
QO6-12S
with Breakers Installed



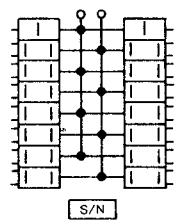
QO12-24
QO12-24HW
QO12-24HAW
QO12-24RB
QO12-24HRB
QO12-24HARB



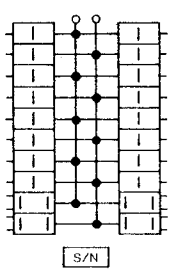
QO12KR



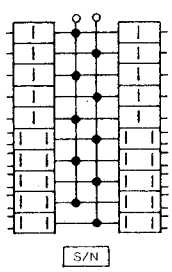
QO16-24W
QO16-24RB



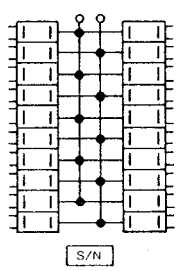
QO16-30HW
QO16-30HAW
QO16-30HRB
QO16-30HARB



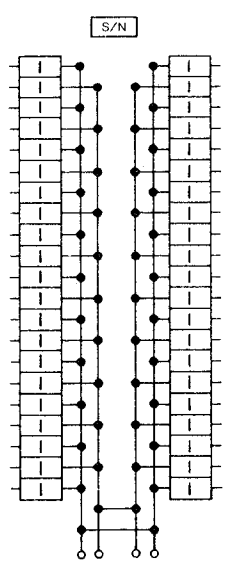
QO20-24W
QO20-24RB



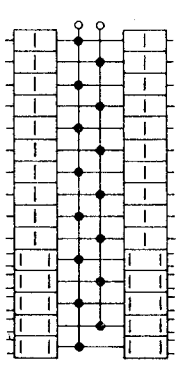
QO20-30HW
QO20-30HRB



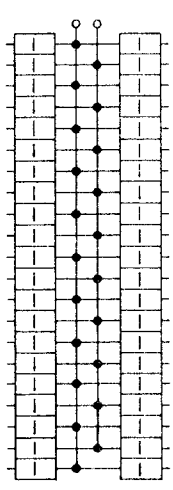
QO20-40HAW
QO20-40HARB



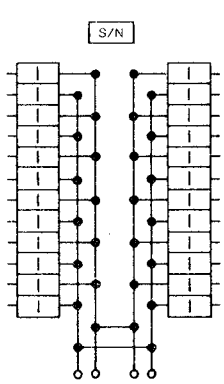
QON42K
QO42KR
QO42LR



QO30-40W
QO30-40RB



QO42W
QO42RB



QON42K
QO24KR
QO24LR

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QO® CIRCUIT BREAKER LOAD CENTERS

SINGLE MAIN DISCONNECT

NEW — 14" WIDE DEVICES AND COVERS

ORDER QO, QOT AND Q1 CIRCUIT BREAKERS FROM PAGES 2 AND 3.

Mains Rating Amps.	Spaces	▲Max. No. Single Poles	Type of Enclosure	Use With Branch Circuit Breakers	Basic Device— Box & Interior Only		Cover with Door (Order Separately)			Ground Bar Kit (Order Separately)		Main Wire Size AWG/MCM		Box No. See P.14, 15
					Catalog No.	Price	Flush	Surface	Price	Catalog No.	Price	Cu	Al	
1 PHASE—3 WIRE 120/240V. AC—MAIN CIRCUIT BREAKER INCLUDED—10,000 A.I.C. UL LISTED														
100	8	16	Indoor Rainproof	QO/QOT & Q1	QO8-16M QO8-16MRB	$81.00 121.00	QOC8MF	QOC8MS	$8.10	PK9GTA	$3.20	4—1		7 5R
100	12	20	Indoor Rainproof		QO12-20MW QO12-20MRB	97.00 140.00	QOC20MWF	QOC20MWS	10.20	PK12GTA	3.70			8 6R
100	14	20	Indoor Rainproof		QO14-20MW QO14-20MRB	100.00 144.00	QOC20MWF	QOC20MWS	10.20	PK12GTA	3.70			8 6R
100	16	20	Indoor Rainproof		QO16-20MW QO16-20MRB	105.00 146.00	QOC20MWF	QOC20MWS	10.20	PK12GTA	3.70			8 6R
100	20	20	Indoor Rainproof	QO/Q1	QO20MW QO20MRB	108.00 150.00	QOC20MWF	QOC20MWS	10.20	PK12GTA	3.70			8 6R
125	16	24	Indoor Rainproof	QO/QOT & Q1	QO16-24MW125 QO16-24MG125RB	170.00 234.00	QOC20MW225F	QOC20MW225S	24.20	PK15GTA	4.00	4—3/0		23 8R
125	20	24	Indoor Rainproof Rainproof		QO20-24MW125 QO20-24MG125RB ★QO20-24MGB125RB	190.00 249.00 249.00	QOC20MW225F	QOC20MW225S	24.20	PK15GTA	4.00			23 8R 8R
150◆	8	16	Rainproof		QO8-16M150FTRB	234.00	.....	.....	.....	PK15GTAL	7.50	2-3/0	1/0-250	8R
150	16	30	Indoor Rainproof		QO16-30MW150 QO16-30MG150RB	170.00 234.00	QOC20MW225F	QOC20MW225S	24.20	PK18GTA △PK27GTA	4.50 8.00	4—3/0		23 8R
150	20	30	Indoor Rainproof Rainproof		QO20-30MW150 QO20-30MG150RB ★QO20-30MGB150RB	190.00 249.00 249.00	QOC20MW225F	QOC20MW225S	24.20	PK18GTA △PK27GTA	4.50 8.00			23 8R 8R
150	30	30	Indoor Rainproof	QO/Q1	QO30MW150 QO30MG150RB	208.00 292.00	QOC30MW225F	QOC30MW225S	24.20	PK18GTA △PK27GTA	4.50 8.00			24 9R
200☆	8	16	Rainproof	QO/QOT & Q1	QO8-16M200FTRB	234.00	.....	.....	.....	PK15GTAL	7.50	2-3/0	1/0-250	8R
200	16	32	Indoor Rainproof		QO16-32MW200 QO16-32MG200RB	170.00 234.00	QOC20MW225F	QOC20MW225S	24.20	PK23GTA △PK27GTA	5.00 8.00	2/0-3/0	2/0-250	23 8R
200	20	40	Indoor Rainproof Rainproof		QO20-40MW200 QO20-40MG200RB ★QO20-40MGB200RB	190.00 249.00 249.00	QOC20MW225F	QOC20MW225S	24.20	PK23GTA △PK27GTA	5.00 8.00			23 8R 8R
200	30	40	Indoor Rainproof		QO30-40MW200 QO30-40MG200RB	238.00 316.00	QOC30MW225F	QOC30MW225S	24.20	PK23GTA △PK27GTA	5.00 8.00			24 9R
200	40	40	Indoor Rainproof	QO/Q1	QO40MW200 QO40MG200RB	282.00 363.00	QOC40MW225F	QOC40MW225S	24.20	PK23GTA △PK27GTA	5.00 8.00			25 10R
225	20	40	Indoor Rainproof	QO/QOT & Q1	QO20-40MW225 QO20-40MG225RB	190.00 249.00	QOC20MW225F	QOC20MW225S	24.20	PK23GTA △PK27GTA	5.00 8.00	3/0-300	250-300	23 8R
225	30	40	Indoor Rainproof		QO30-40MW225 QO30-40MG225RB	238.00 316.00	QOC30MW225F	QOC30MW225S	24.20	PK23GTA △PK27GTA	5.00 8.00			24 9R
225	40	40	Indoor Rainproof		QO40MW225 QO40MG225RB	282.00 363.00	QOC40MW225F	QOC40MW225S	24.20	PK23GTA △PK27GTA	5.00 8.00			25 10R
300	‡42	42	Indoor Rainproof	QO/Q1	QON42M300 ■MH53 QO42M300R	1233.00 113.00 1618.00	QOC42M400F	QOC42M400S	75.00	△PK27GTA PK15GTA-6	8.00 13.40	(1) 3/0-600 or (2) 3/0-250		21 14R
400†	30	40	Indoor		QO2X30-40F/S	382.00	Cover Included		.....	PK23GTA △PK27GTA	5.00 8.00	4-300		25
400	‡42	42	Indoor Rainproof		QON42M400 ■MH53 QO42M400R	1233.00 113.00 1618.00	QOC42M400F	QOC42M400S	75.00	△PK27GTA PK15GTA-6	8.00 13.40	(1) 3/0-600 or (2) 3/0-250		21 14R
600	‡42	42	Rainproof		QO42M600R	2163.00	.....	.....	.....	PK15GTA-6	13.40	(2) 3/0-500		14R
1 PHASE—3 WIRE 120/240V. AC—MAIN CIRCUIT BREAKER INCLUDED—22,000 A.I.C. UL LISTED FOR USE WITH 10,000 A.I.C. BRANCH BREAKERS														
100	20	20	Indoor	QO/Q1	QO20MWVH	142.00	QOC20MWF	QOC20MWS	10.20	PK12GTA	3.70	4—1		8
150◐	30	30	Indoor		QO30MW150VH	374.00	QOC30MVH225F	QOC30MVH225S	24.20	PK18GTA	4.50	4—3/0		24
200◐	40	40	Indoor		QO40MW200VH	448.00	QOC40MVH225F	QOC40MVH225S	24.20	PK23GTA	5.00	2/0-250		25

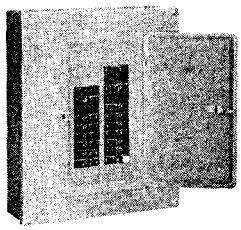
△PK27GTA includes a #1 to 1/0 Cu/Al lug.
‡Device uses double row bus construction. *Q1 Breakers thru 125A. require same space as QO Breakers.*
★Bottom feed rainproof device. For indoor devices see listing on page 16.

Above listings thru 200A. mains rating meet Federal Specification W-P-115a as Type 1, Class 2.
☆Includes 200A. feed through lugs.
◆Includes 150A. feed through lugs.
†Includes 200A. Main Circuit Breaker with provisions to mount a separate 200A. max. Q2L Circuit Breaker.
◐UL Listed for Grounded "B" Systems. 240V. ac 5,000 A.I.C. rated.
▲Maximum number of single pole branch circuits utilizing QO and/or QOT circuit breakers.

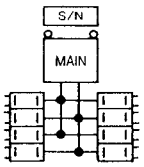
■MH ENCLOSURES SOLD UNDER SCHEDULE G1-1 DISCOUNT.

SQD SLV_000784

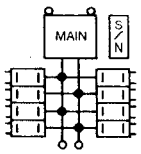
WIRING DIAGRAMS



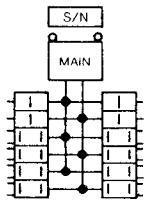
QO20MW with Surface Cover and Breakers Installed



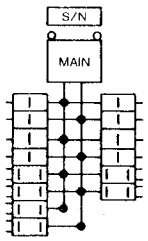
QO8-16M
QO8-16MRB



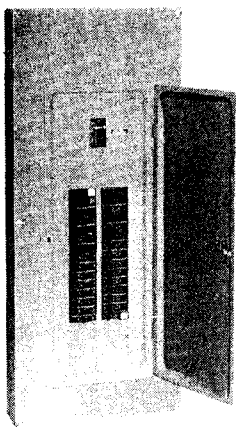
QO8-16M150FTRB
QO8-16M200FTRB



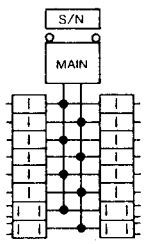
QO12-20MW
QO12-20MRB



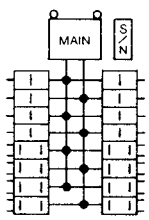
QO14-20MW
QO14-20MRB



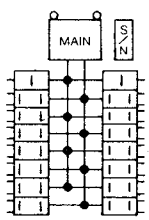
QO30MW150 with Surface Cover and Breakers Installed



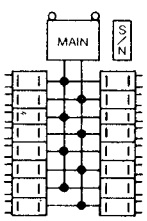
QO16-20MW
QO16-20MRB



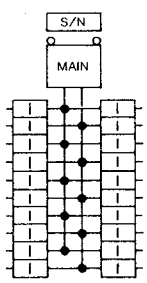
QO16-24MW125
QO16-24MG125RB



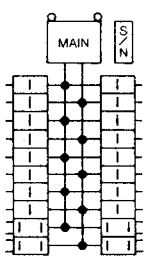
QO16-30MW150
QO16-30MG150RB



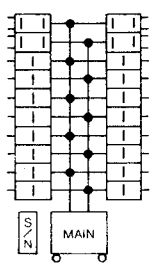
QO16-32MW200
QO16-32MG200RB



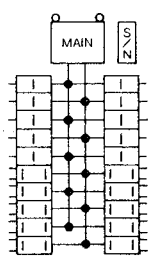
QO20MW
QO20MWVH
QO20MRB



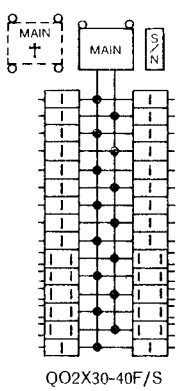
QO20-24MW125
QO20-24MG125RB



QO20-24MGB125RB

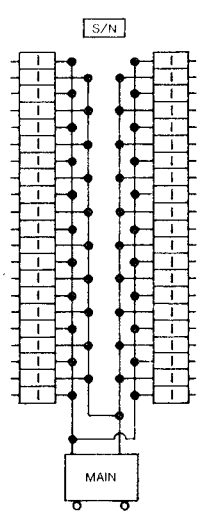


QO20-30MW150
QO20-30MG150RB

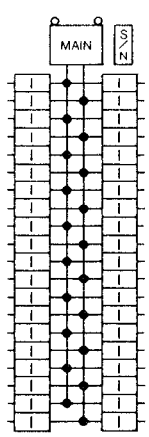


QO2X30-40F/S

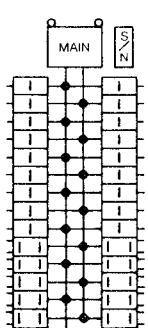
†Provisions for mounting a separate 200A. max. Q2L two pole circuit breaker.



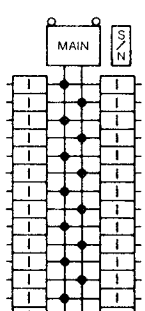
QON42M300
QON42M400
QO42M300R
QO42M400R
QO42M600R



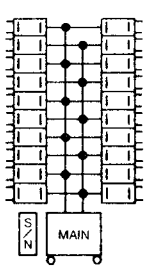
QO40MW200
QO40MW225
QO40MW200VH
QO40MG200RB
QO40MG225RB



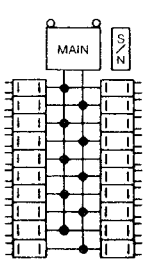
QO30-40MW200
QO30-40MW225
QO30-40MG200RB
QO30-40MG225RB



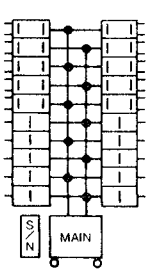
QO30MW150
QO30MW150VH
QO30MG150RB



QO20-40MGB200RB



QO20-40MW200
QO20-40MW225
QO20-40MG200RB
QO20-40MG225RB



QO20-30MGB150RB

QO® CIRCUIT BREAKER LOAD CENTERS — 3 PHASE — 4 WIRE 120/240V. AC

MAIN LUGS ONLY

NEW — 14" WIDE DEVICES AND COVERS

ORDER QO, QOT AND Q1 CIRCUIT BREAKERS FROM PAGES 2 AND 3. **UL LISTED**

Mains Rating Amps.	Spaces	▲Max. No. Single Poles	Type of Enclosure	Use With Branch Circuit Breakers	Basic Device— Box & Interior Only Catalog No.	Price	Cover with Door (Order Separately) Flush	Surface	Price	Ground Bar Kit (Order Separately) Catalog No.	Price	Main Wire Size AWG/MCM Cu	Al	Box No. See P.14,15
60	3	3	Indoor Rainproof	QO	QO403F/S ★ QO403RB	**$26.00** **43.00**	Cover w/o Door Incl. w/Device			PK4GTA	**$2.60**	10-4		3 2R
125	12	24	Indoor Rainproof	QO/QOT & Q1	QO412-24 QO412-24RB	**81.00** **121.00**	QOC12F	QOC12S	**$8.10**	PK15GTA	**4.00**	6-1		7 5R
125	20	30	Indoor Rainproof	QO/QOT & Q1	QO420-30W QO420-30RB	**116.00** **157.00**	QOC20WF	QOC20WS	**10.20**	PK18GTA	**4.50**	10-1		8 6R
200	12	24	Indoor Rainproof	QO/QOT & Q1	QO412-24HAW QO412-24HARB	**109.00** **155.00**	QOC12HWF	QOC12HWS	**10.20**	PK15GTA	**4.00**	6-3/0	6-4/0	8 7R
200	30	40	Indoor Rainproof	QO/QOT & Q1	QO430-40W QO430-40RB	**154.00** **210.00**	QOC30WF	QOC30WS	**20.50**	PK23GTA	**5.00**	4-3/0	2-4/0	23 8R
225	42	42	Indoor Rainproof	QO/Q1	QO442W QO442RB	**210.00** **378.00**	QOC42WF	QOC42WS	**28.00**	PK23GTA	**5.00**	4-2/0		24 9R
400	☆24	24	Rainproof	QO/Q1	QO424KR	**543.00**				PK15GTA-6	**13.40**			11R
400	☆42	42	Indoor Rainproof	QO/Q1	QON442K ▪MH41 QO442KR	**338.00** **90.00** **622.00**	QOC42KF	QOC42KS	**47.00**	△PK27GTA PK15GTA-6	**8.00** **13.40**	(2) 2/0-500		20 11R
600	◆ 6	6	Rainproof	◐FA/Q2	HQ2-418-6R	**694.00**				PK0GTA-6	**9.40**	(2) 3/0-600		16R

SINGLE MAIN DISCONNECT

NEW — 14" WIDE DEVICES & COVERS

ORDER QO, QOT AND Q1 CIRCUIT BREAKERS FROM PAGES 2 AND 3. **UL LISTED**

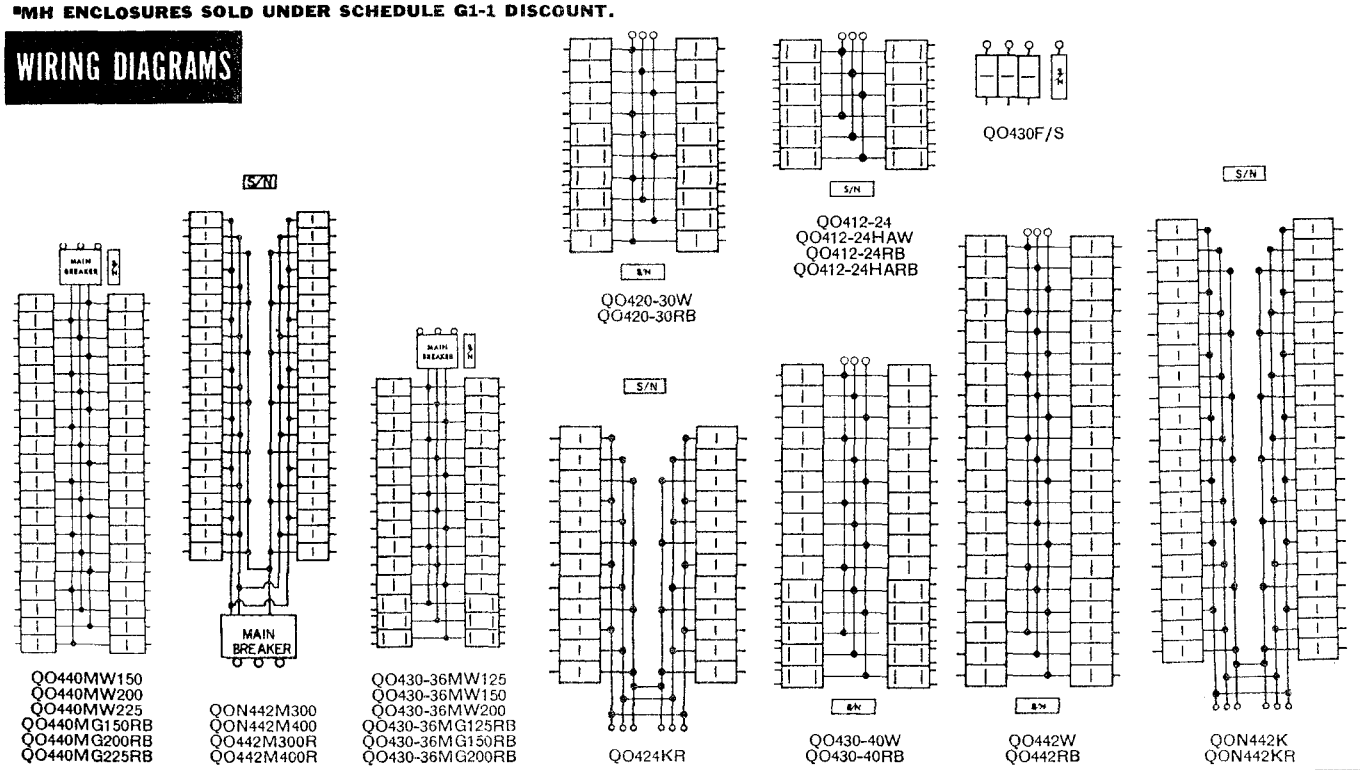
125	30	36	Indoor Rainproof	QO/QOT & Q1	QO430-36MW125 QO430-36MG125RB	**472.00** **550.00**	QOC30MW225F	QOC30MW225S	**24.20**	PK23GTA	**5.00**	4—3/0		24 9R
150	30	36	Indoor Rainproof	QO/QOT & Q1	QO430-36MW150 QO430-36MG150RB	**472.00** **550.00**	QOC30MW225F	QOC30MW225S	**24.20**	PK23GTA △PK27GTA	**5.00** **8.00**	4—3/0		24 9R
150	40	40	Indoor Rainproof	QO/Q1	QO440MW150 QO440MG150RB	**519.00** **598.00**	QOC40MW225F	QOC40MW225S	**24.20**	PK23GTA △PK27GTA	**5.00** **8.00**	4—3/0		25 10R
200	30	36	Indoor Rainproof	QO/QOT & Q1	QO430-36MW200 QO430-36MG200RB	**472.00** **550.00**	QOC30MW225F	QOC30MW225S	**24.20**	PK23GTA △PK27GTA	**5.00** **8.00**	2/0-3/0	2/0-250	24 9R
200	40	40	Indoor Rainproof	QO/Q1	QO440MW200 QO440MG200RB	**519.00** **598.00**	QOC40MW225F	QOC40MW225S	**24.20**	PK23GTA △PK27GTA	**5.00** **8.00**	2/0-3/0	2/0-250	25 10R
225	40	40	Indoor Rainproof	QO/Q1	QO440MW225 QO440MG225RB	**519.00** **598.00**	QOC40MW225F	QOC40MW225S	**24.20**	PK23GTA △PK27GTA	**5.00** **8.00**	3/0-300	250-300	25 10R
300	☆42	42	Indoor Rainproof	QO/Q1	QON442M300 ▪MH53 QO442M300R	**1429.00** **113.00** **1809.00**	QOC42M400F	QOC42M400S	**75.00**	△PK27GTA PK15GTA-6	**8.00** **13.40**	(1) 3/0-600 or (2) 3/0-250		21 14R
400	☆42	42	Indoor Rainproof		QON442M400 ▪MH53 QO442M400R	**1429.00** **113.00** **1809.00**	QOC42M400F	QOC42M400S	**75.00**	△PK27GTA PK15GTA-6	**8.00** **13.40**	(1) 3/0-600 or (2) 3/0-250		21 14R

★Cover included with device. *Order F for Flush, S for Surface.*
☆Q1 Breakers thru 125A. requires same space as QO Breakers.
◆Two Pole Spaces only. If filler plate is needed order SSICP **$8.00** List.
▲Maximum number of single pole branch circuits utilizing QO and/or QOT circuit breakers.
Above listings thru 200A. Mains rating meet Federal Specification W-P-115a as Type I, Class 2.

◐*Order FA or Q2 Two pole Breaker from pages 94, 95.*
Use A-B, B-C, or AC to balance loads on 3Ø 4W.
△PK27GTA includes a #1 to 1/0 Cu/Al lug.

▪MH ENCLOSURES SOLD UNDER SCHEDULE G1-1 DISCOUNT.

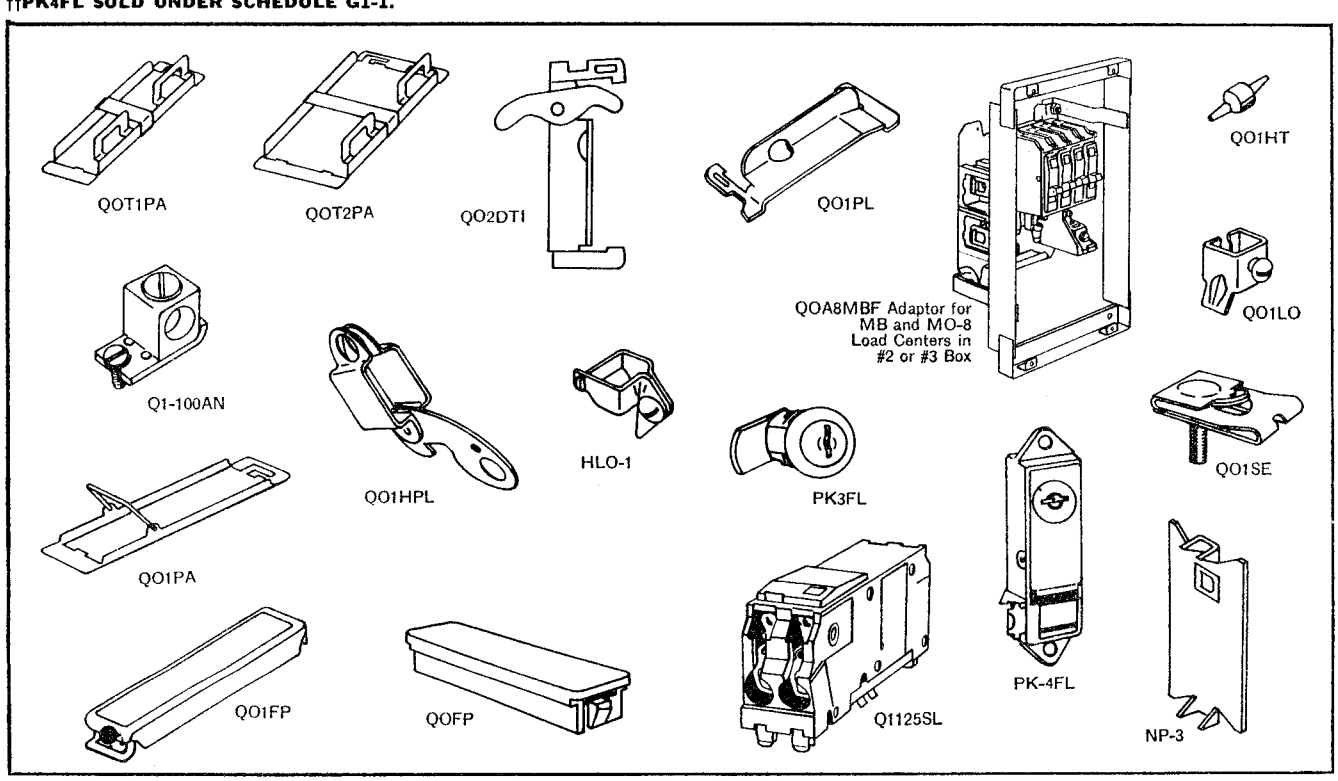
WIRING DIAGRAMS



SQD SLV_000786

Description	Catalog Number	Price
Plug-on 2 pole sub-feed lugs 60 Amp.—2 spaces required 125 Amp.—4 spaces required	 QO60SL Q1125SL	 **$10.90** **33.00**
Load Center Neutral Lug: Field installed for #1 to #1/0 Cu/Al wire	Q1-100AN	**2.50**
Load Center Ground Bar Kit: Standard PK15GTA with a #1 to 4/0 Cu/Al Lug	PK15GTA-L	**7.50**
Load Center Ground Bar Kit: Standard PK18GTA with a #1 to 4/0 Cu/Al Lug	PK18GTA-L	**8.10**
Load Center Ground Bar Kit: Standard PK23GTA with a #1 to 4/0 Cu/Al Lug	PK23GTA-L	**8.70**
Handle Tie: Convert any two adjacent single pole QO or QOT poles to independent trip two pole	◆QO1HT	**.80**
Filler Plate: Fills opening in blanked out type covers and covers with 20 or less shutter type twistouts if twistout is removed in error	QO1FP	**.80**
Filler Plate: Fills opening in covers with 24 or more shutter type and not shutter type twistout if twistout is removed in error	QOFP	**.80**
Handle Lock-Off: Clip for fixing QO single pole handle in "ON" or "OFF" position	QO1LO	**.90**
Handle Lock-Off: Clip for fixing QO, QOT or Q1 either 1, 2 or 3 pole breaker handles in "ON" or "OFF" position	HLO-1	**2.30**
Handle Padlock Attachment: For padlocking one pole QO breaker in "ON" or "OFF" position	QO1PA	**2.50**
Handle Padlock Attachment: For padlocking one pole QOT breaker in "ON" or "OFF" position	QOT1PA	**3.20**
Handle Padlock Attachment: For padlocking two pole QOT breaker in "ON" or "OFF" position	QOT2PA	**4.00**
Handle Padlock Attachment: For 2 and 3 pole QO and Q1 breakers which require padlocking in either "ON" or" OFF" position. Loose Attachment Fixed Attachment	 QO1HPL QO1PL	 **2.50** **2.50**
Flush Lock: Use on most indoor QO load centers thru 225 Amp. to convert door from spring catch to lock type. (New style round knockout)	✱PK3FL	**21.00**
Flush Lock: Use on 300 Amp. & 400 Amp. QO load centers to convert door from spring catch to lock type	††PK4FL	**21.00**
Sealing Ear: Provides means of sealing trim mounting screws on QO load center covers	QO1SE	**.80**
QO Replacement Interior Adaptor: For replacing obsolete multi-breaker type "MB" and "MO-8" interiors in #2 or #3 box (11⅛" H. x 6⅝" W. x 3⅜" D.). Kit consists of QO8-16 interior assembly (125 Amp. Mains), 4—QO120 breakers, interior mounting frame and flush/surface cover combination	QOA8MBF	**88.00**
Mechanical Interlock Attachment: For interlocking the handles of two 2 pole or one 2 pole and one 1 pole QO breakers mounted side-by-side so that only one breaker can be "ON" at a time	QO2DTI	**5.70**
Nail Plate: Use to protect cable wiring thru holes bored in studs against driven nails or screws.	Display Package Quantity—500 per carton Bulk Package Quantity —500 per carton	▲NP-3 **.30** each ◐NP-3B **.10** each

▲Display carton of 500 contains 20 plastic display bags each with 25 NP-3. Display carton quantity is minimum order quantity.
◐Bulk Pack contains 500 individual pieces. Minimum order quantity is bulk package quantity and orders must be in multiples of bulk package quantities.
◆Can not be installed on 15 and 20 ampere QOT-tandem and QO replacement tandem breakers.
✱OO6-12D F/S; QO8-16D F/S; and OOC40MW225 F/S do not have provisions for field installed lock.
††PK4FL SOLD UNDER SCHEDULE G1-1.



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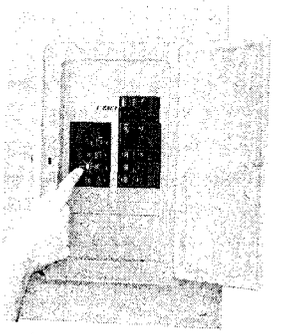
QO® CIRCUIT BREAKER LOAD CENTERS
FOR QO AND Q1 CIRCUIT BREAKERS ONLY

QOT TANDEM CIRCUIT BREAKERS CANNOT BE INSTALLED



This line of QO Load Centers is specifically designed for use in those areas prohibiting the use of tandem type breakers having two poles per single case. Devices listed below accept plug-on QO and Q1 circuit breakers only (one pole per case). Tandem type QOT circuit breakers are physically rejected and cannot be installed.

ORDER QO AND Q1 CIRCUIT BREAKERS FROM PAGES 2 AND 3.

MAIN LUGS ONLY — NEW — 14" WIDE DEVICES AND COVERS

1 PHASE—3 WIRE 120/240V. AC UL LISTED†

Mains Rating Amp.	Spaces and Max. No. Single Poles	Type of Enclosure	Basic Device Box & Interior Only		Cover With Door (Order Separately)			Ground Bar Kit (Order Separately)		Main Wire Size AWG/MCM		Box No. See Pages 14, 15
			Cat. No.	Price	Flush	Surface	Price	Cat. No.	Price	CU	AL	
125	12	Indoor Rainproof	QO12 QO12RB	$31.00 62.00	QOC12F	QOC12S	$8.10	PK9GTA	$3.20	14-2/0	12-2/0	7 5R
125	16	Indoor Rainproof	QO16W QO16RB	44.00 86.00	QOC16WF	QOC16WS	10.20	PK12GTA	3.70	6-1/0		8 6R
125	20	Indoor Rainproof	QO20W QO20RB	61.00 107.00	QOC20WF	QOC20WS	10.20	PK12GTA	3.70	6-1		8 6R
150	30	Indoor Rainproof	QO30HW QO30HRB	88.00 148.00	QOC30WF	QOC30WS	20.50	PK18GTA	4.50	2-3/0		23 8R
200	30	Indoor Rainproof	QO30HAW QO30HARB	106.00 167.00	QOC30WF	QOC30WS	20.50	PK18GTA	4.50	2-4/0		23 8R
225	42	Indoor Rainproof	QO42W QO42RB	182.00 334.00	QOC42WF	QOC42WS	28.00	PK23GTA	5.00			24 9R

SINGLE MAIN BREAKER — NEW — 14" WIDE DEVICES AND COVERS

1 PHASE—3 WIRE 120/240V. AC—MAIN CIRCUIT BREAKER INCLUDED—10,000 A.I.C. UL LISTED

Mains Rating Amp.	Spaces and Max. No. Single Poles	Type of Enclosure	Basic Device Box and Interior Only		Cover With Door (Order Separately)			Ground Bar Kit (Order Separately)		Main Wire Size AWG/MCM		Box No. See Pages 14, 15
			Cat. No.	Price	Flush	Surface	Price	Cat. No.	Price	CU	AL	
100 A. Breaker	12	Indoor Rainproof	QO12MW QO12MRB	$78.00 118.00	QOC20MWF	QOC20MWS	$10.20	PK9GTA	$3.20	4-1		8 6R
100 A. Breaker	16	Indoor Rainproof	QO16MW QO16MRB	88.00 131.00	QOC20MWF	QOC20MWS	10.20	PK12GTA	3.70			8 6R
100 A. Breaker	20	Indoor Rainproof	QO20MW QO20MRB	108.00 150.00	QOC20MWF	QOC20MWS	10.20	PK12GTA	3.70			8 6R
150 A. Breaker	30	Indoor Rainproof	QO30MW150 QO30MG150RB	208.00 292.00	QOC30MW225F	QOC30MW225S	24.20	PK18GTA	4.50	4-3/0		24 9R
200 A. Breaker	30	Indoor Rainproof	QO30MW200 QO30MG200RB	216.00 301.00	QOC30MW225F	QOC30MW225S	24.20	PK18GTA	4.50	2/0-3/0	2/0-250	24 9R
200 A. Breaker	40	Indoor Rainproof	QO40MW200 QO40MG200RB	282.00 363.00	QOC40MW225F	QOC40MW225S	24.20	PK23GTA	5.50			25 10R

SPLIT BUS

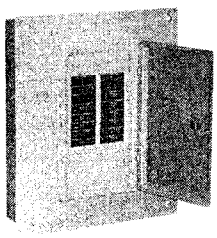
1 PHASE—3 WIRE 120/240V. AC UL LISTED—PARALLEL MAINS

Mains Rating Amp.	Main Section 2 Pole Spaces		Lighting Section 1 Pole Spaces	Type of Enclosure	Box, Interior and Cover* With Door		Ground Bar Kit (Order Separately)		Main Wire Size AWG/MCM		Box No. See Pages 14, 15
	Lighting Main	Branch	Maximum No. Single Poles		Cat. No.	Price	Cat. No.	Price	CU	AL	
125	1	3	12	Indoor Rainproof	QO20-412WF/S QO20-412RB	$63.00 96.00	PK9GTA	$3.20	10-1		8 6R
125	1	5	14	Indoor Rainproof	QO26-614F/S QO26-614RB	95.00 118.00	PK12GTA	3.70	2-3/0		9 8R
150	1	5	14	Indoor Rainproof	QO26-614HF/S QO26-614HRB	109.00 140.00	PK12GTA	3.70			9 8R
200	1	5	14	Indoor Rainproof	QO26-614HAF/S QO26-614HARB	126.00 156.00	PK12GTA	3.70	4-3/0	2-4/0	9 8R

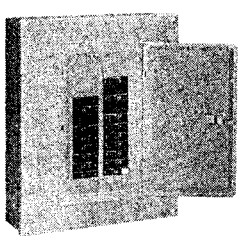
*Cover included with device. Order F for Flush, S for Surface.
†UL Listed for 3Ø Grounded "B" Systems. 240 V. ac rated.
Above listings thru 200 A. Mains Rating meet Federal Specification W-P-115a as Type I, Class 2.

SQD SLV_000788

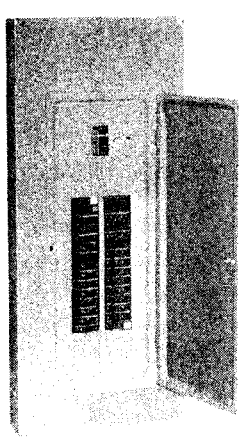
WIRING DIAGRAMS



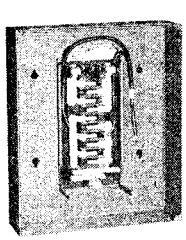
QO20W with Flush Cover and Breakers Installed



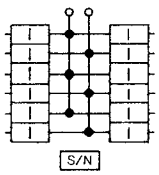
QO20MW with Surface Cover and Breakers Installed



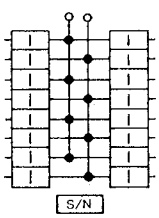
QO30MW200 with Surface Cover Installed



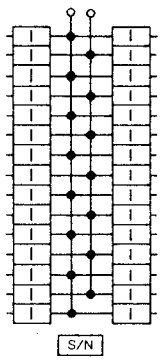
QO20-412W



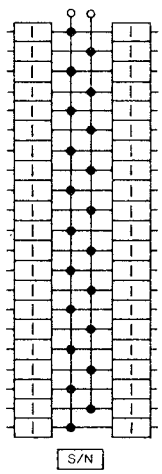
QO12
QO12RB



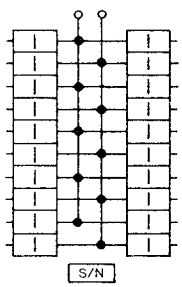
QO16W
QO16RB



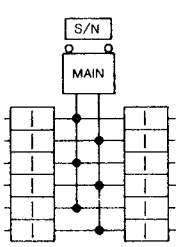
QO30HW
QO30HAW
QO30HRB
QO30HARB



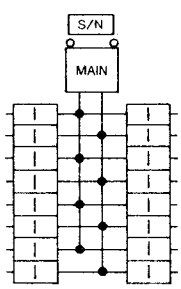
QO42W
QO42RB



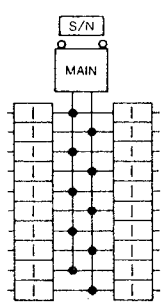
QO20W
QO20RB



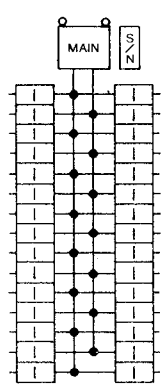
QO12MW
QO12MRB



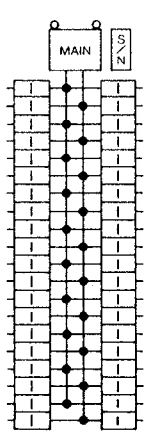
QO16MW
QO16MRB



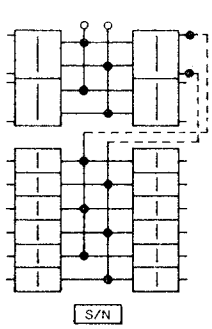
QO20MW
QO20MRB



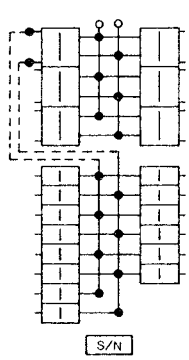
QO30MW150
QO30MW200
QO30MG150RB
QO30MG200RB



QO40MW200
QO40MG200RB



QO20-412WF/S
QO20-412RB



QO26-614F/S
QO26-614HF/S
QO26-614HAF/S
QO26-614RB
QO26-614HRB
QO26-614HARB

QO® CIRCUIT BREAKER LOAD CENTERS

SPLIT BUS

1 PHASE—3 WIRE 120/240V. AC UL LISTED PARALLEL MAINS
ORDER QO, QOT AND Q1 CIRCUIT BREAKERS FROM PAGES 2 AND 3.

NEW — 14″ WIDE DEVICES

Mains Rating Amperes	Main Section 2 Pole Spaces: Lighting Main	Main Section 2 Pole Spaces: Branch	Lighting Section: 1 Pole Spaces	Lighting Section: ▲Max. No. Single Poles	Type Enclosure	Use with Branch Circuit Breakers	Box, Interior and Cover ★ with Door: Cat. No.	Box, Interior and Cover ★ with Door: Price	Ground Bar Kit (Order Separately): Cat. No.	Ground Bar Kit (Order Separately): Price	Main Wire Size AWG/MCM: CU	Main Wire Size AWG/MCM: AL	Box No. See P. 14, 15
125	1	3	8	14	Indoor Rainproof	QO/QOT/Q1	QO4X8-14WF/S QO4X8-14RB	$ 63.00 95.00	PK12GTA	$3.70	6-1/0		8 6R
125	1	3	12	12	Indoor Rainproof	QO/Q1	QO20-412WF/S QO20-412RB	63.00 96.00	PK9GTA	3.20	10-1/0		8 6R
125	1	5	8	14	Indoor Rainproof	QO/QOT/Q1	QO6X8-14WF/S QO6X8-14RB	93.00 124.00	PK12GTA	3.70	6-1/0		8 6R
150	2	4	12	22	Indoor		QO6X12-22F/S	112.00	PK18GTA	4.50	2-3/0		9
150	1	5	14	14	Indoor Rainproof	QO/Q1	QO26-614HF/S QO26-614HRB	109.00 140.00	PK12GTA	3.70			9 8R
150	2	4	18	26	Indoor Rainproof	QO/QOT/Q1	QO6X18-26F/S QO6X18-26RB	140.00 180.00	PK18GTA	4.50			9 8R
200	1◐	4	10	20	Indoor Rainproof		QO5X10-20F/S QO5X10-20RB	186.00 222.00	PK15GTA	4.00	4-3/0	2-4/0	9 8R
200	1	5	12	24	Indoor Rainproof		QO6X12-24HAF/S QO6X12-24HARB	148.00 205.00	PK18GTA	4.50	6-3/0	6-4/0	23 8R
200	1	5	14	14	Indoor Rainproof	QO/Q1	QO26-614HAF/S QO26-614HARB	126.00 156.00	PK12GTA	3.70	4-3/0	2-4/0	9 8R
200	2	4	18	26	Indoor Rainproof	QO/QOT/Q1	QO6X18-26AF/S QO6X18-26ARB	156.00 194.00	PK18GTA	4.50	4-3/0	2-250	9 8R

▲Maximum number of single pole branch circuits utilizing QO and/or QOT circuit breakers.

AUXILIARY GUTTERS

UL LISTED FOR USE WITH STANDARD LOAD CENTERS FOR RISER APPLICATIONS

Catalog Number	Cover	Conduit Riser Size	Price	Width	Height	Depth
QOAG17	Flush	2½ or △3	$52.00	13.63	17.13	3.75
QOAG26	Flush	2½ or △3	70.00	13.63	26.13	3.75
QOAG34	Flush	4	94.00	16.14	34.13	5.75

△When used with B300 Bolt-on Hub.

TAP KITS

120/240V. AC—UL LISTED FOR USE WITH AUXILIARY GUTTERS ABOVE.

‡Catalog Number	Use with Auxiliary Gutter Cat. No.	Riser Wire: Lug Type	Riser Wire: Cu/Al Wire Size	Tap Off Wire: Lug Type	Tap Off Wire: Cu/Al Wire Size	Price Each
QOGT300-20	QOAG17 QOAG26	Mechanical (Included)	(2) #6-300MCM	Mechanical (Included)	(1) #6-2/0	$14.40
QOGT300-300	QOAG17 QOAG26	Mechanical (Included)	(2) #6-300MCM	Mechanical (Included)	(1) #6-300MCM	22.70
QOGT500-20	QOAG26	Mechanical (Included)	(2) #3/0-500MCM	Mechanical (Included)	(1) #6-2/0	32.00
QOGT750-300	QOAG34	Mechanical (Included)	(2) #3/0-750MCM	Mechanical (Included)	(1) #6-300MCM	44.00
QOGT-300C-10C	QOAG17 QOAG26	Anderson #VCEL-030-516H1 (Not Included)	(2) #4-300MCM	Anderson #VCEL-021-14S1 (Not Included)	(1) #8-1/0	11.40
QOGT300C-300C	QOAG17 QOAG26	Anderson #VCEL-030-516H1 (Not Included)	(2) #4-300MCM	Anderson #VCEL-030-516H1 (Not Included)	(1) #4-300MCM	15.70
QOGT500C-10C	QOAG26	Anderson #VCEL-050-12H1 (Not Included)	(2) #2/0-500MCM	Anderson #VCEL-021-14S1 (Not Included)	(1) #8-1/0	18.40
QOGT750C-300C	QOAG34	Anderson #VCEL:075-12H1 (Not Included)	(2) 500-750MCM-AL (2) 500MCM-CU	Anderson #VCEL-030-516H1 (Not Included)	(1) #4-300MCM	24.20
QOGL-20	QOAG17 QOAG26	Mechanical (Included)	(2) #6-2/0	.....	.....	9.40

‡ONE TAP KIT REQUIRED FOR EACH RISER WIRE

RISER PANEL

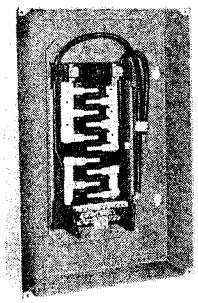
UL LISTED—ORDER QO, QOT AND Q1 CIRCUIT BREAKERS FROM PAGES 2 AND 3.

Mains Rating	Spaces	▲Max. No. Single Poles	Use With Branch Circuit Breakers	Box Only: Cat. No.	Box Only: Price	Interior Only: Cat. No.	Interior Only: Price	Flush Cover With Door: Cat. No.	Flush Cover With Door: Price	Ground Bar Kit (Order Separately): Cat. No.	Ground Bar Kit (Order Separately): Price	Main Wire Size AWG/MCM: CU	Main Wire Size AWG/MCM: AL	Box No. See P. 14, 15
1 PHASE—3 WIRE 120/240V. AC—MAIN LUGS ONLY														
†100	6	12	QO QOT	QOB6WG	$ 18.40	QON6-12WG	$18.70	QOC6WGF	$18.40	PK9GTA	$3.20	10-1	8-1	14
†125	8	16	QO QOT & Q1	QOB12WG	23.40	QON8-16WG	23.40	QOC12WGF	23.40	PK15GTA	4.00	14-2/0	12-2/0	15
	12	24				QON12-24WG	43.00			PK15GTA	4.00			
*225	12	24		QO12-24FT225F	156.00	Included	....	Included	....	PK15GTA-FT	11.20	6-300		9
3 PHASE—4 WIRE 120/240V. AC—MAIN LUGS ONLY														
*120	12	12	QO/Q1	QO412FT120WF	160.00	Included	....	Included	....	PK9GTA-FT	11.20	10-1/0		8
*225	12	24	QO QOT & Q1	QO412-24FT225F	189.00	Included	....	Included	....	PK15GTA-FT	11.20	6-300		22

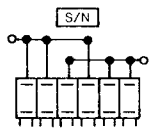
★Cover included with device. Order F for Flush, S for Surface.
◐Includes 100 amp lighting main factory installed.
†Extended side gutter type.
*Feed-thru type. Cover included with device.
▲Maximum number of single pole branch circuits utilizing QO and/or QOT circuit breakers.
Above listings thru 200 A. Mains rating meet Federal Specification W-P-115a as Type 1, Class 2.

SQD SLV_000790

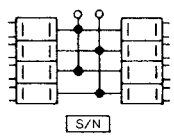
WIRING DIAGRAMS



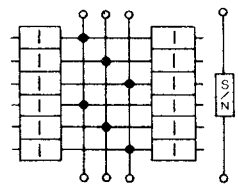
QO6X8-14W with Cover Removed



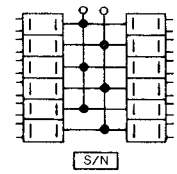
QON6-12WG



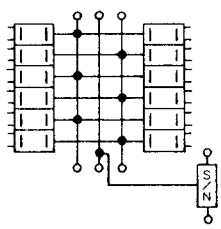
QON8-16WG



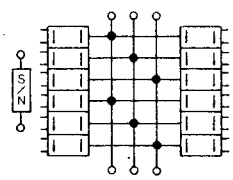
QO412FT120WF



QON12-24WG



QO12-24FT225F



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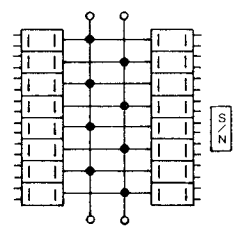

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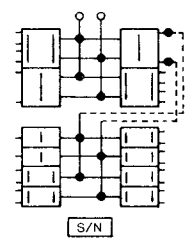
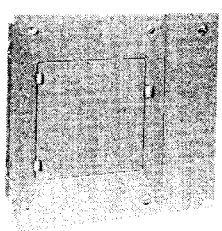
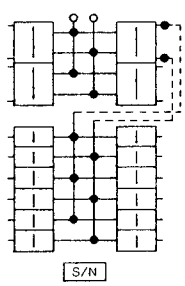


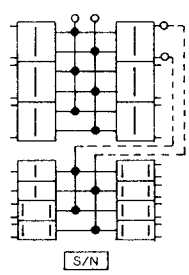
QO4X8-14WF/S
QO4X8-14RB



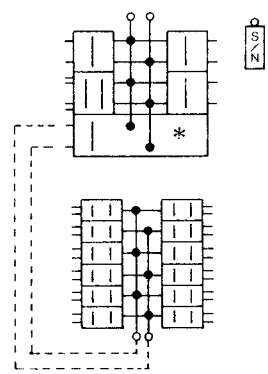
QOB6WG
with QOC6WGF Installed



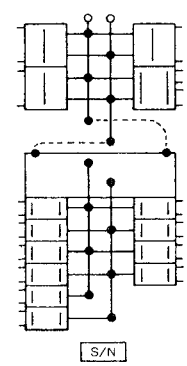
QO20-412WF/S
QO20-412RB



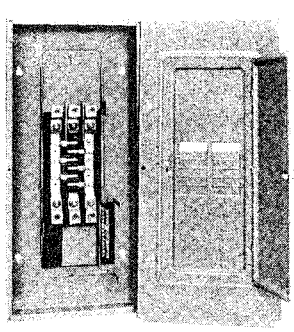
QO6X8-14WF/S
QO6X8-14RB



QO6X12-24HAF/S
QO6X12-24HARB
*Q1 or QO Lighting Main



QO5X10-20F/S
QO5X10-20RB



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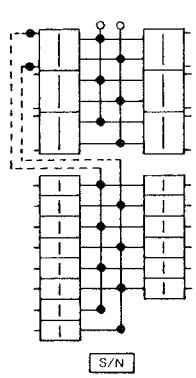
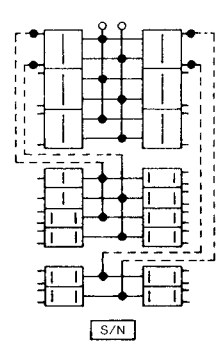
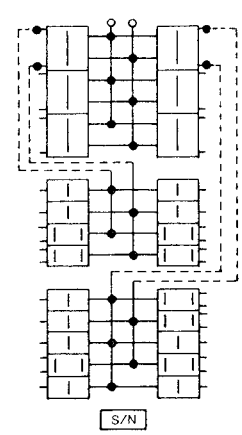


QO26-614HF/S
QO26-614HAF/S
QO26-614HRB
QO26-614HARB



QO6X12-22F/S



QO6X18-26F/S
QO6X18-26AF/S
QO6X18-26RB
QO6X18-26ARB

KNOCKOUTS

	KNOCKOUTS															
Symbol	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	W	X
Size	7/32	1/2	1/2	1/2	1/2	3/4	1	1	1 1/4	1 1/2	2	1 1/4	1 1/4	2 1/2	3/4	1	1 1/2
	..	..	3/4	3/4	3/4	1	1 1/4	1 1/4	1 1/2	2	2 1/2	1 1/2	1 1/2	3	1	1 1/4	2
	..	..	..	1	1	1 1/4	1 1/2	2	2	2 1/2	3	2	2	3 1/2	...	1 1/2	2 1/2
	..	..	..	...	1 1/4	1 1/2	2	2 1/2	2 1/2	3	3 1/2	2 1/2	2 1/2	4	...	2	3
	..	..	..	...	...	...	...	...	...	...	...	3	3	...	...	2 1/2	3 1/2
	..	..	..	...	...	...	...	...	...	...	...	...	3 1/2	...	...	3	4

Box No.	W	H	D
1	3.81	6.69	3.00
2	4.81	8.56	3.19
3	7.13	9.13	3.31
4	7.38	9.89	3.31
5	7.38	9.89	3.80
6	8.63	12.38	3.63
7	11.38	14.13	3.80
8	14.13	17.13	3.80
9	12.13	26.13	3.80
10	12.13	30.63	3.80
11	12.13	34.13	3.89
12	14.13	35.63	4.19
13	14.13	40.13	4.19
14	10.75	9.88	3.88
15	15.13	14.13	3.88
16	5.88	12.38	3.38
17	9.63	16.75	4.75
18	11.38	19.63	3.81
19	20.00	38.00	5.75
20	20.00	41.00	5.75
21	20.00	53.00	5.75
22	14.00	26.00	3.80
23	14.13	26.00	3.80
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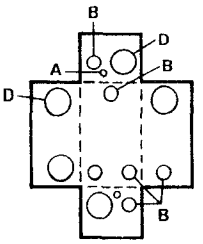
27	7.80	16.62	4.00



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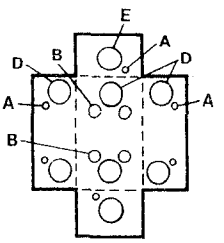

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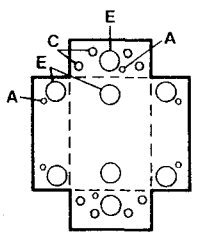
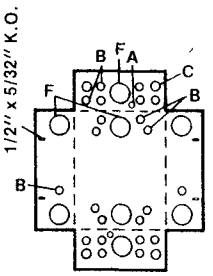
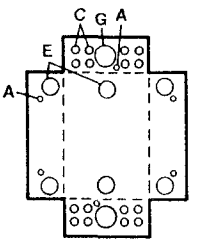


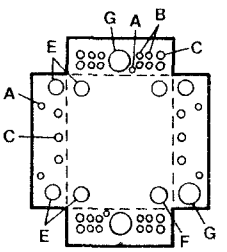
Box 3



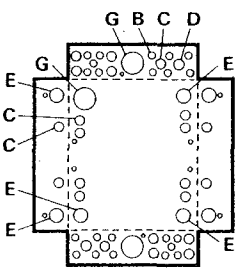
Box 4, 5



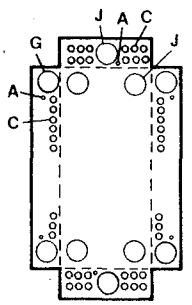
Box 6



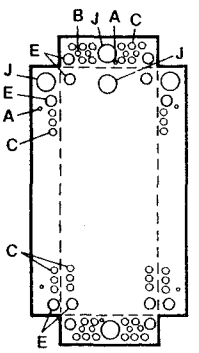
Box 7, 18



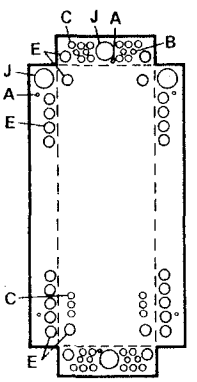
Box 8



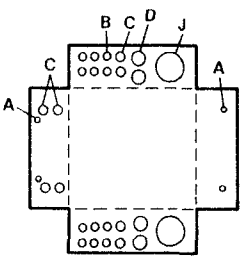
Box 9, 10, 11



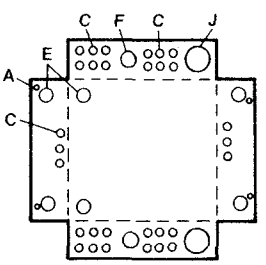
Box 12



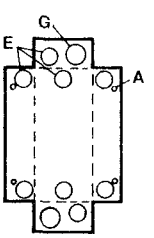
Box 13



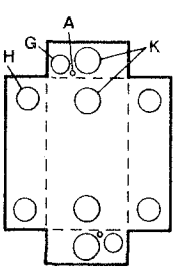
Box 14



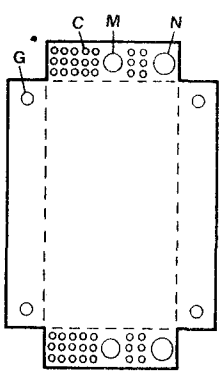
Box 15



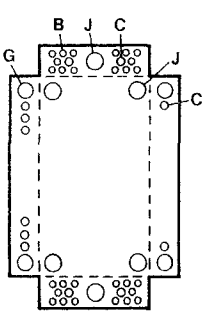
Box 16



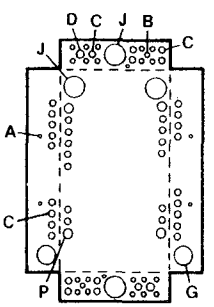
Box 17



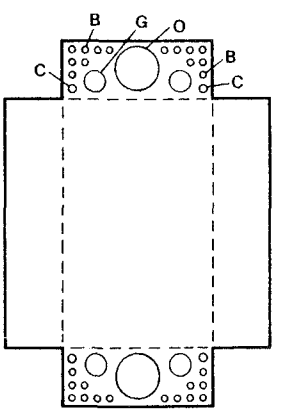
Box 19, 20, 21



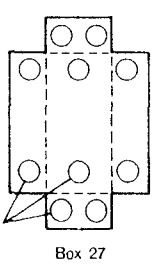
Box 22



Box 23, 24, 25



Box 26

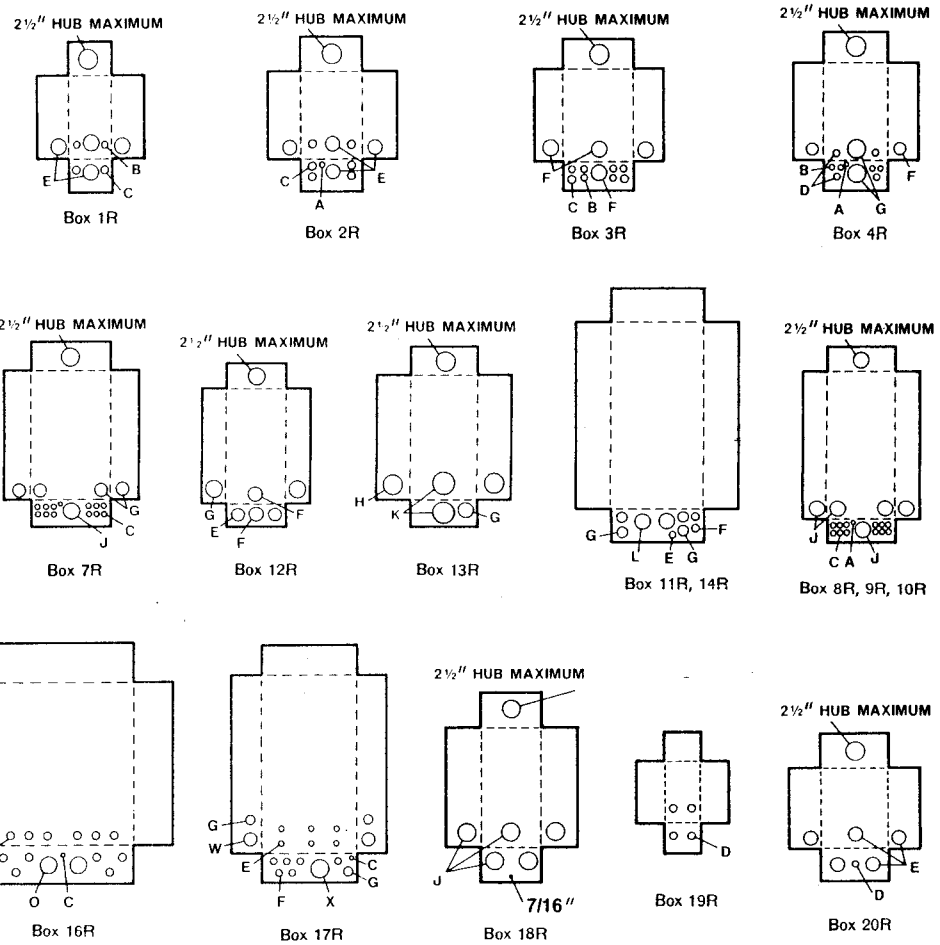


Box 27

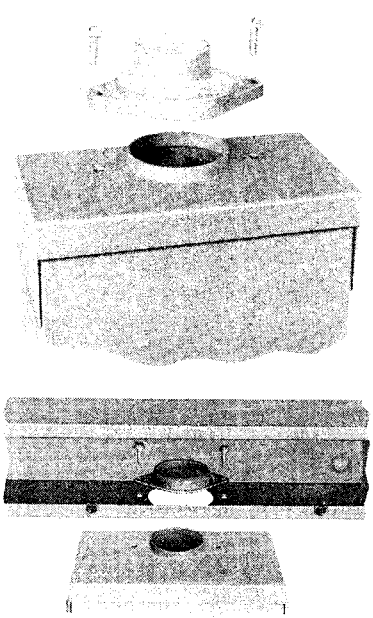
SQD SLV_000792

RAINPROOF QO® CIRCUIT BREAKER LOAD CENTERS
KNOCKOUT INFORMATION & ENCLOSURE DIMENSIONS

Box No.	W	H	D
1R	4.88	9.38	4.00
2R	7.13	10.25	4.06
3R	7.38	10.25	4.06
4R	7.88	12.69	4.06
5R	11.38	15.13	4.06
6R	11.38	18.13	4.06
7R	12.13	18.56	4.63
8R	12.13	26.13	4.63
9R	12.13	30.63	4.63
10R	12.13	34.13	4.63
11R	22.25	48.25	8.50
12R	6.94	13.13	4.41
13R	9.63	16.63	5.81
14R	22.25	58.00	8.50
15R	11.38	20.63	4.06
16R	29.36	33.04	8.24
17R	18.14	36.00	6.14
18R	8.50	16.63	4.93
19R	4.56	6.39	3.88
20R	7.68	10.00	4.68



BOLT-ON HUBS



Square D equipment with "R" or "RB" suffix, designated Rainproof (NEMA 3R Rainproof Construction), utilizes bolt-on hubs listed below. "RB" devices will accept ¾" through 2½" bolt-on hubs without the use of reducers. Off-center conduit thread openings and elongated mounting holes provide quick and easy adjustment to eliminate costly conduit offsets and bends. Catalog suffix "R" devices require 3" through 4" field cut opening.

BOLT-ON HUBS UL LISTED FOR "RB" DEVICES

Conduit Size	¾"	1"	1¼"	1½"	2"	2½"
Hub Cat. No.	B075	B100	B125	B150	B200	B250
Price	**$8.60**	**$8.60**	**$8.60**	**$8.60**	**$15.60**	**$26.00**

NOTE: Closing cap (catalog number B-CAP) is provided factory installed on each device having "RB" suffix. Price **$0.90** if ordered separately.

BOX COUPLING UL LISTED FOR "RB" DEVICES

Designed for connecting wireway or other enclosures to units having the "RB" bolt-on conduit provisions. Provides bushed opening equal to 2" conduit. Eliminates the need for conduit nippling.	Cat. No.	Price
	BC200	**$8.60**

BOLT-ON HUBS UL LISTED FOR MOUNTING IN FIELD CUT OPENING

Conduit Size	3"	3½"	4"	
Hub Cat. No.	B300	B350	B400	Designed for mounting in field cut opening. Includes gasket and four mounting bolts and nuts.
Price	**$46.00**	**$69.00**	**$86.00**	

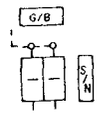
SQD SLV_000793

QO® CIRCUIT BREAKER LOAD CENTERS

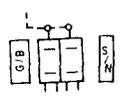
MOBILE HOME AND TRAILER LOAD CENTERS

ORDER QO, QOT AND Q1 CIRCUIT BREAKERS FROM PAGES 2 AND 3.

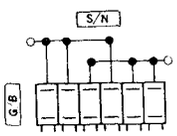
These load centers have a factory installed equipment ground bus. They conform with Mobile Home Manufacturers Association and Trailer Coach Association standards and are UL listed. Lugs only devices on this page are also CSA listed.



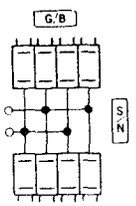
QO2TTF/S



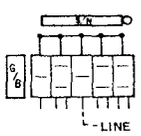
QO2-4ATTF/S



QO6-12TF/S
QO6-12DTF/S



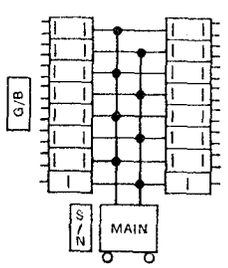
QO8-16TF/S
QO8-16DTF/S



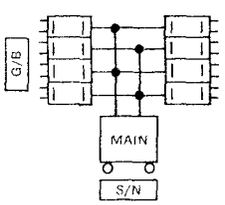
QO5TTS

Mains Rating Amps.	Spaces	▲Max. No. Single Poles	Type of Enclosure	Use With Branch Circuit Breakers	Box, Interior and Cover ★With Door		Main Wire Size AWG/MCM		Box No. See P. 14.
					Cat. No.	Price	CU	AL	15
1 PHASE 2 WIRE 120V. AC—LUGS ONLY									
30	2	2	Indoor	QO	QO2TTS✤ QO2TTF	**$ 13.30** **15.70**	14-8	12-8	1 2
50	2	4	Indoor	QO/QOT	QO2-4ATTF/S	**19.40**	14-6	.....	2
1 PHASE—2 WIRE 120V. AC—MAIN CIRCUIT BREAKER✻									
70	4	7	Indoor	QO/QOT	QO5TTS	**21.60**	See Breaker Table Page 3		4
1 PHASE—3 WIRE 120/240V. AC—LUGS ONLY									
100	6	12	Indoor	QO/QOT	QO6-12TF/S	**22.20**	10-1	8-1	4
100	6	12	Indoor	QO/QOT	QO6-12DTF/S	**26.00**	10-1	8-1	5
125	8	16	Indoor	QO/QOT/Q1	QO8-16TF/S	**36.00**	10-1		6
125	8	16	Indoor	QO/QOT/Q1	QO8-16DTF/S	**38.00**	14-2/0	12-2/0	6
1 PHASE—3 WIRE 120/240V. AC—BOTTOM FEED MAIN CIRCUIT BREAKER—INCLUDED‡ NEW—14" WIDE									
100A. Breaker	8	16	Indoor	QO/QOT/Q1	QO8-16MTF/S	**90.00**	4-1		7
	12	20			QO12-20MWTF/S	**112.00**			8
150A. Breaker	16	30			QO16-30MWB150TF/S	**205.00**	4-3/0		23
	20	30			QO20-30MWB150TF/S	**219.00**			23
	30	30		QO/Q1	QO30MWB150TF/S	**239.00**			24
200A. Breaker	20	40		QO/QOT/Q1	QO20-40MWB200TF/S	**220.00**	2/0-3/0	2/0-250	23
	30	40			QO30-40MWB200TF/S	**265.00**			24
	40	40		QO/Q1	QO40MWB200TF/S	**312.00**			25

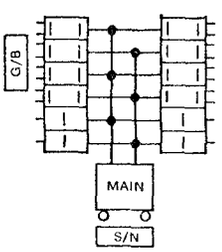
★Cover included with device. Order F for Flush, S for Surface. QO2TTF/S, QO2-4ATTF/S, QO5TTS, QO6-12TF/S and QO8-16TF/S covers do not have a door.
‡Not CSA listed.
✻Main circuit breaker is field installed standard QO single pole. Order separately from page 2.
✤Will not accept QWIK-GARD Circuit Breakers.
▲Maximum number of single pole branch circuits utilizing QO and/or QOT circuit breakers.



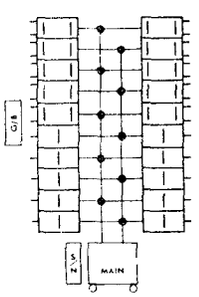
QO16-30MWB150TF/S



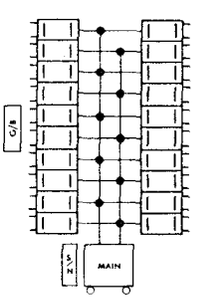
QO8-16MTF/S



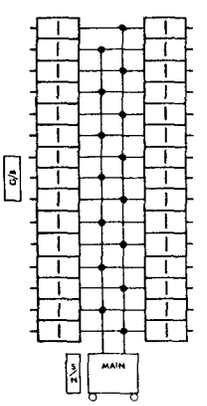
QO12-20MWTF/S



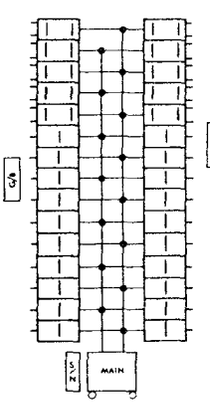
QO20-30MWB150T F/S



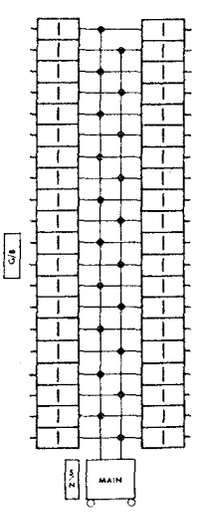
QO20-40MWB200TF/S



QO30MWB150TF/S



QO30-40MWB200TF/S



QO40MWB200TF/S

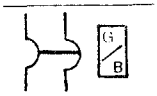
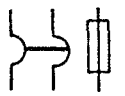
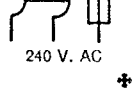
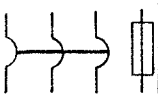
QO and QWIK-GARD are Registered Trademarks of Square D Company.

SQD SLV_000794

CIRCUIT BREAKERS, FUSIBLE PULLOUTS AND QO LOAD CENTERS

For use as a separate service entrance main breaker or for circuit disconnect and protection on 240 V. ac 3 wire and 4 wire systems. UL listed for Service Equipment. No door. All circuit breakers have 10,000 A.I.C. UL listed interrupting capacity.

ENCLOSED BREAKERS

Service	Amps.	†General Purpose				Rainproof				Breaker Incl. Terminals*		Box No. (see pp. 14-15)
		Complete Unit	Price	Enclosure Only	Price	Complete Unit	Price	Enclosure Only	Price	Breaker Cat. No.	Price☆	
 240 V. AC	●60 Non Auto	QO260NATS	**$40.00**	.....	....	QO200TR	**$43.00**	.....	....	.....	....	2 19R◐
	★70	QO2100-70F/S	**70.00**	.....	....	QO2100-70RB	**86.00**	.....	....	.....	....	16
	★100	QO2100NF/S	**70.00**	.....	....	QO2100NRB	**86.00**	.....	....	.....	....	12R
	★125	QO2125F/S	**130.00**	.....	....	QO2125RB	**146.00**	.....	....	.....	....	12R
	★‡100 Non-Auto	QO2000NAS	**70.00**	.....	....	QO2000NARB	**86.00**	.....	....	.....	....	16 12R
 240 V. AC ✣	125 150 175 200 225	.....	....	Q2-2225NS Q2-3225NF/S	**$46.00** **55.00**	.....	....	Q2-2225NRB Q2-3225NRB	**$98.00** **108.00**	Q2L2125 Q2L2150 Q2L2175 Q2L2200 Q2L2225	**$120.00** **120.00** **120.00** **120.00** **120.00**	27 18R 17 13R
 240 V. AC ✣	70 100	QO3100-70F/S QO3100F/S	**131.00** **131.00**	....	....	QO3100-70RB QO3100RB	**148.00** **148.00**	....	....	....	....	16 12R
	125 150 175 200 225	.....	....	Q2-3225NF/S	**55.00**	.....	....	Q2-3225NRB	**108.00**	Q2L3125 Q2L3150 Q2L3175 Q2L3200 Q2L3225	**316.00** **316.00** **316.00** **316.00** **316.00**	17 13R

‡Molded Case Switch—Maximum 15 HP 240V. ac.
*For terminal lug wire information see page 59.
†Order F for Flush, S for Surface.
✣For Ground Bar Kit order PK0GTA-2 **$11.00** list.

●Molded Case Switch—Maximum 10 HP 240V. ac. Not UL Listed for Service Equipment.
◐Top endwall has no hub opening.
★3 wire S/N devices are rated 120/240 V. AC.

A1-2 DISCOUNT

☆**Q2L CIRCUIT BREAKERS SOLD UNDER SCHEDULE B1-2**

1 PHASE—3 WIRE 120/240V. AC.
UL LISTED
100,000 AMPS. RMS SYMMETRICAL SHORT CIRCUIT CURRENT RATING USING CLASS T FUSES

FUSIBLE MAIN LOAD CENTERS

Mains Rating Amp.	Spaces and Max. No. Single Poles	Type of Enclosure	Basic Device Box and Interior Only		Cover With Door (Order Separately)			Ground Bar Kit (Order Separately)		Main Wire Size AWG/MCM	Box No. (see pp. 14-15)
			Cat. No.	Price	Flush	Surface	Price	Cat. No.	Price	CU or AL	
100 A. Pullout	20	Indoor	QO20MPW100	**$142.00**	QOC20MPW200F	QOC20MPW200S	**$10.20**	PK15GTA	**$4.00**	4-3/0	23
200 A. Pullout	30	Indoor	QO30MPW200	**216.00**	QOC30MPW200F	QOC30MPW200S	**24.20**	PK18GTA	**4.50**	4-300	24
200 A. Pullout	40	Indoor	QO40MPW200	**282.00**	QOC40MPW200F	QOC40MPW200S	**24.20**	PK23GTA	**5.00**		25

UL Listed for grounded (B) systems, 240V. ac 5,000 AIC rated.

C1-1 DISCOUNT

ENCLOSED MAIN FUSIBLE PULLOUTS

120/240V. AC—UL Listed

Mains		Main Wire Size AWG/MCM		Rainproof		Mains		Main Wire Size AWG/MCM		Rainproof		▪Mains		Main Wire Size AWG/MCM	✣Rainproof		Box No. (see pp 14-15)
System	Rating	Cu	Al	Cat. No.	Price	System	Rating	Cu	AL	Cat. No.	Price	System	Rating	Cu or AL	Cat. No.	Price	
1Ø3W	30	14-4	12-2	FS230RB	**$61.00**	1Ø3W	60	14-4	12-2	FS260RB	**$61.00**	1Ø3W	200	4-300	FT2200RB	**$234.00**	20R 18R

▪Will accept Class "T" Fuses (100,000 Amps RMS Symmetrical Short Circuit Current Rating).
✣For Ground Bar Kit order PK0GTA-2 **$11.00** list.

C1-3 DISCOUNT

REPLACEMENT MAIN BREAKERS

Type	100 Ampere Catalog No.	Price	125 Ampere Catalog No.	150 Ampere Catalog No.	175 Ampere Catalog No.	200 Ampere Catalog No.	225 Ampere Catalog No.	Price	▲ 300 Ampere Catalog No.	▲ 400 Ampere Catalog No.	Price
2 Pole Top Feed	Q1-2100TF	**$51.**	Q2M-2125MT	Q2M-2150MT	Q2M-2175MT	Q2M-2200MT	Q2M-2225MT	**$120.**	.....	.....	...
2 Pole Bottom Feed	.....	...	Q2M-2125MB	Q2M-2150MB	Q2M-2175MB	Q2M-2200MB	.....	**120.**	LAP26300MB	LAP26400MB	**$ 915.**
3 Pole Top Feed	.....	...	Q2M-3125MT	Q2M-3150MT	Q2M-3175MT	Q2M-3200MT	.....	**316.**	.....	.....	...
3 Pole Bottom Feed	.....	...	.....	.....	.....	.....	.....	...	LAP36300MB	LAP36400MB	**1110.**

B1-1 DISCOUNT

▲**LAP Circuit Breakers Sold Under Schedule B1-2**

QO is a Registered Trademark of Square D Company.

SQD SLV_000795

METER DEVICES — COMBINATION SERVICE ENTRANCE — RAINPROOF

1Ø-3W. 120/240V. ac maximum service. Suitable only for use as service equipment. UL listed. 10,000 AIC*

Mains Rating	●Branches: Spaces	●Branches: Max. No. Single Poles	●Branches: Use With	Catalog Number: Surface	Catalog Number: Semi-Flush	Price	Ground Bar Kit (Order Separately): Catalog Number	Ground Bar Kit (Order Separately): ◐ Price	Main Wire Size AWG/MCM: Cu	Main Wire Size AWG/MCM: Al	Dimensions: W	Dimensions: H	Dimensions: D
SINGLE MAIN DISCONNECT Top Service; Bottom Load▲													
100	0	0	Circuit Breaker Included	C100QRB	C100QRF	**$132.**	.....	....	14-1/0	14-1/0	7.00	20.75	3.62 *
125	0	0		C125QRB	C125QRF	**187.**	.....	....	14-1/0	14-1/0	7.00	20.75	3.62 *
150	0	0		C150QRB	C150QRF	**373.**	.....	....	4-300	4-300	7.00	27.75	3.62 *
200	0	0		C200QRB	C200QRF	**373.**	.....	....	4-300	4-300	7.00	27.75	3.62 *
MAIN LUGS ONLY Top Service; Top or Bottom Load▲													
125	8	16	QO/QOT/Q1	C816RB	.....	**$123.**	PK9GTA	**$3.20**	10-2/0	6-2/0	12.75	22.25	5.63
125	12	24		C1224RB	.....	**150.**	PK15GTA	**4.00**	10-2/0	6-2/0	12.75	22.25	5.63
200	12	24		C2224RB	.....	**318.**	PK15GTA	**4.00**	6-300	6-300	12.75	22.25	5.63
SINGLE MAIN DISCONNECT Top Service; Top or Bottom Load▲													
100	12	20	QO/QOT/Q1	C1220QRB	C1220QRF	**$195.**	PK15GTA	**$4.00**	10-2/0	6-2/0	13.00	23.38	5.13
100	16	20		C1620QRB	C1620QRF	**203.**	PK15GTA	**4.00**	10-2/0	6-2/0	13.00	23.38	5.13
125	20	24		C2024QRB	C2024QRF	**299.**	PK15GTA	**4.00**	10-2/0	6-2/0	12.75	31.88	5.63
150	20	30		C2030QRB	C2030QRF	**384.**	PK23GTA	**5.00**	6-300	6-300	12.88	33.25	5.63
200	24	40		C2440QRB	C2440QRF	**396.**	PK23GTA	**5.00**	6-300	6-300	12.88	33.25	5.63
MAIN LUGS ONLY Bottom Service; Top Load													
125	8	8	QO/Q1	.....	UGC8RF-125★	**$182.**	PK5GTA	**$2.80**	14-1/0	12-1/0	14.50	20.13	4.25
200	8	8		.....	UGC8RF-200★	**301.**	PK5GTA	**2.80**	6-300	6-300	14.50	23.63	5.75
SINGLE MAIN DISCONNECT Bottom Service; Top Load													
100	0	0	Circuit Breaker Included	.....	UGC100QRF	**$180.**	.....	....	14-1/0	12-1/0	14.50	20.13	4.25
125	0	0		.....	UGC125QRF	**210.**	.....	....	14-1/0	12-1/0	14.50	20.13	4.25
150	0	0		.....	UGC150QRF	**427.**	.....	....	6-300	6-300	14.50	23.63	5.75
200	0	0		.....	UGC200QRF	**427.**	.....	....	6-300	6-300	14.50	23.63	5.75
100	12	24	QO/QOT/Q1	.....	UGC12-24QRF	**228.**	PK15GTA	**$4.00**	14-1/0	12-1/0	14.50	24.25	4.25
100	16	24		.....	UGC16-24QRF	**234.**	PK15GTA	**4.00**	14-1/0	12-1/0	14.50	24.25	4.25
125	12	24		.....	UGC12-24QRF-125	**315.**	PK15GTA	**4.00**	14-1/0	12-1/0	14.50	24.25	4.25
125	16	24		.....	UGC16-24QRF-125	**331.**	PK15GTA	**4.00**	14-1/0	12-1/0	14.50	24.25	4.25
150	20	30		.....	UGC20-30QRF	**450.**	PK23GTA	**5.00**	6-300	6-300	14.50	34.00	5.75
200	24	40		.....	UGC24-40QRF	**450.**	PK23GTA	**5.00**	6-300	6-300	14.50	34.00	5.75
SINGLE MAIN DISCONNECT Bottom Service; Top or Bottom Load													
100	0	0	Circuit Breaker Included	UGC100QR	.....	**$180.**	.....	....	10-2/0	6-2/0	12.50	19.13	5.63
125	0	0		UGC125QR	.....	**210.**	.....	....	10-2/0	6-2/0	12.50	19.13	5.63
150	0	0		UGC150QR	.....	**427.**	.....	....	6-300	6-300	14.75	22.38	6.12
200	0	0		UGC200QR	.....	**427.**	.....	....	6-300	6-300	14.75	22.38	6.12
100	12	24	QO/QOT	UGC12-24QR	.....	**228.**	PK15GTA	**$4.00**	10-2/0	6-2/0	14.75	24.50	5.63
100	16	24		UGC16-24QR	.....	**234.**	PK15GTA	**4.00**	10-2/0	6-2/0	14.75	24.50	5.63
125	12	24		UGC12-24QR-125	.....	**315.**	PK15GTA	**4.00**	10-2/0	6-2/0	14.75	24.50	5.63
125	16	24		UGC16-24QR-125	.....	**331.**	PK15GTA	**4.00**	10-2/0	6-2/0	14.75	24.50	5.63
150	16	30	QO/QOT/Q1	UGC16-30QR	.....	**434.**	PK18GTA	**5.00**	6-300	6-300	21.80	21.50	6.12
200	24	40		UGC24-40QR	.....	**450.**	PK23GTA	**5.00**	6-300	6-300	21.00	25.13	6.12
400	42	42	QO/Q1	.....	UGC440QRF△	**2769.**	PK27GTA	**8.00**	1-600	1-600	30.00	55.00	7.63

●Order QO, QOT, or Q1 breakers separately from pages 2 and 3.
▲Type RB rainproof devices have a bolt-on closing cap factory installed. Order bolt-on hub on page 15.
★UGC8RF-125 and UGC8RF-200 UL listed 22,000 AIC with Q1-VH CB 100A. max and 42,000 AIC with Q1H CB 100A. max.
*Semi-flush device depth is 4.88 inches.
△Sealable C.T. compartment, test perch, and 6-jaw meter socket.
◐Schedule C1-1 Discount.

Above listings thru 200A. mains rating meet Federal Specification W-P-115a as Type I, Class 2.

INDOOR CURRENT TRANSFORMER CABINETS

Cat. No. 13991 accommodates meter test perch.
Cat. No. 13992 accommodates one or two transformers and has one-piece removable cover hinged at long side. Drilled for current transformer.
Cat. No. SK2146 accommodates three transformers.

Cat. No.	Price	Height	Width	Depth
13991	**$ 45.**	11	12⅞	4½
13992	**170.**	24⅝	32⅝	10 3/16
SK2146	**255.**	36⅝	32⅝	10 3/16

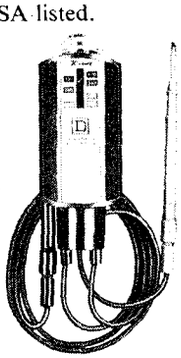
C1-2 DISCOUNT

CLASS 6610

VOLTAGE TESTERS (FORMERLY CATALOG NUMBER 5008)

SOLENOID TYPE with polarity indication and slotted receptacles for holding prods. UL and CSA listed.

	Description	Type	Price
The Wiggy®	STANDARD TESTER 120-240-480-600V. ac 50/60 Hz. 120-240-600V. dc	VT-1	**$29.00**
	Same as VT-1 except with fused leads	VT-1S	**33.00**
CARRYING CASE	LEATHER (Simulated)	L-1	**16.00**
	VINYL	V-1	**7.00**
REPAIR PARTS	REPLACEMENT LEADS FOR 5009 Neon type tester—(Now obsolete)	5009P	**13.00**
	IMPORTANT: The following will fit only those current design testers having SERIES A or Catalog Number 5008. SERIES B designation on the nameplate. Leads must be replaced as a unit. Replacement of individual lead components must not be attempted.		
	POLARITY INDICATION CAP FOR 5008, 5008S, SERIES B; VT-1, VT-1S, SERIES A	PC-1	**4.00**
	REPLACEMENT LEADS FOR 5008, SERIES B; VT-1, SERIES A	P-1	**11.00**
	REPLACEMENT LEADS FOR 5008S, SERIES B; VT-1S, SERIES A	P-1S	**15.00**



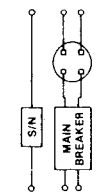
TYPE VT-1

D18 DISCOUNT

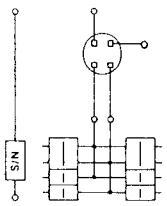
QO is a Registered Trademark of Square D Company.

SQD SLV_000796

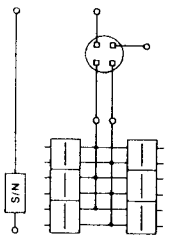
WIRING DIAGRAMS



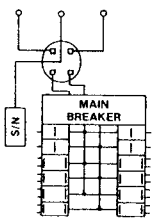
C100QRB/QRF
C125QRB/QRF
C150QRB/QRF
C200QRB/QRF



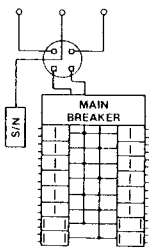
C8-16RB



C12-24RB
C22-24RB



C12-20QRB/QRF



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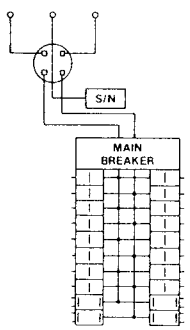

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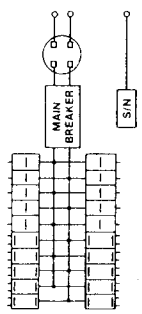

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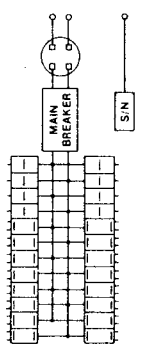
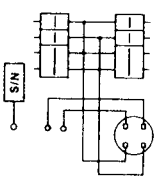


C24-40QRB/QRF



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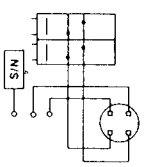

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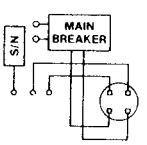
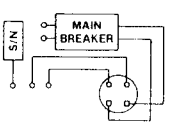


UGC100QRF
UGC125QRF



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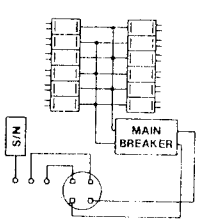
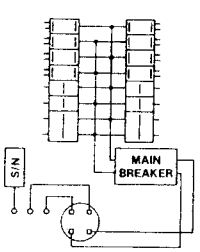
UGC200QRF



UGC12-24QRF
UGC12-24QRF-125



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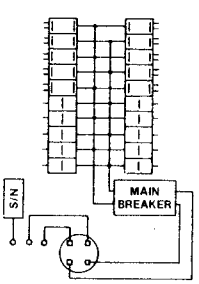
UGC16-24QRF-125



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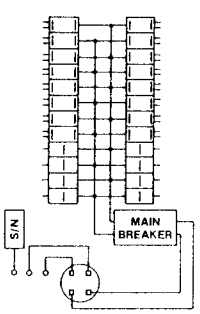

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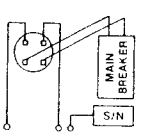

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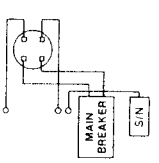

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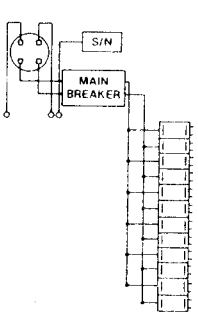

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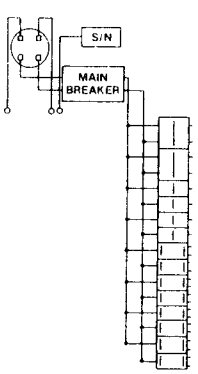

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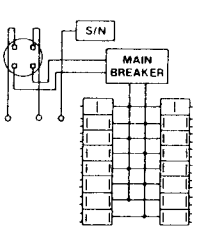

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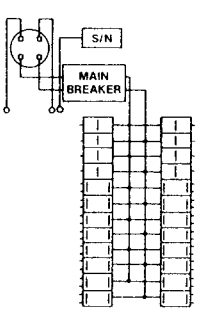

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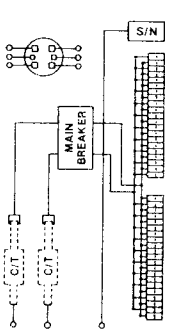


UGC440QRF

EZ METER-pak® METER CENTERS — INDOOR AND RAINPROOF

UL LISTED SHORT CIRCUIT CURRENT RATING SELECTION PROCEDURE

- Select equipment from the page having the proper short circuit current rating for your particular application.

APPLICATION SUGGESTIONS

- 125 A. meter/breaker devices 800 A. main cross bus, must have center located 1000, 1200 and 1600 A. main devices.
- 150-200 A. meter/breaker devices 1200 A. main cross bus, must have center located 1600 A. main devices.
- 125A. devices, 800A. main cross bus, and 150-200A. devices, 1200A. main cross bus, may be interconnected.
- Q2M-2. . .MB circuit breakers 100-200 A. may be substituted in 150 and 200 A. basic meter/breaker devices at standard device pricing.
- Equipment ground bar factory installed in top wiring gutter and field movable to bottom.
- 3Ø-4 W. 120/208 V. ac service meter/breaker devices are phase balanced for easy selection and application.

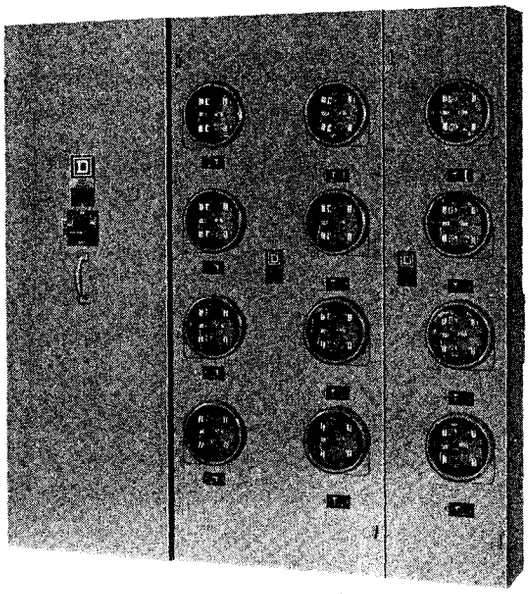
Catalog Number	Phase Connections		
	AB	BC	CA
EZM43-	1	1	1
EZM44-	1	2	1
EZM45-	2	1	2
EZM46-	2	2	2
EZM47-	2	3	2
EZM48-	3	2	3
EZM410-	3	4	3

- Fifth jaw is factory installed at 9 o'clock position on all 1-phase 3-wire network meter sockets on 3Ø-4 W. systems.
- All main devices may be top or bottom fed.

METERING EQUIPMENT AND LOAD CENTER BRANCH BREAKERS

Available Short Circuit Current Rms Sym. Amps.	EZ METER-PAK Meter Centers	* QO Load Center
	Page Number	Branch Breaker Cat. No. Prefix
10,000	21	QO, Q1, QO-GFI
22,000	22	QO, Q1, QO-GFI
42,000	22	QO, Q1, QO-1 Pole GFI Non Tandem
65,000	23	QO, Q1, QO-1 Pole GFI Non Tandem

*Load centers using 10,000 AIC rated non tandem QO, Q1 and single pole GFI circuit breakers may be installed twenty feet downstream from a properly applied EZ METER-PAK meter center on systems capable of delivering up to 65,000 amperes short circuit current.



INDOOR ONLY BUSWAY TAP FOR SERIES 3 AND 4 800-3000 AMPERES PLUG-IN BUSWAY

BEFORE ORDERING:

A. Determine meter height requirements per power company. This determines height of center line of Bus Tap; X + 40.25″. For 5 high units add 11.44″ to this sum.

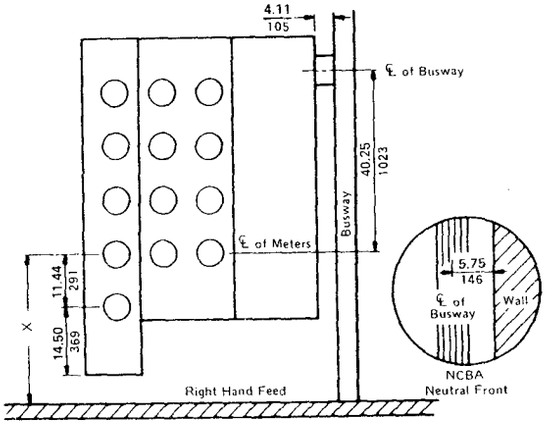
B. Determine which side the main device is fed from.

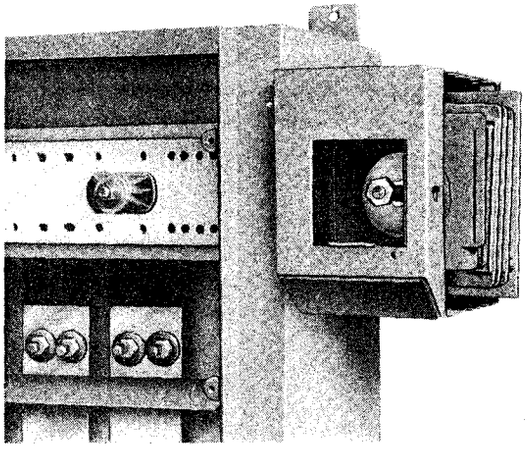
C. Center line of Busway must be 5¾″ from wall.

D. Check phasing. Neutral Front: NCBA; Neutral Back: ABCN.

BUS TAP AVAILABLE FOR

EZM325N • EZM326N
EZM32400N • EZM32600N • EZM32800N





Dual Dimensions: INCHES / Millimeters

SQD SLV_000798

EZ METER-pak® METER CENTERS — INDOOR AND RAINPROOF

UL LISTED 10,000 AMP. RMS SYMMETRICAL SHORT CIRCUIT CURRENT RATING

MAIN DEVICES

Ampere Rating	Indoor 1Ø-3W. 120/240V. ac Catalog Number	Price	Indoor 3Ø-4W. 120/208V. ac Catalog Number	Price	Width	Rainproof 1Ø-3W. 120/240V. ac Catalog Number	Price	Rainproof 3Ø-4W. 120/208V. ac Catalog Number	Price	Width	Line Lug Wire Size AL/CU
MAIN FUSIBLE SWITCH											
400	EZM225N	**$ 657.**	EZM325N	**$ 795.**	18.00	EZM225NR	**$ 874.**	EZM325NR	**$ 988.**	18.19	(1)-750 or (2)-300 MCM
600	EZM226N	**1305.**	EZM326N	**1469.**	21.75	EZM226NR	**1652.**	EZM326NR	**1990.**	21.94	(2)-750MCM
MAIN CIRCUIT BREAKER											
400	EZM22400N	**1196.**	EZM32400N	**1428.**	20.25	EZM22400NR	**1490.**	EZM32400NR	**1724.**	20.38	(1)-600 or (2)-250MCM
600	EZM22600N	**1807.**	EZM32600N	**2244.**	20.25	EZM22600NR	**2251.**	EZM32600NR	**2688.**	20.38	(3)-500MCM
800	EZM22800N	**2317.**	EZM32800N	**2975.**	20.25	EZM22800NR	**2850.**	EZM32800NR	**3508.**	20.38	(3)-500MCM
1000	EZM221000N	**3353.**	EZM321000N	**3808.**	25.25	EZM221000NR	**3904.**	EZM321000NR	**4457.**	25.50	(4)-750MCM
1200	EZM221200N	**4864.**	EZM321200N	**5306.**	25.25	EZM221200NR	**5510.**	EZM321200NR△	**6106.**	25.50	(4)-750MCM
1600	EZM221600N	**7304.**	EZM321600N	**7819.**	25.25	.....	.....	.....	.....	...	(4)-750MCM
TERMINAL BOX											
800	EZM3800TB	**228.**	EZM4800TB	**255.**	15.25	EZM3800TBR	**307.**	EZM4800TBR	**340.**	16.38	(2)-750MCM
1600	EZM31600TB	**924.**	EZM41600TB	**971.**	21.00	EZM31600TBR	**1005.**	EZM41600TBR	**1053.**	21.19	(4)-750MCM

BASIC METER/BREAKER DEVICES

Number of Meters	125 Ampere Branches Order Plug-On Circuit Breaker 800A. Main Cross Bus Catalog Number	Price	Width	150 or 200 Ampere Branches Circuit Breakers Included 1200A. Main Cross Bus Catalog Number 150A.	Catalog Number 200A.	Price	Width
INDOOR							
1Ø-3W. 120/240V. ac SYSTEMS							
3	EZM33-125	**$ 315.**	12.00	EZM33-150	EZM33-200	**$1002.**	13.25
4	EZM34-125	**420.**	12.00	EZM34-150	EZM34-200	**1336.**	13.25
5	EZM35-125	**525.**	12.00	.....	.....	.....	.....
6	EZM36-125	**630.**	20.00	EZM36-150	EZM36-200	**2004.**	24.00
7	EZM37-125	**735.**	20.00	EZM37-150	EZM37-200	**2338.**	24.00
8	EZM38-125	**840.**	20.00	EZM38-150	EZM38-200	**2672.**	24.00
10	EZM310-125	**1050.**	20.00	.....	.....	.....	.....
1Ø-3W. NETWORK METERS ON 3Ø-4W. 120/208V. ac SYSTEMS							
3	EZM43-125	**336.**	12.00	EZM43-150	EZM43-200	**1032.**	13.25
4	EZM44-125	**448.**	12.00	EZM44-150	EZM44-200	**1376.**	13.25
5	EZM45-125	**560.**	12.00	.....	.....	.....	.....
6	EZM46-125	**672.**	20.00	EZM46-150	EZM46-200	**2064.**	24.00
7	EZM47-125	**784.**	20.00	EZM47-150	EZM47-200	**2408.**	24.00
8	EZM48-125	**896.**	20.00	EZM48-150	EZM48-200	**2752.**	24.00
10	EZM410-125	**1120.**	20.00	.....	.....	.....	.....
RAINPROOF							
1Ø-3W. 120/240V. ac SYSTEMS							
3	EZM33-125R	**336.**	12.19	EZM33-150R	EZM33-200R	**1026.**	13.25
4	EZM34-125R	**448.**	12.19	EZM34-150R	EZM34-200R	**1368.**	13.25
6	EZM36-125R	**672.**	20.12	EZM36-150R	EZM36-200R△	**2052.**	24.19
7	EZM37-125R	**784.**	20.12	EZM37-150R△	EZM37-200R△	**2394.**	24.19
8	EZM38-125R	**896.**	20.12	EZM38-150R	EZM38-200R△	**2736.**	24.19
1Ø-3W. NETWORK METERS ON 3Ø-4W. 120/208V. ac SYSTEMS							
3	EZM43-125R	**360.**	12.19	EZM43-150R	EZM43-200R	**1056.**	13.25
4	EZM44-125R	**480.**	12.19	EZM44-150R	EZM44-200R	**1408.**	13.25
6	EZM46-125R	**720.**	20.12	EZM46-150R	EZM46-200R	**2112.**	24.19
7	EZM47-125R	**840.**	20.12	EZM47-150R	EZM47-200R	**2464.**	24.19
8	EZM48-125R	**960.**	20.12	EZM48-150R	EZM48-200R	**2816.**	24.19

ACCESSORIES

Description	Catalog Number	Price
FIFTH JAW		
Four Fifth Jaws Per Kit	EZM45J	**$ 19.00**
Five Fifth Jaws Per Kit	EZM55J	**23.80**
BUSSED EXTENSION (INDOOR)		
400-1200A. 1Ø-3W. Service	EZM31200BE	**184.00**
400-1200A. 3Ø-4W. Service	EZM41200BE	**231.00**
BUSSED CORNER SECTION (INDOOR)		
400-1200A. 1Ø-3W. Service	EZM31200BCS	**464.00**
400-1200A. 3Ø-4W. Service	EZM41200BCS	**577.00**
BUSWAY TAP (INDOOR)		
3Ø-4W. 400-600A. Switches and 400-800A. Circuit Breakers Only.	Special— Factory Installed	**565.00** Adder
SEALING RINGS (Non-Standard)		
Snap-on Type Stainless Steel	29008DS	**3.20**
Latch-Type Stainless Steel	29008G	**5.00**
Screw-Type Aluminum	29008W	**5.00**

Description	Catalog Number	Price
◐SLIDER TYPE MANUAL CIRCUIT CLOSING		
Indoor—		
125A. Left Side of Wiring Gutter	EZM125MCC-L	**$45.00**
125A. Right Side of Wiring Gutter	EZM125MCC-R	**45.00**
150-200A. Left Side of Wiring Gutter	EZM200MCC-L	**45.00**
150-200A. Right Side of Wiring Gutter	EZM200MCC-R	**45.00**
Rainproof—		
125A. Left Side of Wiring Gutter	EZM125MCC-LR	**45.00**
125A. Right Side of Wiring Gutter	EZM125MCC-RR	**45.00**
150-200A. Left Side of Wiring Gutter	EZM200MCC-LR	**45.00**
150-200A. Right Side of Wiring Gutter	EZM200MCC-RR	**45.00**
GLASS METER SOCKET COVER PLATE	29007	**2.60**
◐AUTOMATIC CIRCUIT CLOSING	ACC200	**22.90**
EQUIPMENT GROUND TERMINAL	.....	INCLUDED

◐Meter centers with manual or automatic circuit closers are rated 10,000 AIC maximum.

C1-2 DISCOUNT

PLUG-ON CIRCUIT BREAKER KITS

Common Trip Two Pole 120/240V. ac

Ampere Rating	Catalog Number	Price	Ampere Rating	Catalog Number	Price
60	QO260	**$18.20**	90	QO290	**$51.00**
70	QO270	**37.00**	100	QO2100	**51.00**
80	QO280	**51.00**	125	Q12125	**110.00**

B1-1 DISCOUNT

Detailed dimensions are in Catalog Section 4161

△Order only. Not stocked in PDS. Order Point: Lexington

SQD SLV_000799

EZ METER-pak® METER CENTERS — INDOOR AND RAINPROOF

UL LISTED 42,000 AMP. RMS SYMMETRICAL SHORT CIRCUIT CURRENT RATING

MAIN DEVICES

Ampere Rating	Indoor: 1Ø-3W. 120/240V. ac Catalog Number	Price	Indoor: 3Ø-4W. 120/208V. ac Catalog Number	Price	Width	Rainproof: 1Ø-3W. 120/240V. ac Catalog Number	Price	Rainproof: 3Ø-4W. 120/208V. ac Catalog Number	Price	Width	Line Lug Wire Size Al/Cu
MAIN FUSIBLE SWITCH MUST HAVE HRK-4060 AND CLASS R FUSES FIELD INSTALLED											
400	EZM225N	**$ 657.**	EZM325N	**$ 795.**	18.00	EZM225NR	**$ 874.**	EZM325NR	**$ 988.**	18.19	(1)-750 or (2)-300MCM
600	EZM226N	**1305.**	EZM326N	**1469.**	21.75	EZM226NR	**1652.**	EZM326NR	**1990.**	21.94	(2)-750MCM
MAIN CIRCUIT BREAKER											
400	EZM22400N	**1196.**	EZM32400N	**1428.**	20.25	EZM22400NR	**1490.**	EZM32400NR	**1724.**	20.38	(1)-600 or (2)-250MCM
600	EZM22600N	**1807.**	EZM32600N	**2244.**	20.25	EZM22600NR	**2251.**	EZM32600NR	**2688.**	20.38	(3)-500MCM
800	EZM22800N	**2317.**	EZM32800N	**2975.**	20.25	EZM22800NR	**2850.**	EZM32800NR	**3508.**	20.38	(3)-500MCM
1000	EZM221000N	**3353.**	EZM321000N	**3808.**	25.25	EZM221000NR	**3904.**	EZM321000NR	**4457.**	25.50	(4)-750MCM
1200	EZM221200N	**4864.**	EZM321200N	**5306.**	25.25	EZM221200NR	**5510.**	EZM321200NR△	**6106.**	25.50	(4)-750MCM
1600	EZM221600N	**7304.**	EZM321600N	**7819.**	25.25	.....	.....	.....	.....	.....	(4)-750MCM
TERMINAL BOX—MUST BE PROTECTED BY SQUARE D CIRCUIT BREAKERS OR CLASS R FUSES WHEN NOT USED FOR SIX SUBDIVISION APPLICATION★											
800	EZM3800TB	**228.**	EZM4800TB	**255.**	15.25	EZM3800TBR	**307.**	EZM4800TBR	**340.**	15.38	(2)-750MCM
1600	EZM31600TB	**924.**	EZM41600TB	**971.**	21.00	EZM31600TBR	**1065.**	EZM41600TBR	**1053.**	21.19	(4)-750MCM

BASIC METER/BREAKER DEVICES

	Number of Meters	125 Ampere Branches Order Plug-On Circuit Breaker Kits 800A. Main Cross Bus: Catalog Number	Price	Width	150 or 200 Ampere Branches Circuit Breakers Included 1200A. Main Cross Bus: Catalog Number 150A.	Catalog Number 200A.	Price	Width
INDOOR	**1Ø-3W. 120/240V. ac SYSTEMS**							
	3	EZM33-125	**$315.**	12.00	EZM33-150-22H△	EZM33-200-22H△	**$1506.**	13.25
	4	EZM34-125	**420.**	12.00	EZM34-150-22H△	EZM34-200-22H△	**2008.**	13.25
	5	EZM35-125	**525.**	12.00	.....	.....	.....	.....
	6	EZM36-125	**630.**	20.00	EZM36-150-22H△	EZM36-200-22H△	**3012.**	24.00
	7	EZM37-125	**735.**	20.00	EZM37-150-22H△	EZM37-200-22H△	**3514.**	24.00
	8	EZM38-125	**840.**	20.00	EZM38-150-22H△	EZM38-200-22H△	**4016.**	24.00
	10	EZM310-125	**1050.**	20.00	.....	.....	.....	.....
	1Ø-3W. NETWORK METERS ON 3Ø-4W. 120/208V. ac SYSTEMS							
	3	EZM43-125	**336.**	12.00	EZM43-150-22H△	EZM43-200-22H△	**1539.**	13.25
	4	EZM44-125	**448.**	12.00	EZM44-150-22H△	EZM44-200-22H△	**2052.**	13.25
	5	EZM45-125	**560.**	12.00	.....	.....	.....	.....
	6	EZM46-125	**672.**	20.00	EZM46-150-22H△	EZM46-200-22H△	**3078.**	24.00
	7	EZM47-125	**784.**	20.00	EZM47-150-22H△	EZM47-200-22H△	**3591.**	24.00
	8	EZM48-125	**896.**	20.00	EZM48-150-22H△	EZM48-200-22H△	**4104.**	24.00
	10	EZM410-125	**1120.**	20.00	.....	.....	.....	.....
RAINPROOF	**1Ø-3W. 120/240V. ac SYSTEMS**							
	3	EZM33-125R	**336.**	12.19	EZM33-150R-22H△	EZM33-200R-22H△	**1533.**	13.25
	4	EZM34-125R	**448.**	12.19	EZM34-150R-22H△	EZM34-200R-22H△	**2044.**	13.25
	6	EZM36-125R	**672.**	20.12	EZM36-150R-22H△	EZM36-200R-22H△	**3066.**	24.19
	7	EZM37-125R	**784.**	20.12	EZM37-150R-22H△	EZM37-200R-22H△	**3577.**	24.19
	8	EZM38-125R	**896.**	20.12	EZM38-150R-22H△	EZM38-200R-22H△	**4088.**	24.19
	1Ø-3W. NETWORK METERS ON 3Ø-4W. 120/208V. ac SYSTEMS							
	3	EZM43-125R	**360.**	12.19	EZM43-150R-22H△	EZM43-200R-22H△	**1566.**	13.25
	4	EZM44-125R	**480.**	12.19	EZM44-150R-22H△	EZM44-200R-22H△	**2088.**	13.25
	6	EZM46-125R	**720.**	20.12	EZM46-150R-22H△	EZM46-200R-22H△	**3132.**	24.19
	7	EZM47-125R	**840.**	20.12	EZM47-150R-22H△	EZM47-200R-22H△	**3654.**	24.19
	8	EZM48-125R	**960.**	20.12	EZM48-150R-22H△	EZM48-200R-22H△	**4176.**	24.19

ACCESSORIES

Description	Catalog Number	Price
FIFTH JAW		
Four Fifth Jaws Per Kit	EZM45J	**$ 19.00**
Five Fifth Jaws Per Kit	EZM55J	**23.80**
BUSSED EXTENSION (INDOOR)		
400-1200A. 1Ø-3W. Service	EZM31200BE	**184.00**
400-1200A. 3Ø-4W. Service	EZM41200BE	**231.00**
BUSSED CORNER SECTION (INDOOR)		
400-1200A. 1Ø-3W. Service	EZM31200BCS	**464.00**
400-1200A. 3Ø-4W. Service	EZM41200BCS	**577.00**
BUSWAY TAP (INDOOR)		
3Ø-4W. 400-600A. Switches 400-800A. Circuit Breakers Only.	Special—Factory Installed	**565.00** Adder

Description	Catalog Number	Price
FUSE REJECTION KITS (Rejects all but Class R Fuses)	HRK-4060	**$26.00**
GLASS METER SOCKET COVER PLATE	29007	**2.60**
SEALING RINGS (Non-Standard)		
Snap-on Type Stainless Steel	29008DS	**3.20**
Latch-Type Stainless Steel	29008G	**5.00**
Screw-Type Aluminum	29008W	**5.00**
EQUIPMENT GROUND TERMINAL	.....	INCLUDED

C1-2 DISCOUNT

TABLE A
PLUG-ON CIRCUIT BREAKER KITS

Common Trip Two Pole 120/240V. ac

Ampere Rating	Catalog Number	Price	Ampere Rating	Catalog Number	Price
60	Q1260VHIN	**$37.**	90	Q1290VHIN	**$ 83.**
70	Q1270VHIN	**58.**	100	Q12100VHIN	**83.**
80	Q1280VHIN	**83.**	125	Q12125VHIN	**267.**

B1-1 DISCOUNT

△Order only. Not Stocked in PDS. Order Point: Lexington

Detailed dimensions are in Catalog Section 4161

★When Terminal Boxes are used for *six subdivision applications*—

1. At 22,000 amp. RMS symmetrical short circuit capacity use:
   a. 125A. 3, 4, 5, or 6 gang basic meter/breaker devices with "VHIN" suffix circuit breaker kits listed in Table A.
   b. 150-200A. 3, 4, or 6 gang basic meter/breaker devices with "22H" suffix listed above.
2. At 42,000 amp. RMS symmetrical short circuit capacity use:
   a. 125A. 3, 4, 5, or 6 gang meter/breaker devices with circuit breaker kits *listed below.*

Ampere Rating	Catalog Number	Price	Ampere Rating	Catalog Number	Price
60	Q1H260IN	**$ 82.**	90	Q1H290IN	**$166.**
70	Q1H270IN	**133.**	100	Q1H2100IN	**166.**
80	Q1H280IN	**166.**	125	Q1H2125IN	**354.**

   b. 150-200A. 3, 4, or 6 gang basic meter/breaker devices *listed above* and change "22H" to "42H" suffix and add **$94.** list per breaker position. Example: EZM33-150-42H at **$1506.** + (**$94.** x 3) = **$1788.** list.

SQD SLV_000800

EZ METER-pak® METER CENTERS — INDOOR AND RAINPROOF

UL LISTED 65,000 AMP. RMS SYMMETRICAL SHORT CIRCUIT CURRENT RATING

MAIN DEVICES

Ampere Rating	Indoor 1Ø-3W. 120/240V. ac Catalog Number	Price	Indoor 3Ø-4W. 120/208V. ac Catalog Number	Price	Width	Rainproof 1Ø-3W. 120/240V. ac Catalog Number	Price	Rainproof 3Ø-4W. 120/208V. ac Catalog Number	Price	Width	Line Lug Wire Size AL/CU
MAIN FUSIBLE SWITCH MUST HAVE HRK-4060 AND CLASS R FUSES FIELD INSTALLED											
400	EZM225N	**$ 657.**	EZM325N	**$ 795.**	18.00	EZM225NR	**$ 874.**	EZM325NR	**$ 988.**	18.19	(1)-750 or (2)-300MCM
600	EZM226N	**1305.**	EZM326N	**1469.**	21.75	EZM226NR	**1652.**	EZM326NR	**1990.**	21.94	(2)-750MCM
MAIN CIRCUIT BREAKER											
400	EZM22400NH△	**1809.**	EZM32400NH△	**2146.**	20.25	EZM22400NRH△	**2106.**	EZM32400NRH△	**2442.**	20.38	(1)-600 or (2)-250MCM
600	EZM22600NH△	**2256.**	EZM32600NH△	**2700.**	20.25	EZM22600NRH△	**2700.**	EZM32600NRH△	**3142.**	20.38	(3)-500MCM
800	EZM22800NH△	**2782.**	EZM32800NH△	**3443.**	20.25	EZM22800NRH△	**3314.**	EZM32800NRH△	**3977.**	20.38	(3)-500MCM
1000	EZM221000N	**3353.**	EZM321000N	**3808.**	25.25	EZM221000NR	**3904.**	EZM321000NR	**4457.**	25.50	(4)-750MCM
1200	EZM221200N	**4864.**	EZM321200N	**5306.**	25.25	EZM221200NR	**5510.**	EZM321200NR△	**6106.**	25.50	(4)-750MCM
1600	EZM221600N	**7304.**	EZM321600N	**7819.**	25.25	.....	.....	.....	.....	.....	(4)-750MCM
TERMINAL BOX MUST BE PROTECTED BY SQUARE D CIRCUIT BREAKERS OR CLASS R FUSES											
800	EZM3800TB	**228.**	EZM4800TB	**255.**	15.25	EZM3800TBR	**307.**	EZM4800TBR	**340.**	15.38	(2)-750MCM
1600	EZM31600TB	**924.**	EZM41600TB	**971.**	21.00	EZM31600TBR	**1005.**	EZM41600TBR	**1053.**	21.19	(4)-750MCM

BASIC METER/BREAKER DEVICES

	Number of Meters	125 Ampere Branches Order Plug-On Circuit Breaker Kits 800A. Main Cross Bus Catalog Number	Price	Width	150 or 200 Ampere Branches Circuit Breakers Included 1200A. Main Cross Bus Catalog Number 150A.	Catalog Number 200A.	Price	Width
		1Ø-3W. 120/240V. ac SYSTEMS						
INDOOR	3	EZM33-125	**$315.**	12.00	EZM33-150-22H△	EZM33-200-22H△	**$1506.**	13.25
	4	EZM34-125	**420.**	12.00	EZM34-150-22H△	EZM34-200-22H△	**2008.**	13.25
	5	EZM35-125	**525.**	12.00	.....	.....	.....	.....
	6	EZM36-125	**630.**	20.00	EZM36-150-22H△	EZM36-200-22H△	**3012.**	24.00
	7	EZM37-125	**735.**	20.00	EZM37-150-22H△	EZM37-200-22H△	**3514.**	24.00
	8	EZM38-125	**840.**	20.00	EZM38-150-22H△	EZM38-200-22H△	**4016.**	24.00
	10	EZM310-125	**1050.**	20.00	.....	.....	.....	.....
		1Ø-3W. NETWORK METERS ON 3Ø-4W. 120/208V. ac SYSTEMS						
	3	EZM43-125	**336.**	12.00	EZM43-150-22H△	EZM43-200-22H△	**1539.**	13.25
	4	EZM44-125	**448.**	12.00	EZM44-150-22H△	EZM44-200-22H△	**2052.**	13.25
	5	EZM45-125	**560.**	12.00	.....	.....	.....	.....
	6	EZM46-125	**672.**	20.00	EZM46-150-22H△	EZM46-200-22H△	**3078.**	24.00
	7	EZM47-125	**784.**	20.00	EZM47-150-22H△	EZM47-200-22H△	**3591.**	24.00
	8	EZM48-125	**896.**	20.00	EZM48-150-22H△	EZM48-200-22H△	**4104.**	24.00
	10	EZM410-125	**1120.**	20.00	.....	.....	.....	.....
		1Ø-3W. 120/240V. ac SYSTEMS						
RAINPROOF	3	EZM33-125R	**336.**	12.19	EZM33-150R-22H△	EZM33-200R-22H△	**1533.**	13.25
	4	EZM34-125R	**448.**	12.19	EZM34-150R-22H△	EZM34-200R-22H△	**2044.**	13.25
	6	EZM36-125R	**672.**	20.12	EZM36-150R-22H△	EZM36-200R-22H△	**3066.**	24.19
	7	EZM37-125R	**784.**	20.12	EZM37-150R-22H△	EZM37-200R-22H△	**3577.**	24.19
	8	EZM38-125R	**896.**	20.12	EZM38-150R-22H△	EZM38-200R-22H△	**4088.**	24.19
		1Ø-3W. NETWORK METERS ON 1Ø-4W. 120/208V. ac SYSTEMS						
	3	EZM43-125R	**360.**	12.19	EZM43-150R-22H△	EZM43-200R-22H△	**1566.**	13.25
	4	EZM44-125R	**480.**	12.19	EZM44-150R-22H△	EZM44-200R-22H△	**2088.**	13.25
	6	EZM46-125R	**720.**	20.12	EZM46-150R-22H△	EZM46-200R-22H△	**3132.**	24.19
	7	EZM47-125R	**840.**	20.12	EZM47-150R-22H△	EZM47-200R-22H△	**3654.**	24.19
	8	EZM48-125R	**960.**	20.12	EZM48-150R-22H△	EZM48-200R-22H△	**4176.**	24.19

ACCESSORIES

Description	Catalog Number	Price
FIFTH JAW		
Four Fifth Jaws Per Kit	EZM45J	**$ 19.00**
Five Fifth Jaws Per Kit	EZM55J	**23.80**
BUSSED EXTENSION (INDOOR)		
400-1200A. 1Ø-3W. Service	EZM31200BE	**184.00**
400-1200A. 3Ø-4W. Service	EZM41200BE	**231.00**
BUSSED CORNER SECTION (INDOOR)		
400-1200A. 1Ø-3W. Service	EZM31200BCS	**464.00**
400-1200A. 3Ø-4W. Service	EZM41200BCS	**577.00**
BUSWAY TAP (INDOOR)		
3Ø-4W. 400-600A. Switches 400-800A. Circuit Breakers Only.	Special— Factory Installed	**565.00** Adder

Description	Catalog Number	Price
FUSE REJECTION KITS (Rejects all but Class R Fuses)	HRK-4060	**$26.00**
GLASS METER SOCKET COVER PLATE	29007	**2.60**
SEALING RINGS (Non-Standard)		
Snap-on Type Stainless Steel	29008DS	**3.20**
Latch-Type Stainless Steel	29008G	**5.00**
Screw-Type Aluminum	29008W	**5.00**
EQUIPMENT GROUND TERMINAL	.....	INCLUDED

PLUG-ON CIRCUIT BREAKER KITS

C1-2 DISCOUNT

Common Trip Two Pole 120/240V. ac

Ampere Rating	Catalog Number	Price	Ampere Rating	Catalog Number	Price
60	Q1260VHIN	**$37.**	90	Q1290VHIN	**$ 83.**
70	Q1270VHIN	**58.**	100	Q12100VHIN	**83.**
80	Q1280VHIN	**83.**	125	Q12125VHIN	**267.**

B1-1 DISCOUNT

△Order only. Not stocked in PDS. Order Point: Lexington

Detailed dimensions are in Catalog Section 4161

SQD SLV_000801

EZ METER-pak® METER CENTERS — INDOOR AND RAINPROOF

UL LISTED 100,000 AMP. RMS SYMMETRICAL SHORT CIRCUIT CURRENT RATING*

MAIN DEVICES

Ampere Rating	Indoor: 1Ø-3W. 120/240V. ac Catalog Number	Price	Indoor: 3Ø-4W. 120/208V. ac Catalog Number	Price	Width	Rainproof: 1Ø-3W. 120/240V. ac Catalog Number	Price	Rainproof: 3Ø-4W. 120/208V. ac Catalog Number	Price	Width	Line Lug Wire Size AL/CU
MAIN FUSIBLE SWITCH MUST HAVE HRK-4060 AND CLASS R FUSES FIELD INSTALLED											
400	EZM225N	**$ 657.**	EZM325N	**$ 795.**	18.00	EZM225NR	**$ 874.**	EZM325NR	**$ 988.**	18.19	(1)-750 or (2)-300MCM
600	EZM226N	**1305.**	EZM326N	**1469.**	21.75	EZM226NR	**1652.**	EZM326NR	**1990.**	21.94	(2)-750MCM
TERMINAL BOX MUST BE PROTECTED BY CLASS R FUSES											
800	EZM3800TB	**228.**	EZM4800TB	**255.**	15.25	EZM3800TBR	**307.**	EZM4800TBR	**340.**	15.38	(2)-750MCM
1600	EZM31600TB	**924.**	EZM41600TB	**971.**	21.00	EZM31600TBR	**1005.**	EZM41600TBR	**1053.**	21.19	(4)-750MCM

BASIC METER/BREAKER DEVICES

	Number of Meters	125 Ampere Branches Order Plug-On Circuit Breaker Kits 800A. Main Cross Bus: Catalog Number	Price	Width	150 or 200 Ampere Branches Circuit Breakers Included 1200A. Main Cross Bus: Catalog Number 150A.	Catalog Number 200A.	Price	Width
INDOOR	**1Ø-3W. 120/240V. ac SYSTEMS**							
	3	EZM33-125	**$315.**	12.00	EZM33-150-22H△	EZM33-200-22H△	**$1506.**	13.25
	4	EZM34-125	**420.**	12.00	EZM34-150-22H△	EZM34-200-22H△	**2008.**	13.25
	5	EZM35-125	**525.**	12.00	.....	.....	.....	.....
	6	EZM36-125	**630.**	20.00	EZM36-150-22H△	EZM36-200-22H△	**3012.**	24.00
	7	EZM37-125	**735.**	20.00	EZM37-150-22H△	EZM37-200-22H△	**3514.**	24.00
	8	EZM38-125	**840.**	20.00	EZM38-150-22H△	EZM38-200-22H△	**4016.**	24.00
	10	EZM310-125	**1050.**	20.00	.....	.....	.....	.....
	1Ø-3W. NETWORK METERS ON 3Ø-4W. 120/208V. ac SYSTEMS							
	3	EZM43-125	**336.**	12.00	EZM43-150-22H△	EZM43-200-22H△	**1539.**	13.25
	4	EZM44-125	**448.**	12.00	EZM44-150-22H△	EZM44-200-22H△	**2052.**	13.25
	5	EZM45-125	**560.**	12.00	.....	.....	.....	.....
	6	EZM46-125	**672.**	20.00	EZM46-150-22H△	EZM46-200-22H△	**3078.**	24.00
	7	EZM47-125	**784.**	20.00	EZM47-150-22H△	EZM47-200-22H△	**3591.**	24.00
	8	EZM48-125	**896.**	20.00	EZM48-150-22H△	EZM48-200-22H△	**4104.**	24.00
	10	EZM410-125	**1120.**	20.00	.....	.....	.....	.....
RAINPROOF	**1Ø-3W. 120/240V. ac SYSTEMS**							
	3	EZM33-125R	**336.**	12.19	EZM33-150R-22H△	EZM33-200R-22H△	**1533.**	13.25
	4	EZM34-125R	**448.**	12.19	EZM34-150R-22H△	EZM34-200R-22H△	**2044.**	13.25
	6	EZM36-125R	**672.**	20.12	EZM36-150R-22H△	EZM36-200R-22H△	**3066.**	24.19
	7	EZM37-125R	**784.**	20.12	EZM37-150R-22H△	EZM37-200R-22H△	**3577.**	24.19
	8	EZM38-125R	**896.**	20.12	EZM38-150R-22H△	EZM38-200R-22H△	**4088.**	24.19
	1Ø-3W. NETWORK METERS ON 3Ø-4W. 120/208V. ac SYSTEMS							
	3	EZM43-125R	**360.**	12.19	EZM43-150R-22H△	EZM43-200R-22H△	**1566.**	13.25
	4	EZM44-125R	**480.**	12.19	EZM44-150R-22H△	EZM44-200R-22H△	**2088.**	13.25
	6	EZM46-125R	**720.**	20.12	EZM46-150R-22H△	EZM46-200R-22H△	**3132.**	24.19
	7	EZM47-125R	**840.**	20.12	EZM47-150R-22H△	EZM47-200R-22H△	**3654.**	24.19
	8	EZM48-125R	**960.**	20.12	EZM48-150R-22H△	EZM48-200R-22H△	**4176.**	24.19

ACCESSORIES

Description	Catalog Number	Price
FIFTH JAW		
Four Fifth Jaws Per Kit	EZM45J	**$ 19.00**
Five Fifth Jaws Per Kit	EZM55J	**23.80**
BUSSED EXTENSION (INDOOR)		
400-1200A. 1Ø-3W. Service	EZM31200BE	**184.00**
400-1200A. 3Ø-4W. Service	EZM41200BE	**231.00**
BUSSED CORNER SECTION (INDOOR)		
400-1200A. 1Ø-3W. Service	EZM31200BCS	**464.00**
400-1200A. 3Ø-4W. Service	EZM41200BCS	**577.00**
BUSWAY TAP (INDOOR)		
3Ø-4W. 400-600A. Switches Only	Special— Factory Installed	**565.00** Adder

Description	Catalog Number	Price
FUSE REJECTION KITS (Rejects all but Class R Fuses)	HRK-4060	**$26.00**
GLASS METER SOCKET COVER PLATE	29007	**2.60**
SEALING RINGS (Non-Standard)		
Snap-on Type Stainless Steel	29008DS	**3.20**
Latch-Type Stainless Steel	29008G	**5.00**
Screw-Type Aluminum	29008W	**5.00**
EQUIPMENT GROUND TERMINAL	.....	INCLUDED

PLUG-ON CIRCUIT BREAKER KITS

C1-2 DISCOUNT

Common Trip Two Pole 120/240V. ac

Ampere Rating	Catalog Number	Price	Ampere Rating	Catalog Number	Price
60	Q1260VHIN	**$37.**	90	Q1290VHIN	**$ 83.**
70	Q1270VHIN	**58.**	100	Q12100VHIN	**83.**
80	Q1280VHIN	**83.**	125	Q12125VHIN	**267.**

B1-1 DISCOUNT

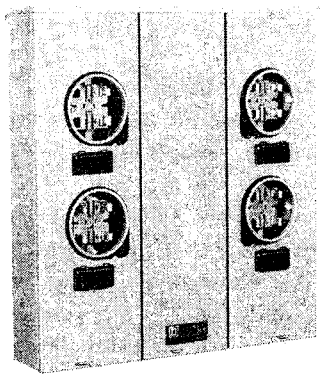
△Order only. Not stocked in PDS. Order Point: Lexington

Detailed dimensions are in Catalog Section 4161

*Load centers using 10,000 AIC rated non-tandem QO and Q1 circuit breakers may be installed twenty feet downstream from one of the above EZ METER-PAK meter centers on systems capable of delivering up to 100,000 amperes short circuit current.

SQD SLV_000802

METER-pak METER CENTERS — INDOOR AND RAINPROOF
WITH UL LISTED SHORT CIRCUIT CURRENT RATINGS



- Two to six meters—indoor or rainproof construction.
- 200A. Meter Socket with front removable spring reinforced Jaws.
- Provisions for plug-on QO or Q1 two pole circuit breakers—15-125A.
- 150-200A. devices have factory installed two pole Q2 circuit breakers.
- A mounting channel is provided for ease of mounting. Channel is positioned on wall and then device is hung. Device has a formed top end-wall for permanent mounting on channel.
- Swingable mounting feet at bottom, to secure to wall.

METERING EQUIPMENT AND LOAD CENTER BRANCH BREAKERS

Available Short Circuit Current Rms Sym. Amps.	* QO Load Center — Branch Breaker Cat. No. Prefix
10,000	QO, Q1, QO-GFI
22,000	QO, Q1, QO-GFI
42,000	QO, Q1, QO-1 Pole GFI Non Tandem

*Load centers using 10,000 AIC rated non tandem QO, Q1 and single pole GFI circuit breakers may be installed twenty feet downstream from a properly applied METER-PAK meter center on systems capable of delivering up to 42,000 amperes short circuit current.

1Ø-3W 120/240V. 125 AMPERE BRANCHES (ORDER PLUG-ON CIRCUIT BREAKERS SEPARATELY)

Number of Meters	Main Rating	Rainproof Catalog Number	Rainproof Price	Indoor Catalog Number	Indoor Price	Line Lug Wire Size AL-CU
2	200	MP22-125R	**$252.**	MP22-125	**$238.**	(1)-300MCM
3	300	MP33-125R	**307.**	MP33-125	**299.**	(2)-600MCM
4	400	MP44-125R	**427.**	MP44-125	**384.**	(2)-600MCM
5	400	MP45-125R	**538.**	MP45-125	**487.**	(2)-600MCM
6	400	MP46-125R	**625.**	MP46-125	**588.**	(2)-600MCM
6	600	MP66-125R	**712.**	MP66-125	**615.**	(2)-600MCM

C1-2 DISCOUNT

PLUG-ON CIRCUIT BREAKERS

Ampere Rating	Meter Center Short Circuit Capacity: 10,000 AIC With Listed Plug-On Circuit Breakers Installed — Catalog Number	Price	22,000 AIC With Listed Plug-On Circuit Breaker Kits Installed — Catalog Number	Price	42,000 AIC With Listed Plug-On Circuit Breaker Kits Installed — Catalog Number	Price
60	QO260	**$18.20**	Q1260VHIN	**$ 37.**	Q1H260IN	**$ 82.**
70	QO270	**37.00**	Q1270VHIN	**58.**	Q1H270IN	**133.**
80	QO280	**51.00**	Q1280VHIN	**83.**	Q1H280IN	**166.**
90	QO290	**51.00**	Q1290VHIN	**83.**	Q1H290IN	**166.**
100	QO2100	**51.00**	Q12100VHIN	**83.**	Q1H2100IN	**166.**
125	Q12125	**110.00**	Q12125VHIN	**267.**	Q1H2125IN	**354.**

B1-1 DISCOUNT

1Ø-3W 120/240V. 150 OR 200 AMPERE BRANCHES

Number of Meters	Mains Rating	10,000 AIC Rainproof Catalog Number Circuit Breakers Included: 150A.	200A.	Price	22,000 AIC Rainproof Catalog Number Circuit Breakers Included: 150A.	200A.	Price	42,000 AIC Rainproof Catalog Number Circuit Breakers Included: 150A.	200A.	Price	Line Lugs Wire Size AL-CU
2	300	MP32-150R	.....	**$571.**	MP32-150R-22H△	.....	**$909.**	MP32-150R-42H△	.....	**$1095.**	(2)-600MCM
2	400	.....	MP42-200R	**571.**	.....	MP42-200R-22H△	**909.**	.....	MP42-200R-42H△	**1095.**	(2)-600MCM
3	300	MP33-150R	.....	**852.**	MP33-150R-22H△	.....	**1358.**	MP33-150R-42H△	.....	**1639.**	(2)-600MCM
3	400	.....	MP43-200R	**852.**	.....	MP43-200R-22H△	**1358.**	.....	MP43-200R-42H△	**1639.**	(2)-600MCM
4	400	MP44-150R	.....	**1138.**	MP44-150R-22H△	.....	**1814.**	MP44-150R-42H△	.....	**2189.**	(2)-600MCM
4	600	.....	MP64-200R	**1209.**	.....	MP64-200R-22H△	**1884.**	.....	MP64-200R-42H△	**2257.**	(2)-600MCM
5	600	MP65-150R	MP65-200R	**1419.**	MP65-150R-22H△	MP65-200R-22H△	**2264.**	MP65-150R-42H△	MP65-200R-42H△	**2732.**	(2)-600MCM
5	800	MP85-150R	MP85-200R	**1475.**	MP85-150R-22H△	MP85-200R-22H△	**2320.**	MP85-150R-42H△	MP85-200R-42H△	**2785.**	(2)-600MCM
6	600	MP66-150R	MP66-200R	**1704.**	MP66-150R-22H△	MP66-200R-22H△	**2717.**	MP66-150R-42H△	MP66-200R-42H△	**3280.**	(2)-600MCM
6	800	MP86-150R	MP86-200R	**1767.**	MP86-150R-22H△	MP86-200R-22H△	**2781.**	MP86-150R-42H△	MP86-200R-42H△	**3339.**	(2)-600MCM

△Order only. Not stocked in PDS. Order point: Lexington

C1-2 DISCOUNT

ACCESSORIES

Description	Catalog Number	Price
SLIDER TYPE MANUAL CIRCUIT CLOSING		
125A. INDOOR; Right Meter Socket	MP125MCCR•	**$45.00**
125A. INDOOR; Left Meter Socket	MP125MCCL•	**45.00**
125A. RAINPROOF; Right Meter Socket	MP125MCCRR•	**45.00**
125A. RAINPROOF; Left Meter Socket	MP125MCCLR•	**45.00**
150-200A. RAINPROOF; Right Meter Sockets	MP200MCCRR•	**45.00**
150-200A. RAINPROOF; Left Meter Sockets	MP200MCCLR•	**45.00**
AUTOMATIC CIRCUIT CLOSING	ACC200•	**22.90**

Description	Catalog Number	Price
FIFTH JAW		
2 Meter Positions	MP25J	**$ 9.50**
3 Meter Positions	MP35J	**14.30**
GLASS METER SOCKET COVER PLATE	29007	**2.60**
SEALING RING (Non-Standard)		
Snap-on Stainless Steel	29008DS	**3.20**
Latch-Type Stainless Steel	29008G	**5.00**
Screw Type Aluminum	29008W	**5.00**

•The meter center short circuit capacity is 10,000 amperes RMS symmetrical when manual or automatic circuit closing is used.

C1-2 DISCOUNT

Detailed dimensions are in Catalog Section 4141.

QO is a Registered Trademark of Square D Company

SQD SLV_000803

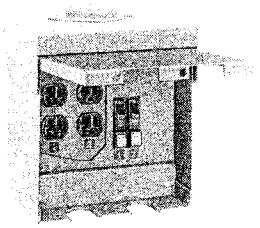
SERVICEpak® POWER OUTLET PANELS

FOR CONSTRUCTION SITES

Used to provide temporary power at construction sites. A variety of receptacles are available to meet different job requirements. Each receptacle is individually protected on its supply side with QWIK-GARD circuit breaker GFCI's or QO circuit breaker in compliance with NEC requirements. Each enclosure is rainproof and box nos. 2R and 3R have provisions to field install a type "B" hub on the bottom endwall for bottom feed from a conduit riser. UL listed as suitable for use as temporary site service equipment. Rated 10,000 AIC.

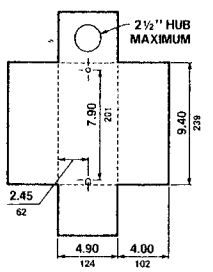
Power Outlet Configuration	Service	Mains Rating Amps.	Circuit Breaker (Included)	Receptacles (Included)		▲Catalog Number	Price	Main Wire Size AWG/MCM CU	Main Wire Size AWG/MCM AL	Box No.
	1Ø2W	40	(1)QO120GFI	One 20A. 125V. 2W. and Grd. Duplex NEMA 5-20R		•PAK10C	$112.	14-4	12-2	1R
	1Ø2W	40	(1)QO120GFI	One 20A. 125V. 2W. and Grd. Duplex NEMA 5-20R		PAK10C-1	112.	14-4	12-2	2R
	1Ø2W	40	(2)QO120GFI	Two 20A. 125V. 2W. and Grd. Duplex NEMA 5-20R		•PAK11C	206.	14-4	12-2	1R
	1Ø2W	40	(2)QO120GFI	Two 20A. 125V. 2W. and Grd. Duplex NEMA 5-20R		PAK11C-1	206.	14-4	12-2	2R
	1Ø3W	70	(1)QO120GFI and (1)QO230	One 20 Amp. 125 Volts 2W. and Grd. Duplex NEMA 5-20R	One 30 Amp. 125/250 Volts 3W. and Grd. Single NEMA 14-30R	PAK31C	155.	6-2	6-2	3R
	1Ø3W	70	(1)QO120GFI (1)QO220	One 20A. 125V. 2W. and Grd. Duplex NEMA 5-20R	One 20A. 250V. 2W. and Grd. Duplex NEMA 6-20R	PAK36C-1	155.	6-2	6-2	3R
	1Ø3W	70	(1)QO120GFI (1)QO250	One 20A. 125V. 2W. and Grd. Duplex NEMA 5-20R	One 50A. 250V. 2W. and Grd. Single NEMA 6-50R	PAK51C	155.	6-2	6-2	3R
	1Ø3W	50	(1)QO250		One 50 Amp. 125/250 Volts 3W. and Grd. Single NEMA 14-50R	*PAK54C	62.	14-4	12-2	2R
	1Ø3W	70	(1)QO120GFI (1)QO250	One 20 Amp. 125 Volts 2W. and Grd. Duplex NEMA 5-20R	One 50 Amp. 125/250 Volts 3W. and Grd. Single NEMA 14-50R	PAK55C	155.	6-2	6-2	3R
	1Ø3W	60	(1)QO260 MAIN (1)QO120GFI (1)QO250	One 20 Amp. 125 Volts 2W. and Grd. Duplex NEMA 5-20R	One 50 Amp. 125/250 Volts 3W. and Grd. Single NEMA 14-50R	PAK55M	176.	14-4	12-2	3R
	1Ø3W	70	(2)QO120GFI (1)QO250	Two 20 Amp. 125 Volts 2W. and Grd. Duplex NEMA 5-20R	One 50 Amp. 125/250 Volts 3W. and Grd. Single NEMA 14-50R	PAK76C	241.	6-2	6-2	3R
	1Ø3W	100	(1)QO120GFI (2)QO250	One 20 Amp. 125 Volts 2W. and Grd. Duplex NEMA 5-20R	Two 50 Amp. 125/250 Volts 3W and Grd. Single NEMA 14-50R	PAK1004C	216.	6-1	6-1	3R

•Receptacles in these devices are in the bottom endwall and are accessible with outer door padlocked.
▲All devices have bolt-on closing cap factory installed. Order bolt-on hub separately from page 15.
*UL Listed Power Outlet—Not marked "Suitable for use as temporary site service equipment".

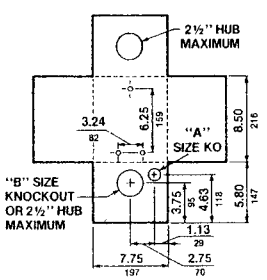


PAK11C-1

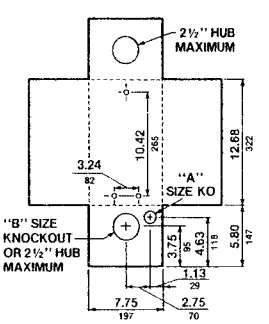
KNOCKOUT INFORMATION & ENCLOSURE DIMENSIONS



BOX 1R



BOX 2R



BOX 3R

KNOCKOUT TABLE

Conduit Size / Symbol	½"	¾"	1"	1¼"	1½"	2"	2½"
A	√	√	√				
B				√	√	√	√

QO and QWIK-GARD are Registered Trademarks of Square D Company.

Dual Dimensions: **INCHES** / Millimeters

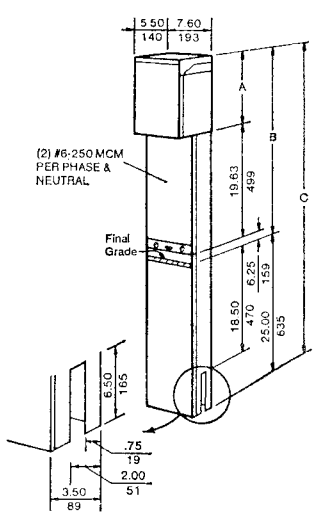
SQD SLV_000804

SERVICEPAK® POWER OUTLET PANELS

FOR RECREATIONAL VEHICLE PARKS

Used to provide electrical power to individual lot sites in recreational vehicle parks. Each receptacle is protected on its supply side by the appropriate QO circuit breaker. Each enclosure is rainproof and non-pedestal devices have provisions to field install a type "B" hub on the bottom endwall for bottom feed from a conduit riser. Devices are 1∅ 2 W. and 1∅ 3 W. with loop feed terminals and are UL listed. All receptacles and circuit breakers are included. Rated 10,000 AIC.

Power Outlet Configuration (See Receptacle Details Below)	Service	Mains Rating Amps.	Catalog Number and Price: Standard Breakers (No GFI)	Price	20 Amp. Circuit Breaker is Ground Fault Type	Price	With 20A. and 30A. Ground Fault Breaker	Price	△Main Wire Size AWG/MCM: Phase and Neutral Cu	Phase and Neutral Al	Equipment Ground Cu	Equipment Ground Al	Box No.
UNDERGROUND OR OVERHEAD LOOP FEED TERMINALS—NON-PEDESTAL●													
	1∅ 2 W.	40	PAK10CT	$ 58.	PAK10CTG	$118.	..	..	14-4	12-2	12-4		2R
	1∅ 2 W.	40	PAK11CT	81.	PAK11CTG	201.	..	..					
	1∅ 2 W.	50	PAK13CT ☆	60.	..	..	..	..					
	1∅ 2 W.	50	PAK41CT ☆	83.	PAK41CTG	143.	PAK41CTGFI	$203.					
	1∅ 2 W.	75	PAK60CT ☆	86.	..	..	..	..	14-2				3R
	1∅ 2 W.	75	PAK61CT ☆	105.	PAK61CTG ☆	165.	..	..					
	1∅ 3 W.	100	PAK75CT (Not Loop Feed) ☆	108.	PAK75CTG (Not Loop Feed) ☆	168.	..	..	6-1				
PEDESTAL MOUNTED—UNDERGROUND LOOP FEED TERMINALS∗													
	1∅ 2 W.	40	PAK11P	$142.	PAK11PG	$262.	..	..					
	1∅ 2 W.	50	PAK13P ☆	131.	..	..	..	..					
	1∅ 2 W.	50	PAK41P ☆	194.	PAK41PG	214.	PAK41PGFI	$274.					
	1∅ 2 W.	75	PAK60P ☆	160.	..	..	..	..					
	1∅ 2 W.	75	PAK61P ☆	170.	PAK61PG ☆	230.	..	..					
	1∅ 3 W.	100	PAK75P ☆	194.	PAK75PG ☆	254.	..	..					



Box 4R

☆QWIK-GARD ground fault circuit interrupter can be substituted for standard 30A. breaker. Add **$60.00** per circuit breaker.
●Devices have a bolt-on factory installed closing cap. Order type "B" bolt-on hub separately from page 15.
∗Stabilizer foot—for use in unstable ground, order catalog number HNP-SF **$9.40** list.
△Two wires each per phase, neutral, and equipment ground—for loop feed.

	20 Amp. 125 Volt 2W. and Grd. Duplex ANSI C73. 12-1972
	30 Amp. 125 Volt 2W. and Grd. Single ANSI C73. 13-1972
	50 Amp. 125/250 Volt 3W. and Grd. Single ANSI C73. 17-1972

Dual Dimensions: **INCHES** / Millimeters

Catalog Number	DIMENSIONS (IN.) PAK11P PAK11PG PAK13P PAK41P PAK41PG PAK41PGFI	PAK60P PAK61P PAK61PG PAK75P PAK75PG
A	8.63	12.88
B	34.50	38.75
C	59.50	63.75

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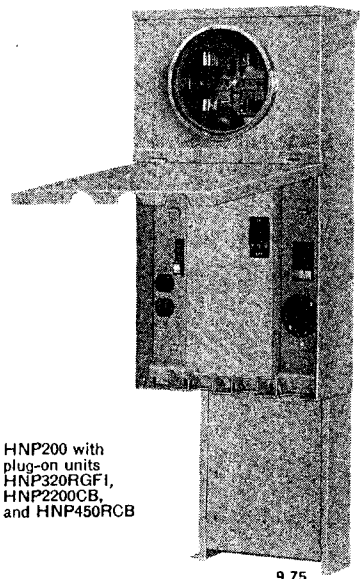
SQD SLV_000805

HITCH-N-POST® METER PEDESTALS

UL LISTED AS MOBILE HOME SERVICE EQUIPMENT ‡



HNP200 with plug-on units HNP320RGFI, HNP2200CB, and HNP450RCB

RAINPROOF POWER OUTLET PANEL WITH 4-JAW METER SOCKET—10,000 AIC

Mains Rating	Catalog Number	Price	Description	Main Wire Size Cu/Al Per Phase and Neutral
200 Ampere	HNP200	**$279.00**	Main lugs only for bottom—loop feed.	(2)#6-250 MCM
200 Ampere	HNP200RB	**246.00**	Top-feed, cannot be pedestal mounted	(1)#6-300 MCM

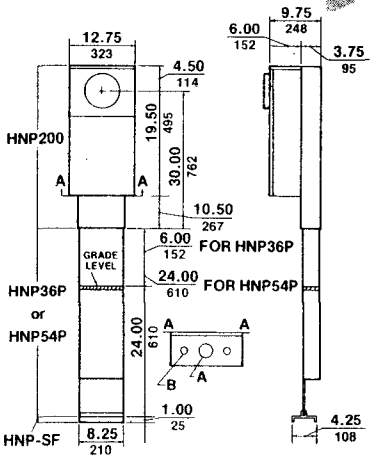
PEDESTAL BASE WITH VAPOR BARRIER

Meter Height Above Grade Level	Catalog Number	Price	Description
36 Inches	HNP36P	**$35.00**	Pedestal base wiring channel for mounting HNP200
54 Inches	HNP54P	**58.00**	Pedestal base wiring channel for mounting HNP200

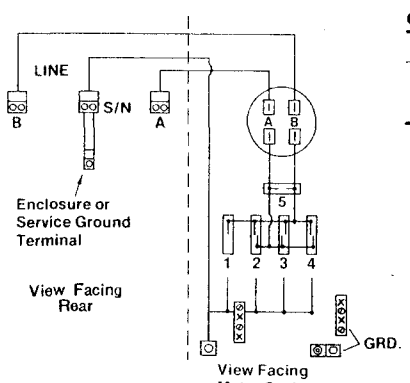
PLUG-ON UNITS

Mount in Position*	Catalog Number	Price	Rating Amps.	Circuit Breaker (Included)	Receptacle (Included)
1, 2, 3 or 4	HNP320RCB◐ ★	**$ 40.00**	20A.	1-Pole	3-wire duplex NEMA 5-20R
1, 2, 3 or 4	HNP320RGFI◐	**107.00**	20A.	1-Pole GFI	3-wire duplex NEMA 5-20R
1, 2, 3 or 4	HNP330RCB◐	**43.00**	30A.	1-Pole	3-wire ANSI C 73.13-1972
2, 3 or 4	HNP230RCB◐	**43.00**	30A.	2-Pole	3-wire NEMA 6-30R
2, 3 or 4	HNP450RCB◐	**62.00**	50A.	2-Pole	4-wire NEMA 14-50R
2, 3 or 4	HNP250RCB◐	**62.00**	50A.	2-Pole	3-wire NEMA 6-50R
1, 2, 3 or 4	QO115 or QO120●	**8.00**	15-20A.	1-Pole	.....
2, 3 or 4	QO250 thru QO260●	**18.20**	50-60A.	2-Pole	.....
4	QO280 thru QO2100●	**51.00**	80-100A.	2-Pole	.....
4	Q12125●	**110.00**	125A.	2-Pole	.....
5▲	HNP2150CB◐	**120.00**	150A.	2-Pole	.....
5▲	HNP2175CB◐	**120.00**	175A.	2-Pole	.....
5▲	HNP2200CB◐	**120.00**	200A.	2-Pole	.....

*For location on panel interior see position number on wiring diagram below.
▲When 150-200A. HNP....CB breakers are mounted in position 5, other units can not be mounted in positions 2 & 3.
●Outlet panel is supplied with closing plates having twistouts to accommodate 1 & 2 pole QO breakers.
◐These plug-on units include required closing plates.
‡Also to provide temporary power at construction sites and for power distribution to individual lot sites at recreational vehicle parks.
★Not UL listed.



Box Diagram
HNP200



View Facing Meter Socket
Wiring Diagram
HNP200

ACCESSORIES AND REPLACEMENT PARTS

Description	Catalog Number	List Price
Stabilizer Foot—Use for unstable soil	HNP-SF	$ 9.40
TV & Telephone Terminal Mounting Bracket	HNP-TB	4.50
Slider Type Manual Circuit Closing Adaptor	HNP200MCC■	45.00
Automatic Circuit Closing Adaptor	ACC200	22.90
Filler Plate—To close twist out opening in closing plate	QO1FP	.80

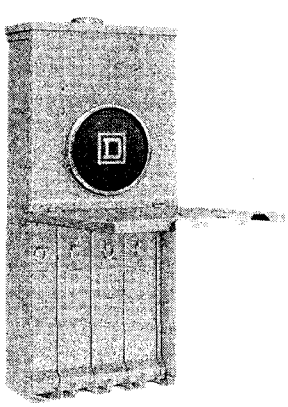
■Order only. Not stocked in PDS. Order point: Lexington.

NEMA #	5-20R	6-30R	6-50R	14-50R
Receptacle Configuration				
Rating	20A. 125V.	30A. 250V.	50A. 250V.	50A. 125/250V.

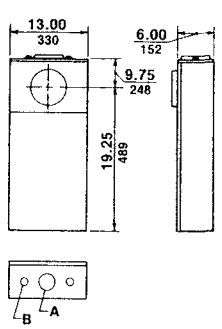
ANSI #	C73. 13-1972
Receptacle Configuration	
Rating	30A. 125V.

ORDERING INFORMATION

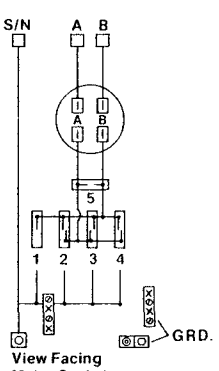
For Underground Service	For Overhead Service
1. Order HNP200 2. Order HNP36P or HNP54P 3. Order Plug-On Units and Accessories	1. Order HNP200RB 2. Order Bolt-On Hub (from p. 15) 3. Order Plug-On Units and Accessories



HNP200RB



Box Diagram
HNP200RB



View Facing Meter Socket
Wiring Diagram
HNP200RB

KNOCKOUT TABLE

Symbol \ Conduit Size	½"	¾"	1"	1¼"	1½"	2"	2½"
A	√	√	√	√	√	√	√
B	√	√	√				

Dual Dimensions: **INCHES** / Millimeters

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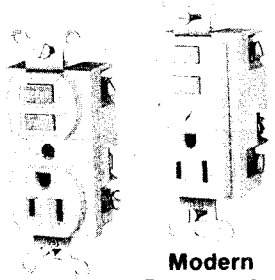
SQD SLV_000806

QWIK-GARD® RECEPTACLES
CLASS A GROUND FAULT PROTECTED 120V. AC RECEPTACLES

Direct-wired QWIK-GARD receptacles

For wiring into a standard 1½" or deeper outlet box.
Terminal connections.



Standard **Modern (Rectangular)**

GFSR Units . . . *all Feed-Thru*

★Rating	Color	Standard		Modern (Rectangular)		Price
		Receptacle Configuration	Copper Wire Only +Catalog No.	Receptacle Configuration	Copper Wire Only +Catalog No.	
15/20	Brown Ivory	NEMA 5-15R	GFSR-115BC GFSR-115IC	NEMA 5-15R	GFSR-115RBC GFSR-115RIC	$63.00
20/20	Brown Ivory	NEMA 5-20R	GFSR-120BC GFSR-120IC	NEMA 5-20R	GFSR-120RBC GFSR-120RIC	66.00

★15/20 amp. devices accept 15 amp. plugs only and may be installed on **either** a 15 amp. or 20 amp. circuit. 20/20 amp. devices accept 15 amp. or 20 amp. plugs and must be installed on a 20 amp. circuit.
+Does not include cover plate. Standard device uses standard duplex cover plate; Rectangular device uses rectangular opening cover plate.

Plug-in QWIK-GARD receptacle

For plug-in installation in either two or three-wire 120V. ac receptacles.



Description	Catalog No.	Price
Receptacle	GFRP-115	$98.00
Vinyl Case	GFRP-C	10.00

P DISCOUNT

GFRP-115

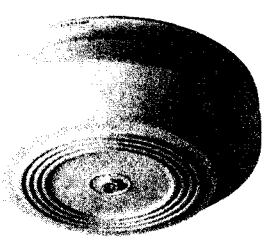
Accessories

Description	Catalog Number	Price	Package Quantity
Cube Tap—Converts Protected Receptacle Into 3 Protected Receptacles			
Brown	GFSR-BCT	$ 4.00	10
Ivory	GFSR-ICT	4.00	10
RaynTite—Weatherproof Covers			
Standard Duplex Opening—Horizontal Mounting	GFSR-HOC	10.40	1
Standard Duplex Opening—Horizontal Mounting	GFSR-HOC-1★	10.40	1
Standard Duplex Opening—Vertical Mounting	GFSR-VOC	10.40	1

★The catalog number GFSR-HOC-1 cover is the same as catalog number GFSR-HOC cover except it is supplied with a thick gasket to permit mounting of the cover to irregular surfaces.

P DISCOUNT

EARLI-GARD® SMOKE AND FIRE DETECTORS
FOR RESIDENTIAL APPLICATIONS



UL Listed (UL 217)

Description	Catalog Number	Price
120V. ac Direct-Wired, Single Station	EGD-4S	$33.00
120V. ac Direct-Wired, Multiple Station	EGD-4I	39.00
120V. ac Direct-Wired, Multiple Station, with Auxiliary Contacts●	EGD-4IR	56.00
Battery Operated	EGD-4B	36.00

●N.O. contacts rated 120V. ac, 2½ amperes

S DISCOUNT

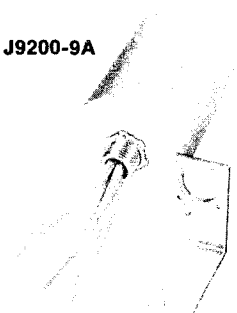
LIGHTNING ARRESTERS
FOR VOLTAGE SURGE PROTECTION ON SECONDARY ELECTRICAL WIRING SYSTEMS

UL Listed



J9200-10

J9200-9A



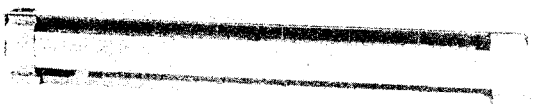
Description	Catalog Number	Price
175V. ac To Ground Max. ★Two or Three Wire Grounded Services	J9200-10	$27.00
650V. ac To Ground Max. Three or Four Wire Grounded Services	J9200-9A	72.00

★Two J9200-10 may be installed to provide protection on 120/208V. ac 3Ø4W grounded services.

A1-4 DISCOUNT

RaynTite is a Registered Trademark of Square D Company.

SQUARE D ELECTRIC BASEBOARD HEATERS



- UL Listed.
- Easily installed without disassembly.
- Dual and triple ratings allow 16 models to cover 40 variations of wattage and voltage.
- Designed for quiet operation . . . no popping and pinging normally associated with baseboard heaters.
- Lead wires allow quick field connection to either end of heater.
- Continuous capillary tube safety thermal cutout protection in case of air flow blockage. Manual reset cutout available.
- Seven knockouts at each end for convenient wiring. Knockouts inside wiring compartment allow field installation of conduit from end-to-end, forming UL Listed wireway. UL Listed for 60°C supply wire.
- 21 different accessories available.
- Chimney fin element design for maximum air circulation. Air flow is directed away from walls to help prevent wall soiling.
- UL Listed for installation on wall at floor level with wall-to-wall carpeting. Heater stands unsupported during installation.
- Electrostatically applied fawn-colored baked powdered epoxy finish provides attractive appearance while supplying superior resistance to chipping and scratching . . . tougher than paint.

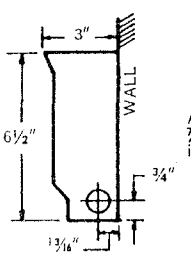
Watts	Length	BTU/Hr. Output	Catalog Number* 240 Volt	120 Volt	208 Volt	277 Volt	Weight (lbs.)	Price
STANDARD DENSITY—250 WATTS PER FOOT								
500	2'-4"	1706	25242-4	25122-4	25202-4	25272-4	7	**$ 38.80**
750	3'	2559	25243	25123	25203	25273	8.5	**44.10**
1000	4'	3412	25244	25124	25204	25274	11	**51.40**
1250	5'	4265	25245	25125	25205	25275	13.5	**61.00**
1500	6'	5118	25246	25126	25206	25276	16	**68.30**
2000	8'	6824	25248	.....	25208	25278	21	**87.00**
2500	10'	8530	25240	.....	25200	25270	25.5	**104.00**
3000	10'	10236	30240	.....	30200	30270	25.5	**104.00**
LOW DENSITY—187 WATTS PER FOOT								
375	2'-4"	1280	25272-4	18122-4	25242-4	.....	7	**$ 38.80**
575	3'	1962	25273	18123	25243	18273	8.5	**44.10**
750	4'	2559	25274	18124	25244	18274	11	**51.40**
950	5'	3241	25275	18125	25245	18275	13.5	**61.00**
1150	6'	3924	25276	18126	25246	18276	16	**68.30**
1500	8'	5118	25278	.....	25248	18278	21	**87.00**
1900	10'	6483	25270	.....	25240	18270	25.5	**104.00**
2250	10'	7677	30270	.....	30240	22270	25.5	**104.00**
DRAFT BARRIER DENSITY—145/170 WATTS PER FOOT								
275	2'-4"	938	.....	.....	25272-4	.....	7	**$ 38.30**
425	3'	1449	18273	.....	25273	.....	8.5	**44.10**
575	4'	1961	18274	.....	25274	.....	11	**51.40**
725	5'	2472	18275	.....	25275	.....	13.5	**61.00**
875	6'	2984	18276	.....	25276	.....	16	**68.30**
1150	8'	3921	18278	.....	25278	.....	21	**87.00**
1450	10'	4944	18270	.....	25270	.....	25.5	**104.00**
1700	10'	5797	22270	.....	30270	.....	25.5	**104.00**

*Manual high temperature limit protection available. Add suffix "M" to catalog number and **$10.** to price.

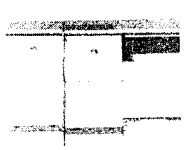
ACCESSORIES

Catalog No.	Description	Case Qty.	Case Weight (lbs.)	Price Each
TX-1	Baseboard Thermostat, SP 22 Ampere, 40° to 100°F.	36	16	**$17.80**
TX-2	Baseboard Thermostat, DP 22 Ampere, 40° to 100°F.	36	20	**21.90**
TX-1TP	Baseboard Thermostat, SP 22 Ampere, Tamperproof, 40° to 100°F.	36	16	**24.00**
TX-2TP	Baseboard Thermostat, DP 22 Ampere, Tamperproof, 40° to 100°F. Thermostats Rated 2500 W. @ 120 V., 4500 W. @ 208 V., 5000 W. @ 240/277 V.	36	20	**27.90**
HCX12-15/20	Heat-Cool Control, 125V. } 15 and 20 Amp. Receptacle	40	57	**40.60**
HCX24-15/20	Heat-Cool Control, 250V. } connect to 20 Amp. Max. Circuit	40	57	**43.50**
RX-1	Duplex Receptacle	36	10	**6.20**
ICX	Inside Corner	20	11	**7.60**
GN-4	Installation Tool—To start screw or to nail without disassembly of heater	25	6	**6.20**
RSX12/24	Low Voltage Relay Section w/Transformer 120 V./24 V.-25A	..	2	**57.90**
RSX20/24	Low Voltage Relay Section w/Transformer 208 V./24 V.-25A.	..	2	**57.90**
RSX24/24	Low Voltage Relay Section w/Transformer 240 V./24 V.-25A.	..	2	**57.90**
RSX27/24	Low Voltage Relay Section w/Transformer 277 V./24 V.-25A.	..	2	**57.90**
BDX	Blank Section of Heater—3⅛ inches	..	1	**22.60**
BDX2	Blank Section of Heater—2 feet-4 inches	..	4	**28.00**
BDX3	Blank Section of Heater—3 feet	..	5	**31.80**
BDX4	Blank Section of Heater—4 feet	..	7	**37.00**
BDX5	Blank Section of Heater—5 feet	..	9	**43.90**
BDX6	Blank Section of Heater—6 feet	..	11	**49.10**
BDX8	Blank Section of Heater—8 feet	..	14	**62.70**
BDX10	Blank Section of Heater—10 feet	..	18	**74.90**

APPROXIMATE DIMENSIONS (Inches)



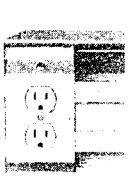
All knockout holes are ⅞ inch diameter for ½ inch conduit.



RSX Relay Sections. Designed to mount at either end of the heater without the use of joining strips.

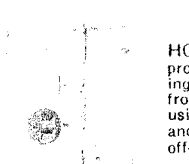


†TX-1 Single pole baseboard thermostat breaks one side of the line on temperature rise.
†TX-2 Double pole baseboard thermostat breaks one side of the line on temperature rise and provides mechanical break on both sides of the line in OFF position.



†RX-1 125 volt receptacle section.

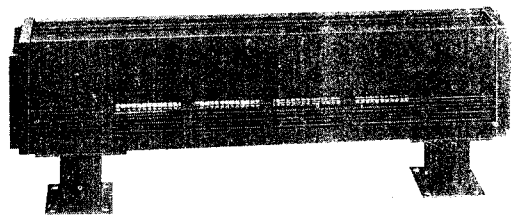
†NOTE: These accessories mount on the heater in place of standard wiring compartment cover with one top mounted screw.



HCX Heat-cool switches provide for operating heating and air conditioning from the same circuit by using a plug-in receptacle and three position heat-off-cool switch.

SQD SLV_000808

SQUARE D ARCHITECTURAL ELECTRIC CONVECTOR HEATERS



Architectural electric convector provides primary or supplemental heating in commercial and industrial applications. The sturdy, attractive units are ideal for offices, lobbies, corridors and comparable facilities.

- UL Listed.
- Convector front and top is single piece, 14 gauge extruded aluminum with bronze brown enamel finish.
- Unique adjustable end caps and joiner sleeves permit a perfect fit without cutting of heaters.
- Heating capacities of 250 watts per foot at 240 volts and 188 watts per foot at 208 volts.
- Units are UL Listed for up to ¾" thick carpet when mounted on floor surface.
- Long life chimney fin element is free-floating for noiseless expansion and contraction.
- Thermal limit switch with linear type sensing bulb provides constant protection against overheating.
- Lead wires allow quick field connection to either end of heater.
- Complete line of accessories as listed below.

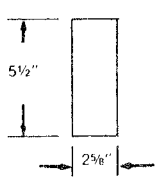
Catalog Number	Length	Watts*		BTU/Hr. Output		Amperage		Weight (lbs.)	Price
		Standard Density 240 Volt	Low Density 208 Volt	240 Volt	208 Volt	240 Volt	208 Volt		
CBP-25242	2′	500	375	1707	1280	2.0	1.8	10	**$203.**
CBP-25243	3′	750	565	2560	1925	3.1	2.7	13	**238.**
CBP-25244	4′	1000	750	3413	2560	4.1	3.6	17	**273.**
CBP-25245	5′	1250	940	4266	3208	5.2	4.5	22	**308.**
CBP-25246	6′	1500	1125	5120	3840	6.3	5.4	26	**343.**
CBP-25247	7′	1750	1316	5973	4492	7.3	6.3	30	**400.**
CBP-25248	8′	2000	1500	6826	5120	8.3	7.2	35	**458.**
CBP-25249	9′	2250	1692	7680	5775	9.4	8.1	39	**515.**
CBP-25240	10′	2500	1875	8533	6400	10.4	9.0	43	**562.**

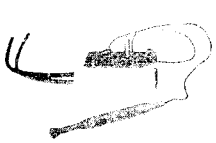
*Additional wattages and voltages are available—Consult Factory.

ACCESSORIES

Catalog Number	Description	Case Qty.	Case Weight (lbs.)	Price
CBPJ-4	4" Joiner Sleeve Kit adjust from 0" to 3"	8	8	**$18.**
CBPJ-7	7" Joiner Sleeve Kit adjust from 3" to 6"	8	16	**21.**
CBPJ-10	10" Joiner Sleeve Kit adjust from 6" to 9"	8	24	**25.**
CBPJ-13	13" Joiner Sleeve Kit adjust from 9" to 12"	8	32	**28.**
CBPECR	Left and Right Hand End Cap Kit	8	16	**33.**
CBPIC	Inside Corner Kit	8	16	**50.**
CBPOC	Outside Corner Kit	8	16	**50.**
CBPPED	Pedestal Kit (2 per Kit)	8	48	**57.**
CBPSP-1	Bronze Brown Spray Paint (6 oz.)	8	16	**13.**
CTX-1	Thermostat, SP 22 Ampere, Tamperproof, 40° to 90°F.	8	8	**48.**
CTX-2	Thermostat, DP 22 Ampere, Tamperproof, 40° to 90°F.	8	8	**56.**
CDS	Double Line Disconnect Rocker Switch, 20 Ampere/120-277 V. ac	8	8	**56.**
CBPRXI-4	4" Duplex Receptacle, 15 Ampere/120 V. ac	8	8	**37.**

DIMENSIONS

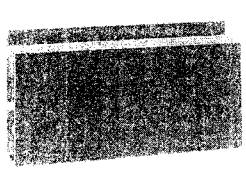




CTX-1, Single pole thermostat breaks one side of the line on temperature rise.



CBPRXI-4, 120 Volt receptacle section adjusts from 0" to 3" the same as joiner sleeve.



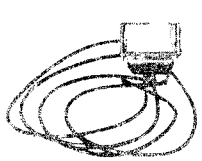
Adjustable joiner sleeve permits custom fit installation without cutting of heaters.



CTX-2, Double pole thermostat breaks both sides of the line on temperature rise.



CBPPED-Pedestal Kit contains two pedestals. Dimensions (3⅛"x3⅛"x2¾").



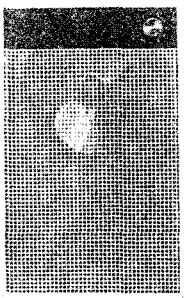
CDS, Double Line Disconnect Rocker Switch. Rated 20 Ampere/120-277 V. ac.

SQD SLV_000809

SQUARE D FORCED AIR WALL HEATERS (UL LISTED)

MWD

Aesthetically designed for residential, institutional and commercial installations.
- Decorative grill with simulated woodgrain trim and rugged baked powdered epoxy finish.
- Downflow air movement for maximum comfort.
- Integral high temperature limit control.
- Open-coil quick response element eliminates need for fan delay switch.
- Dual voltage rating minimizes inventory—1500 watt heater can be reconnected in field for use at 120 volt.
- Double line break integral thermostat.
- Grill 19⅜" H x 12¼" W



Watts	BTU/Hour Output	Catalog Number*	Weight Lbs.	Price
1500 at 240V. or 120V.	5120	MWD2415	15	**$122.00**
2000 at 240V.	6825	MWD2420	15	**128.00**

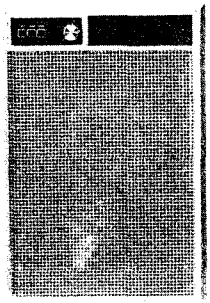
Accessories

Description	Catalog Number	Weight Lbs.	Price
Surface Mount Kit	MWA-SMK	7	**$28.00**
Tamperproof Thermostat Kit	TPW	1	**2.40**

*Includes Enclosure 17½" H, 10⅛" W, 3¾" D

LWD

Architecturally designed and engineered for residential, commercial and industrial installations:
- Push button control with:
  - "Off" position—Double line break.
  - "2500 W" position—For lower heat requirements.
  - "4000 W" position—For higher heat requirements.
- Sensitive bulb type thermostat.
- *High temperature cutout.*
- Permanently lubricated enclosed motor.
- Cushion mounted fan for quiet operation.
- Decorative grill with simulated woodgrain trim and rugged baked powdered epoxy finish.
- Installs quickly in new or existing construction.
- Dual voltage rating minimizes inventory.
- Grill 22¼" H x 15¼" W



Watts	BTU/Hour Output	Catalog Number*	Weight Lbs.	Price
2500/4000 at 240V.	8530/13660	LWD2440	18	**$194.00**
1875/3000 at 208V.	6398/10240			

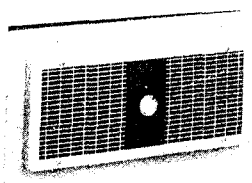
Accessory

Description	Catalog Number	Weight Lbs.	Price
Surface Mount Kit	LWA-SMK	8	**$31.00**

*Includes Enclosure 20¼" H, 13" W, 4" D

SW

One of the shallowest heaters on the market. Ideal for mobile homes, recreational vehicles, boats, and residential installations.
- 2" deep wall box for shallow wall construction.
- Open coil quick-response element, eliminates need for fan delay switch.
- Durable and attractive design with rugged powdered epoxy finish.
- Quick, easy installation in both new and existing construction.
- Multi-bladed fan for quiet operation.
- Mounts vertically or horizontally in the wall.
- Operation protection with safety thermal cutout.
- Grill 8" H x 15" W

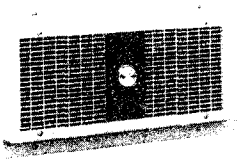


Watts	BTU/Hour Output	Catalog Number* 120 V.	Weight Lbs.	Price
1000	3413	SW 1210	7	**$71.00**

*Enclosure 7¼" H, 14" W, 2" D included with unit. Thermostat included with unit.

SWD

Compact size and multiple mounting planes make this one of the most versatile heaters on the market for new or remodel installations in all types of structures.
- Mounts vertically or horizontally.
- Mounts in wall or ceiling.
- Operational protection with safety thermal cutout.
- Integral thermostat—Remote control available.
- Quick, easy installation for either new or existing installations.
- Durable and attractive design with rugged baked powdered epoxy finish.
- Grill 8" H x 15" W



Watts	BTU/Hour Output	Catalog Number* 120 V.	Catalog Number* 240 V.	Weight Lbs.	Price
1750	5973	SWD 1217	.....	11	**$89.00**
1750	5973	.....	SWD 2417	11	**89.00**
1750	5973	SWD1217-R	.....	11	**79.00**
1750	5973	.....	SWD2417-R	11	**79.00**

*Enclosure 7¼" H, 14" W, 4" D included with unit. Unit without thermostat indicated by suffix-R.

SQD SLV_000810

UL LISTED SQUARE D FORCED AIR WALL HEATERS

MWA

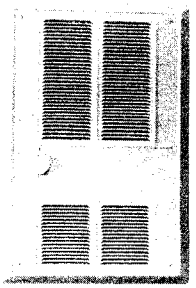
Watts	BTU/Hour Output	Catalog Number*			Weight Lbs.	Price
		120 Volt	208 Volt	240 Volt		
1125	3838	.....	MWA2415	.....	15	**$101.00**
1500	5120	MWA1215	.....	MWA2415	15	**101.00**
1500	5120	.....	MWA2420	.....	15	**109.00**
1875	6398	.....	MWA2425	.....	15	**117.00**
2000	6825	.....	MWA2020	MWA2420	15	**109.00**
2500	8530	.....	MWA2025	MWA2425	15	**117.00**

*Enclosure 17½" H x 10⅛" W x 3⅞" D included.

Accessories and Options

Description	Cat No.	Wt.	Price
Double line break thermostat in place of single line break	Suffix-D*	..	**$ 6.90**
Tamperproof thermostat Kit	TPW	1	**2.40**
Unit without thermostat (for Remote Control)	Suffix-R*	..	No Chg.
Surface Mount Kit	MWA-SMK	4	**28.00**
Enclosure only (no interior)	MWA-C	5	**17.20**
Interior only (no enclosure) MWA2415, MWA1215	Suffix-I	10	**87.00**
Interior only (no enclosure) MWA2020, MWA2420	Suffix-I	10	**95.00**
Interior only (no enclosure) MWA2025, MWA2425	Suffix-I	10	**103.00**

*Add price and suffix to catalog number and price of desired heater listed above.



Versatile multi-rated forced air heater used in residential, institutional and commercial construction.
- Design flexibility—1125 through 2500 watts.
- Open coil quick response element eliminates need for fan delay switch.
- Downflow air movement for maximum comfort.
- Durable and attractive with rugged baked powdered epoxy finish.
- Integral thermostat control—Remote control and tamper-proof control available.
- Operational protection with safety thermal cutout.
- Quick, easy installation in both new and existing walls.
- Surface mount installation kit available.
- Cushion mounted fan for quiet operation.
- Grill 20½" H x 13½" W

LWA

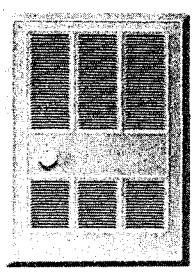
Watts	BTU/Hour Output	Heater Catalog Number*		Weight Lbs.	Price
		208 Volt	240 Volt		
3000	10240	.....	LWA2430	20	**$160.00**
3000	10240	LWA2440	.....	20	**170.00**
4000	13660	LWA2040	LWA2440	20	**170.00**

*Enclosure 20¼" H, 13" W, 4" D included.

Accessories and Options

Description	Cat. No.	Wt.	Price
Double line break thermostat in place of single line break	Suffix-D*		**$ 6.90**
Tamperproof thermostat Kit	TPW	1	**2.40**
Unit without thermostat (for Remote Control)	Suffix-R*	..	No Chg.
Surface Mount Kit	LWA-SMK	8	**31.00**
Enclosure only (no interior)	LWA-C	9	**24.00**
Interior only (no enclosure) LWA2430	Suffix-I	16	**140.00**
Interior only (no enclosure) LWA2040, LWA2440	Suffix-I	16	**149.00**

*Add price and suffix to catalog number and price of desired heater listed above.



Designed for large rooms, lobbies, halls and other areas requiring 3 or 4KW heating units.
Designed for residential, commercial and industrial applications.
- Open coil quick response element eliminates need for fan delay switch.
- Permanently lubricated fully enclosed motor.
- Downflow air movement for maximum comfort.
- Durable and attractive design with rugged baked powdered epoxy finish.
- Integral thermostat control—Remote control and tamper-proof control available.
- Operational protection with safety thermal cutout.
- Quick, easy installation in both new and existing walls.
- Surface mount installation kit available.
- Cushion mounted fan for quiet operation.
- Grill 23" H x 16½" W

KSH

Watts	BTU/Hour Output	Volts			Catalog Number*	Weight Lbs.	Price
		120	208	240			
500	1706	X			KSH2420	20	**$170.70**
750	2560		X				
1000	3412	X		X			
1500	5120	X	X				
2000	6826	X		X			

*Enclosure 3½" H, 22¼" W, 11½" D included.

Accessories

Description	Catalog Number	Weight Lbs.	Price
Integral Thermostat Kit—Single Pole	KST-1	1	**$27.60**
Integral Thermostat Kit—Double Pole	KST-2	1	**35.50**

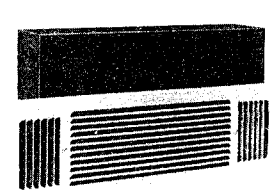


Compact design fits easily over or under cabinets in kitchens and bathrooms.
- Only one model for three voltages and five wattages.
- Compact—only 3½" H x 22¼" W x 11½" D
- Easily accessible outlet box.
- Plug-in assembly—simple to install—simple to clean.
- Enclosed, helical finned heating element.
- Quiet, "blow thru" air flow.
- Thermal limit safety switch.
- Black shadow grill and beige trim ring included.

TW

* Catalog Number	Voltage	Wattage	BTU/Hour Output	Weight Lbs.	Price
TW1222	120	All models are field adaptable for 750W 1100W 1500W 2200W	2560 3754 5120 7679	11	**$133.60**
TW2022	208			11	**133.60**
TW2422	240			11	**133.60**

*Enclosure 7⅝" H, 14⅜" W, 4" D included.
Thermostat not included.



Exceptionally compact, efficient forced air heater for use as primary or supplementary heating system in residential and commercial buildings.
- Four different wattages for selection in the field.
- Blower wheel provides 53 CFM and quiet operation.
- Operational protection with safety thermal cutout.
- Open-coil quick-response element eliminates need for fan delay switch.
- Downflow air movement for maximum comfort.
- Durable and attractive design with rugged baked powdered epoxy finish.
- Designed for control from a remote thermostat.
- Compact register grill (5" H x 15" W) allows decorating versatility.
- 4-pole motor and enlarged bearings assure long and quiet operation.

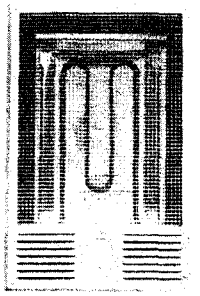
SQD SLV_000811

SQUARE D RADIANT WALL AND CEILING HEATERS (UL) LISTED

NBRA

Designed to provide safe, dependable radiant heat for the bath and laundry room.

- Tubular metal sheathed heating element.
- Versatility in wattage selection.
- Five control options
- Low installation cost.
- Durable and attractive design with baked powdered epoxy finish.
- Quick, easy installation for either new construction or existing walls.
- Nickle-plated grill for protection against rust.
- Grill 19¼" H x 12⅜" W



Watts	BTU/Hour Output	Heater Catalog Number*			Weight Lbs.	Price
		120 Volt	208 Volt	240 Volt		
562	1760	.....	NBRA-2475	.....	9	**$58.30**
750	2559	NBRA-1275	NBRA-2410	NBRA-2475	9	**58.30**
937	3198	.....	NBRA-2412	.....	9	**58.30**
1000	3413	.....	.....	NBRA-2410	9	**58.30**
1250	4266	NBRA-1212	.....	NBRA-2412	9	**58.30**

*Enclosure 17½" H, 10⅛" W, 3⅜" D included.

Accessories and Options

Description	Cat. No.	Price
Interior only with single line break thermostat (no enclosure)	Suffix-I	**$44.70**
Double line break thermostat instead of single line break thermostat	Suffix-D*	**13.80**
Timer in place of single line break thermostat	Suffix-T*	**18.40**
"ON-OFF" switch in place of single line break thermostat	Suffix-SW*	**8.10**
Cover Plate in place of single line break thermostat (Remote Control)	Suffix-R*	No Chg.
Enclosure only (no interior)	NBRA-C	**17.20**
Surface Mount Kit	MWA-SMK	**27.60**

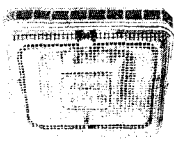
*Add price and suffix to catalog number and price of desired heater listed above.

NW DISCOUNT

RC

Designed to provide safe, dependable radiant heat for bathrooms or laundries.

- Heater mounts quickly and easily to standard ceiling junction box.
- Mounting slots allow unit to be squared up with room.
- Fan assures low unit temperatures and longer element life.
- Efficient tubular sheath heating element.
- Safety limit for protection.
- Fast, easy plug-in installation connection.



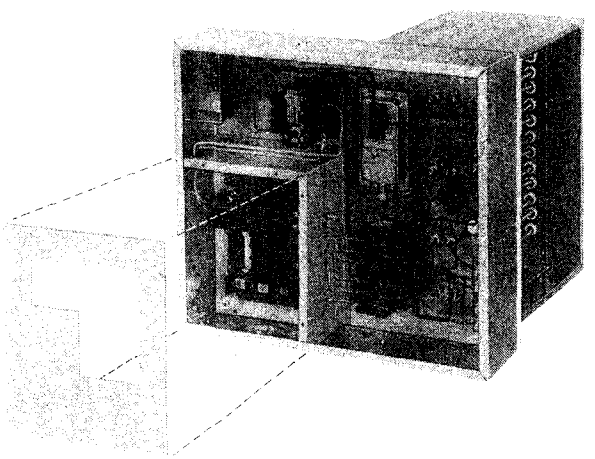
Watts	BTU/Hour Output	Catalog Number		Weight Lbs.	Price
		120 V.	240 V.		
1250	4266	RC 1212	RC 2412	5½	**$80.60**

Overall dimensions 10⅞" H, x 10⅞" W, x 2¹¹⁄₁₆" D

NW DISCOUNT

ELECTRIC DUCT HEATERS AND OEM PROCESS HEATERS

Electric duct heaters are for use in air ducts with a remote air blower. They can be used as primary or supplementary heat in either new or existing installations. OEM process heaters are custom designed for process heating or drying machinery with outlet air requirements up to 300°F. (no UL Listing category applicable). See Electric Duct Heater price book for pricing and ordering information.

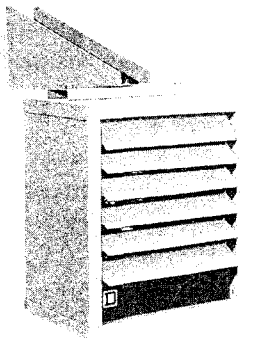


- Zero clearance.
- UL Listed, 0.5 KW to 5000 KW, .75 square foot duct area to 200.
- Manual and automatic temperature limits standard.
- All surfaces in air stream are corrosion protected.
- Standard with insulated terminal box for protection against condensation.
- High quality, extra heavy duty long-life nickel-chromium alloy open coil elements.
- Custom designed, flanged or insert type duct heater.
- Supply voltages of 120, 208, 240, 277, 480, 600 Single-phase or Three-phase. Control voltages of 24, 120, 208, 240, or 277.
- Approved for use in elevated air temperature applications (i.e. with heat pumps, etc.)
- Approved for use in high relative humidity applications (i.e. with cooling equipment.)
- Complete variety of prewired controls and circuit protection.

SQD SLV_000812

UL LISTED SQUARE D ELECTRIC UNIT HEATERS
PROPELLER TYPE

3 TO 15 KW CAPACITY



APPLICATION

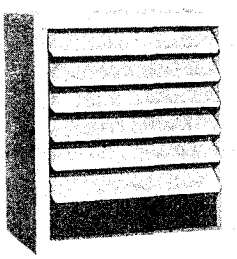
For primary, supplementary or spot heating in residential, commercial or industrial structures.

- Built-in contactors (except 3 & 5 KW, 1 phase)
- Automatic reset high temperature limit control
- Built-in transformer on 480V. units for 240V. control circuit power
- Totally enclosed motor
- Accepts copper or aluminum supply conductors
- Dual voltage rating 208-240V.
- Compact attractive appearance
- Durable baked powdered epoxy finish
- Rugged sheathed finned heating elements

Heater Output					Heater Input							
	BTUH		Temp Rise Deg. F at 240 or 480V.	CFM at 240 or 480V.	Amps.							
KW	at 208V.	at 240 or 480V.			at 208V.	at 240-480V.	Volts	Phase	* Air Throw	★ Catalog Number	Approx. Shipping Wt. Lbs.	Price
3	7,677	10,236	31	450	11.5	13	208-240	1	15′	UP 2413	32	**$229.**
5	12,795	17,060	37	450	19	21.5	208-240	1	20′	UP 2415	32	**262.**
5	12,795	17,060	37	450	11	12.5	208-240	3	20′	UP 2435	32	**290.**
5	....	17,060	37	450	...	6.3	480	3	20′	UP 4835	39	**370.**
7½	19,193	25,590	55	450	28	32	208-240	1	20′	UP 2417	32	**397.**
7½	19,193	25,590	55	450	16	18.5	208-240	3	20′	UP 2437	32	**397.**
7½	....	25,590	55	450	...	9.3	480	3	20′	UP 4837	39	**463.**
10	25,590	34,120	40	900	32.5	39	208-240	1	35′	UP 24110	42	**438.**
10	25,590	34,120	40	900	20	23	208-240	3	35′	UP 24310	42	**438.**
10	....	34,120	40	900	...	12	480	3	35′	UP 48310	49	**490.**
15	38,385	51,180	55	900	32.5	37	208-240	3	45′	UP 24315	42	**717.**
15	....	51,180	55	900	...	18.5	480	3	45′	UP 48315	49	**792.**

*Approximate distance based on still air conditions.
★For factory installed Fan Relay, add suffix -F to catalog number and add **$42.**

20 TO 35 KW CAPACITY



APPLICATION

Complete primary or supplementary general area heating for such locations as factories, warehouses, stores, garages, loading dock or wherever fast, high capacity heating is required.

- Same as above with these additional features
- Factory installed circuit breakers are standard on all 208-240V. units to provide overcurrent protection and disconnect means (subject to local inspection interpretation).
- Combination single/multiple entry lugs on units exceding 48 amps. For copper or aluminum conductor.
- Vertical downflow application—consult factory

HEATER OUTPUT					HEATER INPUT							
	BTUH		Temp. Rise Deg. F. at 240 or 480V.	CFM At 240 or 480V.	Amps.▲							
KW	At 208V.	At 240 or 480V.			At 208V.	At 240 or 480V.	Volts	Phase	* Air Throw	★ Catalog Number	Approx. Shipping Wt. Lbs.	Price
20	51,195	68,260	35	1800	50.5	58.5	208-240	1	40	UP24320B	75	**$1005.**
20	....	68,260	35	1800	...	28.9	480	3	40	UP48320	90	**1005.**
25	63,994	85,325	45	1750	64.0	74.0	208-240	1	45	UP24325B	80	**1185.**
25	....	85,325	45	1750	...	38.5	480	3	45	UP48325	95	**1185.**
30	76,793	102,390	55	1750	64.0	74.0	208-240	1	45	UP24330B	85	**1395.**
30	....	102,390	55	1750	...	38.5	480	3	45	UP48330	100	**1395.**
35	89,564	119,419	65	1700	82.0	94.5	208-240	1	50	UP24335B	90	**1752.**
35	....	119,419	65	1700	...	48.0	480	3	50	UP48335	105	**1752.**

*Approximate distance based on still air conditions.
★For factory installed fan relay, add suffix—F to catalog number and add **$21.00** list.
▲For multiple supply circuit data—See owner's manual.

ACCESSORIES FOR UP HEATERS

Catalog Number	Description	Price
UT-1	Unit Mount Thermostat Kit (Single Line Break).	**$39.00**
UPB-1	Wall Mounting Bracket (15KW and Under).	**30.00**
UPB-2	Wall/Ceiling Mounting Bracket (20KW and Above).	**37.00**
24A01G-2	Relay/Transformer 240V. to 24V.—For Field Conversion of 240V. Control System to 24V. For Remote Wall Mounted Thermostats, See Control Page 37.	**27.20**

SQD SLV_000813

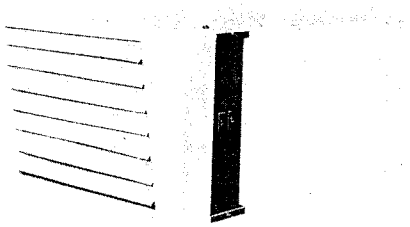
SQUARE D ELECTRIC UNIT HEATERS

UL LISTED

BLOWER TYPE

Blower type unit heaters are designed for industrial and commercial applications where large volume air movement is desirable.

The "B" and "S" series blower unit heaters consist of a "UH" series blower unit heater adaptor kit and a "B" or "S" series electric furnace. These two units are ordered separately and must be field assembled. Furnace is complete with blower relay (for remote control of fan only and for automatic speed reduction in heating/cooling applications—except "62" motor code), fully insulated cabinet, heating elements, controls, heavy duty 24 volt control transformer and disposable air filter.



"B" AND "S" SERIES BLOWER UNIT HEATER

DUAL RATED 208-240V. SINGLE PHASE (UL Listed)

Model Number		Price of Furnace and Kit	KW at 240V.	KW at 208V.	BTUH (Not Including Motor Heat)		Max. Amperage (Including Motor)		Blower (Direct Drive 1Ø)		HP	Staging	
Furnace Plus	Kit				240V.	208V.	240V.	208V.	CFM at 240V 5 ESP	CFM at 208V. 5 ESP		First Stage KW	Second Stage KW
•B20-16-10-C00001T	UH20	**$413.**	10	7.5	34,130	25,598	46	40	High 800	High 600	⅙ DD 1Ø (4 amps.)	10	—
B20-16-12-C00001T	UH20	**440.**	12	9.0	40,956	30,717	54	48	Low 600	Low 500		12	—
B20-03-15-C00001T	UH20	**470.**	15	11.25	51,195	38,396	66	57	High 1200	High 1000	¼ DD 1Ø (3 amps.)	15	—
B20-03-18-C00001T	UH20	**485.**	18	13.5	61,434	46,076	78	68	Med 1000	Med 800		18	—
B20-03-20-C00001T	UH20	**500.**	20	15.0	68,260	51,195	86	75	Low 850	Low 625		20	—
B20-04-23-C00001T	UH20	**530.**	23	17.25	78,499	58,874	100	87	High 1425	High 1400	⅓ DD 1Ø (4 amps.)	15	8
B20-04-25-C00001T	UH20	**550.**	25	18.75	85,325	63,994	108	94	Med 1375	Med 1250		15	10
B20-04-30-C00001T	UH20	**575.**	30	22.5	102,390	76,793	129	112	Low 1300	Low 1150		15	15

DUAL RATED 208-240V. THREE PHASE (UL Listed)

•B20-03-15-J00001T	UH20	**$480.**	15	11.25	51,195	38,396	39	34	High 1200	High 1000	¼ DD 1Ø (3 amps.)	15	—
•B20-03-18-J00001T	UH20	**495.**	18	13.5	61,434	46,076	46	40	Med 1000	Med 800		18	—
B20-03-20-J00001T	UH20	**515.**	20	15.0	68,260	51,195	58	50	Low 850	Low 625		20	—
B20-04-23-J00001T	UH20	**540.**	23	17.25	78,499	58,874	68	59	High 1425	High 1400	⅓ DD 1Ø (4 amps.)	18	5
B20-04-25-J00001T	UH20	**560.**	25	18.75	85,325	63,994	76	66	Med 1375	Med 1250		15	10
B20-04-30-J00001T	UH20	**585.**	30	22.5	102,390	76,793	76	66	Low 1300	Low 1150		15	5
B19-55-36-J00001T	UH19	**970.**	36	27.0	122,868	92,151	100	87	High 2100 Med 2000 Low 1900	High 2000 Med 1900 Low 1800	¾ DD 1Ø (5 amps.)	All units are Three Staged See B19 price sheet for details	
B19-62-40-J00001T	UH19	**1315.**	40	30.0	136,520	102,390	112	97	3100	3000	1 BD 3Ø (5 amps.)		
B19-62-45-J00001T	UH19	**1345.**	45	33.75	153,585	115,189	121	109					
B19-62-48-J00001T	UH19	**1370.**	48	36.0	163,824	122,868	144	125					

480 VOLT—THREE PHASE (UL Listed)

Model Number		Price of Furnace and Kit	KW at 480V.	BTUH (Not Including Motor Heat)	Max. Amperage (Including Motor)	Blower Data (Single Speed)		Staging		
Furnace Plus	Kit					CFM	HP	Stage 1	Stage 2	Stage 3
•B15-32-15-D00001T	UH15	**$670.**	15	51,195	20	@ 2 ESP 1550	⅓ DD 1Ø (2 amps.)	All units are Single Stage Heating		
•B15-32-18-D00001T	UH15	**690.**	18	61,434	24					
•B15-32-20-D00001T	UH15	**705.**	20	68,260	30					
•B15-32-25-D00001T	UH15	**725.**	25	85,325	38					
•B15-32-30-D00001T	UH15	**750.**	30	102,390	45					
•B19-56-36-D00001T	UH19	**990.**	36	122,868	46	2000	¾ DD 1Ø (3 amps.)	18	12	6
B19-62-40-D00001T	UH19	**1425.**	40	136,520	56	@ 3 ESP 3000	1 BD 3Ø (3 amps.)	18	12	10
B19-62-45-D00001T	UH19	**1365.**	45	153,585	64			18	17	10
B19-62-48-D00001T	UH19	**1390.**	48	163,824	68			18	18	12

ACCESSORIES

Model Number	Price	Description
UT-1	See previous page.	Unit Mount Thermostat Kit, Single Line Break

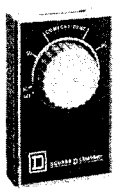
NOTES: • Available in "S" series—without circuit breaker. Deduct **$20.** from B20-16-10-C, **$15.** from other B20 with •, **$30.** from all B15 units and **$50.** from B19-56-36-D.
Approximate Weights: B20—112 lbs., B15—240 lbs. and B19—240 lbs.

BEFORE PURCHASING THIS APPLIANCE, READ IMPORTANT ENERGY COST AND EFFICIENCY INFORMATION AVAILABLE FROM YOUR RETAILER.

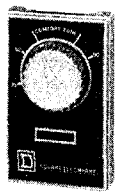
SQD SLV_000814

SQUARE D CONTROLS AND ACCESSORIES

WALL THERMOSTATS—LINE VOLTAGE (277V. MAX.)



S3, S4



S3-T, S4-T

Catalog Number	Description	Case Qty.	Case Wt.	Price Each
S3	Single Line Break	25	17	$ 8.90
S4	Double Line Break	25	17	11.60
S3-T	Single Line Break with Thermometer	25	17	11.20
S4-T	Double Line Break with Thermometer	25	17	14.30
RK2	Temperature Setting Range Stop Add-on Kit for above Thermostats.	50	2	1.70

Switch rating resistive loads 22 amps. at 277V. max. ¼ H.P. at 125V. ½ H.P. at 250V. Range 35° to 90°F.

WALL THERMOSTATS—LOW VOLTAGE (24V.) AND ACCESSORIES



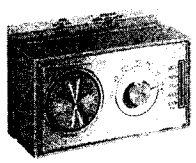
1F56-301



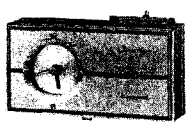
T834C1004



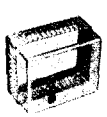
T87F1800 Mounted on Q539 Subbase



1F86-2



T8082A1015



TG500A-1045



NSP-1



24A01G-2

Catalog Number	Description	Case Qty.	Case Wt.	Price Each
1F56-301	WHITE-RODGERS Single Stage Heating and Cooling Thermostat with Subbase. Fan Auto-On, system Cool-Off-Heat. 45° to 90°F.	20	15	$ 20.00
T834C1004	HONEYWELL Single Stage Heating and Cooling Thermostat with Subbase. Fan Auto-On, system Heat-Off-Cool. 55° to 95°F.	50	17	20.00
T87F1800	HONEYWELL Single Stage Heating (For cooling systems add Q539 subbase). 50° to 100°F.	50	17	16.10
Q539A1006	Subbase must be used with T87F on combination Heat/Cool systems. Fan switch Auto-On, system Cool-Off-Heat.	50	7	10.50
1F86-2	WHITE-RODGERS Electric Clock Thermostat, single stage heating and cooling with subbase. Fan Auto-On, system Cool-Off-Heat. 55° to 90°F. Two set back periods. Battery power.	6	10	101.40
T8082A1015	HONEYWELL Electric Clock Thermostat, single stage heating (For cooling add Q682 subbase) 40° to 90°F. Battery power.	10	15	116.60
Q682A1004	Subbase must use with T8082 on combination Heat/Cool systems. Fan switch Auto-On, system Heat-Off-Cool.	10	3	11.70
TG500A-1045	Universal Thermostat Guard with clear plastic cover and tumbler lock. Fits most thermostats, 6⅞" wide x 5⅝" high x 3⅜" deep.	1	3	13.30
NSP-1	12 oz. Aerosol Can of touch up paint for most Square D heating or cooling equipment.	1	1.3	4.80
24A01G-2	Relay/Transformer, 240V. primary, 24V. secondary 25 amps. non-inductive switch rating. With case and conduit spud.	25	47	27.20

SQD SLV_000815

SUN DIAL® HEATING AND AIR CONDITIONING EQUIPMENT

ELECTRIC FURNACES
Heating capacities—5 thru 48 KW
Cooling capacities—1 thru 5 ton
Voltage—dual rated, 208-240V., single and three phase—480 volt, three phase
Mounting—upflow, downflow, or horizontal airflow with or without cooling coil
UL Listed

"CE" AND "CF" SERIES REMOTE CONDENSING UNITS
Cooling capacities—1 thru 5 ton
Voltage—dual rated, 208-240V. single phase
—208-240V., three phase on 3 tons and larger
UL Listed

COOLING AND HEAT PUMP COILS
Evaporator cooling coil capacities—1 thru 5 ton (EVC & EPP series)
Heat pump coil capacities—1½ thru 4 ton (HVC series)

HEAT PUMP SYSTEMS
Cooling capacities—1½ thru 4 ton
Supplemental resistant heat
Voltage—dual rated, 208-240V. single phase
UL Listed

GAS FURNACES
Heating capacities—45,000 to 150,000 BTUH input
Cooling capacities—1 thru 5 ton
Mounting—highboy (upflow), counterflow and horizontal

"PE" SERIES PACKAGED ELECTRIC/ELECTRIC ROOFTOP UNITS
Cooling capacities—7½ and 10 ton
Heating capacities—15, 30, 45 and 60 KW heat packages, factory or field installed
Voltage—280-240V., three phase and 480V., three phase
Mounting—units are completely factory assembled (except for options,) with the flexibility of field conversion for downflow or horizontal airflow

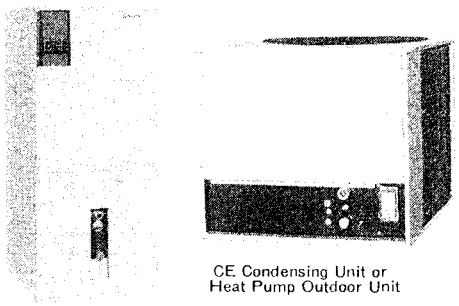
"CC" SERIES REMOTE CONDENSING UNITS
Cooling capacities—7½ and 10 ton
Voltage—208-240V., three phase and 480V., three phase
UL Listed

"AO" SERIES COMMERCIAL AIR HANDLER
Cooling capacities—7½ and 10 ton
Voltage—115-120V., single phase; 208V., three phase; 240-480V., three phase
Mounting—vertical or horizontal
UL Listed

The above commercial equipment can be coupled with an energy management system to provide a complete energy efficient package.

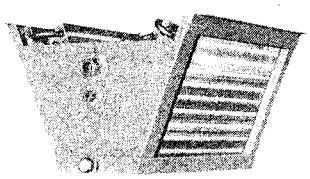
CONTACT YOUR LOCAL SQUARE D REPRESENTATIVE FOR DETAILED INFORMATION.

RESIDENTIAL EQUIPMENT
5 TON AND UNDER



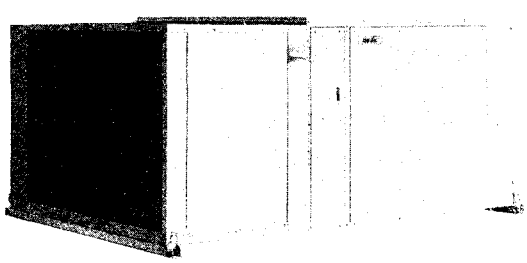
CE Condensing Unit or Heat Pump Outdoor Unit

Indoor Furnace

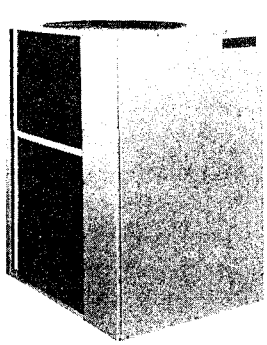


Indoor Cooling or Heat Pump Coil

COMMERCIAL EQUIPMENT
7.5 AND 10 TON

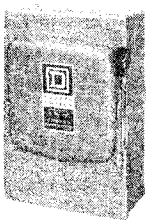


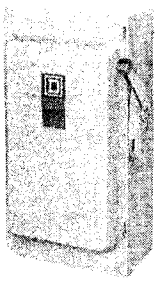
"PE" Rooftop Unit

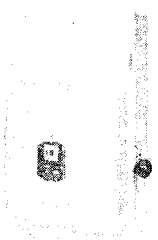


"CC" Condensing Unit

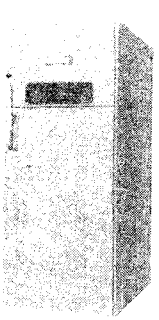
SQD SLV_000816











Maximum System Voltage	Maximum Ampere Rating	Switch Type	UL LISTED Fusing: Class	UL LISTED Fusing: Interrupting Rating (RMS Sym. Amperes)	Type of Enclosure	Digest Page
GENERAL DUTY SAFETY SWITCHES—SINGLE THROW					**GENERAL DUTY**	
240V. ac	600A.	Fusible	H	10,000	NEMA 1 and NEMA 3R	40, 41
		Not Fusible	..	.....		
HEAVY DUTY SAFETY SWITCHES—SINGLE THROW					**HEAVY DUTY**	
600V. ac 600V. dc	1200A.	Fusible	H R J L	10,000 200,000 200,000 200,000	NEMA 1 NEMA 3R NEMA 4 & 5 NEMA 4X NEMA 7 & 9 NEMA 12 & 12K	42-47
		Not Fusible	..	.....		
DOUBLE THROW SAFETY SWITCHES					**DOUBLE THROW**	
600V. ac	600A.	Fusible	H	10,000	NEMA 1 and NEMA 3R	48, 49
		Not Fusible	..	.....		
BOLT-LOC—SINGLE THROW BOLTED PRESSURE SWITCHES					**BOLT-LOC**	
600V. ac	4000A.	Fusible	L	200,000	NEMA 1 NEMA 3R NEMA 12	51, 52
		Not Fusible	..	.....		
INDIVIDUALLY ENCLOSED LOAD INTERRUPTER SWITCHES					**HVL**	
13.8KV	600A.	Fusible	....	See page 53 for available fusing	NEMA 1 NEMA 3R	53
		Not Fusible	....	.....		

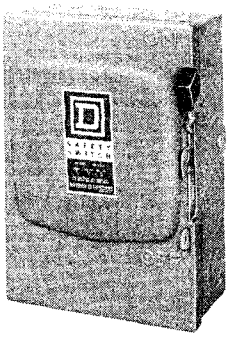
BOLT-LOC is a Registered Trademark of Square D Company.

SQD SLV_000817

SAFETY SWITCHES — GENERAL DUTY

General Duty Safety Switches are designed for residential and commercial applications where economy is a prime consideration—typical loads are lighting, air conditioning and appliances. For UL Listed interrupting ratings, see page 39. Suitable for use as service equipment when equipped with field or factory installed solid neutral assembly (60-600A.) or service grounding kit (30A.). These switches are UL listed, File E2875 and meet or exceed NEMA KS1-1975 for Type GD.

General Duty Switches, in NEMA 1 enclosures meet Federal Specification W-S-865c for Type LD or for 240V. Type ND with single interlock. They meet the above Specification for Type LD without interlock in NEMA 3R enclosure.



FUSIBLE

System	Amp.	Fuse	NEMA 1 Indoor Cat. No.	Price	NEMA 3R Rainproof Cat. No.	Price	●Horsepower Rating Standard 1Ø	Standard 3Ø	Maximum 1Ø	Maximum 3Ø
2 WIRE S/N (1 BLADE, 1 FUSE) 120 VOLTS AC										
	30	Plug	D111N	$17.70	D111NRB	$39.00	½	....	2	....
	30	Cart.	D121N	19.60	D121NRB	46.00	1½	....	2	....
2 POLE — 120/240 VOLTS AC (PLUG) — 240 VOLTS AC (CART.)										
	30	Plug	▲D211	$ 22.20	D211NRB	$ 46.00	½	....	2	....
	30	Cart.	▲D221	26.00	D221NRB	48.00	1½	....	3	....
	60		D222N	52.00	D222NRB	84.00	3	....	10	....
	100		D223N	108.00	D223NRB	124.00	7½	....	15	....
	200		D224N	228.00	D224NRB	310.00	15	....	....	....
	400		D225N	642.00	D225NR	870.00	....	....	....	....
	600		D226N	1284.00	D226NR	1649.00	....	....	....	....
3 WIRE — S/N (2 BLADE — 2 FUSES) 120/240 VOLTS AC (PLUG) — 240 VOLTS AC (CART.)										
	30	Plug	D211N	$ 22.80	D211NRB	$ 46.00	½	....	2	....
	30	Plug	△D211NWH	32.00	.....	.....	½	....	2	....
	30	Cart.	D221N	31.00	D221NRB	48.00	1½	3	3	7½
	60		D222N	52.00	D222NRB	84.00	3	7½	10	15
	100		D223N	108.00	D223NRB	124.00	7½	15	15	30
	200		D224N	228.00	D224NRB	310.00	15	25	....	50
	400		D225N	642.00	D225NR	870.00	....	....	....	....
	600		D226N	1284.00	D226NR	1649.00	....	....	....	....
3 POLE — 240 VOLTS AC (CART.)										
	30	Cart.	▲D321	$ 49.00	▲D321RB	$ 75.00	1½	3	3	7½
	60		D322	84.00	D322RB	114.00	3	7½	10	15
	100		D323	146.00	D323RB	210.00	7½	15	15	30
	200		D324	311.00	D324RB	378.00	15	25	....	50
	400		D325	685.00	D325R	889.00	....	50	....	125
	600		D326	1376.00	D326R	1921.00	....	....	....	....
4 WIRE — S/N (3 BLADES — 3 FUSES) — 240 VOLTS AC (CART.)										
	30	Cart.	D321N	$ 49.00	D321NRB	$ 75.00	....	3	....	7½
	60		D322N	84.00	D322NRB	114.00	3	7½	10	15
	100		D323N	146.00	D323NRB	210.00	7½	15	15	30
	200		D324N	311.00	D324NRB	378.00	15	25	....	50
	400		D325N	782.00	D325NR	976.00	....	50	....	125
	600		D326N	1463.00	D326NR	1975.00	....	....	....	....

FIELD INSTALLABLE SOLID NEUTRAL ASSEMBLY

Ampere Rating	Catalog Number	Price
60	D60SN	$ 7.50
100	D100SN■	11.40
200	D200SN■	15.00
400	D400SN	58.00
600	D600SN	58.00

■Installable in fusible switches only.

NOT FUSIBLE

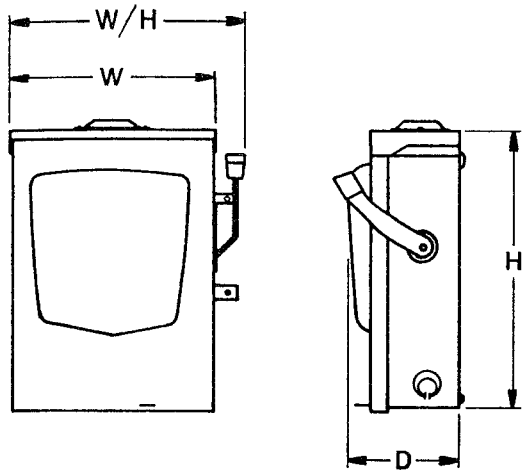
System	Amp.	Fuse	NEMA 1 Indoor Cat. No.	Price	NEMA 3R Rainproof Cat. No.	Price	Horsepower Rating 1Ø	Horsepower Rating 3Ø
2 POLE, 240 VOLTS AC								
	30		.....	.....	▲DU221RB	$46.00	3	....
	60		.....	.....	DU222RB	90.00	10	....
	60		QO260NATS*	$40.00	QO260NATR*	43.00	10	....
	100		QO2000NAS*	70.00	QO2000NARB*	86.00	15	....
	200		Use 3 Pole	.....	Use 3 Pole	.....	....	....
	400		Switch	.....	Switch	.....	....	....
	600		.....	.....	.....	.....	....	....
3-POLE, 240 VOLTS AC								
	30		▲DU321	$ 39.00	▲DU321RB	$ 75.00	3	7½
	60		DU322	52.00	DU322RB	114.00	10	15
	100		DU323	124.00	DU323RB	210.00	15	30
	200		DU324	228.00	DU324RB	378.00	25	50
	400		DU325	552.00	.....	.....	....	125
	600		DU326	1053.00	.....	.....	....	....
3-POLE, ENCLOSED RAINPROOF MANUAL MOTOR STARTING SWITCH (Enclosed 2510 KO-2)								
	Resistance Rating 30A.—250V. ac 20A.—600V. ac		....	....	DU361R	$96.00	Max. HP—3Ø ac 200/230—5 HP 460/575—10 HP	

FIELD INSTALLABLE EQUIPMENT GROUNDING KITS

Switch Ampere Rating	Catalog Number	Price
30	PK3GTA-1	$ 2.50
60		
100	PK0GTA-2	11.00
200		

△Dead Front Construction.
*Enclosed Molded Case Switch. **A1-2 DISCOUNT**
●The starting current of motors of more than standard horsepower rating may require the use of fuses with appropriate time delay characteristics.
▲*Suitability for service equipment use requires field installation of PK3GTA-1 kit for service ground.*

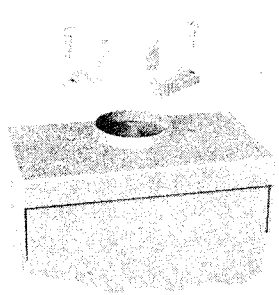
SQD SLV_000818



TERMINAL LUG DATA		
Ampere Rating	Conductors Per Phase	UL Listed Wire Size
30 Line	1	#12-6 Al. or #14-6 Cu.
30 Load	1	#14-8 Al. or Cu.
DU361R	1	#14-10 Cu Only
60	1	#14-2 Al. or Cu.
100	1	#6-1/0 Al. or Cu.
200	1	#4-300MCM Al. or Cu.
400	1 or 2	#3/0-600MCM Al. or Cu. or #3/0-250MCM Al. or Cu.
600	2 or 4	#3/0-600MCM Al. or Cu. or #3/0-250MCM Al. or Cu.

APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS

Catalog Number	Wt. (Lbs.)	Overall Dimensions H	W	W/H	D	Std. Pack.
D111N	3¼	7⅞	5	5¾	4¼	5
D111NRB	5	9⅜	5⅛	6	4½	5
D121N	3	7⅞	5	5¾	4¼	5
D121NRB	5	9⅜	5⅛	6	4½	5
D211	3	7⅞	5	5¾	4¼	5
D211N	3½	7⅞	5	5¾	4¼	5
D211NRB	5	9⅞	5⅛	6	4½	5
D211NWH	3¾	8	5	5¾	4¼	5
D221	3¼	7⅞	5	5¾	4¼	5
D221N	3¼	7⅞	5	5¾	4¼	5
D221NRB	5	9⅜	5⅛	6	4½	5
D222N	9	11¼	7⅞	8¾	4¾	1
D222NRB	11	12¼	7⅞	8 15/16	5	1
D223N	14	16⅜	9⅜	9½	5⅝	1
D223NRB	16	17¼	8 15/16	10⅜	5⅞	1
D224N	23	20 1/16	13 5/16	13 13/16	7	1
D224NRB	33	19 15/16	13¼	14⅝	7¼	1
D225N	70	30¼	20⅜	21⅜	10¼	1
D225NR	85	30⅛	20⅞	21⅞	10	1
D226N	100	33⅜	20 11/16	23⅝	11½	1
D226NR	146	33⅝	21⅜	23⅛	11⅞	1
D321	4½	7⅞	6¾	7½	4¼	10
D321N	4½	7⅞	6¾	7½	4¼	10
D321NRB	6½	9⅜	6½	7⅜	4½	5
D321RB	7	9⅜	6½	7⅜	4½	5
D322	9	11¼	8 1/16	8⅜	4¾	1
D322N	9	11¼	7⅞	8¾	4¾	1
D322NRB	11	12¼	7⅞	8 15/16	5	1
D322RB	11	12¼	7⅞	8 15/16	5	1
D323	14	16⅜	9⅜	9½	5⅝	1
D323N	14	16⅜	9⅜	9½	5⅝	1
D323NRB	16	17¼	8 15/16	10⅜	5⅞	1
D323RB	16	17¼	8 15/16	10⅜	5⅞	1
D324	23	20 1/16	13 15/16	13 13/16	7	1
D324N	23	20 1/16	13 15/16	13 13/16	7	1
D324NRB	34	19 15/16	13¼	14⅝	7¼	1
D324RB	34	19 15/16	13¼	14⅝	7¼	1
D325	80	30¼	20⅜	21⅜	10¼	1
D325N	80	30¼	20⅜	21⅜	10¼	1
D325NR	95	30⅛	20⅞	21⅞	10	1
D325R	95	30⅛	20⅞	21⅞	10	1
D326	131	33⅜	26 11/16	29 1/16	11½	1
D326N	131	33⅜	26 11/16	29 1/16	11½	1
D326NR	140	33 1/16	27¾	29⅝	11⅞	1
D326R	140	33 1/16	27¾	29⅝	11⅞	1
DU221RB	5	9⅜	5⅛	6	4½	5
DU222RB	5	9⅜	5⅛	6	4½	5
DU321	5	7⅞	6¾	7½	4¼	10
DU321RB	7	9⅜	6½	7⅜	4½	5
DU322	5	7⅞	6¾	7½	4¼	10
DU322RB	7	9⅜	6½	7⅜	4½	5
DU323	14	16⅜	9 1/16	9½	5 9/16	1
DU323RB	17	17¼	8 15/16	10⅜	5⅞	1
DU324	23	20 1/16	13⅝	13 13/16	7	1
DU324RB	30	19 15/16	13¼	14⅝	7¼	1
DU325	84	30¼	20⅜	21⅜	10¼	1
DU326	140	33⅜	26 11/16	29 5/16	11½	1
DU361R	5	9⅜	5⅛	....	4⅛	5
QO260NATR	6	9⅜	4⅞	....	4	1
QO260NATS	4	8 9/16	4 13/16	....	3 3/16	1
QO2000NARB	10	13⅛	6	....	4 13/32	1
QO2000NAS	7	12⅜	5⅞	....	3⅜	1



"RB Hub"

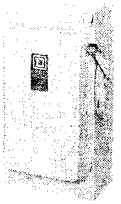
BOLT-ON HUBS

Conduit Size	¾	1	1¼	1½	2	2½	3	3½	4	Closing Cap	Box Coupling
Hub Cat. No.	B075	B100	B125	B150	B200	B250	B300	B350	B400	BCAP	BC200
Price Each	**$8.60**	**$8.60**	**$8.60**	**$8.60**	**$15.60**	**$26.00**	**$46.00**	**$69.00**	**$86.00**	**$0.90**	**$8.60**

Type RB rainproof enclosures have a bolt-on closing cap factory installed. Order bolt-on hubs separately from table above. For more details see page 15. Hubs, thru size 2½ can be directly installed on RB devices. Devices requiring 3" or larger hubs must have holes cut in the field.
All hubs are UL listed for indoor and outdoor use.

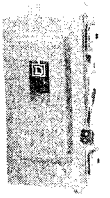
A1-4 DISCOUNT

SAFETY SWITCHES — HEAVY DUTY
VISIBLE BLADES


NEMA 1


NEMA 3R


NEMA 4 and 5
Stainless Steel


NEMA 12

Visible Blade Heavy Duty Safety Switches are designed for application where maximum performance and continuity of service are required. All Heavy Duty Safety Switches feature Quick-make, Quick-break operating mechanism, full cover interlock and indicator handle. They meet Federal Specification W-S-865c for Heavy Duty Switches, are UL listed (File E2875), and meet NEMA KSI-1975 for Type HD. Suitable for use as service equipment.
Finish—Gray baked enamel over rust inhibiting primer.

240 VOLT

SINGLE THROW FUSIBLE

Systems	Amps.	NEMA 1 Indoor Cat. No.	NEMA 1 Indoor Price	NEMA 3R Rainproof (Bolt-on Hubs Page 41) Cat. No.	NEMA 3R Rainproof (Bolt-on Hubs Page 41) Price	NEMA 4 and 5 Dusttight, Watertight Stainless Steel (Hubs Page 43) Cat. No.	NEMA 4 and 5 Dusttight, Watertight Stainless Steel (Hubs Page 43) Price	JIC-Mill & Foundry Type NEMA 12K With Knockouts Cat. No.	JIC-Mill & Foundry Type NEMA 12 Without Knockouts Cat. No.	JIC-Mill & Foundry Type Price	●Horsepower Ratings 240 V. ac Std. 1φ	Std. 3φ	Max. 1φ	Max. 3φ	250 V. dc	Amps.
2 POLE, 240 VOLTS AC — 250 VOLTS DC																
	30	H221	$ 61.	Use 2 Pole— 3 Wire For 2 Pole Application		H221DS	$ 465.	H221A	H221AWK	$ 114.	1½	..	3	..	5	30
	30	*H221-2	105.			.....	....	*H221-2A	*H221-2AWK	141.	1½	..	3	..	5	30
	60	H222	118.			H222DS	561.	H222A	H222AWK	156.	3	..	10	..	10	60
	100	H223	183.			H223DS	1230.	H223A	H223AWK	228.	7½	..	15	..	20	100
	200	H224	328.	H224RB	$ 391.	H224DS	1685.	H224A	H224AWK	379.	15	..	..	..	40	200
	400	H225	679.	H225R	968.	H225DS	3427.	H225A	H225AWK	855.	..	..	..	..	50	400
	600	H226	1351.	H226R	1814.	H226DS	4919.	.....	H226AWK	1498.	..	..	..	..	..	600
	800	△H227	2094.	△H227R	2844.	.....	....	‡	‡	....	..	..	..	..	..	....
	1200	△H228	2892.	△H228R	3835.	.....	....	‡	‡	....	..	..	..	..	..	....
3 WIRE S/N (2 BLADES 2 FUSES) 240 VOLTS AC — 125/250 VOLTS DC																
	30	H221N	$ 61.	H221NRB	$ 114.	H221NDS	$ 483.	H221NA	H221NAWK	$ 126.	1½	3	3	7½	5	30
	60	H222N	118.	H222NRB	214.	H222NDS	585.	H222NA	H222NAWK	167.	3	7½	10	15	10	60
	100	H223N	183.	H223NRB	276.	H223NDS	1269.	H223NA	H223NAWK	268.	7½	15	15	30	20	100
	200	H224N	328.	H224NRB	398.	H224NDS	1739.	H224NA	H224NAWK	419.	15	25	..	60	40	200
	400	H225N	771.	H225NR	968.	H225NDS	3499.	.....	H225NAWK	1021.	..	50	..	125	50	400
	600	H226N	1450.	H226NR	1814.	H226NDS	4991.	.....	H226NAWK	1583.	..	75	..	200	..	600
	800	△H227N	2492.	△H227NR	3024.	.....	....	‡	‡	....	..	..	..	..	..	....
	1200	△H228N	3076.	△H228NR	4125.	.....	....	‡	‡	....	..	..	..	..	..	....
3 POLE, 240 VOLTS AC																
	30	H321	$ 80.	H321RB	$ 141.	H321DS	$ 491.	H321A	H321AWK	$ 141.	..	3	..	7½	..	30
	30	*H321-2	126.	.....	....	.....	....	*H321-2A	*H321-2AWK	167.	..	3	..	7½	..	30
	60	H322	135.	H322RB	227.	H322DS	608.	H322A	H322AWK	199.	..	7½	..	15	..	60
	100	H323	214.	H323RB	326.	H323DS	1233.	H323A	H323AWK	308.	..	15	..	30	..	100
	200	H324	370.	H324RB	444.	H324DS	1815.	H324A	H324AWK	463.	..	25	..	60	..	200
	400	H325	852.	H325R	990.	H325DS	3540.	H325A	H325AWK	1009.	..	50	..	125	..	400
	600	H326	1537.	H326R	2064.	H326DS	5067.	.....	H326AWK	1679.	..	75	..	200	..	600
	800	H327	2836.	H327R	3675.	.....	....	‡	‡	....	..	..	..	..	..	....
	1200	H328	3599.	H328R	4794.	.....	....	‡	‡	....	..	..	..	..	..	....
4 WIRE S/N (3 BLADES 3 FUSES) 240 VOLTS AC																
	30	H321N	$ 80.	H321NRB	$ 141.	H321NDS	$ 514.	H321NA	H321NAWK	$ 159.	..	3	..	7½	..	30
	60	H322N	135.	H322NRB	227.	H322NDS	628.	H322NA	H322NAWK	214.	..	7½	..	15	..	60
	100	H323N	214.	H323NRB	326.	H323NDS	1332.	H323NA	H323NAWK	347.	..	15	..	30	..	100
	200	H324N	370.	H324NRB	444.	H324NDS	1872.	H324NA	H324NAWK	499.	..	25	..	60	..	200
	400	H325N	944.	H325NR	1078.	H325NDS	3540.	H325NA	H325NAWK	1089.	..	50	..	125	..	400
	600	H326N	1625.	H326NR	2149.	H326NDS	5067.	.....	H326NAWK	1769.	..	75	..	200	..	600
	800	H327N	3017.	H327NR	3852.	.....	....	‡	‡	....	..	..	..	..	..	....
	1200	H328N	3792.	H328NR	4975.	.....	....	‡	‡	....	..	..	..	..	..	....
4 POLE, 240 VOLTS AC▲												2φ		2φ		
	30	*H421-2	$ 156.	.....	....	.....	....	.....	*H421-2AWK	$199.	..	3	..	10	..	30
	60	H422	210.	.....	....	.....	....	.....	H422AWK	242.	..	7½	..	20	..	60
	100	H423	328.	.....	....	.....	....	.....	H423AWK	400.	..	15	..	30	..	100
	200	H424	594.	.....	....	.....	....	.....	H424AWK	695.	..	30	..	50	..	200
	400	H425	1134.	.....	....	.....	....	.....	H425AWK	1339.	..	..	..	50	..	400
	600	H426	2028.	.....	....	.....	....	.....	.....	....	..	..	..	..	..	600

*60 ampere switch with 30 ampere fuse spacing and clips.
‡For application above 600 amperes, refer to BOLT-LOC switches on page 51.
△AC only.
●The starting current of motors of more than standard horsepower rating may require the use of fuses with appropriate time delay characteristics.
▲Not suitable for use as service equipment.

Electrical Interlocks—Pages 44, 46 & 47

Dimensions: NEMA 1 & 3R—Page 46
NEMA 4 & 5, 12—Page 47

CLASS R FUSE KITS—240 Volt (One kit per 3 pole switch)

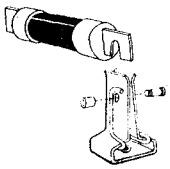
Amps.	Series	Catalog Number	Price Each
30	D2 & D4	HRK-30(R)	$ 6.10
30	D1	HTK-30	6.10
60	D1	HTK-60	6.10
60	D2 & D4	HRK-60	6.10
100	D2, D3 & D4	HRK-1020	11.20
200	D2 & D4	HRK-1020	11.20
400	D2	HRK-4060	26.00
600	D2	HRK-4060	26.00

Kits reject all except class R fuses. Class R fuse will install in standard switch **without** the use of kit. Kit is to reject class H, K, etc. fuses.
¶ H221-2, H321-2, H421-2, H221-2A,AWK, H321-2A,AWK and H421-2AWK use QMB-30R Class R fuse kit.
Price $11.20 GS-1 DISCOUNT.

BOLT-LOC is a Registered Trademark of Square D Company.

SQD SLV_000820

Class R Fuse Provisions:



Fusible Square D Heavy Duty safety switches will accept Class R fuses as standard. A field installable rejection kit is available which, when installed, rejects all but Class R fuses. With the installation of the rejection kit and Class R fuses, the switch is UL listed for use on systems with up to 200,000 RMS symmetrical amperes fault current available. See listing below.

Class J Fuse Provisions:
Provisions for installing Class J fuses are included in 30 through 400 ampere 600 volt, and 100 through 400 ampere 240 volt fusible heavy duty safety switches. Conversion to Class J fuse spacing requires relocating the load side fuse base assembly from the standard Class H fuse location to an alternate position as marked in the enclosure. Switches rated 600 amperes, 240 or 600 volt, require the addition of an adapter kit, H600J at **$126.** One kit per 3 pole switch.

800A. and 1200A. Safety Switches use NEMA Class L bolt-in fuses and are rated for use on systems with up to 200,000 RMS symmetrical amperes at 600V. ac max.

600 VOLT

SINGLE THROW—FUSIBLE

System	Amps.	NEMA 1 Indoor Catalog Number	NEMA 1 Price	NEMA 3R Raintight (Bolt-on Hubs Page 41) Catalog Number	NEMA 3R Price	NEMA 4 and 5 Dusttight, Watertight Stainless Steel (Hubs—See Below) Cat. No.	NEMA 4 and 5 Price	JIC-Mill & Foundry Type NEMA 12K With Knockouts Cat. No.	JIC-Mill & Foundry Type NEMA 12 Without Knockouts Cat. No.	JIC-Mill & Foundry Type Price	●HORSEPOWER RATINGS 480 V. ac Std. 1φ	480 V. ac Max. 1φ	600 V. ac Std. 1φ	600 V. ac Max. 1φ	dc 250	dc 600	Amps.
2 POLE, 480 VOLTS AC — 600 VOLTS AC OR DC																	
	30	H261	$ 135.	Use 3 Pole		H261DS	$ 576.	H261A	H261AWK	$ 193.	3	7½	3	10	5	15	30
	60	H262	162.	Switch for		H262DS	647.	H262A	H262AWK	199.	5	20	10	25	10	25	60
	100	★H263	302.	2 Pole Application		★H263DS	1270.	★H263A	★H263AWK	334.	10	30	15	40	20	..	100
	200	H264	436.			H264DS	1752.	H264A	H264AWK	463.	25	50	30	50	..	60	200
	400	H265	1051.	H265R	$1351.	H265DS	3540.	H265A	H265AWK	1146.	..	..	..	..	..	..	400
	600	H266	1657.	H266R	2664.	H266DS	5067.	.....	H266AWK	1707.	..	..	..	..	..	..	600
	800	△H267	2565.	△H267R	4057.	.....	....	‡	‡	....	..	..	..	..	..	..	800
	1200	△H268	3607.	△H268R	5249.	.....	....			....	..	..	..	..	..	..	1200
3 POLE, 480 VOLTS AC — 600 VOLTS AC											3φ	3φ	3φ	3φ			
	30	H361	$ 135.	H361RB	$ 228.	▲H361DS	$ 604.	H361A	H361AWK	$ 222.	5	15	7½	20	..	15	30
	30	✱H361-2	158.	.....	....	.....	....	✱H361-2A	✱H361-2AWK	227.	5	15	7½	20	..	15	30
	60	H362	162.	H362RB	268.	H362DS	666.	H362A	H362AWK	228.	15	30	15	50	..	30	60
	100	H363	302.	H363RB	419.	H363DS	1329.	H363A	H363AWK	354.	25	60	30	75	..	..	100
	200	▲H364	436.	▲H364RB	576.	▲H364DS	1861.	▲H364A	▲H364AWK	566.	50	125	60	150	..	60	200
	400	H365	1135.	H365R	1351.	H365DS	3540.	H365A	H365AWK	1246.	100	250	125	350	..	..	400
	600	H366	1906.	H366R	2664.	H366DS	5067.	.....	H366AWK	2099.	150	400	200	500	..	..	600
	800	H367	3297.	H367R	4084.	.....	....	‡	‡	....	..	..	..	..	..	..	800
	1200	H368	4335.	H368R	5309.	.....	....			....	..	..	..	..	..	..	1200
4 WIRE S/N (3 BLADES 3 FUSES) 277/480 VOLTS AC—480 VOLTS AC—600 VOLTS AC											3φ	3φ	3φ	3φ			
	30	H361N	$ 158.	H361NRB	$ 250.	H361NDS	$ 622.	H361NA	H361NAWK	$ 238.	5	15	7½	20	..	..	30
	60	H362N	181.	H362NRB	288.	H362NDS	685.	H362NA	H362NAWK	244.	15	30	15	50	..	..	60
	100	H363N	326.	H363NRB	443.	H363NDS	1374.	H363NA	H363NAWK	387.	25	60	30	75	..	..	100
	200	H364N	476.	H364NRB	614.	H364NDS	1906.	H364NA	H364NAWK	604.	50	125	60	150	..	..	200
	400	H365N	1220.	H365NR	1437.	H365NDS	3623.	H365NA	H365NAWK	1329.	100	250	125	350	..	..	400
	600	H366N	1998.	H366NR	2754.	H366NDS	5157.	.....	H366NAWK	2191.	150	400	200	500	..	..	600
	800	H367N	3475.	H367NR	4259.	.....	....	‡	‡	....	..	..	..	..	..	..	800
	1200	H368N	4484.	H368NR	5469.	.....	....			....	..	..	..	..	..	..	1200
▲4 POLE, 480 VOLTS AC — 600 VOLTS AC											2φ	2φ	2φ	2φ			
	30	✱H461-2	$ 222.	.....	....	.....	....	.....	✱H461-2AWK	$ 268.	7½	20	10	25	..	..	30
	60	H462	259.	.....	....	.....	....	.....	H462AWK	302.	15	40	20	50	..	..	60
	100	H463	432.	.....	....	.....	....	.....	H463AWK	464.	25	50	30	50	..	..	100
	200	H464	717.	.....	....	.....	....	.....	H464AWK	774.	50	50	50	50	..	..	200
	400	H465	1473.	.....	....	.....	....	.....	H465AWK	1616.	..	..	..	..	..	..	400
	600	H466	2398.	.....	....	.....	....	.....	.....	....	..	..	..	..	..	..	600

✱60 ampere switch with 30 ampere fuse spacing and clips.
★600 V. ac—250 V. dc only.
‡For application above 600 amperes, refer to BOLT-LOC switches on page 51.
△AC only.
●The starting current of motors of more than standard horsepower rating may require the use of fuses with appropriate time delay characteristics.
▲Not suitable for use as service equipment.

Electrical Interlocks: Pages 44, 46, 47
Dimensions: NEMA 1 & 3R—Page 46
NEMA 4 & 5, 12—Page 47

CLASS R FUSE KITS—600 VOLT (one kit per 3 pole switch)

Amps.	Switch Series (See Pages 46 & 47)	Catalog Number	Price Each
30	D2 & D4	HRK-30H◐	$ 6.10
30	D1	HTK-30H	6.10
60	D1	HTK-60H	6.10
60	D2 & D4	HRK-60H	6.10
100	D2, D3 & D4	HRK-100D	11.20
200	D2 & D4	HRK-100D	11.20
400	D2	HRK-400D	26.00
600	D2	HRK-400D	26.00

◐H361-2, A, AWK, H461-2, AWK requires HRK-60 Class R fuse kit. Price **$6.10.**

FIELD INSTALLABLE EQUIPMENT GROUNDING KITS

Switch Ampere Rating	Catalog Number (AL-CU)	Price	Catalog Number (CU only)△	Price
30 60	PK3GTA-1	$ 2.50	PKOGTC-1	$ 3.10
100 200	PKOGTA-2	11.00	PKOGTC-2	13.80

△For use in NEMA 4 & 5 stainless steel and NEMA 12, when all copper current carrying parts are required.

FIELD INSTALLABLE SOLID NEUTRAL ASSEMBLIES

Ampere Rating	Catalog Number (AL/CU)+	Price	Catalog Number (CU Only)△	Price
30 & 60	H60SN	$ 19.50	H60SNC	$ 24.40
100	H100SN	39.00	H100SNC	50.00
200	+H200SN	48.00	+H200SNC	60.00
400 & 600	H600SN	85.00	H600SNC	106.00
800	H800SN	177.00	.....	...
1200	H1200SN	243.00	.....	...

+Neutral kit for all 200 ampere switches except fusible 600V. 3 phase—3 wire.
△For use in NEMA 4 & 5 stainless steel and NEMA 12, when all copper current carrying parts are required.

WATERTIGHT HUBS—
(For use on NEMA 4 & 5 Stainless Steel and NEMA 12)

Size	Standard—Zinc Catalog Number	Standard—Zinc Price	Chrome Plated Catalog Number	Chrome Plated Price
½"	H050	$ 7.60	H050CP	$ 9.90
¾"	H075	10.90	H075CP	13.80
1"	H100	11.60	H100CP	14.70
1¼"	H125	13.20	H125CP	16.20
1½"	H150	19.80	H150CP	24.00
2"	H200	28.00	H200CP	34.00
2½"	H250	35.00	H250CP	45.00
3"	H300	44.00	H300CP	59.00
3½"	H350	69.00	H350CP	86.00
4"	H400	93.00	H400CP	99.00

BOLT-LOC is Registered Trademark of Square D Company.

SQD SLV_000821

SAFETY SWITCHES — HEAVY DUTY
VISIBLE BLADES

600 VOLT

SINGLE THROW—NOT FUSIBLE

System	Amps.	NEMA 1 Indoor Catalog Number	NEMA 1 Price	NEMA 3R Rainproof (Bolt-on Hubs-p. 41) Catalog Number	NEMA 3R Price	NEMA 4 and 5 Dusttight, Watertight Stainless Steel (Hubs-p. 43) Catalog Number	NEMA 4 and 5 Price	JIC-Mill & Foundry Type NEMA 12K With Knockouts Catalog Number	JIC-Mill & Foundry Type NEMA 12 Without Knockouts Catalog Number	JIC-Mill & Foundry Type Price	HORSEPOWER RATINGS 240V.ac 1ϕ	240V.ac 3ϕ	480V. ac 1Ø	480V. ac 3Ø	600V. ac 1Ø	600V. ac 3Ø	dc 250	dc 600
2 POLE, 480 VOLTS AC — 600 VOLTS AC OR DC																		
	30	HU261	$ 70.	Use 3 Pole Switch for 2 Pole Application		HU261 DS	$ 465.	HU261A	HU261AWK	$126.	..	..	7½	..	10		5	15
	60	HU262	126.			HU262 DS	561.	HU262A	HU262AWK	141.	..	..	20	..	25		10	25
	100	★HU263	199.			★HU263 DS	1219.	★HU263A	★HU263AWK	227.	..	..	30	..	40	..	20	..
	200	HU264	308.			HU264 DS	1613.	HU264A	HU264AWK	325.	..	..	50	..	50	..	40	50
	400	HU265	685.	HU265R	$ 938.	HU265DS	3030.	.....	HU265AWK	734.	..	..	..	..	..	..	50	..
	600	HU266	1219.	HU266R	1878.	HU266DS	4369.	.....	HU266AWK	1234.	..	..	..	..	..	..	..	..
	800	△HU267	1849.	△HU267R	3189.	.....	....	‡‡	‡‡	....	..	..	..	..	..	..	..	..
	1200	△HU268	2531.	△HU268R	4424.	.....	....			....	..	..	..	..	..	..	..	..
3 POLE, 480 VOLTS AC — 600 VOLTS AC OR 250 VOLTS DC																		
	30	HU361	$ 70.	HU361RB	$ 126.	HU361DS	$ 508.	HU361A	HU361AWK	$156.	5	10	..	20	..	30	5	15
	30	HU361-EI	156.	HU361RB-EI	212.	HU361DSEI	594.	HU361A-EI	HU361AWK-EI	242.	5	10	..	20	..	30	5	15
	60	HU362	126.	HU362RB	223.	HU362DS	604.	HU362A	HU362AWK	193.	10	20	..	50	..	60	10	25
	60	HU362-EI	212.	HU362RB-EI	309.	HU362DSEI	690.	HU362A-EI	HU362AWK-EI	279.	10	20	..	50	..	60	10	25
	100	HU363	199.	HU363RB	311.	HU363DS	1234.	HU363A	HU363AWK	276.	15	40	..	75	..	100	20	..
	200	HU364	308.	HU364RB	378.	HU364DS	1685.	HU364A	HU364AWK	370.	15	60	..	125	..	150	40	..
	400	HU365	685.	HU365R	938.	HU365DS	3382.	HU365A	HU365AWK	954.	..	125	..	250	..	350	..	..
	600	HU366	1219.	HU366R	1876.	HU366DS	4513.	.....	HU366AWK	1531.	..	..	..	400	..	500	..	..
	800	△HU367	2472.	△HU367R	3230.	.....	....	‡‡	‡‡	....	..	..	..	..	..	..	..	..
	1200	△HU368	3323.	△HU368R	4424.	.....	....			....	..	..	..	..	..	..	..	..
▲4 POLE, 480 VOLTS AC — 600 VOLTS AC													2Ø	3Ø	2Ø	3Ø		
	30	HU461	$ 201.	.....	....	HU461DS	$ 621.	.....	HU461AWK	$ 219.	..	10	20	20	25	30	5	10
	60	HU462	222.	.....	....	HU462DS	728.	.....	HU462AWK	242.	..	15	40	30	50	50	10	25
	100	HU463	400.	.....	....	.....	....	.....	HU463AWK	431.	..	..	50	..	50	..	..	..
	200	HU464	582.	.....	....	.....	....	.....	HU464AWK	680.	..	..	50	..	50	..	..	..
	400	HU465	1234.	.....	....	.....	....	.....	HU465AWK	1345.	..	..	..	..	..	..	..	..
	600	HU466	2153.	.....	....	.....	....	.....	.....	....	..	..	..	..	..	..	..	..

Switches with EI suffix are stocked with pre-installed electrical interlocks with one normally open and one normally closed contacts.
★600V. ac—250V. dc only.
△AC only.
‡For application above 600 amperes, refer to BOLT-LOC switches on page 51.
▲Not suitable for use as service equipment.

Dimensions: NEMA 1 & 3R—Page 46
NEMA 4 & 5, 12—Page 47

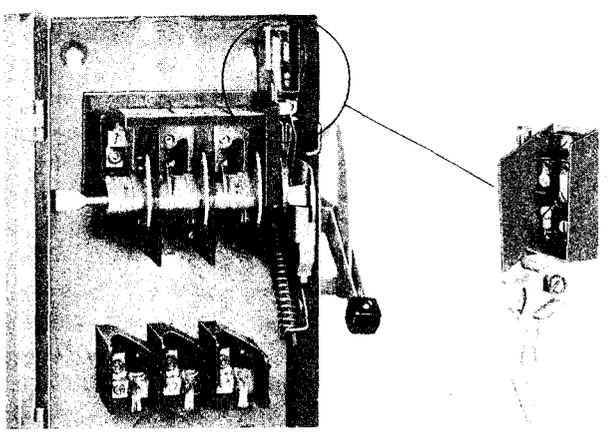
ELECTRICAL INTERLOCKS

Electrical interlocks for Heavy Duty Visible Blade Safety Switches are available in kit form for field or factory installation. Each kit contains instructions for proper field mounting. A pivot arm operates from switch mechanism, breaking the control circuit before the main switch blades break. Electrical Interlock Kits are UL listed.

See page 46 or 47 for proper interlock for heavy duty visible blade switches

Interlock Kit Catalog Number	Price Kit Only	Price Factory Installed
EI-300•	$52.	$ 86.
EK-300-1 or 2▲	52.	86.
EI-306-1 or 2▲	52.	86.
EK-306-1 or 2 ▲	52.	86.
EI-1020-1 or 2 ▲	85.	124.
EK-1020-1 or 2▲	85.	124.
EIK-4060-1 or 2▲	126.	159.

•One normally open **or** one normally closed contact.
▲-1 indicates one normally open and one normally closed contact.
-2 indicates two normally open and two normally closed contacts.



EK-1020-1

PARTS KITS

Description	Cat. No.	Price
16 oz. Aerosol Paint Can, containing Sq. D Gray Paint	PK-49SP	$9.60
Cover Padlock Attachment for NEMA 12 Switches (Std. Pkg 5)	CPA-100	4.60
Cover Release Handle for NEMA 12 Switches & Brkrs	C1H-100	4.60
*30 Ampere Fuse Puller Kit	H30FP	6.90
*60 Ampere Fuse Puller Kit	H60FP	8.10
*100 Ampere Fuse Puller Kit	H100FP	9.70

*Kit consists of three fuse pullers as required for a 3 pole, fusible, 240V. or 600V. switch. Kits can be installed in switches manufactured after Feb. 1980.



CPA-100

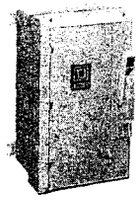


C1H-100

BOLT-LOC is a Registered Trademark of Square D Company.

SQD SLV_000822

NEMA 4X KRYDON ENCLOSURES



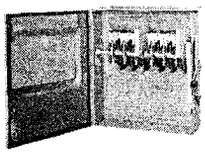
H361DX

3 POLE FUSIBLE 600V. AC—250V. DC—NOT UL LISTED

Amps.	Field Installable Electrical Interlock ●	Horsepower Rating 480V. ac 3Ø Std.	480V. ac 3Ø Max.	600V. ac 3Ø Std.	600V. ac 3Ø Max.	250V. dc	Catalog Number	Price
30	9999R6 or 9999R7	5	15	7½	20	5	H361DX	$ 873.
60	9999R6 or 9999R7	15	30	15	40	10	H362DX	972.
100	9999R8 or 9999R9	25	60	30	50	20	H363DX	1862.

●See Page 458 for details.

SINGLE THROW SWITCHES—6 POLE SIX POLE



HU663 RWK

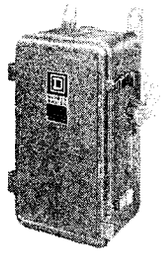
One Enclosure for NEMA 1, 3 or 12 application.

600 VOLT—NOT FUSIBLE UL LISTED

Amps.	Catalog No.	Price
30	HU661RWK	$ 807.
60	HU662RWK	935.
100	HU663RWK	1152.
200	HU664RWK	2594.

Electrical Interlocks—p. 47.

NEMA 4 & 5



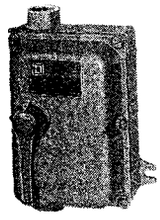
NEMA 4 & 5
Cast Aluminum Enclosure

WATERTIGHT, DUSTTIGHT—UL LISTED **CAST ALUMINUM**

Amps.	Catalog No.	Price	Maximum Horsepower Ratings 240V. ac 1Ø	240V. ac 3Ø	480V. ac 1Ø	480V. ac 3Ø	600V. ac 1Ø	600V. ac 3Ø	dc 250	dc 600
3 POLE, 240 VOLTS AC, FUSIBLE										
30	H321D	$ 531.	..	..	..	..	..	..	..	..
60	H322D	658.	..	..	..	..	..	..	..	..
100	H323D	1400.	15	30	..	..	..	..	20	..
3 POLE, 4 WIRE, S/N, 277/480 VOLTS AC, FUSIBLE										
30	H361ND	$ 675.	..	..	..	15	..	..	..	..
60	H362ND	742.	..	..	..	30	..	..	..	..
3 POLE, 600 VOLTS AC, FUSIBLE										
30	H361D	$ 655.	..	..	..	15	..	20	..	..
60	H362D	719.	..	..	..	30	..	40	..	..
100	H363D	1440.	..	..	..	60	..	50	..	..
200	H364D	2014.	..	..	..	60	..	50	..	..
3 POLE, 600 VOLTS AC, 250 VOLTS DC, NOT FUSIBLE										
30	HU361D	$ 550.	5	10	7½	20	10	30	5	15
60	HU362D	655.	10	15	20	30	25	40	10	..
100	HU363D	1337.	15	30	30	60	40	50	20	..
200	HU364D	1825.	..	50	..	60	..	50	40	..

PENDING OBSOLESCENCE

NEMA 7 & 9



H60XFA

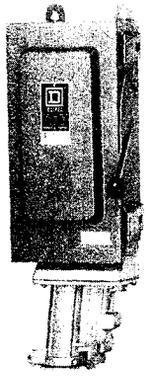
An enclosed Molded Case Switch for use in a Class I, Groups C & D, (NEMA 7), or Class II, Groups E, F & G, (NEMA 9), hazardous location, safety switch application. Suitable for outdoor use. UL listed.

3 POLE, NOT FUSIBLE, 600V. AC—250V. DC

Amps.	Maximum Horsepower Ratings—3Ø 240V. ac	480V. ac	600V. ac	Enclosed Molded Case Switch Catalog Number△	Price	Solid Neutral Assembly Catalog Number	Price
60	15	30	50	H-60-XFA	$ 591.	100SNA	$36.
100	30	60	75	H-100-XFA	704.	100SNA	36.
200	60	125	150	H-225-XKA	1474.	225SNA	48.

△Includes necessary breather and drain required for outdoor use.

RECEPTACLE SWITCHES



Interlocked Receptacle Switch with Crouse-Hinds ARKTITE Receptacle

Interlocked Receptacle Switches are furnished for NEMA 1 or NEMA 12 applications. Switches are furnished with 60 ampere, 3 phase 4 wire grounded type special HUBBELLOCK receptacle, or Crouse-Hinds ARKTITE receptacle, prewired and mounted with interlock linkage to the switch mechanism. Interlock linkage prevents insertion or removal of the plug while switch is in the "ON" position. Linkage prevents operation of the switch if incorrect plug is inserted into switch with HUBBELLOCK or ARKTITE receptacle. Not suitable for use as service equipment.

60 AMPERE INTERLOCKED RECEPTACLE SWITCHES

Type of Receptacle Provided	Enclosure Type	240 Volt Fusible Catalog No.	240 Volt Fusible Price	240 Volt Use with Plug	600 Volt Fusible Catalog No.	600 Volt Fusible Price	600 Volt Not Fusible Catalog No.	600 Volt Not Fusible Price	600 Volt Use with Plug	Price
Hubbellock (UL Listed)	NEMA 1	.....	....	.....	H362WH	$570.	HU362WH	$543.	△ SD-12781	$126.
	NEMA 12	.....	....	.....	H362AWH	596.	HU362AWH	560.		
Arktite (UL Listed)	NEMA 1	H322WC	$550.	* APJ 6463-S4 or APJ 6465-S4 or APJ 6485-S4	H362WC	$570.	HU362WC	$543.	* APJ 6463 or APJ6465 or APJ 6485	....
	NEMA 12	H322AWC	567.		H362AWC	596.	HU362AWC	561.		

*Order from local Crouse-Hinds distributor.
△Plug furnished with Kellems grip for 1⅛" to 1²¹⁄₆₄" cable diameter.

SHADED AREA DENOTES PENDING OBSOLESCENCE

Hubbell PIN and SLEEVE RECEPTACLES are available factory mounted and prewired on heavy duty safety switches and circuit breakers. Contact local Square D Office for ordering information.

HUBBELLOCK is a Registered Trademark of Harvey Hubbell, Inc.
ARKTITE is a Registered Trademark of Crouse-Hinds Co.

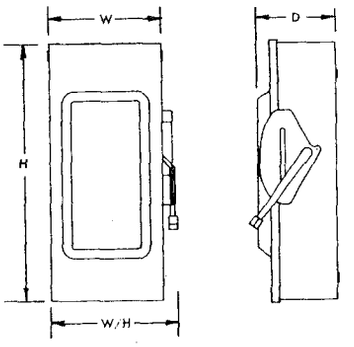
KRYDON is a Trademark of Crouse-Hinds Co.

DIMENSIONS: Page 47

SQD SLV_000823

SAFETY SWITCHES — HEAVY DUTY
NEMA 1 AND NEMA 3R

TERMINAL LUG DATA			
Ampere Rating	Conductors Per Phase	Mechanical Lug UL Listed Wire Size	Optional VERSA-CRIMP Compression Lug—Field Installable—See Page 169
30	1	#14-4 Al or Cu	.....
60	1	#14-4 Al or Cu	.....
100	1 1	#6-1/0 Al or #10-1/0 Cu	VCEL-021-14S1
200	1	#6-300 MCM Al or Cu	VCEL-030-516H1
400	1 or 2	#3/0-750 MCM Al or Cu 1-#3/0-750 MCM Al or Cu and 1-#6-300 MCM Al or Cu	VCEL-075-12H1 VCEL-030-516H1 and VCEL-050-12H1
600	2	#3/0-500 MCM Al or Cu	VCEL-050-12H1
800	3	#4-750 MCM Al or Cu	.....
1200	4	#4-750 MCM Al or Cu	.....



Typical NEMA 1

APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS AND ELECTRICAL INTERLOCKS

Catalog Number	Series	Wt. Lbs.	Overall Dimensions (Inches) H	W	W/H	D	Electrical Interlock
H221	D2	8	11 1/8	6 1/2	7 3/8	4 3/4	EK-300-1 or 2
H221-2	D2	14	15 13/16	7 3/4	8 1/2	5 13/16	EK-306-1 or 2
H221N	D2	8	11 1/8	6 1/2	7 3/8	4 3/4	EK-300-1 or 2
H221NRB	D2	8	12 5/8	7	7 5/8	5	EK-300-1 or 2
H222, N	D2	14	15 13/16	7 3/4	8 1/2	5 13/16	EK-306-1 or 2
H222NRB	D2	17	17 7/8	8 5/16	8 3/4	5 13/16	EK-306-1 or 2
H223, N	D2	26	19 1/16	10 3/16	11 7/16	6 1/4	EK-1020-1 or 2
H223NRB	D2	29	19 13/16	10 15/16	12 3/16	6 7/16	EK-1020-1 or 2
H224, N	D2	41	23 3/4	12 7/8	14 3/8	7 1/2	EK-1020-1 or 2
H224NRB, RB	D2	47	23 7/8	13 1/4	14 3/4	7 3/4	EK-1020-1 or 2
H225, N	D2	115	36 3/4	25 1/8	25 1/4	12	EIK-4060-1 or 2
H225NR, R	D2	115	39 13/16	25 1/8	25 1/4	12	EIK-4060-1 or 2
H226, N	D2	150	40	25 1/8	25 1/4	15 1/16	EIK-4060-1 or 2
H226NR, R	D2	150	40	25 1/4	25 7/16	15 1/16	EIK-4060-1 or 2
H227, N	C1	280	48 1/4	32 1/2	35	12 1/2	Not Available
H227NR, R	C1	285	48 5/8	33	35 1/8	13	Not Available
H228, N	C1	300	51 1/4	38 1/4	40 3/4	12 7/8	Not Available
H228NR, R	C1	305	51 3/4	38 1/2	40 3/4	12 7/8	Not Available
H261	D2	9	14 1/4	6 1/2	7 3/8	4 3/4	EK-300-1 or 2
H262	D2	15	15 13/16	7 3/4	8 1/2	5 13/16	EK-306-1 or 2
H263	D2	27	19 1/16	10 3/16	11 7/16	6 1/4	EK-1020-1 or 2
H264	D2	41	23 3/4	12 7/8	14 3/8	7 1/2	EK-1020-1 or 2
H265	D2	117	39 3/4	25 1/8	25 1/4	12	EIK-4060-1 or 2
H265R	D2	117	39 3/4	25 1/4	25 7/16	12 5/16	EIK-4060-1 or 2
H266	D2	147	40	25 1/8	25 1/4	15 1/16	EIK-4060-1 or 2
H266R	D2	163	40	25 1/4	25 7/16	15 1/16	EIK-4060-1 or 2
H267	C1	280	48 1/4	32 1/2	35	12 1/2	Not Available
H267R	C1	285	48 5/8	33	35 1/8	13	Not Available
H268	C1	300	51 1/4	38 1/4	40 3/4	12 7/8	Not Available
H268R	C1	305	51 3/4	38 1/2	40 3/4	12 7/8	Not Available
H321	D2	8	11 1/8	6 1/2	7 3/8	4 3/4	EK-300-1 or 2
H321-2	D2	17	15 13/16	7 3/4	8 1/2	5 13/16	EK-306-1 or 2
H321N	D2	8	11 1/8	6 1/2	7 3/8	4 3/4	EK-300-1 or 2
H321RB	D2	8	12 5/8	7	7 5/8	5	EK-300-1 or 2
H321NRB	D2	8	12 5/8	7	7 5/8	5	EK-300-1 or 2
H322, N	D2	17	15 15/16	7 3/4	8 1/2	5 13/16	EK-306-1 or 2
H322RB, NRB	D2	20	17 7/8	8 5/16	8 3/4	5 13/16	EK-306-1 or 2
H322WC	D2	20	25 15/16	7 3/4	8 1/2	5 13/16	EK-306-1 or 2
H323, N	D3	30	19 1/16	10 3/16	11 7/16	6 1/4	EK-1020-1 or 2
H323RB, NRB	D3	35	19 13/16	10 15/16	12 3/16	6 7/16	EK-1020-1 or 2
H324, N	D2	48	23 3/4	12 7/8	14 3/8	7 1/2	EK-1020-1 or 2
H324RB, NRB	D2	57	23 7/8	13 1/16	14 3/4	7 3/4	EK-1020-1 or 2
H325, N	D2	127	36 3/4	25 1/8	25 1/4	12	EIK-4060-1 or 2
H325R, NR	D2	127	39 13/16	25 1/4	25 7/16	12 5/16	EIK-4060-1 or 2
H326, N	D2	166	40	25 1/8	25 1/4	15 1/16	EIK-4060-1 or 2
H326R, NR	D2	166	40	25 1/4	25 7/16	15 1/16	EIK-4060-1 or 2
H327, N	C1	280	48 1/4	32 1/2	35	12 1/2	Not Available
H327NR, R	C1	285	48 5/8	33	35 1/8	13	Not Available
H328, N	C1	300	51 1/4	38 1/4	40 3/4	12 7/8	Not Available
H328NR, R	C1	305	51 3/4	38 1/2	40 3/4	12 7/8	Not Available
H361	D2	9	14 1/4	6 1/2	7 3/8	4 3/4	EK-300-1 or 2
H361-2	D2	22	15 13/16	7 3/4	8 1/2	5 13/16	EK-306-1 or 2
H361N	D2	9	14 1/4	6 1/2	7 3/8	4 3/4	EK-300-1 or 2
H361NRB, RB	D2	11	15 3/4	7	7 5/8	5	EK-300-1 or 2
H362, N	D2	22	15 15/16	7 3/4	8 1/2	5 13/16	EK-306-1 or 2
H362NRB, RB	D2	20	17 7/8	8 5/16	8 3/4	5 13/16	EK-306-1 or 2
H362WC	D2	24	25 15/16	7 3/4	8 1/2	5 13/16	EK-306-1 or 2
H362WH	D2	20	19 15/16	7 3/4	8 1/2	5 13/16	EK-306-1 or 2
H363, N	D3	39	19 1/16	10 3/16	11 7/16	6 1/4	EK-1020-1 or 2
H363NRB, RB	D3	35	19 13/16	10 15/16	12 3/16	6 7/16	EK-1020-1 or 2
H364	D2	47	23 3/4	12 7/8	14 3/8	7 1/2	EK-1020-1 or 2
H364N	D2	52	24 1/8	16 3/16	17 3/8	7 1/2	EK-1020-1 or 2
H364NRB	D2	60	24 5/16	16 1/8	17 7/8	7 3/4	EK-1020-1 or 2
H364RB	D2	57	23 7/8	13 1/16	14 3/4	7 3/4	EK-1020-1 or 2
H365, N	D2	142	39 3/4	25 1/8	25 1/4	12	EIK-4060-1 or 2
H365R, NR	D2	153	39 13/16	25 1/4	25 7/16	12 5/16	EIK-4060-1 or 2
H366, N	D2	166	40	25 1/8	25 1/4	15 1/16	EIK-4060-1 or 2
H366NR, R	D2	163	40	25 1/4	25 7/16	15 1/16	EIK-4060-1 or 2
H367, N	C1	280	48 1/4	32 1/2	35	12 1/2	Not Available
H367NR, R	C1	285	48 5/8	33	35 1/8	13	Not Available
H368, N	C1	300	51 1/4	38 1/4	40 3/4	12 7/8	Not Available
H368NR, R	C1	305	51 3/4	38 1/2	40 3/4	12 7/8	Not Available
H421-2	D2	22	15 13/16	9 11/16	10 3/4	5 11/16	EK-306-1 or 2
H422	D2	22	15 13/16	9 11/16	10 3/4	5 11/16	EK-306-1 or 2
H423	D2	40	19 1/4	12 3/16	13 1/16	6 1/4	EK-1020-1 or 2
H424	D2	66	24 1/8	16 3/16	17 3/8	7 1/2	EK-1020-1 or 2
H425	D2	160	39 3/4	29 1/8	29 1/4	12 1/2	EIK-4060-1 or 2
H426	D2	180	40	31 5/16	31 7/16	15 1/16	EIK-4060-1 or 2
H461-2	D2	22	15 13/16	9 11/16	10 3/4	5 11/16	EK-306-1 or 2
H462	D2	22	15 13/16	9 11/16	10 3/4	5 11/16	EK-306-1 or 2
H463	D2	41	19 1/16	12 3/16	13 1/16	6 1/4	EK-1020-1 or 2
H464	D2	66	24 1/8	16 3/16	17 3/8	7 1/2	EK-1020-1 or 2
H465	D2	160	39 3/4	29 1/8	29 1/4	12 1/2	EIK-4060-1 or 2
H466	D2	190	40	31 5/16	31 7/16	15 1/16	EIK-4060-1 or 2
HU261	D2	8	11 1/8	6 1/2	7 3/8	4 3/4	EK-300-1 or 2
HU262	D2	13	15 13/16	7 3/4	8 1/2	5 13/16	EK-306-1 or 2
HU263	D2	24	19 1/16	10 3/16	11 7/16	6 1/4	EK-1020-1 or 2
HU264	D2	37	23 3/4	12 7/8	14 1/8	7 1/2	EK-1020-1 or 2
HU265	D2	106	36 3/4	25 1/8	25 1/4	12	EIK-4060-1 or 2
HU265R	D2	106	39 13/16	25 1/4	25 7/16	12 5/16	EIK-4060-1 or 2
HU266	D2	139	40	25 1/8	25 1/4	15 1/16	EIK-4060-1 or 2
HU266R	D2	145	40	25 1/4	25 1/8	15 1/16	EIK-4060-1 or 2
HU267	C1	280	48 1/4	32 1/2	35	12 1/2	Not Available
HU267R	C1	285	48 5/8	33	35 1/8	13	Not Available
HU268	C1	300	51 1/4	38 1/4	40 3/4	12 7/8	Not Available
HU268R	C1	305	51 3/4	38 1/2	40 3/4	12 7/8	Not Available
HU361	D2	8	11 1/8	6 1/2	7 3/8	4 3/4	EK-300-1 or 2
HU361RB	D2	8	12 5/8	7	7 5/8	5	EK-300-1 or 2
HU362	D2	15	15 13/16	7 3/4	8 1/2	5 13/16	EK-306-1 or 2
HU362RB	D2	17	17 7/8	8 5/16	8 3/4	5 13/16	EK-306-1 or 2
HU362WC	D2	24	25 15/16	7 3/4	8 1/2	5 13/16	EK-306-1 or 2
HU362WH	D2	18	19 15/16	7 3/4	8 1/2	5 13/16	EK-306-1 or 2
HU363	D3	26	19 1/16	10 3/16	11 7/16	6 1/2	EK-1020-1 or 2
HU363RB	D3	30	19 13/16	10 15/16	12 3/16	6 7/16	EK-1020-1 or 2
HU364	D2	43	23 3/4	12 7/8	14 3/8	7 1/2	EK-1020-1 or 2
HU364RB	D2	46	23 7/8	12 7/8	14 3/8	9 1/8	EK-1020-1 or 2
HU365	D2	115	36 3/4	25 1/8	25 1/4	12	EIK-4060-1 or 2
HU365R	D2	115	39 13/16	25 1/4	25 7/16	12 5/16	EIK-4060-1 or 2
HU366	D2	151	40	25 1/8	25 1/4	15 1/16	EIK-4060-1 or 2
HU366R	D2	151	40	25 1/4	25 1/8	15 1/16	EIK-4060-1 or 2
HU367	C1	280	48 1/4	32 1/2	35	12 1/2	Not Available
HU367R	C1	285	48 5/8	33	35 1/8	13	Not Available
HU368	C1	300	51 1/4	38 1/4	40 3/4	12 7/8	Not Available
HU368R	C1	305	51 3/4	38 1/2	40 3/4	12 7/8	Not Available
HU462	D2	21	15 5/16	9 11/16	10 3/4	5 11/16	EK-306-1 or 2
HU463	D2	37	19 1/16	12 3/16	13 1/16	6 1/4	EK-1020-1 or 2
HU464	D2	60	24 1/8	16	17 3/8	7 1/2	EK-1020-1 or 2
HU465	D2	173	39 3/4	29 1/8	29 1/4	12 1/2	EIK-4060-1 or 2
HU466	D2	190	40	31 5/16	31 7/16	15 1/16	EIK-4060-1 or 2

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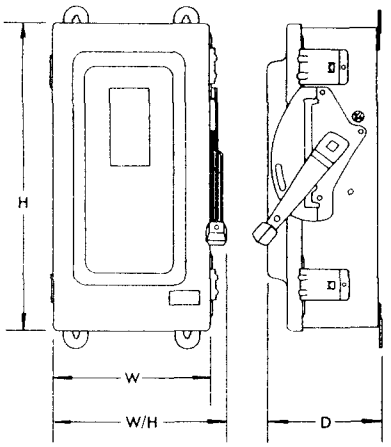
SQD SLV_000824

HEAVY DUTY SAFETY SWITCHES
NEMA 4 & 5, 4X, 7, 9 AND 12



Typical NEMA 4 & 5 and 12

TERMINAL LUG DATA

Ampere Rating	Conductors Per Phase	Mechanical Lug UL Listed Wire Size	Optional VERSA-CRIMP Compression Lug—Field Installable—See Page 169
30•	1	#14-4 Cu*	.....
60•	1	#14-4 Cu*	.....
100•	1	#14-0 Cu**	VCEL-021-14S1
200	1	#6-250 MCM Cu	VCEL-030-516H1
400	1 or 2	#1/0-600 MCM Cu #1/0-600 MCM Cu and #6-250 MCM Cu	VCEL-075-12H1 VCEL-030-516H1 and VCEL-050-12H1
600	2	#4-350 MCM Cu	VCEL-050-12H1

•NEMA 4X devices, refer to page 46 for lug data.
*NEMA 7 & 9 devices—#10-1/0 Al-Cu.
**NEMA 7 & 9 devices—#4-300 MCM Al-Cu.

CONDUIT PROVISIONS—NEMA 4 & 5; NEMA 4X; NEMA 7 & 9

Ampere Rating	Top Endwall—One Hub			Bottom Endwall—One Hub		
	NEMA 4 & 5 Cast Aluminum	NEMA 4X ▲	NEMA 7 & 9	NEMA 4 & 5 Cast Aluminum	NEMA 4X ▲	NEMA 7 & 9
30	1" or 1¼"	¾"	...	1" or 1¼"	¾"	...
60	1¼" or 1½"	1¼"	1¼"	1¼" or 1½"	1¼"	1¼"
100	1½" or 2"	2"	2"	1½" or 2"	2"	2"
200	2½" or 3"	...	2½"	2½" or 3"	...	2½"

▲Hubs and hub drilling templates are provided for field installation.

APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS AND ELECTRICAL INTERLOCKS

Catalog Number	Series	Wt. Lbs.	Overall Dimensions (Inches) H	W	W/H	D	Electrical Interlock
H60XFA	C1	18	12½	9½	9½	6 31/32	.....
H100XFA	C1	19	15 13/16	9⅞	9⅞	6 31/32	.....
H221A, DS, NA, NDS	D4	12	14⅞	6⅝	7 25/32	5⅛	EK-300-1 or 2
H221-2A	D4	18	16⅛	8⅛	9	6⅛	EK-306-1 or 2
H222A, DS, NA, NDS	D4	18	16⅛	8⅛	9	6⅛	EK-306-1 or 2
H223A, DS, NA, NDS	D4	33	19 3/16	10⅜	11½	6½	EK-1020-1 or 2
H224A, DS, NA, NDS	D4	47	23 15/16	13⅛	14¼	8	EK-1020-1 or 2
H225AWK, DS, NAWK, NDS	D3	115	39¾	25⅛	25¼	12⅛	EIK-4060-1 or 2
H225XKA	C1	41	22 9/16	10⅛	10⅞	7¾	.....
H226AWK, DS, NAWK, NDS	D3	155	40	25⅛	25¼	14 15/16	EIK-4060-1 or 2
H261A, DS	D4	18	16⅛	8⅛	9	6⅛	EK-300-1 or 2
H262A, DS	D4	18	16⅛	8⅛	9	6⅛	EK-306-1 or 2
H263A, DS	D4	32	19 3/16	10⅜	11½	6½	EK-1020-1 or 2
H264A, DS	D4	48	23 15/16	13⅛	14¼	8	EK-1020-1 or 2
H265AWK, DS	D3	117	39¾	25⅛	25¼	12⅛	EIK-4060-1 or 2
H266AWK, DS	D3	152	40	25⅛	25¼	14 15/16	EIK-4060-1 or 2
H321A, DS, NA, NDS	D4	12	14⅞	6⅝	7 25/32	5⅛	EK-300-1 or 2
H321D	D1	21	13¼	9½	11¾	6 9/16	EI-306-1 or 2
H321-2A	D4	20	16⅛	8⅛	9	6⅛	EK-306-1 or 2
H322A, DS, NA, NDS	D4	20	16⅛	8⅛	9	6⅛	EK-306-1 or 2
H322AWC	D4	27	26⅛	8⅛	9	6⅛	EK-306-1 or 2
H322D	D1	28	16¼	10½	12¾	7¼	EI-306-1 or 2
H323A, DS, NA, NDS	D4	36	19 3/16	10⅜	11½	6½	EK-1020-1 or 2
H323D	3	45	19¾	13 7/16	15 1/16	8¾	EI-1020-1 or 2
H324A, DS, NA, NDS	D4	54	23 15/16	13⅛	14¼	8	EK-1020-1 or 2
H325AWK, DS, NAWK, NDS	D3	127	39¾	25⅛	25¼	12⅛	EIK-4060-1 or 2
H326AWK, DS, NAWK, NDS	D3	171	40	25⅛	25¼	14 15/16	EIK-4060-1 or 2
H361A, DS	D4	12	14⅞	6⅝	7 25/32	5⅛	EK-300-1 or 2
H361D, ND	D1	21	13¼	9½	11¾	6 9/16	EI-306-1 or 2
H361DX	1	35	19 13/32	11 13/32	11 13/32	8 23/32	*
H361NA, NDS	D4	12	14⅞	6⅝	7 25/32	5⅛	EK-300-1 or 2
H361-2A	D4	20	16⅛	8⅛	9	6⅛	EK-306-1 or 2
H362A, DS	D4	20	16⅛	8⅛	9	6⅛	EK-306-1 or 2
H362AWC	D4	27	26⅛	8⅛	9	6⅛	EK-306-1 or 2
H362AWH	D4	23	20⅛	8⅛	9	6⅛	EK-306-1 or 2
H362D, ND	D1	28	16¼	10½	12¾	6½	EI-306-1 or 2
H362DX	1	39	19 13/32	11 13/32	11 13/32	7¼	*
H362NA, NDS	D4	23	16⅛	8⅛	9	6⅛	EK-306-1 or 2
H363A, DS, NA, NDS	D4	40	19 3/16	10⅜	11½	6½	EK-1020-1 or 2
H363D	3	45	19¾	13 7/16	15 1/16	8¾	EI-1020-1 or 2
H363DX	1	52	27 13/32	15 13/32	15 13/32	9 23/32	*
H364A, DS	D4	52	23 15/16	13⅛	14¼	7½	EK-1020-1 or 2
H364D	3	58	25	16¼	18½	9 11/16	EI-1020-1 or 2
H364NA, NDS	D4	60	24 1/16	16¼	17½	8	EK-1020-1 or 2
H365AWK, DS, NAWK, NDS	D3	158	39¾	25⅛	25¼	12⅛	EIK-4060-1 or 2
H366AWK, DS, NAWK, NDS	D3	171	39¾	25⅛	25¼	14 5/16	EIK-4060-1 or 2
H421-2AWK	D4	23	16⅛	10⅛	11	6½	EK-306-1 or 2
H422AWK	D4	23	16⅛	10⅛	11	6⅛	EK-306-1 or 2
H423AWK	D4	41	19 3/16	12¼	13½	6½	EK-1020-1 or 2
H424AWK	D4	68	24 5/16	16¼	17½	8	EK-1020-1 or 2
H425AWK	D3	185	39¾	29⅛	29¼	12⅛	EIK-4060-1 or 2
H461-2AWK	D4	23	16⅛	10⅛	11	6⅛	EK-306-1 or 2
H462AWK	D4	23	16⅛	10⅛	11	6⅛	EK-306-1 or 2
H463AWK	D4	46	19 3/16	12¼	13½	6½	EK-1020-1 or 2
H464-AWK	D4	64	24 5/16	16¼	17½	8	EK-1020-1 or 2
H465AWK	D3	185	39¾	29⅛	29¼	12⅛	EIK-4060-1 or 2
HU261A, DS	D4	12	14⅞	6⅝	7 25/32	5⅛	EK-300-1 or 2
HU262A, DS	D4	17	15⅞	8⅛	10¼	6½	EI-306-1 or 2
HU263A, DS	D4	29	19 3/16	10⅜	11½	6½	EK-1020-1 or 2
HU264A, DS	D4	43	23 15/16	13⅛	14¼	8	EK-1020-1 or 2
HU265AWK, DS	D3	106	39¾	25⅛	25¼	12⅛	EIK-4060-1 or 2
HU266AWK, DS	D3	144	40	25⅛	25¼	14 15/16	EIK-4060-1 or 2
HU361A, A-EI, DS, DS-EI	D4	12	14⅞	6⅝	7 25/32	5⅛	EK-300-1 or 2
HU361D	D1	21	13¼	9½	11¾	6 9/16	EI-306-1 or 2
HU362A, A-EI, DS, DS-EI	D4	19	16⅛	8⅛	9	6⅛	EK-306-1 or 2
HU362AWC	D4	26	26⅛	8⅛	9	6⅛	EK-306-1 or 2
HU362AWH	D4	22	20⅛	8⅛	9	6⅛	EK-306-1 or 2
HU362D	D1	28	16¼	10½	12¾	7¼	EI-306-1 or 2
HU363A, DS	D4	31	19 3/16	10⅜	11½	6½	EK-1020-1 or 2
HU363D	3	45	19¾	13 7/16	15 1/16	8¾	EI-1020-1 or 2
HU364A, DS	D4	48	23 15/16	13⅛	14¼	8	EK-1020-1 or 2
HU364D	D1	58	25	16¼	18½	9 11/16	EI-1020-1 or 2
HU365AWK, DS	D3	115	39¾	25⅛	25¼	12⅛	EIK-4060-1 or 2
HU366AWK, DS	D3	156	40	25⅛	25¼	14 5/16	EIK-4060-1 or 2
HU462AWK	D4	22	16⅛	10⅛	11	6⅛	EK-306-1 or 2
HU463AWK	D4	40	19 3/16	12¼	13½	6½	EK-1020-1 or 2
HU464AWK	D4	57	24 5/16	16¼	17½	8	EK-1020-1 or 2
HU465AWK	D3	173	39¾	29⅛	29¼	12⅛	EIK-4060-1 or 2
HU661RWK	D2	38	20½	17⅛	19¼	6½	EK-1020-1 or 2
HU662AWK	D2	38	20½	17⅛	19¼	6½	EK-1020-1 or 2
HU663RWK	D2	38	20½	17⅛	19¼	6½	EK-1020-1 or 2
HU664RWK	D2	66	25¾	22⅛	24⅞	7¾	EK-1020-1 or 2

Switches with "AWK" suffix have same dimensions and require same electrical interlocks as switches with "A" suffix.
*Refer to Page 45 for electrical interlock.

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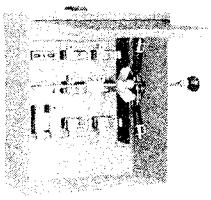
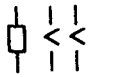
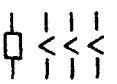
SQD SLV_000825

SAFETY SWITCHES — DOUBLE THROW

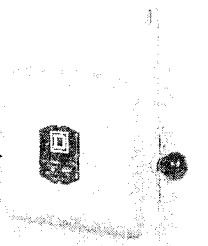
RAINPROOF MANUAL TRANSFER SWITCHES are designed to transfer loads from one supply source to another. These switches are rated 240 Volt ac with Solid Neutral, NEMA 3R—Rainproof. UL listed—File E2875. Suitable for use as service equipment. Horsepower ratings are not provided, since use as motor circuit switches is not recommended. Includes closing cap with provisions for Bolt-on Hubs.



DTU223NRB

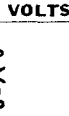
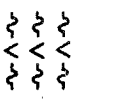
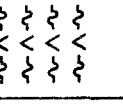
System	Ampere Rating	Catalog Number	Price
3 WIRE S/N (2 BLADES) 240V. AC			
	100	DTU223NRB	**$190.**
	200	DTU224NRB	**500.**
4 WIRE S/N (3 BLADES) 240V. AC			
	100	DTU323NRB	**$400.**
	200	DTU324NRB	**691.**

82,000 AND 92,000 LINE DOUBLE THROW SAFETY SWITCHES are designed to transfer loads from one supply source to another. These switches are UL listed—File E2875, except as noted. For UL LISTED interrupting ratings, see page 39. 82,000 line NEMA 1 devices meet WS865-C for Type NDD switches. Suitable for use as service equipment when installed with appropriate service grounding kit. Horsepower ratings are not provided, since use as motor circuit switches is not recommended. 400 and 600 ampere switches are top feed for top and center lugs and bottom feed for bottom lugs.

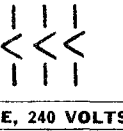
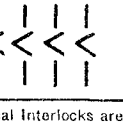


82,000 Line NEMA 1

FUSIBLE

System	Ampere Rating	240 Volt NEMA 1 Catalog Number	240 Volt NEMA 1 Price	600 Volt NEMA 1 Catalog Number	600 Volt NEMA 1 Price	600 Volt NEMA 3R● Catalog Number	600 Volt NEMA 3R● Price
2-POLE, 240 VOLTS AC—250 VOLTS DC				**2-POLE, 600 VOLTS AC 250 VOLTS DC**			
	30	92251F	**$ 222.**	†★82261F	**$ 434.**	.....	...
	60	82252F	**391.**	★82262F	**451.**	.....	...
	100	82253F	**588.**	82263F	**784.**	.....	...
	200	82254F	**823.**	82264F	**954.**	.....	...
	400	∗92255F	**1657.**	†92245F	**1779.**	.....	...
	600	∗92256F	**2064.**	.....	...	.....	...
3-POLE, 240 VOLTS AC				**3-POLE, 600 VOLTS AC**			
	30	92351F	**$ 230.**	†82341F	**$ 465.**	.....	...
	60	82352F	**431.**	82342F	**470.**	.....	...
	100	82353F	**715.**	82343F	**840.**	.....	...
	200	82354F	**1071.**	82344F	**1256.**	.....	...
	400	92355F	**2273.**	†92345F	**2333.**	.....	...
	600	92356F	**2748.**	†92346F	**4648.**	.....	...
4-POLE, 240 VOLTS AC				**4-POLE, 600 VOLTS AC**			
	30	†92451F	**$ 328.**	†92441F	**$ 694.**	.....	...
	60	†92452F	**520.**	†92442F	**715.**	.....	...
	100	†92453F	**840.**	†92443F	**1234.**	.....	...
	200	†82454F	**1364.**	†82444F	**1586.**	.....	...
	400	92455F	**2531.**	†92445F	**2738.**	.....	...
	600	92456F	**3283.**	.....	...	.....	...

NOT FUSIBLE

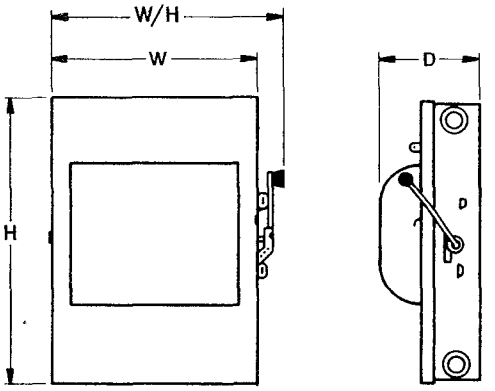
System	Ampere Rating	240 Volt NEMA 1 Catalog Number	240 Volt NEMA 1 Price	600 Volt NEMA 1 Catalog Number	600 Volt NEMA 1 Price	600 Volt NEMA 3R● Catalog Number	600 Volt NEMA 3R● Price
2-POLE, 240 VOLTS AC—250 VOLTS DC				**2-POLE, 600 VOLTS AC—250 VOLTS DC**			
	30	92251	**$ 135.**	.....	...	.....	...
	60	82252	**214.**	★82262	**$ 222.**	★82262RB	**$ 370.**
	100	82253	**310.**	82263	**338.**	82263RB	**567.**
	200	82254	**417.**	82264	**465.**	82264RB	**1140.**
	400	∗92255	**1165.**	†92245	**1308.**	.....	...
	600	∗92256	**1655.**	†92246	**1841.**	.....	...
3-POLE, 240 VOLTS AC				**3-POLE, 600 VOLTS AC**			
	30	92351	**$ 158.**	.....	...	.....	...
	60	82352	**230.**	82342	**$ 263.**	82342RB	**$ 436.**
	100	82353	**378.**	82343	**417.**	82343RB	**693.**
	200	82354	**590.**	82344	**640.**	82344RB	**1313.**
	400	92355	**1616.**	†92345	**1649.**	92345R	**3210.**
	600	92356	**2169.**	†92346	**2386.**	.....	...
4-POLE, 240 VOLTS AC				**4-POLE, 600 VOLTS AC**			
	30	92451	**$ 228.**	.....	...	.....	...
	60	92452	**328.**	92442	**$ 359.**	.....	...
	100	92453	**669.**	92443	**770.**	.....	...
	200	92454	**934.**	92444	**1024.**	.....	...
	400	92455	**2097.**	†92445	**2288.**	.....	...
	600	92456	**2725.**	†92446	**2957.**	.....	...

Electrical Interlocks are available factory installed only. Contact local field office for price and delivery.

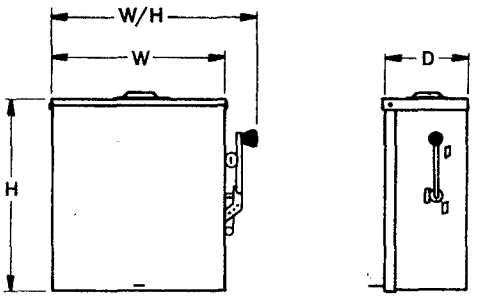
★600 Volts dc rated. †Not UL listed. Not suitable for use as service equipment. ∗240 Volts ac only.

●Complete line of NEMA 3R switches available. Contact local field offices for price and delivery.

SQD SLV_000826



TYPICAL NEMA 1



TYPICAL NEMA 3R

TERMINAL LUG DATA

Ampere Rating	Conductors Per Phase	Mechanical Lug UL listed Wire Size	Optional VERSA-CRIMP Compression Lug—Field Installable See Page 169.
30	1	#14-2 Al or Cu.	.....
60	1	#14-2 Al or Cu.	.....
100	1	#6-2/0 Al or Cu.	VCEL-021-14S1
200	1	#6-300MCM Al or Cu.	VCEL-030-516H1
400•	2	#4-350MCM Al or Cu.	.....
600	2	#4-600MCM Al or Cu.	.....

•4 Pole Not Fusible suitable for 1 #4/0-500 MCM Cu only.

SERVICE GROUND KITS—For Double Throw Switches. Required for service equipment use.

Ampere Rating	Catalog Number	Price
30	DT 30 SG	**$6.90**
60 100 200	DT 100 SG	**7.10**
400 600	PKO GTA-2 (2 Req'd)	**11.00**

APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS

Catalog Number	Wt. (Lbs.)	Overall Dimensions H	W	W/H	D	Catalog Number	Wt. (Lbs.)	Overall Dimensions H	W	W/H	D
DTU 223NRB	34	18 1/4	15 5/16	18 3/8	8 7/16	92246	184	52 11/16	18 7/8	22	16 3/8
DTU 224NRB	66	24 5/8	19 1/2	22 1/4	10	92251	9	10 3/4	7 1/8	10 3/8	4 1/4
DTU 323NRB	45	18 1/4	18 3/32	21 3/32	8 7/16	92251F	18	16 7/8	9 3/8	12 5/8	6 3/8
DTU 324NRB	75	24 5/8	23 1/2	25 1/2	10	92255	75	31 1/8	16 3/4	20	12 1/8
82252	16	13 3/8	9 1/8	12 3/4	6 3/8	92255F	180	46 3/4	25 3/4	29	12 3/4
82252F	22	23 1/8	9 3/16	11 11/16	6 5/16	92256	180	52 11/16	18 7/8	22	16 3/8
82253	24	16 13/16	11 3/16	14 5/16	8 1/16	92256F	300	54 5/8	33	36 5/16	14 3/8
82253F	40	30 11/16	11 1/4	14 13/16	7 7/8	92345	125	31 1/8	21 11/16	25 13/16	12 1/4
82254	49	22 3/8	15 3/4	19	9 11/16	92345F	205	46 3/4	25 3/4	29	12 3/4
82254F	74	38 13/16	15 3/4	19 3/8	9 7/8	92346	236	52 3/4	25 3/8	28 3/4	16 3/8
82261F	22	23 1/8	9 3/16	11 11/16	6 5/16	92346F	340	54 1/8	33	36 3/8	14 3/8
82262	16	13 3/8	9 1/8	12 3/4	6 3/8	92351	13	10 3/4	11 5/8	14 3/4	4 1/4
82262F	22	23 1/8	9 3/16	11 11/16	6 5/16	92351F	24	16 7/8	14 1/2	17 5/8	6 1/2
82262RB	29	14	12 3/8	16 1/8	7	92355	110	31 1/8	21 11/16	24 13/16	12 1/4
82263	26	16 13/16	11 3/16	14 5/16	8 1/16	92355F	195	46 3/4	25 3/4	29	12 3/4
82263F	42	30 11/16	11 1/4	14 13/16	7 7/8	92356	225	52 3/4	25 3/8	28 3/4	16 3/8
82263RB	31	18 1/4	15 5/16	18 3/8	8 7/16	92356F	340	54 5/8	33	36 5/16	14 3/8
82264	50	22 3/8	15 3/4	19	9 11/16	92441F	42	12 7/8	17	20 1/4	7 1/2
82264F	77	38 13/16	15 3/4	19 3/8	9 7/8	92442	28	12 7/8	17	20 1/4	7 1/2
82264RB	39	24 5/8	19 1/2	22 1/4	10	92442F	42	23	18 1/2	20 3/8	6 1/2
82341F	29	23 1/8	12 13/16	16 1/2	6 5/16	92443	59	22 1/2	20 1/4	23 1/2	11 1/8
82342	19	12 7/8	12 13/16	16 7/16	6 5/16	92443F	80	30 1/2	18 1/4	19 7/8	7 1/2
82342F	30	23 1/8	12 13/16	16 1/2	6 5/16	92444	86	31 1/8	22 7/8	26 1/8	11 3/4
82342RB	29	14	12 3/8	16 1/8	7	92445	180	38 5/8	24 3/4	28 1/4	14 5/16
82343	33	16 13/16	15 13/16	18 1/2	8 5/8	92445F	190	46 3/4	36 1/4	37 5/8	13
82343F	48	30 11/16	15 5/16	19	8 11/16	92446	316	52 3/4	31 13/16	34 1/8	16 1/2
82343RB	31	18 1/4	15 5/16	18 3/8	8 7/16	92451	19	12 7/8	13	14 5/8	6 1/2
82344	63	23 1/16	20	23 3/4	11 11/16	92451F	34	16 7/8	17 5/8	21 3/8	6 1/2
82344F	98	38 13/16	20	23 3/4	11 11/16	92452	26	12 7/8	17	20 1/4	7 1/2
82344RB	39	24 5/8	19 1/2	22 1/4	10	92452F	42	18	17 5/8	20 7/8	6 5/16
82352	18	12 7/8	12 13/16	16 7/16	6 5/16	92453	60	22 1/2	20 1/4	23 1/2	11 1/8
82352F	29	23 1/8	12 13/16	16 1/2	6 5/16	92453F	81	30 1/2	18 1/4	19 7/8	7 1/2
82353	31	16 13/16	15 5/16	18 1/2	8 5/8	92454	82	31 1/8	22 7/8	26 1/8	11 3/4
82353F	50	30 11/16	15 5/16	19	8 11/16	92455	165	38 5/8	24 3/4	28 1/4	14 5/16
82354	62	23 1/16	20	23 3/4	11 11/16	92455F	295	46 3/8	36 1/4	37 5/8	13
82354F	93	38 13/16	20	23 3/4	11 11/16	92456	290	52 3/4	31 13/16	34 1/8	16 1/2
82444F	140	38 13/16	25 1/16	28 3/16	12 3/4	92456F	466	55	42 5/8	45 7/8	14 1/2
82454F	140	38 13/16	25 11/16	28 3/16	12 3/4						
92245	82	31 1/8	16 3/4	20	12 1/8						
92245F	180	46 3/4	25 3/4	29	12 3/4						

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SQD SLV_000827

Low Voltage Power Capacitors

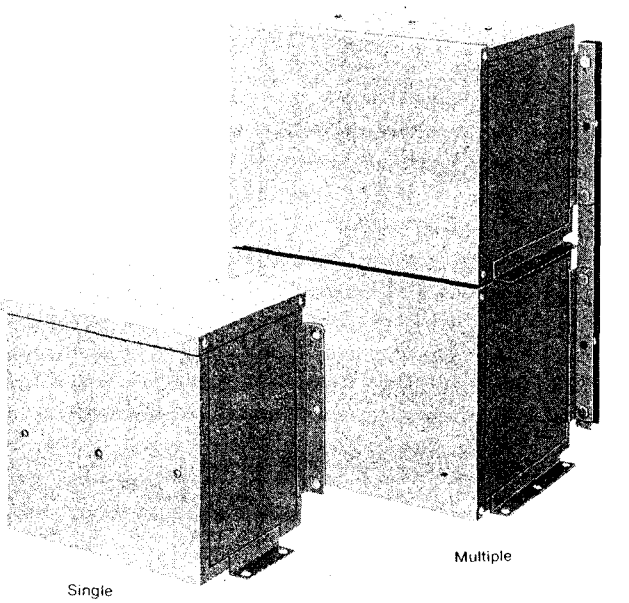
The inexpensive, efficient way to provide power factor correction

Benefits of Power Factor Improvement

- Power costs are reduced.
- System capacity is increased.
- Voltage is improved and power losses reduced.

These UL listed devices utilize a metallized polypropylene dielectric system with "self healing" properties to restore the dielectric to an acceptable condition should a breakdown in the dielectric occur during operation. Each capacitor cell has a pressure sensitive interrupter which eliminates the need for separate protective fusing.

Enclosures are fabricated from heavy duty steel and are supplied without knockouts. They are finished with gray enamel and are suitable for either indoor or outdoor use. They are designed for installation in accordance with Article 460 of the 1981 National Electrical Code and can be either wall or floor mounted.



Single

Multiple

240 VOLT* 3 PHASE/60 HZ

KVAR Rating	Catalog Number	Price	Rated Current Amperes	Terminal Lug Wire Size	Dimensions (Inches)		
					H	W	D
2.5	PFC2002	**$ 395.**	6	#14-6 CU	10⅞	12¾	8¼
5	PFC2005	**448.**	12.3	#14-6 CU	10⅞	12¾	8¼
7.5	PFC2007	**500.**	18.4	#14-6 CU	10⅞	12¾	8¼
10	PFC2010	**632.**	24.1	#8-2 CU	10⅞	12¾	8¼
15	PFC2015	**869.**	36.1	#8-2 CU	10⅞	12¾	11
20	PFC2020	**1079.**	48.1	#2-1/0 CU	10⅞	15½	11
25	PFC2025	**1264.**	60.1	#2-1/0 CU	10⅞	17⅞	11

*For 208 volt operation derate KVAR and current to 75% of tabulated value.

480 VOLT 3 PHASE/60 HZ

KVAR Rating	Catalog Number	Price	Rated Current Amperes	Terminal Lug Wire Size	Dimensions (Inches)		
					H	W	D
1.5	PFC4001	**$ 335.**	1.8	#14-6 CU	10⅞	12¾	8¼
2.5	PFC4002	**340.**	3	#14-6 CU	10⅞	12¾	8¼
3	PFC4003	**343.**	3.6	#14-6 CU	10⅞	12¾	8¼
4	PFC4004	**348.**	4.8	#14-6 CU	10⅞	12¾	8¼
5	PFC4005	**353.**	6	#14-6 CU	10⅞	12¾	8¼
6	PFC4006	**377.**	7.2	#14-6 CU	10⅞	12¾	8¼
7.5	PFC4007	**406.**	9	#14-6 CU	10⅞	12¾	8¼
10	PFC4010	**453.**	12	#14-6 CU	10⅞	12¾	8¼
12.5	PFC4012	**511.**	15	#14-6 CU	10⅞	12¾	8¼
15	PFC4015	**558.**	18	#14-6 CU	10⅞	12¾	8¼
18	PFC4018	**643.**	21.7	#8-2 CU	10⅞	12¾	8¼
20	PFC4020	**669.**	24.1	#8-2 CU	10⅞	12¾	8¼
22.5	PFC4022	**690.**	27.1	#8-2 CU	10⅞	12¾	8¼
25	PFC4025	**706.**	30.1	#8-2 CU	10⅞	12¾	8¼
30	PFC4030	**753.**	36.1	#8-2 CU	10⅞	12¾	11
35	PFC4035	**856.**	42.1	#8-2 CU	10⅞	12¾	11
40	PFC4040	**906.**	48.1	#2-1/0 CU	10⅞	15½	11
45	PFC4045	**995.**	54.1	#2-1/0 CU	10⅞	15½	11
50	PFC4050	**1043.**	60.1	#2-1/0 CU	10⅞	15½	11
60	PFC4060	**1190.**	72.2	#2-1/0 CU	10⅞	17⅞	11

600 VOLT♦ 3 PHASE/60 HZ

KVAR Rating	Catalog Number	Price	Rated Current Amperes	Terminal Lug Wire Size	Dimensions (Inches)		
					H	W	D
2.5	PFC6002	**$ 340.**	2.4	#14-6 CU	10⅞	12¾	8¼
5	PFC6005	**353.**	4.8	#14-6 CU	10⅞	12¾	8¼
7.5	PFC6007	**406.**	7.2	#14-6 CU	10⅞	12¾	8¼
10	PFC6010	**453.**	9.6	#14-6 CU	10⅞	12¾	8¼
12.5	PFC6012	**511.**	12	#14-6 CU	10⅞	12¾	8¼
15	PFC6015	**558.**	14.4	#14-6 CU	10⅞	12¾	8¼
20	PFC6020	**669.**	19.2	#14-6 CU	10⅞	12¾	8¼
25	PFC6025	**706.**	24.1	#8-2 CU	10⅞	12¾	11
30	PFC6030	**753.**	28.9	#8-2 CU	10⅞	12¾	11
35	PFC6035	**856.**	33.7	#8-2 CU	10⅞	15½	11
40	PFC6040	**906.**	38.5	#8-2 CU	10⅞	15½	11
45	PFC6045	**995.**	43.3	#8-2 CU	10⅞	17⅞	11
50	PFC6050	**1043.**	48.1	#2-1/0 CU	10⅞	17⅞	11

MULTIPLE UNITS♦ FOR LARGER KVAR RATINGS 3 PHASE/60 HZ

Voltage Rating	KVAR Rating	Catalog Number	Price	Rated Current Amperes	Terminal Lug Wire Size	Dimensions (Inches)		
						H	W	D
240	40	PFC2040	**$2579.**	96.2	#4-3/0 CU	22	15½	11⅞
	50	PFC2050	**2974.**	120	2/0-4/0 CU	22	18¼	11⅞
	60	PFC2060	**3816.**	144	2/0-4/0 CU	33	15½	11⅞
	75	PFC2075	**4395.**	180	1/0-350 MCM CU	33	18¼	11⅞
480	70	PFC4070	**2048.**	84.2	#4-3/0 CU	22	12¾	11⅞
	75	PFC4075	**2185.**	90.2	#4-3/0 CU	22	15½	11⅞
	80	PFC4080	**2316.**	96.2	#4-3/0 CU	22	15½	11⅞
	90	PFC4090	**2448.**	108	#4-3/0 CU	22	15½	11⅞
	100	PFC4100	**2579.**	120	2/0-4/0 CU	22	15½	11⅞
	125	PFC4125	**3395.**	150	1/0-350 MCM	33	18¼	11⅞
600	60	PFC6060	**1900.**	57.8	#2-1/0 CU	22	12¾	11⅞
	100	PFC6100	**2579.**	96.2	#4-3/0 CU	22	18¼	11⅞
	125	PFC6125	**3395.**	120	2/0-4/0 CU	33	18¼	11⅞
	150	PFC6150	**3837.**	144	2/0-4/0 CU	33	18¼	11⅞

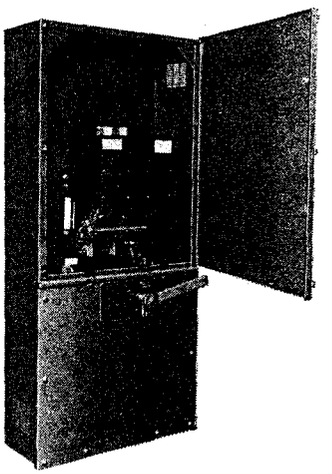
♦Order only. Not stocked in PDS. Order point: Lexington.

SQD SLV_000828

FRONT OPERATED AC LOAD-BREAK SWITCHES WITH TERMINAL LUGS

Fusible BOLT-LOC Switches have been tested in accordance with Underwriters' Subject 977—Requirements for Fused Power Circuit Devices, Bolted Pressure Contact Switches. Switches rated 240 volts ac are suitable for use on circuits capable of delivering 100,000 RMS symmetrical amperes. Switches rated either 480 or 600 volts ac are suitable for use on circuits capable of delivering 200,000 RMS symmetrical amperes. Fusible switches with electric trip mechanism meet the requirements stated in Article 230-95 of the National Electric Code and Underwriters' Laboratories Subject 977, for ground fault applications.

Enclosures—NEMA 1, steel, medium gray finish. All devices listed are for cables entering at top and exiting at bottom.



FRONT-OPERATED SWITCHES IN GENERAL PURPOSE (NEMA 1) ENCLOSURES

Volts	Ampere Rating	2-Pole—2-Wire* Catalog Number	2-Pole—2-Wire* Price	3-Pole—3-Wire Catalog Number	3-Pole—3-Wire Price	2-Pole—2-Wire Catalog Number	2-Pole—2-Wire Price	3-Pole—3-Wire Catalog Number	3-Pole—3-Wire Price
		FUSIBLE—(Prices do not include fuses)				**NOT-FUSIBLE**			
240V. ac 60Hz	800	BLG-22080	**$2684.**	BLG-32080	**$2983.**	BLG-22080-U	**$2616.**	BLG-32080-U	**$2873.**
	1200	BLG-22120	**2856.**	BLG-32120	**3209.**	BLG-22120-U	**2785.**	BLG-32120-U	**3103.**
	1600	BLG-22160	**3182.**	BLG-32160	**3573.**	BLG-22160-U	**3054.**	BLG-32160-U	**3467.**
	2000	BLG-22200	**3303.**	BLG-32200	**3783.**	BLG-22200-U	**3235.**	BLG-32200-U	**3680.**
	2500	BLG-22250	**3729.**	BLG-32250	**4358.**	BLG-22250-U	**3659.**	BLG-32250-U	**4253.**
	3000	BLG-22300	**5168.**	BLG-32300	**5988.**	BLG-22300-U	**4979.**	BLG-32300-U	**5883.**
	4000	BLG-22400	**6230.**	BLG-32400	**8063.**	BLG-22400-U	**6161.**	BLG-32400-U	**7953.**
480/600V.† ac 60Hz	800	BLG-24080	**2866.**	BLG-34080	**3175.**	BLG-24080-U	**2785.**	BLG-34080-U	**3057.**
	1200	BLG-24120	**3210.**	BLG-34120	**3560.**	BLG-24120-U	**3138.**	BLG-34120-U	**3454.**
	1600	BLG-24160	**3503.**	BLG-34160	**3926.**	BLG-24160-U	**3434.**	BLG-34160-U	**3820.**
	2000	BLG-24200	**3597.**	BLG-34200	**4138.**	BLG-24200-U	**3525.**	BLG-34200-U	**4032.**
	2500	BLG-24250	**3975.**	BLG-34250	**4709.**	BLG-24250-U	**3946.**	BLG-34250-U	**4605.**
	3000	BLG-24300	**5486.**	BLG-34300	**6334.**	BLG-24300-U	**5416.**	BLG-34300-U	**6227.**
	4000	BLG-24400	**6484.**	BLG-34400	**8413.**	BLG-24400-U	**6416.**	BLG-34400-U	**8309.**

*NOTE: Do not use Neutral Assembly for three-phase, two-wire, grounded-phase circuits on 240V. ac rated devices.
†For 600 volt ac applications, replace the second numerical digit "4" with a "6". No price increase is involved.
For 600 volt dc applications, replace the second numerical digit "4" with a "7" and add UPS catalog number. No price increase is involved.

FRONT OPERATED AC LOAD-BREAK SWITCHES

Prices of additions and special features	Form Letters	Price
Auxiliary electrical switch, 10 ampere, with 1-N.O. and 1-N.C. contact. Electrical ratings are the same as Class 9007, Type B switch	X	$ 222.
Provisions for Key interlock	K	206.
With lock mounted for Key interlock (Specify locking sequence)	K1	371.
NEMA 3R Enclosure 800-2500 Ampere	*	432.
NEMA 3R Enclosure 3000-4000 Ampere	*	529.
Blown Main Fuse Detector Assembly (Electric trip mechanism must be specified and priced as a separate item)	B	499.
Electric Trip Mechanism. Installed and wired to terminals. Available only on 480 Volt or 600 Volt rated switches (not available on 5000A.) 600 Volt rating must be specified if required	E	1036.
Capacitor Trip (800-4000A. Electric Trip Only)	CT-400	472.
Ground Fault Protection (includes sensor, solid state relay and control transformer) Installed and wired to electric trip mechanism. Electric trip mechanism must be specified and priced as a separate item. 800-2000 Ampere (With sensor having 8" x 20" conductor window)	G4▲	4398.
Ground Fault Protection (includes sensor, solid state relay and control transformer) Installed and wired to electric trip mechanism. Electric trip mechanism must be specified and priced as a separate item. 2500-4000 Ampere (With sensor having 11" x 26" conductor window)	G5▲	4502.
Inverted & Enclosed—Manually Operated—800-3000 Amperes Electric Trip—800-2500 Amperes	I	+10%
Neutral Assembly 800 Ampere	N-08	106.
Neutral Assembly 1200 Ampere	N-12	109.
Neutral Assembly 1600 Ampere	N-16	125.
Neutral Assembly 2000 Ampere	N-20	164.
Neutral Assembly 2500 Ampere	N-25	170.
Neutral Assembly 3000 Ampere	N-30	178.
Neutral Assembly 4000 Ampere	N-40	283.

*Substitute letter "W" in place of "G" in the catalog number of switch in NEMA 1 enclosure. Price does not include conduit hubs. Consult your local field office for dimensions.
▲Complete the Form Letter designation by adding appropriate ground fault relay number 1, 2, 3 or 5 for desired time delay as follows: 1=.1 sec. delay; 2=.2 sec. delay; 3=.3 sec. delay; and 5=.5 sec. delay.

Switch Ampere Rating	NEMA 1 Dimensions (Inches) H	W	D	No. of Lugs Per Terminal Phase & Neutral #2-600 MCM▲
800	73.5	36.0	12.4	3
1200	73.5	36.0	12.4	4
1600	73.5	36.0	12.4	5
2000	81.5	42.0	14.4	6
2500	81.5	42.0	14.4	7
3000	90.0	48.0	18.4	8
4000	90.0	48.0	18.4	10

▲Suitable for copper or aluminum cable.

GROUND FAULT ENCLOSURE DIMENSIONS (INCHES)

Switch Ampere Rating	HEIGHT NEMA 1	HEIGHT NEMA 3R	WIDTH NEMA 1	WIDTH NEMA 3R	DEPTH NEMA 1	DEPTH NEMA 3R
800	90.38	90.38	36.50	38.38	20.13	34.00
1200	90.38	90.38	36.50	38.38	20.13	34.00
1600	90.38	90.38	36.50	38.38	20.13	34.00
2000	90.38	90.38	36.50	48.38	20.13	34.00
2500	90.38	90.38	36.50	48.38	20.13	34.00
3000	90.38	90.38	42.35	48.38	32.13	42.00
4000	90.38	90.38	42.35	48.38	32.13	42.00

DIMENSIONS ARE APPROXIMATE—NOT FOR CONSTRUCTION

ORDERING INFORMATION REQUIRED

1. Catalog number, and form letters (if any).
2. Number of poles and wires.
3. Voltage and ampere rating, and whether ac or dc.
4. Type of cable, lug sizes and quantity required.
5. If special features are required, order as "similar to catalog number . . . . except (clearly describe special features)".

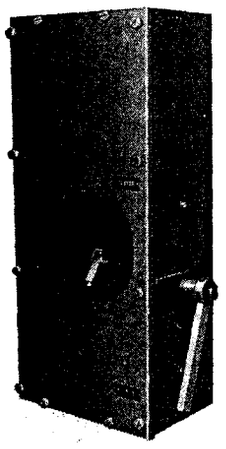
BARKELEW® CATALOG REFERENCE: SECTION 9810

SQD SLV_000829

BOLT-LOC® SWITCHES
SINGLE-THROW, BOLTED-CONTACT

MANUAL SIDE-OPERATED LOAD-BREAK SWITCHES
NEMA 12 DUSTTIGHT ENCLOSURES—WITH TERMINAL LUGS

BOLT-LOC heavy-duty load-break mill switches in dusttight steel enclosures have applications in steel mills, foundries, cement mills, textile plants and are extensively used for crane control. The standard switches are in steel enclosures designed for wall mounting and for cables entering at top and exiting at bottom.



Manual Side-Operated BOLT-LOC Switch in NEMA 12 Enclosure

DIMENSIONS ARE APPROXIMATE—NOT FOR CONSTRUCTON

Volt-Pole-Wire	Ampere Rating	Dimensions H	W	D
240 V. ac 3 Pole-3 Wire Fusible and Not Fusible	800	60	30	14
	1200	60	30	14
480/600 V. ac 3 Pole-3 Wire Fusible and Not Fusible	1600	60	30	14
	2000	60	30	14
	2500	..	..	..
250 V. dc 2 Pole-2 Wire Fusible	3000	..	..	..
	4000	..	..	..

250 Volt dc, 2 Pole-2 Wire—Not Fusible

Ampere Rating	Dimensions H	W	D
800	42	18	12
1200	42	18	12
1600	54	24	14
2000	54	24	14
2500	54	24	14
3000	54	30	18
4000	54	30	18

ORDERING INFORMATION REQUIRED
(See Page 51)

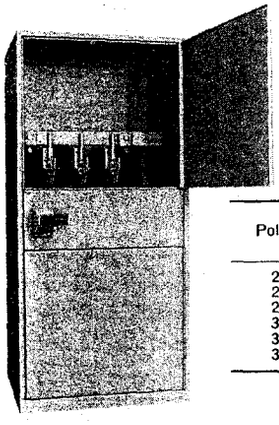
SIDE-OPERATED SWITCHES IN DUSTTIGHT INDUSTRIAL USE (NEMA 12) ENCLOSURES

Volts and Poles	Ampere Rating	Fusible Catalog Number	Fusible Price	Not-Fusible Catalog Number	Not-Fusible Price
DC SIDE-OPERATED SWITCHES					
250 V. dc 2 Pole 2 Wire	800	BLD-23080	**$3043.**	BLD-23080-U	**$2938.**
	1200	BLD-23120	**3103.**	BLD-23120-U	**2999.**
	1600	BLD-23160	**3400.**	BLD-23160-U	**3294.**
	2000	BLD-23200	**3559.**	BLD-23200-U	**3453.**
	2500	BLD-23250	**4049.**	BLD-23250-U	**3944.**
	3000	BLD-23300	**5270.**	BLD-23300-U	**5078.**
	4000	BLD-23400	**5665.**	BLD-23400-U	**6563.**
AC SIDE-OPERATED SWITCHES					
240 V. ac 3 Pole 3 Wire 60 Hz	800	BLD-32080	**$3209.**	BLD-32080-U	**$3096.**
	1200	BLD-32120	**3445.**	BLD-32120-U	**3335.**
	1600	BLD-32160	**3828.**	BLD-32160-U	**3719.**
	2000	BLD-32200	**4049.**	BLD-32200-U	**3939.**
	2500	BLD-32250	**4641.**	BLD-32250-U	**4531.**
	3000	BLD-32300	**6356.**	BLD-32300-U	**6240.**
	4000	BLD-32400	**8552.**	BLD-32400-U	**8437.**
480/600 V.‡ ac 3 Pole 3 Wire 60 Hz	800	BLD-34080	**3415.**	BLD-34080-U	**3294.**
	1200	BLD-34120	**3824.**	BLD-34120-U	**3709.**
	1600	BLD-34160	**4205.**	BLD-34160-U	**4093.**
	2000	BLD-34200	**4424.**	BLD-34200-U	**4312.**
	2500	BLD-34250	**5023.**	BLD-34250-U	**4905.**
	3000	BLD-34300	**6725.**	BLD-34300-U	**6608.**
	4000	BLD-34400	**8927.**	BLD-34400-U	**8817.**

NOTE: See Page 51 for standard lug arrangements.
‡For 600 volt ac applications, replace the second numerical digit "4" with a "6". No price increase is involved.

ENCLOSED TRANSFER SWITCHES, NON-LOAD BREAK

Enclosures: The NEMA 1 and NEMA 3R enclosures are free standing steel, medium gray enamel finish. The NEMA 1 enclosure has a removable top and bottom panels to accommodate cable entry and exit. The NEMA 3R enclosure has a removable bottom panel only. These devices are designed to provide a means of selecting either of two sources of supply or furnishing power to two loads from one source of supply.



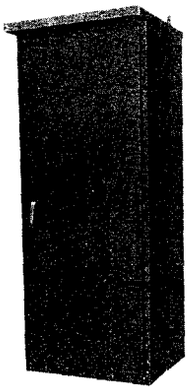
NEMA 1

NEMA 1
600V. AC, 60 Hertz, Manually Operated

Poles	Wires	Ampere Rating	Catalog Number	List Price	Dimensions Height	Width	Depth
2	2	1200	TSG-26120	**$ 6,111.**	91.50	36.00	36.00
2	2	2500	TSG-26250	**7,122.**	91.50	36.00	36.00
2	2	4000	TSG-26400	**10,900.**	91.50	42.00	36.00
3	3	1200	TSG-36120	**6,411.**	91.50	36.00	36.00
3	3	2500	TSG-36250	**7,554.**	91.50	36.00	36.00
3	3	4000	TSG-36400	**13,108.**	91.50	42.00	36.00

NEMA 3R
600V. AC, 60 Hertz, Manually Operated

Poles	Wires	Ampere Rating	Catalog Number	List Price	Dimensions Height	Width	Depth
2	2	1200	TSW-26120	**$ 6,656.**	91.50	48.38	36.00
2	2	2500	TSW-26250	**7,667.**	91.50	48.38	36.00
2	2	4000	TSW-26400	**11,445.**	91.50	48.38	42.00
3	3	1200	TSW-36120	**6,956.**	91.50	48.38	36.00
3	3	2500	TSW-36250	**8,099.**	91.50	48.38	36.00
3	3	4000	TSW-36400	**13,653.**	91.50	48.38	42.00



NEMA 3R

Prices of additions and special features	Form Letters	Price
Auxiliary electrical switch, 10 ampere, with 1-N.O. and 1-N.C. contact. Electrical ratings are the same as Class 9007, Type B switch	X	**$222.**
Provisions for Key interlock. (Type SB)	K	**206.**
With lock mounted for Key interlock (Specify locking sequence) (Type SB)	K1	**371.**

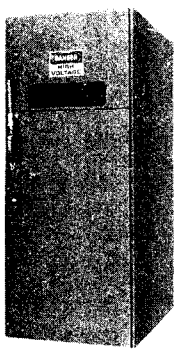
Prices of additions and special features	Form Letters	Price
Neutral Assembly		
800 Ampere	N-08	**$106.**
1200 Ampere	N-12	**109.**
1600 Ampere	N-16	**125.**
2000 Ampere	N-20	**164.**
2500 Ampere	N-25	**170.**
3000 Ampere	N-30	**178.**
4000 Ampere	N-40	**283.**

BARKELEW® CATALOG REFERENCE: CLASS 9810

SQD SLV_000830

INDIVIDUALLY ENCLOSED TYPE—600 AMPERES

Individually enclosed 600 ampere, 3 pole HVL switches are available in free standing general purpose, NEMA 1 enclosures and in weatherproof, NEMA 3R enclosures. These switches can be fused or not-fusible as required. The standard switch price includes bolted top and rear panels; a bolted front panel over the switch which is equipped with a viewing window. If the switch is fused, the fuse compartment is provided with a door which is mechanically interlocked with the switch operating handle. One 3-phase set of incoming and outgoing double clamp type cable lugs suitable for use with copper cable is supplied. Cable guides and a ground bus are included. For more detailed information, see Catalog Section 6140.



NEMA 1 Construction

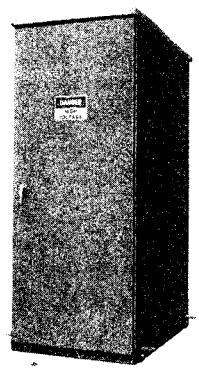
HVL SWITCH NOT-FUSIBLE NEMA 1 ENCLOSURE

Switch Rating	Switch Catalog Number	List Price
4.16 KV	HVL-305OUG-OOO	**$4498.**
13.8 KV	HVL-315OUG-OOO	**4909.**

HVL SWITCH COMPLETE WITH THREE CURRENT LIMITING NON-DISCONNECT TYPE FUSES—NEMA 1 ENCLOSURE

4.16 KV RATING		13.8 KV RATING	
Switch Catalog Number ‡	List Price	Switch Catalog Number †	List Price
HVL-305CLG-(1)	**$5546.**	HVL-315CLG-(4)	**$6507.**
HVL-305CLG-(2)	**6107.**	HVL-315CLG-(5)	**6691.**
HVL-305CLG-250	**6950.**	HVL-315CLG-125*	**6901.**
HVL-305CLG-300	**7128.**	HVL-315CLG-150*	**7290.**
HVL-305CLG-(3)	**7182.**	HVL-315CLG-175*	**7695.**

‡Add fuse rating to end of catalog number. Standard ratings are as follows: (1) 10E, 15E, 20E, 25E, 30E, 40E, 50E, 65E, 80E, 100E (2) 125E, 150E, 200E (3) 325X, 375X, 400X, 450X (4) 10E, 15E, 20E, 25E, 30E, 40E, 50E, (5) 65E, 80E, 100C, 100E.
*Fuse not E rated.



NEMA 3R Construction

PRICES OF ADDITIONS AND SPECIAL FEATURES

	Price
NEMA 3R Enclosure (substitute letter "W" in place of "G" in the catalog number)...4.16KV.	**$ 980.**
Includes a 120 volt strip heater & fuses.....7.2/13.8KV.	**1080.**
Duplex receptacle available upon request at no/charge.	
Porcelain insulators (specify form letter "P") polyester furnished as standard	**225.**
Auxiliary switch (specify form letter "X") 1-N.O. & 1-N.C. contact.....	**200.**
Key Interlock—Specify locking sequence:	
Provisions for lock on switch operator (specify form letter "K").....	**181.**
Complete with lock installed on switch operator (specify form "K1").....	**326.**
Additional cable lugs (loop feed).....	**65.**
Distribution class lightning arresters.....5KV.	**995.**
15KV.	**1155.**

ORDERING INFORMATION REQUIRED
1. Catalog number and form letter (if any).
2. Specify system voltage.

DE CATALOG REFERENCE: SECTION 6140

HVL SWITCH COMPLETE WITH BORIC ACID NON-DISCONNECT TYPE FUSE HOLDERS AND FUSE REFILL UNITS

Switch Rating	Fuse Type●	Max. Fuse Unit Holder will Accept	Catalog Number General Purpose Enclosed †	List Price
4.16 KV	RBA-200	200E	HVL-305R2G	**$5827.**
	RBA-400	400E	HVL-305R4G	**6800.**
7.2 KV	RBA-200	200E	HVL-307R2G	**6107.**
	RBA-400	400E	HVL-307R4G	**7187.**
13.8 KV	RBA-200	200E	HVL-315R2G	**6539.**
	RBA-400	400E	HVL-315R4G	**7609.**

●SM-4S fuses can be substituted for RBA-200 fuses and SM-5S fuses for RBA-400 fuses at no additional charge when specified on order.
†Add fuse refill unit rating to end of catalog number. Standard current ratings are as follows: 3E, 5E, 7E, 10E, 13E, 15E, 20E, 25E, 30E, 40E, 50E, 65E, 80E, 100E, 125E, 150E, 200E, 250E, 300E, 400E.
Example: 50E fuse refill—Cat. No. would be HVL-305R2G-050.s
Standard speed fuse refill units will be supplied unless otherwise specified.

INDIVIDUALLY ENCLOSED TYPE—200 AMPERES

Individually enclosed 200 ampere, 3 pole HVL switches are available in free standing general purpose, NEMA 1 and in weatherproof, NEMA 3R enclosures. These switches can be fused or not-fusible as required. The standard switch price includes bolted rear panel. The door is mechanically interlocked with the switch operating handle. Fuses are not furnished with this equipment.

PRICES OF ADDITIONS AND SPECIAL FEATURES

	Price
NEMA 3R Enclosure (substitute letter "W" in place of "G" in the catalog number)..4.16	$ N/C
Auxiliary switch (specify form letter "X") 1-N.O & 1-N.C. contact....	**200.**
Key Interlock—Specify locking sequence: Provisions for lock on switch operator (specify form letter "K".....	**115.**
Complete with lock installed on switch operator (specify form "K1").....	**165.**
Additional cable lugs (loop feed).....	**65.**

ORDERING INFORMATION REQUIRED
1. Catalog number and form letter (if any).
2. Specify system voltage.

HVL SWITCH NON-FUSIBLE NEMA 1 ENCLOSURE

Switch Rating ●	Switch Catalog Number	List Price
4.16 KV	HVMW 305000U	**$2600.**

DIMENSIONS: 48" H x 25.5" W x 25.25" D

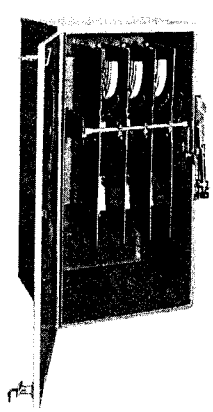
HVL SWITCH WITH PROVISIONS FOR THREE CURRENT LIMITING NON-DISCONNECT TYPE FUSES—NEMA 1 ENCLOSURE

4.16 KV RATING ●		DIMENSIONS (Inches)		
Switch Catalog Number ‡	List Price	H	W	D
HVMW 305025 (1)	**$2766.**	48	25.5	25.25
HVMW 305100 (2)	**2766.**	48	25.5	25.25
HVMW 305200 (3)	**3000.**	58	25.5	25.25

‡Add fuse rating to end of catalog number. (Fuses are not included)

Standard ratings are as follows:	
(1)	10E, 15E, 20E, 25E
(2)	30E, 40E, 50E, 65E, 80E, 100E
(3)	125E, 150E, 200E

	5KV
●—Momentary Rating (10 Cycles)	20,000A ASY
Maximum Fault Closing without Fuses	20,000A ASY
Maximum Fault Closing with Current Limiting Fuses	40,000A ASY

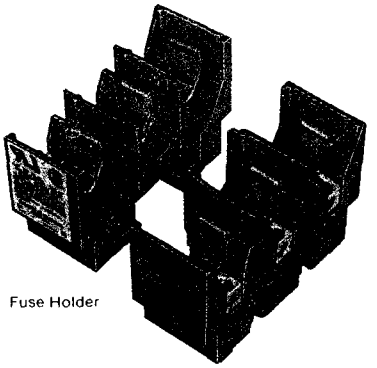


NEMA 1/NEMA 3R Construction

SQD SLV_000831

POWER FUSE HOLDER KITS—UL COMPONENT RECOGNIZED, FILE NUMBER E75206; CSA CERTIFIED, FILE NUMBER LR5473-1

Each kit consists of line and load side fuse base assemblies, polyester glass drilling template* and mounting screws.



Fuse Holder

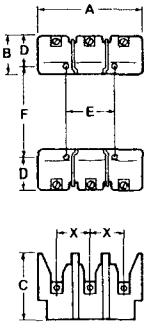


Figure 1

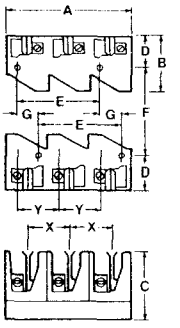


Figure 2

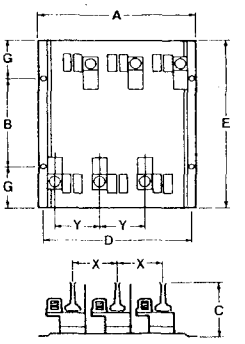


Figure 3

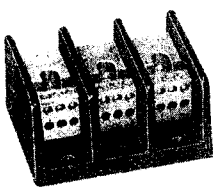
Amperes	Maximum Voltage	Number of Poles	Catalog Number	Wire Size	List Price	Fig. No.	A	B	C	D	E	Mounting Holes F Class H, K, R• 250V.	Mounting Holes F Class H, K, R• 600V.	Mounting Holes Dia.	G	X	Y
WITH COPPER ONLY LUGS (All current carrying parts are plated copper)																	
1-30	600	3	FB361C	Pressure plate type (2) 14-8 Cu matches size 0 and 1 starter	**$ 22.40**	1	3.77	2.04	2.70	0.36	1.24	—	4.50	.22	—	1.24	—
31-60	250	3	FB322C	14-4 Cu matches size 2 starter	**28.00**	1	4.74	1.92	3.16	1.41	2.18	1.25	—	.25	—	1.54	—
31-60	600	3	FB362C	14-4 Cu	**40.00**	1	4.74	1.92	3.16	1.41	2.18	—	3.75	.25	—	1.54	—
61-100	250-600	3	FB363C	14-1/0 Cu	**89.00**	2	6.04	2.54	3.22	1.41	4.00	2.80	4.80	.25	1.06	2.00	2.00
101-200	250-600	3	FB364C*	6-250 MCM Cu	**174.00**	3	10.62	6.00	3.75	10.12	11.32	—	—	.25	2.66	3.00	3.00
WITH AL-CU LUGS																	
201-400	250-600	3	FB365	(1) 1-600 MCM or (2) 1/0-250 MCM AL/CU	**403.00**	2	13.44	3.63	4.69	—	—	—	—	.22	.50	4.00	4.00

•Consult factory if Class R fuse provisions are required.
*200A furnished on steel mounting pan. Mounting pan is used as drilling template.

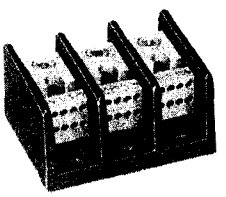
POWER DISTRIBUTION BLOCKS—UL COMPONENT RECOGNIZED, FILE NUMBER E68151

REFER TO CLASS 9080 SECTION FOR COMPLETE LISTING OF TERMINAL BLOCKS

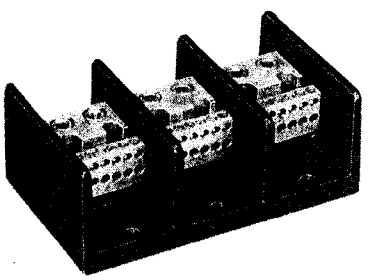
600V. AC MAX.



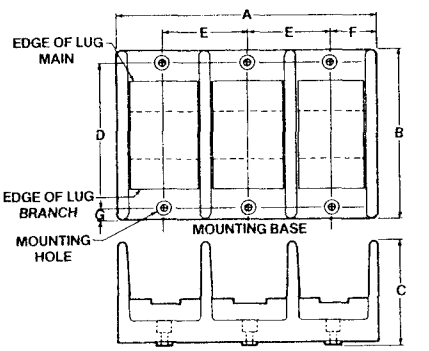
LBC 66063



LBC 66083

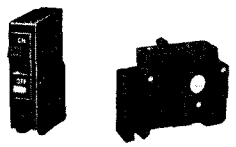


LBC 68143



Wire Range Main	Wire Range Branch	Aluminum Catalog Number	Aluminum Price	Copper Catalog Number	Copper Price	Dimensions A	B	C	D	E	F	G
(1) #12-2/0	(1) #12-2/0	LBA 67053	**$27.00**	LBC 66053	**$ 63.00**	5	4	2.63	3.38	1.53	.95	.31
(1) #12-2/0	(4) #14-4	LBA 67073	**31.00**	LBC 66073	**74.00**	5	4	2.63	3.38	1.53	.95	.31
(1) #12-2/0	(6) #14-4	LBA 67063	**33.00**	LBC 66063	**77.00**	5	4	2.63	3.38	1.53	.95	.31
(1) #6-350MCM	(1) #6-350MCM	LBA 67003	**29.00**	LBC 66003	**70.00**	5	4	2.63	3.38	1.53	.95	.31
(1) #6-350MCM	(8) #14-6	LBA 67083	**44.00**	LBC 66083	**104.00**	5	4	2.63	3.38	1.53	.95	.31
(1) #6-350MCM	(12) #14-4	LBA 69153	**67.00**	LBC 68153	**157.00**	8.5	5.5	3.25	4.75	2.69	1.56	.38
(1) #6-350MCM	(6) #12-2/0	LBA 69173	**64.00**	LBC 68173	**151.00**	8.5	5.5	3.25	4.75	2.69	1.56	.38
(1) #4-500MCM	(1) #4-500MCM	LBA 69053	**48.00**	LBC 68053	**114.00**	8.5	5.5	3.25	4.75	2.69	1.56	.38
(1) #4-500MCM	(12) #14-4	LBA 69083	**69.00**	LBC 68083	**162.00**	8.5	5.5	3.25	4.75	2.69	1.56	.38
(1) #4-500MCM	(6) #12-2/0	LBA 69073	**63.00**	LBC 68073	**148.00**	8.5	5.5	3.25	4.75	2.69	1.56	.38
(1) #4-500MCM	(2) #6-350MCM	LBA 69063	**50.00**	LBC 68063	**117.00**	8.5	5.5	3.25	4.75	2.69	1.56	.38
(2) #12-2/0	(2) #12-2/0	LBA 67023	**33.00**	LBC 66023	**77.00**	5	4	2.63	3.38	1.53	.95	.31
(2) #12-2/0	(6) #14-4	LBA 67043	**34.00**	LBC 66043	**80.00**	5	4	2.63	3.38	1.53	.95	.31
(2) #12-2/0	(12) #14-4	LBA 69163	**68.00**	LBC 68163	**160.00**	8.5	5.5	3.25	4.75	2.69	1.56	.38
(2) #6-350MCM	(2) #6-350MCM	LBA 69123	**54.00**	LBC 68123	**127.00**	8.5	5.5	3.25	4.75	2.69	1.56	.38
(2) #6-350MCM	(12) #14-4	LBA 69143	**71.00**	LBC 68143	**166.00**	8.5	5.5	3.25	4.75	2.69	1.56	.38
(2) #6-350MCM	(6) #12-2/0	LBA 69133	**71.00**	LBC 68133	**167.00**	8.5	5.5	3.25	4.75	2.69	1.56	.38
(2) #4-500MCM	(2) #4-500MCM	LBA 69093	**68.00**	LBC 68093	**161.00**	8.5	5.5	3.25	4.75	2.69	1.56	.38
(2) #4-500MCM	(12) #14-4	LBA 69113	**73.00**	LBC 68113	**171.00**	8.5	5.5	3.25	4.75	2.69	1.56	.38
(2) #4-500MCM	(6) #12-2/0	LBA 69103	**76.00**	LBC 68103	**179.00**	8.5	5.5	3.25	4.75	2.69	1.56	.38

SQD SLV_000832

Description	Catalog Number Prefix	Ratings: Maximum Voltage	Ratings: Amperes	Application	Digest 161 Page Number
PLUG-ON AND BOLT-ON CIRCUIT BREAKERS					
 **THERMAL-MAGNETIC CIRCUIT BREAKERS**	QO, Q1	240V. ac	10-150	QO Load Centers Plug-On Unit Bases NQO Panelboards	2, 3 58 78
	QOB, Q1B	240V. ac	10-100	Bolt-On Unit Base NQOB Panelboards	58 80
	EH, EHB	277/480V. ac	15-60	Unit Base & Enclosure NEHB Panelboards	58 88
UNIT MOUNTED CIRCUIT BREAKERS (LUGS BOTH ENDS)					
 **THERMAL-MAGNETIC CIRCUIT BREAKERS** 	QOU, Q1U	240V. ac	10-125	Unit Mounting	59
	Q1L	240V. ac	15-125	Unit Mounting & Enclosures	59
	Q2L	240V. ac	100-225		
	Q4L	240V. ac	250-400		
	FAL, FHL	600V. ac, 250V. dc	15-100	Unit Mounting & Enclosures	60, 62
	KAL, KHL	600V. ac, 250V. dc	70-225		
	LAL, LHL	600V. ac, 250V. dc	125-400	Unit Mounting & Enclosures	61, 62
	MAL, MHL	600V. ac, 250V. dc	125-1000		
	NHL	480V. ac	600-1200		
	PA, PH★	600V. ac	600-2000		
	PC★	600V. ac	1600-2500		
TM **I-LIMITER CURRENT LIMITING CIRCUIT BREAKERS**	IFL	480V. ac	15-100	Unit Mounting & Enclosures	63
	IKL	480V. ac	110-225		
SOLID STATE TRIP CIRCUIT BREAKERS	ME	600V. ac	400-2000	Unit Mounting & Enclosures	64
	PE★	600V. ac			65
 **MAG-GARD CIRCUIT BREAKERS Motor Circuit Protector**		600V. ac	3-2000	Unit Mounting	66
MOLDED CASE SWITCHES		600V. ac	60-2500	Unit Mounting & Enclosures	66
I-LINE CIRCUIT BREAKERS					
 **THERMAL MAGNETIC CIRCUIT BREAKERS**	Q2 Q4	240V. ac	110-225 250-400	I-LINE Panelboards and Switchboards	94
	FA, FH KA, KH LA, LH MA, MH	600V. ac 250V. dc	15-100 70-225 125-400 125-800		94, 95
TM **I-LIMITER CURRENT LIMITING CIRCUIT BREAKERS**	IF IK	480V. ac	15-100 110-225		95
SOLID STATE TRIP CIRCUIT BREAKERS	ME	600V. ac	400-800		95

★Supplied without lugs. Refer to page 70 for termination information.

Circuit Breaker: A device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined overcurrent without injury to itself when applied within its rating.

Thermal-Magnetic: Describes a circuit breaker having both inverse time (thermal) and instantaneous (magnetic) tripping characteristics.

Adjustable Instantaneous Trip, Magnetic Only: Describes a circuit breaker having instantaneous (magnetic) tripping action, but not having an inverse time tripping characteristic.

Molded Case Switch: A not fusible switch which opens only in response to an operator. It contains no overcurrent protection.

Molded Case Switch (Auto): Offered only by Square D. A not fusible switch which, in addition to responding to the act of an operator, will also open automatically at a predetermined level of high fault current. It contains no overcurrent protection.

Push-To-Trip: A means of mechanically simulating overcurrent tripping. It exercises parts of the tripping mechanism not operated by the circuit breaker handle.

I-75,000: Indicates circuit breakers that have been specially designed for high interrupting capability. Circuit breakers with this construction have gray handles.

I-LIMITER: A Square D Company trademark associated with circuit breakers which are current limiting. Circuit breakers with this construction have yellow handles.

I-75,000 is a Trademark of Square D Company. I-LINE, I-LIMITER, QO and MAG-GARD are Registered Trademarks of Square D Company.

SQD SLV_000833

CIRCUIT BREAKER DATA

Catalog Number Prefix	No. Poles	Ampere Rating	UL Listed Interrupting Rating—RMS Symmetrical Amperes								*Federal Specs. W-C-375B	DE Catalog Section	Digest 161 Page No.
			AC Voltage							DC Voltage			
			120	120/240	240	277	277/480	480	600	250			
QO-GFI, QOB-GFI	1	15-30	10000	.....	.....	.....	.....	.....	.....	.....	11a	630/810	3, 78, 80
	2	15-30	.....	10000	.....	.....	.....	.....	.....	.....	10a, 12a		
QO-VHGFI, QOB-VHGFI	1	15-30	22000	.....	.....	.....	.....	.....	.....	.....	11a	630/810	3, 78, 80
QO-QOB	1	10-70	.....	10000	.....	.....	.....	.....	.....	.....	10a, 11a, 12a	630/632	2, 58, 78, 80
	2	●10-100	.....	10000	.....	.....	.....	.....	.....	.....	10a, 12a		
	3	10-60	.....	.....	10000	.....	.....	.....	.....	.....	10b, 11b, 12b		
QO-H, QOB-H	2	15-30	.....	.....	10000	.....	.....	.....	.....	.....	10b, 11b, 12b	630	2, 78, 80
QOT	1	15-30	.....	▲10000	.....	.....	.....	.....	.....	.....	10a, 11a, 12a	631	2
	2	15-30	.....	10000	.....	.....	.....	.....	.....	.....	10a, 12a		
QO-VH, QOB-VH	1	10-30	.....	22000	.....	.....	.....	.....	.....	.....	14a	630	2, 78, 80
	2	15-30	.....	22000	.....	.....	.....	.....	.....	.....	14a		
	3	15-30	.....	.....	22000	.....	.....	.....	.....	.....	...		
QOU	1	10-70	.....	10000	.....	.....	.....	.....	.....	.....	10a, 12a	632	59
	2	10-70	.....	10000	.....	.....	.....	.....	.....	.....	10a, 12a		
	3	10-50	.....	.....	10000	.....	.....	.....	.....	.....	10b, 11b, 12b		
QH-QHB	1	10-30	.....	65000	.....	.....	.....	.....	.....	.....	15a	630	2, 78, 80
	2	15-30	.....	65000	.....	.....	.....	.....	.....	.....	15a		
	3	15-30	.....	.....	65000	.....	.....	.....	.....	.....	15b		
Q1	2	80-150	.....	10000	.....	.....	.....	.....	.....	.....	10a, 12a	633	2, 58, 78
	3	70-100	.....	.....	10000	.....	.....	.....	.....	.....	10b, 11b, 12b		
Q1B	2	80-100	.....	10000	.....	.....	.....	.....	.....	.....	10a, 12a	633	58, 80
	3	70-100	.....	.....	10000	.....	.....	.....	.....	.....	10b, 11b, 12b		
Q1-H, Q1B-H	2	35-100	.....	.....	10000	.....	.....	.....	.....	.....	10b, 11b, 12b	633	2, 78, 80
Q1-VH	2	35-125	.....	22000	.....	.....	.....	.....	.....	.....	14a	633	2, 78
	3	35-100	.....	.....	22000	.....	.....	.....	.....	.....	14b		
Q1B-VH	2	35-100	.....	22000	.....	.....	.....	.....	.....	.....	14a	633	80
	3	35-100	.....	.....	22000	.....	.....	.....	.....	.....	14b		
Q1H	2	35-125	.....	42000	.....	.....	.....	.....	.....	.....	14a	633	2, 78
Q1BH	2	35-100	.....	42000	.....	.....	.....	.....	.....	.....	14a	633	80
Q1L	1	15-100	10000	.....	5000	.....	.....	.....	.....	.....	10a, 12a	633	59
	2	15-125	.....	10000	5000	.....	.....	.....	.....	.....	10a, 10b, 12a		
	3	15-100	.....	.....	10000	.....	.....	.....	.....	.....	10b, 11b, 12b		
Q1U	2	15-125	.....	10000	5000	.....	.....	.....	.....	.....	10a, 10b, 12a	633	59
	3	15-100	.....	.....	10000	.....	.....	.....	.....	.....	10b, 11b, 12b		
Q2	2	100-225	.....	10000	.....	.....	.....	.....	.....	.....	...	634	94
Q2L	2	100-225	.....	10000	.....	.....	.....	.....	.....	.....	...	634	59
Q2, Q2L	3	100-225	.....	.....	10000	.....	.....	.....	.....	.....	12b	634	59, 94
Q2-H, Q2L-H†	2	100-225	.....	.....	22000	.....	.....	.....	.....	.....	12b, 14b	634	59, 94
	3	100-225	.....	.....	22000	.....	.....	.....	.....	.....	12b, 14b		
Q2H, Q2LH	2	100-225	.....	.....	42000	.....	.....	.....	.....	.....	12b, 14b	634	59, 94
Q4, Q4L	2	250-400	.....	.....	22000	.....	.....	.....	.....	.....	14b	635	59, 94
	3	250-400	.....	.....	22000	.....	.....	.....	.....	.....	14b		
EH, EHB	1	15-30	65000	.....	.....	14000	.....	.....	.....	.....	11a, 13a	652	58, 88
	2	15-60	.....	65000	.....	.....	14000	.....	.....	.....	13b, 15a		
	3	15-60	.....	.....	65000	.....	14000	.....	.....	.....	13b, 15b		
FY	1	15-30	18000	.....	.....	14000	.....	.....	.....	.....	11a, 13a	651	94
FA-FAL 240V.	1	15-100	10000	.....	.....	.....	.....	.....	.....	5000■	11a	650	60, 94
	2	15-100	.....	.....	10000	.....	.....	.....	.....	5000	11b, 12b		
	3	15-100	.....	.....	10000	.....	.....	.....	.....	.....	11b, 12b		
FA-FAL 480V.	1	15-100	18000	.....	.....	14000	.....	.....	.....	10000■	11a, 12c, 13a	650	60, 94
	2	15-100	.....	.....	18000	.....	.....	14000	.....	10000	13b		
	3	15-100	.....	.....	18000	.....	.....	14000	.....	.....	13b		
FA-FAL 600V.	2	15-100	.....	.....	18000	.....	.....	14000	14000	10000	18a	650	60, 94
	3	15-100	.....	.....	18000	.....	.....	14000	14000	.....	18a		
FH-FHL	1	15-30	.....	.....	.....	65000	.....	.....	.....	10000■	13a	650	62, 95
	1	35-100	65000	.....	.....	25000	.....	.....	.....	10000■	13a		
	2	15-100	.....	.....	65000	.....	.....	25000	18000	10000	22a		
	3	15-100	.....	.....	65000	.....	.....	25000	18000	.....	22a		
IF-IFL	2	15-100	.....	.....	100000	.....	.....	100000	.....	.....	16a	720	63, 95
	3	15-100	.....	.....	100000	.....	.....	100000	.....	.....	16a		
KA-KAL	2	70-225	.....	.....	25000	.....	.....	22000	22000	10000	20a	655	60, 94
	3	70-225	.....	.....	25000	.....	.....	22000	22000	.....	20a		
KH-KHL	2	70-225	.....	.....	65000	.....	.....	35000	25000	10000	23a	655	62, 95
	3	70-225	.....	.....	65000	.....	.....	35000	25000	.....	23a		
IK-IKL	2	110-225	.....	.....	100000	.....	.....	100000	.....	.....	16a	725	63, 95
	3	110-225	.....	.....	100000	.....	.....	100000	.....	.....	16a		
LA-LAL	2	125-400	.....	.....	42000	.....	.....	30000	22000	10000	21a	660	61, 94
	3	125-400	.....	.....	42000	.....	.....	30000	22000	.....	21a		
LH-LHL	2	125-400	.....	.....	65000	.....	.....	35000	25000	10000	23a	660	62, 95
	3	125-400	.....	.....	65000	.....	.....	35000	25000	.....	23a		
MA-MAL	2	125-1000	.....	.....	42000	.....	.....	30000	22000	14000	21a	665	61, 94
	3	125-1000	.....	.....	42000	.....	.....	30000	22000	.....	21a		
MH-MHL	2	125-1000	.....	.....	65000	.....	.....	50000	25000	14000	23a	665	62, 95
	3	125-1000	.....	.....	65000	.....	.....	50000	25000	.....	23a		
ME-MEL	2	400-800	.....	.....	65000	.....	.....	35000	25000	.....	23a	666	64, 95
	3	400-800	.....	.....	65000	.....	.....	35000	25000	.....	23a		
NHL	2	600-1200	.....	.....	65000	.....	.....	35000	.....	.....	23a	670	61
	3	600-1200	.....	.....	65000	.....	.....	35000	.....	.....	23a		
PAF	2	600-2000	.....	.....	65000	.....	.....	50000	42000	.....	24a	675	61
	3	600-2000	.....	.....	65000	.....	.....	50000	42000	.....	24a		
PHF	2	600-2000	.....	.....	125000	.....	.....	85000	65000	.....	25a	675	62
	3	600-2000	.....	.....	125000	.....	.....	85000	65000	.....	25a		
PEF, PEC	2	1000-2000	.....	.....	125000	.....	.....	85000	65000	.....	25a	677	65
	3	1000-2000	.....	.....	125000	.....	.....	85000	65000	.....	25a		
PCF	2	1600-2500	.....	.....	125000	.....	.....	85000	65000	.....	25a	676	61
	3	1600-2500	.....	.....	125000	.....	.....	85000	65000	.....	25a		

*Federal Specs. do not require dc ratings.
■125V. dc.
▲QOT 1515, QOT 1520 and QOT 2020 rated 120V. ac.
†2 Pole rated 10,000 AIC, 240V., 3Ø, Grd. BØ.
●QO only. QOB maximum rating 70 amperes.

SQD SLV_000834

CIRCUIT BREAKER DIMENSIONS

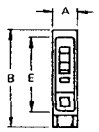


Fig. 1

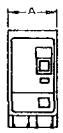


Fig. 2

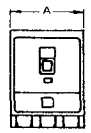
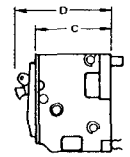
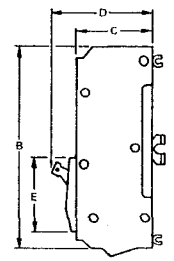


Fig. 3



QO, QOB



Q1, Q1B, Q1L

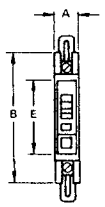


Fig. 4

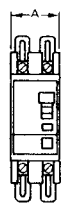


Fig. 5

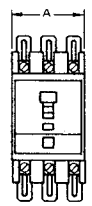
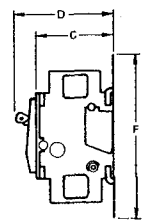
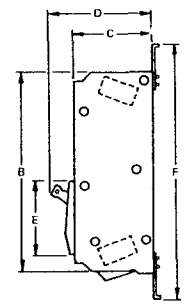


Fig. 6



QOU, QYU



Q1U

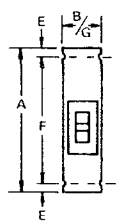


Fig. 7

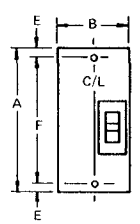


Fig. 8

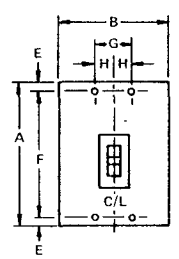
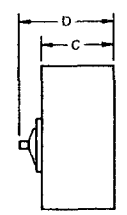


Fig. 9



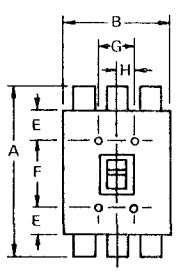
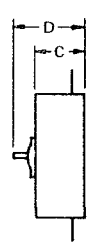


Fig. 10



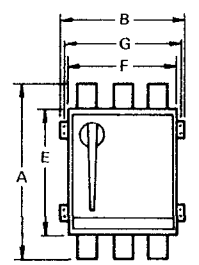
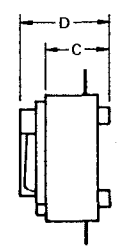
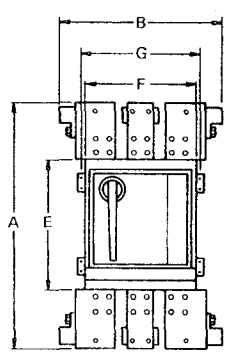


Fig. 11





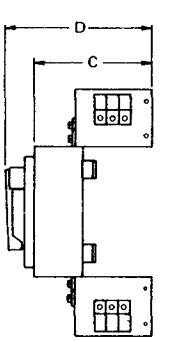


Fig. 12

QO, Q1, QOU & Q1U CIRCUIT BREAKERS

Breaker Catalog Number Prefix	No. Poles	Fig. No.	Dimensions—Inches						
			A	B	C	D	E	F	G
QO, QOB	1	1	.73	3.00	2.31	2.91	2.25	...	...
	2	2	1.48	3.00	2.31	2.91	2.25	...	...
	3	3	2.23	3.00	2.31	2.91	2.25	...	...
Q1, Q1B Q1L	1	1	.73	6.00	2.31	2.91	2.25	...	...
	2	2	1.48	6.00	2.31	3.06	2.25	...	...
	3	3	2.23	6.00	2.31	3.06	2.25	...	...
QOU QYU	1	4	.75	3.98	2.38	3.06	2.25	5.00	.59
	2	5	1.50	3.98	2.38	2.98	2.25	5.00	1.34
	3	6	2.25	3.98	2.38	2.98	2.25	5.00	2.09
Q1U	1	4	.73	6.00	2.31	2.98	2.25	7.63	.59
	2	5	1.48	6.00	2.31	3.06	2.25	7.63	1.34
	3	6	2.23	6.00	2.31	3.06	2.25	7.63	2.06

Q2, Q4, FA, IF, KA, IK, LA, MA, ME CIRCUIT BREAKERS

Breaker Catalog Number Prefix	No. Poles	Fig. No.	Dimension—Inches							
			A	B	C	D	E	F	G	H
Q2L, Q2L-H	2	8	6.44	2.97	3.03	3.78	*	4.25	...	...
	3	9	6.44	4.47	3.03	3.78	*	4.25	1.5	.75
Q4L	2 & 3	9	11	5.97	4.06	5.84	.88	9.25	2	1
FAL, FHL	1	7	6	1.5	3.16	4.13	.44	5.13	1.5	...
	2	8	6	3	3.16	4.13	.44	5.13	...	...
	3	9	6	4.47	3.16	4.13	.44	5.13	1.5	.75
IFL	2 & 3	9	8.29	4.46	3.67	4.70	.44	7.41	1.5	.75
KAL, KHL	2 & 3	9	8	4.47	3.66	4.75	.44	7.13	1.5	.75
IKL	2 & 3	9	11	6	4.02	5.51	.88	9.25	2	1
LAL, LHL	2 & 3	9	11	5.97	4.06	5.84	.88	9.25	2	1
MAL, MHL	2 & 3	9	14	8.97	4.53	6.5	1.66	10.69	3	1.5
MEL	2 & 3	9	14.75	8.97	4.37	6.5	1.66	11.43	3	1.5

*DIMENSIONS E 1.56 at "ON" end, .66 at "OFF" end.

NA, PA, PC, PE CIRCUIT BREAKERS

Breaker Catalog Number Prefix	No. Poles	Fig. No.	Dimensions—Inches						
			A	B	C	D	E	F	G
NHF, NHL	2 & 3	10	20	12	5.75	8.13	2.38	7.75	4
PAF, PHF, PEF, PEC-12,16	2 & 3	11	20	13.75	7.25	10.41	14	12	12.75
PAL	2 & 3	12	26	16.34	13.25	16.38	14	12	12.75
PCF, PEC-20	2 & 3	●	23.86	27.88	15.18	17.20	14	12	...

●PCF and PEC-20 not pictorially correct as shown in fig. 12, overall dimensional information is given only.

QO is a Registered Trademark of Square D Company.

SQD SLV_000835

PLUG-ON AND BOLT-ON CIRCUIT BREAKERS AND UNIT MOUNTING BASES

QO-QOB

(QO and QOB circuit breakers with higher interrupting ratings and with accessories are available, refer to listings on pages 2, 3, 78 and 80.)

Ampere Rating	One Pole				Two Pole				Three Pole			
	Plug-On■		Bolt-On✝		Plug-On■		Bolt-On✝		Plug-On■		Bolt-On✝	
	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price
	120/240V. ac—10,000 AIC				120/240V. ac—10,000 AIC				240V. ac—10,000 AIC			
10	QO 110	$8.00	QOB 110	$9.50	QO 210	$18.20	QOB 210	$21.20	QO 310	$62.00	QOB 310	$67.00
15	▲ QO 115	8.00	▲ QOB 115	9.50	◐QO 215	18.20	◐QOB 215	21.20	QO 315	62.00	QOB 315	67.00
15	▲●QO 115HM	8.00	▲●QOB 115HM	9.50	.....	.....	.....	.....	.....	.....	.....	.....
20	▲●QO 120	8.00	▲ QOB 120	9.50	◐QO 220	18.20	◐QOB 220	21.20	QO 320	62.00	QOB 320	67.00
20	▲●QO 120HM	8.00	▲●QOB 120HM	9.50	.....	.....	.....	.....	.....	.....	.....	.....
25	QO 125	8.00	QOB 125	9.50	◐QO 225	18.20	◐QOB 225	21.20	QO 325	62.00	QOB 325	67.00
30	QO 130	8.00	QOB 130	9.50	◐QO 230	18.20	◐QOB 230	21.20	QO 330	62.00	QOB 330	67.00
35	QO 135	8.00	QOB 135	9.50	◐QO 235	18.20	◐QOB 235	21.20	QO 335	62.00	QOB 335	67.00
40	QO 140	8.00	QOB 140	9.50	◐QO 240	18.20	◐QOB 240	21.20	QO 340	62.00	QOB 340	67.00
45	QO 145	8.00	QOB 145	9.50	◐QO 245	18.20	◐QOB 245	21.20	QO 345	62.00	QOB 345	67.00
50	QO 150	8.00	QOB 150	9.50	◐QO 250	18.20	◐QOB 250	21.20	QO 350	62.00	QOB 350	67.00
60	QO 160	8.00	QOB 160	9.50	◐QO 260	18.20	◐QOB 260	21.20	QO 360	62.00	QOB 360	67.00
70	QO 170	17.40	QOB 170	18.90	QO 270	37.00	QOB 270	40.00	Q1 370	81.00	Q1B 370	98.00
80	.....	....	.....	....	QO 280	51.00	Q1B 280	66.00	Q1 380	94.00	Q1B 380	111.00
90	.....	....	.....	....	QO 290	51.00	Q1B 290	66.00	Q1 390	94.00	Q1B 390	111.00
100	.....	....	.....	....	QO 2100	51.00	Q1B 2100	66.00	Q1 3100	94.00	Q1B 3100	111.00
Molded Case Switch 60A. Maximum—240V. ac.....					QO 200	18.20	QOB 200	21.20	QO 300	62.00	QOB 300	67.00
Molded Case Switch 100A. Maximum—240V. ac.....					Q1 2000	51.00	Q1B 2000	66.00	Q1 3000	94.00	Q1B 3000	111.00

▲ UL Listed as SWD (switching duty) rated suitable for switching 120V. ac fluorescent lighting loads.
● High magnetic trip breakers.
◐ UL Listed as HACR type for use with air conditioning, heating and refrigerating equipment having motor group combinations.

EH-EHB

	277V. ac—14,000 AIC 120V. ac—65,000 AIC				277/480V. ac—14,000 AIC 120/240V. ac—65,000 AIC				277/480V. ac—14,000 AIC 240V. ac—65,000 AIC			
15	✻EH 14015	$32.00	✻EHB 14015	$36.00	EH 24015	$82.00	EHB 24015	$90.00	EH 34015	$146.00	EHB 34015	$158.00
20	✻EH 14020	32.00	✻EHB 14020	36.00	EH 24020	82.00	EHB 24020	90.00	EH 34020	146.00	EHB 34020	158.00
25	EH 14025	32.00	EHB 14025	36.00	EH 24025	82.00	EHB 24025	90.00	EH 34025	146.00	EHB 34025	158.00
30	EH 14030	32.00	EHB 14030	36.00	EH 24030	82.00	EHB 24030	90.00	EH 34030	146.00	EHB 34030	158.00
40	.....	....	.....	....	EH 24040	82.00	EHB 24040	90.00	EH 34040	146.00	EHB 34040	158.00
50	.....	....	.....	....	EH 24050	82.00	EHB 24050	90.00	EH 34050	146.00	EHB 34050	158.00
60	.....	....	.....	....	EH 24060	82.00	EHB 24060	90.00	EH 34060	146.00	EHB 34060	158.00

✻UL Listed as SWD (switching duty) rated suitable for switching 277V. ac or 120V. ac fluorescent lighting loads.

B1-3 DISCOUNT

EPD

QO/QOB CIRCUIT BREAKERS WITH 30MA EQUIPMENT PROTECTION (UL Component Recognition)

Ampere Rating	Single Pole QO with VISI-TRIP 120V. ac 10,000 AIC 1 Space Required				Single Pole with Alarm Switch✝ QO with VISI-TRIP 120V. ac 10,000 AIC 2 Spaces Required			
	Plug-On■		Bolt-On✝		Plug-On■		Bolt-On✝	
	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price
15	QO 115EPD	$115.00	QOB 115EPD	$115.00	QO 115EPD-2100	$148.00	QOB 115EPD-2100	$148.00
20	QO 120EPD	115.00	QOB 120EPD	115.00	QO 120EPD-2100	148.00	QOB 120EPD-2100	148.00
25	QO 125EPD	115.00	QOB 125EPD	115.00	QO 125EPD-2100	148.00	QOB 125EPD-2100	148.00
30	QO 130EPD	115.00	QOB 130EPD	115.00	QO 130EPD-2100	148.00	QOB 130EPD-2100	148.00

✝Alarm Switch Electrical Rating: 5 amps maximum at 120V. ac, 50/60 Hz.

UNIT MOUNTING BASES

SYSTEM	Main Lug Rating	No. One Pole Breakers	Catalog Number	Price	Main Wire Size Cu	Main Wire Size Al	Wiring Diagram
QO AND Q1 PLUG-ON MOUNTING BASES							
1 PHASE 2 WIRE (Without Neutral Assy.)	70A.	2	QON2ACL	$ 6.80	#14-#4	#12-#2	1
	125A.	4	SK9948	18.50	#12-1/0	#12-1/0	2
	125A.	4	SK9842	18.50	#12-1/0	#12-1/0	3
	125A.	6	SK9795	23.10	#12-1/0	#12-1/0	4
	125A.	6	SK9801	28.00	#12-1/0	#12-1/0	5
	150A.	6	SK9796	33.00	#8-3/0	#8-3/0	4
	150A.	8	SK9797	37.00	#8-3/0	#8-3/0	6
	150A.	8	SK9797A	37.00	#8-3/0	#8-3/0	7
3 PHASE 3 WIRE (Without Neutral Assy.)	100A.	6 QO or 3 Q1	Q1N3HCL	26.00	#10-1/0	#10-1/0	8
1 PHASE 3 WIRE	40A.	2	QON2CL	8.80	#14-#6	#12-#6	9
	70A.	2	QON24ACL	12.80	#14-#4	#12-#2	9
3 PHASE 4 WIRE	60A.	3	QON403CL	12.30	#10-#4	.....	10
QOB AND Q1B BOLT-ON MOUNTING BASES							
1 PHASE 3 WIRE	70A.	2	QON2B	14.40	#14-#4	#14-#4	11
3 PHASE 3 WIRE (Without Neutral Assy.)	60A.	3	QON3B	14.40	#10-1/0	#10-1/0	12
	100A.	3Q1B	Q1N3HBCL	40.00	#10-1/0	#10-1/0	12
EH AND EHB MOUNTING BASE—PLUG-ON AND BOLT-ON							
3 PHASE 3 WIRE (Without Neutral Assy.)	100A.	3	EHN3	15.80	#14-2/0	#12-2/0	12

■Plug-On QO, Q1 and EPD breakers sold on B1-1 DISCOUNT
✝Bolt-On QOB, Q1B and EPD breakers sold on B1-4 DISCOUNT

QO and VISI-TRIP are Registered Trademarks of Square D Company.

C1-1 DISCOUNT

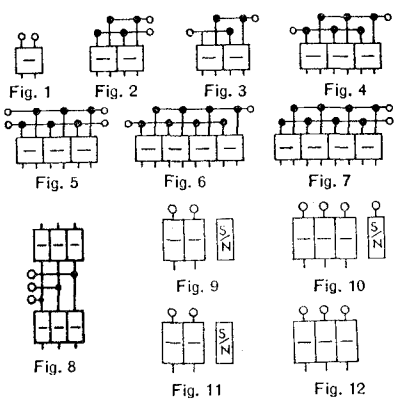
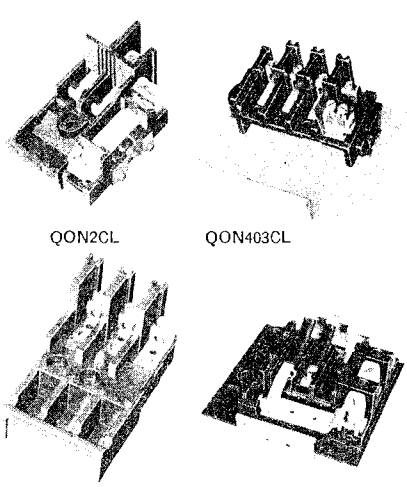
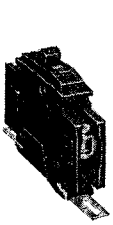


Fig. 1 Fig. 2 Fig. 3 Fig. 4
Fig. 5 Fig. 6 Fig. 7
Fig. 8 Fig. 9 Fig. 10
Fig. 11 Fig. 12

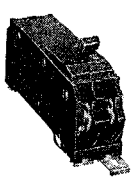

QON2CL QON403CL
QON3B Q1N3HBCL

SQD SLV_000836

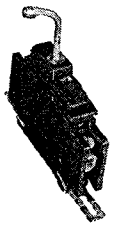
UNIT BREAKERS AND ACCESSORIES



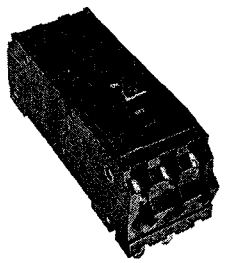
QOU
QYU



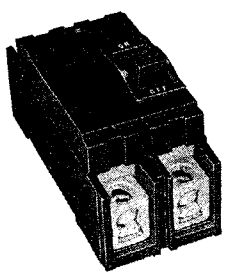
Q1U



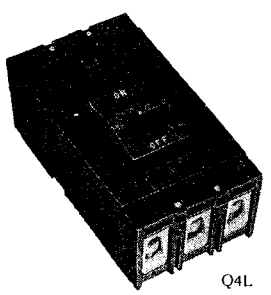
QOUK
Includes key with VISI-TRIP indication.
UL Listed.



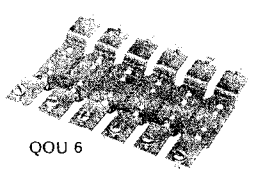
Q1L



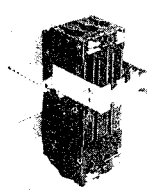
Q2L



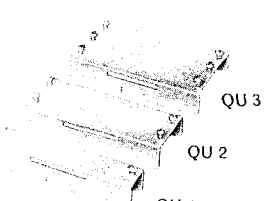
Q4L



QOU 6



1UD



QU 3
QU 2
QU 1

10,000 AIC—125 AMPERE MAXIMUM 240V. AC PERMANENT TRIP — QOU-Q1U

Ampere Rating	Single Pole 120/240 V. ac Cat. No.	Price	Single Pole 120V. ac—Key Operated Cat. No.	Price	Two Pole 120/240 V. ac Cat. No.	Price	Three Pole 240 V. ac Cat. No.	Price
10	QOU 110	**$10.00**	QOU 110K	**$13.00**	QOU 210	**$21.80**	QOU 310	**$72.00**
15	QOU 115	**10.00**	QOU 115K	**13.00**	◐QOU 215	**21.80**	QOU 315	**72.00**
15	QOU 115HM	**10.00**	.....	...	.....	...	.....	...
20	QOU 120	**10.00**	QOU 120K	**13.00**	◐QOU 220	**21.80**	QOU 320	**72.00**
20	QOU 120HM	**10.00**	.....	...	.....	...	.....	...
25	QOU 125	**10.00**	QOU 125K	**13.00**	◐QOU 225	**21.80**	QOU 325	**72.00**
30	QOU 130	**10.00**	QOU 130K	**13.00**	◐QOU 230	**21.80**	QOU 330	**72.00**
35	QOU 135	**10.00**	.....	...	◐QOU 235	**21.80**	QOU 335	**72.00**
40	QOU 140	**10.00**	.....	...	◐QOU 240	**21.80**	QOU 340	**72.00**
45	QOU 145	**10.00**	.....	...	◐QOU 245	**21.80**	QOU 345	**72.00**
50	QOU 150	**10.00**	.....	...	◐QOU 250	**21.80**	QOU 350	**72.00**
60	QOU 160	**10.00**	.....	...	◐QOU 260	**21.80**	Q1U 360	**72.00**
70	QOU 170	**19.40**	.....	...	QOU 270	**43.00**	Q1U 370	**86.00**
80	.....	...	.....	...	Q1U 280	**58.00**	Q1U 380	**99.00**
90	.....	...	.....	...	Q1U 290	**58.00**	Q1U 390	**99.00**
100	.....	...	.....	...	Q1U 2100	**58.00**	Q1U 3100	**99.00**
125	.....	...	.....	...	Q1U 2125	**113.00**	.....	...

◐UL Listed as HACR Type for use with air conditioning, heating and refrigerating equipment having motor group combinations.

10,000 AIC—125 AMPERE MAXIMUM 240 V. AC PERMANENT TRIP — Q1

15	●Q1L 115	**$33.00**	.....	...	Q1L 215	**$41.00**	Q1L 315	**$72.00**
20	●Q1L 120	**33.00**	.....	...	Q1L 220	**41.00**	Q1L 320	**72.00**
25	●Q1L 125	**33.00**	.....	...	Q1L 225	**41.00**	Q1L 325	**72.00**
30	●Q1L 130	**33.00**	.....	...	Q1L 230	**41.00**	Q1L 330	**72.00**
35	●Q1L 135	**33.00**	.....	...	Q1L 235	**41.00**	Q1L 335	**72.00**
40	●Q1L 140	**33.00**	.....	...	Q1L 240	**41.00**	Q1L 340	**72.00**
45	●Q1L 145	**33.00**	.....	...	Q1L 245	**41.00**	Q1L 345	**72.00**
50	●Q1L 150	**33.00**	.....	...	Q1L 250	**41.00**	Q1L 350	**72.00**
60	●Q1L 160	**33.00**	.....	...	Q1L 260	**41.00**	Q1L 360	**72.00**
70	●Q1L 170	**36.00**	.....	...	Q1L 270	**46.00**	Q1L 370	**86.00**
80	●Q1L 180	**42.00**	.....	...	Q1L 280	**58.00**	Q1L 380	**99.00**
90	●Q1L 190	**42.00**	.....	...	Q1L 290	**58.00**	Q1L 390	**99.00**
100	●Q1L 1100	**42.00**	.....	...	Q1L 2100	**58.00**	Q1L 3100	**99.00**
125	.....	...	.....	...	Q1L 2125	**113.00**	.....	...

●240V, ac

B1-1 DISCOUNT

5000 AIC—30 AMPERE MAXIMUM 277V. AC PERMANENT TRIP — QYU

Ampere Rating	Single Pole Catalog Number	Price	Two Pole—Switch Neutral Catalog Number	Price
15	*QYU-115	**$31.00**	*QYU-215-SWN	**$50.00**
20	*QYU-120	**31.00**	*QYU-220-SWN	**50.00**
25	*QYU-125	**31.00**	*QYU-225-SWN	**50.00**
30	*QYU-130	**31.00**	*QYU-230-SWN	**50.00**

*UL Component Recognized.

225 AMPERE MAXIMUM 240 V. AC PERMANENT TRIP — Q2

Ampere Rating	10,000 AIC Two Pole 120/240V. ac Cat. No.	Price	10,000 AIC Three Pole 240V. ac Cat. No.	Price	22,000 AIC †Two Pole 240V. ac Cat. No.	Price	22,000 AIC Three Pole 240V. ac Cat. No.	Price	42,000 AIC Two Pole 240V. ac Cat. No.	Price
100	Q2L 2100	**$120.**	Q2L 3100	**$316.**	Q2L 2100H	**$289.**	Q2L 3100H	**$451.**	Q2LH 2100	**$383.**
110	Q2L 2110	**120.**	Q2L 3110	**316.**	Q2L 2110H	**289.**	Q2L 3110H	**451.**	Q2LH 2110	**383.**
125	Q2L 2125	**120.**	Q2L 3125	**316.**	Q2L 2125H	**289.**	Q2L 3125H	**451.**	Q2LH 2125	**383.**
150	Q2L 2150	**120.**	Q2L 3150	**316.**	Q2L 2150H	**289.**	Q2L 3150H	**451.**	Q2LH 2150	**383.**
175	Q2L 2175	**120.**	Q2L 3175	**316.**	Q2L 2175H	**289.**	Q2L 3175H	**451.**	Q2LH 2175	**383.**
200	Q2L 2200	**120.**	Q2L 3200	**316.**	Q2L 2200H	**289.**	Q2L 3200H	**451.**	Q2LH 2200	**383.**
225	Q2L 2225	**120.**	Q2L 3225	**316.**	Q2L 2225H	**289.**	Q2L 3225H	**451.**	Q2LH 2225	**383.**

†2 Pole, Q2L-H rated 10,000 AIC, 240V., 3Ø, Grd. BØ.

400 AMPERE MAXIMUM 240 V. AC PERMANENT TRIP — Q4

250	.....	....	.....	....	Q4L 2250	**$762.**	Q4L 3250	**$922.**	.....	....
300	.....	....	.....	....	Q4L 2300	**762.**	Q4L 3300	**922.**	.....	....
350	.....	....	.....	....	Q4L 2350	**762.**	Q4L 3350	**922.**	.....	....
400	.....	....	.....	....	Q4L 2400	**762.**	Q4L 3400	**922.**	.....	....

B1-2 DISCOUNT

QOU & Q1U MOUNTING BRACKETS

Brackets for mounting QOU circuit breakers on Class 9080 mounting channels.

1 Pole **QU1** Price **$2.80**
2 Pole **QU2** Price **3.60**
3 Pole **QU3** Price **4.50**

QOU 1, 2, 3 POLE
Base or front mounting brackets packed with each breaker. Base mounting brackets for 6 QOU poles
Catalog Number: **QOU 6** Price: **$8.30**
Q1U, A1U 1, 2, 3 POLE
Front mounting bracket
Catalog Number: **1-UD** Price: **$2.80**

SHUNT TRIP
AUXILIARY SWITCH
ALARM SWITCH

For QO(U)(B) and Q1(U)(B)(L)—Select From Page 68

B1-1 DISCOUNT

TERMINAL LUG DATA

Breaker	Ampere Rating	Wire Size Conductors/Ø Aluminum/Copper
QOU QYU	10-70 15-30	1—#14-2 or 2—#14-6
Q1U	60-125	#4-2/0
Q1L	15-50 60-125	#14-4 #4-2/0
Q2L	100-225	#4-300MCM
Q4L	250-400	1—#1-600MCM or 2—#1/0-250MCM

VISI-TRIP is a Registered Trademark of Square D Company.

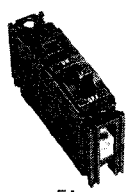
SQD SLV_000837

CIRCUIT BREAKERS — THERMAL MAGNETIC MOLDED CASE
UNIT BREAKER ONLY WITHOUT ENCLOSURES

Circuit Breakers are UL listed and CSA certified. They meet the requirements of Federal Specification W-C-375B/GEN as indicated on Page 56. For I-LINE circuit breakers, see listing on Pages 94 and 95.

FA 100 AMPERE FRAME—PERMANENT TRIP

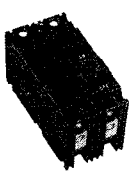
Ampere Rating	Single Pole 120V. ac, 125V. dc Catalog Number	Price	Two Pole 240V. ac, 250V. dc Catalog Number	Price	Three Pole 240V. ac Catalog Number	Price	Terminal Lug Wire Size
15	FAL 12015	$48.	FAL 22015	$ 81.	FAL 32015	$117.	#14-4 Cu or Al
20	FAL 12020	48.	FAL 22020	81.	FAL 32020	117.	
25	FAL 12025	48.	FAL 22025	81.	FAL 32025	117.	
30	FAL 12030	48.	FAL 22030	81.	FAL 32030	117.	
35	FAL 12035	48.	FAL 22035	81.	FAL 32035	117.	#14-1/0 Cu or Al
40	FAL 12040	48.	FAL 22040	81.	FAL 32040	117.	
45	FAL 12045	48.	FAL 22045	81.	FAL 32045	117.	
50	FAL 12050	48.	FAL 22050	81.	FAL 32050	117.	
60	FAL 12060	48.	FAL 22060	81.	FAL 32060	117.	
70	FAL 12070	64.	FAL 22070	129.	FAL 32070	169.	
80	FAL 12080	64.	FAL 22080	129.	FAL 32080	169.	
90	FAL 12090	64.	FAL 22090	129.	FAL 32090	169.	
100	FAL 12100	64.	FAL 22100	129.	FAL 32100	169.	



FA
Single Pole
15-100 Amperes

FA 100 AMPERE FRAME—PERMANENT TRIP

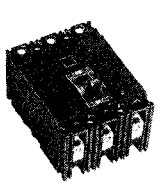
Ampere Rating	Single Pole 277V. ac, 125V. dc Catalog Number	Price	Two Pole 480V. ac, 250V. dc Catalog Number	Price	Three Pole 480V. ac Catalog Number	Price	Terminal Lug Wire Size
15	FAL 14015	$61.	FAL 24015	$147.	FAL 34015	$187.	#14-4 Cu or Al
20	FAL 14020	61.	FAL 24020	147.	FAL 34020	187.	
25	FAL 14025	61.	FAL 24025	147.	FAL 34025	187.	
30	FAL 14030	61.	FAL 24030	147.	FAL 34030	187.	
35	FAL 14035	61.	FAL 24035	147.	FAL 34035	187.	#14-1/0 Cu or Al
40	FAL 14040	61.	FAL 24040	147.	FAL 34040	187.	
45	FAL 14045	61.	FAL 24045	147.	FAL 34045	187.	
50	FAL 14050	61.	FAL 24050	147.	FAL 34050	187.	
60	FAL 14060	61.	FAL 24060	147.	FAL 34060	187.	
70	FAL 14070	75.	FAL 24070	189.	FAL 34070	222.	
80	FAL 14080	75.	FAL 24080	189.	FAL 34080	222.	
90	FAL 14090	75.	FAL 24090	189.	FAL 34090	222.	
100	FAL 14100	75.	FAL 24100	189.	FAL 34100	222.	



FA
Two Pole
15-100 Amperes

FA 100 AMPERE FRAME—PERMANENT TRIP

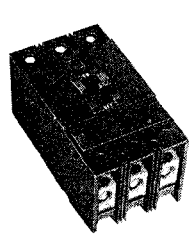
Ampere Rating	Single Pole Catalog Number	Price	Two Pole 600V. ac, 250V. dc Catalog Number	Price	Three Pole 600V. ac Catalog Number	Price	Terminal Lug Wire Size
15	.....	..	FAL 26015	$169.	FAL 36015	$218.	#14-4 Cu or Al
20	.....	..	FAL 26020	169.	FAL 36020	218.	
25	.....	..	FAL 26025	169.	FAL 36025	218.	
30	.....	..	FAL 26030	169.	FAL 36030	218.	
35	.....	..	FAL 26035	169.	FAL 36035	218.	#14-1/0 Cu or Al
40	.....	..	FAL 26040	169.	FAL 36040	218.	
45	.....	..	FAL 26045	169.	FAL 36045	218.	
50	.....	..	FAL 26050	169.	FAL 36050	218.	
60	.....	..	FAL 26060	169.	FAL 36060	218.	
70	.....	..	FAL 26070	215.	FAL 36070	267.	
80	.....	..	FAL 26080	215.	FAL 36080	267.	
90	.....	..	FAL 26090	215.	FAL 36090	267.	
100	.....	..	FAL 26100	215.	FAL 36100	267.	



FA
Three Pole
15-100 Amperes

KA 225 AMPERE FRAME—600V. AC, 250V. DC PERMANENT TRIP

Ampere Rating	AC Magnetic Trip Settings Amperes Low	High	Two Pole Catalog No.	Price	Three Pole Catalog No.	Price	Terminal Lug Wire Size
70	350	700	KAL 26070	$499.	KAL 36070	$625.	one #4-300 MCM Cu or Al
80	400	800	KAL 26080	499.	KAL 36080	625.	
90	450	900	KAL 26090	499.	KAL 36090	625.	
100	500	1000	KAL 26100	499.	KAL 36100	625.	
110	550	1100	KAL 26110	499.	KAL 36110	625.	
125	625	1250	KAL 26125	499.	KAL 36125	625.	
150	750	1500	KAL 26150	499.	KAL 36150	625.	
175	875	1750	KAL 26175	499.	KAL 36175	625.	
200	1000	2000	KAL 26200	499.	KAL 36200	625.	
225	1125	2250	KAL 26225	499.	KAL 36225	625.	

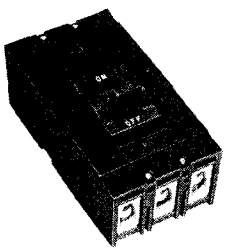


KA
70-225 Amperes

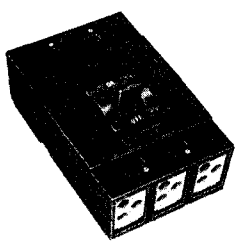
I-LINE is a Registered Trademark of Square D Company.

SQD SLV_000838

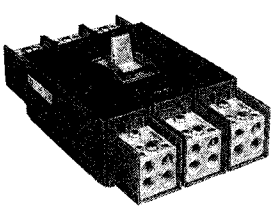
THERMAL MAGNETIC MOLDED CASE CIRCUIT BREAKERS
UNIT BREAKER ONLY WITHOUT ENCLOSURES



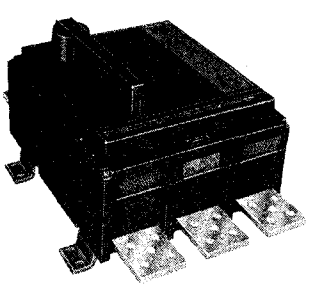
LA
125-400 Amperes



MA
125-1000 Amperes



NA
600-1200 Amperes



PA
600-2000 Amperes

Ampere Rating	AC Magnetic Trip Settings Amperes Low	AC Magnetic Trip Settings Amperes High	Two Pole Catalog No.	Two Pole Price	Three Pole Catalog No.	Three Pole Price	Terminal Lug Wire Size
400 AMPERE FRAME—600V. AC, 250V. DC PERMANENT TRIP							**LA**
125	625	1250	LAL 26125	**$915.**	LAL 36125	**$1110.**	
150	750	1500	LAL 26150	**915.**	LAL 36150	**1110.**	
175	875	1750	LAL 26175	**915.**	LAL 36175	**1110.**	
200	1000	2000	LAL 26200	**915.**	LAL 36200	**1110.**	one #1-600 MCM or two #1/0-250 MCM Cu or Al
225	1125	2250	LAL 26225	**915.**	LAL 36225	**1110.**	
250	1250	2500	LAL 26250	**915.**	LAL 36250	**1110.**	
300	1500	3000	LAL 26300	**915.**	LAL 36300	**1110.**	
350	1750	3500	LAL 26350	**915.**	LAL 36350	**1110.**	
400	2000	4000	LAL 26400	**915.**	LAL 36400	**1110.**	
1000 AMPERE FRAME—600V. AC, 250V. DC PERMANENT TRIP							**MA**
125	625	1250	MAL 26125	**$1433.**	MAL 36125	**$1818.**	
150	750	1500	MAL 26150	**1433.**	MAL 36150	**1818.**	
175	875	1750	MAL 26175	**1433.**	MAL 26175	**1818.**	
200	1000	2000	MAL 26200	**1433.**	MAL 36200	**1818.**	one #1-600 MCM or two #1/0-250 MCM Cu or Al
225	1125	2250	MAL 26225	**1433.**	MAL 36225	**1818.**	
250	1250	2500	MAL 26250	**1433.**	MAL 36250	**1818.**	
300	1500	3000	MAL 26300	**1433.**	MAL 36300	**1818.**	
350	1750	3500	MAL 26350	**1433.**	MAL 36350	**1818.**	
400	2000	4000	MAL 26400	**1433.**	MAL 35400	**1818.**	
450	2250	4500	MAL 26450	**1433.**	MAL 36450	**1818.**	
500	2500	5000	MAL 26500	**1433.**	MAL 36500	**1818.**	
600	3000	6000	MAL 26600	**1433.**	MAL 36600	**1818.**	
700	3500	7000	MAL 26700	**1856.**	MAL 36700	**2387.**	three #3/0-500 MCM Al or Cu
800	4000	8000	MAL 26800	**1856.**	MAL 36800	**2387.**	
900	4500	9000	MAL 26900	**2648.**	MAL 36900	**3055.**	
1000	5000	10000	MAL 261000	**2648.**	MAL 361000	**3055.**	
1200 AMPERE FRAME—480V. AC PERMANENT TRIP							**NA**
600	2000	10000	NHL 26600	**$2594.**	NHL 36600	**$2968.**	
700	2000	10000	NHL 26700	**2594.**	NHL 36700	**2968.**	
800	2000	10000	NHL 26800	**2594.**	NHL 36800	**2968.**	four 350-750 MCM Cu or Al
1000	2000	10000	NHL 261000	**3139.**	NHL 361000	**3516.**	
1200	2000	10000	NHL 261200	**3742.**	NHL 361200	**4146.**	
2000 AMPERE FRAME—600V. AC WITH RATING COLUMNS (Rating columns to change trip setting are available)							**PA**
600	2000	8000	PAF 26600	**$4180.**	PAF 36600	**$5379.**	
700	1500	6500	PAF 26700	**4180.**	PAF 36700	**5379.**	
800	1500	6500	PAF 26800	**4180.**	PAF 36800	**5379.**	
1000	2000	6000	PAF 261000	**4180.**	PAF 361000	**5379.**	Price does not include required terminal pads and lugs. See page 70 for catalog numbers and price.
1200	2000	6000	PAF 261200	**4180.**	PAF 361200	**5379.**	
1400	2500	7500	PAF 261400	**4180.**	PAF 361400	**5379.**	
1600	3000	8000	PAF 261600	**4180.**	PAF 361600	**5379.**	
1800	4500	9000	PAF 261800	**4180.**	PAF 361800	**5379.**	
2000	6000	10000	PAF 262000	**4180.**	PAF 362000	**5379.**	
2500 AMPERE FRAME—600V. AC WITH RATING COLUMNS (Rating columns to change trip setting are available)							**PC**
1600	6000	12000	PCF 261600	**$7641.**	PCF 361600	**$9470.**	
1800	6000	12000	PCF 261800	**7641.**	PCF 361800	**9470.**	Price does not include lugs. See page 70 for catalog numbers and price.
2000	6000	12000	PCF 262000	**7641.**	PCF 362000	**9470.**	
2500	8000	14000	PCF 262500	**7641.**	PCF 362500	**9470.**	

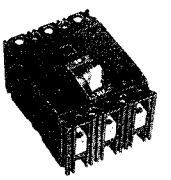
SQD SLV_000839

CIRCUIT BREAKERS — THERMAL MAGNETIC MOLDED CASE
UNIT BREAKER ONLY WITHOUT ENCLOSURES

I-75,000 HIGH INTERRUPTING RATING

FH **100 AMPERE FRAME—PERMANENT TRIP**

Ampere Rating	Single Pole 277V. ac, 125V. dc		Two Pole 600V. ac, 250V. dc		Three Pole 600V. ac		Terminal Lug Wire Size
	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price	
15	FHL 16015	$108.	FHL 26015	$280.	FHL 36015	$326.	#14-4 Cu or Al
20	FHL 16020	108.	FHL 26020	280.	FHL 36020	326.	
25	FHL 16025	108.	FHL 26025	280.	FHL 36025	326.	
30	FHL 16030	108.	FHL 26030	280.	FHL 36030	326.	
35	FHL 16035	108.	FHL 26035	280.	FHL 36035	326.	
40	FHL 16040	108.	FHL 26040	280.	FHL 36040	326.	#14-1/0 Cu or Al
45	FHL 16045	108.	FHL 26045	280.	FHL 36045	326.	
50	FHL 16050	108.	FHL 26050	280.	FHL 36050	326.	
60	FHL 16060	108.	FHL 26060	280.	FHL 36060	326.	
70	FHL 16070	123.	FHL 26070	324.	FHL 36070	371.	
80	FHL 16080	123.	FHL 26080	324.	FHL 36080	371.	
90	FHL 16090	123.	FHL 26090	324.	FHL 36090	371.	
100	FHL 16100	123.	FHL 26100	324.	FHL 36100	371.	

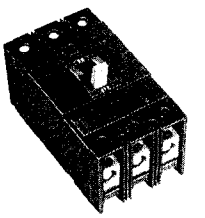


FH
15-100 Amperes

Ampere Rating	AC Magnetic Trip Settings Amperes		Two Pole		Three Pole		Terminal Lug Wire Size
	Low	High	Catalog No.	Price	Catalog No.	Price	

KH **225 AMPERE FRAME—600V. AC, 250V. DC PERMANENT TRIP**

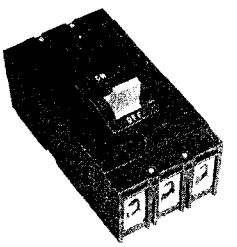
70	350	700	KHL 26070	$1163.	KHL 36070	$1406.	one #4-300 MCM Cu or Al
80	400	800	KHL 25080	1163.	KHL 35080	1406.	
90	450	900	KHL 26090	1163.	KHL 36090	1406.	
100	500	1000	KHL 26100	1163.	KHL 36100	1406.	
110	550	1100	KHL 26110	1163.	KHL 36110	1406.	
125	625	1250	KHL 26125	1163.	KHL 36125	1406.	
150	750	1500	KHL 26150	1163.	KHL 26150	1406.	
175	875	1750	KHL 26175	1163.	KHL 36175	1406.	
200	1000	2000	KHL 26200	1163.	KHL 36200	1406.	
225	1125	2250	KHL 26225	1163.	KHL 36225	1406.	



KH
70-225 Amperes

LH **400 AMPERE FRAME—600V. AC, 250V. DC PERMANENT TRIP**

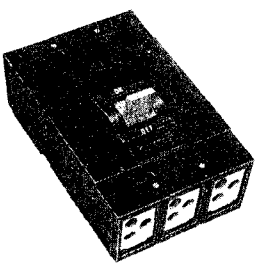
125	625	1250	LHL 26125	$1530.	LHL 36125	$1827.	one #1-600 MCM or two #1/0-250 MCM Cu or Al
150	750	1500	LHL 26150	1530.	LHL 36150	1827.	
175	875	1750	LHL 26175	1530.	LHL 36175	1827.	
200	1000	2000	LHL 26200	1530.	LHL 36200	1827.	
225	1125	2250	LHL 26225	1530.	LHL 36225	1827.	
250	1250	2500	LHL 26250	1530.	LHL 36250	1827.	
300	1500	3000	LHL 26300	1530.	LHL 36300	1827.	
350	1750	3500	LHL 26350	1530.	LHL 36350	1827.	
400	2000	4000	LHL 26400	1530.	LHL 36400	1827.	



LH
25-400 Amperes

MH **1000 AMPERE FRAME—600V. AC, 250V. DC PERMANENT TRIP**

125	625	1250	MHL 26125	$1882.	MHL 36125	$2273.	one #1-600 MCM or two #1/0-250 MCM Cu or Al
150	750	1500	MHL 26150	1882.	MHL 36150	2273.	
175	875	1750	MHL 26175	1882.	MHL 36175	2273.	
200	1000	2000	MHL 26200	1882.	MHL 36200	2273.	
225	1125	2250	MHL 26225	1882.	MHL 36225	2273.	
250	1250	2500	MHL 26250	1882.	MHL 36250	2273.	
300	1500	3000	MHL 26300	1882.	MHL 36300	2273.	
350	1750	3500	MHL 26350	1882.	MHL 36350	2273.	
400	2000	4000	MHL 26400	1882.	MHL 36400	2273.	
450	2250	4500	MHL 26450	1882.	MHL 36450	2273.	three #3/0-500 MCM Cu or Al
500	2500	5000	MHL 26500	1882.	MHL 36500	2273.	
600	3000	6000	MHL 26600	1882.	MHL 36600	2273.	
700	3500	7000	MHL 26700	2321.	MHL 36700	2857.	
800	4000	8000	MHL 26800	2321.	MHL 36800	2857.	
900	4500	9000	MHL 26900	2935.	MHL 36900	3384.	
1000	5000	10000	MHL 261000	2935.	MHL 361000	3384.	

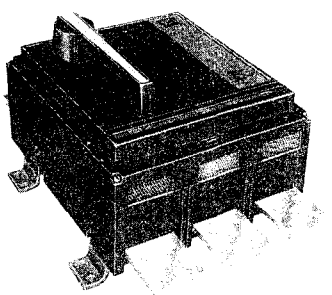


MH
125-1000 Amperes

NH **1200 AMPERE FRAME—480V. AC PERMANENT TRIP** See page 61 for complete listing.

PH **2000 AMPERE FRAME—600V. AC WITH RATING COLUMNS**
(Rating columns to change trip setting are available)

600	2000	8000	PHF 26600	$4506.	PHF 36600	$5763.	Price does not include required terminal pads and lugs. See page 70 for catalog numbers and price.
700	1500	8500	PHF 26700	4506.	PHF 36700	5763.	
800	1500	6500	PHF 26800	4506.	PHF 36800	5763.	
1000	2000	6000	PHF 261000	4506.	PHF 361000	5763.	
1200	2000	6000	PHF 261200	4506.	PHF 361200	5763.	
1400	2500	7500	PHF 261400	4506.	PHF 361400	5763.	
1600	3000	8000	PHF 261600	4506.	PHF 361600	5763.	
1800	4500	9000	PHF 261800	4783.	PHF 361800	5945.	
2000	6000	10000	PHF 262000	4783.	PHF 362000	5945.	



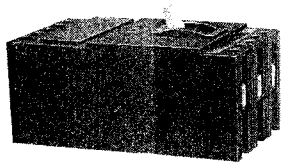
PH
600-2000 Amperes

SQD SLV_000840

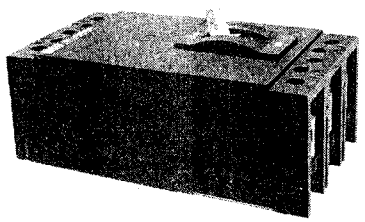
I-LIMITER®

Current Limiting Circuit Breakers

- UL LISTED 100,000 ampere rms symmetrical interrupting rating at 240 or 480 volts ac.
- No fuses to replace - resets same as a conventional circuit breaker.
- Main breaker application allows the use of standard Square D 10,000 AIC minimum branch circuit breakers on systems capable of delivering fault currents up to 100,000 rms symmetrical amperes.
- Meets Federal Specification W-C-375B/GEN.
- Push-to-trip—Al/Cu lugs—Mounts in any position.



IFL
15-100 amperes
Lugs both ends

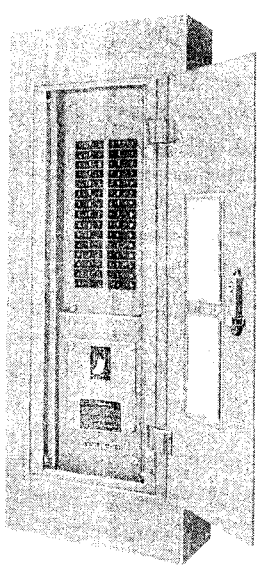


IKL
110-225 amperes
Lugs both ends

Ampere Rating	AC Magnetic Trip Settings Amperes		Two Pole		Three Pole		Terminal Lug Wire Size
	Low	High	Catalog No.	Price	Catalog No.	Price	
IF	**100 AMPERE FRAME—480 V. AC PERMANENT TRIP**						
15	...	...	IFL 24015	**$802.**	IFL 34015	**$967.**	#14-4 Cu or Al
20	...	...	IFL 24020	**802.**	IFL 34020	**967.**	
30	...	...	IFL 24030	**802.**	IFL 34030	**967.**	
40	...	...	IFL 24040	**802.**	IFL 34040	**967.**	#14-1/0 Cu or Al
50	...	...	IFL 24050	**802.**	IFL 34050	**967.**	
60	...	...	IFL 24060	**802.**	IFL 34060	**967.**	
70	...	...	IFL 24070	**802.**	IFL 34070	**967.**	
90	...	...	IFL 24090	**802.**	IFL 34090	**967.**	
100	...	...	IFL 24100	**802.**	IFL 34100	**967.**	
IK	**225 AMPERE FRAME—480 V. AC PERMANENT TRIP**						
110	550	1100	IKL 24110	**$1494.**	IKL 34110	**$1874.**	one #4-300 MCM Cu or Al.
125	625	1250	IKL 24125	**1494.**	IKL 34125	**1874.**	
150	750	1500	IKL 24150	**1494.**	IKL 34150	**1874.**	
175	875	1750	IKL 24175	**1494.**	IKL 34175	**1874.**	
200	1000	2000	IKL 24200	**1494.**	IKL 34200	**1874.**	
225	1000	2000	IKL 24225	**1494.**	IKL 34225	**1874.**	

For I-Line Panelboard or Switchboard Mounting see page 95.

B1-2 DISCOUNT



PANELBOARDS WITH I-LIMITER MAIN BREAKERS

Square D NQO/NQOB, NEHB or NH1B panelboards with I-LIMITER main breakers are competitively priced, thereby providing economic, as well as protective advantages. Due to the current limiting ability of the I-LIMITER main breaker, standard 10,000 AIC minimum branch breakers may be used on systems capable of delivering up to 100,000 rms symmetrical amperes. The result is a panelboard UL LISTED for the combination 100,000/10,000 amperes, series connected interrupting rating. With the I-LIMITER as the main breaker, the expense of replacing fuses or fuse-type current limiters in integrally fused circuit breakers is eliminated. The following example is typical:

Cost Comparison—Factory Assembled NQOB panelboards (from page 87)

with high interrupting capacity main and branches.		with I-LIMITER main and standard branches	
65,000 AIC	List Price	100,000 AIC	List Price
FH Main — 100A.	**$ 604.**	IF Main - 100A.	**$1222.**
Solid Neutral	**36.**	Solid Neutral	**36.**
(30) QHB-120	**1140.**	(30) QOB-120	**510.**
G2 Discount	**Total $1780.**	**G2 Discount**	**Total $1768.**

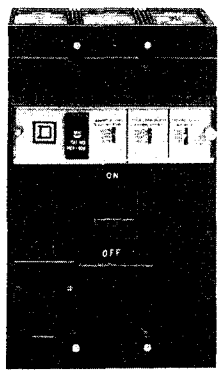
I-LINE is a Registered Trademark of Square D Company

SOLID STATE TRIP CIRCUIT BREAKERS

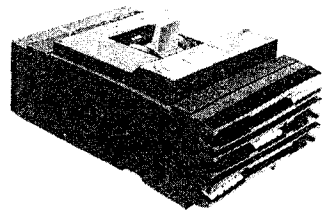
NEW ME CIRCUIT BREAKER JOINS SOLID STATE TRIP FAMILY

- Ampere setting provides adjustment of current carrying capacity to 70%, 80%, 90% and 100% of rating plug.
- Short time delay trip pickup point may be set at 2x, 4x, 6x or 8x ampere setting of the ME circuit breaker.
- Integral 3 phase, 3 wire equipment ground fault protection — 3 phase, 4 wire systems require only the addition of an external neutral CT. Ground fault current trip point at 40% of rating plug — time delay selection at .1, .2, .3 or .5 seconds for system coordination, plus ground fault trip indicator.
- Instantaneous operation at 9x ampere setting.
- UL Listed Interrupting Ratings:

  ME—65,000 A. RMS symmetrical at 240V. ac, 35,000 A. RMS symmetrical at 480V. ac, 25,000 A. RMS symmetrical at 600V. ac.



MEL



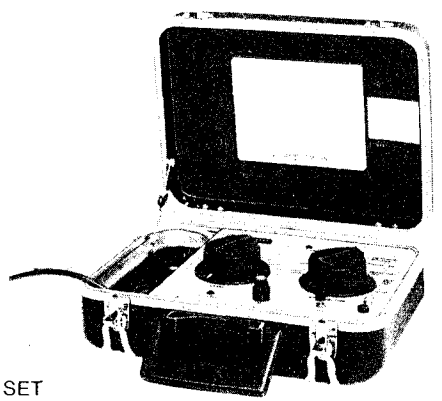
ME circuit breakers for mounting in I-LINE panelboards and switchboards are listed on page 95.



RATING PLUG

ME **SOLID STATE TRIP CIRCUIT BREAKER—600V. ac - WITH LUGS**
Standard Rated Breaker

Ampere Rating	Unit Breaker - Frame Only				Rating Plug		Terminal Lug Wire Size
	Two Pole		Three Pole		One Required		
	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	
Without Ground Fault Protection							
225 AMPERE FRAME							
125 150 175 200 225	MEL2-26	**$1485.**	MEL2-36	**$1791.**	ME2-125 ME2-150 ME2-175 ME2-200 ME2-225	**122.** **122.** **122.** **122.** **122.**	One #4-300 MCM Cu or Al
400 AMPERE FRAME							
250 300 350 400	MEL4-26	**1485.**	MEL4-36	**1791.**	ME4-250 ME4-300 ME4-350 ME4-400	**122.** **122.** **122.** **122.**	Three #3/0-500 MCM Cu or Al wire
800 AMPERE FRAME							
400 450 500 600 700 800	MEL8-26	**2197.**	MEL8-36	**2734.**	ME8-400 ME8-450 ME8-500 ME8-600 ME8-700 ME8-800	**122.** **122.** **122.** **122.** **122.** **122.**	Three #3/0-500 MCM Cu or Al wire
With Integral Ground Fault Equipment Protection (includes neutral CT for 3Ø 4W application)							
225 AMPERE FRAME							
125 150 175 200 225	MEL2-26G	**$2393.**	MEL2-36G	**$2699.**	ME2-125 ME2-150 ME2-175 ME2-200 ME2-225	**122.** **122.** **122.** **122.** **122.**	One #4-300 MCM Cu or Al
400 AMPERE FRAME							
250 300 350 400	MEL4-26G	**2393.**	MEL4-36G	**2699.**	ME4-250 ME4-300 ME4-350 ME4-400	**122.** **122.** **122.** **122.**	Three #3/0-500 MCM Cu or Al wire
800 AMPERE FRAME							
400 450 500 600 700 800	MEL8-26G	**3105.**	MEL8-36G	**3642.**	ME8-400 ME8-450 ME8-500 ME8-600 ME8-700 ME8-800	**122.** **122.** **122.** **122.** **122.** **122.**	Three #3/0-500 MCM Cu or Al wire



TEST SET

A lightweight, portable test set for ME and PE solid state trip circuit breakers permits field verification of electronic function and operation of the trip mechanism. The test set requires 120V. ac, 60 Hz. power and permits testing of the following.

Long Time Delay Pickup
Short Time Delay Pickup
Ground Fault Pickup
Instantaneous Trip
Trip Solenoid Operation
Rating Plug Calibration

Catalog Number CBT-78 ..... **$1200.**

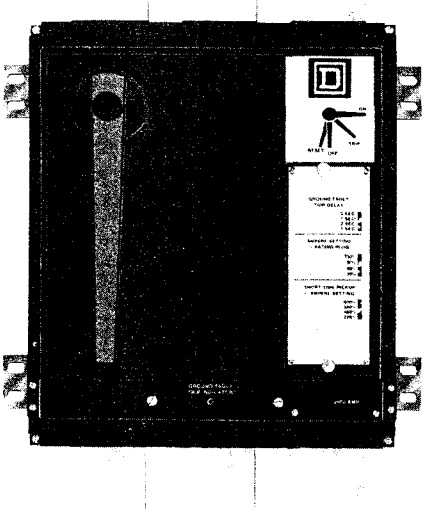


MONITOR PANEL

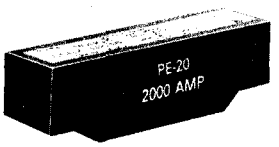
Monitor Panel GP-MP1 (See listing Page 92) is UL Listed for use with ME and PE Circuit Breakers with integral ground fault equipment protection to provide performance testing capability per NEC 230-95(C).

SQD SLV_000842

SOLID STATE TRIP CIRCUIT BREAKERS



PE



RATING PLUG

- Ampere setting provides adjustment of current carrying capacity to 70%, 80%, 90% and 100% of rating plug.
- Short time delay trip pickup point may be set at 2x, 4x, 5x or 6x ampere setting of the PE circuit breaker.
- Integral 3 phase, 3 wire equipment ground fault protection — 3 phase, 4 wire systems require only the addition of an external neutral CT (included with the breaker). Ground fault current trip point at 40% of rating plug — time delay selection at .1, .2, .3 or .5 seconds for system coordination, plus ground fault trip indicator.
- Instantaneous operation at 9x ampere setting.
- UL Listed Interrupting Ratings:

  PE—125,000 A. RMS symmetrical at 240V. ac, 85,000 A. RMS symmetrical at 480V. ac, 65,000 A. RMS symmetrical at 600V. ac.

PE **SOLID STATE TRIP CIRCUIT BREAKER—600 V. ac - WITHOUT LUGS ****

Ampere Rating	Standard Rated Breaker - Frame Only				100% Rated Breaker - Frame Only				Rating Plug		Ampere Rating
	Two Pole		Three Pole		Two Pole		Three Pole		One Required		
	Cat. No.	Price	Cat. No.	Price	Cat No.	Price	Cat No.	Price	Cat. No.	Price	
Without Ground Fault Protection											
1200 AMPERE FRAME											
600 700 800 1000 1200	PEF12-26	**$3868.**	PEF12-36	**$4219.**	PEC12-26	**$4383.**	PEC12-36	**$5642.**	PE12-0600 PE12-0700 PE12-0800 PE12-1000 PE12-1200	**$122.** **122.** **122.** **122.** **122.**	600 700 800 1000 1200
1600 AMPERE FRAME											
1000 1200 1400 1600	PEF16-26	**4383.**	PEF16-36	**5642.**	PEC16-26	**4661.**	PEC16-36	**5824.**	PE16-1000 PE16-1200 PE16-1400 PE16-1600	**122.** **122.** **122.** **122.**	1000 1200 1400 1600
2000 AMPERE FRAME											
1000 1200 1400 1600 1800 2000	PEF20-26	**4661.**	PEF20-36	**5824.**	PEC20-26	**5594.**	PEC20-36	**6990.**	PE16-1000 PE16-1200 PE16-1400 PE16-1600 PE20-1800 PE20-2000	**122.** **122.** **122.** **122.** **122.** **122.**	1000 1200 1400 1600 1800 2000
With Integral Ground Fault Equipment Protection (includes neutral CT for 3∅ 4W application)											
1200 AMPERE FRAME											
600 700 800 1000 1200	PEF12-26G	**$4786.**	PEF12-36G	**$5137.**	PEC12-26G	**$5301.**	PEC12-36G	**$6560.**	PE12-0600 PE12-0700 PE12-0800 PE12-1000 PE12-1200	**$122.** **122.** **122.** **122.** **122.**	600 700 800 1000 1200
1600 AMPERE FRAME											
1000 1200 1400 1600	PEF16-26G	**5376.**	PEF16-36G	**6635.**	PEC16-26G	**5654.**	PEC16-36G	**6817.**	PE16-1000 PE16-1200 PE16-1400 PE16-1600	**122.** **122.** **122.** **122.**	1000 1200 1400 1600
2000 AMPERE FRAME											
1000 1200 1400 1600 1800 2000	PEF20-26G	**5654.**	PEF20-36G	**6817.**	PEC20-26G	**6587.**	PEC20-36G	**7983.**	PE16-1000 PE16-1200 PE16-1400 PE16-1600 PE20-1800 PE20-2000	**122.** **122.** **122.** **122.** **122.** **122.**	1000 1200 1400 1600 1800 2000

**Complete breaker requires frame, rating plug and necessary terminations. Refer to page 70 for information on available terminations.

SQD SLV_000843

Mag-Gard® CIRCUIT BREAKER — MOTOR CIRCUIT PROTECTOR

Instantaneous trip magnetic only circuit breakers have a single adjustment which simultaneously sets the magnetic trip level of each individual pole. In combination with motor starters, these UL recognized components provide motor circuit protection to comply with NEC requirements. Their current interrupting ratings are established in combination with motor starters.

Mag-Gard circuit breakers with properly selected trip ranges provide short circuit protection of portable cables and cords in compliance with the Federal Register for mining applications. All Mag-Gard circuit breakers are provided with the same lugs as equivalent thermal magnetic circuit breakers.

3-2000 AMPERES — **PERMANENT TRIP** — **600 V. AC, 60 Hz△**

Ampere Rating	Adjustable Trip Range Amperes	Two Pole† Catalog Number	Two Pole† Price	Three Pole Catalog Number	Three Pole Price
FA 3	8-22	FAL 26003-11M•	$169.	FAL 36003-11M	$218.
FA 7	18-58	FAL 26007-12M•	169.	FAL 36007-12M	218.
FA 15	50-150	FAL 26015-13M•	169.	FAL 36015-13M	218.
FA 30	50-150	FAL 26030-13M•	169.	FAL 36030-13M•	218.
30	100-300	FAL 26030-15M•	169.	FAL 36030-15M	218.
FA 50	75-225	FAL 26050-14M•	169.	FAL 36050-14M•	218.
50	150-480	FAL 26050-16M•	169.	FAL 36050-16M	218.
100	150-480	FAL 26100-16M•	215.	FAL 36100-16M•	267.
100	330-1200	FAL 26100-18M•	215.	FAL 36100-18M	267.
KA 150	750-1500	KAL 26150-26M	262.	KAL 36150-26M	326.
KA 225	350-1000	KAL 26225-19M•	499.	KAL 36225-19M•	625.
	500-1000	KAL 26225-22M•	499.	KAL 36225-22M•	625.
	625-1250	KAL 26225-25M	499.	KAL 36225-25M	625.
	750-1500	KAL 26225-26M	499.	KAL 36225-26M	625.
	875-1750	KAL 26225-29M	499.	KAL 36225-29M	625.
	1000-2000	KAL 26225-30M	499.	KAL 36225-30M	625.
	1125-2250	KAL 26225-31M	499.	KAL 36225-31M	625.
LA 400	500-1000	LAL 26400-22M	915.	LAL 36400-22M	1110.
	750-1600	LAL 26400-28M	915.	LAL 36400-28M	1110.
	1000-2000	LAL 26400-30M	915.	LAL 36400-30M	1110.
	1125-2250	LAL 26400-31M	915.	LAL 36400-31M	1110.
	1250-2500	LAL 26400-32M	915.	LAL 36400-32M	1110.
	1500-3000	LAL 26400-33M	915.	LAL 36400-33M	1110.
	1750-3500	LAL 26400-35M	915.	LAL 36400-35M	1110.
	2000-4000	LAL 26400-36M	915.	LAL 36400-36M	1110.

Ampere Rating	Adjustable Trip Range Amperes	Suffix	Two Pole† Catalog Number		Price	Three Pole Catalog Number		Price
MA *								
MA 600			MAL 26600-	Add	$1433.	MAL 36600-	Add	$1818.
MA 800			MAL 26800-	Suffix	1856.	MAL 36800-	Suffix	2387.
MA 1000			MAL 261000-		2648.	MAL 361000-		3055.
	625-1250•	25M						
	750-1500•	26M						
	1000-2000•	30M						
	1500-3000•	33M						
	2000-4000•	36M						
	2500-5000	40M						
	3000-6000	42M						
	3500-7000	44M						
	4000-8000	45M						
	4500-9000	46M						
	5000-10000	47M						
NA 1000	2000-8000•		NHL 261000-38M		3139.	NHL 361000-38M		3516.
NA 1200	2000-8000•		NHL 261200-38M		3742.	NHL 361200-38M		4146.
PA *								
PA 1600			PAF 261600-	Add	4180.	PAF 361600-	Add	5379.
PA 2000			PAF 262000-	Suffix	4180.	PAF 362000-	Suffix	5379.
	1500-6500•	34M						
	3000-8000•	43M						
	6000-10000•	48M						

†Two pole breakers require same mounting space as three pole breakers.
•No UL component recognition.
*Each ampere rating can be ordered with any designated trip range for the frame by adding the proper suffix to catalog numbers.
△250 V. dc circuit breakers are available. Consult factory for trip range. No UL component recognition.

MOLDED CASE SWITCHES

Molded case switches contain no overcurrent protection. Molded case switches open when the handle is switched to the OFF position or in response to an auxiliary tripping device such as a shunt trip. Automatic molded case switches also open instantaneously at a factory preset magnetic trip point calibrated to protect only the molded case switch itself when it is subjected to high fault currents. The trip point is nonadjustable and provides no overload or low level fault protection. Separate short circuit and overload protection must be provided on systems where molded case switches are used.

Circuit breaker accessories such as shunt trip, auxiliary switches and undervoltage trips may be provided in either standard or automatic molded case switches, with the exception of QO, Q1 and Q2.

Standard and automatic molded case switches are UL listed and CSA certified.

240 V. ac Max. Standard Molded Case Switches

UNIT MOUNTING—MOUNTING BRACKETS PROVIDED

Ampere Rating	Two Pole Catalog Number	Two Pole Price	Three Pole Catalog Number	Three Pole Price
60	QOU 200	$21.80	QOU 300	$72.00
100	Q1U 2000	58.00	Q1U 3000	99.00
125	Q1U 20001	113.00	.....	....

UNIT MOUNTING

Ampere Rating	Two Pole Catalog Number	Two Pole Price	Three Pole Catalog Number	Three Pole Price
100	Q1L 2000	$ 58.00	Q1L 3000	$ 99.00
125	Q1L 20001	113.00	.....	....
225	Q2L 2000	97.00	Q2L 3000	287.00
400	Q4L 2000	582.00	Q4L 3000	742.00

600 V. ac Max. Molded Case Switches

Ampere Rating	Standard Two Pole Catalog Number	Standard Two Pole Price	Standard Three Pole Catalog Number	Standard Three Pole Price	Automatic Two Pole Catalog Number	Automatic Two Pole Price	Automatic Three Pole Catalog Number	Automatic Three Pole Price	I-75000 Automatic Two Pole Catalog Number	I-75000 Automatic Two Pole Price	I-75000 Automatic Three Pole Catalog Number	I-75000 Automatic Three Pole Price
240 V. ac												
100	FAL 22000	$ 81.	FAL 32000	$117.	.....	....	.....	....	.....	....	.....	....
480 V. ac												
100	FAL 24000	$133.	FAL 34000	$174.	FAL 24000M	$147.	FAL 34000M	$192.	.....	....	.....	....
1200	NAL 260000	1748.	NAL 360000	2115.	.....	....	.....	....	NHL 260000M	$2287.	NHL 360000M	$2696.
600 V. ac												
100	FAL 26000	$169.	FAL 36000	$218.	FAL 26000M	$186.	FAL 36000M	$240.	FHL 26000M	$ 280.	FHL 36000M	$ 326.
225	KAL 26000	398.	KAL 36000	499.	KAL 26000M	439.	KAL 36000M	549.	KHL 26000M	1104.	KHL 36000M	1330.
400	LAL 26000	786.	LAL 36000	947.	LAL 26000M	864.	LAL 36000M	1041.	LHL 26000M	1401.	LHL 36000M	1759.
800	MAL 260008	1095.	MAL 360008	1393.	MAL 260008M	1206.	MAL 360008M	1531.	MHL 260008M	1669.	MHL 360008M	2001.
1000	MAL 26000	1632.	MAL 36000	2030.	MAL 26000M	1795.	MAL 36000M	2233.	MHL 26000M	2082.	MHL 36000M	2563.
2000	PAF 260000	3461.	PAF 360000	4277.	PAF 260000M	3807.	PAF 360000M	4704.	PHF 260000M	4065.	PHF 360000M	4844.
2500	PCF 260000	5507.	PCF 360000	6806.	.....	....	.....	....	PCF 260000M	6056.	PCF 360000M	7486.

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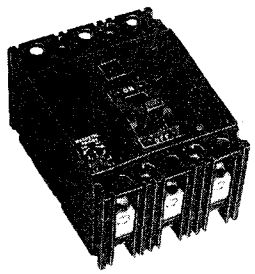
SQD SLV_000844

SELECTION TABLE
FOR Mag-Gard ADJUSTABLE INSTANTANEOUS TRIP CIRCUIT BREAKERS
FOR SINGLE MOTOR CIRCUIT PROTECTION

Based on 1981 NEC Article 430-52 and Table 430-150.
See Page 66 for a complete listing of Square D Adjustable Instantaneous Trip Motor Circuit Protectors.



Adjustable instantaneous trip circuit breakers are intended for use in combination with motor starters with overload relays for the protection of motor circuits from short circuits. Other specific applications include rectifiers and resistance welders. These C/B's contain a magnetic trip element in each pole with the trip point adjustable from the front. Interrupting ratings are determined by testing the instantaneous trip C/B in combination with a contactor and overload relay.

Select instantaneous trip C/B's as follows:

1. This selection table is suitable for motors with Locked-Rotor Indicating Code Letters per 1981 NEC Table 430-7 (b) as follows:

Horsepower	Motor Code Letters
½ or less	A-L
¾ to 1½	A-K
2 to 3	A-J
5 to 25	A-H
30 to 125	A-G
150 or more	A-F

For other motors order a special thermal trip circuit breaker with magnetic trip settings for the specific motor—specify motor horsepower, voltage, frequency, full load current and code letter or locked rotor current.

2. Determine motor HP rating from the motor nameplate.
3. Refer to the table at right and select an instantaneous trip C/B with an ampere rating recommended for the HP and voltage involved.
4. Select an adjustable trip setting of at least 700%, not to exceed 1300%, of the motor full load amperes. (FLA).
5. The NEC 1300% maximum setting may be **inadequate** for instantaneous trip circuit breakers to withstand current surges typical of the magnetization current of autotransformer type reduced voltage starters, or open transition wye-delta starters during transfer from "start" to "run", and constant HP Multi-Speed motors. Select Thermal-Magnetic Circuit Breakers from page 478 for those applications.
6. Part-winding motors, per 1981 NEC 430-3, should have two circuit breakers selected from the above at not more than one half the allowable trip setting for the horsepower rating. The two circuit breakers should operate simultaneously as a disconnecting means per 1981 NEC 430-103.

*Motor full load currents, ½ HP thru 200 HP are taken from Table 430-150 of the 1981 NEC. Above 200 HP from UL 98, Table 18.2. Select wire and circuit breakers on basis of horsepower rather than nameplate full load current per 1981 NEC Article 430-6 (a) for General Motor Applications. **Do not use these values to select overload relay thermal units.** See Digest 161, page 469 for selection of thermal units when **actual** full load **is not** known. The voltages listed are rated motor voltages. Corresponding nominal system voltages are 200 to 208, 220 to 240, 440 to 480 and 550 to 600 volts.

HP Ratings of Induction Type Squirrel-Cage and Wound Rotor Motors — Three Phase 60 Hz. ac				* Full Load Amps.	MAG-GARD C/B Catalog No.	MAG-GARD C/B Adjustable Settings as Per Cent of Motor Full Load Amps.						
200 Volts	230 Volts	460 Volts	575 Volts			LO	2	3	4	5	6	HI
.....	.....	.....	½	0.8	FAL36003-11M	1000%	1200%	1500%	1800%	2000%	2400%	2800%
.....	.....	½	.....	1.0	FAL36003-11M	800%	1000%	1200%	1400%	1600%	1900%	2200%
.....	.....	.....	¾	1.1	FAL36003-11M	700%	900%	1100%	1300%	1500%	1700%	2000%
.....	.....	¾	1	1.4	FAL36003-11M	600%	700%	900%	1000%	1200%	1400%	1600%
.....	.....	1	.....	1.8	FAL36003-11M	400%	600%	700%	800%	900%	1100%	1200%
.....	½	.....	.....	2.0	FAL36007-12M	900%	1300%	1600%	1900%	2300%	2600%	2900%
.....	.....	.....	1½	2.1	FAL36007-12M	900%	1200%	1500%	1800%	2100%	2500%	2800%
½	.....	.....	.....	2.3	FAL36007-12M	800%	1100%	1300%	1700%	2000%	2300%	2500%
.....	.....	1½	.....	2.6	FAL36007-12M	700%	1000%	1200%	1500%	1700%	2000%	2200%
.....	.....	.....	2	2.7	FAL36007-12M	700%	900%	1100%	1400%	1700%	1900%	2100%
.....	¾	.....	.....	2.8	FAL36007-12M	600%	900%	1100%	1400%	1600%	1900%	2100%
¾	.....	.....	.....	3.22	FAL36007-12M	600%	800%	1000%	1200%	1400%	1600%	1800%
.....	.....	2	.....	3.4	FAL36007-12M	500%	700%	900%	1100%	1300%	1500%	1700%
.....	1	.....	.....	3.6	FAL36007-12M	500%	700%	900%	1100%	1300%	1400%	1600%
.....	.....	.....	3	3.9	FAL36007-12M	500%	600%	800%	1000%	1200%	1300%	1500%
1	.....	.....	.....	4.14	FAL36007-12M	400%	600%	700%	900%	1100%	1300%	1400%
.....	.....	3	.....	4.8	FAL36007-12M	400%	500%	600%	800%	900%	1100%	1200%
.....	1½	.....	.....	5.2	FAL36015-13M	1000%	1300%	1600%	1900%	2200%	2600%	2900%
1½	.....	.....	.....	5.98	FAL36015-13M	800%	1100%	1400%	1700%	1900%	2200%	2500%
.....	.....	.....	5	6.1	FAL36015-13M	800%	1100%	1400%	1600%	1900%	2200%	2500%
.....	2	.....	.....	6.8	FAL36015-13M	700%	1000%	1200%	1500%	1700%	2000%	2200%
.....	.....	5	.....	7.6	FAL36015-13M	700%	900%	1100%	1300%	1500%	1800%	2000%
2	.....	.....	.....	7.82	FAL36015-13M	600%	800%	1100%	1300%	1500%	1700%	1900%
.....	.....	.....	7½	9.0	FAL36015-13M	600%	700%	900%	1100%	1300%	1500%	1700%
.....	3	.....	.....	9.6	FAL36015-13M	500%	700%	900%	1000%	1200%	1400%	1600%
3	.....	7½	10	11.0	FAL36015-13M	500%	600%	800%	900%	1100%	1200%	1400%
.....	.....	10	.....	14.0	FAL36030-15M	700%	900%	1200%	1400%	1600%	1900%	2100%
.....	5	.....	.....	15.2	FAL36030-15M	700%	900%	1100%	1300%	1500%	1700%	2000%
.....	.....	.....	15	17.0	FAL36030-15M	600%	800%	1000%	1200%	1400%	1600%	1800%
5	.....	.....	.....	17.5	FAL36030-15M	600%	700%	900%	1100%	1300%	1500%	1700%
.....	.....	15	.....	21	FAL36030-15M	500%	600%	800%	1000%	1100%	1300%	1400%
.....	7½	.....	20	22	FAL36030-15M	500%	600%	800%	900%	1000%	1200%	1400%
7½	.....	.....	.....	25.3	FAL36050-16M	600%	800%	1000%	1200%	1500%	1700%	1900%
.....	.....	20	25	27	FAL36050-16M	600%	700%	1000%	1100%	1400%	1600%	1800%
.....	10	.....	.....	28	FAL36050-16M	500%	700%	900%	1100%	1300%	1500%	1700%
10	.....	.....	30	32	FAL36050-16M	500%	600%	800%	1000%	1200%	1300%	1500%
.....	.....	25	.....	34	FAL36050-16M	400%	600%	800%	900%	1100%	1200%	1400%
.....	.....	30	.....	40	FAL36100-18M	800%	1000%	1300%	1500%	2000%	2500%	3000%
.....	.....	.....	40	41	FAL36100-18M	800%	1000%	1300%	1500%	2000%	2500%	2900%
.....	15	.....	.....	42	FAL36100-18M	800%	1000%	1200%	1400%	1900%	2400%	2900%
15	.....	.....	.....	48.3	FAL36100-18M	700%	900%	1100%	1300%	1700%	2100%	2500%
.....	.....	40	50	52	FAL36100-18M	600%	800%	1000%	1200%	1500%	1900%	2300%
.....	20	.....	.....	54	FAL36100-18M	600%	800%	900%	1100%	1500%	1900%	2200%
20	.....	.....	60	62	KAL36225-25M	1000%	1200%	1500%	1600%	1800%	1900%	2000%
.....	.....	50	.....	65	FAL36100-18M	500%	600%	800%	900%	1200%	1500%	1800%
.....	25	.....	.....	68	FAL36100-18M	500%	600%	800%	900%	1200%	1500%	1800%
.....	.....	60	75	77	KAL36225-25M	800%	1000%	1200%	1300%	1400%	1600%	1600%
25	.....	.....	.....	78.2	FAL36100-18M	400%	500%	700%	900%	1000%	1300%	1500%
.....	30	.....	.....	80	FAL36100-18M	400%	500%	600%	800%	1000%	1300%	1500%
30	.....	.....	.....	92	KAL36225-25M	700%	800%	1000%	1100%	1200%	1300%	1400%
.....	.....	75	.....	96	KAL36225-25M	700%	800%	900%	1000%	1100%	1200%	1300%
.....	.....	.....	100	99	KAL36225-25M	600%	800%	900%	1000%	1100%	1200%	1300%
.....	40	.....	.....	104	KAL36225-26M	700%	800%	1000%	1100%	1300%	1400%	1400%
40	.....	.....	.....	120	KAL36225-26M	600%	700%	800%	1000%	1100%	1200%	1300%
.....	.....	100	.....	124	KAL36225-29M	700%	800%	1000%	1100%	1200%	1300%	1400%
.....	.....	.....	125	125	KAL36225-29M	700%	800%	1000%	1100%	1200%	1300%	1400%
.....	50	.....	.....	130	KAL36225-29M	700%	800%	900%	1100%	1200%	1300%	1300%
.....	.....	.....	150	144	KAL36225-30M	700%	800%	900%	1000%	1200%	1300%	1400%
50	.....	.....	.....	150	KAL36225-30M	700%	700%	900%	1000%	1100%	1300%	1300%
.....	60	.....	.....	154	KAL36225-31M	700%	800%	900%	1000%	1200%	1300%	1500%
.....	.....	125	.....	156	KAL36225-31M	700%	800%	900%	1000%	1200%	1300%	1400%
60	.....	.....	.....	177	LAL36400-32M	700%	1000%	1100%	1300%	.....	.....	1400%
.....	.....	150	.....	180	LAL36400-32M	700%	900%	1100%	1300%	.....	.....	1400%
.....	75	.....	200	192	LAL36400-32M	700%	900%	1000%	1200%	.....	.....	1300%
75	.....	.....	.....	221	LAL36400-33M	700%	900%	1000%	1200%	.....	.....	1400%
.....	.....	200	.....	240	LAL36400-35M	700%	900%	1000%	1200%	.....	.....	1500%
.....	.....	.....	250	242	LAL36400-35M	700%	900%	1000%	1200%	.....	.....	1400%
.....	100	.....	.....	248	LAL36400-35M	700%	800%	1000%	1200%	.....	.....	1400%
100	.....	.....	.....	285	LAL36400-36M	700%	900%	1200%	1300%	.....	.....	1400%
.....	.....	.....	300	289	LAL36400-36M	700%	900%	1100%	1300%	.....	.....	1400%
.....	.....	250	.....	302	LAL36400-36M	700%	900%	1100%	1300%	.....	.....	1300%
.....	125	.....	.....	312	MAL36600-40M	800%	1000%	1300%	1400%	.....	.....	1600%
.....	.....	.....	350	336	MAL36600-40M	700%	1000%	1200%	1300%	.....	.....	1500%
125	.....	.....	.....	359	MAL36600-40M	700%	900%	1100%	1300%	.....	.....	1400%
.....	150	.....	.....	360	MAL36600-40M	700%	900%	1100%	1300%	.....	.....	1400%
.....	.....	300	.....	361	MAL36600-40M	700%	900%	1100%	1200%	.....	.....	1400%
.....	.....	.....	400	382	MAL36600-40M	700%	800%	1000%	1200%	.....	.....	1300%
150	.....	350	.....	414	MAL36600-42M	700%	800%	1100%	1300%	.....	.....	1400%
.....	.....	.....	500	472	MAL36600-44M	700%	1000%	1200%	1400%	.....	.....	1500%
.....	.....	400	.....	477	MAL36600-44M	700%	900%	1200%	1400%	.....	.....	1500%
.....	200	.....	.....	480	MAL36600-44M	700%	900%	1100%	1400%	.....	.....	1500%
200	.....	.....	.....	552	MAL36800-45M	700%	1100%	1300%	1400%	.....	.....	1400%
.....	.....	500	.....	590	MAL36800-45M	700%	1000%	1200%	1300%	.....	.....	1400%
.....	250	.....	.....	602	MAL36800-45M	700%	1000%	1200%	1200%	.....	.....	1300%

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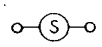
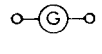
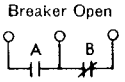
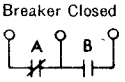
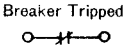
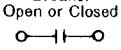
SQD SLV_000845

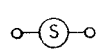
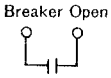
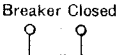
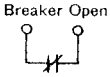
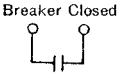
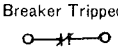
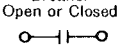
MOLDED CASE CIRCUIT BREAKERS
ACCESSORIES — FACTORY INSTALLED

FA, IF, KA, IK, LA, Q4, MA, ME, NA, PA, PC and PE molded case circuit breakers and molded case switches are available with UL listed accessories, factory installed only. All accessory devices are internally mounted and provided with 18″ lead wires. Combinations of more than one accessory must be ordered by description.

Accessory	Diagram	Description and Electrical Ratings	Volts		Coil Burden VA	Add Suffix To Breaker Cat. No.	Price Adder FA Thru NA	Price Adder PA and PC	Price Adder PE
SHUNT TRIP		Used for tripping the circuit breaker electrically using remote control source. Will operate at 55% rated voltage or more on ac system, 75% rated voltage or more on dc systems. Maximum Ratings: 480V. ac † 50/60 Hz or 250V. dc. Color Code: Black leads.	AC	24	9.0	**1042**	**$183.**	**$278.**	**$278.**
				120 208 240	140 415 550	**1021**			
				277 480	12.2 36.5	**1037**			
			DC	12 24 48 125 250	9.6 8.9 6.6 14.3 14.0	**1039** **1027** **1028** **1029** **1030**			
GROUND FAULT SHUNT TRIP		Used only with GROUND-CENSOR Type GP components listed on Page 92. Color Code: Orange leads.				**G**	**183.**	**278.**	...
UNDERVOLTAGE TRIP		Used to trip the circuit breaker when the control circuit voltage falls below 35-70% of normal—not field adjustable. Pick up at 85% of normal voltage or lower. Maximum Ratings: 240V. ac †50/60 Hz. or 24V. dc‡—Specify voltage. Color Code: Brown leads.	AC	24	4.8	**1143**	**183.**	**278.**	**278.**
				120	7.2	**1121**			
				208 240	4.2 7.2	**1122** **1124**			
AUXILIARY SWITCHES	Breaker Open  Breaker Closed 	Used for control circuits associated with circuit breaker operation. Each auxiliary switch contains one, two or three snap switches. Each with one "A" contact and one "B" contact. Maximum Ratings: 10A.—120 or 240V. ac 1/3 hp—120 or 240V. ac 5A.—120V. ac lamp load ½A.—125V. dc ¼A.—250V. dc Color Code: Yellow leads for "A" contacts, Blue leads for "B" contacts, Striped leads for common.			1A and 1B Contacts	**1212**	**75.**	**107.**	**107.**
					2A and 2B Contacts	**1352**	**150.**	**150.**	**150.**
					3A and 3B Contacts	**1364**	**192.** ★	**192.**	**192.**
ALARM SWITCH	Breaker Tripped  Breaker Open or Closed 	Used with control circuits; actuated only when the circuit breaker has tripped. Standard construction with N.O. contact. Maximum Rating: 7A.-240V. ac Color Code: Red leads.				**2100**	**75.**	**110.**	**110.**

†Additional ac control voltage ratings to 600V. ac are available and will be supplied with a 120V. ac rated device and control voltage transformer for user mounting. Not UL listed.
‡Additional undervoltage trip ratings to 250V. dc will be supplied with a resistor for user mounting. Not UL listed.
★MA and NA only, not available on FA thru LA.
■Not UL listed on IK.

QO, QOU, QOB, GFI, Q1, Q1U, Q1B and Q1L molded case circuit breakers. UL listed—one per breaker—requires one additional pole space—factory installed only. Accessory terminals for (2) #14-#12 Cu wire.

Accessory	Diagram	Description and Electrical Ratings	Volts	Coil Burden	Add Suffix To Breaker Cat. No.	Price Adder QO	Price Adder QO GFI	Price Adder Q1
SHUNT TRIP		Used for tripping the circuit breaker electrically using remote control source, 50/60 Hz. Includes coil clearing contact.	24 ac 12 dc	35 21.6	**1042**	**47.**	**47.**	**47.**
			120 ac 208 ac 240 ac	72 229 288	**1021**			
AUXILIARY SWITCH "A" CONTACT	Breaker Open  Breaker Closed 	One contact only, opens when breaker is OFF or TRIPPED. 5A. max. at 120V. ac, 50/60 Hz.			**1200**	**33.**	**33.**	**33.**
AUXILIARY SWITCH "B" CONTACT	Breaker Open  Breaker Closed 	One contact only, closed when breaker is OFF or TRIPPED. 5A. max. at 120V. ac, 50/60 Hz.			**1201**	**33.**	**33.**	...
ALARM SWITCH	Breaker Tripped  Breaker Open or Closed 	One contact only, closed when breaker is TRIPPED. 5A. max. at 120V. ac, 50/60 Hz.			**2100**	**33.**	**33.**	...

ACCESSORY DISCOUNT SCHEDULE—SAME AS ASSOCIATED CIRCUIT BREAKER

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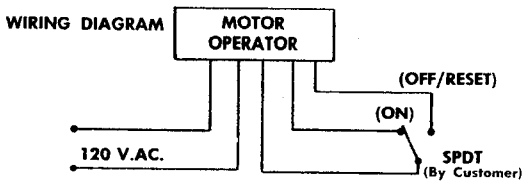
SQD SLV_000846

ELECTRICAL OPERATORS

Electrical operators provide remote OPEN, CLOSE and RESET control of molded case circuit breakers. Operators for FA, KA, LA, Q4 and MA circuit breakers may be field installed on I-LINE circuit breakers in panelboards or switchboards and require 4½" of circuit breaker mounting space. Unit mounted circuit breakers require a separate mounting pan. PA electrical operators must be factory installed. Contact local field office for individually enclosed circuit breaker applications.



When remote indication of circuit breaker status is required, order circuit breaker with 1A-1B auxiliary switch for ON-OFF indication and alarm switch for TRIP indication. Electrical operators require SPDT maintained contact switch. Refer to Class 9001 control unit listing for operators and pilot lights.

Breaker Cat. No. Prefix	120 V. ac Operator		Operator For Use On Higher Control Voltages	Mounting Pan	
	Cat. No.	Price		Cat. No.	Price
FA, FH FAL, FHL	FA-MO1	**$314.**	Order Operator and Separate Class 9070, EO-1 Control Circuit Transformer	FA-MOP	**$26.00**
KA, KH KAL, KHL	KA-MO1	**844.**		KA-MOP	**32.00**
LA, LH, Q4 LAL, LHL, Q4L	LA-MO1	**1086.**	Order Operator and Separate Class 9070, EO-3 Control Circuit Transformer	LA-MOP	**45.00**
MA, MH MAL, MHL	MA-MO1	**1086.**		MA-MOP	**45.00**
PAF PHF PCF	Add Suffix -MO1	**1221.**		.....	..

B1-2 DISCOUNT

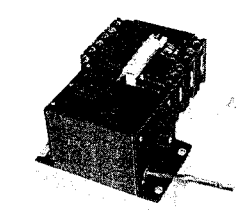
CIRCUIT BREAKER HANDLE ACCESSORIES

Accessory	Circuit Breaker Catalog Number Prefix	Circuit Breaker Number of Poles	Catalog Number	Price
Handle Lock-Off	QO QO, QOU, Q1	1 1, 2, 3	QO-1LO HLO-1	**$ .90** **2.30**
Handle Padlock Attachment	QOU	1 2, 3	QOU-1PA QOU-1PL	**2.50** **2.50**
	QO QO, Q1 (Loose) QO, Q1 (Fixed)	1 2, 3 2, 3	QO-1PA QO-1HPL QO-1PL	**2.50** **2.50** **2.50**

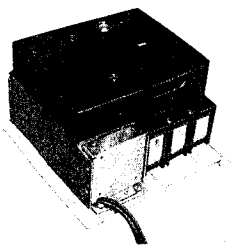
B1-1 DISCOUNT

Handle Lock-Off and Padlock Attachment	Q2 and FY IF, FA and KA IK, LA, MA & Q4 NA	1, 2, 3 1, 2, 3 2, 3 2, 3	HPA-FYQ HPA-FK HPA-LM HPA-NA	**4.80** **5.70** **6.30** **6.30**
Handle Extension	LA and Q4 MA	2, 3 2, 3	LA-HEX MA-HEX	**22.60** **22.60**
Handle Tie	2 FA or 2 KA 2 LA or 2 Q4	2, 3 2, 3	FK-HT LA-HT	**51.00** **118.00**
California Title 24 Combination Handle Tie and Lock-Off	FY FA	3 Single Pole 3 Single Pole	FY-3HT FA-3HT	**12.60** **12.60**

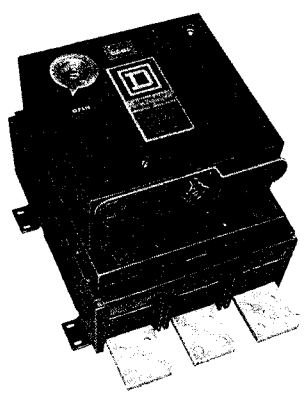
B1-2 DISCOUNT



FA-MO1 Operator with FAL Circuit Breaker on FA-MOP Mounting Pan



LA-MO1 Operator with LAL Circuit Breaker on LA-MOP Mounting Pan



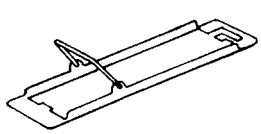
PAF Circuit Breaker with factory installed Electrical Operator



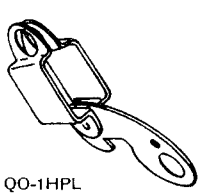
QO-1LO



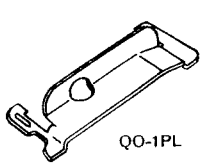
HLO-1



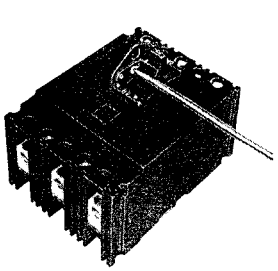
QO-1PA



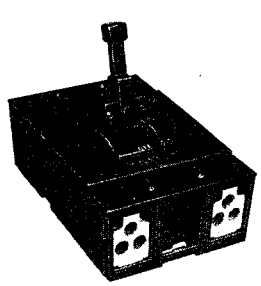
QO-1HPL



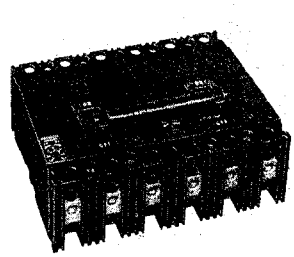
QO-1PL



HPA-FK on FAL Circuit Breaker



MA-HEX Handle Extension on MAL Circuit Breaker



FK-HT Handle Tie on Two FAL Circuit Breakers

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SQD SLV_000847

MOLDED CASE CIRCUIT BREAKERS

ACCESSORIES FOR FIELD INSTALLATION

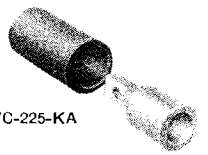
VERSA-CRIMP LUG KITS FOR CIRCUIT BREAKERS—FOR FIELD REPLACEMENT OF MECHANICAL LUGS

Compression lug kits have been developed specifically for mounting on Square D Molded Case Circuit Breakers. Kits contain lugs, mounting hardware, insulators for 600V. clearances and all necessary instructions. Each kit provides for the connection of **one circuit breaker terminal**. Example: A three pole FAL breaker would require six kits if all six line and load terminals were to be converted to VERSA-CRIMP lugs. UL listed.

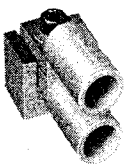
FA THRU NHL BREAKERS

Fits Breaker	One Kit Per Terminal: Lugs Per Kit	One Kit Per Terminal: Wire Range Each Lug	VERSA-CRIMP Tool Type	A (In.)	Catalog No.	Price Per Kit	Min. Order Qty.
FA, FAL, FH, FHL, IF, IFL	1	#8-1/0 Al/Cu	VC-6 Series	1.3	VC-100-FA	**$ 8.00**	3
KA, KAL, KH, KHL	1	#4-300 MCM Al/Cu	VC-6 Series	1.5	VC-225-KA	**15.70**	3
LA, LAL, LH, LHL, Q4, Q4L	1	#2/0-500 MCM Al/Cu	VC-6 Series	2.2	VC-400-LA5	**22.70**	1
LA, LAL, LH, LHL, Q4, Q4L	1	500 MCM Cu or 500 MCM-750 MCM Al	VC-6 FT or VC-8	2.5	VC-400-LA7	**29.00**	1
MA, MAL, MH, MHL	2	#2/0-500 MCM Al/Cu	VC-6 Series	1.9	VC-600-MA5	**70.00**	1
MA, MAL, MH, MHL	2	500 MCM Cu or 500 MCM-750 MCM Al	VC-6 FT or VC-8	2.1	VC-800-MA7	**75.00**	1
NHL	4	#2/0-500 MCM Al/Cu	VC-6 Series	0	VC-1200-NA5	**128.00**	1
NHL	4	500 MCM Cu or 500 MCM-750 MCM Al	VC-6 FT or VC-8	0	VC-1200-NA7	**140.00**	1
PAF, PHF, PCF, PEF AND PEC BREAKERS							
PAF, PHF, PEF ●	1	#2/0-500 MCM Al/Cu	VC-6 Series	●	VC-2000-PA5	**24.00**	1
PAF, PHF, PEF ●	1	500 MCM Cu or 500 MCM-750 MCM Al	VC-6 FT or VC-8	●	VC-2000-PA7	**24.00**	1
PCF, PEC ★	2	500 MCM Cu or 500 MCM-750 MCM Al	VC-6 FT or VC-8	0	VC-2500-PC7	**47.00**	1

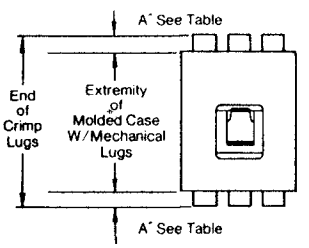
●PAF, PHF and PEF require terminal pads for mounting lugs of any type. Select from table below. One lug per kit, maximum six lugs per terminal.
★PCF and PEC do not require terminal pads for lug mounting. Two lugs per kit, maximum eight lugs per terminal.



VC-225-KA



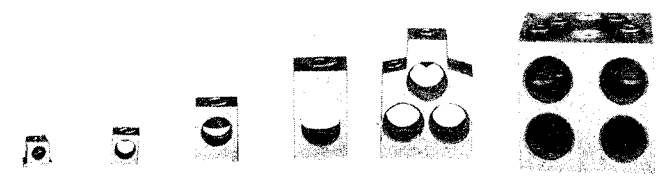
VC-600-MA5



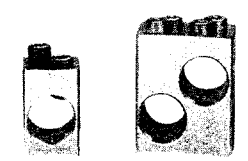
FAL THRU MAL
Breaker Dimensions with standard mechanical lugs p. 59

STANDARD AND OPTIONAL MECHANICAL LUGS—FA THRU NH

Circuit Breaker Prefix	Catalog Number	Price Per Lug	Minimum Ordering Quantity	UL Listed Wire Size
Standard Al or Cu Lugs				
FAL	AL50FA	$ **2.70**	3	one #14-4 Al or Cu
FAL, IFL	AL100FA	**2.70**	3	one #14-1/0 Al or Cu
KAL, IKL	AL225KA	**8.70**	3	one #4-300 MCM Al or Cu
LAL, Q4L	AL400LA	**8.70**	1	one #1-600 MCM Al or Cu or two #1/0-250 MCM Al or Cu
MAL	AL900MA	**22.90**	1	three #3/0-500 MCM Al or Cu
NHL	AL1200NA	**51.00**	1	four 350-750 MCM Al or Cu
Optional 750 MCM Al or Cu Lugs (For field installation)				
LAL, Q4L	AL400LA7	**10.90**	1	one 500-750 MCM Al or Cu
MAL	AL800MA7	**34.00**	1	two 750 MCM Al or Cu
Optional Copper Only Lugs				
FAL	CU100FA	**2.70**	3	one #14-1 Cu
KAL	CU225KA	**8.70**	3	one #6-4/0 Cu
LAL, Q4L	CU400LA	**8.70**	1	one #1-600 MCM Cu or two #1-250 MCM Cu
MAL	CU1000MA	**22.90**	1	three #3/0-500 MCM Cu



AL50FA AL100FA AL225KA AL400LA AL900MA AL1200NA

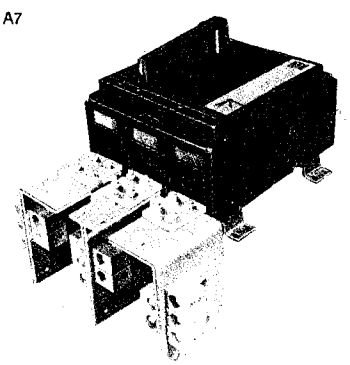


AL400LA7 AL800MA7

MECHANICAL LUGS AND TERMINAL PAD KITS FOR PA, PE AND PC

Circuit Breaker Prefix	Terminal Pad Kit: Cat. No.	Terminal Pad Kit: Price	Al/Cu Lug Kits: Cat. No.	Al/Cu Lug Kits: Price	Al/Cu Lug Kits: UL Listed Wire Size
PAF, PHF, PEF PEC-12, PEC-16	PAL-TB (See photo at right)	**$219.**	AL2000PA*	**$15.**	one #3/0-750 MCM Al or Cu
PCF, PEC-20	Not Required	...	AL2500PC**	**30.**	one #3/0-750 MCM Al or Cu

*One lug per kit, maximum six lugs per terminal.
**Two lugs per kit, maximum eight lugs per terminal.



PAF circuit breaker with one PAL-TB terminal pad kit installed. Kits mount on either line or load end of the breaker. Each kit contains three terminal pads, one per phase, with provisions for mounting a maximum of six lugs per pad. Order lugs separately.

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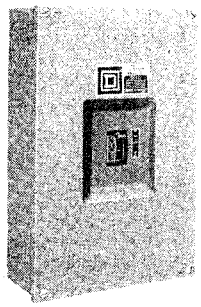
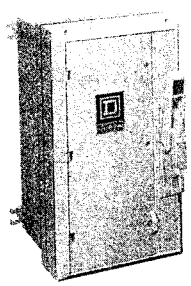
SQD SLV_000848



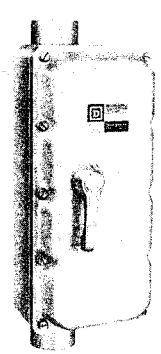
KA-225-S



FA-100-AWK



KA-225-DX



KA-225-X

Circuit breaker enclosures are UL listed except as indicated below, and are suitable for use as service entrance equipment when equipped with field or factory installed neutral assembly. Enclosures listed below are for use with unit circuit breakers listed on Pages 58, 59, 60, 61, 62, 63 and 64. Breakers are ordered and shipped separately for field installation. Enclosed molded case switches should be ordered as assembled devices from Pages 72 and 73.

NEMA 1—Indoor—General Purpose
NEMA 3R—Outdoor—Rainproof and Sleet (Ice) Resistant

Circuit Breaker			**NEMA 1** Flush		**NEMA 1** Surface		▲**NEMA 3R**	
Catalog Number Prefix	Ampere Rating	Number of Poles	Enclosure Catalog Number	Price	Enclosure Catalog Number	Price	Enclosure Catalog Number	Price
EH, EHB	15-60	1, 2, 3	EHB 125 NF†	**$ 58.**	EHB 125 NS†	**$ 58.**	EHB 125 NRB†	**$134.**
Q1L	15-100	1, 2, 3	E 100 NF†	**43.**	E 100 NS†	**43.**	E 100 NRB†	**119.**
FAL, FHL	15-100	1, 2, 3	FA 100 F	**43.**	FA 100 S	**43.**	FA 100 RB	**119.**
Q2L, Q2L-H, Q2LH	100-225	2	.....	....	Q2 2225 NS†	**46.**	Q2 2225 NRB†	**98.**
		2, 3	Q2 3225 NF†	**55.**	Q2 3225 NS†	**55.**	Q2 3225 NRB†	**108.**
KAL, KHL, IFL‡	70-225	2, 3	KA 225 F	**52.**	KA 225 S	**52.**	KA 225 RB	**175.**
LAL, LHL, Q4L, IKL‡	125-400	2, 3	LA 400 F	**75.**	LA 400 S	**75.**	LA 400 R	**398.**
MAL, MHL‡	125-1000	2, 3	MA 1000 F	**136.**	MA 1000 S	**136.**	MA 1000 R	**518.**
NHL‡	600-1200	2, 3	.....	....	■NA 1200 S	**261.**	■NA 1200 R	**620.**

■Provisions for field installation of GROUND-CENSOR components GP-MP1, GT-918 and Ground Fault Relay are standard.
▲Enclosures for maximum 100 Amp. and 225 Amp. circuit breakers use bolt-on hubs. For details and hub catalog numbers see Page 15.
†Factory installed groundable neutral assembly.
‡KA enclosure will accept FA breakers, LA enclosures will accept KA breakers, MA enclosure will accept LA breakers and NA enclosures will accept MA breakers.

NEMA 4X—Indoor and Outdoor—Watertight, Dusttight and Corrosion-resistant
NEMA 4 & 5—Indoor—Dusttight and Watertight
NEMA 12—Indoor—Dusttight and Driptight

Circuit Breaker		**NEMA 4X** ● KRYDON		**NEMA 4 & 5** Stainless Steel (Hubs—See page 43)		**NEMA 12** Catalog Number		
Catalog Number Prefix	Ampere Rating	Enclosure Catalog Number	Price	Enclosure Catalog Number	Price	With Knockouts	Without Knockouts	Price
FAL, FHL	15-50	FA 100 DXE	**$724.**	FA 100 DS	**$334.**	FA 100 A	FA 100 AWK	**$ 72.**
	60-100	FA 100 DXH	**724.**					
KAL, KHL	70-225	KA 225 DX	**724.**	KA 225 DS	**680.**	KA 225 A	KA 225 AWK	**119.**
LAL, LHL, Q4L, IKL▲	125-400	LA 400 DX	**1273.**	LA 400 DS	**1323.**	LA 400 A	LA 400 AWK	**210.**
MAL, MHL	125-800	.....	.....	MA 800 DS	**2363.**	.....	MA 800 AWK	**398.**
★MAL, MHL, MEL	125-1000	.....	.....	MA 1000 DS	**2363.**	.....	MA 1000 AWK	**398.**

●Not UL listed.
▲NEMA 4X KRYDON enclosure will not accept IKL breakers.
★Available September, 1981.

NEMA 7—Indoor Hazardous Locations—Class I, Groups C and/or D
NEMA 9—Indoor Hazardous Locations—Class II, Groups E, F and/or G

Circuit Breaker		**NEMA 7** Cast Aluminum		**NEMA 4, 5 & 9** Cast Aluminum	
Catalog Number Prefix	Ampere Rating	Enclosure Catalog Number	Price	Enclosure Catalog Number	Price
FAL, FHL	15-50	FA 050 X*△	**$345.**	FA 050 Y	**$ 271.**
	60-100	FA 100 X*△	**463.**	FA 100 Y	**334.**
KAL, KHL, IFL	70-225	KA 225 X*△	**943.**	KA 225 Y	**680.**
LAL, LHL, Q4L, IKL	125-400	LA 400 X*	**1991.**	LA 400 Y	**1323.**
MAL, MHL	125-600	MA 600 X*	**2780.**	MA 600 Y	**2126.**
	125-800	MA 800 X●	**3394.**	MA 800 Y	**2363.**

*CSA Certified. ●Not UL listed. △Suitable for outdoor use—Includes necessary breather and drain.

ACCESSORIES

Description	Catalog Number	Price	Enclosures
Cover Padlock Attachment	CPA-100	**$4.60**	NEMA 12—LA & MA
Cover Release Handle	CIH-100	**4.60**	
Electrical Interlocks	EI306-1 or 2	**52.00**	NEMA 4 & 5—FA & KA
	EI1020-1 or 2	**85.00**	NEMA 4, 5 & 12—LA & MA
Equipment Ground Bar Kits	PK0GTA2	**11.00**	NEMA 1 & 3R—Q2 NEMA 12—FA, KA
	PK3GTA-1	**2.50**	NEMA 1 & 3R—EH/EHB (15-60A.)
Breather and Drain	PKDB-1	**31.00**	NEMA 7 & 9

INSULATED GROUNDABLE NEUTRAL ASSEMBLY

Circuit Breaker		◆Neutral Assembly for use with				
		Steel Enclosure		Cast Aluminum Enclosure		
Catalog Number Prefix	Ampere Rating	Catalog Number	Price	Catalog Number	Price	UL Listed Terminal Lug Wire Size
FAL, FHL, IFL	100	SN 100 FA	**$16.70**	100 SNA	**$36.00**	Two #10—#1/0 Cu or Al
KAL, KHL, IKL	225	SN 225 KA	**48.00**	225 SNA	**48.00**	Two #4—300 MCM Cu or Al
LAL, LHL, Q4L	400	400 SN	**59.00**	400 SNA	**84.00**	Two #3/0—600 MCM or Four #3/0—250 MCM Cu or Al
MAL, MHL	1000◐	AL 800 SN	**85.00**	.....	.....	Six #3/0—500 MCM Cu or Al
NHL	1200	AL 1200 SN	**102.00**	.....	.....	Eight #350-750 MCM Cu or Al

◐Cu conductors must be used on 1000 ampere applications.

◆Not for use with NEMA 4X enclosure.

KRYDON is a Trademark of Crouse-Hinds Company.

GROUND-CENSOR is a Registered Trademark of Square D Company.

SQD SLV_000849

CIRCUIT BREAKERS — ENCLOSED

THESE DEVICES SHOULD BE ORDERED AND ARE SHIPPED SEPARATELY AS AN ENCLOSURE ONLY AND UNIT CIRCUIT BREAKER, EXCEPT MOLDED CASE SWITCHES AND ENCLOSED PA AND PE BREAKERS. Insulated groundable neutrals, if required, must be ordered separately from Page 71.

For I-75,000 high interrupting capacity enclosed breakers use prices in shaded column.

EHB — 100 AMPERE FRAME—PERMANENT TRIP

System	Ampere Rating ★	Plug-On Description Add Suffix →	Plug-On NEMA 1 (F) or (S)	Plug-On NEMA 3R (RB)▲	Bolt-On Description Add Suffix →	Bolt-On NEMA 1 (F) or (S)	Bolt-On NEMA 3R (RB)▲
1 POLE 277V. AC	15	EH 14015N( )	**$ 90.**	**$166.**	EHB 14015N( )	**$ 94.**	**$170.**
	20	EH 14020N( )			EHB 14020N( )		
	25	EH 14025N( )			EHB 14025N( )		
	30	EH 14030N( )			EHB 14030N( )		
2 POLE 277/480V. AC	15	EH 24015N( )	**140.**	**216.**	EHB 24015N( )	**148.**	**224.**
	20	EH 24020N( )			EHB 24020N( )		
	25	EH 24025N( )			EHB 24025N( )		
	30	EH 24030N( )			EHB 24030N( )		
	40	EH 24040N( )			EHB 24040N( )		
	50	EH 24050N( )			EHB 24050N( )		
	60	EH 24060N( )			EHB 24060N( )		
3 POLE 277/480V. AC	15	EH 34015N( )	**204.**	**280.**	EHB 34015N( )	**216.**	**292.**
	20	EH 34020N( )			EHB 34020N( )		
	25	EH 34025N( )			EHB 34025N( )		
	30	EH 34030N( )			EHB 34030N( )		
	40	EH 34040N( )			EHB 34040N( )		
	50	EH 34050N( )			EHB 34050N( )		
	60	EH 34060N( )			EHB 34060N( )		

FA — 100 AMPERE FRAME—PERMANENT TRIP

System	Amp. Rating ★	Description Add Suffix →	NEMA 1 (F) or (S)	NEMA 3R (RB)▲	NEMA 4&5 (DS)	NEMA 7 (X)	NEMA 4, 5 & 9 (Y)	NEMA 12 (A) or AWK
1 POLE 120V. AC 125V. DC	15	FAE 12015( )	**$ 91.**	**$167.**	**$382.**	**$362.**	**$319.**	**$120.**
	20	FAE 12020( )						
	30	FAE 12030( )						
	40	FAE 12040( )						
	‡50	FAE 12050( )						
2 POLE 240V. AC 250V. DC	15	FAE 22015( )	**124.**	**200.**	**415.**	**395.**	**352.**	**153.**
	20	FAE 22020( )						
	30	FAE 22030( )						
	40	FAE 22040( )						
	50	FAE 22050( )						
	60	FAE 22060( )	**124.**	**200.**	**415.**	**513.**	**415.**	**153.**
	70	FAE 22070( )						
	90	FAE 22090( )	**172.**	**248.**	**463.**	**561.**	**463.**	**201.**
	100	FAE 22100( )						
Molded Case Switch		FAE 22000( )	**124.**	**200.**	**415.**	**513.**	**415.**	**153.**
3 POLE 240V. AC	15	FAE 32015( )	**160.**	**236.**	**451.**	**431.**	**388.**	**189.**
	20	FAE 32020( )						
	30	FAE 32030( )						
	40	FAE 32040( )						
	50	FAE 32050( )						
	60	FAE 32060( )	**160.**	**236.**	**451.**	**549.**	**451.**	**189.**
	70	FAE 32070( )						
	90	FAE 32090( )	**212.**	**288.**	**503.**	**601.**	**503.**	**241.**
	100	FAE 32100( )						
Molded Case Switch		FAE 32000( )	**160.**	**236.**	**451.**	**549.**	**451.**	**189.**

FA — 100 AMPERE FRAME—PERMANENT TRIP

System	Amp. Rating ★	Description Add Suffix →	NEMA 1 (F) or (S)	NEMA 3R (RB)▲	NEMA 4 & 5 (DS)	NEMA 7 (X)	NEMA 4, 5 & 9 (Y)	NEMA 12 (A) or (AWK)
1 POLE 277V. AC	15	FAE 14015( )	**$104.**	**$180.**	**$395.**	**$375.**	**$332.**	**$133.**
	20	FAE 14020( )						
	30	FAE 14030( )						
	40	FAE 14040( )						
	‡50	FAE 14050( )						
2 POLE 480V. AC 250V. DC	15	FAE 24015( )	**190.**	**266.**	**481.**	**461.**	**418.**	**219.**
	20	FAE 24020( )						
	30	FAE 24030( )						
	40	FAE 24040( )						
	50	FAE 24050( )						
	60	FAE 24060( )	**190.**	**266.**	**481.**	**579.**	**481.**	**219.**
	70	FAE 24070( )						
	90	FAE 24090( )	**239.**	**308.**	**523.**	**621.**	**523.**	**261.**
	100	FAE 24100( )						
Molded Case Switch		FAE 24000( )	**176.**	**252.**	**467.**	**565.**	**467.**	**205.**
3 POLE 480V. AC	15	FAE 34015( )	**230.**	**306.**	**521.**	**501.**	**458.**	**259.**
	20	FAE 34020( )						
	30	FAE 34030( )						
	40	FAE 34040( )						
	50	FAE 34050( )						
	60	FAE 34060( )	**230.**	**306.**	**521.**	**619.**	**521.**	**259.**
	70	FAE 34070( )						
	90	FAE 34090( )	**265.**	**341.**	**556.**	**654.**	**556.**	**294.**
	100	FAE 34100( )						
Molded Case Switch		FAE 34000( )	**217.**	**293.**	**508.**	**606.**	**508.**	**246.**

FA — 100 AMPERE FRAME—PERMANENT TRIP

System	Ampere Rating ★	Description Add Suffix →	NEMA 1 (F) or (S)		NEMA 3R (RB)▲		NEMA 4 & 5 Stainless Steel (DS)		NEMA 7 (X)		NEMA 4 & 5, 9 Cast Aluminum (Y)		NEMA 12 & 12K (AWK) & (A)	
1 POLE 277V. AC 250V. DC	15	FHE 16015( )	...	**$151.**	...	**$227.**	...	**$442.**	...	**$422.**	...	**$379.**	...	**$180.**
	20	FHE 16020( )												
	30	FHE 16030( )												
	40	FHE 16040( )												
	‡50	FHE 16050( )												
2 POLE 600V. AC 250V. DC	15	FAE 26015( )	**$212.**	**323.**	**$288.**	**399.**	**$503.**	**614.**	**$483.**	**594.**	**$440.**	**551.**	**$241.**	**352.**
	20	FAE 26020( )												
	30	FAE 26030( )												
	40	FAE 26040( )												
	50	FAE 26050( )												
	60	FAE 26060( )	**212.**	**323.**	**288.**	**399.**	**503.**	**614.**	**601.**	**712.**	**503.**	**614.**	**241.**	**352.**
	70	FAE 26070( )												
	90	FAE 26090( )	**258.**	**367.**	**334.**	**443.**	**549.**	**658.**	**647.**	**756.**	**549.**	**658.**	**287.**	**396.**
	100	FAE 26100( )												
Molded Case Switch	100A. Max.	FAE 26000( )	**212.**	**■323.**	**288.**	**■399.**	**503.**	**■614.**	**601.**	**■712.**	**503.**	**■614.**	**241.**	**■396.**
3 POLE 600V. AC	15	FAE 36015( )	**261.**	**369.**	**337.**	**445.**	**552.**	**660.**	**532.**	**640.**	**489.**	**597.**	**290.**	**398.**
	20	FAE 36020( )												
	30	FAE 36030( )												
	40	FAE 36040( )												
	50	FAE 36050( )												
	60	FAE 36060( )	**261.**	**369.**	**337.**	**445.**	**552.**	**660.**	**650.**	**758.**	**552.**	**660.**	**290.**	**398.**
	70	FAE 36070( )												
	90	FAE 36090( )	**310.**	**414.**	**386.**	**490.**	**601.**	**705.**	**699.**	**803.**	**606.**	**705.**	**339.**	**443.**
	100	FAE 36100( )												
Molded Case Switch	100A. Max.	FAE 36000( )	**261.**	**■369.**	**337.**	**■445.**	**552.**	**■660.**	**650.**	**■758.**	**552.**	**■660.**	**290.**	**■398.**

★Additional branch ampere ratings in accordance with the 1981 National Electrical Code are available. Refer to numerical listing for prices.
▲The RB rainproof enclosures have a bolt-on closing cap factory installed. Order bolt-on hubs separately from the table on Page 15.
‡60-100 Amp. single pole devices available on order.
■ Molded Case Switch (Auto).

SQD SLV_000850

System	Ampere Rating ★	Description	NEMA 1		NEMA 3R		NEMA 4 & 5 Stainless Steel	NEMA 7		NEMA 4 & 5, 9 Cast Aluminum		NEMA 12 & 12K	
		Add Suffix ➔	(F) or (S)		(RB)▲		(DS)	(X)		(Y)		(AWK) & (A)	
225 AMPERE FRAME—600V. AC PERMANENT TRIP KA													
2 POLE 600V. AC 250V. DC	125	KAE 26125( )	$ 551.	$1215.	$ 674.	$1338.	$1179.	$1843.	$1411.	$2075.	$1179.	$1843.	$ 618.	$1282.
	150	KAE 26150( )												
	175	KAE 26175( )												
	200	KAE 26200( )												
	225	KAE 26225( )												
Molded Case Switch	225A. Max.	KAE 26000( )	450.	■1156.	573.	■1279.	1078.	■1784.	1310.	■2016.	1078.	■1784.	517.	■1223.
3 POLE 600V. AC	125	KAE 36125( )	677.	1458.	800.	1581.	1305.	2086.	1537.	2318.	1305.	2086.	744.	1525.
	150	KAE 36150( )												
	175	KAE 36175( )												
	200	KAE 36200( )												
	225	KAE 36225( )												
Molded Case Switch	225A. Max.	KAE 36000( )	551.	■1382.	674.	■1505.	1179.	■2010.	1411.	■2242.	1179.	■2010.	618.	■1449.
400 AMPERE FRAME—600V. AC PERMANENT TRIP LA													
2 POLE 600V. AC 250V. DC	250	LAE 26250( )	$ 990.	$1605.	$1313.	$1928.	$2238.	$2853.	$2906.	$3521.	$2238.	$2853.	$1125.	$1740.
	300	LAE 26300( )												
	350	LAE 26350( )												
	400	LAE 26400( )												
Molded Case Switch	400A. Max.	LAE 26000( )	861.	■1476.	1184.	■1799.	2109.	■2724.	2777.	■3392.	2109.	■2724.	996.	■1611.
3 POLE 600V. AC	250	LAE 36250( )	1185.	1902.	1508.	2225.	2433.	3150.	3101.	3521.	2433.	3150.	1320.	2037.
	300	LAE 36300( )												
	350	LAE 36350( )												
	400	LAE 36400( )												
Molded Case Switch	400A. Max.	LAE 36000( )	1022.	■1834.	1345.	■2157.	2270.	■3082.	2938.	■3750.	2270.	■3082.	1157.	■1969.
1000 AMPERE FRAME—600V. AC PERMANENT TRIP MA													
2 POLE 600V. AC 250V. DC	500	MAE 26500( )	$1569.	$2018.	$1951.	$2400.	$3796.	$4245.	$4213.	$4662.	$3559.	$4008.	$1831.	$2280.
	600	MAE 26600( )	1569.	2018.	1951.	2400.	3796.	4245.	4213.	4662.	3559.	4008.	1831.	2280.
	700	MAE 26700( )	1992.	2457.	2374.	2839.	4219.	4684.	5250.	5715.	4219.	4684.	2254.	2719.
	800	MAE 26800( )	1992.	2457.	2374.	2839.	4219.	4684.	5250.	5715.	4219.	4684.	2254.	2719.
	900	MAE 26900( )	2784.	3071.	3166.	3453.	...	...	...	...	...	...	...	...
	1000	MAE 261000( )	2784.	3071.	3166.	3453.	...	...	...	...	...	...	...	...
Molded Case Switch	800A. Max.	MAE 260008( )	1231.	■1342.	1613.	■1724.	3458.	■4032.	4489.	■5063.	3458.	■4032.	1493.	■2067.
	1000A. Max.	MAE 26000( )	1768.	■2218.	2150.	■2600.	...	...	...	...	...	...	...	...
3 POLE 600V. AC	500	MAE 36500( )	1954.	2409.	2336.	2791.	4181.	4636.	4598.	5053.	3944.	4399.	2216.	2671.
	600	MAE 36600( )	1954.	2409.	2336.	2791.	4181.	4636.	4598.	5053.	3944.	4399.	2216.	2671.
	700	MAE 36700( )	2523.	2993.	2905.	3375.	4750.	5220.	5781.	6522.	4750.	5220.	2785.	3255.
	800	MAE 36800( )	2523.	2993.	2905.	3375.	4750.	5220.	5781.	6522.	4750.	5220.	2785.	3255.
	900	MAE 36900( )	3191.	3520.	3573.	3902.	...	...	...	...	...	...	...	...
	1000	MAE 361000( )	3191.	3520.	3573.	3902.	...	...	...	...	...	...	...	...
Molded Case Switch	800A. Max.	MAE 360008( )	1529.	■1667.	1911.	■2049.	3756.	■4364.	4787.	■5395.	3756.	■4364.	1791.	■2399.
	1000A. Max.	MAE 36000( )	2166.	■2699.	2548.	■3081.	...	...	...	...	...	...	...	...
1200 AMPERE FRAME—480V. AC PERMANENT TRIP NA													
2 POLE 480V. AC	600	NHE 26600( )	...	$2855.	...	$3214.								
	700	NHE 26700( )	...	2855.	...	3214.								
	800	NHE 26800( )	...	2855.	...	3214.								
	1000	NHE 261000( )	...	3400.	...	3759.								
	1200	NHE 261200( )	...	4003.	...	4362.								
Molded Case Switch (Auto)	1200A. Max.	NHE 260000M( )	...	■2548.	...	■2907.								
3 POLE 480V. AC	600	NHE 36600( )	...	3229.	...	3588.								
	700	NHE 36700( )	...	3229.	...	3588.								
	800	NHE 36800( )	...	3229.	...	3588.								
	1000	NHE 361000( )	...	3777.	...	4136.								
	1200	NHE 361200( )	...	4407.	...	4766.								
Molded Case Switch (Auto)	1200A. Max.	NHE 360000M( )	...	■2957.	...	■3316.								

FIELD INSTALLABLE GROUND-CENSOR GROUND FAULT PROTECTION SYSTEM COMPONENTS—See listing, page 92

Monitor Panel—GP-MP1
Relay—GP-200( )
Sensor—GT-918

2000 AMPERE FRAME—600V. AC WITH RATING COLUMNS PA

System	Ampere Rating	Catalog Number	NEMA 1		NEMA 3R	
		Add Suffix➔	(S)		(R)	
2 POLE 600V. AC	1000	PAE261000N( )	$5857.	$6182.	$7100.	$7426.
	1200	PAE261200N( )	5857.	6182.	7100.	7426.
	1400	PAE261400N( )	5919.	6245.	7162.	7488.
	1600	PAE261600N( )	5981.	6306.	7225.	7550.
	1800	PAE261800N( )	6065.	6668.	7308.	7911.
	2000	PAE262000N( )	6065.	6668.	7308.	7911.
Molded Case Switch	2000A. Max.	PAE260000N( )	5345.	■ 5949.	6589.	■ 7193.
3 POLE 600V. AC	1000	PAE361000N( )	7180.	7564.	8424.	8807.
	1200	PAE361200N( )	7180.	7564.	8424.	8807.
	1400	PAE361400N( )	7272.	7656.	8516.	8900.
	1600	PAE361600N( )	7365.	7749.	8609.	8993.
	1800	PAE361800N( )	7449.	8015.	8693.	9258.
	2000	PAE362000N( )	7449.	8015.	8693.	9258.
Molded Case Switch	2000A. Max.	PAE360000N( )	6347.	■ 6914.	7591.	■ 8158.

SOLID STATE TRIP—STANDARD RATED BREAKER 1200, 1600, and 2000 AMPERE FRAME—600V. AC WITH INTEGRAL GROUND FAULT PROTECTION PE

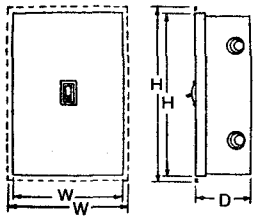
Catalog Number	NEMA 1	NEMA 3R	Terminal Lug Wire Size—PA or PE
Add Suffix➔	(S)	(R)	
.....	....	....	Four #3/0-750MCM Al or Cu
.....	....	....	Five #3/0-750MCM Al or Cu
.....	....	....	Six #3/0-750MCM Al or Cu
.....	....	....	
PEE12-361000GN( )	$6214.	$6581.	Four #3/0-750MCM Al or Cu
PEE12-361200GN( )	6214.	6581.	
PEE16-361400GN( )	8445.	9712.	Five #3/0-750MCM Al or Cu
PEE16-361600GN( )	8445.	9712.	
PEE20-361800GN( )	8808.	10074.	Six #3/0-750 MCM Al or Cu
PEE20-362000GN( )	8808.	10074.	
.....	....	....	

PA enclosed circuit breakers are shipped completely assembled and have a factory installed neutral assembly. If neutral is not required, delete suffix letter N from basic catalog number and deduct **$150.** from 1000-1600 ampere prices or **$234.** from 1800-2000 ampere prices.
PE enclosed circuit breakers are listed above with Integral Ground Fault Protection. If ground fault protection is not required, delete suffix letter G from basic catalog number and deduct **$918.** from 1000-1200 ampere prices or **$993.** from 1400-2000 ampere prices.
★Additional branch ampere ratings in accordance with the 1978 National Electrical Code are available. Refer to numerical listing for prices.
▲FAE and KAE devices use bolt-on hubs and have suffix **RB**. For details and hub catalog numbers see Page 15. LAE, MAE and PAE devices have blank end walls and use suffix **R**.
■Molded Case Switch (Auto)

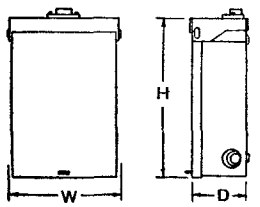
GROUND-CENSOR is a Registered Trademark of Square D Company.

SQD SLV_000851

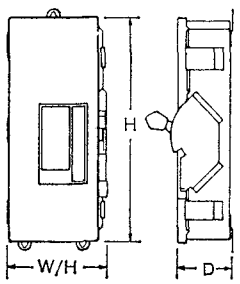
CIRCUIT BREAKER ENCLOSURES
DIMENSIONS



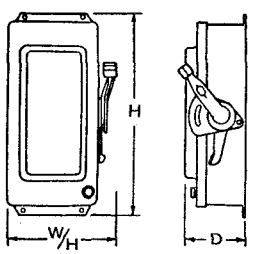
NEMA 1



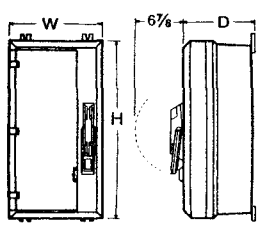
NEMA 3R



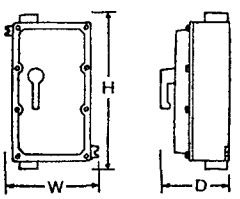
NEMA 4 & 5—FA, KA, LA, MA1000DS
NEMA 12—FA, KA, LA, MA1000AWK



MA800DS
MA800AWK



NEMA 4X



NEMA 4 & 5, 7, 9
Cast Aluminum
FA & KA

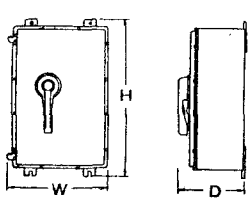
NEMA 1 Flush				NEMA 1 Surface				NEMA 3R			
Enclosure Cat. No.	H	W	D	Enclosure Cat. No.	H	W	D	Enclosure Cat. No.	H	W	D
E100NF	13⅝	7⅛	3 17/32	E100NS	12⅝	6⅛	3 17/32	E100NRB	13 3/16	7 11/32	4 5/16
EHB125NF	13 21/64	8 53/64	3 23/32	EHB125NS	12⅜	7⅞	3 23/32	EHB125NRB	12¾	7 27/32	4½
FA100F	15⅛	9⅞	4⅛	FA100S	13¾	8½	4⅛	FA100RB	13 1/16	8 25/32	5 1/16
Q2-3225NF	16¾	9⅝	4¾	Q2-2225NS Q2-3225NS	16⅝ 16¾	7 13/16 9⅝	4 4¾	Q2-2225NRB Q2-3225NRB	16 1/16 16⅝	8½ 9 15/16	4 15/16 5 13/16
KA225F	20⅛	13 21/32	5⅜	KA225S	18¾	12¼	5⅜	KA225RB	18¾	12 17/32	6 13/32
LA400F	28½	16 13/32	6⅝	LA400S	27½	15¼	6⅝	LA400R	27¼	15⅜	7⅞
MA1000F	39¾	21 13/16	7¾	MA1000S	38⅛	20¼	7¾	MA1000R	38¼	20¾	9 13/16
.....	....	....	....	NA1200S	52	22½	14½	NA1200R	52	22½	14½
.....	....	....	....	PAE, PEE	91½	30	24	PAE, PEE	92½	30⅝	31½

NEMA 4X KRYDON					NEMA 4 & 5 Stainless Steel				NEMA 12			
Enclosure Cat. No.	H	W	D	Hubs ▲	Enclosure Cat. No.	H	W/H	D	Enclosure Cat. No.	H	W/H	D
FA100DXE	19 7/16	11 7/16	8¾	two 1¼"	FA100DS	19 7/16	9⅛	4 13/16	FA100A, AWK	19 7/16	9⅛	4 13/16
FA100DXH	19 7/16	11 7/16	8¾	two 2"	KA225DS	25¼	9½	5⅜	KA225A, AWK	25¼	9½	5⅜
KA225DX	19 7/16	11 7/16	8¾	two 2½"	LA400DS	36 1/16	13⅞	6⅜	LA400AWK	36 1/16	13⅞	6⅜
LA400DX	27 7/16	15 7/16	9¾	two 3"	MA800DS	36⅜	20¾	9⅜	MA800AWK	36⅜	20¾	9⅜
	...	...	...	...	MA1000DS	57½	20⅜	8½	MA1000AWK	57½	20⅜	8½

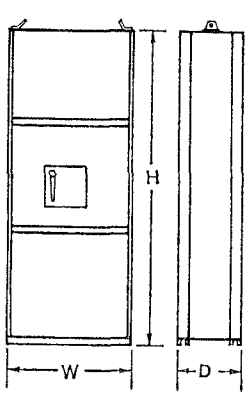
▲Hubs and hub drilling templates provided for field installation.

NEMA 4, 5 & 9 Cast Aluminum					NEMA 7 Cast Aluminum				
Enclosure Cat. No.	H	W	D	Tapped Conduit Opening△	Enclosure Cat. No.	H	W	D	Tapped Conduit Opening△
FA050Y	13 3/16	9½	6⅞	one 1¼"	FA050X	12 7/16	9½	7 31/32	one 1¼"
FA100Y	16⅛	9⅞	6 31/32	one 2"	FA100X	15 5/16	9⅞	6 31/32	one 2"
KA225Y	21 13/16	10⅞	7½	one 2½"	KA225X	22 9/16	10⅞	7¾	one 2½"
LA400Y	26½	16¾	12 5/32	one 3"	LA400X	26 31/32	16	12¾	one 3"
MA600Y	38½	16¾	12½	two 3"	MA600X	35	20 1/16	12 27/32	two 3"
MA800Y	44½	16¾	12½	two 3½"	MA800X	43	20 1/16	12 27/32	two 3½"

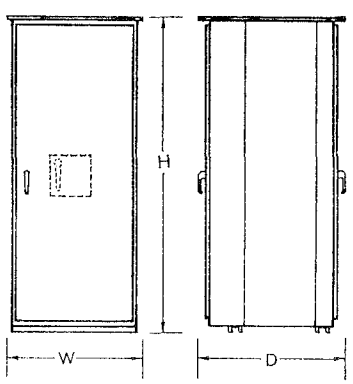
△Number per endwall.



NEMA 4 & 5, 7, 9
Cast Aluminum
LA & MA



NEMA 1
PAE, PEE



NEMA 3R
PAE, PEE

KRYDON is a Trademark of Crouse-Hinds Company.

SQD SLV_000852

CIRCUIT BREAKER PANELBOARDS, FUSIBLE PANELBOARDS, SWITCHBOARDS & MOTOR STARTER CENTERS

UL Listed—Integrated Equipment short circuit current rating (IER)

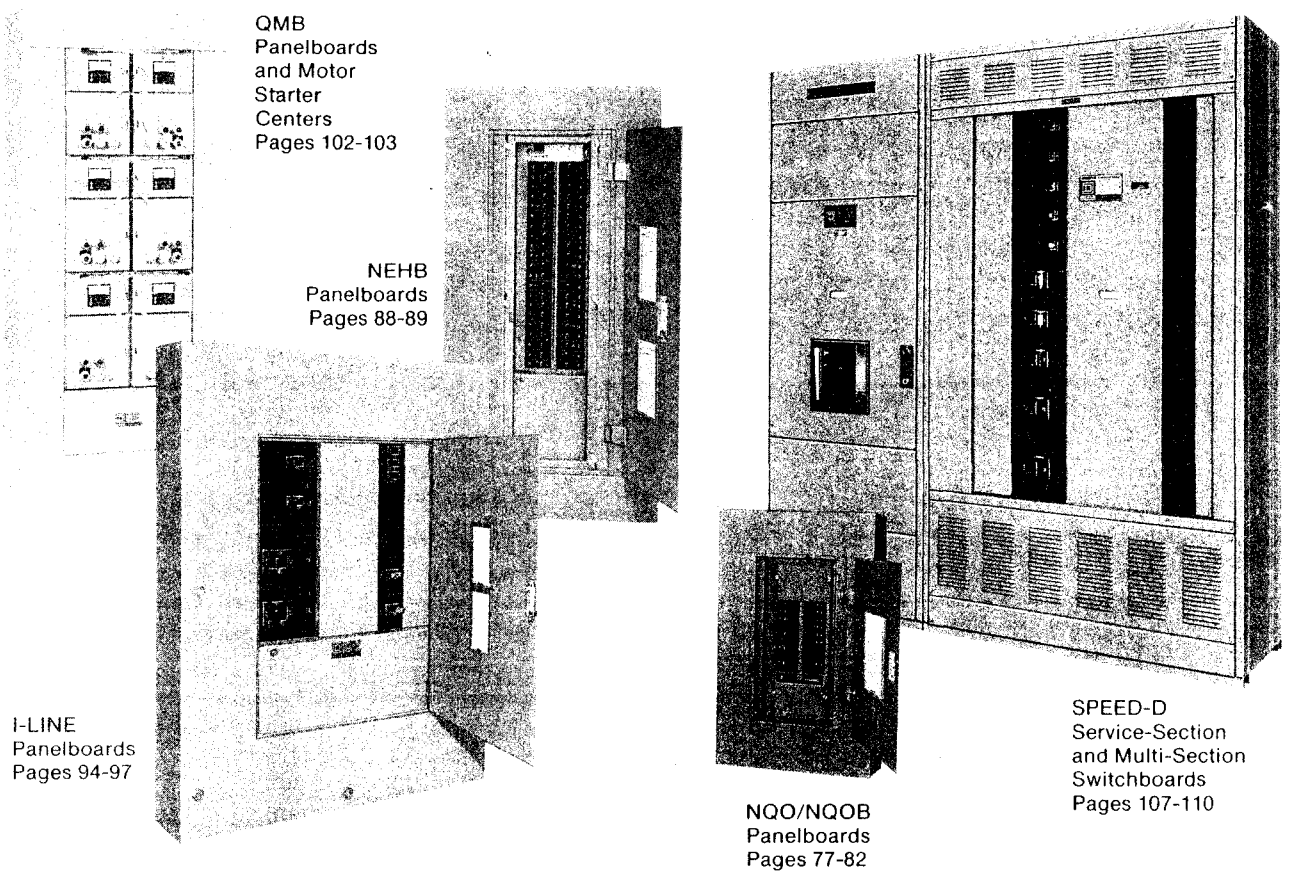
UL Listed—AL or CU wire

UL Listed—SWD (switching duty), 15 and 20 ampere single pole FY, QO, QOB, EH and EHB branch breakers plug-on or bolt-on construction

VISI-TRIP—Trip Indication available on all QO, QOB, Q1, Q1B, Q2, EH and EHB breakers

For Use on the Following Voltage Systems

Device	120/208V.	120/240V.	240V.	277/480V.	480V.	600V.	125V. 250V. DC
NQO	X	X	X	—	—	—	—
NQOB	X	X	X	—	—	—	—
NEHB	X	X	X	X	—	—	—
I-LINE	X	X	X	X	X	X	X
QMB	X	X	X	X	X	X	X
SPEED-D Switchboard	X	X	X	X	X	X	—
SPEED-D Motor Starter Center	X	X	X	X	X	X	—



QMB Panelboards and Motor Starter Centers Pages 102-103

NEHB Panelboards Pages 88-89

I-LINE Panelboards Pages 94-97

NQO/NQOB Panelboards Pages 77-82

SPEED-D Service-Section and Multi-Section Switchboards Pages 107-110

QO, VISI-TRIP, I-LINE, QMB and SPEED-D are Registered Trademarks of Square D Company

and they're in stock

SQD SLV_000853

PANELBOARDS AND MOTOR STARTER CENTERS

INDEX AND SELECTION

NOTE: For complete circuit breaker interrupting ratings and Federal Specifications refer to Page 56.

Panelboard Type	Maximum System Voltage	Integrated Equipment Short Circuit Rating RMS Sym. Amps. (UL Listed)	Mains Rating: Main Lugs Only	Mains Rating: Main Circuit Breaker 100A.	225A.	400A.	600A. or 800A.	1200A.	Branch Ratings: Branch (Catalog Prefix)	Ampere Rating	UL Listed Interrupting Rating (RMS Sym. Amps.)	Box Size (Inches)	Page No. Unassembled	Page No. Factory Assembled
CIRCUIT BREAKER PANELBOARDS (Circuit Breaker panelboards meet Federal Specification W-P-115a, Type 1, Class 1.)														
NQO Plug-on	240V. ac	10,000	400A. Max.	Q1B	Q2, KA	LA	..	..	QO, QO-H Q1, Q1-H	15-150	10,000	14W. x 4D. 14W. x 5¾D. 20W. x 5¾D.	77, 78, 79	84, 85
		†22,000		Q1B-VH	..	..	..	..						
		22,000		Q1B-VH	Q2-H, KA	LA	..	..	QO-VH, Q1-VH	15-125	22,000			
		42,000		..	KH	LA	..	..	Q1H	35-125	42,000			
		65,000		..	KH	LH	..	..	QH	15-30	65,000			
		■100,000		IF	IK	..	..	..	QO, QO-H, Q1, Q1-H	15-100	10,000			
NQO-LX Plug-on Column Width	240V. ac	10,000	225A. Max.	Q1L	Q2	..	..	..	QO, QO-H	15-100	10,000	8⅝W. x 5D. 6⅞W. x 5D.	77, 78, 82	84, 85
		22,000		..	Q2-H	..	..	..	QO-VH	15-30	22,000			
		65,000		..	..	..	..	..	QH	15-30	65,000			
NQOB Bolt-on	240V. ac	10,000	600A. Max.	Q1B	Q2, KA	LA	..	..	QOB, QOB-H Q1B, Q1B-H	15-100	10,000	14W. x 4D. 14W. x 5¾D. 20W. x 5¾D.	77, 80, 81	86, 87
		†22,000		Q1B-VH	..	..	..	..						
		22,000		Q1B-VH	Q2-H, KA	LA	..	..	QOB-VH, Q1B-VH	15-100	22,000			
		42,000		..	KH	LA	..	..	Q1HB	35-100	42,000			
		65,000		..	KH	LH	..	..	QHB	15-30	65,000			
		■100,000		IF	IK	..	..	..	QOB, QOB-H Q1B, Q1B-H	15-100	10,000			
NQOB-LX Bolt-on Column Width	240V. ac	10,000	225A. Max.	Q1L	Q2	..	..	..	QOB, QOB-H	15-70	10,000	8⅝W. x 5D. 6⅞W. x 5D.	..	86, 87
		22,000		..	Q2-H	..	..	..	QOB-VH	15-30	22,000			
		65,000		..	..	..	..	..	QHB	15-30	65,000			
NEHB Plug-on or Bolt-on	120/208V. ac	65,000	600A. Max.	FH	KH	LH	..	..	EH, EHB	15-60	65,000	20W. x 5¾D.	88	89
	277/480V. ac	14,000		FA	KA	LA	..	..			14,000			
		■100,000		IF	IK	..	..	..						
NH1B I-LINE	480V. Max. ac	14,000	600A. Max.	FA	KA	LA	..	..	FY, FA	15-100	14,000	26W. x 6½D.	..	90, 91
		25,000		FH	KH	LH	..	..	FH	15-100	25,000			
		35,000		..	KH	LH	..	..	FH	15-30	65,000			
		■100,000		IF	IK	..	..	..	FY, FA	15-100	14,000			
NH1B-LX Column Width	277/480V. ac	★14,000	225A. Max.	FA	KA	..	..	..	FAL	15-50	14,000	8⅝W. x 5D.	..	90, 91
HCN I-LINE	600V. ac 250V. dc	Equal to the lowest interrupting capacity rating at the supply voltage of any circuit breaker installed Limited to: ▲ 65,000 Max. at 240V. ac 35,000 Max. at 480V. ac 25,000 Max. at 600V. ac	600A. Max.	FA or FH	KA or KH	LA or LH	.. .. ..	.. .. ..	FA, FH, FY Q2, Q2-H, Q2H	15-100 110-225	100,000 Max. Refer to Page 56 for complete data	26W. x 6½D.	93, 94, 95, 96, 97	98, 99
HCM I-LINE			800A. Max.	FA or FH	KA or KH	LA or LH	MA or MH	.. ..	FA, FH, FY, IF, Q2 Q2-H, Q2H, KA, KH	15-100 110-225		32W. x 8¼D.		
HCW I-LINE			1200A. Max.	FA or FH	KA or KH	LA or LH	MA or MH	..	FA, FH, FY, IF, Q2 Q2-H, Q2H, KA, KH IK, Q4, LA, LH	15-100 110-225 250-400		41W. x 9½D.		
HCWM I-LINE			1200A. Max.	.. ..	.. ..	.. ..	.. ..	.. ..	FA, FH, FY, IF, Q2 Q2-H, Q2H, KA, KH IK, Q4, LA, LH MA, MH, ME	15-100 110-225 250-400 450-800		41W. x 9½D.		
HCWA I-LINE			..	..	..	..	..	NH				48W. x 14D.		
I-LINE			1200A. Max. Main Circuit Breaker						FA, FH, FY, IF, Q2 Q2-H, Q2H, KA, KH IK, Q4, LA, LH MA, MH, ME	15-100 110-225 250-400 450-800		Refer to Pages 98 & 99 for dimensions	..	98, 99
FUSIBLE PANELBOARDS (Fusible panelboards meet Federal Specification W-P-115a, Type II, Class 1.)														
QMB	600V. ac 250V. dc	200,000 with appropriately rated Class R or J Fuses	1200A. Max.	*600A. Main Switch Maximum					Quick-Make Quick-Break Cart. Fuse	30-200 *400-600	200,000 with appropriately rated Class R or J Fuses	31W. x 10⅞D. 38W. x 14⅞D.	102	104
MOTOR STARTER CENTERS (Distribution and Motor Starter branches may be combined.)														
HCM I-LINE	600V. ac	22,000 Max. refer to page no. at right	400A. Max.	FA	KA	..	..	..	15-225A.—FA, KA Breaker NEMA Size 0-4 Motor Starter			32W. x 8¼D.	100, 101	....
QMB	600V. ac	22,000 Max. refer to page no. at right	1200A. Max.	*600A. Main Switch Maximum					15-225A.—FA, KA Breaker NEMA Size 0-4 Motor Starter			31W. x 10⅞D. 36W. x 14⅞D.	103	105
		100,000 with appropriately rated Class R or J Fuses							30-200A. Fusible Switch NEMA Size 0-4 Motor Starter					

PENDING OBSOLESCENCE

†Applicable to main lug panelboards supplied by a remote Q1(B)-VH circuit breaker or main breaker panelboards with a Q1(B)-VH main.
■ Applicable to main lug panelboards supplied by a remote I-LIMITER circuit breaker or main breaker panelboards with an I-LIMITER main.
★Panelboard short circuit rating not UL listed.
* 800A. main and branch switch also available, not UL listed or short circuit rated.
▲100,000A. Max. at 240V. ac or 480V. ac applicable to I-LIMITER branch circuit breakers.

I-LINE and I-LIMITER are Registered Trademarks of Square D Company.

Additional panelboard features, see Page 106.

SQD SLV_000854

UNASSEMBLED CIRCUIT BREAKER PANELBOARDS

240 V. AC
PLUG-ON AND BOLT-ON

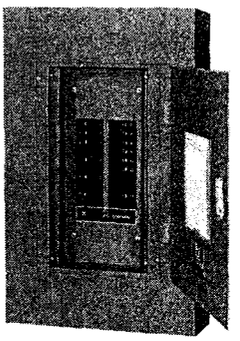
NQO
NQOB

APPLICATION DATA

APPLICATION: For use on ac only. Meet Federal Specification W-P-115a, Type I, Class 1. Listed by Underwriters Laboratories.

SERVICE: 120/240 Volts, 1Ø 3W., ac
◆3Ø, Grd. "B" Ø.
240 Volts, 1Ø 2W., ac
120/208 Volts, 3Ø 4W., ac
240 Volts, 3Ø 3W., ac

I.E.R.: INTEGRATED EQUIPMENT SHORT CIRCUIT RATINGS: See Page 76.



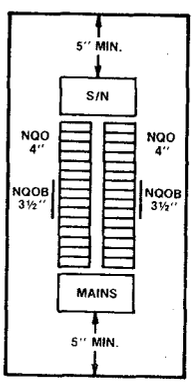
MAINS: Distributed Phase Bussing

Type NQO—Plug-on
Main Lugs:
100A.—1#10-2/0 Cu or 1#6-2/0 Al
225A.—1#6-300 MCM Al or Cu
400A.—2#2/0-500 MCM Al or Cu
Main Breaker: (See Page 56 for interrupting rating)
60A.—Q1B—1#4-1/0 Al or 1#6-1/0 Cu
100A.—Q1B—1#4 1/0 Al or 1#6-1/0 Cu
IF—1#10-1/0 Al or Cu
225A.—Q2 (Optional KA)—1#4-300 MCM Al or Cu
IK—1#4-300 MCM Al or Cu
400A.—LA—1#1-600 MCM or 2#1-250 MCM Al or Cu

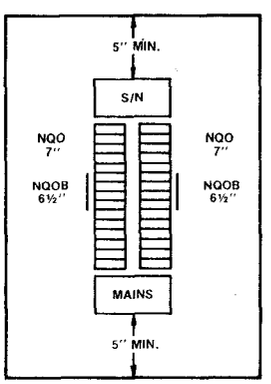
Type NQOB—Bolt-on
Main Lugs:
100A.—1#10-2/0 Cu or 1#6-2/0 Al
225A.—1#6-300 MCM Al or Cu
Main Breaker: (See Page 56 for interrupting rating)
100A.—Q1B—(Optional Q1B-VH)
1#4-1/0 Al or 1#6-1/0 Cu
IF—1#10-1/0 Al or Cu
225A.—Q2 (Optional KA)—1#4-300 MCM Al or Cu
IK—1#4-300 MCM Al or Cu

BRANCHES: Plug-on QO and Q1 and Bolt-on QOB Circuit Breakers, meet Federal Specification W-C-375B, see Page 56 for class numbers.
Plug-on or Bolt-on QWIK-GARD circuit breaker with ground fault circuit interruption.
QO, 1, 2 and 3 Pole—15-30 A.—#8 Al or #10 Cu
QO, 1, 2 and 3 Pole—40-50 A.—#4 Al or #6 Cu
QO, 2 and 3 Pole—60-70 A.—#2 Al or #4 Cu
QO, 2 Pole—80-100A.—#2/0 Al or Cu
▲Q1, 2 and 3 Pole—70-100 A.—#1/0 Al or Cu
▲Q1, 2 Pole—110-125 A.—#1/0 Al or Cu
▲Q1, 2 Pole—150 A.—#4/0 Al or Cu
QOB—15-30 A., 1, 2 and 3 Pole—#8 Al or #10 Cu
QOB—40-50 A., 1, 2 and 3 Pole—#4 Al or #6 Cu
QOB—60-70 A., 2 and 3 Pole—#2 Al or #4 Cu

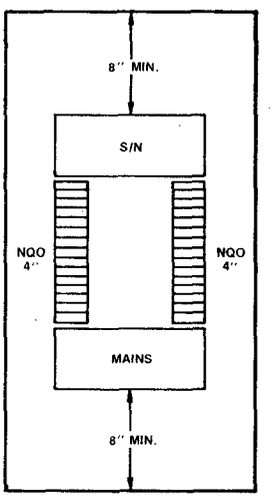
CABINET DATA: **MONO-FLAT** Fronts with concealed trim clamps, door with concealed hinges and flush lock, gray baked enamel finish. Column width has screw cover fronts. Boxes—Galvanized steel with knockouts. Gutters—See below.



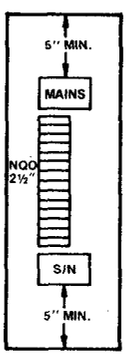
14" Wide Cabinet
Main Lugs—4" or 5¾" Deep
Main Breaker—5¾" Deep Only
225 A. Maximum Mains



20" Wide x 5¾" Deep Cabinet
225 A. Maximum Mains



20" Wide x 5¾" Deep Cabinet
400 A. Mains—NQO Only
(400 A. NQOB available factory assembled only—See Page 87)



8⅝" Wide x 5" Deep Cabinet
Column Width for 10" WF Beams
225 A. Max. Mains
(Column Width NQOB available factory assembled only—See Pages 86 and 87)

NOTE: Interiors are symmetrical and may be mounted for either top or bottom feed. On 225 A. Q2 main breaker devices handle will be inverted when mounted for top feed.

SELECTION PROCEDURE

CIRCUIT BREAKERS—PAGE 78 (QO) OR PAGE 80 (QOB)
NQO INTERIORS, BOXES & FRONTS—PAGE 79
NQOB INTERIORS, BOXES & FRONTS—PAGE 81
COLUMN WIDTH & ALL ACCESSORIES—PAGE 82

1. List Circuit Breakers required, either plug-on or bolt-on. See Pages 78 or 80 for Catalog Numbers.
2. Determine equivalent total number of poles required. (See "Panelboard Space Requirements" table, Pages 78 or 80.)
3. **Interiors, Boxes, Mounting Brackets and Fronts are ordered separately.** Select proper Main Lugs or Main Breaker Interior Catalog Number, based on equivalent total number of poles, from Page 79 (NQO) or Page 81 (NQOB). Interior includes Solid Neutral.
   Column Width NQO Panelboards are ordered as box and interior with solid neutral and Front rather than Interior, Box and Front. Select from page 82.
4. Select Box and Front Catalog Numbers corresponding to Interior Catalog Number from Page 79 or Page 81. Include Mounting Bracket Catalog Number, when required.
   Front Catalog Number must be completed by adding suffix "F" for Flush or "S" for Surface.
5. For complete panelboard price, add the component prices. Include any required accessories from Page 82. Cable Troughs and Pullboxes for use with Column Width Panelboards are listed on Page 82.

◆1Ø 3W Main Lugs panelboards; and 15 thru 30 ampere, two pole, 240 volt, QO-H and QOB-H branch breakers and 35 thru 100 ampere, two pole, Q1-H branch breakers; are UL listed for use on 3Ø, Grounded "B" Ø systems, with 5,000 A.I.C.

▲Q1 breakers cannot be mounted in column width panelboards.

SAMPLE ESTIMATE
120/208 V. AC, 3Ø 4W., FLUSH MOUNT
225 A. MAIN LUGS

No. Req'd	Brkr. Amp.	No. Poles	Catalog Number	Total Poles	Price Each	Total Price
10	20	1	QO-120	10	**$ 8.00**	**$ 80.00**
2	50	3	QO-350	6	**62.00**	**124.00**
1	100	2	QO-2100	2	**51.00**	**51.00**
2	100	3	Q1-3100	12	**94.00**	**188.00**
				30		
			Interior:	NQO-304-2		**$208.00**
			Box (14" Wide):	NQ-28B		**56.00**
			Front:	NQC-28TF		**98.00**
					Total	**$805.00**

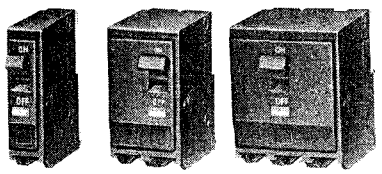
QO, QWIK-GARD and MONO-FLAT are Registered Trademarks of Square D Company.

DE CATALOG REFERENCE: NQO-SECTION 1610, NQOB-SECTION 1620

SQD SLV_000855

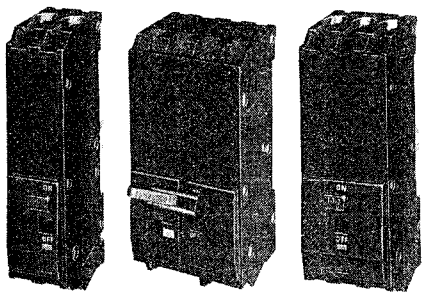
CIRCUIT BREAKERS
FOR NQO PANELBOARDS

QO® PLUG-ON with VISI-TRIP® INDICATOR



1 Pole 2 Pole 3 Pole

Q1 PLUG-ON with VISI-TRIP® INDICATOR



2 Pole 2 Pole—150 A. 3 Pole

Ampere Rating	One Pole—120/240 V. ac		⊹Two Pole—120/240 V. ac		Two Pole—240 V. ac		Three Pole—240 V. ac	
	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price
10,000 AMPERES RMS—UL Listed Interrupting Rating								
10	QO 110	$ 8.00	QO 210	$18.20	.....	....	QO 310	$62.00
15	QO 115	8.00	QO 215	18.20	◆QO 215H	$50.00	QO 315	62.00
15	‡QO 115HM	8.00	.....	....	.....	....	.....	....
20	QO 120	8.00	QO 220	18.20	◆QO 220H	50.00	QO 320	62.00
20	‡QO 120HM	8.00	.....	....	.....	....	.....	....
25	QO 125	8.00	QO 225	18.20	◆QO 225H	50.00	QO 325	62.00
30	QO 130	8.00	QO 230	18.20	◆QO 230H	50.00	QO 330	62.00
35	QO 135	8.00	QO 235	18.20	◆Q1 235H	50.00	QO 335	62.00
40	QO 140	8.00	QO 240	18.20	◆Q1 240H	50.00	QO 340	62.00
45	QO 145	8.00	QO 245	18.20	◆Q1 245H	50.00	QO 345	62.00
50	QO 150	8.00	QO 250	18.20	◆Q1 250H	50.00	QO 350	62.00
60	QO 160	8.00	QO 260	18.20	◆Q1 260H	50.00	QO 360	62.00
70	QO 170	17.40	QO 270	37.00	◆Q1 270H	58.00	Q1 370	81.00
80	.....	....	QO 280	51.00	◆Q1 280H	83.00	Q1 380	94.00
90	.....	....	QO 290	51.00	◆Q1 290H	83.00	Q1 390	94.00
100	.....	....	QO 2100	51.00	◆Q1 2100H	83.00	Q1 3100	94.00
110	.....	....	Q1 2110	110.00	.....	....	.....	....
125	.....	....	Q1 2125	110.00	.....	....	.....	....
150	.....	....	Q1 2150	110.00	.....	....	.....	....

‡High magnetic trip breakers. ◆UL listed for use on 3 ∅, grounded B∅ systems with 5000 AIC.

22,000 AMPERES RMS—UL Listed Interrupting Rating								
15	QO 115VH	$15.60	QO 215VH	$37.00	.....	....	QO 315VH	$95.00
20	QO 120VH	15.60	QO 220VH	37.00	.....	....	QO 320VH	95.00
25	QO 125VH	18.10	QO 225VH	37.00	.....	....	QO 325VH	95.00
30	QO 130VH	18.10	QO 230VH	37.00	.....	....	QO 330VH	95.00
35	.....	....	•Q1 235VH	37.00	.....	....	•Q1 335VH	95.00
40	.....	....	•Q1 240VH	37.00	.....	....	•Q1 340VH	95.00
45	.....	....	•Q1 245VH	37.00	.....	....	•Q1 345VH	95.00
50	.....	....	•Q1 250VH	37.00	.....	....	•Q1 350VH	95.00
60	.....	....	•Q1 260VH	37.00	.....	....	•Q1 360VH	95.00
70	.....	....	•Q1 270VH	58.00	.....	....	•Q1 370VH	121.00
80	.....	....	•Q1 280VH	83.00	.....	....	•Q1 380VH	134.00
90	.....	....	•Q1 290VH	83.00	.....	....	•Q1 390VH	134.00
100	.....	....	•Q1 2100VH	83.00	.....	....	•Q1 3100VH	134.00
110	.....	....	•Q1 2110VH	267.00	.....	....	.....	....
125	.....	....	•Q1 2125VH	267.00	.....	....	.....	....

•UL listed for use ahead of QO & Q1 10,000 AIC breakers to permit their application at 22,000 ampere fault levels.
⊹42,000 AIC, 2 pole 120/240V. breakers also available. See page 2 for listing.

65,000 AMPERES RMS (Sym.) 75,000 AMPERES RMS (Asym.)—UL Listed Interrupting Rating, Identification—Gray Handle.								
15	QH 115	$29.00	QH 215	$74.00	.....	....	QH 315	$129.00
20	QH 120	29.00	QH 220	74.00	.....	....	QH 320	129.00
25	QH 125	29.00	QH 225	74.00	.....	....	QH 325	129.00
30	QH 130	29.00	QH 230	74.00	.....	....	QH 330	129.00

Qwik-Gard

CIRCUIT BREAKER WITH GROUND FAULT CIRCUIT INTERRUPTER

10,000 AIC—UL Listed
Class A



10,000 AMPERES RMS (Sym.)—UL Listed Interrupting Rating

Ampere Rating	One Pole—120 V. ac		Two Pole—120/240 V. ac	
	Catalog No.	Price	Catalog No.	Price
15	QO 115GFI	$68.00	QO 215GFI	$120.00
20	QO 120GFI	68.00	QO 220GFI	120.00
25	QO 125GFI	68.00	QO 225GFI	120.00
30	QO 130GFI	68.00	QO 230GFI	120.00

22,000 AMPERES RMS (Sym.)—UL Listed Interrupting Rating

15	QO 115VHGFI	$136.00	.....	.....
20	QO 120VHGFI	136.00	.....	.....

KEY OPERATED QO
10,000 AIC—UL Listed, One Pole—120 V. ac

Catalog No.	Price
QO 115K	$10.40
QO 120K	10.40
QO 125K	10.40
QO 130K	10.40

FACTORY INSTALLED ACCESSORIES—UL LISTED
For Additional Information, Refer to Page 67

One Additional Pole Space Required Max. One Accessory Per Breaker	Available On	Add Suffix	Wire Range	Price Adder
Shunt Trip 120 to 240 V. ac, 50/60 Hz	QO, Q1	-1021	(2) 14-12CU	$47.00
Auxiliary Switch "A" Contact	QO, GFI, Q1	-1200		33.00
Auxiliary Switch "B" Contact	QO, GFI	-2201		33.00
Alarm Switch	QO, GFI	-2100		33.00

TWO AND THREE WIRE SWITCH NEUTRAL BREAKERS—See Page 3.

CIRCUIT BREAKER INTERRUPTING RATING—See Page 56.

QWIK-GARD is a Registered Trademark of Square D Company.

PANELBOARD SPACE REQUIREMENTS—No. of QO 1 Pole Spaces

Maximum Panelboard Mains Rating	QO			Q1		
	1P	2P	3P	2P		3P
				35-125 A.	150 A.	
225	1	2	3	4	8	6
400	1	2	3	2	4	3

SQD SLV_000856

UNASSEMBLED CIRCUIT BREAKER PANELBOARDS

STANDARD WIDTH

240 V. AC PLUG-ON **NQO**

INTERIORS (with solid neutral) AND NEMA 1 OR NEMA 3R/12 ENCLOSURES

Max. No. of One Pole QO Brkrs.	Mains Rating	Total Price Interior Mounting Bracket and Enclosure NEMA 1	Total Price Interior Mounting Bracket and Enclosure NEMA 3R/12	Interior Only (Order branch breakers separately) Cat. No.	Interior Only Price	NEMA 1 ENCLOSURE H	NEMA 1 ENCLOSURE D	Box Cat. No.	Box Price	MONO-FLAT Front ★ Cat. No.	MONO-FLAT Front ★ Price	Interior Mounting Bracket (Required for all 20" wide) Cat. No.	Interior Mounting Bracket Price	NEMA 3R/12 ENCLOSURE Enclosure 20" W. x 6½" D. H	Enclosure Cat. No.	Enclosure Price	Interior Trim Kit Cat. No.	Interior Trim Kit Price
20" WIDE CABINET																		
Main Lugs Only										**1 PHASE 3 WIRE**								
12	100	$ 258.	$ 620.	NQO-123	$106.	23	5¾	MH-23	$47.	MSC-23T ★	$ 72.	NQL-25	$33.	23	MH-23-WP	$445.	NQ-23-MSK	$36.
20	100	300.	661.	NQO-203-1	139.	26	5¾	MH-26	48.	MSC-26T ★	80.	NQL-25	33.	26	MH-26-WP	453.	NQ-26-MSK	36.
20	225	313.	674.	NQO-203-2	152.	26	5¾	MH-26	48.	MSC-26T ★	80.	NQL-25	33.	26	MH-26-WP	453.	NQ-26-MSK	36.
30	225	348.	709.	NQO-303	167.	29	5¾	MH-29	50.	MSC-29T ★	98.	NQL-25	33.	29	MH-29-WP	471.	NQ-29-MSK	38.
42	225	403.	764.	NQO-423	205.	35	5¾	MH-35	64.	MSC-35T ★	101.	NQL-25	33.	35	MH-35-WP	487.	NQ-35-MSK	39.
*54	225	468.	827.	NQO-543	234.	38	5¾	MH-38	84.	MSC-38T ★	117.	NQL-25	33.	38	MH-38-WP	519.	NQ-38-MSK	41.
30	400	468.	816.	NQO-303-4	253.	38	5¾	MH-38	84.	MDC-38T ★	131.	.....	...	38	MH-38-WP	519.	NQ-38-MDK	44.
42	400	519.	861.	NQO-423-4	291.	41	5¾	MH-41	90.	MDC-41T ★	138.	.....	...	41	MH-41-WP	525.	NQ-41-MDK	45.
Standard Main Breaker—2 Pole																		
12	100	$ 399.	$ 760.	NQO-123M	$238.	26	5¾	MH-26	$48.	MSC-26T ★	$ 80.	NQM-25	$33.	26	MH-26-WP	$453.	NQ-26-MSK	$36.
20	100	435.	796.	NQO-203M	254.	29	5¾	MH-29	50.	MSC-29T ★	98.	NQM-25	33.	29	MH-29-WP	471.	NQ-29-MSK	38.
30	†225	947.	1306.	NQO-303M	713.	38	5¾	MH-38	84.	MSC-38T ★	117.	NQM-25	33.	38	MH-38-WP	519.	NQ-38-MSK	41.
42	†225	993.	1355.	NQO-423M	747.	44	5¾	MH-44	93.	MSC-44T ★	120.	NQM-25	33.	44	MH-44-WP	531.	NQ-44-MSK	44.
*54	†225	1055.	1414.	NQO-543M	778.	50	5¾	MH-50	111.	MSC-50T ★	133.	NQM-25	33.	50	MH-50-WP	558.	NQ-50-MSK	45.
30	400	1514.	1856.	NQO-303-4M	1251.	50	5¾	MH-50	111.	MDC-50T ★	152.	.....	...	50	MH-50-WP	558.	NQ-50-MDK	47.
42	400	1563.	1924.	NQO-423-4M	1282.	53	5¾	MH-53	113.	MDC-53T ★	168.	.....	...	53	MH-53-WP	594.	NQ-53-MDK	48.
I-LIMITER Main Breaker—2 Pole																		
12	100	$1091.	$1452.	NQO-123MIF	$910.	29	5¾	MH-29	$50.	MSC-29T ★	$ 98.	NQM-25	$33.	29	MH-29-WP	$471.	NQ-29-MSK	$38.
20	100	1139.	1500.	NQO-203MIF	941.	35	5¾	MH-35	64.	MSC-35T ★	101.	NQM-25	33.	35	MH-35-WP	487.	NQ-35-MSK	39.
30	225	1958.	2300.	NQO-303MIK	1695.	50	5¾	MH-50	111.	MDC-50T ★	152.	.....	...	50	MH-50-WP	558.	NQ-50-MDK	47.
42	225	2007.	2368.	NQO-423MIK	1726.	53	5¾	MH-53	113.	MDC-53T ★	168.	.....	...	53	MH-53-WP	594.	NQ-53-MDK	48.
Main Lugs Only										**3 PHASE 4 WIRE**								
12	100	$ 288.	$ 650.	NQO-124	$136.	23	5¾	MH-23	$47.	MSC-23T ★	$ 72.	NQL-25	$33.	23	MH-23-WP	$445.	NQ-23-MSK	$36.
20	100	330.	691.	NQO-204	169.	26	5¾	MH-26	48.	MSC-26T ★	80.	NQL-25	33.	26	MH-26-WP	453.	NQ-26-MSK	36.
30	100	365.	726.	NQO-304-1	184.	29	5¾	MH-29	50.	MSC-29T ★	98.	NQL-25	33.	29	MH-29-WP	471.	NQ-29-MSK	38.
30	225	389.	750.	NQO-304-2	208.	29	5¾	MH-29	50.	MSC-29T ★	98.	NQL-25	33.	29	MH-29-WP	471.	NQ-29-MSK	38.
42	225	444.	805.	NQO-424	246.	35	5¾	MH-35	64.	MSC-35T ★	101.	NQL-25	33.	35	MH-35-WP	487.	NQ-35-MSK	39.
*54	225	509.	868.	NQO-544	275.	38	5¾	MH-38	84.	MSC-38T ★	117.	NQL-25	33.	38	MH-38-WP	519.	NQ-38-MSK	41.
30	400	515.	863.	NQO-304-4	300.	38	5¾	MH-38	84.	MDC-38T ★	131.	.....	...	38	MH-38-WP	519.	NQ-38-MDK	44.
42	400	564.	906.	NQO-424-4	336.	41	5¾	MH-41	90.	MDC-41T ★	138.	.....	...	41	MH-41-WP	525.	NQ-41-MDK	45.
Standard Main Breaker—3 Pole																		
12	60	$ 427.	$ 788.	NQO-124M	$266.	26	5¾	MH-26	$48.	MSC-26T ★	$ 80.	NQM-25	$33.	26	MH-26-WP	$453.	NQ-26-MSK	$36.
20	100	515.	876.	NQO-204M	334.	29	5¾	MH-29	50.	MSC-29T ★	98.	NQM-25	33.	29	MH-29-WP	471.	NQ-29-MSK	38.
30	100	562.	923.	NQO-304M	364.	35	5¾	MH-35	64.	MSC-35T ★	101.	NQM-25	33.	35	MH-35-WP	487.	NQ-35-MSK	39.
42	†225	1159.	1521.	NQO-424M	913.	44	5¾	MH-44	93.	MSC-44T ★	120.	NQM-25	33.	44	MH-44-WP	531.	NQ-44-MSK	44.
*54	†225	1221.	1580.	NQO-544M	944.	50	5¾	MH-50	111.	MSC-50T ★	133.	NQM-25	33.	50	MH-50-WP	558.	NQ-50-MSK	45.
30	400	1725.	2067.	NQO-304-4M	1462.	50	5¾	MH-50	111.	MDC-50T ★	152.	.....	...	50	MH-50-WP	558.	NQ-50-MDK	47.
42	400	1774.	2135.	NQO-424-4M	1493.	53	5¾	MH-53	113.	MDC-53T ★	168.	.....	...	53	MH-53-WP	594.	NQ-53-MDK	48.
I-LIMITER Main Breaker—3 Pole																		
12	100	$1295.	$1656.	NQO-124MIF	1114.	29	5¾	MH-29	$50.	MSC-29T ★	$ 98.	NQM-25	$33.	29	MH-29-WP	$471.	NQ-29-MSK	$38.
20	100	1343.	1704.	NQO-204MIF	1145.	35	5¾	MH-35	64.	MSC-35T ★	101.	NQM-25	33.	35	MH-35-WP	487.	NQ-35-MSK	39.
30	100	1400.	1759.	NQO-304MIF	1166.	38	5¾	MH-38	84.	MSC-38T ★	117.	NQM-25	33.	38	MH-38-WP	519.	NQ-38-MSK	41.
42	225	2422.	2783.	NQO-424MIK	2141.	53	5¾	MH-53	113.	MDC-53T ★	168.	.....	...	53	MH-53-WP	594.	NQ-53-MDK	48.
14" WIDE CABINET																		
Main Lugs Only										**1 PHASE 3 WIRE**								
12	100	$ 225.	.....	NQO-123	$106.	20¼	●4	NQ-20B	$47.	NQC-20T ★	$ 72.							
20	100	267.	.....	NQO-203-1	139.	24¼	●4	NQ-24B	48.	NQC-24T ★	80.							
20	225	280.	.....	NQO-203-2	152.	24¼	●4	NQ-24B	48.	NQC-24T ★	80.							
30	225	321.	.....	NQO-303	167.	28	●4	NQ-28B	56.	NQC-28T ★	98.							
42	225	370.	.....	NQO-423	205.	32½	●4	NQ-32B	64.	NQC-32T ★	101.							
*54	225	419.	.....	NQO-543	234.	37¾	●4	NQ-37B	68.	NQC-37T ★	117.							
Standard Main Breaker—2 Pole																		
12	100	$ 366.	.....	NQO-123M	$238.	24¼	5¾	NQ-524B	$48.	NQC-24T ★	$ 80.							
20	100	408.	.....	NQO-203M	254.	28	5¾	NQ-528B	56.	NQC-28T ★	98.							
30	†225	898.	.....	NQO-303M	713.	37¾	5¾	NQ-537B	68.	NQC-37T ★	117.							
42	†225	947.	.....	NQO-423M	747.	42¼	5¾	NQ-542B	80.	NQC-42T ★	120.							
*54	†225	996.	.....	NQO-543M	778.	48¼	5¾	NQ-548B	87.	NQC-48T ★	131.							
I-LIMITER Main Breaker—2 Pole																		
12	100	$1064.	.....	NQO-123MIF	$910.	28	5¾	NQ-528B	$56.	NQC-28T ★	$ 98.							
20	100	1106.	.....	NQO-203MIF	941.	32½	5¾	NQ-532B	64.	NQC-32T ★	101.							
Main Lugs Only										**3 PHASE 4 WIRE**								
12	100	$ 255.	.....	NQO-124	$136.	20¼	●4	NQ-20B	$47.	NQC-20T ★	$ 72.							
20	100	297.	.....	NQO-204	169.	24¼	●4	NQ-24B	48.	NQC-24T ★	80.							
30	100	338.	.....	NQO-304-1	184.	28	●4	NQ-28B	56.	NQC-28T ★	98.							
30	225	362.	.....	NQO-304-2	208.	28	●4	NQ-28B	56.	NQC-28T ★	98.							
42	225	411.	.....	NQO-424	246.	32½	●4	NQ-32B	64.	NQC-32T ★	101.							
*54	225	460.	.....	NQO-544	275.	37¾	●4	NQ-37B	68.	NQC-37T ★	117.							
Standard Main Breaker—3 Pole																		
12	60	$ 394.	.....	NQO-124M	$266.	24¼	5¾	NQ-524B	$48.	NQC-24T ★	$ 80.							
20	100	488.	.....	NQO-204M	334.	28	5¾	NQ-528B	56.	NQC-28T ★	98.							
30	100	529.	.....	NQO-304M	364.	32½	5¾	NQ-532B	64.	NQC-32T ★	101.							
42	†225	1113.	.....	NQO-424M	913.	42¼	5¾	NQ-542B	80.	NQC-42T ★	120.							
*54	†225	1162.	.....	NQO-544M	944.	48¼	5¾	NQ-548B	87.	NQC-48T ★	131.							
I-LIMITER Main Breaker—3 Pole																		
12	100	$1268.	.....	NQO-124MIF	1114.	28	5¾	NQ-528B	$56.	NQC-28T ★	$ 98.							
20	100	1310.	.....	NQO-204MIF	1145.	32½	5¾	NQ-532B	64.	NQC-32T ★	101.							
30	100	1351.	.....	NQO-304MIF	1166.	37¾	5¾	NQ-537B	68.	NQC-37T ★	117.							

*Refer to 42 Circuit Rule—NEC Article 384-14 and 384-15.
†Q2 Main Breaker is standard, for KA Main Breaker add $48. to price above and -KA suffix to interior catalog number.
●5¾" Deep Box may also be used, but requires NQL-15 mounting bracket at $33.
★Add "F" for Flush, "S" for Surface.

CIRCUIT BREAKER QUICK-PRICE TABLE

For NQO Panelboards Only

B1-1 DISCOUNT

No. of Brkrs.	QO 1 Pole 120/240 V. 15-60 A.	QO 2 Pole ▲120/240 V. 15-60 A.	QO 3 Pole 240 V. 15-60 A.	Q1 2 Pole 120/240 V. 80-100 A.	Q1 3 Pole 240 V. 80-100 A.
1	$ 8.00	$ 18.20	$ 62.	$ 51.	$ 94.
2	16.00	36.40	124.	102.	188.
3	24.00	54.60	186.	153.	282.
4	32.00	72.80	248.	204.	376.
5	40.00	91.00	310.	255.	470.
6	48.00	109.20	372.	306.	564.
7	56.00	127.40	434.	357.	658.
8	64.00	145.60	496.	408.	752.
9	72.00	163.80	558.	459.	846.
10	80.00	182.00	620.	510.	940.
11	88.00	200.20	682.	561.	1034.
12	96.00	218.40	744.	612.	1128.
13	104.00	236.60	806.	663.	1222.
14	112.00	254.80	868.	714.	1316.
15	120.00	273.00	930.	765.	1410.
16	128.00	291.20	992.	816.	1504.
17	136.00	309.40	1054.	867.	1598.
18	144.00	327.60	1116.	918.	1692.
19	152.00	345.80	1178.	969.	1786.
20	160.00	364.00	1240.	1020.	1880.
21	168.00	382.20	1302.	1071.	1974.

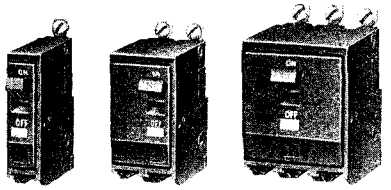
▲Prices shown do not apply to QO, 70 ampere, 1 or 2 pole, 120/240V. and QO-H 15-30 ampere, 2 pole, 240V. branch breakers and QO 80-100 ampere, 2 pole, 120/240V. branch breakers.

QO, I-LIMITER and MONO-FLAT are Registered Trademarks of Square D Company.

SQD SLV_000857

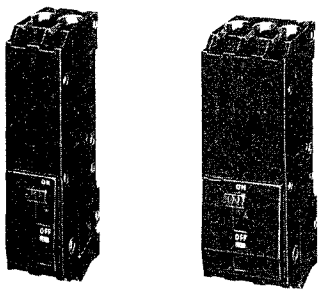
CIRCUIT BREAKERS
FOR NQOB PANELBOARDS

QOB BOLT-ON with VISI-TRIP® INDICATOR



1 Pole 2 Pole 3 Pole

Q1B BOLT-ON with VISI-TRIP® INDICATOR



2 Pole 3 Pole

Ampere Rating	One Pole 120/240 V. ac		✣Two Pole 120/240 V. ac		Two Pole 240 V. ac		Three Pole 240 V. ac	
	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price
10,000 AMPERES RMS—UL Listed Interrupting Rating								
10	QOB 110	**$ 9.50**	QOB 210	**$21.20**	.....	....	QOB 310	**$ 67.00**
15	QOB 115	**9.50**	QOB 215	**21.20**	◆QOB 215H	**53.00**	QOB 315	**67.00**
15	‡QOB 115HM	**9.50**	.....	....	.....	....	.....	....
20	QOB 120	**9.50**	QOB 220	**21.20**	◆QOB 220H	**53.00**	QOB 320	**67.00**
20	‡QOB 120HM	**9.50**	.....	....	.....	....	.....	....
25	QOB 125	**9.50**	QOB 225	**21.20**	◆QOB 225H	**53.00**	QOB 325	**67.00**
30	QOB 130	**9.50**	QOB 230	**21.20**	◆QOB 230H	**53.00**	QOB 330	**67.00**
35	QOB 135	**9.50**	QOB 235	**21.20**	◆Q1B 235H	**65.00**	QOB 335	**67.00**
40	QOB 140	**9.50**	QOB 240	**21.20**	◆Q1B 240H	**65.00**	QOB 340	**67.00**
45	QOB 145	**9.50**	QOB 245	**21.20**	◆Q1B 245H	**65.00**	QOB 345	**67.00**
50	QOB 150	**9.50**	QOB 250	**21.20**	◆Q1B 250H	**65.00**	QOB 350	**67.00**
60	QOB 160	**9.50**	QOB 260	**21.20**	◆Q1B 260H	**65.00**	QOB 360	**67.00**
70	QOB 170	**18.90**	QOB 270	**40.00**	◆Q1B 270H	**73.00**	Q1B 370	**98.00**
80	.....	....	Q1B 280	**66.00**	◆Q1B 280H	**98.00**	Q1B 380	**111.00**
90	.....	....	Q1B 290	**66.00**	◆Q1B 290H	**98.00**	Q1B 390	**111.00**
100	.....	....	Q1B 2100	**66.00**	◆Q1B 2100H	**98.00**	Q1B 3100	**111.00**

‡High magnetic trip breakers. ◆UL listed for use on 3∅, grounded B∅ systems with 5000 AIC.

22,000 AMPERES RMS—UL Listed Interrupting Rating								
15	QOB 115VH	**$17.10**	QOB 215VH	**$40.00**	.....	....	QOB 315VH	**$100.00**
20	QOB 120VH	**17.10**	QOB 220VH	**40.00**	.....	....	QOB 320VH	**100.00**
25	QOB 125VH	**19.60**	QOB 225VH	**40.00**	.....	....	QOB 325VH	**100.00**
30	QOB 130VH	**19.60**	QOB 230VH	**40.00**	.....	....	QOB 330VH	**100.00**
35	.....	....	•Q1B 235VH	**52.00**	.....	....	•Q1B 335VH	**112.00**
40	.....	....	•Q1B 240VH	**52.00**	.....	....	•Q1B 340VH	**112.00**
45	.....	....	•Q1B 245VH	**52.00**	.....	....	•Q1B 345VH	**112.00**
50	.....	....	•Q1B 250VH	**52.00**	.....	....	•Q1B 350VH	**112.00**
60	.....	....	•Q1B 260VH	**52.00**	.....	....	•Q1B 360VH	**112.00**
70	.....	....	•Q1B 270VH	**73.00**	.....	....	•Q1B 370VH	**138.00**
80	.....	....	•Q1B 280VH	**98.00**	.....	....	•Q1B 380VH	**151.00**
90	.....	....	•Q1B 290VH	**98.00**	.....	....	•Q1B 390VH	**151.00**
100	.....	....	•Q1B 2100VH	**98.00**	.....	....	•Q1B 3100VH	**151.00**

•UL listed for use ahead of QO & Q1 10,000 AIC breakers to permit their application at 22,000 ampere fault levels.
✣42,000 AIC, 2 pole 120/240V. breakers also available.

65,000 AMPERES RMS (Sym.) 75,000 AMPERES RMS (Asym.)—UL Listed Interrupting Rating, Identification—Gray Handle.								
15	QHB 115	**$31.00**	QHB 215	**$77.00**	.....	....	QHB 315	**$134.00**
20	QHB 120	**31.00**	QHB 220	**77.00**	.....	....	QHB 320	**134.00**
25	QHB 125	**31.00**	QHB 225	**77.00**	.....	....	QHB 325	**134.00**
30	QHB 130	**31.00**	QHB 230	**77.00**	.....	....	QHB 330	**134.00**

Qwik-Gard

CIRCUIT BREAKER WITH GROUND FAULT CIRCUIT INTERRUPTER

10,000 AIC—UL Listed
Class A



10,000 AMPERES RMS (Sym.)—UL Listed Interrupting Rating

Ampere Rating	One Pole—120 V. ac		Two Pole—120/240 V. ac	
	Catalog No.	Price	Catalog No.	Price
15	QOB 115GFI	**$68.00**	QOB 215GFI	**$120.00**
20	QOB 120GFI	**68.00**	QOB 220GFI	**120.00**
25	QOB 125GFI	**68.00**	QOB 225GFI	**120.00**
30	QOB 130GFI	**68.00**	QOB 230GFI	**120.00**

22,000 AMPERES RMS (Sym.)—UL Listed Interrupting Rating

15	QOB 115HGFI	**$136.00**	.....	.....
20	QOB 120VHGFI	**136.00**	.....	.....

KEY OPERATED QOB
10,000 AIC—UL Listed, One Pole—120 V. ac

Catalog No.	Price
QOB 115K	**$11.90**
QOB 120K	**11.90**
QOB 125K	**11.90**
QOB 130K	**11.90**

FACTORY INSTALLED ACCESSORIES—UL LISTED
For Additional Information, Refer to Page 67

One Additional Pole Space Required Max. One Accessory Per Breaker	Available On	Add Suffix	Wire Range	Price Adder
Shunt Trip—120 to 240 V. ac—50/60 Hz	QOB, Q1B	**-1021**	(2) 14-12CU	**$47.00**
Auxiliary Switch "A" Contact	QOB, GFI, Q1B	**-1200**		**33.00**
Auxiliary Switch "B" Contact	QOB, GFI	**-1201**		**33.00**
Alarm Switch	QOB, GFI	**-2100**		**33.00**

Switch Neutral—NEC 514-5
Common Trip—10,000 AIC

2 Wire—120 V. ac		3 Wire—120/240 V. ac	
Catalog No.	Price	Catalog No.	Price
QOB 215SWN	**$27.00**	QOB 315SWN	**$41.00**
QOB 220SWN	**27.00**	QOB 320SWN	**41.00**
QOB 230SWN	**27.00**	QOB 330SWN	**41.00**
QOB 240SWN	**27.00**	.....	.....
QOB 250SWN	**27.00**	.....	.....

PANELBOARD SPACE REQUIREMENTS—No. of QOB 1 Pole Spaces

Maximum Panelboard Mains Rating	QOB			Q1B	
	1 P	2 P	3 P	2 P	3 P
225	1	2	3	4	6
400	1	2	3	2	3

CIRCUIT BREAKER INTERRUPTING RATING—See Page 56.

QWIK-GARD is a Registered Trademark of Square D Company.

SQD SLV_000858

UNASSEMBLED CIRCUIT BREAKER PANELBOARDS

◐STANDARD WIDTH

BOLT-ON 240 V. AC **NQOB**

INTERIORS (with solid Neutral) AND NEMA 1 OR NEMA 3R/12 ENCLOSURES

Max. No. of One Pole QOB Brkrs.	Mains Rating	Total Price Interior Mounting Bracket and Enclosure		Interior Only (Order branch breakers separately)		NEMA 1 ENCLOSURE						Interior Mounting Bracket (Required for all 20" wide)		NEMA 3R/12 ENCLOSURE				
								Box		MONO-FLAT Front ★				Enclosure 20" W. x 6½" D.			Interior Trim Kit	
		NEMA 1	NEMA 3R/12	Cat. No.	Price	H	D	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	H	Cat. No.	Price	Cat. No.	Price
20" WIDE CABINET																		
Main Lugs Only									**1 PHASE 3 WIRE**									
12	100	$ 258.	$ 620.	NQOB-123	$106.	23	5¾	MH-23	$47.	MSC-23T ★	$72.	NQM-25	$33.	23	MH-23-WP	$445.	NQ-23-MSK	$36.
20	100	300.	661.	NQOB-203-1	139.	26	5¾	MH-26	48.	MSC-26T ★	80.	NQM-25	33.	26	MH-26-WP	453.	NQ-26-MSK	36.
20	225	313.	674.	NQOB-203-2	152.	26	5¾	MH-26	48.	MSC-26T ★	80.	NQM-25	33.	26	MH-26-WP	453.	NQ-26-MSK	36.
30	225	348.	709.	NQOB-303	167.	29	5¾	MH-29	50.	MSC-29T ★	98.	NQM-25	33.	29	MH-29-WP	471.	NQ-29-MSK	38.
42	225	403.	764.	NQOB-423	205.	35	5¾	MH-35	64.	MSC-35T ★	101.	NQM-25	33.	35	MH-35-WP	487.	NQ-35-MSK	39.
Standard Main Breaker—2 Pole																		
8	100	$ 384.	$ 746.	NQOB-083M	$232.	23	5¾	MH-23	$47.	MSC-23T ★	$72.	NQM-25	$33.	23	MH-23-WP	$445.	NQ-23-MSK	$36.
16	100	416.	777.	NQOB-163M	255.	26	5¾	MH-26	48.	MSC-26T ★	80.	NQM-25	33.	26	MH-26-WP	453.	NQ-26-MSK	36.
20	100	435.	796.	NQOB-203M	254.	29	5¾	MH-29	50.	MSC-29T ★	98.	NQM-25	33.	29	MH-29-WP	471.	NQ-29-MSK	38.
30	†225	947.	1306.	NQOB-303M	713.	38	5¾	MH-38	84.	MSC-38T ★	117.	NQM-25	33.	38	MH-38-WP	519.	NQ-38-MSK	41.
42	†225	993.	1355.	NQOB-423M	747.	44	5¾	MH-44	93.	MSC-44T ★	120.	NQM-25	33.	41	MH-44-WP	531.	NQ-44-MSK	44.
I-LIMITER Main Breaker—2 Pole																		
12	100	$1091.	$1452.	NQOB-123MIF	$910.	29	5¾	MH-29	$50.	MSC-29T ★	$98.	NQM-25	$33.	29	MH-29-WP	$471.	NQ-29-MSK	$38.
20	100	1139.	1500.	NQOB-203MIF	941.	35	5¾	MH-35	64.	MSC-35T ★	101.	NQM-25	33.	35	MH-35-WP	487.	NQ-35-MSK	39.
30	225	1958.	2300.	NQOB-303MIK	1695.	50	5¾	MH-50	111.	MSC-50T ★	152.	.....	...	50	MH-50-WP	558.	NQ-50-MDK	45.
42	225	2007.	2368.	NQOB-423MIK	1726.	53	5¾	MH-53	113.	MSC-53T ★	168.	.....	...	53	MH-53-WP	594.	NQ-53-MDK	48.
Main Lugs Only									**3 PHASE 4 WIRE**									
12	100	$ 288.	$ 650.	NQOB-124	$136.	23	5¾	MH-23	$47.	MSC-23T ★	$72.	NQM-25	$33.	23	MH-23-WP	$445.	NQ-23-MSK	$36.
20	100	330.	691.	NQOB-204	169.	26	5¾	MH-26	48.	MSC-26T ★	80.	NQM-25	33.	26	MH-26-WP	453.	NQ-26-MSK	36.
30	100	365.	726.	NQOB-304-1	184.	29	5¾	MH-29	50.	MSC-29T ★	98.	NQM-25	33.	29	MH-29-WP	471.	NQ-29-MSK	38.
30	225	389.	750.	NQOB-304-2	208.	29	5¾	MH-29	50.	MSC-29T ★	98.	NQM-25	33.	29	MH-29-WP	471.	NQ-29-MSK	38.
42	225	444.	805.	NQOB-424	246.	35	5¾	MH-35	64.	MSC-35T ★	101.	NQM-25	33.	35	MH-35-WP	487.	NQ-35-MSK	39.
Standard Main Breaker—3 Pole																		
14	100	$ 487.	$ 848.	NQOB-144M	$326.	26	5¾	MH-26	$48.	MSC-26T ★	$80.	NQM-25	$33.	26	MH-26-WP	$453.	NQ-26-MSK	$36.
24	100	537.	898.	NQOB-244M	356.	29	5¾	MH-29	50.	MSC-29T ★	98.	NQM-25	33.	29	MH-29-WP	471.	NQ-29-MSK	38.
30	100	562.	923.	NQOB-304M	364.	35	5¾	MH-35	64.	MSC-35T ★	101.	NQM-25	33.	35	MH-35-WP	487.	NQ-35-MSK	39.
42	†225	1159.	1521.	NQOB-424M	913.	44	5¾	MH-44	93.	MSC-44T ★	120.	NQM-25	33.	44	MH-44-WP	531.	NQ-44-MSK	44.
I-LIMITER Main Breaker—3 Pole																		
12	100	$1295.	$1656.	NQOB-124MIF	1114.	29	5¾	MH-29	$50.	MSC-29T ★	$98.	NQM-25	$33.	29	MH-29-WP	$471.	NQ-29-MSK	$38.
20	100	1343.	1704.	NQOB-204MIF	1145.	35	5¾	MH-35	64.	MSC-35T ★	101.	NQM-25	33.	35	MH-35-WP	487.	NQ-35-MSK	39.
30	100	1400.	1759.	NQOB-304MIF	1166.	38	5¾	MH-38	84.	MSC-38T ★	117.	NQM-25	33.	38	MH-38-WP	519.	NQ-38-MSK	41.
42	225	2422.	2783.	NQOB-424MIK	2141.	53	5¾	MH-53	113.	MSC-53T ★	168.	.....	...	53	MH-53-WP	594.	NQ-53-MDK	48.
14" WIDE CABINET																		
Main Lugs Only									**1 PHASE 3 WIRE**									
12	100	$ 225.	.....	NQOB-123	$106.	20¼	●5¾	NQ-520B	$47.	NQC-20T ★	$72.							
20	100	267.	.....	NQOB-203-1	139.	24¼	●5¾	NQ-524B	48.	NQC-24T ★	80.							
20	225	280.	.....	NQOB-203-2	152.	24¼	●5¾	NQ-524B	48.	NQC-24T ★	80.							
30	225	321.	.....	NQOB-303	167.	28	●5¾	NQ-528B	56.	NQC-28T ★	98.							
42	225	370.	.....	NQOB-423	205.	32½	●5¾	NQ-532B	64.	NQC-32T ★	101.							
Standard Main Breaker—2 Pole																		
8	100	$ 351.	.....	NQOB-083M	$232.	20¼	5¾	NQ-520B	$47.	NQC-20T ★	$72.							
16	100	383.	.....	NQOB-163M	255.	24¼	5¾	NQ-524B	48.	NQC-24T ★	80.							
20	100	408.	.....	NQOB-203M	254.	28	5¾	NQ-528B	56.	NQC-28T ★	98.							
30	†225	898.	.....	NQOB-303M	713.	37¾	5¾	NQ-537B	68.	NQC-37T ★	117.							
42	†225	947.	.....	NQOB-423M	747.	42¼	5¾	NQ-542B	80.	NQC-42T ★	120.							
I-LIMITER Main Breaker—2 Pole																		
12	100	$1064.	.....	NQOB-123MIF	$910.	28	5¾	NQ-528B	$56.	NQC-28T ★	$98.							
20	100	1106.	.....	NQOB-203MIF	941.	32½	5¾	NQ-532B	64.	NQC-32T ★	101.							
Main Lugs Only									**3 PHASE 4 WIRE**									
12	100	$ 255.	.....	NQOB-124	$136.	20¼	●5¾	NQ-520B	$47.	NQC-20T ★	$72.							
20	100	297.	.....	NQOB-204	169.	24¼	●5¾	NQ-524B	48.	NQC-24T ★	80.							
30	100	338.	.....	NQOB-304-1	184.	28	●5¾	NQ-528B	56.	NQC-28T ★	98.							
30	225	362.	.....	NQOB-304-2	208.	28	●5¾	NQ-528B	56.	NQC-28T ★	98.							
42	225	411.	.....	NQOB-424	246.	32½	●5¾	NQ-532B	64.	NQC-32T ★	101.							
Standard Main Breaker—3 Pole																		
14	100	$ 454.	.....	NQOB-144M	$326.	24¼	5¾	NQ-524B	$48.	NQC-24T ★	$80.							
24	100	510.	.....	NQOB-244M	356.	28	5¾	NQ-528B	56.	NQC-28T ★	98.							
30	100	529.	.....	NQOB-304M	364.	32½	5¾	NQ-532B	64.	NQC-32T ★	101.							
42	†225	1113.	.....	NQOB-424M	913.	42¼	5¾	NQ-542B	80.	NQC-42T ★	120.							
I-LIMITER Main Breaker—3 Pole																		
12	100	$1268.	.....	NQOB-124MIF	1114.	28	5¾	NQ-528B	$56.	NQC-28T ★	$98.							
20	100	1310.	.....	NQOB-204MIF	1145.	32½	5¾	NQ-532B	64.	NQC-32T ★	101.							
30	100	1351.	.....	NQOB-304MIF	1166.	37¾	5¾	NQ-537B	68.	NQC-37T ★	117.							

†Q2 Main Breaker is standard, for KA Main Breaker add **$48.** to price above and -KA suffix to catalog number.
●4" Deep Box may also be used, but requires Shallow Trim Kit. Select from Accessories table page 82.
★Add "F" for Flush, "S" for Surface.

CIRCUIT BREAKER QUICK-PRICE TABLE
For NQOB Panelboards Only
B1-4 DISCOUNT

No. of Brkrs.	QOB 1 Pole 120/240V. 15-60A.	QOB ▲2 Pole 120/240V. 15-60A.	QOB 3 Pole 240V. 15-60A.
1	$ 9.50	$ 21.20	$ 67.
2	19.00	42.40	134.
3	28.50	63.60	201.
4	38.00	84.80	268.
5	47.50	106.00	335.
6	57.00	127.20	402.
7	66.50	148.40	469.
8	76.00	169.60	536.
9	85.50	190.80	603.
10	95.00	212.00	670.
11	104.50	233.20	737.
12	114.00	254.40	804.
13	123.50	275.60	871.
14	133.00	296.80	938.
15	142.50	318.00	1005.
16	152.00	339.20	1072.
17	161.50	360.40	1139.
18	171.00	381.60	1206.
19	180.50	402.80	1273.
20	190.00	424.00	1340.
21	199.50	445.20	1407.

▲Prices shown do not apply to QOB, 70 ampere, 1 or 2 pole, 120/240V. and QOB-H, 15-30 ampere, 2 pole, 240V., branch breakers.

◐Column Width Type NQOB Panelboards are available factory assembled only. See Pages 86 and 87.

QO, I-LIMITER and MONO-FLAT are Registered Trademarks of Square D Company.

SQD SLV_000859

CIRCUIT BREAKER PANELBOARDS — UNASSEMBLED
COLUMN WIDTH, MODIFICATIONS AND ACCESSORIES

UNASSEMBLED MAIN BREAKER PANELBOARD MODIFICATIONS

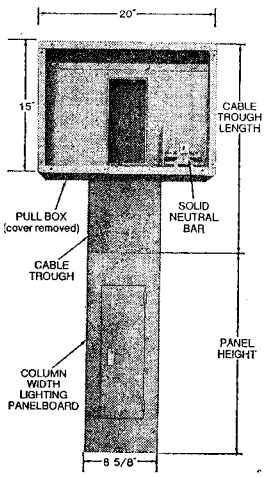
Unassembled main breaker panelboards are also available with the following modifications on a quick-ship basis, includes all unassembled main breaker NQO, NQOB, NEHB and I-Line panelboards.

1. Main breaker ampere rating (change within the same frame size), e.g.; change 225A. main breaker in NQO-424M to 150A. Order by modifying catalog number to NQO-424M-150.

2. Bottom feed to top feed: Standard width NQO and NQOB panelboards are supplied for bottom feed installation from stock. Add suffix -TF to catalog number (e.g., NQO-424MTF) to modify for top feed installation. Column width main breaker panelboards are standard for top feed, add -BF to catalog number for bottom feed.

3. Main breakers with internal accessories, such as shunt trip, undervoltage trip, etc., are available—add price from page 68 and order by description.

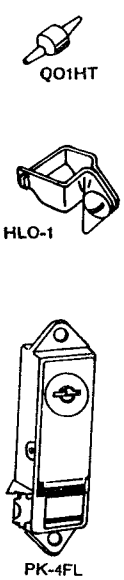
4. Orders must be placed through local Square D field office.



NQO COLUMN WIDTH PANELBOARDS
(Q1 breakers cannot be mounted in column width panelboards)

Max. No. of One Pole QO Brkrs.	Mains Rating	Total Price (Box Interior and Front)	Box and Interior with S/N 8⅝" W. x 5" D. for 10" WF Beams (Order branch breakers separately) Catalog Number	Price	Box Ht.	★Front Catalog Number	Price
1 PHASE 3 WIRE							
Main Lugs Only							
14	100	**$233.**	NQO-826-143	**$161.**	26½	LX-26T( )	**$ 72.**
20	100	**267.**	NQO-832-203	**187.**	32½	LX-32T( )	**80.**
30	225	**321.**	NQO-840-303	**223.**	40	LX-40T( )	**98.**
42	225	**370.**	NQO-849-423	**269.**	49	LX-49T( )	**101.**
Main Circuit Breaker—2 Pole							
14	100	**$374.**	NQO-832-143M	**$294.**	32½	LX-32T( )	**$ 80.**
20	100	**408.**	NQO-840-203M	**310.**	40	LX-40T( )	**98.**
30	225	**898.**	NQO-849-303M	**797.**	49	LX-49T( )	**101.**
42	225	**947.**	NQO-858-423M	**830.**	58	LX-58T( )	**117.**
3 PHASE 4 WIRE							
Main Lugs Only							
14	100	**$263.**	NQO-826-144	**$191.**	26½	LX-26T( )	**$ 72.**
20	100	**297.**	NQO-832-204	**217.**	32½	LX-32T( )	**80.**
30	100	**338.**	NQO-840-304	**240.**	40	LX-40T( )	**98.**
42	225	**411.**	NQO-849-424	**310.**	49	LX-49T( )	**101.**
Main Circuit Breaker—3 Pole							
14	60	**$401.**	NQO-832-144M	**$321.**	32½	LX-32T( )	**$ 80.**
20	100	**488.**	NQO-840-204M	**390.**	40	LX-40T( )	**98.**
30	100	**529.**	NQO-845-304M	**428.**	45	LX-45T( )	**101.**
42	225	**1113.**	NQO-858-424M	**996.**	58	LX-58T( )	**117.**

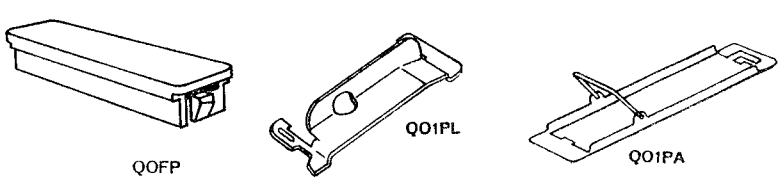
★Add "F" for Flush, "S" for Surface.



ACCESSORIES
For use with NQO and NQOB Panelboards

Description	Catalog No.	Price
(Pictured at left)		
Handle Tie (QO, QOB only)	QO1HT	△$ **.80**
Handle Lockoff (QO, QOB, Q1, Q1B)	HLO-1	△ **2.30**
Handle Padlock Attachment (All 1 Pole)	QO1PA	△ **2.50**
(All 2 & 3 Pole)	QO1PL	△ **2.50**
Closure plate for twistout	QOFP	△ **.80**
Flush lock with two keys for MONO-FLAT Fronts (For replacement only)	PK-4FL	**21.00**
(Not Pictured)		
Flush lock (sliding vault type)	PK-5FL	**41.00**
750 MCM Main Lug Kit for 400A NQO 1Ø3W or 3Ø4W (Not UL listed)	NQO-400-L	**61.00**
‡100 A. Sub-feed Lug Kit	QO-100ASF	**64.00**
‡225 A. Sub-feed Lug Kit	QO-225ASF	**72.00**
Shallow Trim Kits—Mounts NQOB in 4" D. Box		
12 QOB Poles	NQL-14-12	**14.00**
20 QOB Poles—100 A.	NQL-14-20-1	**14.00**
20 QOB Poles—225 A.	NQL-14-20-2	**14.00**
30 QOB Poles	NQL-14-30	**14.00**
42 QOB Poles	NQL-14-42	**14.00**
Equipment Ground Bar Kits		
Max. 12 Circuits, 225 A. Max. Mains	PK-9GTA	★ **3.20**
Max. 20 Circuits, 225 A. Max. Mains	PK-12GTA	★ **3.70**
Max. 30 Circuits, 225 A. Max. Mains	PK-18GTA	★ **4.50**
Max. 54 Circuits, 225 A. Max. Mains	PK-23GTA	★ **5.00**
Max. 54 Circuits, 600 A. Max. Mains	PK-27GTA	★ **8.00**
Combination Handle Tie and Lockoff		
3-1 Poles (QO, QOB)	QO3HT	△ **3.40**
3-1 Poles (Q1, Q1B)	Q13HT	△ **6.20**
Touch-up Paint USAS, #49 Gray (Aerosol Can)	PK-49SP	**9.60**

‡For use with Main Lug NQO Panelboards only. Sub-feed Lugs must be same rating as panelboard.
△**B1-1 DISCOUNT**
★**C1-1 DISCOUNT**



Cable Troughs and **Pull Boxes**

Cable Troughs (L = Length) L (In.)	◆8⅝"x5" Catalog Number	● Price	L (In.)	8⅝"x5" Catalog Number	● Price	Pull Boxes with S/N S/N Terminals	Catalog Number	● Price
36	MTX-836	**$112.**	84	MTX-884	**$159.**			
48	MTX-848	**123.**	96	MTX-896	**172.**	26	‡MPX-815-26	**$90.**
56	MTX-856	**124.**	104	MTX-8104	**185.**	42	MPX-815-42	**90.**
66	MTX-866	**142.**	112	MTX-8112	**201.**			

◆UL listed as Wireway under File E6625.
‡UL listed as Pull Box under File E25442.
●**Schedule G2 Discount**

Versa-Crimp Compression Lugs are UL listed for field installation on Main Lugs of NQO and NQOB panelboards as follows:

Panelboard Ampere Rating	No. of Lugs Per Phase	Versa-Crimp Type VCEL Catalog Number (See Listing Page 169)
100	1	VCEL-021-14S1
225	1	VCEL-030-516H1
400	2	VCEL-030-516H1

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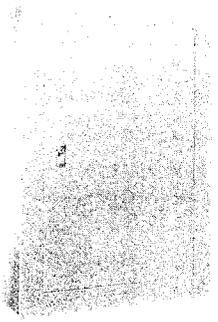
SQD SLV_000860

TELEPHONE & EQUIPMENT CABINETS AND ENCLOSURE COOLERS

WITH MONO-FLAT FRONTS



Two Piece Cabinet with MONO-FLAT Front

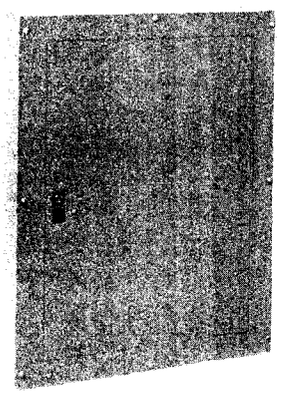
Fronts—MONO-FLAT, code gauge steel, flush or surface with concealed trim clamps, concealed hinges and flush lock keyed same as lighting panelboards, gray baked enamel finish. Boxes—code gauge galvanized steel with removable endwalls. Boxes and fronts are UL listed and match standard lighting panelboards in appearance and dimensions.

Dimensions			Box Only		Front Only		Box & Front		★Wood Backing	
W	H	D	Cat. No.	Price	Cat. No.	Price	Wt.	Price	Cat. No.	Price
14	20¼	4	TC-14204B	$47.00	TC-14204TF or TS	$56.00	20	$103.00	TC-1420W	$12.00
18	24¼	4	TC-18244B	68.00	TC-18244TF or TS	80.00	31	148.00	TC-1824W	18.00
24	23	6	TC-24236B	87.00	TC-24236TF or TS	100.00	42	187.00	TC-2423W	26.00
24	26	6	TC-24266B	98.00	TC-24266TF or TS	104.00	47	202.00	TC-2426W	27.00
24	28	4	TC-24284B	86.00	TC-24284TF or TS	105.00	46	191.00	TC-2428W	31.00
24	35	4	TC-24354B	101.00	TC-24356TF or TS	111.00	72	212.00	TC-2435W	33.00
24	35	6	TC-24356B	105.00	TC-24356TF or TS	111.00	75	216.00	TC-2435W	33.00
*30	29	6	TC-30296B	114.00	*TC-30296TF or TS	144.00	78	258.00	TC-3029W	39.00
*30	32½	4	TC-30324B	111.00	*TC-30324TF or TS	147.00	77	258.00	TC-3032W	41.00
*36	35	6	TC-36356B	167.00	*TC-36356TF or TS	213.00	106	380.00	TC-3635W	52.00

*Fronts have double doors with 3-point flush lock.
★¾" plywood backing finished with black insulating varnish. Easily installed in field.

WITH SCREW COVER FRONTS

Flush or surface fronts have a hinged door with flush lock. Boxes and fronts are steel, finished with gray baked enamel and are UL listed.



Two Piece Cabinet with Screw Cover and Door

Dimensions			Box Only		Front Only		Box & Front		Wood Backing	
W	H	D	Cat. No.	Price	Catalog No.	Price	Wt.	Price	Cat. No.	Price
12	12	4	12124B	$21.00	1212TF or TS	$26.00	11	$47.00	1212W	$ 8.90
12	16	4	12164B	27.00	1216TF or TS	36.00	13	63.00	1216W	12.00
12	16	6	12166B	36.00	1216TF or TS	36.00	14	72.00	1216W	12.00
12	18	4	12184B	27.00	1218TF or TS	39.00	16	66.00	1218W	14.90
12	18	6	12186B	39.00	1218TF or TS	39.00	18	78.00	1218W	14.90
12	24	4	12244B	29.00	1224TF or TS	45.00	22	74.00	1224W	18.00
12	24	6	12246B	45.00	1224TF or TS	45.00	23	90.00	1224W	18.00
18	18	4	18184B	29.00	1818TF or TS	48.00	23	77.00	1818W	18.00
18	18	6	18186B	45.00	1818TF or TS	48.00	25	93.00	1818W	18.00
18	24	4	18244B	47.00	1824TF or TS	71.00	28	118.00	1824W	21.00
18	24	6	18246B	68.00	1824TF or TS	71.00	30	123.00	1824W	21.00
18	30	4	18304B	52.00	1830TF or TS	77.00	33	129.00	1830W	24.00
18	30	6	18306B	71.00	1830TF or TS	77.00	38	148.00	1830W	24.00
24	24	4	24244B	52.00	2424TF or TS	84.00	35	136.00	2424W	27.00
24	24	6	24246B	71.00	2424TF or TS	84.00	37	155.00	2424W	27.00
24	30	4	24304B	70.00	2430TF or TS	104.00	40	174.00	2430W	33.00
24	30	6	24306B	100.00	2430TF or TS	104.00	45	204.00	2430W	33.00
24	36	4	24364B	76.00	2436TF or TS	113.00	57	189.00	2436W	43.00
24	36	6	24366B	101.00	2436TF or TS	113.00	59	214.00	2436W	43.00
30	30	4	30304B	80.00	3030TF or TS	126.00	60	206.00	3030W	45.00
30	30	6	30306B	104.00	3030TF or TS	126.00	62	230.00	3030W	45.00
30	36	4	30364B	87.00	3036TF or TS	137.00	71	224.00	3036W	50.00
30	36	6	30366B	105.00	3036TF or TS	137.00	78	242.00	3036W	50.00
30	48	4	30484B	120.00	3048TF or TS	167.00	101	287.00	3048W	68.00
30	48	6	30486B	138.00	3048TF or TS	167.00	124	305.00	3048W	68.00
†36	48	6	36486B	206.00	†3648TF or TS	237.00	150	443.00	3648W	80.00

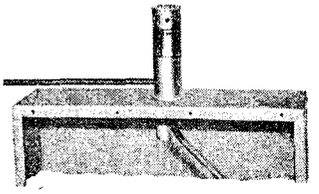
†Front has double doors with 3-point lock.

DE CATALOG REFERENCE: SECTION 6650

MONO-FLAT is a Registered Trademark of Square D Company

ENCLOSURE COOLING SYSTEMS

The Panel Guard, Thermostatic Vortex Cooler and Vortex systems are designed to cool electrical enclosures over a wide range of sizes. Each system consists of the basic cooler with muffler, cold air ducting kit, and a 10 micron automatic drain filter-separator. All components are packaged with the cooler to insure proper operation.



The Panel Guard is thermostatically controlled to turn on at approximately 100°F and shut off at 70°F. The Thermostatic Vortex Cooler has an adjustable thermostat. The Vortex Cooler operates continuously.

All basic coolers are supplied with a factory installed 25 CFM air flow insert which is recommended for most installations. A 15 CFM air flow insert is included with each system for installations where a limited air supply and/or a small cooling load are encountered.

Description	°F On	°F Off	Mounting Hole	Catalog Number	Price
Panel Guard—25 CFM	100	70	2 in.	PK-770	$561.
Thermostatic ◖ Vortex Cooler—25 CFM	▲ Adjustable		1⅛ in.	PK-790	637.
Vortex Cooler—25 CFM	.....	.....	1⅛ in.	PK-780	441.

◖ Order Only. Not stocked in PDS. Order Point: Lexington.
▲ Shipped factory set at 90°F. Adjustment range: 0°F to 170°F.

PANEL GUARD and VORTEX COOLER are Trademarks of Vortec Corporation.

SQD SLV_000861

CIRCUIT BREAKER PANELBOARDS — FACTORY ASSEMBLED

NQO 240 V. AC PLUG-ON

APPLICATION DATA

APPLICATION: For use on ac only. Meet Federal Spec. W-P-115a, Type I, Class 1. Listed by Underwriters Laboratories.

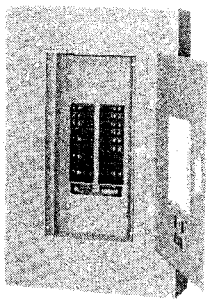
SERVICE: 1Ø 2W., 1Ø 3W., 3Ø 3W., 3Ø 4W., ◆3Ø, Grd. "B" Ø, 240 V. Max. ac.

I.E.R.: INTEGRATED EQUIPMENT SHORT CIRCUIT RATINGS: See Page 76.

MAINS: Distributed Phase Bussing
Main Lugs:
100A.—1#10-2/0 Cu or 1#6-2/0 Al
225A.—1#6-300MCM Al or Cu
400A.—2#2/0-500 MCM Al or Cu

Main Breaker:
60A.—Q1B (Optional Q1B-VH)—1#4-1/0 Al or 1#6-1/0 Cu
100A.—Q1B (Optional Q1B-VH)—1#4-1/0 Al or 1#6-1/0 Cu
IF-1#10-1/0 Al or Cu
225A.—Q2 (Optional KA)—1#4-300 MCM Al or Cu
IK-1#4-300 MCM Al or Cu
400A.—LA-1#1-600 MCM or 2#1-250 MCM Al or Cu

BRANCHES: Plug-On QO and Q1 Circuit Breakers, meet Federal Specification W-C-375B. Plug-On QWIK-GARD Circuit Breaker with Ground Fault Circuit Interruption. Q1 breakers cannot be mounted in column width panelboards.
15-30 A.—QO, 1, 2 and 3 Pole—#8 Al or #10 Cu
40-50 A.—QO, 1, 2 and 3 Pole—#4 Al or #6 Cu
60-70 A.—QO, 2 and 3 Pole—#2 Al or #4 Cu
80-100 A.—QO, 2 Pole—#2/0 Al or Cu
70-100 A.—Q1, 2 and 3 Pole—#1/0 Al or Cu
110-125 A.—Q1, 2 Pole—#1/0 Al or Cu
150 A.—Q1, 2 Pole—#4/0 Al or Cu



CABINETS: **MONO-FLAT** Fronts with concealed trim clamps, door with concealed hinges and flush lock, gray baked enamel finish. Column width has screw cover fronts. Boxes are galvanized steel with knockouts.

GUTTERS: Standard width through 225 A.—4" sides (14" w. box), 7" sides (20" w. box), 5" ends. 400 A.—4" sides, 8" ends.

DIMENSIONS: Standard width through 225 A. mains—See table below. 400 A., column width and optional boxes—Page 85.

METHOD OF PRICING

1. Use Quick-Price Table, below, to price all panelboards, standard or column width with; 225 A. or less mains and maximum 42 circuits, includes 15 through 60 A., 10,000 AIC branches. Price other panelboards from Pricing Table—Page 85. Add additional features, cable troughs, pullboxes, etc., from Page 106.
2. Box sizes for standard panelboards are given below or on Page 85. When additional features are included, consult local Square D Field Office for box size.
3. When number of poles exceeds maximum shown, estimate as two or more panelboards adding sub-feed lugs as required.

1 PHASE 3 WIRE

No. of Poles	Mains Rating	Description Type-Poles-Main	Price	Standard Width—Cabinet Data H	W	D	Box	★Front
MAIN LUGS ONLY								
8	100	NQO-08-3L	**$320.**	20¼	14	4	NQ-20B	NQC-20T( )
10	100	NQO-10-3L	**352.**	20¼	14	4	NQ-20B	NQC-20T( )
12	100	NQO-12-3L	**384.**	20¼	14	4	NQ-20B	NQC-20T( )
14	100	NQO-14-3L	**416.**	24¼	14	4	NQ-24B	NQC-24T( )
16	100	NQO-16-3L	**448.**	24¼	14	4	NQ-24B	NQC-24T( )
18	100	NQO-18-3L	**480.**	24¼	14	4	NQ-24B	NQC-24T( )
20	100	NQO-20-3L	**512.**	24¼	14	4	NQ-24B	NQC-24T( )
22	225	NQO-22-3L	**555.**	28	14	4	NQ-28B	NQC-28T( )
24	225	NQO-24-3L	**587.**	28	14	4	NQ-28B	NQC-28T( )
26	225	NQO-26-3L	**619.**	28	14	4	NQ-28B	NQC-28T( )
28	225	NQO-28-3L	**651.**	28	14	4	NQ-28B	NQC-28T( )
30	225	NQO-30-3L	**683.**	28	14	4	NQ-28B	NQC-28T( )
32	225	NQO-32-3L	**715.**	32½	14	4	NQ-32B	NQC-32T( )
34	225	NQO-34-3L	**747.**	32½	14	4	NQ-32B	NQC-32T( )
36	225	NQO-36-3L	**779.**	32½	14	4	NQ-32B	NQC-32T( )
38	225	NQO-38-3L	**811.**	32½	14	4	NQ-32B	NQC-32T( )
40	225	NQO-40-3L	**843.**	32½	14	4	NQ-32B	NQC-32T( )
42	225	NQO-42-3L	**875.**	32½	14	4	NQ-32B	NQC-32T( )
MAIN CIRCUIT BREAKER—2 POLE								
8	60	NQO-08-3AB	**$413.**	24¼	14	5¾	NQ-524B	NQC-24T( )
10	60	NQO-10-3AB	**445.**	24¼	14	5¾	NQ-524B	NQC-24T( )
12	100	NQO-12-3AB	**522.**	24¼	14	5¾	NQ-524B	NQC-24T( )
14	100	NQO-14-3AB	**554.**	28	14	5¾	NQ-528B	NQC-28T( )
16	100	NQO-16-3AB	**586.**	28	14	5¾	NQ-528B	NQC-28T( )
18	100	NQO-18-3AB	**618.**	28	14	5¾	NQ-528B	NQC-28T( )
20	100	NQO-20-3AB	**650.**	28	14	5¾	NQ-528B	NQC-28T( )
22	225†	NQO-22-3AB	**1121.**	37¾	14	5¾	NQ-537B	NQC-37T( )
24	225†	NQO-24-3AB	**1153.**	37¾	14	5¾	NQ-537B	NQC-37T( )
26	225†	NQO-26-3AB	**1185.**	37¾	14	5¾	NQ-537B	NQC-37T( )
28	225†	NQO-28-3AB	**1217.**	37¾	14	5¾	NQ-537B	NQC-37T( )
30	225†	NQO-30-3AB	**1249.**	37¾	14	5¾	NQ-537B	NQC-37T( )
32	225†	NQO-32-3AB	**1281.**	42¼	14	5¾	NQ-542B	NQC-42T( )
34	225†	NQO-34-3AB	**1313.**	42¼	14	5¾	NQ-542B	NQC-42T( )
36	225†	NQO-36-3AB	**1345.**	42¼	14	5¾	NQ-542B	NQC-42T( )
38	225†	NQO-38-3AB	**1377.**	42¼	14	5¾	NQ-542B	NQC-42T( )
40	225†	NQO-40-3AB	**1409.**	42¼	14	5¾	NQ-542B	NQC-42T( )
42	225†	NQO-42-3AB	**1441.**	42¼	14	5¾	NQ-542B	NQC-42T( )

3 PHASE 4 WIRE

No. of Poles	Mains Rating	Description Type-Poles-Main	Price	Standard Width—Cabinet Data H	W	D	Box	★Front
MAIN LUGS ONLY								
8	100	NQO-08-4L	**$349.**	20¼	14	4	NQ-20B	NQC-20T( )
10	100	NQO-10-4L	**381.**	20¼	14	4	NQ-20B	NQC-20T( )
12	100	NQO-12-4L	**413.**	20¼	14	4	NQ-20B	NQC-20T( )
14	100	NQO-14-4L	**445.**	24¼	14	4	NQ-24B	NQC-24T( )
16	100	NQO-16-4L	**477.**	24¼	14	4	NQ-24B	NQC-24T( )
18	100	NQO-18-4L	**509.**	24¼	14	4	NQ-24B	NQC-24T( )
20	100	NQO-20-4L	**541.**	24¼	14	4	NQ-24B	NQC-24T( )
22	100	NQO-22-4L	**573.**	28	14	4	NQ-28B	NQC-28T( )
24	100	NQO-24-4L	**605.**	28	14	4	NQ-28B	NQC-28T( )
26	100	NQO-26-4L	**637.**	28	14	4	NQ-28B	NQC-28T( )
28	100	NQO-28-4L	**669.**	28	14	4	NQ-28B	NQC-28T( )
30	100	NQO-30-4L	**701.**	28	14	4	NQ-28B	NQC-28T( )
32	225	NQO-32-4L	**757.**	32½	14	4	NQ-32B	NQC-32T( )
34	225	NQO-34-4L	**789.**	32½	14	4	NQ-32B	NQC-32T( )
36	225	NQO-36-4L	**821.**	32½	14	4	NQ-32B	NQC-32T( )
38	225	NQO-38-4L	**853.**	32½	14	4	NQ-32B	NQC-32T( )
40	225	NQO-40-4L	**885.**	32½	14	4	NQ-32B	NQC-32T( )
42	225	NQO-42-4L	**917.**	32½	14	4	NQ-32B	NQC-32T( )
MAIN CIRCUIT BREAKER—3 POLE								
8	60	NQO-08-4AB	**$494.**	24¼	14	5¾	NQ-524B	NQC-24T( )
10	60	NQO-10-4AB	**526.**	24¼	14	5¾	NQ-524B	NQC-24T( )
12	60	NQO-12-4AB	**558.**	24¼	14	5¾	NQ-524B	NQC-24T( )
14	100	NQO-14-4AB	**643.**	28	14	5¾	NQ-528B	NQC-28T( )
16	100	NQO-16-4AB	**675.**	28	14	5¾	NQ-528B	NQC-28T( )
18	100	NQO-18-4AB	**707.**	28	14	5¾	NQ-528B	NQC-28T( )
20	100	NQO-20-4AB	**739.**	28	14	5¾	NQ-528B	NQC-28T( )
22	100	NQO-22-4AB	**771.**	32½	14	5¾	NQ-532B	NQC-32T( )
24	100	NQO-24-4AB	**803.**	32½	14	5¾	NQ-532B	NQC-32T( )
26	100	NQO-26-4AB	**835.**	32½	14	5¾	NQ-532B	NQC-32T( )
28	100	NQO-28-4AB	**867.**	32½	14	5¾	NQ-532B	NQC-32T( )
30	100	NQO-30-4AB	**899.**	32½	14	5¾	NQ-532B	NQC-32T( )
32	225†	NQO-32-4AB	**1471.**	42¼	14	5¾	NQ-542B	NQC-42T( )
34	225†	NQO-34-4AB	**1503.**	42¼	14	5¾	NQ-542B	NQC-42T( )
36	225†	NQO-36-4AB	**1535.**	42¼	14	5¾	NQ-542B	NQC-42T( )
38	225†	NQO-38-4AB	**1567.**	42¼	14	5¾	NQ-542B	NQC-42T( )
40	225†	NQO-40-4AB	**1599.**	42¼	14	5¾	NQ-542B	NQC-42T( )
42	225†	NQO-42-4AB	**1631.**	42¼	14	5¾	NQ-542B	NQC-42T( )

†For KA Main Breaker add **$48.**, not available on column width. ★Add "F" for Flush, "S" for Surface.

Price Additions For Other 10,000 AIC Branch Breakers:
Convert to equivalent number of one pole QO breakers and add as follows:

Poles	Breaker Ampere Rating	Voltage	Breaker	Equiv. No. of 1 Pole QO Brkrs.	Price Addition Per Breaker
1	15-30 A.	120	QO-GFI	1	**$59.**
2	15-60 A.	120/240	QO	2	**2.**
2	70 A.	120/240	QO	2	**20.**
2	80-100 A.	120/240	QO	2	**35.**
2	15-30 A.	240	QO-H	2	**34.**
2	35-60 A.	240	Q1-H	4	**2.**
2	70 A.	240	Q1-H	4	**10.**
2	80-100 A.	240	Q1-H	4	**35.**
3	15-60 A.	240	QO	3	**38.**
3	70 A.	240	Q1	6	**9.**
3	80-100 A.	240	Q1	6	**22.**

Deductions:
Prices above include 15-60 A. one pole breakers mounted in all available spaces.
Deduct **$8.** per pole if breaker is eliminated but **space only** for future is retained.
Deduct **$16.** per pole if breaker is eliminated and **no space** for future is retained.

Increased Mains: (Box dimensions also increase)

From	To	Main Lugs & S/N 1Ø, 3W.	Main Lugs & S/N 3Ø, 4W.	Main Breaker & S/N 1Ø, 3W.	Main Breaker & S/N 3Ø, 4W.
60 A.	100 A.	....	....	**$ 45.**	**$ 53.**
60 A.	225 A.	....	....	**484.** (Q2)	**593.** (Q2)
100 A.	225 A.	**$ 11.**	**$ 24.**	**439.** (Q2)	**540.** (Q2)
100 A.	400 A.	**162.**	**180.**	**1039.** (LA)	**1191.** (LA)
225 A.	400 A.	**151.**	**156.**	**600.** (LA)	**651.** (LA)

Omitting Neutral Bar—100A. and 225A. deduct..... **$ 36.**
400A. deduct..... **102.**

◆1Ø 3W Main Lugs panelboards; and 15 thru 30 ampere two pole, 240 volt, QO-H branch breakers and 35 thru 100 ampere, two pole Q1-H branch breakers; are UL listed on 3Ø, Grounded "B" Ø systems.

DE CATALOG REFERENCE: SECTION 1610

QO, MONO-FLAT and QWIK-GARD are Registered Trademarks of Square D Company.

SQD SLV_000862

FACTORY ASSEMBLED CIRCUIT BREAKER PANELBOARDS

240 V. AC PLUG-ON **NQO**

PRICING

TABLE 1—MAIN LUGS, MAIN CIRCUIT BREAKER, SOLID NEUTRAL

Mains Rating	Main Lugs		Main Breaker (Circuit breaker interrupting rating—Page 56)						Add For Solid Neutral
			Standard IC			HI-IC			
	2 Pole	3 Pole	Brkr.	2 Pole	3 Pole	Brkr.	2 Pole	3 Pole	
60 A.	....	....	‡Q1B	**$249.**	**$ 330.**	IF	**$ 988.**	**$1222.**	**$36.**
100 A.	**$156.**	**$185.**	‡Q1B	**294.**	**383.**	IF	**988.**	**1222.**	**36.**
225 A.	**167.**	**209.**	Q2	**733.**	**923.**	Q2-H	**•868.**	**1042.**	**36.**
225 A.	....	....	KA	**781.**	**971.**	KH	**1452.**	**1652.**	**36.**
225 A.	....	....	....	....	....	IK	**1778.**	**2117.**	**36.**
400 A.	**252.**	**299.**	LA	**1267.**	**1508.**	LH	**1933.**	**2222.**	**102.**

‡Q1B is standard, Q1B-VH may be substituted at same price.
Not available on column width.
• Q2H M/B, 2 Pole—Add **$86.**

Equipment Ground Bar—..... Add **$11.**

Shunt Trip Main Breaker—not available on Q2—add price from Page 68.

TABLE 2— BRANCH BREAKERS—PRICE PER BREAKER

Breaker Ampere Rating	Plug-on Branch Breakers			
	1 Pole 120/240 V.	2 Pole 120/240 V.	2 Pole 240 V.	3 Pole 240 V.
10,000 AIC—QO, QO-H Q1, and Q1-H Breakers				
15-30	**$16.**	**$34.**	**$66.** ◆	**$86.**
35-50	**16.**	**34.**	**66.**✱◆	**86.**
60	**16.**	**34.**	**66.**✱◆	**86.**
70	**25.**	**52.**	**74.**✱◆	**105.**✱
80-100	....	**67.**	**99.**✱◆	**118.**✱
110-150	....	**126.**✱	....	....
QWIK-GARD—10,000 AIC—Class A				
15-30	**$75.** (120 V.)	**$135.**	....	....
22,000 AIC—QO-VH and Q1-VH Breakers				
15-20	**$23.**	**$ 53.**	....	**$119.**
25-30	**25.**	**53.**	....	**119.**
35-60	....	▲ **53.**✱	....	▲ **119.**✱
70	....	▲ **74.**✱	....	▲ **145.**✱
80-100	....	▲ **99.**✱	....	▲ **158.**✱
110-125	....	▲**283.**✱	....	....

▲UL listed for use ahead of QO & Q1 10,000 AIC breakers to permit their application at 22,000 ampere fault levels.

QWIK-GARD—22,000 AIC—Class A

15-30	**$144.** (120V.)	....	....	....

42,000 AIC—Q1H Breakers

35-60	....	**$ 98.**✱	....	....
70	....	**149.**✱	....	....
80-100	....	**182.**✱	....	....
110-125	....	**370.**✱	....	....

65,000 AIC—QH Breakers

15-30	**$37.**	**$90.**	....	**$153.**
SPACE ONLY				
All the above	**$8.**	**$16.**	**$16.**	**$24.**

✱Q1, other circuits are QO, see Panelboard Space Requirements below.
◆UL listed for use on 3Ø, grounded BØ systems, with 5000 AIC.

TABLE 3—SPECIALTY BRANCH BREAKERS—PRICE PER BREAKER

Breaker Ampere Rating	KEY OPERATED	SWITCH NEUTRAL 10,000 AIC		SHUNT TRIP	AUXILIARY SWITCH
	1 Pole 120V. ac 10,000 AIC	2 Wire 120V. ac (2 Spaces)	3 Wire 120/240V. ac (3 Spaces)	ALARM SWITCH	
15-30	**$18.**	**$40.**	**$60.**	Add Price from Page 78	
Space Only	**8.**	**16.**	**24.**		

SAMPLE ESTIMATE—FORMULA PRICING
120/208 V. AC, 3Ø, 4W., SURFACE MTD., BOTTOM FEED

No. Req'd.	Brkr.	Amperes	No. Poles	Total QO Poles	Price
20	QO	20	1	20	**$320.**
1	QO	30	2	2	**34.**
2	QO	20	3	6	**172.**
1	Q1	70	3	6	**105.**
1	Q1	100	3	6	**118.**
1	Solid Neutral	225	.	....	**36.**
1	Main Brkr. (Q2)	225	3	....	**923.**
				40	
Box Dimensions 42¼" H x 14" W x 5¾" D.				Total Price	**$1708.**

ADDITIONAL FEATURES—Price from page 106.
QWIK-GARD is a Registered Trademark of Square D Company.

DIMENSIONS

BOX SELECTION

Select box from table below based on total number of branch poles (See Panelboard Space Requirements below) and required mains rating.

Column Width
All furnished in 8⅝" W. x 5" D. box for 10" WF beams, or in 6⅞" W. x 5" D. box for 8" WF beams. When 6⅞" W. box is required, catalog number is LX-6—B.

Standard Width
Main Lugs—225A.—14" W. x 4" D.
(optional 14" W. x 5¾" D. or 20" W. x 5¾" D.)
400A.—20" W. x 5¾" D.
Main Breaker—225A.—14" W. x 5¾" D.
(optional 20" W. x 5¾" D.)
400A.—20" W. x 5¾" D.

PANELBOARD SPACE REQUIREMENTS
Number of one pole QO spaces required

Max. Mains Rating	QO			Q1		
	1P	2P	3P	2P		3P
				35-125 A.	150 A.	
225	1	2	3	4	8	6
400	1	2	3	2	4	3

CABINET DATA

MAIN LUGS ONLY

No. of 1 Pole QO Spaces			Box Dimensions			Box Catalog Number
100A.	225A.	400A.	H	W	D	
Standard Width						
12	..	..	20¼	14	4 or 5¾	NQ-20B
20	◐20	..	24¼			NQ-24B
★30	30	..	28			NQ-28B
..	42	..	32½			NQ-32B
..	54	..	37¾			NQ-37B
12	..	..	23	20	5¾	MH-23
20	◐20	..	26			MH-26
★30	30	..	29			MH-29
..	42	..	35			MH-35
..	54	30	38			MH-38
..	..	42	41			MH-41
..	..	54	47			MH-47
..	..	66	50			MH-50
Column Width						
14	..	..	26½	8⅝ or 6⅞	5	LX-826B
20	..	..	32½			LX-832B
★30	◐30	..	40			LX-840B
..	42	..	49			LX-849B
..	..	..	..			.....

MAIN CIRCUIT BREAKER

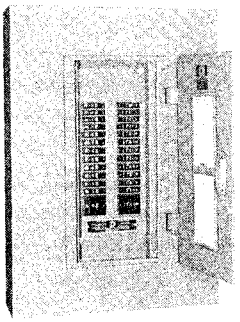
No. of 1 Pole QO Spaces				Box Dimensions			Box Catalog Number
60A., 100A. Q1B or Q1B-VH	100A. IF	225A. Q2 or KA	225A. IK or 400A. LA	H	W	D	
Standard Width							
12	..	..	..	24¼	14	5¾	NQ-524B
20	12	..	..	28			NQ-528B
★30	20	..	..	32½			NQ-532B
..	★30	◐30	..	37¾			NQ-537B
..	..	42	..	42¼			NQ-542B
..	..	54	..	48¼			NQ-548B
12	..	..	..	26	20	5¾	MH-26
20	12	..	..	29			MH-29
★30	20	..	..	35			MH-35
..	★30	◐30	..	38			MH-38
..	..	42	..	44			MH-44
..	..	54	30	50			MH-50
..	..	..	42	53			MH-53
..	..	..	..	..			.....
Column Width							
14	..	..	..	32½	8⅝ or 6⅞	5	LX-832B
20	..	..	..	40			LX-840B
★30	..	..	..	45			LX-845B
..	..	◐30	..	49			LX-849B
..	..	42	..	58	8⅝		LX-858B

Optional Box Sizes available at no extra cost.
◐1Ø, 3W. Only.
★3Ø, 4W. Only.

SQD SLV_000863

CIRCUIT BREAKER PANELBOARDS — FACTORY ASSEMBLED

NQOB 240 V. AC BOLT-ON



APPLICATION DATA

APPLICATION: For use on ac only. Meet Federal Spec. W-P-115a, Type I, Class 1. Listed by Underwriters Laboratories.

SERVICE: 1Ø 2 W., 1Ø 3 W., 3Ø 3W., 3Ø 4 W., ◆3Ø, Grd. "B" Ø 240 V. Max. ac

I.E.R.: INTEGRATED EQUIPMENT SHORT CIRCUIT RATINGS: See page 76.

MAINS: Distributed Phase Bussing

Main Lugs:
100A.—1#10-2/0 Cu or 1#6-2/0 Al
225A.—1#6-300 MCM Al or Cu
400A.—1#6-300 MCM Al or Cu and 1#3/0-750 MCM Al or Cu
600A.—#22/0-500 MCM Al or Cu

Main Breaker:
60A.—Q1B (Optional Q1B-VH)—1#4-1/0 Al or 1#6-1/0 Cu
100A.—Q1B (Optional Q1B-VH)—1#4-1/0 Al or 1#6-1/0 Cu
IF-1#10-1/0 Al or Cu
225A.—Q2 (Optional KA)—1#4-300 MCM Al or Cu
IK-1#4-300 MCM Al or Cu
400A.—LA-1#1-600 MCM or 2#1-250 MCM Al or Cu

BRANCHES: Bolt-On QOB and Q1B Circuit Breakers, meet Federal Specification W-C-375B. Bolt-On QWIK-GARD Circuit Breaker with Ground Fault Circuit Interruption. Q1B Breakers cannot be mounted in column width panelboards.
15-30 A.—QOB, 1, 2 and 3 Pole—#8 Al or #10 Cu
40-50 A.—QOB, 1, 2 and 3 Pole—#4 Al or #6 Cu
60-70 A.—QOB, 2 and 3 Pole—#2 Al or #4 Cu
70-100 A.—Q1B, 2 and 3 Pole—#1/0 Al or Cu

CABINETS: **MONO-FLAT** Fronts with concealed trim clamps, door with concealed hinges and flush lock, gray baked enamel finish. Column width has screw cover fronts. Boxes are galvanized steel with knockouts.

GUTTERS: Standard Width through 225 A. mains—3½" sides (14" W. box), 6½" sides (20" W. box), 5" ends. 600 A. Max—4" sides, 8" ends.

DIMENSIONS: Standard Width through 225 A. mains—see table below. 600 A. Max., column width and optional—Page 87.

METHOD OF PRICING

1. Use Quick-Price Table, below, to price all panelboards, standard column width with; 225 A. or less mains and maximum 42 circuits, includes 15 through 60 A., 10,000 AIC branches. Price other panelboards from Pricing Table—Page 87. Add additional features, cable troughs, pullboxes, etc., from Page 106.
2. Box sizes for standard panelboards are given below or on Page 87. When additional features are included, consult local Square D Field Office for box size.
3. When number of poles exceeds maximum shown, estimate as two or more panelboards adding sub-feed lugs as required.

1 PHASE 3 WIRE

No. of Poles	Mains Rating	Description Type-Poles-Main	Price	Standard Width—Cabinet Data H	W	D	Box	★Front
MAIN LUGS ONLY								
8	100	NQOB-08-3L	**$328.**	23	20	5¾	MH-23	MSC-23T( )
10	100	NQOB-10-3L	**362.**	23	20	5¾	MH-23	MSC-23T( )
12	100	NQOB-12-3L	**396.**	23	20	5¾	MH-23	MSC-23T( )
14	100	NQOB-14-3L	**430.**	26	20	5¾	MH-26	MSC-26T( )
16	100	NQOB-16-3L	**464.**	26	20	5¾	MH-26	MSC-26T( )
18	100	NQOB-18-3L	**498.**	26	20	5¾	MH-26	MSC-26T( )
20	100	NQOB-20-3L	**532.**	26	20	5¾	MH-26	MSC-26T( )
22	225	NQOB-22-3L	**577.**	29	20	5¾	MH-29	MSC-29T( )
24	225	NQOB-24-3L	**611.**	29	20	5¾	MH-29	MSC-29T( )
26	225	NQOB-26-3L	**645.**	29	20	5¾	MH-29	MSC-29T( )
28	225	NQOB-28-3L	**679.**	29	20	5¾	MH-29	MSC-29T( )
30	225	NQOB-30-3L	**713.**	29	20	5¾	MH-29	MSC-29T( )
32	225	NQOB-32-3L	**747.**	35	20	5¾	MH-35	MSC-35T( )
34	225	NQOB-34-3L	**781.**	35	20	5¾	MH-35	MSC-35T( )
36	225	NQOB-36-3L	**815.**	35	20	5¾	MH-35	MSC-35T( )
38	225	NQOB-38-3L	**849.**	35	20	5¾	MH-35	MSC-35T( )
40	225	NQOB-40-3L	**883.**	35	20	5¾	MH-35	MSC-35T( )
42	225	NQOB-42-3L	**917.**	35	20	5¾	MH-35	MSC-35T( )
MAIN CIRCUIT BREAKER—2 POLE								
8	60	NQOB-08-3AB	**$421.**	23	20	5¾	MH-23	MSC-23T( )
10	60	NQOB-10-3AB	**455.**	26	20	5¾	MH-26	MSC-26T( )
12	100	NQOB-12-3AB	**534.**	26	20	5¾	MH-26	MSC-26T( )
14	100	NQOB-14-3AB	**568.**	26	20	5¾	MH-26	MSC-26T( )
16	100	NQOB-16-3AB	**602.**	26	20	5¾	MH-26	MSC-26T( )
18	100	NQOB-18-3AB	**636.**	29	20	5¾	MH-29	MSC-29T( )
20	100	NQOB-20-3AB	**670.**	29	20	5¾	MH-29	MSC-29T( )
22	225†	NQOB-22-3AB	**1143.**	38	20	5¾	MH-38	MSC-38T( )
24	225†	NQOB-24-3AB	**1177.**	38	20	5¾	MH-38	MSC-38T( )
26	225†	NQOB-26-3AB	**1211.**	38	20	5¾	MH-38	MSC-38T( )
28	225†	NQOB-28-3AB	**1245.**	38	20	5¾	MH-38	MSC-38T( )
30	225†	NQOB-30-3AB	**1279.**	38	20	5¾	MH-38	MSC-38T( )
32	225†	NQOB-32-3AB	**1313.**	44	20	5¾	MH-44	MSC-44T( )
34	225†	NQOB-34-3AB	**1347.**	44	20	5¾	MH-44	MSC-44T( )
36	225†	NQOB-36-3AB	**1381.**	44	20	5¾	MH-44	MSC-44T( )
38	225†	NQOB-38-3AB	**1415.**	44	20	5¾	MH-44	MSC-44T( )
40	225†	NQOB-40-3AB	**1449.**	44	20	5¾	MH-44	MSC-44T( )
42	225†	NQOB-42-3AB	**1483.**	44	20	5¾	MH-44	MSC-44T( )

3 PHASE 4 WIRE

No. of Poles	Mains Rating	Description Type-Poles-Main	Price	Standard Width—Cabinet Data H	W	D	Box	★Front
MAIN LUGS ONLY								
8	100	NQOB-08-4L	**$357.**	23	20	5¾	MH-23	MSC-23T( )
10	100	NQOB-10-4L	**391.**	23	20	5¾	MH-23	MSC-23T( )
12	100	NQOB-12-4L	**425.**	23	20	5¾	MH-23	MSC-23T( )
14	100	NQOB-14-4L	**459.**	26	20	5¾	MH-26	MSC-26T( )
16	100	NQOB-16-4L	**493.**	26	20	5¾	MH-26	MSC-26T( )
18	100	NQOB-18-4L	**527.**	26	20	5¾	MH-26	MSC-26T( )
20	100	NQOB-20-4L	**561.**	26	20	5¾	MH-26	MSC-26T( )
22	100	NQOB-22-4L	**595.**	29	20	5¾	MH-29	MSC-29T( )
24	100	NQOB-24-4L	**629.**	29	20	5¾	MH-29	MSC-29T( )
26	100	NQOB-26-4L	**663.**	29	20	5¾	MH-29	MSC-29T( )
28	100	NQOB-28-4L	**697.**	29	20	5¾	MH-29	MSC-29T( )
30	100	NQOB-30-4L	**731.**	29	20	5¾	MH-29	MSC-29T( )
32	225	NQOB-32-4L	**789.**	35	20	5¾	MH-35	MSC-35T( )
34	225	NQOB-34-4L	**823.**	35	20	5¾	MH-35	MSC-35T( )
36	225	NQOB-36-4L	**857.**	35	20	5¾	MH-35	MSC-35T( )
38	225	NQOB-38-4L	**891.**	35	20	5¾	MH-35	MSC-35T( )
40	225	NQOB-40-4L	**925.**	35	20	5¾	MH-35	MSC-35T( )
42	225	NQOB-42-4L	**959.**	35	20	5¾	MH-35	MSC-35T( )
MAIN CIRCUIT BREAKER—3 POLE								
8	60	NQOB-08-4AB	**$502.**	26	20	5¾	MH-26	MSC-26T( )
10	60	NQOB-10-4AB	**536.**	26	20	5¾	MH-26	MSC-26T( )
12	60	NQOB-12-4AB	**570.**	26	20	5¾	MH-26	MSC-26T( )
14	60	NQOB-14-4AB	**604.**	26	20	5¾	MH-26	MSC-26T( )
16	100	NQOB-16-4AB	**691.**	29	20	5¾	MH-29	MSC-29T( )
18	100	NQOB-18-4AB	**725.**	29	20	5¾	MH-29	MSC-29T( )
20	100	NQOB-20-4AB	**759.**	29	20	5¾	MH-29	MSC-29T( )
22	100	NQOB-22-4AB	**793.**	29	20	5¾	MH-29	MSC-29T( )
24	100	NQOB-24-4AB	**827.**	29	20	5¾	MH-29	MSC-29T( )
26	100	NQOB-26-4AB	**861.**	35	20	5¾	MH-35	MSC-35T( )
28	100	NQOB-28-4AB	**895.**	35	20	5¾	MH-35	MSC-35T( )
30	100	NQOB-30-4AB	**929.**	35	20	5¾	MH-35	MSC-35T( )
32	225†	NQOB-32-4AB	**1503.**	44	20	5¾	MH-44	MSC-44T( )
34	225†	NQOB-34-4AB	**1537.**	44	20	5¾	MH-44	MSC-44T( )
36	225†	NQOB-36-4AB	**1571.**	44	20	5¾	MH-44	MSC-44T( )
38	225†	NQOB-38-4AB	**1605.**	44	20	5¾	MH-44	MSC-44T( )
40	225†	NQOB-40-4AB	**1639.**	44	20	5¾	MH-44	MSC-44T( )
42	225†	NQOB-42-4AB	**1673.**	44	20	5¾	MH-44	MSC-44T( )

†For KA Main Breaker add **$48.**, not available on column width. ★Add "F" for Flush, "S" for Surface.

Price Additions For Other Branch Breakers:
Convert to equivalent number of one pole QOB breakers and add as follows:

Poles	Breaker Ampere Rating	Voltage	Breaker	Equiv. No. of 1 Pole QOB Brkrs.	Price Addition Per Breaker
1	15-30 A.	120	QOB-GFI	1	**$58.**
2	15-60 A.	120/240	QOB	2	**2.**
2	70 A.	120/240	QOB	2	**20.**
2	80-100 A.	120/240	Q1B	4	**1.**
2	15-30 A.	240	QOB-H	2	**34.**
2	35-60 A.	240	Q1B-H	4	**0.**
2	70 A.	240	Q1B-H	4	**8.**
2	80-100 A.	240	Q1B-H	4	**33.**
3	15-60 A.	240	QOB	3	**38.**
3	70 A.	240	Q1B	6	**3.**
3	80-100 A.	240	Q1B	6	**19.**

Deductions:
Prices above include 15-60 A. one pole breakers mounted in all available spaces.
Deduct **$9.** per pole if breaker is eliminated but **space only** for future is retained.
Deduct **$17.** per pole if breaker is eliminated and **no space** for future is retained.

Increased Mains: (Box dimensions also increase)

From	To	Main Lugs & S/N 1Ø, 3 W.	Main Lugs & S/N 3Ø, 4 W.	Main Breaker & S/N 1Ø, 3 W.	Main Breaker & S/N 3Ø, 4 W.
60 A.	100 A.	..	..	**$ 45.**	**$ 53.**
60 A.	225 A.	..	..	**484.** (Q2)	**593.** (Q2)
100 A.	225 A.	**$ 11.**	**$ 24.**	**439.** (Q2)	**540.** (Q2)
100 A.	400 A.	**162.**	**130.**	**1039.** (LA)	**1191.** (LA)
225 A.	400 A.	**151.**	**156.**	**600.** (LA)	**651.** (LA)

Omitting Neutral Bar—100A. and 225A. deduct..... **$36.**
400A. deduct..... **102.**

◆1Ø 3W Main Lugs panelboards; and 15 thru 30 ampere, two pole, 240 volt, QOB-H branch breakers and 35 thru 100 ampere, two pole Q1B-H branch breakers; are UL listed for use on 3Ø, Grounded "B" Ø systems.

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SQD SLV_000864

FACTORY ASSEMBLED CIRCUIT BREAKER PANELBOARDS

240 V. AC BOLT-ON **NQOB**

PRICING

TABLE 1—MAIN LUGS, MAIN CIRCUIT BREAKER, SOLID NEUTRAL

Mains Rating	Main Lugs		Main Breaker (Circuit breaker interrupting rating—Page 56.)						Add For Solid Neutral
			Standard IC			HI-IC			
	2 Pole	3 Pole	Brkr.	2 Pole	3 Pole	Brkr.	2 Pole	3 Pole	
60 A.	....	....	‡Q1B	**$249.**	**$ 330.**	IF	**$ 988.**	**$1222.**	**$ 36.**
100 A.	**$156.**	**$185.**	‡Q1B	**294.**	**383.**	IF	**988.**	**1222.**	**36.**
225 A.	**167.**	**209.**	Q2	**733.**	**923.**	Q2-H	**•868.**	**1042.**	**36.**
225 A.	....	....	KA	**781.**	**971.**	KH	**1452.**	**1652.**	**36.**
225 A.	....	....	....	....	....	IK	**1778.**	**2117.**	**36.**
400 A.	**252.**	**299.**	LA	**1267.**	**1508.**	LH	**1933.**	**2222.**	**102.**
600 A.	**320.**	**370.**	....	....	....	....	....	....	**144.**

‡Q1B is standard, Q1B-VH may be substituted at same price.
Not available on column width.
•Q2H M/B, 2-Pole—Add **$86.**

Equipment Ground Bar—..... Add **$11.**
Shunt Trip Main Breaker—Not available on Q2—add price from Page 68.

TABLE 2—BRANCH BREAKERS—PRICE PER BREAKER

Breaker Ampere Rating	Bolt-on Branch Breakers			
	1 Pole 120/240 V.	2 Pole 120/240 V.	2 Pole 240 V.	3 Pole 240 V.
10,000 AIC—QOB, QOB-H, Q1B and Q1B-H Breakers				
15-30	**$17.**	**$36.**	**$68.** ◆	**$89.**
35-50	**17.**	**36.**	**68.**✱◆	**89.**
60	**17.**	**36.**	**68.**✱◆	**89.**
70	**26.**	**54.**	**76.**✱◆	**105.**✱
80-100	....	**69.**✱	**101.**✱◆	**121.**✱
QWIK-GARD—10,000 AIC—Class A.				
15-30	**$75.** (120 V.)	**$135.**	....	.....
22,000 AIC—QOB-VH and Q1B-VH				
15-20	**$24.**	**$55.**	....	**$122.**
25-30	**26.**	**55.**	....	**122.**
35-60	....	▲ **55.**✱	....	**122.**✱
70	....	▲ **76.**✱	....	**148.**✱
80-100	....	▲**101.**✱	....	**161.**✱

▲UL listed for use ahead of QO & Q1 10,000 AIC breakers to permit their application at 22,000 ampere fault levels.

QWIK-GARD—22,000 AIC—Class A

15-30	**$144.** (120V.)	....	....	....

42,000 AIC—Q1HB Breakers

35-60	....	**$100.**✱	....	....
70	....	**151.**✱	....	....
80-100	....	**184.**✱	....	....

65,000 AIC—QHB Breakers

15-30	**$38.**	**$92.**	....	**$156.**
SPACE ONLY				
All the above	**$8.**	**$16.**	**$16.**	**$24.**

✱Q1B other circuits are QOB, see Panelboard Space Requirements below.
◆UL listed for 3Ø, grounded BØ systems, with 5000 AIC.

TABLE 3—SPECIALTY BRANCH BREAKERS—PRICE PER BREAKER

Breaker Ampere Rating	KEY OPERATED	SWITCH NEUTRAL 10,000 AIC		SHUNT TRIP	AUXILIARY SWITCH
	1 Pole 120V. ac 10,000 AIC	2 Wire 120V. ac (2 Spaces)	3 Wire 120/240V. ac (3 Spaces)	ALARM SWITCH	
15-30 Space Only	**$19.** **8.**	**$42.** **16.**	**$63.** **24.**	Add Price from Page 80	

SAMPLE ESTIMATE—FORMULA PRICING
120/208 V. ac, 3Ø 4 W., SURFACE MTD., BOTTOM FEED

No. Req'd.	Brkr.	Amperes	No. Poles	Total QOB Poles	Price
20	QOB	20	1	20	**$340.**
1	QOB	30	2	2	**36.**
2	QOB	20	3	6	**178.**
1	Q1B	70	3	6	**105.**
1	Q1B	100	3	6	**121.**
1	Solid Neutral	225	.	..	**36.**
1	Main Brkr. (Q2)	225	3	..	**923.**
				40	
Box Dimensions: 44" H. x 20" W. x 5¾" D.				Total Price	**$1739.**

ADDITIONAL FEATURES—Price from Page 106.

QWIK-GARD is a Registered Trademark of Square D Company.

DIMENSIONS

BOX SELECTION
Select box from table below based on total number of branch poles (See Panelboard Space Requirements below) and required mains rating.

Column Width
All furnished in 8⅝" W. x 5" D. box for 10" WF beams, or in 6⅞" W. x 5" D. box for 8" WF beams. When 6⅞" W. box is required, catalog number is LX-6—B.

Standard Width
Main Lugs—225A.—20" W. x 5¾" D.
(optional 14" W. x 4" D. or 14" W. x 5¾" D.)
400A.—20" W. x 5¾" D.
Main Breaker—225A.—20" W. x 5¾" D.
(optional 14" W. x 5¾" D.)
400A.—20" W. x 5¾" D.

PANELBOARD SPACE REQUIREMENTS
Number of one pole QOB spaces required

Max. Mains Rating	QOB			Q1B	
	1P	2P	3P	2P	3P
225	1	2	3	4	6
600	1	2	3	2	3

CABINET DATA

MAIN LUGS ONLY

No. of 1 Pole QOB Spaces				Box Dimensions			Box Catalog Number
100A.	225A.	400A.	600A.	H	W	D	
Standard Width							
12	..	..	..	20¼			NQ-20B
20	◐20	..	..	24¼		4	NQ-24B
★30	30	..	..	28	14	or	NQ-28B
..	42	..	..	32½		5¾	NQ-32B
..	54	..	..	37¼			NQ-37B
12	..	..	..	23			MH-23
20	◐20	..	..	26			MH-26
★30	30	..	..	29			MH-29
..	42	..	..	35	20	5¾	MH-35
..	54	30	30	38			MH-38
..	..	42	42	41			MH-41
..	..	54	54	47			MH-47
..	..	66	66	50			MH-50
Column Width							
14	..	..	..	26½			LX-826B
20	..	..	..	32½	8⅝		LX-832B
★30	◐30	..	..	40	or	5	LX-840B
..	42	..	..	49	6⅞		LX-849B

MAIN CIRCUIT BREAKER

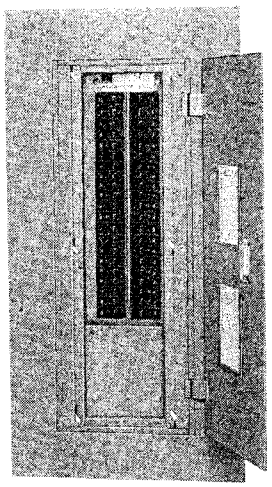
No. of 1 Pole QOB Spaces				Box Dimensions			Box Catalog Number
60A., 100A. Q1B or Q1B-VH	100A. IF	225A. Q2 or KA	225A. IK or 400A. LA	H	W	D	
Standard Width							
◐ 8	..	..	..	20¼			NQ-520B
★14	..	..	..	24¼			NQ-524B
◐16	..	..	..	24¼	14	5¾	NQ-524B
◐20	..	..	..	28			NQ-528B
★24	12	..	..	28			NQ-528B
30	20	..	..	32½			NQ-532B
..	★30	30	..	37¾			NQ-537B
..	..	42	..	42¼			NQ-542B
◐ 8	..	..	..	23			MH-23
★14	..	..	..	26			MH-26
◐16	..	..	..	26			MH-26
◐30	..	..	..	29	20	5¾	MH-29
★24	12	..	..	29			MH-29
30	20	..	..	35			MH-35
..	★30	30	..	38			MH-38
..	..	42	..	44			MH-44
..	..	..	30	50			MH-50
..	..	..	42	53			MH-53
..	..	..	54	59			MH-59
Column Width							
14	..	..	..	32½	8⅝		LX-832B
20	..	..	..	40	or		LX-840B
★30	..	..	..	45	6⅞	5	LX-845B
..	..	◐30	..	49			LX-849B
..	..	42	..	58	8⅝		LX-858B

Optional Box Sizes available at no extra cost.
◐1Ø, 3W. Only.
★3Ø, 4W. Only.

SQD SLV_000865

CIRCUIT BREAKER PANELBOARDS — UNASSEMBLED

NEHB 277/480V. AC MAXIMUM PLUG-ON AND BOLT-ON



APPLICATION DATA

APPLICATION: For use on ac only. Meet Federal Spec. W-P-115a, Type I, Class 1. UL Listed (see exceptions below).
SERVICE: 3Ø 4 W., 277/480V. ac Maximum. 3Ø 3 W., 240V. ac Maximum. Use Type NH1B Panelboards from pages 90 and 91 on 3Ø 3 W., 480V. ac systems.
I.E.R.: INTEGRATED EQUIPMENT SHORT CIRCUIT RATINGS: See page 76.
MAINS: Distributed Phase Bussing

Main Lugs:
125A.—1 #6-2/0 Al, #10-2/0 Cu
225A.—1 #6-300 MCM Al or Cu
400A.—1 #6-300 MCM and 1 #3/0-750 MCM Al or Cu
600A.—2 #3/0-500MCM Al or Cu.

Main Breaker:
100A.—FA or IF—1 #10-1/0 Al or Cu
225A.—KA or IK—1 #4-300 MCM Al or Cu
400A.—LA—1 #1-600 MCM or 2 #1-250 MCM Al or Cu

BRANCHES: Plug-on EH, Bolt-on EHB 1" wide per pole, meet Federal Spec. WC-375B Class 13a and 13b.
15-20A.—1, 2 or 3 pole-1 or 2 #14-#10 Cu or #12-#10 Al
25-30A.—1, 2 or 3 pole-1 or 2 #14-#10 Cu only
35-60A.—2 or 3 pole-1 #14-#2 Cu or #12-#2 Al
CABINETS: MONO-FLAT Fronts with concealed trim clamps, door with concealed hinges and flush lock, gray baked enamel finish. Boxes are galvanized steel with knockouts.
GUTTERS: Side—6", End Opposite Mains—5¾". Mains End—7½" with mechanical lugs or optional compression lugs.
DIMENSIONS: See table below.

INTERIORS (with solid neutral), BOXES AND FRONTS—3 PHASE 4 WIRE

Max. No. of EH or EHB One Pole Breakers	Main Lugs Rating	Total Price Interior, Front and Enclosure NEMA 1	Total Price Interior, Front and Enclosure NEMA 3R/12	Interior only (order branch breakers separately) Cat. No.	Interior only Price	NEMA 1 Enclosure H	D	20" Box Cat. No.	20" Box Price	MONO-FLAT Front ★ Cat. No.	MONO-FLAT Front ★ Price	NEMA 3R/12 Enclosure H	D	Enclosure (20"W.) Cat. No.	Enclosure (20"W.) Price	Interior Trim Kit Cat. No.	Interior Trim Kit Price
MAIN LUGS ONLY																	
12	125	**$391.**	**$756.**	NEHB-12426-1	**$263.**	26	5¾	MH-26	**$ 48.**	NH-26TF or S	**$ 80.**	26	6½	MH-26-WP	**$453.**	NH-26-MK	**$40.**
18	125	**426.**	**792.**	NEHB-18429-1	**278.**	29	5¾	MH-29	**50.**	NH-29TF or S	**98.**	29	6½	MH-29-WP	**471.**	NH-29-MK	**43.**
30	125	**494.**	**861.**	NEHB-30435-1	**329.**	35	5¾	MH-35	**64.**	NH-35TF or S	**101.**	35	6½	MH-35-WP	**487.**	NH-35-MK	**45.**
30	225	**598.**	**965.**	NEHB-30435-2	**433.**	35	5¾	MH-35	**64.**	NH-35TF or S	**101.**	35	6½	MH-35-WP	**487.**	NH-35-MK	**45.**
42	225	**666.**	**1034.**	NEHB-42441-2	**460.**	41	5¾	MH-41	**70.**	NH-41TF or S	**116.**	41	6½	MH-41-WP	**525.**	NH-41-MK	**49.**
30	400	**690.**	....	NEHB-30444-4	**477.**	44	5¾	MH-44	**93.**	NH-44TF or S	**120.**	..	..	.....	...	.....	...
42	400	**758.**	...	NEHB-42450-4	**514.**	50	5¾	MH-50	**111.**	NH-50TF or S	**133.**	..	..	.....	...	.....	...
42	600	**887.**	...	NEHB-42459-6	**570.**	59	5¾	MH-59	**117.**	NH-596TF or S	**200.**	..	..	.....	...	.....	...

STANDARD MAIN BREAKER KIT (Includes 3 Pole Vertically Mounted Main Breaker)

Max. No. of EH or EHB One Pole Breakers	Main Breaker Rating	Total Price Interior Main Breaker Kit, Front and Box NEMA 1	Total Price Interior Main Breaker Kit, Front and Box NEMA 3R/12	Main Breaker Kit Cat. No.	Main Breaker Kit Price	Interior Only Required (order branch breakers separately) Cat. No.	Interior Only Required Price	NEMA 1 Enclosure 20" Box Cat. No.	20" Box Price	MONO-FLAT Front ★ Cat. No.	MONO-FLAT Front ★ Price	NEMA 3R/12 Enclosure Enclosure (20"W.) Cat. No.	Enclosure (20"W.) Price	Interior Trim Kit Cat. No.	Interior Trim Kit Price
12	100	**$ 666.**	**$1033.**			NEHB-12426-1	**$263.**	MH-35	**$64.**	NH-35TF or S	**$101.**	MH-35-WP	**$487.**	NH-35-MK	**$45.**
18	100	**711.**	**1082.**	NEHB-1M	**$238.**	NEHB-18429-1	**278.**	MH-38	**84.**	NH-38TF or S	**111.**	MH-38-WP	**519.**	NH-38-MK	**47.**
30	100	**780.**	**1150.**			NEHB-30435-1	**329.**	MH-44	**93.**	NH-44TF or S	**120.**	MH-44-WP	**531.**	NH-44-MK	**52.**
30	225	**1312.**	**1709.**	NEHB-2M	**656.**	NEHB-30435-2	**433.**	MH-47	**97.**	NH-47TF or S	**126.**	MH-47-WP	**565.**	NH-47-MK	**55.**
42	225	**1379.**	**1770.**			NEHB-42441-2	**460.**	MH-53	**113.**	NH-53TF or S	**150.**	MH-53-WP	**594.**	NH-53-MK	**60.**
30	400	**1950.**	...	NEHB-3M or NEHB-4M	**1163.**	NEHB-30444-4	**477.**	MH-59	**117.**	NH-59TF or S	**193.**	.....	...	.....	...
42	400	**2007.**	...			NEHB-42450-4	**514.**	MH-65	**119.**	NH-65TF or S	**211.**	.....	...	.....	...

I-LIMITER CURRENT MAIN CIRCUIT BREAKER KIT—3 POLE

12	100	**1426.**	**1793.**			NEHB-12426-1	**263.**	MH-35	**64.**	NH-35TF or S	**101.**	MH-35-WP	**487.**	NH-35-MK	**45.**
18	100	**1471.**	**1842.**	NEHB-1M1F	**998.**	NEHB-18429-1	**278.**	MH-38	**84.**	NH-38TF or S	**111.**	MH-38-WP	**519.**	NH-38-MK	**47.**
30	100	**1540.**	**1910.**			NEHB-30435-1	**329.**	MH-44	**93.**	NH-44TF or S	**120.**	MH-44-WP	**531.**	NH-44-MK	**52.**
30	225	**2701.**	**3083.**	NEHB-2M1K	**1967.**	NEHB-30435-2	**433.**	MH-56	**116.**	NH-56TF or S	**185.**	MH-56-WP	**620.**	NH-56-MK	**63.**
42	225	**2749.**	**3167.**			NEHB-42441-2	**460.**	MH-62	**118.**	NH-62TF or S	**204.**	MH-62-WP	**670.**	NH-62-MK	**70.**

BRANCH CIRCUIT BREAKERS FOR NEHB PANELBOARDS—For additional interrupting capacity ratings refer to page 56.

Ampere Rating	1 Pole 277V. ac-14,000 AIC 120V. ac-65,000 AIC Plug-on Cat. No.	Plug-on ▲Price	Bolt-on Cat. No.	Bolt-on ▲Price	2 Pole 277/480V. ac-14,000 AIC 120/240V. ac-65,000 AIC Plug-on Cat. No.	Plug-on ▲Price	Bolt-on Cat. No.	Bolt-on ▲Price	3 Pole 277/480V. ac-14,000 AIC 240V. ac-65,000 AIC Plug-on Cat. No.	Plug-on ▲Price	Bolt-on Cat. No.	Bolt-on ▲Price
15	EH-14015	**$32.**	EHB-14015	**$36.**	EH-24015	**$ 82.**	EHB-24015	**$ 90.**	EH-34015	**$146.**	EHB-34015	**$158.**
20	EH-14020	**32.**	EHB-14020	**36.**	EH-24020	**82.**	EHB-24020	**90.**	EH-34020	**146.**	EHB-34020	**158.**
25	EH-14025	**32.**	EHB-14025	**36.**	EH-24025	**82.**	EHB-24025	**90.**	EH-34025	**146.**	EHB-34025	**158.**
30	EH-14030	**32.**	EHB-14030	**36.**	EH-24030	**82.**	EHB-24030	**90.**	EH-34030	**146.**	EHB-34030	**158.**
40	.....	.....	.....	.....	EH-24040	**82.**	EHB-24040	**90.**	EH-34040	**146.**	EHB-34040	**158.**
50	.....	.....	.....	.....	EH-24050	**82.**	EHB-24050	**90.**	EH-34050	**146.**	EHB-34050	**158.**
60	.....	.....	.....	.....	EH-24060	**82.**	EHB-24060	**90.**	EH-34060	**146.**	EHB-34060	**158.**

COMPRESSION LUGS

Optional Square D Compression Lugs are UL listed for field installation on main lugs of NEHB panelboards as follows:

Panelboard Ampere Rating	No. of Lugs Per Phase and Neutral	Type VCEL Lugs Catalog Number	Wire Size—Al or Cu
125	1	VCEL-021-14S1	#8-1/0
225	1	VCEL-030-516H1	#4-300 MCM
400	1 and 1	VCEL-030-516H1	#4-300 MCM
		VCEL-050-12H1	#2/0-500 MCM
	or 1	VCEL-075-12H1	500-750 MCM

ACCESSORIES

Description	Catalog Number	Price
Filler Plate for Twistout	FP-1	**$ 2.60**
Subfeed Lug Kit (Branch Mounted) 3 Pole—3 Spaces—60A.	EHB60SL	**▲45.00**
Handle Padlock Attachment—60A. Max.	HPA-EH	**▲ 2.60**
Handle Lockoff	HLO-EH	**▲ 2.60**

▲B1-3 DISCOUNT

I-LIMITER, MONO-FLAT and VERSA-CRIMP are Registered Trademarks of Square D Company.
DE CATALOG REFERENCE: SECTION 1660

SQD SLV_000866

FACTORY ASSEMBLED CIRCUIT BREAKER PANELBOARDS

MAXIMUM 277/480V. AC PLUG-ON AND BOLT-ON

NEHB

QUICK PRICING

1. Use Quick-Price Table, below, to price all panelboards with 225A. or less mains and maximum 42 circuits, includes 15 through 30A., 1 Pole 14,000 AIC branches. Price all other panelboards from Pricing Tables at right. And additional features, from Page 106.
2. Box sizes for standard panelboards are given below. When additional features are included, consult local Square D Field Office for box size.
3. When number of poles exceeds maximum shown, estimate as two or more panelboards adding sub-feed lugs as required from Page 106.

3 PHASE 4 WIRE

No. of Poles	Mains Rating	Description Type-Poles-Main	Plug-On Price	Bolt-On Price	Standard Width—Cabinet Data H	W	D	Box	Front F=Flush S=Surface
MAIN LUGS ONLY									
8	125	NEH(B)-08-4L	$ 599.	$ 631.	26	20	5¾	MH-26	NH-26TF or S
10	125	NEH(B)-10-4L	685.	725.	26	20	5¾	MH-26	NH-26TF or S
12	125	NEH(B)-12-4L	771.	819.	26	20	5¾	MH-26	NH-26TF or S
14	125	NEH(B)-14-4L	857.	913.	29	20	5¾	MH-29	NH-29TF or S
16	125	NEH(B)-16-4L	943.	1007.	29	20	5¾	MH-29	NH-29TF or S
18	125	NEH(B)-18-4L	1029.	1101.	29	20	5¾	MH-29	NH-29TF or S
20	125	NEH(B)-20-4L	1115.	1195.	35	20	5¾	MH-35	NH-35TF or S
22	125	NEH(B)-22-4L	1201.	1288.	35	20	5¾	MH-35	NH-35TF or S
24	125	NEH(B)-24-4L	1287.	1383.	35	20	5¾	MH-35	NH-35TF or S
26	125	NEH(B)-26-4L	1373.	1477.	35	20	5¾	MH-35	NH-35TF or S
28	125	NEH(B)-28-4L	1459.	1571.	35	20	5¾	MH-35	NH-35TF or S
30	125	NEH(B)-30-4L	1545.	1665.	35	20	5¾	MH-35	NH-35TF or S
32	225	NEH(B)-32-4L	1677.	1805.	41	20	5¾	MH-41	NH-41TF or S
34	225	NEH(B)-34-4L	1763.	1899.	41	20	5¾	MH-41	NH-41TF or S
36	225	NEH(B)-36-4L	1849.	1993.	41	20	5¾	MH-41	NH-41TF or S
38	225	NEH(B)-38-4L	1935.	2087.	41	20	5¾	MH-41	NH-41TF or S
40	225	NEH(B)-40-4L	2021.	2181.	41	20	5¾	MH-41	NH-41TF or S
42	225	NEH(B)-42-4L	2107.	2275.	41	20	5¾	MH-41	NH-41TF or S
MAIN CIRCUIT BREAKER—3 POLE									
8	100	NEH(B)-08-4AB	$ 865.	$ 897.	35	20	5¾	MH-35	NH-35TF or S
10	100	NEH(B)-10-4AB	951.	991.	35	20	5¾	MH-35	NH-35TF or S
12	100	NEH(B)-12-4AB	1037.	1085.	35	20	5¾	MH-35	NH-35TF or S
14	100	NEH(B)-14-4AB	1123.	1179.	38	20	5¾	MH-38	NH-38TF or S
16	100	NEH(B)-16-4AB	1209.	1273.	38	20	5¾	MH-38	NH-38TF or S
18	100	NEH(B)-18-4AB	1295.	1367.	38	20	5¾	MH-38	NH-38TF or S
20	100	NEH(B)-20-4AB	1381.	1461.	44	20	5¾	MH-44	NH-44TF or S
22	100	NEH(B)-22-4AB	1467.	1555.	44	20	5¾	MH-44	NH-44TF or S
24	100	NEH(B)-24-4AB	1553.	1649.	44	20	5¾	MH-44	NH-44TF or S
26	100	NEH(B)-26-4AB	1639.	1743.	44	20	5¾	MH-44	NH-44TF or S
28	100	NEH(B)-28-4AB	1725.	1837.	44	20	5¾	MH-44	NH-44TF or S
30	100	NEH(B)-30-4AB	1811.	1931.	44	20	5¾	MH-44	NH-44TF or S
32	225	NEH(B)-32-4AB	2422.	2550.	53	20	5¾	MH-53	NH-53TF or S
34	225	NEH(B)-34-4AB	2508.	2644.	53	20	5¾	MH-53	NH-53TF or S
36	225	NEH(B)-36-4AB	2594.	2738.	53	20	5¾	MH-53	NH-53TF or S
38	225	NEH(B)-38-4AB	2680.	2832.	53	20	5¾	MH-53	NH-53TF or S
40	225	NEH(B)-40-4AB	2766.	2926.	53	20	5¾	MH-53	NH-53TF or S
42	225	NEH(B)-42-4AB	2852.	3020.	53	20	5¾	MH-53	NH-53TF or S

Price Additions For Other Branch Breakers:
Convert to equivalent number of one pole breakers and add as follows:

Poles	Breaker Ampere Rating	†Breaker	Equiv. No. of 1 Pole Breakers	Plug-On (EH) Price Addition Per Breaker	Bolt-On (EHB) Price Addition Per Breaker
2	15-60A.	EH or EHB	2	$18.	$18.
3	15-60A.	EH or EHB	3	50.	50.

†Complete interrupting rating data on Page 56.

Deductions:
Prices in Quick-Price Table include 15A. through 30A. one pole breakers mounted in all available spaces. Use table below if breakers are omitted.

Type of Breaker Omitted	Future Space Only Deduction Per Pole	No Space Deduction Per Pole
Plug-On	$32.	$43.
Bolt-On	36.	47.

Increased Mains: (Box Dimensions Also Increase)

From	To	Main Lugs & S/N 3Ø 4W.	Main Breaker & S/N 3Ø 4W.
100 or 125A.	225A.	$ 46.	$ 525.
100 or 125A.	400A.	146.	1089.
225A.	400A.	100.	564.
225A.	600A.	213.	.....
400A.	600A.	113.	.....

FORMULA PRICING

TABLE 1—BASE PRICE (Including Solid Neutral)

Mains Rating	Main Lugs 3Ø 4W.	Main Circuit Breaker 3Ø 4W. Standard		I-LIMITER	
100A.	.....	FA	$ 521.	IF	$1283.
125A.	$255.	...	.....	...	.....
225A.	301.	KA	1046.	IK	2192.
400A.	401.	•LA	1610.	..	....
600A.	514.	....	....	....	....

Equipment Ground Bar Mounted.....**$11.**

TABLE 2—BRANCH BREAKERS—PRICE PER BREAKER
1 POLE 277V. AC. 14,000 AIC—120V. AC—65000 AIC
2 AND 3 POLE 277/480V. AC 14,000 AIC—240V. AC—65,000 AIC

Breaker Ampere Rating	Plug-on Branch 1 Pole	2 Pole	3 Pole	Bolt-on Branch 1 Pole	2 Pole	3 Pole
15-30A.	$43.	$104.	$179.	$47.	$112.	$191.
35-60A.	....	104.	179.	....	112.	191.
Space Only	11.	22.	33.	11.	22.	33.

ADDITIONAL FEATURES—Price from Page 106.

SAMPLE ESTIMATE
277/480V. AC, 3Ø 4W., SURFACE MTD., BOTTOM FEED

No. Req'd.	Breaker	Amperes	No. Poles	Total Poles	Price
12	EHB	15	1	12	$ 564.
15	EHB	20	1	15	705.
Main Lugs & S/N		125	..	..	255.
				27	$1524.

DIMENSIONS

BOX SELECTION:
Select box required based on total number of poles and mains rating.

PANELBOARD SPACE REQUIREMENTS
1 pole—1 Space
2 pole—2 Spaces
3 pole—3 Spaces

CABINET DATA

MAIN LUGS ONLY

Total Poles	Maximum Mains	Box Dimensions H	W	D	Catalog Number
12	125	26	20	5¾	MH-26
18	125	29	20	5¾	MH-29
30	225	35	20	5¾	MH-35
42	225	41	20	5¾	MH-41
30	400	44	20	5¾	MH-44
42	400	50	20	5¾	MH-50
42	600	59	20	5¾	MH-59

MAIN CIRCUIT BREAKER

Total Poles	Maximum Mains	Box Dimensions H	W	D	Catalog Number
12	100FA/IF	35	20	5¾	MH-35
18	100FA/IF	38	20	5¾	MH-38
30	100FA/IF	44	20	5¾	MH-44
30	225KA	47	20	5¾	MH-47
42	225KA	53	20	5¾	MH-53
30	225IK	56	20	5¾	MH-56
42	225IK	62	20	5¾	MH-62
30	400LA	59	20	5¾	MH-59
42	400LA	65	20	5¾	MH-65

I-LIMITER is a Registered Trademark of Square D Company.

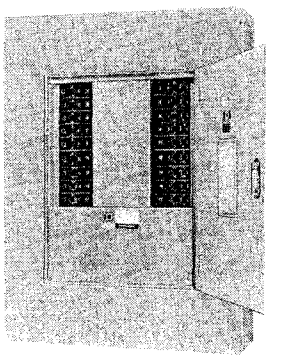
SQD SLV_000867

CIRCUIT BREAKER PANELBOARDS — FACTORY ASSEMBLED

I-LINE® (Column Width Panelboards are not I-LINE Construction)

NH1B 277/480 V. AC
480 V. AC

APPLICATION DATA



APPLICATION: For use on ac only. Meet Federal Spec. W-P-115a, Type I, Class 1. Listed by Underwriters Laboratories.

SERVICE: 1Ø 2 W., 1Ø 3 W., 3Ø 3 W., 3Ø 4 W., 480 V. Max. ac.

I.E.R.: INTEGRATED EQUIPMENT SHORT CIRCUIT RATINGS: See Page 76.

MAINS: Distributed Phase Bussing

Main Lugs:
100A.—1#4-300 MCM Al or Cu
(Column width—#6-2/0 Al, #10-2/0 Cu)
225A.—1#4-300 MCM Al or Cu
400A.—2#4-600 MCM Al or Cu
600A.—2#4-600 MCM Al or Cu

Main Breaker:
60A.—FA-600V. (Optional IF)—1#10-1/0 Al or Cu
100A.—FA-600V. (Optional IF)—1#10-1/0 Al or Cu
225A.—KA—(Optional IK)—1#4-300 MCM Al or Cu
400A.—LA—1#1-600 MCM or 2#1-250 MCM Al or Cu

BRANCHES:

Standard Width
FY and FA 1, 2 and 3 pole, 14,000 AIC
Meet Federal Specification W-C-375B.
FY, 15-30 A.—#8 Al or Cu
FA, 15-30 A.—#4 Al or Cu
35-100 A.—#1/0 Al or Cu

Column Width (Max. 50 A. branch)
FAL, 1, 2 and 3 pole, 14,000 AIC
Meet Federal Specification W-C-375B.
15-30 A.—#4 Al or Cu
35-50 A.—#1/0 Al or Cu

CABINETS: **MONO-FLAT** Fronts with concealed trim clamps, door with concealed hinges and flush lock, gray baked enamel finish. Boxes are galvanized steel with knockouts. Column width has screw cover fronts and boxes with gray baked enamel finish.

GUTTERS: Standard Width through 225 A. mains—5″ sides, 6½″ ends. 600 A. Max.—4″ sides, 8″ ends.

DIMENSIONS: Standard Width through 225 A. mains—see table below. 600 A. Max., Column Width and optional—Page 91.

METHOD OF PRICING

1. Use Quick-Price Table, below, to price all panelboards, standard or column width with; 225A. or less mains and maximum 42 circuits. Price other panelboards from Pricing Table—Page 91. Add additional features, cable troughs, pullboxes, etc., from Page 106.
2. Box sizes for standard panelboards are given below or on Page 91. When additional features are included, consult local Square D Field Office for box size.
3. When number of poles exceeds maximum shown, estimate as two or more panelboards adding sub-feed lugs as required.

STANDARD WIDTH—3 PHASE 4 WIRE

No. of Poles	Mains Rating	Description Type-Poles-Main	Price	Standard Width—Cabinet Data H	W	D	Box	★Front
MAIN LUGS ONLY								
8	100	NH1B-08-4L	$607.	36	26	6½	HC-2636B	HC-2636C( )
10	100	NH1B-10-4L	695.	36	26	6½	HC-2636B	HC-2636C( )
12	100	NH1B-12-4L	783.	36	26	6½	HC-2636B	HC-2636C( )
14	100	NH1B-14-4L	871.	36	26	6½	HC-2636B	HC-2636C( )
16	100	NH1B-16-4L	959.	36	26	6½	HC-2636B	HC-2636C( )
18	100	NH1B-18-4L	1047.	36	26	6½	HC-2636B	HC-2636C( )
20	100	NH1B-20-4L	1135.	45	26	6½	HC-2645B	HC-2645C( )
22	100	NH1B-22-4L	1223.	45	26	6½	HC-2645B	HC-2645C( )
24	100	NH1B-24-4L	1311.	45	26	6½	HC-2645B	HC-2645C( )
26	100	NH1B-26-4L	1399.	45	26	6½	HC-2645B	HC-2645C( )
28	100	NH1B-28-4L	1487.	45	26	6½	HC-2645B	HC-2645C( )
30	100	NH1B-30-4L	1575.	45	26	6½	HC-2645B	HC-2645C( )
32	225	NH1B-32-4L	1709.	54	26	6½	HC-2654B	HC-2654C( )
34	225	NH1B-34-4L	1797.	54	26	6½	HC-2654B	HC-2654C( )
36	225	NH1B-36-4L	1885.	54	26	6½	HC-2654B	HC-2654C( )
38	225	NH1B-38-4L	1973.	54	26	6½	HC-2654B	HC-2654C( )
40	225	NH1B-40-4L	2061.	54	26	6½	HC-2654B	HC-2654C( )
42	225	NH1B-42-4L	2149.	54	26	6½	HC-2654B	HC-2654C( )
MAIN CIRCUIT BREAKER—3 POLE								
8	60	NH1B-08-4AB	$824.	36	26	6½	HC-2636B	HC-2636C( )
10	60	NH1B-10-4AB	912.	36	26	6½	HC-2636B	HC-2636C( )
12	60	NH1B-12-4AB	1000.	36	26	6½	HC-2636B	HC-2636C( )
14	60	NH1B-14-4AB	1088.	45	26	6½	HC-2645B	HC-2645C( )
16	100	NH1B-16-4AB	1225.	45	26	6½	HC-2645B	HC-2645C( )
18	100	NH1B-18-4AB	1313.	45	26	6½	HC-2645B	HC-2645C( )
20	100	NH1B-20-4AB	1401.	45	26	6½	HC-2645B	HC-2645C( )
22	100	NH1B-22-4AB	1489.	45	26	6½	HC-2645B	HC-2645C( )
24	100	NH1B-24-4AB	1577.	45	26	6½	HC-2645B	HC-2645C( )
26	100	NH1B-26-4AB	1665.	54	26	6½	HC-2654B	HC-2654C( )
28	100	NH1B-28-4AB	1753.	54	26	6½	HC-2654B	HC-2654C( )
30	100	NH1B-30-4AB	1841.	54	26	6½	HC-2654B	HC-2654C( )
32	225	NH1B-32-4AB	2454.	54	26	6½	HC-2654B	HC-2654C( )
34	225	NH1B-34-4AB	2542.	54	26	6½	HC-2654B	HC-2654C( )
36	225	NH1B-36-4AB	2630.	54	26	6½	HC-2654B	HC-2654C( )
38	225	NH1B-38-4AB	2718.	63	26	6½	HC-2663B	HC-2663C( )
40	225	NH1B-40-4AB	2806.	63	26	6½	HC-2663B	HC-2663C( )
42	225	NH1B-42-4AB	2894.	63	26	6½	HC-2663B	HC-2663C( )

COLUMN WIDTH—3 PHASE 4 WIRE

No. of Poles	Mains Rating	Description Type-Poles-Main	Price	Column Width—Cabinet Data H	W	D	Box	Front
MAIN LUGS ONLY								
8	100	NH1B-08-4LX	$607.	35	8⅝	5	HX-835B	HX-835TS
10	100	NH1B-10-4LX	695.	35	8⅝	5	HX-835B	HX-835TS
12	100	NH1B-12-4LX	783.	35	8⅝	5	HX-835B	HX-835TS
14	100	NH1B-14-4LX	871.	44	8⅝	5	HX-844B	HX-844TS
16	100	NH1B-16-4LX	959.	44	8⅝	5	HX-844B	HX-844TS
18	100	NH1B-18-4LX	1047.	44	8⅝	5	HX-844B	HX-844TS
20	100	NH1B-20-4LX	1135.	53	8⅝	5	HX-853B	HX-853TS
22	100	NH1B-22-4LX	1223.	53	8⅝	5	HX-853B	HX-853TS
24	100	NH1B-24-4LX	1311.	53	8⅝	5	HX-853B	HX-853TS
26	100	NH1B-26-4LX	1399.	62	8⅝	5	HX-862B	HX-862TS
28	100	NH1B-28-4LX	1487.	62	8⅝	5	HX-862B	HX-862TS
30	100	NH1B-30-4LX	1575.	62	8⅝	5	HX-862B	HX-862TS
32	225	NH1B-32-4LX	1709.	71	8⅝	5	HX-871B	HX-871TS
34	225	NH1B-34-4LX	1797.	71	8⅝	5	HX-871B	HX-871TS
36	225	NH1B-36-4LX	1885.	71	8⅝	5	HX-871B	HX-871TS
38	225	NH1B-38-4LX	1973.	80	8⅝	5	HX-880B	HX-880TS
40	225	NH1B-40-4LX	2061.	80	8⅝	5	HX-880B	HX-880TS
42	225	NH1B-42-4LX	2149.	80	8⅝	5	HX-880B	HX-880TS
MAIN CIRCUIT BREAKER—3 POLE								
6	60	NH1B-06-4ABX	$736.	35	8⅝	5	HX-835B	HX-835TS
8	60	NH1B-08-4ABX	824.	44	8⅝	5	HX-844B	HX-844TS
10	60	NH1B-10-4ABX	912.	44	8⅝	5	HX-844B	HX-844TS
12	60	NH1B-12-4ABX	1000.	44	8⅝	5	HX-844B	HX-844TS
14	100	NH1B-14-4ABX	1137.	53	8⅝	5	HX-853B	HX-853TS
16	100	NH1B-16-4ABX	1225.	53	8⅝	5	HX-853B	HX-853TS
18	100	NH1B-18-4ABX	1313.	53	8⅝	5	HX-853B	HX-853TS
20	100	NH1B-20-4ABX	1401.	62	8⅝	5	HX-862B	HX-862TS
22	100	NH1B-22-4ABX	1489.	62	8⅝	5	HX-862B	HX-862TS
24	100	NH1B-24-4ABX	1577.	62	8⅝	5	HX-862B	HX-862TS
26	100	NH1B-26-4ABX	1665.	71	8⅝	5	HX-871B	HX-871TS
28	100	NH1B-28-4ABX	1753.	71	8⅝	5	HX-871B	HX-871TS
30	100	NH1B-30-4ABX	1841.	71	8⅝	5	HX-871B	HX-871TS
32	225	NH1B-32-4ABX	2454.	80	8⅝	5	HX-880B	HX-880TS
34	225	NH1B-34-4ABX	2542.	80	8⅝	5	HX-880B	HX-880TS
36	225	NH1B-36-4ABX	2630.	80	8⅝	5	HX-880B	HX-880TS
38	225	NH1B-38-4ABX	2718.	89	8⅝	5	HX-889B	HX-889TS
40	225	NH1B-40-4ABX	2806.	89	8⅝	5	HX-889B	HX-889TS
42	225	NH1B-42-4ABX	2894.	89	8⅝	5	HX-889B	HX-889TS

★Add "F" for Flush, "S" for Surface.

Price Additions For Other Branch Breakers:
Convert to equivalent number of one pole breakers and add as follows:

Poles	✻Breaker Ampere Rating	†Breaker	Equiv. No. of 1 Pole Brkrs.	Price Addition Per Breaker
1	△35-60 A.	FA (14,000 AIC at 277 V. ac)	1	$44.
1	70-100 A.	FA (14,000 AIC at 277 V. ac)	1	72.
1	15-30 A.	FH (65,000 AIC at 277 V. ac)	1	79.
2	15-60 A.	FA	2	96.
2	70-100 A.	FA	2	138.
3	15-60 A.	FA	3	103.
3	70-100 A.	FA	3	141.

Deductions:
Prices above include 15-30 A. one pole breakers mounted in all available spaces.
Deduct **$36.** per pole if breaker is eliminated but **space only** for future is retained.
Deduct **$44.** per pole if breaker is eliminated and **no space** for future is retained.

Increased Mains:

From	To	Main Lugs & S/N 3Ø, 4 W.	Main Breaker & S/N 3Ø, 4 W.
60 A.	100 A.	.....	$ 49.
60 A.	225 A.	.....	574.
100 A.	225 A.	$ 46.	525.
100 A.	400 A.	146.	1089.
225 A.	400 A.	100.	564.

✻50 A. maximum branch breaker in column width panelboards.
†Complete interrupting rating data on Page 56.
△15 and 20 ampere single pole breakers are UL Listed as switching duty breakers (SWD).

DE CATALOG REFERENCE: SECTION 1650

MONO-FLAT is a Registered Trademark of Square D Company.

SQD SLV_000868

FACTORY ASSEMBLED CIRCUIT BREAKER PANELBOARDS

(Column width panelboards are not I-LINE construction) I-LINE®

277/480 V. AC
480 V. AC NH1B

PRICING

TABLE 1—MAIN LUGS, MAIN CIRCUIT BREAKER, SOLID NEUTRAL

☆Mains Rating	Main Lugs		Main Breaker (Circuit Breaker interrupting rating—Page 56) Standard IC			HI-IC (Standard Width Only)			Add for Solid Neutral
	2 Pole	3 Pole	Breaker	2 Pole	3 Pole	Breaker	2 Pole	3 Pole	
60 A.	....	....	FA (600 V.)	$336.	$411.	FH	$ 440.	$ 559.	$ 61.
100 A.	$159.	$194.	FA (600 V.)	382.	460.	FH	484.	604.	61.
100 A.	....	....	....	....	....	IF	988.	1222.	61.
225 A.	185.	226.	KA	781.	971.	KH	1452.	1652.	75.
225 A.	....	....	....	....	....	IK	1778.	2117.	75.
400 A.	252.	299.	LA	1267.	1508.	LH	1933.	2222.	102.
600 A.	320.	370.	....	....	....	....	....	....	144.

☆Column Width—Maximum 225 A. Main Lugs or Main Breaker.

Equipment Ground Bar mounted in box.....add **$11.**

Shunt Trip Main Breaker.....add price from page 68.

TABLE 2—BRANCH BREAKERS—PRICE PER BREAKER
(Max. 50 A. branch breaker in column width).

Breaker Rating	Standard IC			HI-IC (Standard Width Only)		
	●1 Pole 277 V. ac (14,000 AIC) H=1½"	2 Pole 480 V. ac (14,000 AIC) H=3"	3 Pole 480 V. ac (14,000 AIC) H=4½"	1 Pole 277 V. ac (65,000 AIC) H=1½"	2 Pole 480 V. ac (25,000 AIC) H=3"	3 Pole 480 V. ac (25,000 AIC) H=4½"
15-30 A.	$44.	$184.	$235.	$123.	$335.	$386.
35-60 A.	87.	184.	235.	▲ 123.	335.	386.
70-100 A. Space Only with Conn.	116.	226.	273.	▲ 148.	374.	435.
	8.	16.	24.	8.	16.	24.

▲25,000 AIC
●Single Pole 15 and 20 ampere FY breakers are rated for switching duty (SWD).

TABLE 3—ACCESSORIES

Description	Catalog Number	Price
Handle Padlock Attachment		
FY—1 Pole.....	HPA-FYQ	$4.80
FA(L)—1, 2 or 3 Pole.....	HPA-FK	5.70
Combination Handle Tie and Lockoff		
For 3—1 Pole FY Breakers Only....	FY-3HT	12.60
For 3—1 Pole FA (L) Breakers Only..	FA-3HT	12.60
B1-2 DISCOUNT		

SAMPLE ESTIMATE—FORMULA PRICING
277/480 V. ac, 3Ø 4 W., SURFACE MTD., BOTTOM FEED

No. Req'd.	Amperes	No. Poles	Branch Mounting Space	Price
2	15	1	3"	$ 88.
2	20	1	3"	88.
1	20	3	4½"	235.
2	30	3	9"	470.
1	70	3	4½"	273.
Solid Neutral	225	.	....	75.
Main Lugs	225	.	....	226.
			24"	—
			Total Price	$1455.

Box Dimensions: 36" H. x 26" W. x 6½" D.

DIMENSIONS

BOX SELECTION
Select box required from table below based on total breaker mounting space and required mains rating.

Standard Width
Main Lugs—100 A. through 600 A.—26" W. x 6½" D.
Main Breaker—60 A. through 400 A.—26" W. x 6½" D.

Column Width
All furnished in 8⅝" W. x 5" D. box for 10" WF beams.
6⅞" W. x 5" D. box not available.

PANELBOARD BRANCH SPACE REQUIREMENTS
1 pole = 1½"
2 pole = 3"
3 pole = 4½"

CABINET DATA

MAIN LUGS ONLY

Total Breaker Mounting Space (Inches)	Maximum Mains Rating	Box Dimensions H	W	D	Box Catalog Number
Standard Width					
27	600	36			HC-2636-B
45	600	45			HC-2645-B
63	600	54	26	6½	HC-2654-B
81	600	63			HC-2663-B
99	600	72			HC-2672-B
135	600	90			HC-2690-B
Column Width (Not I-LINE Construction)					
18	100	35			HX-835-B
27	100	44			HX-844-B
36	100	53			HX-853-B
45	100	62	8⅝	5	HX-862-B
54	225	71			HX-871-B
63	225	80			HX-880-B

MAIN CIRCUIT BREAKER

Total Breaker Mounting Space (Inches)	Maximum Mains Rating	Box Dimensions H	W	D	Box Catalog Number
Standard Width					
18	225KA	36			HC-2636-B
36	225KA	45			HC-2645-B
54	225KA	54			HC-2654-B
63	225KA	63			HC-2663-B
90	225KA	72	26	6½	HC-2672-B
126	225KA	90			HC-2690-B
27	225IK or 400LA	45			HC-2645-B
45	225IK or 400LA	54			HC-2654-B
63	225IK or 400LA	63			HC-2663-B
81	225IK or 400LA	72			HC-2672-B
117	225IK or 400LA	90			HC-2690-B
Column Width (Not I-LINE Construction)					
9	60FA	35			HX-835-B
18	60FA	44			HX-844-B
27	100FA	53			HX-853-B
36	100FA	62	8⅝	5	HX-862-B
45	100FA	71			HX-871-B
54	225KA	80			HX-880-B
63	225KA	89			HX-889-B

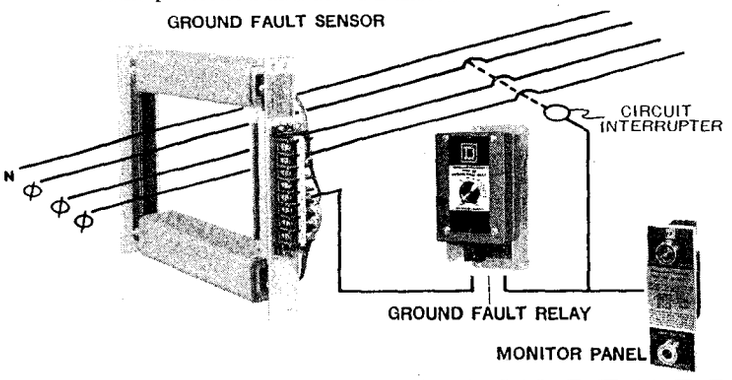
SQD SLV_000869

Ground-Censor® EQUIPMENT GROUND FAULT PROTECTION SYSTEM
TYPES GC and GP

Types GC and GP ground fault protection systems are designed for use on power distribution systems which include a grounded conductor (neutral or grounded phase).

These systems meet the requirements of paragraph 230-95 of the 1981 National Electrical Code for equipment ground fault protection and are UL Listed.

- Zone selective interlocking with Type GC.
- Self-powered—no separate control power source required with Type GP and circuit breaker arrangement.
- Adjustable current pickup setting—100 thru 1,200 amperes for Type GC; 200 thru 1,200 amperes for Type GP.
- Nominal .1, .2, .3 and .5 second time delay for system selectivity.
- Self-contained test circuit tests all components (relay, sensor, circuit breaker or switch trip coil). Requires external 120 V. ac source.
- Monitor Panel—provides visual indication of ground fault interruption. Contains push-to-test button for test circuit.



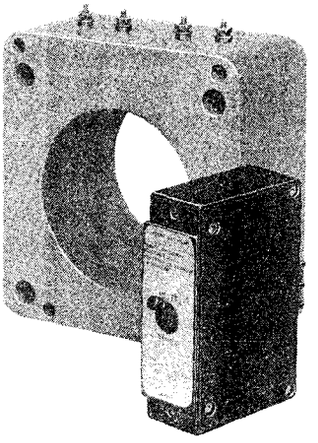
Description		Catalog Number	Price
Ground Fault Relay—Type GC†		GC-100	$632.
Ground Fault Relay—Type GP	.1 Sec. Delay .2 Sec. Delay .3 Sec. Delay .5 Sec. Delay	GP-200B GP-200C GP-200D GP-200F	574.
Ground Fault Sensor Types GC and GP	5" x 8" Window 5" x 14" Window 5" x 26" Window 8" x 14" Window 8" x 20" Window 8" x 26" Window 11" x 26" Window	GT-912 GT-918 GT-930 GT-1218 GT-1224 GT-1230 GT-1530	377. 440. 589. 564. 618. 694. 795.
★Monitor Components—Type GC Test With and Without Tripping	Test Button Reset Button Test Relay Relay Socket	Class 9001 Type K1L-38G-H2 Class 9001 Type K1L-38R-H1 Class 8501 Type RS14, 120 V. ac Class 8501 Type NR44	*
★Monitor Components—Type GC Test With Tripping Only	Test Button Reset Button	Class 9001 Type KR-2B-H5 Class 9001 Type K1L-38R-H6	*
Monitor Panel—Type GP	(Optional)	GP-MP1	196.
Circuit Breaker	Type GP System	Select circuit breaker from page 60-62 and GROUND FAULT SHUNT TRIP from page 68.	
	●Type GC System	Select circuit breaker from page 60-62 and SHUNT TRIP from page 68.	
BOLT-LOC Switch	●▲Type GP System	Select electric trip BOLT-LOC Switch from page 51.	
	●Type GC System	Select electric trip BOLT-LOC Switch from page 51.	

†Time delay is field adjustable for .1, .2, .3 and .5 second nominal.
★A nameplate is provided with each GC-100 giving operation instructions for "Test With and Without Tripping" arrangement. A nameplate is **not** provided for "Test With Tripping Only" arrangement.
*Refer to Digest Section for Class 9001 and Class 8501 devices for pricing.
●Requires separate control power source.
▲Requires auxiliary relay—Class 8501 Type KU12.
NOTE: Type GP systems may be used with other interrupting devices by using an external power source and auxiliary relay. Contact local field office.
DE CATALOG REFERENCE: SECTIONS 830 AND 831.
BOLT-LOC is a Registered Trademark of Square D Company.

Ground-Censor® EQUIPMENT GROUND FAULT PROTECTION SYSTEM
TYPE GA

Type GA ground fault protection system is ideally suited for application on motor control circuits. Current pickup of relay is field adjustable within range of sensor selected and requires no control power to accomplish transfer of its output contacts. Normally open contacts and control power can be used for tripping an overcurrent device. Normally closed contacts can open coil circuit to motor starter.● Operation of the ground fault system is indicated by the relay handle. Time delay relay provides instantaneous to 36 cycle field adjustable delay. Relay contacts are rated 10 amps. continuous at 250V. ac. UL listed.

Description		Ground Fault Trip Ampere Range	Catalog Number	Price
Relay	●Instantaneous	See Below	GA-12	$210.
	●Time Delay		GAT-12	305.
Sensor	3¾" Diameter	4-12, 12-36	GA-375T	163.
	3¾" Diameter	4-12	*GA-375	130.
	2½" Diameter	4-12	*GA-250	120.
	7⅞" x 11¼"	25-75, 50-150, 150-450, 400-1200	GA-811	259.
	7⅞" x 15¾"	50-150, 150-450, 400-1200	GA-816	294.
	7⅞" x 24⅝"	150-450, 400-1200	GA-825	355.
Test Panel		Same As Sensor	GA-12TPM	339.

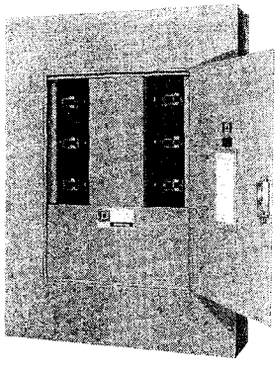


*Does not have connections for Test Panel.
●Use GAT-12 for motor starter applications. Minimum time delay should be 6 cycles to allow circuit interrupting device to interrupt large faults.
DE CATALOG REFERENCE: SECTION 840

SQD SLV_000870

UNASSEMBLED CIRCUIT BREAKER PANELBOARDS

600 V. AC
250 V. DC **I-LINE®**



Type HCN
400 A. Main Lugs

APPLICATION: For use on ac or dc systems. Meet Federal Specification W-P-115a, Type I, Class 1. Listed by Underwriters Laboratories.

SERVICE: 600V. Max. ac
250V. Max. dc

I.E.R.: INTEGRATED EQUIPMENT SHORT CIRCUIT RATINGS: See Page 75.

MAINS:

Main Lugs:
225A.—1#6-300 MCM Al or Cu
400A.—2#4-600 MCM Al or Cu
600A.—2#4-600 MCM Al or Cu
800A.—3#3/0-750 MCM Al or Cu
1200A.—4#2-750 MCM Al or Cu

Main Breaker: (See page 56 for interrupting rating)
100A.—FA (600V.)—1#10-1/0 Al or Cu
225A.—KA—1#4-300 MCM Al or Cu
225A.—IK—1#4-300 MCM Al or Cu
400A.—LA—1#1-600 MCM or 2#1-250 MCM Al or Cu
600A.—MA—3#3/0-500 MCM Al or Cu
800A.—MA—3#3/0-500 MCM Al or Cu
1200A.—NH—4#350-750 MCM Al or Cu

BRANCHES: Plug-on—FA, FH, FY, Q2, Q2-H, Q2H, IF, KA, KH, IK, Q4, LA, LH, MA, ME▲ and MH
Meet Federal Specifications W-C-375B (See page 56 for class numbers)
15—100 A.—1 Pole
15—800 A.—2 and 3 Pole
Branch circuit breakers feeding cycling motor loads, welder loads, or induction heating devices may require derating, refer to bottom of this page for data.

CABINETS: 26" wide, 6½" deep, galvanized steel with knockouts.
MONO-FLAT® fronts with door, gray baked enamel finish.
32" wide 8¼" deep and 41" wide, 9½" deep, 48" wide, 14" wide without knockouts, gray baked enamel finish. Fronts with door, gray baked enamel finish.
All sizes have removable endwalls.

GUTTERS: See table Page 99.

DE CATALOG REFERENCE: SECTION 2110

▲Submittal for UL Listing Pending.

SELECTION OF COMPONENTS

1. List required circuits (ampere rating, voltage and poles).
2. Select branch circuit breakers from Page 95 (include phase connections for one and two-pole branches) and determine total mounting space. Include space for future circuit additions.
   NOTE: Branch breakers mount independently on each side of the I-LINE busbar stack. Total mounting space includes both sides. Make a sketch to be certain all components will mount.
3. Select Main Lugs or †Main Breaker Interior Catalog Number from Page 96 or Page 97 based on required branch mounting space, mains rating, and maximum branch breaker. Interiors are symmetrical and may be installed for either top or bottom feed. When installed for top feed, main lug phase markings will be CBA from left to right. Top-fed main breaker interiors require field modification to provide handle operation with ON in the up position and OFF in the down position. Consult local Square D field office for instructions.
4. Select Box and Front Catalog Numbers corresponding to Interior Catalog Number from Page 96 or 97.
5. Select Solid Neutral Assembly, if required, from Page 97.
6. Select blanks to fill unused mounting space from Page 97.

†Main Breaker may be back-fed breaker mounted as a branch in main lugs interior.

APPLICATION DATA

(FOR I-LINE BUSWAY APPLICATIONS, REFER TO PAGE 126)

Industrial uses of panelboards, motor starter centers and switchboards frequently involve cycling of heavy duty loads such as welders, induction furnaces, molding machines and air compressors. The peak currents obtained and the duty cycle of the equipment involved affect the selection of overcurrent devices.

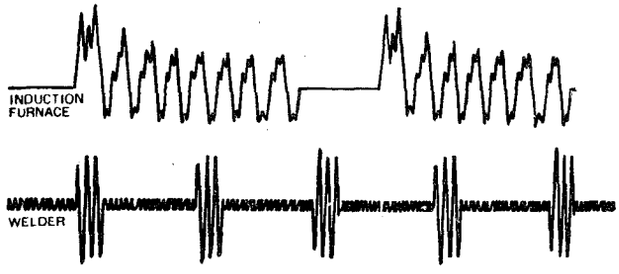
The guidelines below should be followed in selecting branch circuit breakers for use on these type loads.

SINGLE MOTOR BRANCH CIRCUITS

Typical Motor HP	THREE PHASE—230V./60Hz		THREE PHASE—460V./60Hz	
	*Normal Service Thermal-Magnetic Circuit Breaker	●Heavy Service Thermal-Magnetic Circuit Breaker	*Normal Service Thermal-Magnetic Circuit Breaker	●Heavy Service Thermal-Magnetic Circuit Breaker
2	15 FA	15 FA	15 FA	15 FA
3	20 FA	20 FA	15 FA	15 FA
5	30 FA	35 FA	15 FA	15 FA
7½	45 FA	45 FA	20 FA	25 FA
10	60 FA	60 FA	25 FA	30 FA
15	80 FA	90 FA	40 FA	45 FA
20	90 FA	110 KA	60 FA	60 FA
25	100 FA	150 KA	70 FA	70 FA
30	110 KA	175 KA	80 FA	80 FA
40	150 KA	225 LA	90 FA	110 KA
50	200 KA	300 LA	100 FA	150 KA
60	225 LA	350 LA	110 KA	175 KA
75	250 LA	400 MA	125 KA	200 LA
100	350 LA	500 MA	200 KA	250 LA
125	450 MA	700 MA	225 LA	350 LA
150	500 MA	800 MA	250 LA	400 MA
200	700 MA	1000 PA	350 LA	500 MA

*Based on 1981 NEC—Article 430, see Page 478 for details.
●Heavy Service is Jogging or Plugging Duty or Cycling Load with over 25 starts per hour or over 5 starts per minute.

TYPICAL WAVEFORMS



SINGLE PHASE WELDER CIRCUITS

★Rated KVA 1Ø	230 V. Amp. Rating / Square D Brkr.	460 V. Amp. Rating / Square D Brkr.
10	70 FA	40 FA
15	100 FA	50 FA
30	300 LA	150 KA
50	450 MA	225 KA
75	700 MA	350 LA
100	.....	500 MA

★For larger ratings consult local Square D Field Office giving full information on welder type and duty cycle.

INDUCTION DEVICES (Heaters, Furnaces and Molding Machines)

Circuit breaker ampere rating must be
3 TIMES
device nameplate ampere rating
(including internal motors, etc.)

SQD SLV_000871

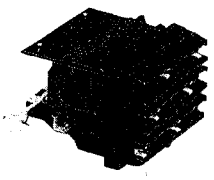
CIRCUIT BREAKERS
FOR I-LINE PANELBOARDS & SWITCHBOARDS

PLUG-ON QO® DISTRIBUTION PANEL—240 V. Max. AC Only

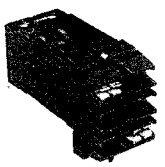
Mounts in Type HCN, HCM, HCW or HCWM I-LINE Panelboards, 30A. Max. Branch Breaker

Not for use in I-LINE Motor Starter Center.—Order QO breakers from page 78

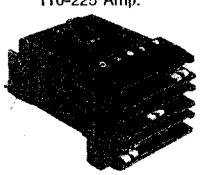
Max. No. One Pole QO Breakers	Phase Connection	Mounting Height (Inches)	2 Pole Catalog Number	3 Pole Catalog Number	Price (Less Breakers)
6	AB	4½	HQO-206AB	.....	**$88.**
6	BC	4½	HQO-206BC	.....	**88.**
6	AC	4½	HQO-206AC	.....	**88.**
6	ABC	4½	.....	HQO-306	**88.**



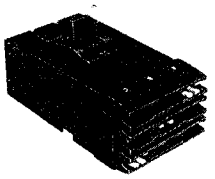
HQO-306



Q2, Q2-H 2 Pole
110-225 Amp.



Q2, Q2-H 3 Pole
110-225 Amp.



Q4 2 and 3 Pole
250-400 Amp.

I-LINE PLUG-ON BRANCH BREAKERS

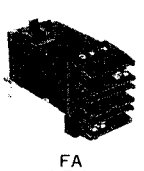
★ Ampere Rating	2 Pole							3 Pole				
	120/240V. ac 10,000 AIC			240V. ac 22,000 AIC		240V. ac 42,000 AIC		240V. ac 10,000 AIC			240V. ac 22,000 AIC	
	Ht. (In.)	✻Catalog Number	Price	✻Catalog Number	Price	✻Catalog Number	Price	Ht. (In.)	Catalog Number	Price	Catalog Number	Price
Q2 AND Q2-H 225 AMPERE FRAME												
110	3	Q2-21110-( )	**$120.**	✙Q2-22110-( )-H	**$289.**	Q2H22110-( )	**$383.**	4½	Q2-32110	**$373.**	Q2-32110-H	**$483.**
125	3	Q2-21125-( )	**120.**	✙Q2-22125-( )-H	**289.**	Q2H22125-( )	**383.**	4½	Q2-32125	**373.**	Q2-32125-H	**483.**
150	3	Q2-21150-( )	**120.**	✙Q2-22150-( )-H	**289.**	Q2H22150-( )	**383.**	4½	Q2-32150	**373.**	Q2-32150-H	**483.**
175	3	Q2-21175-( )	**120.**	✙Q2-22175-( )-H	**289.**	Q2H22175-( )	**383.**	4½	Q2-32175	**373.**	Q2-32175-H	**483.**
200	3	Q2-21200-( )	**120.**	✙Q2-22200-( )-H	**289.**	Q2H22200-( )	**383.**	4½	Q2-32200	**373.**	Q2-32200-H	**483.**
225	3	Q2-21225-( )	**120.**	✙Q2-22225-( )-H	**289.**	Q2H22225-( )	**383.**	4½	Q2-32225	**373.**	Q2-32225-H	**483.**
Q4 400 AMPERE FRAME 240V. AC												
250	6	.....	...	Q4-22250-( )	**$800.**	.....	...	6	.....	...	Q4-32250	**1006.**
300	6	.....	...	Q4-22300-( )	**800.**	.....	...	6	.....	...	Q4-32300	**1006.**
350	6	.....	...	Q4-22350-( )	**800.**	.....	...	6	.....	...	Q4-32350	**1006.**
400	6	.....	...	Q4-22400-( )	**800.**	.....	...	6	.....	...	Q4-32400	**1006.**

★ Amp. Rating	1 Pole			2 Pole			3 Pole		
	Ht. (In.)	✻Catalog Number	Price	Ht. (In.)	✻Catalog Number	Price	Ht. (In.)	Catalog Number	Price
FA 100 AMPERE FRAME 240 VOLT AC									
15	...	.....	...	3	◐FA-22015-( )	**$ 96.**	4½	FA-32015	**$ 137.**
20	...	.....	...	3	◐FA-22020-( )	**96.**	4½	FA-32020	**137.**
30	...	.....	...	3	◐FA-22030-( )	**96.**	4½	FA-32030	**137.**
40	...	.....	...	3	◐FA-22040-( )	**96.**	4½	FA-32040	**137.**
50	...	.....	...	3	◐FA-22050-( )	**96.**	4½	FA-32050	**137.**
60	...	.....	...	3	◐FA-22060-( )	**96.**	4½	FA-32060	**137.**
70	...	.....	...	3	◐FA-22070-( )	**146.**	4½	FA-32070	**186.**
90	...	.....	...	3	◐FA-22090-( )	**146.**	4½	FA-32090	**186.**
100	...	.....	...	3	◐FA-22100-( )	**146.**	4½	FA-32100	**186.**
FA AND FY 100 AMPERE FRAME 480 VOLT AC									
15	1½	▲FY-14015-( )	**$36.**	3	△FA-24015-( )	**$ 158.**	4½	FA-34015	**$ 200.**
20	1½	▲FY-14020-( )	**36.**	3	△FA-24020-( )	**158.**	4½	FA-34020	**200.**
30	1½	▲FY-14030-( )	**36.**	3	△FA-24030-( )	**158.**	4½	FA-34030	**200.**
40	1½	■FA-14040-( )	**73.**	3	△FA-24040-( )	**158.**	4½	FA-34040	**200.**
50	1½	■FA-14050-( )	**73.**	3	△FA-24050-( )	**158.**	4½	FA-34050	**200.**
60	1½	■FA-14060-( )	**73.**	3	△FA-24060-( )	**158.**	4½	FA-34060	**200.**
70	1½	■FA-14070-( )	**79.**	3	△FA-24070-( )	**200.**	4½	FA-34070	**238.**
90	1½	■FA-14090-( )	**79.**	3	△FA-24090-( )	**200.**	4½	FA-34090	**238.**
100	1½	■FA-14100-( )	**79.**	3	△FA-24100-( )	**200.**	4½	FA-34100	**238.**
FA 100 AMPERE FRAME 600 VOLT AC 250 VOLT DC									
15	1½	■FA-14015-( )	**$73.**	3	FA-26015-( )	**$ 186.**	4½	FA-36015	**$ 233.**
20	1½	■FA-14020-( )	**73.**	3	FA-26020-( )	**186.**	4½	FA-36020	**233.**
30	1½	■FA-14030-( )	**73.**	3	FA-26030-( )	**186.**	4½	FA-36030	**233.**
40	...	■FA-14040-( )	**73.**	3	FA-26040-( )	**186.**	4½	FA-36040	**233.**
50	...	■FA-14050-( )	**73.**	3	FA-26050-( )	**186.**	4½	FA-36050	**233.**
60	...	■FA-14060-( )	**73.**	3	FA-26060-( )	**186.**	4½	FA-36060	**233.**
70	...	■FA-14070-( )	**79.**	3	FA-26070-( )	**228.**	4½	FA-36070	**279.**
90	...	■FA-14090-( )	**79.**	3	FA-26090-( )	**228.**	4½	FA-36090	**279.**
100	...	■FA-14100-( )	**79.**	3	FA-26100-( )	**228.**	4½	FA-36100	**279.**
KA 225 AMPERE FRAME 600 VOLT AC 250 VOLT DC									
110	...	.....	...	4½	KA-26110-( )	**$ 527.**	4½	KA-36110	**$ 656.**
125	...	.....	...	4½	KA-26125-( )	**527.**	4½	KA-36125	**656.**
150	...	.....	...	4½	KA-26150-( )	**527.**	4½	KA-36150	**656.**
175	...	.....	...	4½	KA-26175-( )	**527.**	4½	KA-36175	**656.**
200	...	.....	...	4½	KA-26200-( )	**527.**	4½	KA-36200	**656.**
225	...	.....	...	4½	KA-26225-( )	**527.**	4½	KA-36225	**656.**
LA 400 AMPERE FRAME 600 VOLT AC 250 VOLT DC									
250	...	.....	...	6	LA-26250-( )	**$ 953.**	6	LA-36250	**$1163.**
300	...	.....	...	6	LA-26300-( )	**953.**	6	LA-36300	**1163.**
350	...	.....	...	6	LA-26350-( )	**953.**	6	LA-36350	**1163.**
400	...	.....	...	6	LA-26400-( )	**953.**	6	LA-36400	**1163.**
MA 800 AMPERE FRAME 600 VOLT AC 250 VOLT DC									
450	...	.....	...	9	MA-26450-( )	**$1562.**	9	MA-36450	**$1924.**
500	...	.....	...	9	MA-26500-( )	**1562.**	9	MA-36500	**1924.**
600	...	.....	...	9	MA-26600-( )	**1562.**	9	MA-36600	**1924.**
700	...	.....	...	9	MA-26700-( )	**1972.**	9	MA-36700	**2498.**
800	...	.....	...	9	MA-26800-( )	**1972.**	9	MA-36800	**2498.**

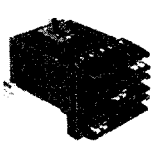
▲Rated 277V. ac. 15 and 20 ampere FY breakers are rated for switching duty (SWD).
■Rated 277V. ac, 125V. dc.
◐Rated 250V. dc or 240V. ac.
△Rated 250V. dc or 480V. ac.
★See page 95.
✻See page 95.
✙2 Pole, Q2-H rated 10,000 AIC 240V. 3Ø Grd. BØ.



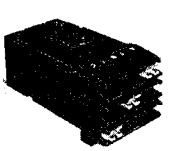
FY, FA
1-Pole
15-100 Amp.



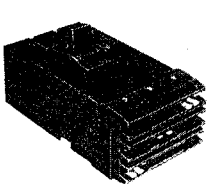
FA
2-Pole
15-100 Amp.



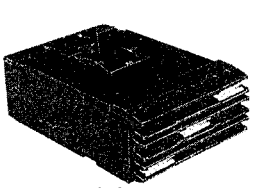
FA
3-Pole
15-100 Amp.



KA
2 and 3-Pole
110-225 Amp.



LA
2 and 3-Pole
250-400 Amp.



MA
2 and 3-Pole
450-800 Amp.

SUB-FEED LUGS
(Plug-on in same manner as a branch breaker)

Ampere Rating	Height (Inches)	Catalog Number	Price
100	4½	SL-100	**$100.**
225	4½	SL-225	**100.**
400	6	SL-400	**135.**
800	9	●SL-800	**399.**

●For use in Type HCWM and HCWA interiors only, all others mount in all interior types.

I-LINE is a Registered Trademark of Square D Company.

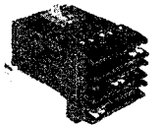
SQD SLV_000872



FH
1-Pole
15-100 Amp.



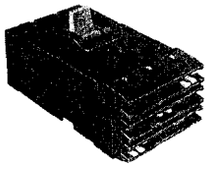
FH
2-Pole
15-100 Amp.



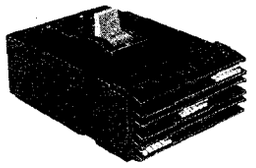
FH
3-Pole
15-100 Amp.



KH
2 and 3-Pole
110-225 Amp.



LH
2 and 3-Pole
250-400 Amp.

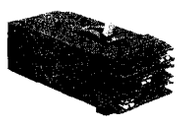


MH
2 and 3-Pole
450-800 Amp.

I-LIMITER
CURRENT LIMITING CIRCUIT BREAKERS



IF
2 and 3-Pole
15-100 Amp.



IK
2 and 3-Pole
110-225 Amp.

IF—100 AMPERE FRAME 480 VOLT AC

★ Amp. Rating	2 Pole Ht. (In.)	2 Pole *Catalog Number	2 Pole Price	3 Pole Ht. (In.)	3 Pole Catalog Number	3 Pole Price
15	4½	IF-24015-( )	$ 831.	4½	IF-34015	$ 998.
20	4½	IF-24020-( )	831.	4½	IF-34020	998.
30	4½	IF-24030-( )	831.	4½	IF-34030	998.
40	4½	IF-24040-( )	831.	4½	IF-34040	998.
50	4½	IF-24050-( )	831.	4½	IF-34050	998.
60	4½	IF-24060-( )	831.	4½	IF-34060	998.
70	4½	IF-24070-( )	831.	4½	IF-34070	998.
90	4½	IF-24090-( )	831.	4½	IF-34090	998.
100	4½	IF-24100-( )	831.	4½	IF-34100	998.

IK—225 AMPERE FRAME 480 VOLT AC

110	6	IK-24110-( )	$1557.	6	IK-34110	$1967.
125	6	IK-24125-( )	1557.	6	IK-34125	1967.
150	6	IK-24150-( )	1557.	6	IK-34150	1967.
175	6	IK-24175-( )	1557.	6	IK-34175	1967.
200	6	IK-24200-( )	1557.	6	IK-34200	1967.
225	6	IK-24225-( )	1557.	6	IK-34225	1967.

***1 and 2 Pole Breaker Catalog Numbers** are completed by adding the required phase connection letters as a suffix to the circuit breakers listed at left and above.

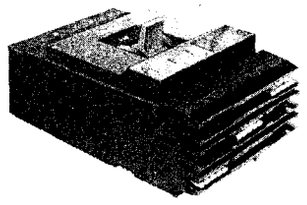
Example: 30A., 480 volt breakers as shown.

Phase Connection	1 Pole	2 Pole	3 Pole
A	FY-14030-A	.....	.....
B	FY-14030-B	.....	.....
C	FY-14030-C	.....	.....
A-B	.....	FA-24030-AB	.....
A-C	.....	FA-24030-AC	.....
B-C	.....	FA-24030-BC	.....
A-B-C	.....	.....	FA-34030

★ Amp. Rating	1 Pole Ht. (In.)	1 Pole *Catalog Number	1 Pole Price	2 Pole Ht. (In.)	2 Pole *Catalog Number	2 Pole Price	3 Pole Ht. (In.)	3 Pole Catalog Number	3 Pole Price
I-75000 HIGH INTERRUPTING CAPACITY CIRCUIT BREAKERS									
FH 100 AMPERE FRAME 600 VOLT AC 250 VOLT DC									
15	1½	▲FH-16015-( )	$121.	3	FH-26015-( )	$ 292.	4½	FH-36015	$ 347.
20	1½	▲FH-16020-( )	121.	3	FH-26020-( )	292.	4½	FH-36020	347.
30	1½	▲FH-16030-( )	121.	3	FH-26030-( )	292.	4½	FH-36030	347.
40	...	▲FH-16040-( )	121.	3	FH-26040-( )	292.	4½	FH-36040	347.
50	...	▲FH-16050-( )	121.	3	FH-26050-( )	292.	4½	FH-36050	347.
60	...	▲FH-16060-( )	121.	3	FH-26060-( )	292.	4½	FH-36060	347.
70	...	▲FH-16070-( )	135.	3	FH-26070-( )	349.	4½	FH-36070	393.
90	...	▲FH-16090-( )	135.	3	FH-26090-( )	349.	4½	FH-36090	393.
100	...	▲FH-16100-( )	135.	3	FH-26100-( )	349.	4½	FH-36100	393.
KH 225 AMPERE FRAME 600 VOLT AC 250 VOLT DC									
110	...	.....	...	4½	KH-26110-( )	$1218.	4½	KH-36110	$1477.
125	...	.....	...	4½	KH-26125-( )	1218.	4½	KH-36125	1477.
150	...	.....	...	4½	KH-26150-( )	1218.	4½	KH-36150	1477.
175	...	.....	...	4½	KH-26175-( )	1218.	4½	KH-36175	1477.
200	...	.....	...	4½	KH-26200-( )	1218.	4½	KH-36200	1477.
225	...	.....	...	4½	KH-26225-( )	1218.	4½	KH-36225	1477.
LH 400 AMPERE FRAME 600 VOLT AC 250 VOLT DC									
250	...	.....	...	6	LH-26250-( )	$1593.	6	LH-36250	$1919.
300	...	.....	...	6	LH-26300-( )	1593.	6	LH-36300	1919.
350	...	.....	...	6	LH-26350-( )	1593.	6	LH-36350	1919.
400	...	.....	...	6	LH-26400-( )	1593.	6	LH-36400	1919.
MH 800 AMPERE FRAME 600 VOLT AC 250 VOLT DC									
450	...	.....	...	9	MH-26450-( )	$1943.	9	MH-36450	$2338.
500	...	.....	...	9	MH-26500-( )	1943.	9	MH-36500	2338.
600	...	.....	...	9	MH-26600-( )	1943.	9	MH-36600	2338.
700	...	.....	...	9	MH-26700-( )	2380.	9	MH-36700	2975.
800	...	.....	...	9	MH-26800-( )	2380.	9	MH-36800	2975.

▲Rated 277V. ac.

ME SOLID STATE TRIP CIRCUIT BREAKER—600V. ac-WITH LUGS
Standard Rated Breaker



Complete breaker requires frame and rating plug.

Ampere Rating	I-LINE Breaker—Frame Only *Two Pole Ht. (In.)	*Two Pole Cat. No.	*Two Pole Price	Three Pole Ht. (In.)	Three Pole Cat. No.	Three Pole Price	Rating Plug One Required Cat. No.	Rating Plug One Required Price
225 AMPERE FRAME								
125 150 175 200 225	9	ME2-26 ( )	$1613.	9	ME2-36	$1913.	ME2-125 ME2-150 ME2-175 ME2-200 ME2-225	$122.
400 AMPERE FRAME								
250 300 350 400	9	ME4-26 ( )	$1613.	9	ME4-36	$1913.	ME4-250 ME4-300 ME4-350 ME4-400	$122.
800 AMPERE FRAME								
400 450 500 600 700 800	9	ME8-26 ( )	$2325.	9	ME8-36	$2856.	ME8-400 ME8-450 ME8-500 ME8-600 ME8-700 ME8-800	$122.

INTEGRAL GROUND FAULT PROTECTION—Add Suffix letter "G" to Frame Only Cat. No., e.g. ME836G. Includes neutral CT for 3 ∅ 4W application. Price adder **$908.** Suitable for use only in factory assembled I-LINE Switchboards.

★Additional branch ampere ratings in accordance with the 1981 National Electrical Code are available. Refer to numerical listing for prices.
Branch circuit breakers feeding cycling motor loads, welder loads, or induction heating devices may require derating, refer to Page 93 for data.
Bolt-on branch breakers are available at no additional cost. Add letter B to catalog number prefix (i.e. FYB-) on order. Not available on MA branch breakers.
Circuit Breaker accessories, see p. 68 & 69.

CIRCUIT BREAKER INTERRUPTING RATING—See page 56.

I-LINE and I-LIMITER are Registered Trademarks of Square D Company
I-75000 is a Trademark of Square D Company

SQD SLV_000873

CIRCUIT BREAKER PANELBOARDS — UNASSEMBLED

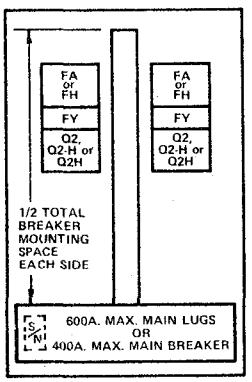
I-LINE® INTERIORS, BOXES AND FRONTS

600 V. AC
250 V. DC

(100 A. and 225A. interiors include solid neutral, all others without solid neutral)

TYPE HCN

100A. MAX. FA, FH, FY-600V. ac
225A. MAX. Q2, Q2-H, Q2H
240V. ac Max. Branch Breaker

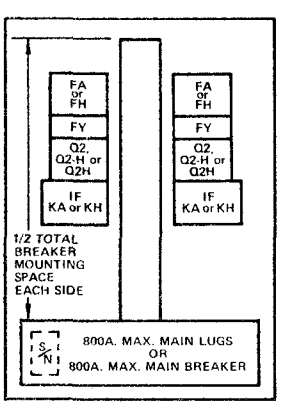


Box Size: 26" Wide, 6½" Deep

Total Breaker Mounting Space (Inches)	Mains Ampere Rating	Complete Price (Less Branch Breakers)	Interior Assembly (Less Branch Breakers) Catalog No.	Price	Front (F=Flush, S=Surface) Catalog No.	Price	Box Catalog No.	Price	Box Height (Inches)
MAIN LUGS ONLY—3 Pole Suitable for use as Service Equipment when provided with a main breaker.									
■27	225	$495.	HCN-1436-2N	$329.	HC-2636-C(F or S)	$ 86.	HC-2636-B	$ 80.	36
■27	400	490.	HCN-1436-4	324.	HC-2636-C(F or S)	86.	HC-2636-B	80.	36
■27	600	545.	HCN-1436-6	379.	HC-2636-C(F or S)	86.	HC-2636-B	80.	36
45	225	602.	HCN-2345-2N	408.	HC-2645-C(F or S)	100.	HC-2645-B	94.	45
45	400	609.	HCN-2345-4	415.	HC-2645-C(F or S)	100.	HC-2645-B	94.	45
45	600	668.	HCN-2345-6	474.	HC-2645-C(F or S)	100.	HC-2645-B	94.	45
63	225	714.	HCN-3254-2N	453.	HC-2654-C(F or S)	142.	HC-2654-B	119.	54
63	400	716.	HCN-3254-4	455.	HC-2654-C(F or S)	142.	HC-2654-B	119.	54
63	600	774.	HCN-3254-6	513.	HC-2654-C(F or S)	142.	HC-2654-B	119.	54
81	225	793.	HCN-4163-2N	498.	HC-2663-C(F or S)	162.	HC-2663-B	133.	63
81	400	795.	HCN-4163-4	500.	HC-2663-C(F or S)	162.	HC-2663-B	133.	63
81	600	856.	HCN-4163-6	561.	HC-2663-C(F or S)	162.	HC-2663-B	133.	63
99	225	924.	HCN-5072-2N	598.	HC-2672-C(F or S)	181.	HC-2672-B	145.	72
99	400	929.	HCN-5072-4	603.	HC-2672-C(F or S)	181.	HC-2672-B	145.	72
99	600	993.	HCN-5072-6	667.	HC-2672-C(F or S)	181.	HC-2672-B	145.	72
135	600	1213.	HCN-6890-6	786.	HC-2690-C(F or S)	234.	HC-2690-B	193.	90
MAIN CIRCUIT BREAKER—Includes 3 Pole, Vertically Mounted Main Breaker Suitable for use as Service Equipment.									
18	100	$ 784.	HCN-0936-1MN	$ 618.	HC-2636-C(F or S)	$ 86.	HC-2636-B	$ 80.	36
18	225	1141.	HCN-0936-2MN	975.	HC-2636-C(F or S)	86.	HC-2636-B	80.	36
●27	225	2284.	HCN-1445-2MNIK	2090.	HC-2645-C(F or S)	100.	HC-2645-B	94.	45
27	400	1544.	HCN-1445-4M	1350.	HC-2645-C(F or S)	100.	HC-2645-B	94.	45
36	100	889.	HCN-1845-1MN	695.	HC-2645-C(F or S)	100.	HC-2645-B	94.	45
36	225	1228.	HCN-1845-2MN	1034.	HC-2645-C(F or S)	100.	HC-2645-B	94.	45
●45	225	4416.	HCN-2354-2MNIK	4155.	HC-2654-C(F or S)	142.	HC-2654-B	119.	54
45	400	1699.	HCN-2354-4M	1438.	HC-2654-C(F or S)	142.	HC-2654-B	119.	54
54	100	1003.	HCN-2754-1MN	742.	HC-2654-C(F or S)	142.	HC-2654-B	119.	54
54	225	1339.	HCN-2754-2MN	1078.	HC-2654-C(F or S)	142.	HC-2654-B	119.	54
●63	225	4534.	HCN-3263-2MNIK	4239.	HC-2663-C(F or S)	162.	HC-2663-B	133.	63
63	225	1396.	HCN-3263-2MN	1101.	HC-2663-C(F or S)	162.	HC-2663-B	133.	63
63	400	1810.	HCN-3263-4M	1515.	HC-2663-C(F or S)	162.	HC-2663-B	133.	63
●81	225	4603.	HCN-4172-2MNIK	4277.	HC-2672-C(F or S)	181.	HC-2672-B	145.	72
81	400	1882.	HCN-4172-4M	1556.	HC-2672-C(F or S)	181.	HC-2672-B	145.	72
●117	225	4837.	HCN-5990-2MNIK	4410.	HC-2690-C(F or S)	234.	HC-2690-B	193.	90
117	400	2118.	HCN-5990-4M	1691.	HC-2690-C(F or S)	234.	HC-2690-B	193.	90
126	225	1737.	HCN-6390-2MN	1310.	HC-2690-C(F or S)	234.	HC-2690-B	193.	90

TYPE HCM

FA, FH, FY, Q2, Q2-H, Q2H, IF, KA, KH
225A. Max. Branch Breaker



Box Size: 32" Wide, 8¼" Deep

Total Breaker Mounting Space (Inches)	Mains Ampere Rating	Complete Price (Less Branch Breakers)	Interior Assembly (Less Branch Breakers) Catalog No.	Price	Front (F=Flush, S=Surface) Catalog No.	Price	Box Catalog No.	Price	Box Height (Inches)
MAIN LUGS ONLY—3 Pole Suitable for use as Service Equipment when provided with a main breaker.									
■27	225	$ 516.	HCM-1438-2N	$337.	HC-3238-T(F or S)	$ 93.	HC-3238-B	$ 86.	38
■27	400	542.	HCM-1438-4	363.	HC-3238-T(F or S)	93.	HC-3238-B	86.	38
■27	600	721.	HCM-1438-6	542.	HC-3238-T(F or S)	93.	HC-3238-B	86.	38
■27	800	844.	HCM-1438-8	665.	HC-3238-T(F or S)	93.	HC-3238-B	86.	38
45	225	626.	HCM-2347-2N	389.	HC-3247-T(F or S)	120.	HC-3247-B	117.	47
45	400	652.	HCM-2347-4	415.	HC-3247-T(F or S)	120.	HC-3247-B	117.	47
45	600	799.	HCM-2347-6	562.	HC-3247-T(F or S)	120.	HC-3247-B	117.	47
45	800	917.	HCM-2347-8	680.	HC-3247-T(F or S)	120.	HC-3247-B	117.	47
63	225	741.	HCM-3256-2N	435.	HC-3256-T(F or S)	164.	HC-3256-B	142.	56
63	400	761.	HCM-3256-4	455.	HC-3256-T(F or S)	164.	HC-3256-B	142.	56
63	600	892.	HCM-3256-6	586.	HC-3256-T(F or S)	164.	HC-3256-B	142.	56
63	800	1030.	HCM-3256-8	724.	HC-3256-T(F or S)	164.	HC-3256-B	142.	56
99	225	971.	HCM-5074-2N	523.	HC-3274-T(F or S)	233.	HC-3274-B	215.	74
99	400	991.	HCM-5074-4	543.	HC-3274-T(F or S)	233.	HC-3274-B	215.	74
99	600	1062.	HCM-5074-6	614.	HC-3274-T(F or S)	233.	HC-3274-B	215.	74
99	800	1234.	HCM-5074-8	786.	HC-3274-T(F or S)	233.	HC-3274-B	215.	74
135	400	1258.	HCM-6892-4	687.	HC-3292-T(F or S)	295.	HC-3292-B	276.	92
135	600	1331.	HCM-6892-6	760.	HC-3292-T(F or S)	295.	HC-3292-B	276.	92
135	800	1531.	HCM-6892-8	960.	HC-3292-T(F or S)	295.	HC-3292-B	276.	92
MAIN CIRCUIT BREAKER—Includes 3 Pole, Vertically Mounted Main Breaker Suitable for use as Service Equipment.									
27	400	$1632.	HCM-1447-4M	$1521.	HC-3247-T(F or S)	$ 120.	HC-3247-B	$117.	47
36	225	1293.	HCM-1847-2MN	1056.	HC-3247-T(F or S)	120.	HC-3247-B	117.	47
36	600	2719.	HCM-1856-6M	2413.	HC-3256-T(F or S)	164.	HC-3256-B	142.	56
36	800	3400.	HCM-1856-8M	3094.	HC-3256-T(F or S)	164.	HC-3256-B	142.	56
45	400	1865.	HCM-2356-4M	1559.	HC-3256-T(F or S)	164.	HC-3256-B	142.	56
54	225	1387.	HCM-2756-2MN	1081.	HC-3256-T(F or S)	164.	HC-3256-B	142.	56
72	600	2889.	HCM-3674-6M	2441.	HC-3274-T(F or S)	233.	HC-3274-B	215.	74
72	800	3607.	HCM-3674-8M	3159.	HC-3274-T(F or S)	233.	HC-3274-B	215.	74
81	400	2172.	HCM-4174-4M	1724.	HC-3274-T(F or S)	233.	HC-3274-B	215.	74
108	800	3902.	HCM-5492-8M	3331.	HC-3292-T(F or S)	295.	HC-3292-B	276.	92
117	400	2372.	HCM-5992-4M	1801.	HC-3292-T(F or S)	295.	HC-3292-B	276.	92
126	225	1838.	HCM-6392-2MN	1267.	HC-3292-T(F or S)	295.	HC-3292-B	276.	92

225 Ampere Main Lugs panelboards are UL listed with VERSA-CRIMP lug No. VCEL-030-516H1, see listing on page 169.
■ Suitable for use as Service Equipment when not more than six main disconnecting means are provided and when used as permitted by Article 384 of the National Electrical Code or when provided with a main breaker.
● Panelboard with I-LIMITER main circuit breaker.

I-LIMITER and VERSA-CRIMP are Registered Trademarks of Square D Company.

SQD SLV_000874

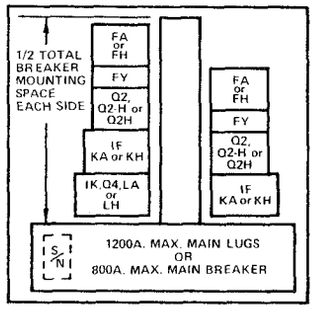
UNASSEMBLED CIRCUIT BREAKER PANELBOARDS

INTERIORS, BOXES AND FRONTS I-LINE®

600 V. AC
250 V. DC

(1200A. interiors include solid neutral—all others without neutral)

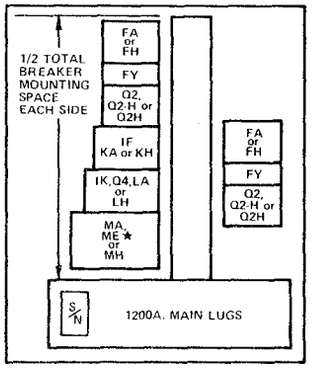
TYPE HCW
FA, FH, FY, Q2, Q2-H, Q2H, IF, KA, KH, IK, Q4, LA and LH
400A. Max. Branch Breaker



Box Size: 41" Wide, 9½" Deep

Total Breaker Mounting Space (Inches)	Max. No. of Q4, LA or MA Brkrs.	Mains Ampere Rating	Complete Price (Less Branch Breakers)	Interior Assembly (Less Branch Breakers) Catalog No.	Price	▲Front (F = Flush, S = Surface) Catalog No.	Price	Box Catalog No.	Price	Box Height (Inches)
MAIN LUGS ONLY—3 Pole Suitable for use as Service Equipment when provided with a main breaker.										
■27	2LA	400	**$ 616.**	HCW-1444-4	**$ 363.**	HCS-4144-TF or S	**$142.**	HC-4144-DB	**$111.**	44
■27	2LA	600	**795.**	HCW-1444-6	**542.**	HCS-4144-TF or S	**142.**	HC-4144-DB	**111.**	44
■27	2LA	800	**1032.**	HCW-1444-8	**779.**	HCS-4144-TF or S	**142.**	HC-4144-DB	**111.**	44
■27	2LA	1200	**1464.**	HCW-1444-12N	**1211.**	HC-4144-TF or S	**142.**	HC-4144-DB	**111.**	44
45	3LA	400	**724.**	HCW-2353-4	**447.**	HCS-4153-TF or S	**157.**	HC-4153-DB	**120.**	53
45	3LA	600	**875.**	HCW-2353-6	**598.**	HCS-4153-TF or S	**157.**	HC-4153-DB	**120.**	53
45	3LA	800	**1114.**	HCW-2353-8	**837.**	HCS-4153-TF or S	**157.**	HC-4153-DB	**120.**	53
45	3LA	1200	**1644.**	HCW-2353-12N	**1367.**	HC-4153-TF or S	**157.**	HC-4153-DB	**120.**	53
63	5LA	400	**843.**	HCW-3262-4	**510.**	HCS-4162-TF or S	**189.**	HC-4162-DB	**144.**	62
63	5LA	600	**1001.**	HCW-3262-6	**668.**	HCS-4162-TF or S	**189.**	HC-4162-DB	**144.**	62
63	5LA	800	**1198.**	HCW-3262-8	**865.**	HCS-4162-TF or S	**189.**	HC-4162-DB	**144.**	62
63	5LA	1200	**1773.**	HCW-3262-12N	**1440.**	HC-4162-TF or S	**189.**	HC-4162-DB	**144.**	62
99	8LA	400	**1056.**	HCW-5080-4	**618.**	HCS-4180-TF or S	**249.**	HC-4180-DB	**189.**	80
99	8LA	600	**1172.**	HCW-5080-6	**734.**	HCS-4180-TF or S	**249.**	HC-4180-DB	**189.**	80
99	8LA	800	**1403.**	HCW-5080-8	**965.**	HCS-4180-TF or S	**249.**	HC-4180-DB	**189.**	80
99	8LA	1200	**1951.**	HCW-5080-12N	**1513.**	HC-4180-TF or S	**249.**	HC-4180-DB	**189.**	80
MAIN CIRCUIT BREAKER—Includes 3 Pole, Vertically Mounted Main Breaker Suitable for use as Service Equipment.										
36	3LA	600	**$2809.**	HCW-1862-6M	**$2476.**	HCS-4162-TF or S	**$189.**	HC-4162-DB	**$144.**	62
36	3LA	800	**3567.**	HCW-1862-8M	**3234.**	HCS-4162-TF or S	**189.**	HC-4162-DB	**144.**	62
72	6LA	600	**2997.**	HCW-3680-6M	**2559.**	HCS-4180-TF or S	**249.**	HC-4180-DB	**189.**	80
72	6LA	800	**3774.**	HCW-3680-8M	**3336.**	HCS-4180-TF or S	**249.**	HC-4180-DB	**189.**	80

TYPE HCWM
FA, FH, FY, Q2, Q2-H, Q2H, IF, KA, KH, IK, Q4, LA, LH, MA, ME★ and MH
800A. Max. Branch Breaker

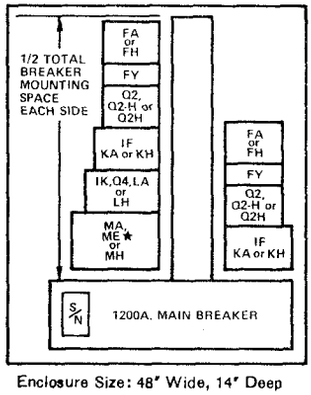


Box Size: 41" Wide, 9½" Deep

MAIN LUGS ONLY—3 Pole Suitable for use as Service Equipment when provided with a main breaker.										
■27	◐1MA	1200	**$1464.**	HCWM-1444-12N	**$1211.**	HC-4144-TF or S	**$142.**	HC-4144-DB	**$111.**	44
45	◐2MA	1200	**1644.**	HCWM-2353-12N	**1367.**	HC-4153-TF or S	**157.**	HC-4153-DB	**120.**	53
63	◐3MA	1200	**1773.**	HCWM-3262-12N	**1440.**	HC-4162-TF or S	**189.**	HC-4162-DB	**144.**	62
99	◐5MA	1200	**1951.**	HCWM-5080-12N	**1513.**	HC-4180-TF or S	**249.**	HC-4180-DB	**189.**	80

◐KA, KH, Q4, LA and LH breakers may be combined with MA, ME and MH breakers in Type HCWM interiors. All mount on one side of interior only.
■ Suitable for use as Service Equipment when not more than six main disconnecting means are provided and when used as permitted by article 384 of the National Electrical Code or when provided with a main breaker.
▲When I-LIMITER circuit breakers are installed, HC-41--series fronts must be used on all HCW panelboards.

TYPE HCWA—480V. ac Max.
FA, FH, FY Q2, Q2-H, Q2H, IF, KA, KH, IK, Q4, LA, LH, MA, ME★ and MH
800A. Max. Branch Breaker



Enclosure Size: 48" Wide, 14" Deep

MAIN CIRCUIT BREAKER
Includes 3 Pole, Vertically Mounted NH Main Breaker

90" High, 48" Wide, 14" Deep freestanding enclosure with hinged gutter covers and no door.

Panelboards with GFP include GROUND-CENSOR Equipment ground fault protection system consisting of sensor, monitor panel and relay (.1 sec.). Test circuit tests all components—requires external 120V. ac source. Meets N.E.C. article 230-95 requirements for equipment ground fault protection on 277/480V. ac 3∅ 4 W. systems.

UL Listed—Suitable for use as service equipment.

Total Breaker Mounting Space (Inches)	Max. No. of LA or MA Brkrs.	Main Breaker Ampere Rating	Complete Assembly with Solid Neutral (Less Branch Breakers) Catalog Number	Price	Enclosure Height (Inches)
Without GFP					
63	‡3MA	1000	HCWA-10MN	**$7305.**	90
63	‡3MA	1000	◆HCWA-10MNT	**7305.**	90
63	‡3MA	1200	HCWA-12MN	**7935.**	90
63	‡3MA	1200	◆HCWA-12MNT	**7935.**	90
With GFP					
63	‡3MA	1000	HCWA-10MNGB	**10470.**	90
63	‡3MA	1000	◆HCWA-10MNGT	**10470.**	90
63	‡3MA	1200	HCWA-12MNGB	**11100.**	90
63	‡3MA	1200	◆HCWA-12MNGT	**11100.**	90

G1-2 DISCOUNT

◆Top Feed.
‡Q4, LA and LH circuit breakers may be combined with MA, ME and MH breakers in Type HCWA. All mount on one side only.

ACCESSORIES

BLANKS
(Required to fill unused mounting space)

Height (Inches)	Catalog Number	Price
1½	HNM-1BL	**$3.**
4½	HNM-4BL	**6.**

SOLID NEUTRAL ASSEMBLIES
(No additional height required)

Ampere Rating	Use with HCN, HCM Cat. No.	Use with HCW, HCWM Cat. No.	Price
225	HC-2SN	.....	**$ 56.**
400	HC-4SN	HCW-4SN	**76.**
600	HC-6SN	HCW-6SN	**105.**
800	HC-8SN	HCW-8SN	**168.**

BOX EXTENSIONS
(Provide additional end gutter—UL listed)

For use with Panel Type	Height (In.)	Catalog Number	Price
HCN	9	HC-2609-EXF or S	**$129.**
HCM	9	HC-3209-EXF or S	**129.**
HCW and HCWM	12	HC-4112-DEXF or S	**150.**

NEMA 3R RAINPROOF ENCLOSURE

For use with HCM-1438—Panelboards only
Complete box with cover and interior trim. Includes 9" oversize bottom wiring gutter for rear exit or entry and mounting provisions for PK-15GTA-6 Ground Bar Kit. No hubs or knockouts.

Use with Interiors	Cat. No.	W	H	D	Price
HCM-1438-2N, 4, 6, 8	HC-3247-R	32	47	8¼	.....

EQUIPMENT GROUND BAR KITS

Use with	Cat. No.	Price
HCN	PK-27GTA	**•$ 8.00**
HCM (NEMA-3R only)	PK-15GTA-6	**• 13.40**
HCM, HCW, HCWM	PK-32DGTA	**27.00**

•C1-1 DISCOUNT

900 MCM AL MAIN LUG KIT for all 400 Ampere I-LINE Panelboards—Catalog Number HC-400-L..... **$61.00**
BLANK EXTENSIONS—Catalog Numbers HLW-1BL.....each **3.00**
HLW-4BL.....each **6.00**
(For replacement only on HCW, HCWM and HCWA panelboards)

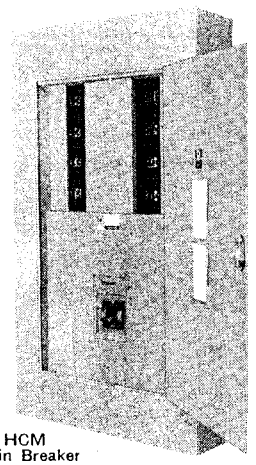
★Use ME breaker **without** integral equipment ground fault protection **only.**

I-LIMITER, GROUND-CENSOR and VERSA-CRIMP are Registered Trademarks of Square D Company.

SQD SLV_000875

CIRCUIT BREAKER PANELBOARDS — FACTORY ASSEMBLED

I-LINE® **250 V. AC OR DC**
600 V. AC



Type HCM
800 A. Main Breaker

APPLICATION: For use on ac or dc systems. Meet Federal Specification W-P-115a, Type I, Class 1.
Listed by Underwriters Laboratories. Service Entrance approved with six circuits or less or with Main Breaker.

SERVICE: Distributed Phase Bussing
1Ø 2W., 1Ø 3W., 3Ø 3W., 3Ø 4W.
600 V. Max. ac 250 V. Max. dc

I.E.R.: INTEGRATED EQUIPMENT SHORT CIRCUIT RATINGS: See Page 76.

BRANCHES: *Plug-on—FA, FH, FY, Q2, Q2-H, Q2H, IF, KA, IK, KH, Q4, LA, LH, MA, ME▲ and MH.
15-100 A.—1 Pole
15-1000 A.—2 and 3 Pole
Branch circuit breakers feeding cycling motor loads, welder loads, or induction heating devices may require derating, refer to Page 93 for data.

MAINS: Main Lugs:
225A.—1#6—300 MCM Al or Cu
400A. & 600A.—2#4—600 MCM Al or Cu
800A.—3#3/0-750 MCM Al or Cu
1200A.—4#2-750 MCM Al or Cu

Main Breaker:
100A.—FA (600V.)—1#10-1/0 Al or Cu
225A.—KA & 225A.-IK—1#4-300 MCM Al or Cu
400A.—LA—1#1-600 MCM or 2#1-250 MCM Al or Cu
600A. & 800A.—MA—3#3/0-500 MCM Al or Cu
1200A.—NH—4 350-750 MCM Al or Cu

CABINETS: Fronts—Maximum 800 A. branch or main breaker—with door, gray enamel finish.
Maximum 1200 A. main breaker—without door, gray enamel finish.
Boxes—Refer to Page 99.

GUTTERS: Main Lugs—Refer to Page 99.
Side—5" Minimum.

▲Submittal for UL Listing Pending.

PRICING
(Additional features—see page 106.)

BASE PRICE

Max. Branch Breaker	MAIN LUGS 225 A.	400 A.	600 A.	800 A.	1200 A.	MAIN BREAKER No. Poles	225A. KA	KH	IK	400A. LA	LH	600A. MA	MH	800A. MA	MH	▲1000A. MA	MH	▲1200A. NH	SOLID NEUTRAL Amp. Rating	Price
225A. Q2, Q2-H	$280.	$339.	$432.	....	....	2	$848.	$1468.	$2198.	$1560.	$2237.	.....	.....	.....	.....	.....	.....	.....	225A.	$ 77.
						3	1005.	1855.	2669.	1839.	2622.	.....	.....	.....	.....	.....	.....	.....		
225A. KA, KH	280.	339.	432.	$521.	....	2	848.	1468.	2198.	1560.	2237.	$2310.	$2797.	$3009.	$3603.	$4069.	$4625.	$5108.	400A.	102.
						3	1005.	1855.	2669.	1839.	2622.	2808.	3328.	3655.	4271.	4663.	5380.	5786.		
400A. Q4, LA, LH	....	398.	521.	644.	$895.	2	....	.....	.....	.....	.....	2310.	2797.	3009.	3603.	4069.	4625.	5108.	600A.	144.
						3	....	.....	.....	.....	.....	2808.	3328.	3655.	4271.	4663.	5380.	5786.		
800A. MA, MH	....	....	....	....	895.	2	....	.....	.....	.....	.....	.....	.....	.....	.....	4069.	4625.	5108.		
						3	....	.....	.....	.....	.....	.....	.....	.....	.....	4663.	5380.	5786.	800A.	203.
.....	....	....	....	....	....	2	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		
						3	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1200A.	237.

Equipment Ground Bar—Mounted in box—**$48.**
▲SWITCHBOARD CONSTRUCTION, See page 99 for dimensions.
★Use ME breaker **without** integral equipment ground fault protection **only.**

GROUND-CENSOR Equipment Ground Fault Protection System—includes relay (specify .1, .2, .3 or .5 second delay), sensor and monitor panel. For 1200A. Main Breaker Panelboard..... **$3165.**

***PLUG-ON BRANCH BREAKERS—PRICE PER BREAKER** (See Page 56 for interrupting rating, voltage ratings, Fed. Specs, etc.)

Breaker Ampere Rating	Breaker	3 POLE 240 V.	480 V.	600 V.	Space Only	H	2 POLE 240 V. ac 250 V. dc	480 V. ac 250 V. dc	600 V. ac 250 V. dc	Space Only	H	1 POLE 120 V.	277 V.	277 V. ac 250 V. dc	Space Only	H
FA, FY, Q2, Q2-H, Q2H, KA, Q4, LA, MA, ME★ and PA BRANCH BREAKERS																
15-60 A.	FA (FY-1P)	$158.	$228.	$ 259.	$26.	4½	$115.	$181.	$ 203.	$20.	3	$58.	$60.	$86.‡	$17.	1½
70-100 A.	FA	215.	268.	313.	26.	4½	163.	223.	249.	20.	3	90.	99.	100.‡	17.	1½
110-225 A.	Q2	435.	....	....	26.	4½	☆148.	....	....	26.	3	....	....	....	....	....
110-225 A.	Q2-H	570.	....	....	26.	4½	■337.	....	....	26.	3	....	....	....	....	....
100-225 A.	Q2H	....	....	....	....	....	427.	....	....	26.	3	....	....	....	....	....
110-225 A.	KA	....	....	725.	26.	4½	....	....	570.	26.	4½	....	....	....	....	....
250-400 A.	Q4	1078.	....	....	57.	6	■881.	....	....	57.	6	....	....	....	....	....
250-400 A.	LA	....	....	1266.	57.	6	....	....	1026.	57.	6	....	....	....	....	....
450-600 A.	MA	....	....	2100.	114.	9	....	....	1629.	114.	9	....	....	....	....	....
700-800 A.	MA	....	....	2731.	114.	9	....	....	2108.	114.	9	....	....	....	....	....
400-800 A.	ME	....	....	3200.	114.	9	....	....	2577.	114.	9	....	....	....	....	....
I-75000—FH, KH, LH and MH BRANCH BREAKERS																
15-60 A.	FH	....	....	$ 372.	$26.	4½	....	....	$ 314.	$20.	3	....	....	$134.	$17.	1½
70-100 A.	FH	....	....	417.	26.	4½	....	....	358.	20.	3	....	....	149.	17.	1½
110-225 A.	KH	....	....	1544.	26.	4½	....	....	1261.	26.	4½	....	....	....	....	....
250-400 A.	LH	....	....	2020.	57.	6	....	....	1649.	57.	6	....	....	....	....	....
500-600 A.	MH	....	....	2565.	114.	9	....	....	2095.	114.	9	....	....	....	....	....
700-800 A.	MH	....	....	3264.	114.	9	....	....	2685.	114.	9	....	....	....	....	....
I-LIMITER CURRENT LIMITING CIRCUIT BREAKERS																
15-100 A.	IF	....	$1105.	....	$26.	4½	....	■$900.	....	$26.	4½	....	....	....	....	....
110-225 A.	IK	....	2067.	....	57.	6	....	■1613.	....	57.	6	....	....	....	....	....

*Bolt-on also available, except on MA breakers. ‡FA, 1P. ☆120/240 V. ac only ■ac only

QO PLUG-ON BRANCH BREAKERS—30 A. MAXIMUM, 240 V. MAX. AC

Transition Charge
$85.
per 6 QO one pole spaces (H=4½" per 6 one pole spaces)
+

Branch Breakers—Price Per Breaker

Breaker Ampere Rating	1 Pole 120/240V. ac	1 Pole QWIK-GARD 120V. ac	2 Pole 120/240V. ac	2 Pole 240V. ac	2 Pole QWIK-GARD 120/240V. ac	3 Pole 240V. ac
10,000 AIC—QO and QO-H BREAKERS						
15-30	$16.	$75.	$34.	$66.	$135.	$86.
22,000 AIC—QO-VH BREAKERS						
15-20	23.	144.	53.	....	....	119.
25-30	25.	....	53.	....	....	119.
65,000 AIC—QH BREAKERS						
15-30	37.	....	90.	....	....	153.

QO, QWIK-GARD, I-LIMITER & GROUND-CENSOR are Registered Tradmarks of Square D Company.
I-75000 is a Trademark of Square D Company.

SQD SLV_000876

CABINET SELECTION DATA AND DIMENSIONS

MAIN LUGS ONLY—1200 A. MAX.
800 A. Maximum Branch Breaker

Total Breaker Mounting Space (Inches)	Maximum Main Lugs Rating	Box Catalog Number	Box Dimensions (Inches) H	W	D
TYPE HCN FA, FH, FY, Q2, Q2-H and Q2H Breakers					
27	600	HC-2636-B	36	26	6½
45	600	HC-2645-B	45	26	6½
63	600	HC-2654-B	54	26	6½
81	600	HC-2663-B	63	26	6½
99	600	HC-2672-B	72	26	6½
135	600	HC-2690-B	90	26	6½
TYPE HCM FA, FH, FY, Q2, Q2-H, Q2H, IF, KA and KH Breakers					
27	800	HC-3238-B	38	32	8¼
45	800	HC-3247-B	47	32	8¼
63	800	HC-3256-B	56	32	8¼
99	800	HC-3274-B	74	32	8¼
135	800	HC-3292-B	92	32	8¼
●TYPE HCW FA, FH, FY, Q2, Q2-H, Q2H, IF, KA, KH, IK, Q4, LA and LH Breakers					
27	1200	HC-4144-DB	44	41	9½
45	1200	HC-4153-DB	53	41	9½
63	1200	HC-4162-DB	62	41	9½
99	1200	HC-4180-DB	80	41	9½
●TYPE HCWM FA, FH, FY, Q2, Q2-H, Q2H, IF, KA, KH, IK, Q4, LA, LH, MA, ME★, and MH Breakers					
27	1200	HC-4144-DB	44	41	9½
45	1200	HC-4153-DB	53	41	9½
63	1200	HC-4162-DB	62	41	9½
99	1200	HC-4180-DB	80	41	9½

MAIN CIRCUIT BREAKER—800 A. MAX.
400 A. Maximum Branch Breaker

Total Breaker Mounting Space (Inches)	Maximum Main Breaker Rating	Box Catalog Number	Box Dimensions (Inches) H	W	D
TYPE HCN FA, FH, FY, Q2, Q2-H and Q2H Breakers					
18	225	HC-2636-B	36	26	6½
36	225	HC-2645-B	45	26	6½
54	225	HC-2654-B	54	26	6½
63	225	HC-2663-B	63	26	6½
90	225	HC-2672-B	72	26	6½
126	225	HC-2690-B	90	26	6½
27	400	HC-2645-B	45	26	6½
45	400	HC-2654-B	54	26	6½
63	400	HC-2663-B	63	26	6½
81	400	HC-2672-B	72	26	6½
117	400	HC-2690-B	90	26	6½
TYPE HCM FA, FH, FY, Q2, Q2-H, Q2H, IF, KA and KH Breakers					
18	225	HC-3238-B	38	32	8¼
36	225	HC-3247-B	47	32	8¼
54	225	HC-3256-B	56	32	8¼
90	225	HC-3274-B	74	32	8¼
126	225	HC-3292-B	92	32	8¼
27	400	HC-3247-B	47	32	8¼
45	400	HC-3256-B	56	32	8¼
81	400	HC-3274-B	74	32	8¼
117	400	HC-3292-B	92	32	8¼
36	800	HC-3256-B	56	32	8¼
72	800	HC-3274-B	74	32	8¼
108	800	HC-3292-B	92	32	8¼
●TYPE HCW FA, FH, FY, Q2, Q2-H, Q2H, IF, KA, KH, IK, Q4, LA and LH Breakers					
36	800	HC-4162-DB	62	41	9½
72	800	HC-4180-DB	80	41	9½

●Refer to sketches and mounting data on page 97.
★Use ME breaker **without** integral equipment ground fault protection **only.**

MINIMUM GUTTER DIMENSIONS

Mains Size	Main Lug	Main Breaker	Solid Neutral
225 A.	7½	5	6¾
400 A.	8½	7	6¾
600 A.	8½	10	6¾
800 A.	10	10	9
1000 A.	....	12	12
1200 A.	12	12	12

*MAIN CIRCUIT BREAKER—1200 A. MAX.
800 A. Max. Branch Breaker

Branch Breaker Mtg. Max. Per Side		1000 A. MA Main Breaker				1000 A. and 1200 A. NH Main Breaker Type HCWA			
Left	Right	Branch Mtg. Space	Enclosure Dimensions W	H	D	Branch Mtg. Space	Enclosure Dimensions W	H	D
FA 100 A.	FA 100 A.	99	30	90	24	....	..	..	..
KA 225 A.	KA 225 A.	99	36	90	24	....	..	..	..
LA 400 A.	KA 225 A.	99	42	90	24	....	..	..	..
MA 800 A.	FA 100 A.	99	42	90	24	....	..	..	..
MA 800 A.	KA 225 A.	..	..	..	..	63	48	90	14

*Not available in weatherproof construction.

METHOD OF PRICING

1. Make listing similar to one shown at right. Include required branch breakers and spaces for future branches.
2. Insert at right of each branch breaker and space in listing the required mounting space (H as shown on Page 98). Total the required branch breaker mounting space.
3. When total branch breaker mounting space exceeds maximum shown in tables above, estimate as two or more panelboards, adding sub-feed lugs as required so purchaser can cable panelboards together.
4. Insert at right of each item in listing the prices as shown in tables on Page 98. Include optional features as required from Page 106. The sum will be the price of the panelboard and cabinet.
5. Panelboard height is based on required branch breaker mounting space and mains capacity.
6. Select box catalog numbers from main lugs or main breaker cabinet tables above.

REPLACEMENT CIRCUIT BREAKERS

To order circuit breakers only for replacement of existing branch circuits or for mounting in an existing space, refer to Pages 94 and 95 for breaker Catalog Numbers and Prices.

SAMPLE ESTIMATE
277/480 V., AC 3Ø 4W. SERVICE
600 A. MAIN LUGS

No. Req'd.	Amp. Rating	No. Poles	Type Brkr.	Branch Mounting Space	Price Each	Total Price
2	20	1	FY	3 '	$ 60.	$120.
2	20	2	FA	6 '	181.	362.
2	30	3	FA	9 '	228.	456.
2	70	3	FA	9 '	268.	536.
1	100	3	FA	4½'	268.	268.
1	225	3	KA	4½'	725.	725.
			Total Branch Space	36 '		
			600 A. Main Lugs	....		432.
			600 A. Solid Neutral	....		144.
			Total Mounting Space	36 '		
					Total Price	$3043.

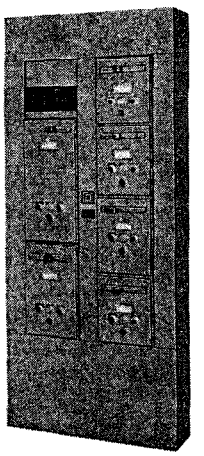
Nearest breaker mounting space—45'.
Cabinet—Catalog No. HC-3247-B.

SQD SLV_000877

MOTOR STARTER CENTERS — UNASSEMBLED

I-LINE® 208 V. AC
240 V. AC
480 V. AC
600 V. AC

UL LISTED SHORT CIRCUIT RATING



APPLICATION: For use on Three Phase ac systems, 208, 240 480, or 600 Volts. Listed by Underwriters Laboratories.

MAINS: Main Lugs:
225A.—1-300 MCM Al or Cu
400A.—2-600 MCM Al or Cu
Main Breaker (branch mounted and back-fed):
100A.—FA—#1/0 A or Cu
225A.—Q2—1-300 MCM Al or Cu
225A.—KA—1-300 MCM Al or Cu

CIRCUIT BREAKERS: Plug-on, Thermal-Magnetic or Adjustable Instantaneous Trip Motor Circuit Protectors†
FA-100 A. Max.-3 Pole
KA-225 A. Max.-3 Pole
(FY, FA. Q2 and KA branches may also be included as lighting and distribution circuits, select from Pages 94 and 95.) Branch circuit breakers feeding cycling motor loads, welder loads, or induction heating devices may require derating, refer to Page 93 for data.

MAGNETIC STARTERS: Non-reversing, 3 Pole, Melting Alloy Thermal Overload Relays, Single Starter Units
Size 0-Class 8536, Type SB
Size 1-Class 8536, Type SC
Size 2-Class 8536, Type SD
Size 3-Class 8536, Type SE
Size 4-Class 8536, Type SF

CABINETS: Four piece front—without door, gray baked enamel finish.
Boxes-32" Wide x 8¼" Deep, without knockouts, gray baked enamel finish, removable endwalls.

GUTTERS: Main Lugs—8½". End Opposite Mains—5". Sides—5" (starter and breaker terminals).
†Not UL LISTED in Unassembled I-LINE Motor Starter Centers.

SELECTION OF COMPONENTS

1. List required branch circuits.
2. Select Circuit Breaker catalog numbers from Table 1 or Table 1A, Page 101. Refer to Page 67 or Page 478 to select proper breaker rating for use on motor branch circuits.
3. Select Starter Unit catalog numbers from Table 2, Page 101 and determine total unit mounting space.
   NOTE: Motor Starter Unit height includes circuit breaker disconnect. Add the heights of any additional circuit breakers (from Pages 94 and 95) not used with starter units to obtain the total branch mounting space required. Include additional space for future circuits if required.
4. Select Main Lugs Interior catalog number† from Table 3, Page 101 based on total branch mounting space (**make a sketch such as shown at right to be certain all components will mount**) and mains rating.
5. Select Box and Front catalog numbers corresponding to interior catalog number from Table 3, Page 101.
6. Select catalog numbers of Accessories from Table 4, Page 101.
7. Control devices such as Push Buttons, Pilot Lights, etc. are ordered separately from page numbers shown in Table 5, Page 101.

UL LISTED SHORT CIRCUIT RATINGS @ 600 VOLT MAX.

Starter Size	Thermal Magnetic Circuit Breaker RMS Sym. Amperes
0	5,000
1	5,000
2	5,000
3	5,000
4	10,000

†When Main Breaker is required, back-feed branch breaker in Main Lugs Interior. Include Breaker Cover Plate for mounting Main Breaker and include Main Breaker height in total Branch Mounting space.

SAMPLE ESTIMATE
480 V. AC, 3Ø 3 W. SERVICE
400 A. MAIN LUGS—SURFACE MOUNTING

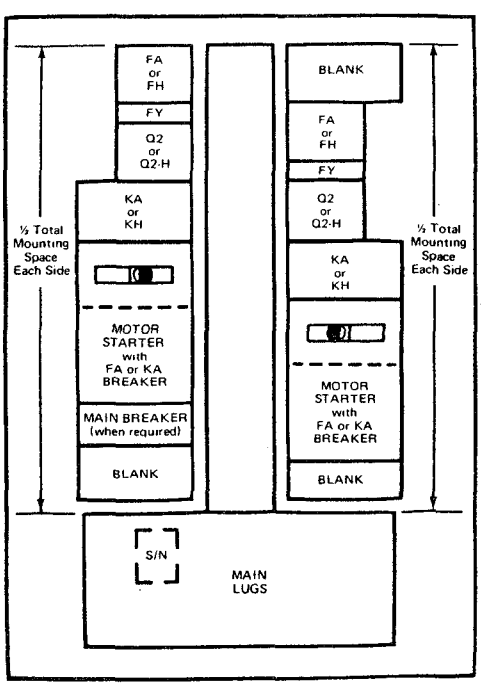
Motor Branch Circuits	Components		Branch Mounting Space	Price Each	Total Price
1—50 HP	1—100A., 3P., FA	1—FA-34100	.....	$238.	$238.
	1—Size 3, 480V.	1—HBS-8536-SE-480	22½"	689.	689.
2—25 HP	2—70A., 3P., FA	2—FA-34070	....	238.	476.
	2—Size 2, 480V.	2—HBS-8536-SD-480	27"	461.	922.
2—7½ HP	2—20A., 3P., FA	2—FA-34020	.....	200.	400.
	2—Size 1, 480V.	2—HBS-8536-SCL-480	27"	292.	584.
1—5 HP	1—15A., 3P., FA	1—FA-34015	....	200.	200.
	1—Size 0, 480V.	1—HBS-8536-SBL-480	13½"	254.	254.
.....	1—150A., 3P., KA	1—KA-36150	4½"	656.	656.
	1—Breaker Cover Plate	1—HBS-4BCP	....	17.	17.
			94½"		
	1—4½" Blank	1—HBS-4BL	4½"	19.	19.
	1—99" Interior	1—HCM-5074-4	99"	991.	991.
	1—Front	1—HC-3274-MTS			
	1—Box	1—HC-3274-B			
			Total Price.....		$5446.

DE CATALOG REFERENCE: SECTION 2310

STARTER UNIT DATA

1. Starter units are available from stock with line voltage coils or with 120 V. coil. Space and drilling provided in 120 V. devices for transformer and fuse block unless noted otherwise. For voltages other than those listed on Page 101 consult Square D Field Office.
2. All starter units are supplied with melting alloy type thermal overload relays with provisions for 3 thermal units. Thermal units are not included. Consult local Square D Field Office for ordering information on starter units with adjustable bimetallic overload relays.
3. Twistouts are provided in starter unit covers for field addition of Class 9001, Type K control units.
4. Starter unit covers are interlocked with disconnect handle.

MOUNTING COMBINATIONS
(All devices mount either side of panel opposite any other device)



TYPE HCM
400A. Max. Main Lugs
225A. Max. Main Breaker
Box Size: 32" Wide 8¼" Deep

OBSOLETE
USE SPECIFIED MOTOR CONTROL

SQD SLV_000878

UNASSEMBLED MOTOR STARTER CENTERS

208 V. AC
240 V. AC
480 V. AC
600 V. AC
I-LINE®

TABLE 1—PLUG-ON THERMAL-MAGNETIC CIRCUIT BREAKERS—3 POLE●

Select Breaker Ampere Rating from Page 478	FA—100 AMPERE FRAME				KA—225 AMPERE FRAME		
	Ampere Rating	3-Pole—240 Volt ac		3-Pole—480 Volt ac	Ampere Rating	3-Pole—600 Volt Max. ac	
		Catalog Number	Price	Catalog Number	Price		Catalog Number	Price
	15	FA-32015	$137.	FA-34015	$200.			
	20	FA-32020	137.	FA-34020	200.			
	30	FA-32030	137.	FA-34030	200.	110	KA-36110	$656.
	40	FA-32040	137.	FA-34040	200.	125	KA-36125	656.
	50	FA-32050	137.	FA-34050	200.	150	KA-36150	656.
	60	FA-32060	137.	FA-34060	200.	175	KA-36175	656.
	70	FA-32070	186.	FA-34070	238.	200	KA-36200	656.
	90	FA-32090	186.	FA-34090	238.	225	KA-36225	656.
	100	FA-32100	186.	FA-34100	238.			

TABLE 1-A—MAG-GARD PLUG-ON ADJUSTABLE INSTANTANEOUS TRIP MOTOR CIRCUIT PROTECTORS—3 POLE●†

Select MCP Ampere Rating from Page 67	FA—100 AMPERE FRAME				KA—225 AMPERE FRAME			
	Ampere Rating	Adjustable Trip Range Amperes	3-Pole—600 Volt Max. ac		Ampere Rating	Adjustable Trip Range Amperes	3-Pole—600 Volt Max. ac	
			Catalog Number	Price			Catalog Number	Price
	3	7-22	FA-36003-11M	$233.				
	7	18-58	FA-36007-12M	233.				
	15	50-150	FA-36015-13M	233.	150	750-1500	KA-36150-26M	$361.
	30	100-300	FA-36030-15M	233.	225	1000-2000	KA-36225-30M	656.
	50	150-480	FA-36050-16M	233.				
	100	275-1000	FA-36100-18M	279.				

●CIRCUIT BREAKERS SOLD UNDER DISCOUNT SCHEDULE B1-2

†Not UL LISTED in Unassembled I-LINE Motor Starter Centers.

TABLE 2—MOTOR STARTER UNITS—NON-REVERSING—SINGLE STARTER UNITS—3 POLE—600 V. AC MAX.—BREAKER NOT INCLUDED

NEMA Size	Unit Height (Includes Breaker Space) (In.)	SEPARATE CONTROL SOURCE 120 V. ac—60 Hz. Starter Coil			LINE VOLTAGE TYPE								
					208 V. ac—60 Hz. Coil			220-240 V. ac—60 Hz. Coil			440-480 V. ac—60 Hz. Coil		
		†Control Transformer Class 9070 Type	Catalog Number	◆Price Starter Unit Only	Max. HP 3Ø 200 V.	Catalog Number	◆Price Starter Unit Only	Max. HP 3Ø 230 V.	Catalog Number	◆Price Starter Unit Only	Max. HP 3Ø 460 V.	Catalog Number	◆Price Starter Unit Only
0	13½	EO-1	HBS-8536-SBL-120	$254.	3	HBS-8536-SBL-208	$254.	3	HBS-8536-SBL-240	$254.	5	HBS-8536-SBL-480	$254.
1	13½	EO-1	HBS-8536-SCL-120	292.	7½	HBS-8536-SCL-208	292.	7½	HBS-8536-SCL-240	292.	10	HBS-8536-SCL-480	292.
2	‡13½	.....	‡HBS-8536-SD-120	461.	10	‡HBS-8536-SD-208	461.	15	‡HBS-8536-SD-240	461.	25	‡HBS-8536-SD-480	461.
2	16½	EO-2	HBS-8536-SDL-120	461.	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	22½	GO-3	HBS-8536-SE-120	689.	25	HBS-8536-SE-208	689.	30	HBS-8536-SE-240	689.	50	HBS-8536-SE-480	689.
4	25½	GO-4	HBS-8536-SF-120	1416.	40	HBS-8536-SF-208	1416.	50	HBS-8536-SF-240	1416.	100	HBS-8536-SF-480	1416.

‡Does not include space for control transformer.
◆Prices do not include overload relay thermal units. Refer to Page 436 for selection procedure (AC Magnetic Starters — small enclosure) and order thermal units separately.
†Control transformer and fuse block not included, order separately from Pages 400-401.

TABLE 3—INTERIORS, BOXES AND FRONTS (225 A. interiors include solid neutral, 400 A. do not. Order 400 A. neutral from page 87.)

★Total Mounting Space (Inches)	Main Lugs Ampere Rating	Complete Price (Less Units)	INTERIOR ASSEMBLY (Less Units)		SURFACE FRONT		BOX		Box Height (Inches)
			Catalog Number	Price	Catalog Number	Price	Catalog Number	Price	
225 AMPERE MAXIMUM BREAKER—STARTER UNITS, SIZE 0-4							BOX SIZE 32" WIDE, 8¼" DEEP		
27	225	$516.	HCM-1438-2N	$337.	HC-3238-MTS	$ 93.	HC-3238-B	$ 86.	38
27	400	542.	HCM-1438-4	363.	HC-3238-MTS	93.	HC-3238-B	86.	38
45	225	626.	HCM-2347-2N	389.	HC-3247-MTS	120.	HC-3247-B	117.	47
45	400	652.	HCM-2347-4	415.	HC-3247-MTS	120.	HC-3247-B	117.	47
63	225	741.	HCM-3256-2N	435.	HC-3256-MTS	164.	HC-3256-B	142.	56
63	400	761.	HCM-3256-4	455.	HC-3256-MTS	164.	HC-3256-B	142.	56
99	225	971.	HCM-5074-2N	523.	HC-3274-MTS	233.	HC-3274-B	215.	74
99	400	991.	HCM-5074-4	543.	HC-3274-MTS	233.	HC-3274-B	215.	74
135	400	1258.	HCM-6892-4	687.	HC-3292-MTS	295.	HC-3292-B	276.	92

★Mounting space includes both sides of bus stack, make a sketch as shown on Page 100 to make certain all components will mount.

TABLE 4—ACCESSORIES

BLANKS (Required to fill unused mounting space)			BREAKER COVER PLATES (Required for mounting breakers not used with starter units)				STARTER ENCLOSURES ONLY (Includes breaker operator)					EXTERNAL CIRCUIT BREAKER OPERATOR & ACCESSORY CABINETS (Match Starter Units Above)			
Height (In.)	Catalog Number	Price	Height (In.)	Use With	Catalog Number	Price	Unit Height	Use With Starter Size	Use With Starter Catalog No.	Enclosure Catalog No.	Price	Height (In.)	Description	Catalog Number	Price
1½	HBS-1BL	$ 6.	1½ or 3	1 or 2 1P brkrs. or 1 2P brkr.	HBS-3BCP	$12.	13½	0	8536-SBO-2	HBS-135-CB	$213.	4½	External Operator	HBS-4FK	$101.
3	HBS-3BL	13.						1	8536-SCO-3						
4½	HBS-4BL	19.	4½	1 2P or 3P or 3 1P brkrs.	HBS-4BCP	17.	16½	2	8536-SDO-1	HBS-165-CB	266.	9	*Accessory Cabinet	HBS-9B	142.
							22½	3	8536-SEO-1	HBS-225-CB	311.	18	*Accessory Cabinet	HBS-18B	187.
							25½	4	8536-SFO-1	HBS-255-CB	421.				

*Cabinets only, no space for circuit breaker.

TABLE 5—CONTROL DEVICES (Order from pages shown)

Class 9001, Type K Control Units.....Pages 319-338 | Class 9070, Control Transformer....Pages 428-429 | Class 9999, Electrical Interlocks.....Page 455

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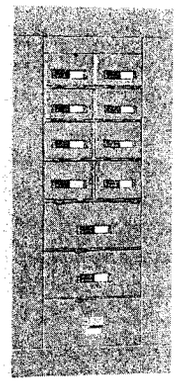
DISCONTINUED
USE SPEEDFACE
I-LINE MOTOR CENTERS

SQD SLV_000879

FUSIBLE PANELBOARDS — UNASSEMBLED

QMB 250 V. AC or DC 600 V. AC



APPLICATION: For use on ac or dc systems. Meet Federal Specification W-P-115a.
Type II, Class 1. Listed by Underwriters Laboratories.
Service Entrance approved with six circuits or less or with Main Switch.

I.E.R.: INTEGRATED EQUIPMENT SHORT CIRCUIT RATINGS: QMB Fusible Panelboards are UL listed for use on systems with 200,000 Max. RMS Sym. amperes available when equipped with appropriately rated Class R or J fuses.

SERVICE: 600V. Max. ac
250V. Max. dc

MAINS: Main Lugs:
200A.—1#6-300 MCM Al or Cu
400A.—1#6-300 MCM, 1#3/0-750 MCM Al or Cu
600A.—2#3/0-500 MCM
Main Switch:
100A.—1#6-300 MCM Al or Cu
200A.—1#6-300 MCM Al or Cu

BRANCHES: Quick-make, Quick-break HP Rated Plug-On Switch Units. HP ratings see Page 478.
30A.—1#14-#2 Al or Cu
60A.—1#14-#2 Al or Cu
100A.—1#14-1/0 Al or Cu
200A.—1#4-300 MCM Al or Cu

CABINETS: Fronts—Four-piece construction, finished gray baked enamel, without door. Concealed, self-adjusting trim clamps.
Boxes—Without knockouts, finished gray baked enamel, 31" wide, 10⅞" deep.

GUTTERS: Top and Bottom—8" Minimum (Except 32" High Box—5¾") Side—6"

TABLE 1 — PLUG-ON SWITCH UNITS

Unit Type	Unit Ampere Rating	*240 VOLTS AC					▲600 VOLTS AC Series D2 Construction				
		Unit Height (Inches)	Two Pole—250 Volts, dc		Three Pole		Unit Height (Inches)	Two Pole—250 Volts, dc		Three Pole	
			Catalog Number	Price	Catalog Number	Price		Catalog Number	Price	Catalog Number	Price
Branch Switches	30-30 Twin	3	QMB-203-T	$105.	QMB-303-T	$142.	6	★QMB-262-T1	$230.	★QMB-362-T1	$271.
	60-60 Twin	4½	QMB-206-T	133.	QMB-306-T	181.	6	★QMB-262-T	230.	★QMB-362-T	271.
	100-100 Twin	6	QMB-210-T	217.	QMB-310-T	276.	7½	★QMB-263-T	337.	★QMB-363-T	428.
	200 Single	9	†QMB-224	262.	†QMB-324	367.	9	★QMB-264	392.	★QMB-364	504.
Main Switch	100 A.	9	†QMB-223-M	328.	†QMB-323-M	437.	9	QMB-263-M	440.	QMB-363-M	572.
	200 A.	9	†QMB-224-M	328.	†QMB-324-M	437.	9	QMB-264-M	440.	QMB-364-M	572.

★Class J fuse provisions—To field modify switch, move load—side fuse base assembly to position indicated in switch.
*Twin 250 volt units may be converted to 30-60, 30-100 and 60-100 twin units by using adaptor kits, consult local Field Office.
▲30-60, 30-100 and 60-100, 600 volt units are available from factory stock. Consult local Field Office for pricing.
†Series D2 Construction

ELECTRICAL INTERLOCK KITS—For Series D2 Construction only.					
Number of Contacts		30-100 Ampere		200 Ampere	
N.O.	N.C.	Catalog No.	Price	Catalog No.	Price
1	1	QMB-610EK-1	$77.	QMB-200EK-1	$77.
2	2	QMB-610EK-2	77.	QMB-200EK-2	77.

CLASS R FUSE KITS—For all switch units listed above.					
Ampere Rating	Qty. of Kits Required	250V.		600V.	
		Catalog No.	Price	Catalog No.	Price
◆30A.-Twin	1	QMB-30R	$11.20	QMB-36R	$11.20
60A.-Twin	1	QMB-36R	11.20	QMB-60R	11.20
100A.-Twin	2	QMB-100R	21.90	HRK-1020	11.20
200A.-Single	1	HRK-1020	11.20	HRK-1020	11.20
400A.-Single	1	HRK-4060	26.00	HRK-4060	26.00
600A.-Single	1	HRK-4060	26.00	HRK-4060	26.00

TABLE 2 — INTERIORS, BOXES AND FRONTS (Without Solid Neutral)

◆Class R Fuse Kits must be factory installed in QMB-203-T and QMB-303-T.

‡Total Unit Mounting Space (Inches)	Ampere Rating of Mains	Interior, Front and Box Price (Less Units)	COMPONENT ORDERING TABLES						Box Height (Inches)
			INTERIOR ASSEMBLY (Less Units)		FRONT		BOX		
			Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	
18	200	$374.	QMB-1832-2	$231.	QM-3132-TS	$ 56.	QM-3132-B	$ 87.	32
27	200	450.	QMB-2744-2	233.	QM-3144-TS	84.	QM-3144-B	133.	44
24	400	496.	QMB-2444-4	279.	QM-3144-TS	84.	QM-3144-B	133.	44
39	200	527.	QMB-3956-2	249.	QM-3156-TS	105.	QM-3156-B	173.	56
36	400	615.	QMB-3656-4	337.	QM-3156-TS	105.	QM-3156-B	173.	56
48	400	717.	QMB-4868-4	367.	QM-3168-TS	133.	QM-3168-B	217.	68
48	600	815.	QMB-4868-6	465.	QM-3168-TS	133.	QM-3168-B	217.	68
60	600	1008.	QMB-6080-6	542.	QM-3180-TS	187.	QM-3180-B	279.	80
75	200	1000.	QMB-7592-2	462.	QM-3192-TS	221.	QM-3192-B	317.	92
72	600	1180.	QMB-7292-6	642.	QM-3192-TS	221.	QM-3192-B	317.	92

‡Solid Neutral, if required, is mounted in main lugs compartment. No additional space required.
EQUIPMENT GROUND BAR KIT—Catalog Number PK-32DGTA (For all QMB Panelboards).....$27.

TABLE 3—BLANKS, NEUTRAL ASSEMBLIES, COMPRESSION LUGS

BLANKS			SOLID NEUTRAL ASSEMBLY			COMPRESSION LUGS		
Height	Catalog Number	Price	Amp. Cap.	Catalog Number	Price	Ampere Rating	No. of Lugs Per Phase	VCEL Lug Catalog Number (See listing Page 169)
1½	QM-1BL	$8.	◐200	◐QM-1SN	$56.	100	1	VCEL-021-14S1
3	QM-3BL	9.	200	QM-2SN	56.	200	1	VCEL-030-516H1
6	QM-6BL	10.	400	QM-4SN	76.	400	1	VCEL-075-12H1
9	QM-9BL	12.	600	QM-6SN	98.			

◐For use on Interior Catalog Number QMB-1832-2 only.

SELECTION OF COMPONENTS

1. List required circuits including main switch if desired (ampere rating and poles).
2. Select catalog numbers of switch units from Table 1 and determine total unit space.
   NOTE: If solid neutral is required, select from Table 3. No additional height required.
3. Select interior, box and front catalog numbers based on required unit space and Mains capacity from Table 2.
4. Select blanks, if required to complete unit space from Table 3.
   NOTE: Two pole branch units are shipped with outside (A-C) phase connections. Center (B) phase connector furnished with unit for easy field conversion.

SAMPLE ESTIMATE—277/480 V., AC 3φ 4 W. SERVICE
400 A. MAIN LUGS—SURFACE MOUNTING

Components		Mounting Space	Price Each	Total Price
4— 30 A. 3P.	2—QMB-362-T1	12"	$271.	$542.
2— 60 A. 3P.	1—QMB-362-T	6"	271.	271.
4—100 A. 3P.	2—QMB-363-T	15"	428.	856.
1—200 A. 3P.	1—QMB-364	9"	504.	504.
1—400 A. S/N	1—QM-4SN	....	76.	76.
		42"		
1—6" Blank	1—QM-6BL	6"	10.	10.
1—48" Interior	1—QMB-4868-4	48"		
1—Front	1—QM-3168-TS		717.	717.
1—Box	1—QM-3168-B			
		Total Price.....		$2976.

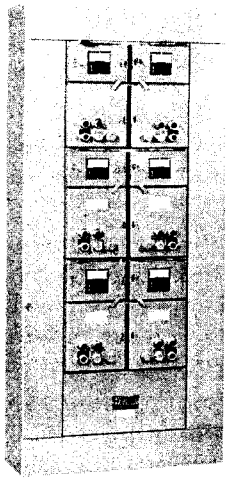
DE CATALOG REFERENCE: SECTION 4620

SQD SLV_000880

UNASSEMBLED MOTOR STARTER CENTERS

208 V. AC
240 V. AC
480 V. AC

QMB



APPLICATION: For use on Three Phase ac systems, 208, 240 or 480 Volts. Listed by Underwriters Laboratories.

MAINS: Main Lugs: 200, 400 or 600A. (Refer to Page 102 for listing.) Main Fusible Switch: 100 or 200A. Main Circuit Breaker: 100 thru 225A.

FUSIBLE SWITCHES Type QMB—Quick-Make, Quick-Break HP rated Plug-On Switch Units. (Refer to Page 102 for listing.)

CIRCUIT BREAKERS: FA, 100A. frame, and KA, 225A. frame, 3 Pole, Plug-On Breaker Units rated 240V., 480V. and 600V., ac. MAG-GARD instantaneous trip circuit breakers are not UL listed for use in unassembled QMB Motor Starter Centers.

STARTERS: Line Voltage Type:
Non-Reversing—Twin Units:
Sizes 0 through 4—Class 8536 Types SB, SC, SD, SE and SF.
Reversing—Single Units:
Sizes 0 through 4—Class 8736 Types SB, SC, SD, SE and SF.

CABINETS: Front—Without door, finished gray baked enamel.
Boxes—Without knockouts, finished gray baked enamel.
(Complete box and gutter dimension data on Page 102.)

CIRCUIT BREAKER ENCLOSURES—600 V. MAX.

QMB circuit breaker enclosures include plug-on bus connectors and provisions for mounting, one or two 3 pole FAL or one 3 pole KAL circuit breakers. Circuit breakers are not included, order from Pages 60 or 61.

Example: 30A., 480V. twin unit—order (1) QMB-FA and (2) FAL-34030.

TWIN MOUNTED FA—PRICE PER TWIN ENCLOSURE

Description	Cat. No.	Height	Price
Mounts (1) or (2) 3 pole FAL, 15-100 A. Circuit Breakers	QMB-FA	6"	$134.

SINGLE MOUNTED KA—PRICE EACH ENCLOSURE

Description	Cat. No.	Height	Price
Mounts (1) 3 pole KAL, 110-225 A. Circuit Breaker	QMB-KA	6"	$152.

UL LISTED SHORT CIRCUIT RATINGS @600 VOLT MAX.

Starter Size	Fusible Switch (w/Class R or J Fuse) RMS Sym. Amperes	Thermal Magnetic Circuit Breaker RMS Sym. Amperes
0	100,000	5,000
1	100,000	5,000
2	100,000	5,000
3	100,000	5,000
4	100,000	10,000

Individual motor starter branches without a fusible switch or circuit breaker in series are same as thermal magnetic circuit breaker ratings.

STARTERS

NEMA Size	Maximum Rating: Motor Voltage	Maximum Rating: HP (3Ø)	‡Class 8536—Types SB, SC, SD, SE and SF Type S—Non-Reversing: Unit Height (Inches)	Twin-Starter Unit (Two Non-Reversing Starters) Catalog Number	Price*	Class 8736—Types SB, SC, SD, SE and SF Reversing: Unit Height (Inches)	Single-Starter Unit (One Reversing Starter) Catalog Number	Price*
0	200	3	9	QMBS 8536-1-00-208	$ 440.	9	QMBS 8736-1-0-208	$ 600.
0	230	3	9	QMBS 8536-1-00-240	440.	9	QMBS 8736-1-0-240	600.
0	460	5	9	QMBS 8536-1-00-480	440.	9	QMBS 8736-1-0-480	600.
1	200	7½	9	QMBS 8536-1-11-208	482.	9	QMBS 8736-1-1-208	668.
1	230	7½	9	QMBS 8536-1-11-240	482.	9	QMBS 8736-1-1-240	668.
1	460	10	9	QMBS 8536-1-11-480	482.	9	QMBS 8736-1-1-480	668.
2	200	10	10½	QMBS 8536-2-22-208	754.	12	QMBS 8736-2-2-208	941.
2	230	15	10½	QMBS 8536-2-22-240	754.	12	QMBS 8736-2-2-240	941.
2	460	25	10½	QMBS 8536-2-22-480	754.	12	QMBS 8736-2-2-480	941.
3	200	25	18	QMBS 8536-3-33-208	1355.	18	QMBS-8736-3-3-208	1437.
3	230	30	18	QMBS 8536-3-33-240	1355.	18	QMBS 8736-3-3-240	1437.
3	460	50	18	QMBS 8536-3-33-480	1355.	18	QMBS 8736-3-3-480	1437.
4	200	40	21	QMBS 8536-4-44-208	2673.	22½	QMBS 8736-4-4-208	2828.
4	230	50	21	QMBS 8536-4-44-240	2673.	22½	QMBS 8736-4-4-240	2828.
4	460	100	21	QMBS 8536-4-44-480	2673.	22½	QMBS 8736-4-4-480	2828.

*Prices do not include overload relay thermal units. Refer to Page 466 for selection procedure (AC Magnetic Starters—small enclosure) and order thermal units separately
‡Space and drilling provided for field addition of control voltage transformer and fuse base.

SELECTION OF COMPONENTS

1. List required motor starter units (reversing or non-reversing) and circuit breaker disconnects from tables above. Specify HP, voltage, phase, frequency and full load current rating of motor.

   Circuit breaker or fusible switch rating for motor branch circuits may be determined from selection tables on Page 478.

   For motor starter voltages other than merchandised standard voltages of 208, 240 and 480 volts, use factory assembled panelboards listed on Page 105 or distributor modified motor starters.
2. List required fusible switches and branch circuits from Page 102.
3. Select interior, box and front catalog numbers and blanks (if required) as outlined on Page 102.

STARTER DATA

1. Line voltage coils are furnished as standard on all starters.
2. Twistouts are provided in starter covers for Start-Stop push buttons, selector switches and pilot lights, see Accessories table below.
3. Starter door interlocks furnished with motor starter enclosures.
4. Type S starter enclosures include drillings for next smaller size.
5. All Type S starters have provisions for 3 overload relay thermal units, as required by 1981 NEC Table 430-37 for 3 phase ac motor circuits.

ACCESSORIES

Accessories listed below are available for field installation on all units. Consult page numbers shown for prices.

Description	Type	Starter Size	Page No.
Push Buttons and Selector Switches: Class 9001 Type K			319
Pilot Light Class 9001 Type KP			327
Electrical Interlocks Class 9999			455
Control Voltage Transformer Class 9070	EO-1	0&1 Non. Rev.	428
	EO-2	2, 0&1 Rev.	428
	GO-3	3	429
	GO-4	4	429

DE CATALOG REFERENCE: SECTION 2320

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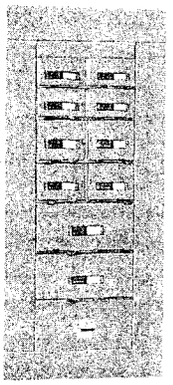
SQD SLV_000881

FUSIBLE PANELBOARDS — FACTORY ASSEMBLED

QMB 250 V. AC or DC 600 V. AC



APPLICATION: For use on ac or dc systems. Meet Federal Specification W-P-115a, Type II, Class 1. Listed by Underwriters Laboratories. Service Entrance approved with six circuits or less or with Main Switch.

I.E.R.: INTEGRATED EQUIPMENT SHORT CIRCUIT RATINGS: QMB Fusible Panelboards are UL listed for use on systems with 200,000 Max. RMS Sym. amperes available when equipped with appropriately rated Class R or J fuses. (Not applicable on 800A. branch or main switches.)

SERVICE: 1Ø, 2W., 1Ø, 3W., 3Ø, 3W., 3Ø, 4W.
600V. Max. ac—250V. Max. dc

MAINS:

Main Lugs	Main Switch:
200A.—1#6-300MCM Al or Cu	100A.—1#6-300 MCM Al or Cu
400A.—1#6-300 MCM Al or Cu and 1#3/0-750 MCM Al or Cu	200A.—1#6-300 MCM Al or Cu 400A.—2#4-600 MCM Al or Cu
600A.—2#3/0-500 MCM Al or Cu	600A.—2#3/0-500 MCM Al or Cu
800A.—3#3/0-750 MCM Al or Cu	◆800A.—3#3/0-750 MCM Al or Cu
1200A.—4#3/0-750 MCM Al or Cu	

BRANCHES: Type QMB Quick-Make, Quick-Break, HP rated Switch Units. HP ratings see Page 478.
30-200 Ampere Units are Plug-on Connection. 400-800 Ampere Units are Bolted Connection.

30A.—1#14-#2 Al or Cu	200A.—1#6-300 MCM Al or Cu
60A.—1#14-#2 Al or Cu	400A.—2#4-600 MCM Al or Cu
100A.—1#4-1/0 Al or Cu	600A.—2#3/0-500 MCM
	◆800A.—3#3/0-750 MCM

CABINETS: *Fronts—Without door, gray baked enamel finish.* (See note below.)
Boxes—Without knockouts, gray baked enamel finish. Maximum 200A. switch—31" wide, 10⅞" deep. Maximum 800A. switch—38" wide, 14⅞" deep.

PRICING (Price additional features from Page 106)

BASE PRICE—MAIN LUGS ONLY (2 or 3 Pole)

Max. Branch Switch	MAIN LUGS RATING 200 A.	H†	400 A.	H†	600 A.	H†	800 A.	H†	1200 A.	H†
200	**$278.**	20	**$339.**	20	**$432.**	20	**$521.**	32	**$736.**	32
600	....	..	**398.**	20	**521.**	20	**644.**	32	**897.**	32

SOLID NEUTRAL
(No additional space required. Mounted in mains compartment).

200 A.	400 A.	600 A.	800 A.	1200 A.
$77.	**$102.**	**$144.**	**$202.**	**$237.**

EQUIPMENT GROUND BAR mounted in box..... **$48.**

BASE PRICE—MAIN SWITCH

No. of Poles	MAIN SWITCH RATING 100 A.	H†	200 A.	H†	400 A.	H†	600 A.	H†	◆800 A.	†H
250 V. AC										
● 2	**$607.**	29	**$607.**	29	**$1183.**	32	**$1807.**	35	**$2811.**	48½
3	**746.**	29	**746.**	29	**1518.**	32	**2178.**	35	**3471.**	48½
600 V. AC										
● 2	**$727.**	29	**$727.**	29	**$1453.**	32	**$1975.**	35	**$2811.**	48½
3	**881.**	29	**881.**	29	**1820.**	32	**2321.**	35	**3471.**	48½

†H dimension includes main lugs or main switch and solid neutral compartment, top and bottom gutters.
●Two pole switches 400 ampere and below in addition to the ac rating have a 250V. dc rating.

BRANCH SWITCHES

Ampere Rating Branch Switches	Type Unit	250 V. AC ● 2 Pole	3 Pole	Space Only	H	600 V. AC ● 2 Pole	3 Pole	Space Only	H
Twin Mounted Branch Switches—Price Per Twin Unit									
30 A.-30 A.	Twin	**$156.**	**$ 202.**	**$49.**	3	**$278.**	**$ 335.**	**$100.**	6
60 A.-60 A.	Twin	**185.**	**252.**	**73.**	4½	**278.**	**335.**	**100.**	6
100 A.-100 A.	Twin	**282.**	**352.**	**100.**	6	**414.**	**528.**	**114.**	7½
Single Mounted Switches—Price Each									
200 A.	Single	**$344.**	**$480.**	**$144.**	9	**$467.**	**$613.**	**$144.**	9
400 A.	Single	**754.**	**1093.**	**217.**	12	**1028.**	**1393.**	**217.**	12
600 A.	Single	**1175.**	**1542.**	**217.**	15	**1337.**	**1690.**	**217.**	15
◆800 A.	Single	**2155.**	**2811.**	**411.**	31½	**2155.**	**2811.**	**411.**	31½

◆Not UL listed. 800 ampere switches have provisions for NEMA Class L fuses.
●Two pole switches 400 ampere and below in addition to the ac rating have a 250V. dc rating.

METHOD OF PRICING

1. Make a sketch with main lugs or main switch at top or bottom.
2. List required branch circuits including ampere capacity and number of poles. Include any spaces for future circuits.
   30-60 twin units are available at same price as 60-60 twin.
   30-100 or 60-100 twin units are available at same price as 100-100 twin unit.
3. List neutral if required. No additional space required.
4. Insert mains capacity, voltage and type of distribution system.
5. Insert height in inches opposite all items.
6. If total height exceeds 92 inches, estimate as two or more single panelboards (separate base for each), adding sub-feed lugs (see Page 106) as required so that contractor can cable panelboards together. If total height is less than 44 inches enough "SPACE ONLY" SECTIONS at full price must be added to equal 44 inches.
7. Insert at the right of each item the prices taken from tables above and the sum will be the price of complete panelboard including the cabinet.

NOTE:
If door in cabinet is required, add **$199.** for 31" wide box or **$226.** for 38" wide box.

ELECTRICAL INTERLOCK (INSTALLED)

Number of Contacts N.O.	N.C.	Switch Ampere Rating 30-200
1	1	**$119.**
2	2	**119.**

CLASS J OR R FUSE CLIPS (ASSEMBLED TO SWITCH)

Ampere Rating	Class J (600V. ac only) 2 Pole	3 Pole	Class R (250 or 600V.) 2 or 3 Pole
30A. Twin	**$26.**	**$26.**	**$26.**
60A. Twin	**26.**	**26.**	**26.**
100A. Twin	**38.**	**38.**	**38.**
200A. Single	**26.**	**26.**	**26.**
400A. Single	**40.**	**40.**	**40.**
600A. Single	**87.**	**134.**	**40.**

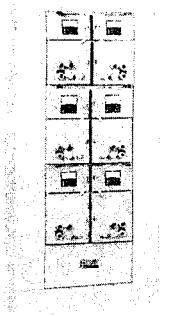
CABINET SELECTION: Select box required from table below based on total unit mounting space and required mains rating

Unit Mounting Space in Inches: Main Lugs 600A. Max.	Main Lugs 800-1200A.	Main Switch 200A.	400A.	600A.	800A.	31" Wide, 10⅞" Deep Catalog Number (200A. Max. Main or Branch Switch) Box	Front	38" Wide, 14⅞" Deep Catalog Number (800A. Max. Main or Branch Switch) Box	Front	Std. Box Height (Inches)
24	..	15	12	..	....	QM-3144-B	QM-3144-TS	PPM-3844-B	QW-3844-TS	44
36	24	27	24	21	....	QM-3156-B	QM-3156-TS	PPM-3856-B	QW-3856-TS	56
48	36	39	36	33	19½	QM-3168-B	QM-3168-TS	PPM-3868-B	QW-3868-TS	68
60	48	51	48	45	31½	QM-3180-B	QM-3180-TS	PPM-3880-B	QW-3880-TS	80
72	60	63	60	57	43½	QM-3192-B	QM-3192-TS	PPM-3892-B	QW-3892-TS	92

DE CATALOG REFERENCE: SECTION 4620

SQD SLV_000882

FACTORY ASSEMBLED MOTOR STARTER CENTERS



208 V. AC
240 V. AC
480 V. AC
600 V. AC

QMB

APPLICATION: For use on Three Phase systems, 208, 240, 480 or 600 volts. Listed by Underwriters Laboratories.

MAINS: Main Lugs: 200A. thru 1200A. (Refer to Page 104 for Listing.) Main Switch: 100A. thru 800A. Main Breaker: 100A. thru 225A.

FUSIBLE SWITCHES: Type QMB—Quick-Make, Quick-Break, HP rated Plug-On Switch Units. (Refer to Page 104 for Listing.)

CIRCUIT BREAKERS: Plug-On Breaker Units with FA, 15-100 ampere, or KA, 110-225 ampere Circuit Breakers.

STARTERS: ●Line Voltage Type: Non-Reversing—Twin Units: Sizes 0 thru 4—Class 8536 Types SB, SC, SD, SE and SF. Reversing—Single Units: Sizes 0 thru 4—Class 8736 Types SB, SC, SD, SE and SF.

CABINETS: Fronts—Without door, finished gray baked enamel. Boxes—Without knockouts, finished gray baked enamel, (Complete box dimension data on Page 104.)

PRICING PROCEDURE

1. Obtain QMB base price from Page 104.
2. Price QMB switches from Page 104 or QMB circuit breakers from below. Select switch or breaker ampere rating from page 478.
3. Price starters from table at right.
4. Add separately for optional features on starter units from table below.
5. To obtain height of motor starter center, use standard dimensions of main lugs or main switch, required QMB units and solid neutral, if required, from Page 104. Add height of starters as shown at right. Box height is not to exceed 92 inches.

UL LISTED SHORT CIRCUIT RATINGS

Starter Size	Fusible Switch—600V. Max. (w/Class R or J Fuses) RMS Sym. Amps.	MAG-GARD C/B RMS Sym. Amps. 480V. Max.	MAG-GARD C/B RMS Sym. Amps. 600V.	Thermal-Mag. C/B 600V. Max. RMS Sym. Amps.
0	100,000	22,000	10,000	5,000
1	100,000	22,000	10,000	5,000
2	100,000	22,000	22,000	5,000
3	100,000	22,000	22,000	5,000
4	100,000	22,000	22,000	10,000

Without switch or circuit breaker in series, same as thermal-mag. C/B.

CIRCUIT BREAKERS

TWIN MOUNTED FA—PRICE PER TWIN UNIT

Circuit Breaker Ampere Rating Left Unit	Right Unit	Height (Inches)	Price—3 Pole 240V.	480V.	600V.	Space Only
15-60A.	Blank	6	**$287.**	**$357.**	**$388.**	**$56.**
15-60A.	15-60A.	6	**404.**	**544.**	**606.**	**56.**
70-100A.	Blank	6	**339.**	**392.**	**437.**	**56.**
70-100A.	15-60A.	6	**456.**	**579.**	**655.**	**56.**
70-100A.	70-100A.	6	**508.**	**614.**	**704.**	**56.**
Twin MAG-GARD 3-50A.		6	....	....	**606.**	**56.**
Twin MAG-GARD 100A.		6	....	....	**704.**	**56.**

SINGLE MOUNTED KA—PRICE EACH

Circuit Breaker Ampere Rating	Height (Inches)	Price—3 Pole 600V.	Space Only
110-225A.	6	**$816.**	**$56.**
MAG-GARD 150A.	6	**517.**	**56.**
MAG-GARD 225A.	6	**816.**	**56.**

OPTIONAL FEATURES

Features			Price
Push Buttons and Selector Switches: Class 9001 Type K (Wired).....each			**$ 29.**
Pilot Light: Red or Green, Class 9001 Type KP (wired)..... (Includes electric interlock when required)			**97.**
Electrical Interlocks, additional (unwired).....			**39.**
	Starter Size	VA	
Control Circuit Transformer with Fuse Block Specify volts, 60 Hz. (wired).	0 Non. Rev.	50	**102.**
	1 Non. Rev.	50	**102.**
	2, 0&1 Rev.	100	**142.**
	3	150	**209.**
	4	300	**253.**

STARTER DATA

Melting alloy type overload relays furnished as standard (overload relay thermal units not included). When specified, bi-metal overload relays (not UL listed) will be supplied at no extra charge. Line voltage coils will be furnished as standard. Starter can be supplied for separate control (specify voltage and frequency)—Form S. (For compliance with NEC 430-74a add **$109.00** for factory installed electrical interlock to disconnect separate control source when a fusible QMB switch is used in combination with the separately controlled starter.)

STARTERS—CLASS 8536, 3P., NON-REVERSING—TWIN UNITS

NEMA STARTER SIZE Left Unit	Right Unit	208V. AC, 240V. AC, 480V. AC or 600V.AC Maximum HP 200V. or 230V. Left Unit	Right Unit	Maximum HP 460V. or 575V. Left Unit	Right Unit	Price◐ Starter Only (Does Not include Disconnect)	Unit Height (Inches) Starter Unit Only
0	0	3	3	5	5	**$ 559.**	9 ∗†
0	Blank	3	.....	5	...	**372.**	9 ∗†
1	1	7½	7½	10	10	**626.**	9 ∗†
1	0	7½	3	10	5	**609.**	9 ∗†
1	Blank	7½	.....	10	...	**420.**	9 ∗†
2	2	‡15	‡15	25	25	**898.**	10½∗
2	1	‡15	7½	25	25	**785.**	10½∗
2	0	‡15	3	25	5	**768.**	10½∗
2	Blank	‡15	.....	25	...	**591.**	10½∗
3	3	★30	★30	50	50	**1599.**	18 ∗
3	2	★30	‡15	50	25	**1444.**	18 ∗
3	1	★30	7½	50	10	**1331.**	18 ∗
3	0	★30	3	50	5	**1314.**	18 ∗
3	Blank	★30	.....	50	...	**1103.**	18 ∗
4	4	☆50	☆50	100	100	**2940.**	21 ∗
4	3	☆50	★30	100	50	**2419.**	21 ∗
4	2	☆50	‡15	100	25	**2264.**	21 ∗
4	1	☆50	7½	100	10	**2151.**	21 ∗
4	0	☆50	3	100	5	**2134.**	21 ∗
4	Blank	☆50	.....	100	...	**1923.**	21 ∗

STARTERS—CLASS 8736, 3P., REVERSING—SINGLE UNITS

0	3	5	**$ 718.**	9
1	7½	10	**777.**	9
2	‡15	25	**1099.**	12
3	★30	50	**1664.**	18
4	☆50	100	**3081.**	21

∗Type S, Class 8536, Types SB, SC, SD, SE and SF starters. Unit includes space for addition of control voltage transformer and fuse block (Form FT).
‡Maximum 10 HP rating on Size 2 Starter at 200V. ac.
★Maximum 25 HP rating on Size 3 Starter at 200V. ac.
☆Maximum 40 HP rating on Size 4 Starter at 200V. ac.
†6" high enclosure with Type S starters available. Consult local Field Office.
◐Prices do not include overload relay thermal units. Refer to Page 466 for selection procedure. (AC Magnetic Starters—small enclosure) and order thermal units separately.
●3∅ ac system voltages are 208V., 240V., 480V. and 600V. Corresponding NEMA Standard motor voltages are 200V., 230V., 460V. and 575V.

DE CATALOG REFERENCE: SECTION 2320

G2 DISCOUNT

REPLACEMENT QMB BRANCH SWITCHES

(For Factory Assembled QMB Panelboards (38" Wide) and Switchboards)

Ampere Rating	Poles	Phase Conn.	Ht. (In.)	Catalog Number and Price 250V. ac	Price	600V. ac	Price
400A.	2	CA	12	◆QMB-2240	**$673.**	◆QMB-2640	**$868.**
		AB		◆QMB-2240-L	**673.**	◆QMB-2640-L	**868.**
		BC		◆QMB-2240-R	**673.**	◆QMB-2640-R	**868.**
	3	...	12	QMB-3240	**936.**	QMB-3640	**1192.**
600A.	2	CA	15	QMB-2260	**1047.**	QMB-2660	**1134.**
		AB		QMB-2260-L	**1047.**	QMB-2660-L	**1134.**
		BC		QMB-2260-R	**1047.**	QMB-2660-R	**1134.**
	3	...	15	QMB-3260	**1369.**	QMB-3660	**1475.**

◆250 volts dc rated.
30A. thru 200A. branch switches are listed on Page 102.

G1-1 DISCOUNT

PLUG-ON EXTENSION ASSEMBLIES

Required on all 30-200 ampere switches when used in QW type panelboards—38" wide box or switchboards.

Ampere Rating	Ht. (In.)	Catalog Number	Price	Ampere Rating	Ht. (In.)	Catalog Number	Price
30-30A.	3	QMB-303-LEX	**$20.30**	30-30A.	6	QMB-306-EX	**$26.00**
60-60A.	4½	QMB-306-LEX	**21.70**	60-60A.	6	QMB-306-EX	**26.00**
100-100A.	6	QMB-310-LEX	**26.00**	100-100A.	7½	QMB-310-EX	**61.00**
				200A.	9	QMB-320-EX	**61.00**

BLANKS

For 38" wide Panelboards & Switchboards.

Height	Catalog Number	Price
1½	QW-1BL	**$ 8.**
3	QW-3BL	**9.**
6	QW-6BL	**10.**
9	QW-9BL	**12.**

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SQD SLV_000883

FACTORY ASSEMBLED PANELBOARDS
ADDITIONAL FEATURES

None of these features can be furnished on UNASSEMBLED I-LINE®, NQO, NQOB, NEHB or QMB panelboards.

INTERIORS

1. Sub-Feed Lugs:
NQO, NQOB, NH1B or NEHB Main Lugs Panelboards only

No. Poles	Ampere Rating	
	100A.	225A.
2	$34.	$34.
3	34.	34.

I-LINE or QMB Distribution Panelboards

No. Poles	Ampere Rating				
	225 A.	400 A.	600 A.	800 A.	1200 A.
2	$53.	$102.	$202.	$283.	$337.
3	73.	122.	220.	318.	371.

2. Lugs, Special Make or Type: Specify type and tool to be used.

All panelboards are normally furnished with Square D solderless lugs in mains and branches for all current capacities in excess of 30 A.

Compression Type Lugs (On both mains and solid neutral).

NQO, NQOB, NEHB, NH1B.....Add **$34.** Per Lug
I-LINE and QMB..... **60.** Per Lug

Square D Type VCEL
NQO, NQOB, NEHB..... No Charge
NH1B, I-LINE, QMB Max. 225 A. mains.....No Charge
I-LINE, QMB -400 A thru 1200 A. mains.....Consult Local Field Office

3. Sub-Feed Circuit Breaker—NQO or NQOB panelboards
Max. One per 225A. Panelboard—Max. Two per 400A. or 600A. Panelboard

No. Poles	Price (110-225A.)				Max. No. of One Pole Branches	Box Height 20" W. x 5¾" D.	
	Q2	Q2-H	KA	KH		225A.▲	400A. or 600A.▲
2	$356.	$512.	$559.	$1174.	12	35"	47"
3	419.	536.	698.	1433.	28	41"	53"
Space Only	218.	218.	218.	218.	44	47"	59"

▲Main Lugs or Main Breaker.

4. Split Bus:
NQO, NQOB, or NH1B panelboards

No. Poles	Ampere Rating			
	100A.	225A.	400A.	600A.
2	$ 83.	$ 83.	$172.	$202.
3	114.	114.	202.	220.

I-LINE or QMB Distribution Panelboards
Consult Field Office for additional height required.

No. Poles	Mains Ampere Rating				
	225 A.	400 A.	600 A.	800 A.	1200 A.
2	$144.	$172.	$202.	$283.	$339.
3	172.	202.	220.	318.	370.

5. Lighting Contactors for tungsten and ballast lamp loads.
(Push buttons not included).

Ampere Rating 480 V. ac Max.	Electrically Held	Mechanically Held	
	Square D Class 8903	Square D Class 8903	ASCO Bul. 920
2 POLE			
30	$ 616.	$ 814.	$ 860.
60	768.	1020.	1093.
75	.....	.....	1093.
100	989.	1154.	1218.
150	.....	.....	1697.
200	1622.	1996.	1996.
300	1763.	.....	.....
3 POLE			
30	$ 713.	$ 814.	$ 996.
60	924.	1154.	1402.
75	.....	.....	1402.
100	1164.	1389.	1688.
150	.....	.....	2386.
200	1945.	2292.	2651.
300	2170.	.....	.....

30 ampere light duty mechanically held contactors are also available:
2 Pole—ASCO Bul. 909..... Add **$410.**
3 Pole—ASCO Bul. 909..... Add **494.**

6. Panelboard interiors and fronts to fit existing boxes:
No deduction from the price of the complete panelboard for omitting the box. The price of the panelboard interior and special front will be the price of the complete standard panelboard having the desired interior, providing the existing box is the same depth or deeper than the standard for the panelboard being ordered and mounting brackets are not required.

Deeper box than our standard and mounting brackets are required; add to price of complete standard panelboard.....**$71.**△
Shallower box than our standard; add to price of complete standard panelboard.....**$144.**△
Special front only to fit existing box and interior; add to price of standard front.....**$144.**△

7. Busway Connection—For price addition to I-LINE or QMB Distribution panelboard mounted on feeder busway, refer to Page 125.

FRONTS

8. Locks:
Corbin 2510, 2520 .....Consult local Square D Field Office
Yale 511, 511S (Obsolete—No longer available)
Corbin 2720.....Consult local Square D Field Office
Master Keying—per lock (for above locks)..... **11.**

9. Directory frame with glass (other than manufacturer's standard)..... **17.**

10. No. 10 gauge fronts or boxes—(heavier than Code gauge) ..... **85.**△*
Box and front..... **114.**△*

11. Dust resisting fronts only:
Maximum 26" wide cabinet.....**167.**△*
Maximum 41" wide cabinet.....**220.**△*

12. Three Point Locks—vault type (when not furnished as standard).... **83.**

13. Special front or door arrangements including:
(a) Door-in-door with one door over interior and additional door which exposes wiring gutter.
(b) Double or split door, one above the other.
(c) One front with two doors in place of two individual fronts (to cover two separate boxes mounted side by side)..... **167.** *

14. Nameplates:
For identification purposes. (Includes engraving and mounting);
Black and white laminated bakelite, each..... **19.**△
Stainless steel, each..... **36.**△
Chromium plated brass, each.....**119.**△

15. Fronts hinged to the box..... **73.** *

BOXES

16. Standard commercially available colors:
Black, green, brown, gray, crystallic or prime coat only.
For other colors.....**$167.** *

17. Increasing maximum 26" wide panelboard box to 8" maximum depth or 41" wide panelboard box to 18" maximum depth..... **114.** *

18. Increased side gutters—For each 7" or fraction thereof increase in width..... **114.** *

19. Increased end gutters—*For each 12" or fraction thereof increase in* length..... **114.**△*

20. Weatherproof or dust-resisting panelboard cabinets, (NEMA 3R or 12).
Maximum 26" wide cabinet
Single door type.....**395.** *
Maximum 41" wide cabinet
Single door type.....**532.** *

Note: For QMB include front-with-door charge from Page 104.

21. Special drillings or knockouts in endwalls when template accompanies order..... **34.**

22. Cable Troughs and **Pull Boxes** for Column Width NQO, NQOB or NH1B Panelboards

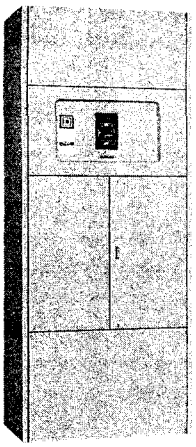
✣Cable Troughs (L = Length)						Pull Boxes		
L (In.)	◆8⅝"x5" Catalog Number	Price	L (In.)	8⅝"x5" Catalog Number	Price	S/N Terminals	Catalog Number	Price
36	MTX-836	$112.	84	MTX-884	$159.			
48	MTX-848	123.	96	MTX-896	172.	26	‡MPX-815-26	$90.
56	MTX-856	124.	104	MTX-8104	185.	42	MPX-815-42	90.
66	MTX-866	142.	112	MTX-8112	201.			

◆UL listed as Wireway under File E6625.
✣6⅞" x 5" Cable Trough available at same price as 8⅝" x 5". Change Cat. No. to MTX-636 etc.
‡UL listed as Pull Box under File E25442.

△Applicable to column width (LX) panelboards.
*If individual order calls for duplicate devices with the same special feature or if a quantity of 10 or more assorted panelboards is involved, deduct 25% of the price shown for the additional feature.

SQD SLV_000884

SPEED-D® WALL MOUNTED METERING EQUIPMENT



Standard Unit

MAIN BREAKER AND CURRENT TRANSFORMER COMPARTMENT
SERVICE ENTRANCE EQUIPMENT
HOT OR COLD SEQUENCE METERING
TOP OR BOTTOM FEED
INDOOR CONSTRUCTION
600 VOLTS

APPLICATION: Provides hot or cold sequence metering on ac systems. Listed by Underwriters' Laboratories as suitable for use as service equipment.

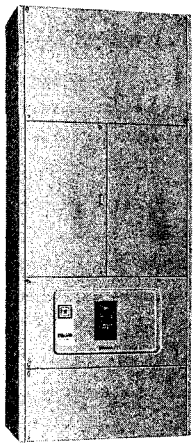
SERVICE: 1Ø3W, 3Ø3W, 3Ø4W 600V. maximum.

METERING: Current transformer compartment with provisions for installing bar type current transformers. See supp. price sheet, section 2605, page 1 for bus bar links for use with window type current transformers.

ENCLOSURE: Standard gray baked enamel finish over a phosphate pretreatment.
Dimensions 70.5" H x 30" W x 14" D.

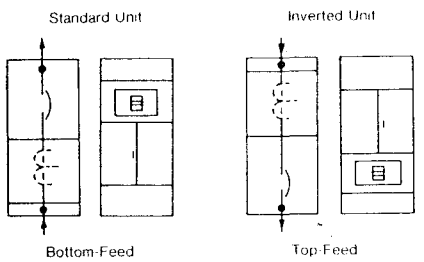
MAINS: 400A. LA, 600A., 800A. or 1000A. MA, molded case circuit breaker.

WEIGHT: 250 lbs.

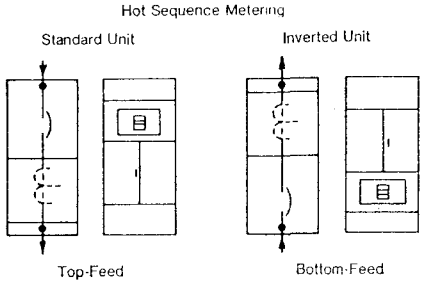


Inverted Unit

SERVICE APPLICATIONS



Hot Sequence Metering



Cold Sequence Metering

SELECTION TABLE

Service Voltage	Ampere Rating	System	Catalog Number	Price
120/240	400	1Ø3W	CTC-264	$1815.
120/208 240 277/480 or 600	400	3Ø3W or 3Ø4W	CTC-364	2005.
	600		CTC-366	2885.
	800		CTC-368	3685.
	1000		CTC-3610	4465.
Ground Fault protection equipment (Factory Installed Only—Order Point: Peru)				1290.

Circuit breaker modifications available—Factory Installed Only.

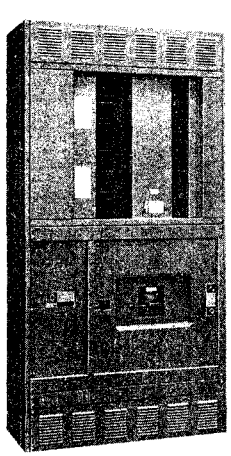
LUG TABLE

Ampere Rating	INCOMING Clamp Type Lugs Per Phase On Main Breaker	LOADSIDE Clamp Type Lugs Per Phase*
400	1-600MCM; 2-250MCM, Al or Cu	1-750MCM; 1-300MCM, Al or Cu
600	3-500MCM, Al or Cu	2-750MCM, Al or Cu
800	3-500MCM, Al or Cu	3-750MCM, Al or Cu
1000	3-500MCM, Al or Cu	3-750MCM, Al or Cu

*Incoming lugs will become loadside lugs on inverted units.
NEUTRAL LUGS—400A., 1-750MCM, Al or Cu; 600A., 2-750MCM, Al or Cu; 800A. and 1000A., 3-750MCM, Al or Cu. (Incoming or loadside, clamp type lugs).
GROUND LUG 1-300MCM

DE CATALOG REFERENCE: SECTION 2690

SPEED-D® SERVICE/DISTRIBUTION SWITCHBOARDS — 480 VAC MAX.



MAIN CIRCUIT BREAKER

Includes 3 Pole, Vertically Mounted Main Breaker

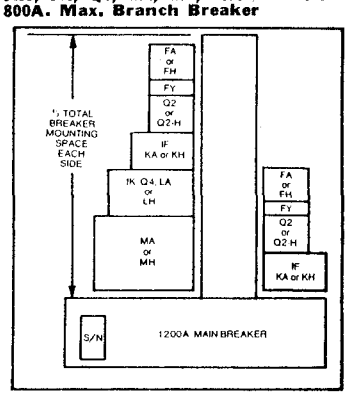
90" High, 48" Wide, 14" Deep freestanding enclosure with hinged gutter covers and no door. Switchboards with GFP include GROUND-CENSOR Equipment ground fault protection system consisting of sensor, monitor panel and relay (.1 sec). Test circuit tests all components—requires external 120V. ac source. Meets N.E.C. Article 230-95 requirements for equipment ground fault protection on 277/480V. ac, 3Ø4W systems.

UL Listed—Suitable for use as Service Equipment.

Total Bkr. Mtg. Space (In.)	Max. No. of LA or MA Bkrs.‡	Main Bkr. Amp. Rtg.	Complete Assembly With Solid Neutral (Less Branch Breakers) Without GFP Catalog No.	Price	With GFP Catalog No.	Price	Encl. Ht. (In.)
63	3MA	1000	HCWA-10MN	$7305.	HCWA-10MNGB	$10470.	90
63	3MA	1000	◆HCWA-10MNT	7305.	◆HCWA-10MNGT	10470.	90
63	3MA	1200	HCWA-12MN	7935.	HCWA-12MNGB	11100.	90
63	3MA	1200	◆HCWA-12MNT	7935.	◆HCWA-12MNGT	11100.	90

◆Top Feed.
‡Q4, LA and LH Circuit Breakers may be combined with MA and MH breakers in Type HCWA. All mount on one side only.

FA, FH, FY, Q2, Q2-H, IF, KA, KH, IK, Q4, LA, LH, MA and MH 800A. Max. Branch Breaker

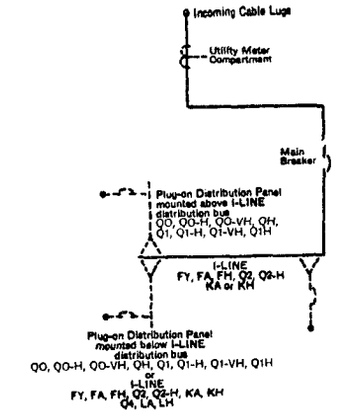


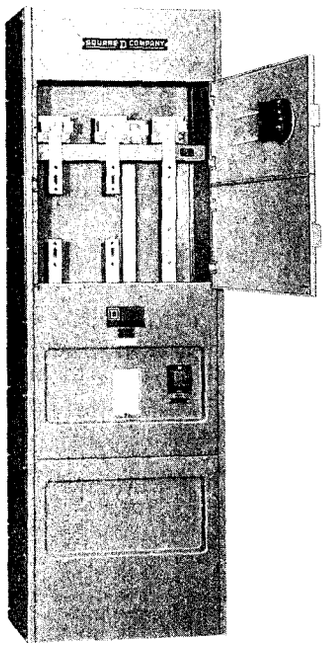
Enclosure Size: 48" Wide, 14" Deep

SQD SLV_000885

SPEED-D ® SERVICE SECTION SWITCHBOARDS — UNASSEMBLED

I-LINE ® 240 V. AC 600 V. AC





Meets P.U.E.S.R. and W.U.E.S.S.C. Joint Requirements

APPLICATION: Suitable for use as Service Entrance Equipment on ac systems. Listed by Underwriters' Laboratories. The I-LINE Distribution Interior is Integrated Equipment Rated.

SERVICE: 1Ø 3 W., 3Ø 3 W., 3Ø 4 W. 240 and 600 V. Max. ac

METERING: Current transformer compartment with meter socket and doors to meet P.U.E.S.R. and W.U.E.S.S.C. joint standards.

MAINS: 400, 600 or 800 Amp Main molded case circuit breaker.
Incoming Cable Lugs: 400 A.—2-#3/0-750 MCM Al or Cu 600 A.—2-#3/0-750 MCM Al or Cu
800 A.—3-#3/0-750 MCM Al or Cu

BRANCHES: Plug-on QO, QO-H, QO-VH, QH, Q1, Q1-H, Q1-VH, Q1H, FY, FA, FH, Q2, Q2-H, KA, KH, Q4, LA or LH *10-100 A.—1 Pole 15-400 A.—2 and 3 Pole*

ENCLOSURE: Totally enclosed, front accessible, gray baked enamel finish. 90" high, 14" deep, 24" or 30" wide—see table.

GUTTERS: Meet space requirements per P.U.E.S.R. and W.U.E.S.S.C. joint standards.

INDOOR SERVICE SECTION INCLUDES METERING COMPARTMENT, BARRIER, MAIN CIRCUIT BREAKER, I-LINE DISTRIBUTION PANEL AND NEUTRAL ASSEMBLY WITH GROUNDING PROVISIONS WHERE APPLICABLE.

Service Voltage AC	System	Ampere Rating of Mains	Branch Circuit Breakers Available Mounting Space: I-LINE ‡ (Inches)	Branch Circuit Breakers Available Mounting Space: QO & Q1 ★ (1-Pole Spaces)	Section Width (Inches)	Catalog Number	Price
120/240	1Ø 3 W. ‡	400	9 18 18	24 12 None	24	SSB-224-NP	$1165.
		600	9 18 18	24 12 None		SSB-226-NP	1490.
		800	9 18 18	24 12 None		SSB-228-NP	1920.
240	3Ø 3 W.	400	13.5 22.5 22.5	24 12 None	30	SSB-324-P	1290.
		600	13.5 22.5 22.5	24 12 None	30	SSB-326-P	1810.
		800	13.5 22.5 22.5	24 12 None	30	SSB-328-P	2340.
120/208 Wye & 120/240 Delta	3Ø 3 W. 3Ø 4 W. Delta▲	400	13.5 22.5 22.5	24 12 None	30	SSB-324-NP ▲SS-8-MX	1450.
		600	13.5 22.5 22.5	24 12 None		SSB-326-NP ▲SS-8-MX	2015.
		800	13.5 22.5 22.5	24 12 None		SSB-328-NP ▲SS-8-MX	2620.
480 and 600	3Ø 3 W.	400 600 800	22.5 22.5 22.5	N/A N/A N/A	30	SSB-364-P SSB-366-P SSB-368-P	2140. 3145. 4085.
277/480	3Ø 4 W.	400 600 800	22.5 22.5 22.5	N/A N/A N/A	30	SSB-364-NP SSB-366-NP SSB-368-NP	2305. 3340. 4335.

‡For 1Ø, 3W. switchboards and for 3Ø, 4W. Delta systems feeding lighting circuits, 1 & 2 pole I-LINE circuit breakers require A, C or AC connections respectively.
★To obtain these mounting provisions requires purchase of Plug-on Distribution Panel Accessory listed below.
▲Order both catalog numbers for 3Ø 4 W. Delta connected switchboard. Price includes both catalog numbers.

ORDERING INSTRUCTIONS

1. Order Service Section Switchboard by Cat. No. determined from the main bus Amp. Rating, Voltage and System.
2. Order Accessories by catalog number, as required.
3. I-LINE branch circuit breakers—order by Cat. No. as determined from the voltage, breaker type (FY, FA, FH, Q2, Q2-H, KA, KH, Q4, LA, LH), No. of poles and trip rating.
4. QO, QO-H, QO-VH, QH, Q1, Q1-H, Q1-VH and Q1H branch circuit breakers (240 volt maximum).
   (a) *Order circuit breakers by quantity and catalog number as determined from voltage, circuit breaker type, number of poles and trip rating.*
   (b) The distribution panel for mounting these circuit breakers should be ordered by catalog number determined by the number of 1-pole spaces required.

BRANCH CIRCUIT BREAKERS

QO, QH, Q1 page 78

I-LINE page 94, 95

Additional accessories listed in Supplementary Price Sheet, Section 2605, consult local field office.

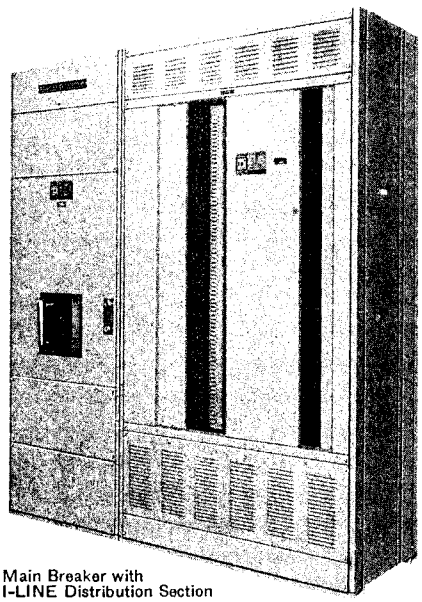
ACCESSORIES

Description				Catalog Number	Price
INDOOR UNDERGROUND PULL SECTION—Conduit entrance top, bottom or side.			Full Height and Depth—12" Wide 25" Wide	SS-12-UGP SS-25-UGP	$260. 520.
LOAD SIDE WIREWAY—Conduit entrance top or bottom. Available for indoor use only.			Full Height and Depth—5" Wide	SS-5-LW	120.
RAINPROOF ENCLOSURE Adds exterior rainproof enclosure to the service section switchboard. Shipped completely assembled.			1Ø 3 W.: 36" W. x 25" D. x 91" H. 3Ø 3 W. & 3Ø 4 W.: 42" W. x 25" D. x 91" H.	Add Suffix "R" to Indoor Service Section Catalog Number	Add $895. to price of Indoor Section
RAINPROOF UNDERGROUND PULL SECTION			12" Wide x 25" D. x 91" H. 25" Wide x 25" D. x 91" H.	SS-12-UGPR SS-25-UGPR	580. 970.
LUG LANDING KIT—For terminating utility cables in Underground Pull Section. Includes supports, lug pads, and load side lugs for terminations to 800A. Lug Landing Kit mounts in 25" wide Underground Pull Section. P.U.E.S.R. and W.U.E.S.S.C. require a 25" wide Underground Pull Section and Lug Landing Kit for underground services over 400A.				S3-4825-LL	315.
PLUG-ON DISTRIBUTION PANEL—For vertical mounting either above, below, or both above and below the horizontal I-LINE distribution bus. Contains space and mounting provisions for QO, QO-H, QO-VH, QH, Q1, Q1-H, Q1-VH or Q1H 240V. maximum branch circuit breakers. Distribution Panel mounted below the horizontal I-LINE distribution bus occupies 9" of I-LINE branch circuit breaker mounting space. Distribution Panel is rated 225 amperes per 12 pole spaces.	System	Phase Conn.	Single Pole Spaces		
	1Ø 3 W.	A C	12 Mtd. Above	SS-212-DPTAC	275.
			12 Mtd. Below	SS-212-DPAC	275.
			24	SS-224-DPAC	495.
	3Ø 3 W. or 3Ø 4 W.Y	A B C	12 Mtd. Above	SS-312-DPT	310.
			12 Mtd. Below	SS-312-DP	310.
			24	SS-324-DP	560.
LA BRANCH CIRCUIT BREAKER MOUNTING KIT—Includes pan extension, neutral lug and front cover assembly for mounting one Q4, LA or LH branch circuit breaker on 6" of I-LINE branch circuit breaker mounting space. Installation limits the use of the Plug-on Distribution Panel accessory to 12 pole spaces mounted above the I-LINE distribution bus. Circuit breaker is not included—order from the I-LINE circuit breaker listings in this digest.			24" Wide Section 30" Wide Section	SS-24-LA SS-30-LA	310. 310.

SQD SLV_000886

SPEED-D® MULTI-SECTION SWITCHBOARDS — UNASSEMBLED

I-LINE® 600 V. AC MAXIMUM



Main Breaker with
I-LINE Distribution Section

FOR USE AS SERVICE ENTRANCE OR DISTRIBUTION SWITCHBOARDS ON AC SYSTEMS

APPLICATION: Listed by Underwriters' Laboratories — Suitable for Use as Service Equipment and Dead-front Switchboards. The Sections are Short Circuit Current Rated.

SERVICE: 3Ø 3 W., 3Ø 4 W. 240, 480 or 600 V. ac, 60 Hz.

MAINS: Main Circuit Breaker or Main Switch Sections 1200, 1600 or 2000A. Incoming Cable Lugs are top feed for following cable sizes per phase and neutral:
1200 A., 4-#3/0 to 750 MCM Cu or Al
1600 A., 5-#3/0 to 750 MCM Cu or Al
2000 A., 6-#3/0 to 750 MCM Cu or Al

Load side terminations are to EXTRU-BUS™ through bus.

Main Sections are listed as Suitable for Use as Service Equipment and are furnished standard with 100% neutral bus with disconnect link, ground bus, main bonding jumper and lug attached to ground bus for connection to grounding electrode.

BRANCHES: I-LINE Distribution Sections have a total of 117" of branch circuit breaker mounting space for I-LINE FA, FH, FY, IF, Q2, Q2-H, KA, KH, IK, Q4, LA, LH, MA and MH circuit breakers. Left row mounts 58½" of FA thru MH circuit breakers and is filled with Blank Extensions. Right row mounts 58½" of I-LINE FA, FH, FY, Q2 and Q2-H circuit breakers and is filled with I-LINE Blank Fillers.

QMB Distribution Sections have a total of 60" of branch fusible switch mounting space for 30, 60, 100, 200, 400 and 600 Amp. switches. 30, 60 and 100 Amp. switches are twin units. No blank filler included—see below.

ENCLOSURE: Each Switchboard Section is of welded and bolted construction consisting of side frames, horizontal channels and angles and removable top, side, back and front plates. Bottom base channels permit jacking or moving section on rollers. Lifting angles are furnished with each Main and Distribution Section. Paint finish is gray baked enamel over a phosphate pretreatment. Sections are completely front accessible and front connectable allowing the switchboard to be installed next to a wall.

SELECTION TABLE

Description All sections mount to either side of adjacent section	Voltage Rating	Ampere Rating	Dimensions (In.) H	W	D	Catalog Number	Price
MAIN CIRCUIT BREAKER SECTION WITH GROUND FAULT PROTECTION—600V. molded case circuit breaker type, manually operated, equipped with ground trip mechanisms and ground fault protection system.	600	1200 1600 2000	91.5	30	24	SB-MB-1200 SB-MB-1600 SB-MB-2000	**$10815.** **12920.** **13575.**
MAIN CIRCUIT BREAKER SECTION WITHOUT GROUND FAULT PROTECTION—600V., molded case circuit breaker type, manually operated.	600	1200 1600 2000	91.5	30	24	SB-M-1200 SB-M-1600 SB-M-2000	**8405.** **9885.** **11165.**
MAIN SWITCH SECTION—480V., BOLT-LOC® fusible switch type, manually operated, equipped with electric trip mechanism and ground fault protection system. Fuses not included.	480	1200 1600 2000	91.5	36 36 42	24	SB-FE-1200 SB-FE-1600 SB-FE-2000	**12495.** **13555.** **15565.**
MAIN SWITCH SECTION—480V., BOLT-LOC fusible switch type, manually operated. Fuses not included.	480	1200 1600 2000	91.5	36 36 42	24	SB-FM-1200 SB-FM-1600 SB-FM-2000	**7620.** **8580.** **10315.**
DISTRIBUTION SECTION—600V., I-LINE branch molded case circuit breaker type. Furnished with two 58.5" high circuit breaker mounting rows to contain FA thru MH circuit breakers on the left side and FA, FH, FY, Q2 and Q2-H on the right side.	600	1200 1600 2000	91.5	48	24	SB-IMF-1200 SB-IMF-1600 SB-IMF-2000	**2380.** **2735.** **3055.**
DISTRIBUTION SECTION—600V., QMB branch fusible switch type. Furnished with 60" of fusible switch mounting to contain 30, 60, 100, 200 (plug-on), 400 and 600 (bolt-on) amp. QMB fusible switches.	600	1200 1600 2000	91.5	36	24	SB-QW-1200 SB-QW-1600 SB-QW-2000	**1860.** **2135.** **2405.**
AUXILIARY SECTION—For cable transition of bottom feed cables to top feed main section lugs. Also use with main lug bus kit for load side cable exit from a main section or for line side cable entry to a distribution section. Includes ground bus.	...	....	91.5	24	24	SB-1A	**1170.**
MAIN LUG BUS KIT—For use with auxiliary section. Provides load side cable exit from a main section or line side cable entry to a distribution section. Lug quantity and range per phase: 1200A., 4-#3/0 thru 750 MCM Cu or Al. 1600 and 2000A., 6-#3/0 thru 750 MCM Cu or Al.	600	1200 1600 2000	Mounts in Auxiliary Section			SB-ML-1200 SB-ML-2000 SB-ML-2000	**450.** **815.** **815.**
TRANSITION SECTION—For use to connect SPEED-D Multi-Section Switchboards to SPEED-D Motor Control Centers. Includes bussing that connects to the EXTRU-BUS through bus in the switchboard and to the horizontal bus that is located near the top of the Motor Control Center.	600	600 1200	91.5	24	24	SB-T-600 SB-T-1200	**2110.** **3390.**
SIDE CLOSURE PLATE—Used when only one of above sections are used.			90	..	24	SB-SC	**115.**

ORDERING INSTRUCTIONS

1. Select Main Switch or Main Circuit Breaker Section based on system voltage and applicable ampere rating.
2. Select Distribution Section with applicable ampere rating.
3. Select as required, Auxiliary Section and Main Lug Bus Kit and/or Transition Section.
4. Select branch circuit breakers or branch QMB fusible switches for Distribution Section, taking into consideration voltage and ampere rating, number of poles, interrupting rating and system available fault current or main fuse let-through current. 30, 60, 100 and 200 ampere QMB fusible switches require bus extension kits (QW-____) found on page 105.
5. Select additional blank fillers to cover unused I-LINE branch circuit breaker mounting space where less than 58.5 inches of circuit breakers are installed (page 97) or to cover unused QMB branch fusible switch mounting space (QW-____, page 105.)

REFERENCES:

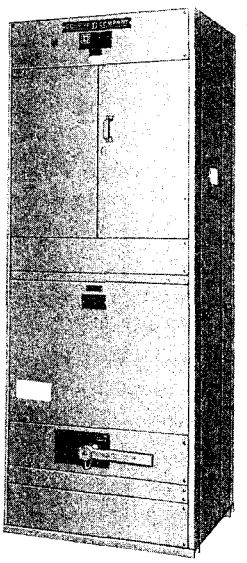
	Page
30, 60, 100 and 200 ampere QMB switches	102
Bus extension kits (required for 30 to 200A. QMB's)	105
400 and 600 ampere QMB switches	105
Blank fillers (required for unused QMB panel length)	105
I-LINE circuit breakers	94, 95
Blank fillers (required when less than 58½" of I-LINE panel is used)	97
Blank extensions (for replacement purposes)	97

SQD SLV_000887

SPEED-D® "QAD" SERVICE SECTION SWITCHBOARDS

MAIN CIRCUIT BREAKER OR MAIN SWITCH AND C/T COMPARTMENT
HOT OR COLD SEQUENCE METERING
SERVICE ENTRANCE EQUIPMENT
CONNECTS TO SPEED-D DISTRIBUTION SECTIONS
AVAILABLE FROM ASSEMBLY PLANT
2-3 WEEK DELIVERY
GROUND FAULT PROTECTION

240 V. AC
480 V. AC



Main Switch and
Current Transformer Compartment

APPLICATION: Listed by Underwriters' Laboratories — Suitable for Use as Service Equipment. Provides hot or cold sequence metering. "Top feed" (Bottom feed applications require an Auxiliary Section from Digest page 100).

SERVICE: 3 Ø 4 W. 240 or 480 V. ac, 60 Hz.

METERING: Current transformer compartment built to meet utility requirements. Standardized to include hinged double doors, bus link kit and barriers.

MAINS: Main Circuit Breaker or Main Switch Sections 1200, 1600 or 2000A. Incoming Cable Lugs are top feed for following cable sizes per phase and neutral:
1200 A., 4-#3/0 to 750 MCM Cu or Al
1600 A., 5-#3/0 to 750 MCM Cu or Al
2000 A., 6-#3/0 to 750 MCM Cu or Al

Load side terminations are to EXTRU-BUS™ through bus.

Service Sections are listed as Suitable for Use as Service Equipment and are furnished standard with 100% neutral bus with disconnect link, ground bus, main bonding jumper and lug attached to ground bus for connection to grounding electrode.

ENCLOSURE: Each Switchboard Section is of welded and bolted construction consisting of side frames, horizontal channels and angles and removable top, side, back and front plates. Bottom base channels permit jacking or moving section on rollers. Lifting angles are furnished with each Main Section. Paint finish is gray baked enamel over a phosphate pretreatment. Sections are completely front accessible and front connectable allowing the switchboard to be installed next to a wall.

SELECTION TABLE

Description	CURRENT TRANSFORMER COMPARTMENT	Voltage Rating	Ampere Rating	Dimensions (In.) H	W	D	Catalog Number	Price
MAIN CIRCUIT BREAKER/CT COMPARTMENT SECTION—240V. molded case circuit breaker type, manually operated. CT compartment built to utility requirements.	HOT SEQUENCE METERING	240	1200 1600 2000	91.5	36	24	#CTPA-1200-240 #CTPA-1600-240 *#CTPA-2000-240	**$ 9,854.** **11,796.** **12,687.**
	COLD SEQUENCE METERING	240	1200 1600 2000	91.5	36	24	#PACT-1200-240 #PACT-1600-240 *#PACT-2000-240	**9,854.** **11,796.** **12,687.**
MAIN SWITCH/CT COMPARTMENT SECTION—240V. BOLT-LOC# fusible switch type, manually operated. Fuses not included. CT compartment built to utility requirements.	HOT SEQUENCE METERING	240	1200 1600 2000	91.5	36 36 42	24	#CTBL-1200-240 #CTBL-1600-240 #CTBL-2000-240	**9,642.** **10,876.** **12,622.**
	COLD SEQUENCE METERING	240	1200 1600 2000	91.5	36 36 42	24	#BLCT-1200-240 #BLCT-1600-240 #BLCT-2000-240	**9,642.** **10,876.** **12,622.**
MAIN CIRCUIT BREAKER/CT COMPARTMENT SECTION—480V. molded case circuit breaker type, manually operated, equipped with ground trip mechanism and ground fault protection system. CT compartment built to utility requirements.	HOT SEQUENCE METERING	480	1200 1600 2000	91.5	36	24	#CTPA-1200-480 #CTPA-1600-480 *#CTPA-2000-480	**13,020.** **14,964.** **16,471.**
	COLD SEQUENCE METERING	480	1200 1600 2000	91.5	36	24	#PACT-1200-480 #PACT-1600-480 *#PACT-2000-480	**13,020.** **14,964.** **16,471.**
MAIN SWITCH/CT COMPARTMENT SECTION—480V. BOLT-LOC fusible switch type, manually operated, equipped with electric trip mechanism and ground fault protection system. Fuses not included. CT compartment built to utility requirements.	HOT SEQUENCE METERING	480	1200 1600 2000	91.5	36 36 42	24	#CTBL-1200-480 #CTBL-1600-480 #CTBL-2000-480	**14,995.** **16,090.** **18,731.**
	COLD SEQUENCE METERING	480	1200 1600 2000	91.5	36 36 42	24	#BLCT-1200-480 #BLCT-1600-480 #BLCT-2000-480	**14,995.** **16,090.** **18,731.**

* Not yet available
#Add **$360.** for pullbox

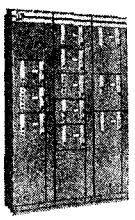
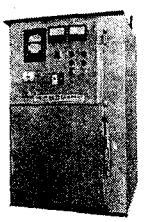
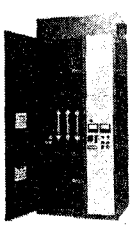
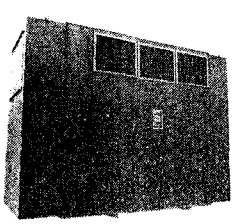
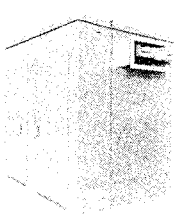
For PH main circuit breaker in service section add: 1200A **$567.** 1600A **403.** 2000A **$2,115.**

ORDERING INSTRUCTIONS

1. Select Main Switch/CT Compartment or Main Circuit Breaker/CT Compartment Section based on system voltage and applicable ampere rating. Order from Assembly Plant.
2. Select as required from Digest page 109, Distribution Section with applicable ampere rating. (Indicate on which side of the Main Section that the Distribution Section will be mounted.)
3. Select as required from Digest page 109, Auxiliary Section and Main Bus Kit and/or Transition Section.
4. Specify utility when ordering (Check Power Company C/T Compartment Cross Reference for utility approval.)

REFERENCES:	Page
I-LINE* Distribution Section	109
QMB Distribution Section	109
Auxiliary Section	109
Main Lug Bus Kit	109
Transition Section	109
Side Closure Plate	109

SQD SLV_000888

Selection Guide	Technical Data	Pricing
 **MOTOR CONTROL CENTERS—SPEED D® UNASSEMBLED OR ASSEMBLED** Speed D offers FAST DELIVERY of a limited selection of the most popular structures and units either unassembled or assembled. 600V. Maximum, 1200A., Starter Sizes 1-4 FVNR, 1-2 FVR, 1-2 two-speed, 4-6 Auto-transformers, select branch feeders through 225A.	Field Sales Office	Digest Pages 307-311
 **MOTOR CONTROL CENTERS—FACTORY ASSEMBLED** 600V. Maximum, 600A. to 1800A., Maximum Starter Size: 7	Control Products Catalog	Control Products Catalog
 **5KV CONTROLLERS** MINI-flex™ Individually Mounted Air Break, 5000 Volt Maximum NEMA Class E2	MINI-FLEX Catalog 8196	MINI-FLEX Catalog 8196
 **5KV CONTROLLERS** ISO-flex™ Motor Control Center Construction Air Break, 5000 Volt Maximum NEMA Class E2	ISO-FLEX Catalog 8198	ISO-FLEX Catalog 8198
 **Power-Cast™** **SOLID DIELECTRIC TRANSFORMERS** Indoor or Outdoor Enclosure 5—8.17—15—34.5KV Non-Flammable, Low Maintenance, Cast Coil Construction	Field Sales Office	Field Sales Office
 **OUTDOOR DRY TYPE TRANSFORMERS** •No Fire Hazard •No Pollution Ventilated Enclosure, Three Phase, 225-1500 KVA, 600V.-15,000V. Non-ventilated Enclosure, Three Phase, 500-2000KVA, 600V.-15,000V.	Sorgel Bulletins D-1E, D-1G and Digest Page 160	Field Sales Office

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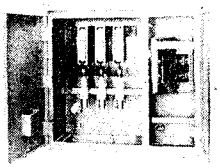
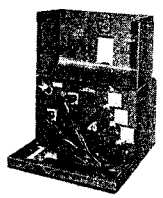
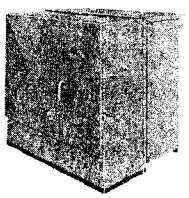
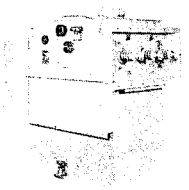
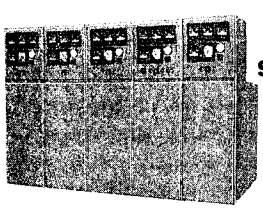
Selection Guide	Technical Data	Pricing
 **PAD MOUNTED TRANSFORMERS—DRY TYPE** Three Phase, 45-500KVA, 600V.-15,000V. Available with High Voltage Switch and Low Voltage Breakers or Switches	Sorgel Bulletin D-1E and Digest Page 160	Field Sales Office
 **PAD MOUNTED TRANSFORMERS LIQUID FILLED** Single Phase 25-250KVA, 2.4-35KV	Field Sales Office	Field Sales Office
 **PAD MOUNTED TRANSFORMERS—LIQUID FILLED** Three Phase 45-3750KVA, 2.4-35KV	DE Catalog Section 6330	Field Sales Office
 **SMALL POWER TRANSFORMERS—LIQUID FILLED** Single Phase 500-1667KVA, 2.4-35KV Three Phase 500-5000KVA, 2.4-35KV	Field Sales Office	Field Sales Office
 **FLUARC™ SF_6 CIRCUIT BREAKER** Ratings—10KV to 38KV 110KV to 150KV BIL Ampacities—600A., 1200A. and 2500A. 40 KA (max. interrupting) capability	Field Sales Office	Field Sales Office
 **SWITCHGEAR—SOLENARC® DSE METAL-CLAD** Breaker Type DSE Rating—4.15KV to 13.8KV Ampacities—1200A., 2000A. and 3000A. Interrupting Capacity—75MVA to 1000MVA	DE Catalog Sections 6150, 6150A	Field Sales Office

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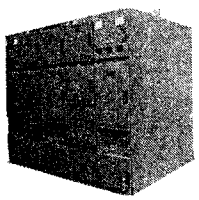
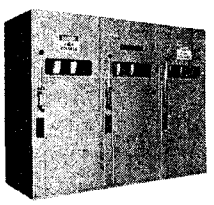
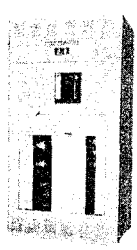
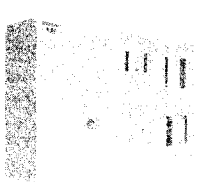
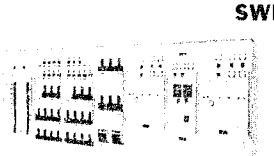
Selection Guide	Technical Data	Pricing
 **SWITCHGEAR—POWER-ZONE II® LOW VOLTAGE DRAWOUT** Breaker Type DS Rated 600 Volts Ampacities—800A. to 4000A. Interrupting Capacity—30KA at 85KA† at 480V. ac UL Listing as an option †200,000 Interrupting Capacity when fused	DE Catalog Section 6130	Field Sales Office
 **HVL SWITCHGEAR ASSEMBLIES** HVL Load Interrupter Rated—600A. and 1200A. 5KV to 38KV & 60KV to 150KV BIL Switches—Not Fused —With Current Limiting Fuses —With Boric Acid Power Fuses	Field Sales Office For Single Enclosed HVL Devices See Page 53	Field Sales Office
 **SWITCHGEAR—INSULATED CASE LOW VOLTAGE DRAWOUT BREAKERS** Rated—600 volts. Frame Sizes 800A. to 3000A. Interrupting Capacity—100,000A. UL listed for 100% application True 2 Step Stored Energy Mechanism Zone Selective Ground Fault Space Saving 6 high construction thru 800A. Hi-Quality Switch Gear Construction	Field Sales Office	Field Sales Office
 **SWITCHBOARDS—SERVICE SECTION** 400 to 2000 Amperes 600V. ac max./250V. dc max. Circuit Breakers to 2000A. max. Switches to 2000A. max.	DE Catalog Section 2610	Field Sales Office
 **SWITCHBOARDS—MULTI-SECTION** 400 to 5000 Amperes 600V. ac max./250V. dc max. Circuit Breakers to 4000A. max. Switches to 5000A. max.	DE Catalog Section 2620	Field Sales Office
 **SWITCHBOARDS—MARINE & MINING** 400 to 5,000 Amperes 600V. ac max./250V. dc max. Circuit Breakers to 4000A. max. Switches to 5000A. max.	Marine Catalog Section 2650 Mining Catalog Section 2670	Field Sales Office

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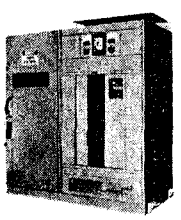
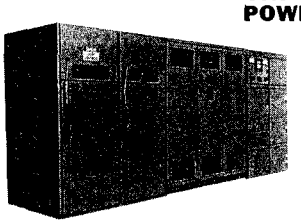
Selection Guide	Technical Data	Pricing
 **SPEED-D®** **WALL MOUNTED METERING EQUIPMENT** 400, 600, 800 & 1000 Amperes 600V. ac max. Main Circuit Breaker to 1000A. max.	DE Catalog Section 2690	Digest Page 107
 **SPEED-D®** **SWITCHBOARDS—SERVICE SECTION** 400, 600 & 800 Amperes 240V. & 600V. ac max. Branch Circuit Breakers to 400A. max. **SWITCHBOARDS—SERVICE/DISTRIBUTION** 1000 and 1200 Amperes 480V. ac max. Branch Circuit Breakers to 800A. max.	DE Catalog Section 2605 Field Sales Office	Digest Page 108 Digest Page 107
 **SPEED-D®** **SWITCHBOARDS—MULTI-SECTION** 1200, 1600 & 2000 Amperes 240, 480 & 600V. ac Branch Circuit Breakers to 300A. max. Branch Switches to 600A. max. **TRANSITION SECTION** 600 and 1200 Amperes 600V..ac max. 3Ø, 3W	DE Catalog Section 2630	Digest Page 109
 **SPEED-D®** **SWITCHBOARDS—"QAD" SERVICE SECTION** 1200, 1600 or 2000 Amperes 3Ø, 4W 240 or 480V. ac Circuit Breaker or Fusible Switch	DE Catalog Section 2610	Digest Page 110
 **PACKAGE SUBSTATIONS—MODEL III** Primary HVL Load Interrupter Switch 600 Amperes 5-15KV—Fused or Not Fused Transformers Rated 75KVA to 750KVA Primary Voltage—5KV to 15KV Secondary Voltage—600 Volts or Less 3Ø, 3W or 3Ø, 4W—Open Ventilated Dry Type Integral Secondary Molded Case Circuit Breakers or Main BOLT-LOC® and I-LINE® Distribution Section	DE Catalog Section 6110	Field Sales Office Digest Pages 115-118
 **UNIT SUBSTATIONS—** **POWER-ZONE® LOAD CENTER** Primary Load Interrupter Switch 600 Amperes 5-38KV—Fused and Not Fused Type Transformers Rated 150KVA to 5000KVA Primary Voltage—5-38KV Secondary Voltage—600 Volts or Less 3Ø, 3W or 3Ø, 4W—Open Ventilated Dry Type, Cast Resin and Liquid Filled Types Secondary Distribution Sections— Metal-Enclosed Drawout Switchgear and Switchboards	DE Catalog Section 6120	Field Sales Office

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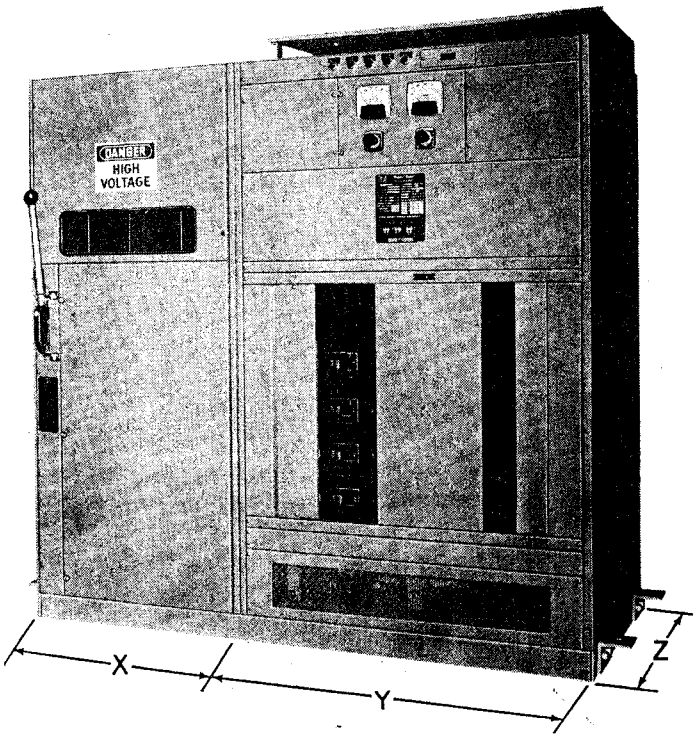
MODEL III PACKAGE SUBSTATIONS

For Use as a Service Entrance or Distribution for ac Systems.



BASIC MODEL III PACKAGE SUBSTATION

BASIC MODEL III DIMENSIONS			
HVL	X	Y	Z
5 KV	34	48	36
15 KV	38	48	36

APPLICATION:

Suitable for use as Service Entrance and Dead Front Switchboards. Requires minimum floor space, is lightweight, low in height and totally front accessible. Units are expandable to provide additional secondary distribution control.

SERVICE MAINS:

3Ø, 3 W.—4160 volts ac up to 13,800 volts ac, 60 Hz.
3Ø, 3 W. HVL load interrupter switch rated 600 amps. Quick-make, quick-break stored energy operating mechanism. Equipped with viewing window and ground bus.

Fuses are generally used to provide short circuit protection for the transformers. The fuses are mounted below the switch and are visible through the viewing window. Enclosure furnished with interlock.

Line and load side terminals designed for cable connection and each terminal is equipped with clamp type lugs.

BRANCHES:

Secondary distribution is accommodated by either a BOLT-LOC® bolted pressure switch or circuit breaker main and by circuit breakers.

ENCLOSURE:

Each Substation Section is of welded and bolted construction consisting of side frames, horizontal channels and angles and removable top, side, back and front plates. Bottom base channels permit jacking or moving section on rollers. All sections have provisions for mounting lifting angles. Paint finish is gray enamel over a phosphate rust-inhibiting primer. Sections are completely front accessible and front connectable allowing the substation to be installed against a wall. The substation has provisions for lifting and jacking.

MODEL III PRIMARY EQUIPMENT PRICES

If 4.8 KV switch is required, price from a 4.8 KV system voltage column unless 75 KV Basic Insulation Level is specified, then price from 13.8 KV system voltage column.

		4.8 KV Model III	13.8 KV Model III
	HIGH VOLTAGE TERMINATION—(Select One Only) Model III Substations		
	Cable Lugs (for single feeder)	No Charge	
	Cable Lugs (for two feeders—loop feed)	$ 200.	$ 200.
SELECT ONE ONLY	1—3 conductor pothead or 3—1 conductor potheads (single feed)	1140.	1140.
	2—3 conductor potheads or 6—1 conductor potheads (two feeders—loop feed)	2265.	2265.
	AIR INTERRUPTER SWITCH—(Select One Only) Model III Substation		
	None	No Charge	
SELECT ONE ONLY	Load Interrupter Switch—600A., 2 Position in NEMA I Enclosure		
	a) Fusible (includes required fuses—current limiting fuse furnished unless otherwise specified)		
	1. 300 KVA & below	$7275.	$8475.
	2. 400 KVA & above	9065.	9935.
	b) Non-fusible	5975.	6560.

DUPLEX INTERRUPTER SWITCH—Contact your local Square D representative.

DE CATALOG REFERENCE: SECTION 6110

	4.8 KV Model III	13.8 KV Model III
ACCESSORIES—		
HIGH VOLTAGE COMPARTMENT Key interlocks between high voltage disconnect and secondary main or feeder breakers	$225.	$ 225.
LIGHTNING PROTECTION EQUIPMENT		
Lightning arresters—one set of three .. Distribution class (included as standard 2400V. & up)	No Charge	
Intermediate class or line type	$1190.	$1590.
Station class	2075.	3640.

NOTE: If no high voltage load interrupter switch is required, an auxiliary high voltage terminal chamber section must be provided for incoming feed and lightning arrestors.

Terminal Chamber (without switch or cutouts);
a) Cable lugs—22" wide
b) Potheads (single feed)—22" wide
c) Potheads (loop-feed)—22" wide
d) Lightning arrester distribution class—mounted in terminal chamber—22" wide

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MODEL III PACKAGE SUBSTATIONS

TRANSFORMER PRICES

Select proper prices on the basis of primary voltage, secondary voltage and KVA. MODEL III SUBSTATION—This substation uses 220°C. insulation, (for 150°C. rise open ventilated dry type transformer).†

KVA	*Primary Voltage (Delta) 2400, 4160, 4800 Secondary Voltage			*Primary Voltage (Delta) 6900, 7200, 8320, 12000, 12470, 13200, 13800 Secondary Voltage			Lighting Substation
	208Y/120	240	600 or 480 480Y/277	208Y/120	240	600 or 480 480Y/277	600 or 480 to 208Y/120
75	**$ 5990.**	**$ 5990.**	**$ 5965.**	**$ 9400.**	**$ 8950.**	**$ 8640.**	**$ 7225.**
112½	**7540.**	**9840.**	**7265.**	**12100.**	**11600.**	**11300.**	**8365.**
150	**8865.**	**8500.**	**8450.**	**12600.**	**12100.**	**11775.**	**9590.**
225	**10600.**	**10140.**	**9715.**	**13990.**	**13290.**	**12800.**	**11975.**
300	**11875.**	**11340.**	**10850.**	**14565.**	**14040.**	**13540.**	**14415.**
500	**15825.**	**15150.**	**14365.**	**17840.**	**17540.**	**16590.**	**18765.**
750	**20925.**	**20075.**	**19200.**	**21865.**	**20800.**	**19950.**	.....

*A delta-connected transformer primary is recommended. If the incoming service is 4 wire connect neutral wire to the system ground if approved by the utility company, and use a transformer with standard primary connection.
†For H-115°C. rise transformer, add 10% to above price. (not available on 750KVA size).
Add **$105.00** for bottom plate if required.

COPPER WINDINGS—Aluminum windings and low voltage bus are standard. If copper windings are required, low voltage copper bus will be furnished in the distribution panel. Add to the transformer price only . . CONTACT FACTORY.

NOTE: The Model III Package Substation is of quiet design and is considerably less then NEMA standard sound levels.

OPTIONAL MODIFICATIONS TO TRANSFORMERS

Temperature alarm and Forced Air Cooling—Temperature is measured from center coil only of the 3Ø transformer.

1. Forced Air Cooling and Temperature Alarm—Type SU-1 (750 KVA Requires 12" Pullbox)
   Increases KVA rating 33½%. Devices include—Fan motor and blade, non-indicating single bulb temperature control, bell alarm, pilot lights and push buttons Factory Installed..... **$1600.**
   Field Installed—Consult local field office, for pricing
2. Temperature alarm and provisions for forced air cooling—Type SU-2
   a. Devices include—same as item 1 except less fan motor and blade... **1300.**
3. Temperature alarm devices—Type SU-3
   a. Devices include—Non-indicating single bulb temperature control, bell alarm, push buttons, pilot lights..... **$625.**
   b. Export packing—Commercial below deck type, add to transformer price only..... 5%
4. Provisions only (must be ordered with transformer)..... N/C

SPARE CURRENT LIMITING FUSES—Consult Factory

NOTE: A distribution panel section is not available in front of a 750 KVA transformer. Consult with the factory to select an appropriate distribution section and associated crossover bus. These items must be priced additionally.

LOW VOLTAGE SECTION COMPONENTS

MOLDED CASE CIRCUIT BREAKERS — I-LINE® panel type construction. Price includes circuit breakers arranged in group mounted construction.

For customers to receive bus bars behind any unfilled portion of a panel "space only for future breakers" must be priced.

Maximum panel is 49½" high except when meters are specified. This height can be either single or twin row construction. Where less panel height is required to mount the breakers and "spaces" ordered, 31½" or 40½" high panels will be used.

MOLDED CASE CIRCUIT BREAKERS

Type	Frame Size	Overload Trip Ampere Rating*	Each Breaker Unit		Each Space Only For Future Breakers	
			2 Pole	3 Pole	2 Pole	3 Pole
FA	100A.	15, 20, 30, 40, 50 & 60A.	**$ 130.**	**$ 170.**	**$20.**	**$20.**
		70, 100A.	**155.**	**200.**	**20.**	**20.**
FH	100A.	15, 20, 30, 40, 50 & 60A.	**195.**	**240.**	**20.**	**20.**
		70, 90, 100A.	**220.**	**265.**	**20.**	**20.**
KA	225A.	125, 150, 175, 200, 225A.	**355.**	**450.**	**20.**	**20.**
KH	225A.	125, 150, 175, 200, 225A.	**795.**	**965.**	**20.**	**20.**
LA	400A.	125, 150, 175, 200, 225, 250, 275, 300, 350, 400A.	**615.**	**765.**	**40.**	**40.**
MA	800A.	125, 150, 175, 200, 225, 250, 300, 350, 400, 500, 600A.	**967.**	**1250.**	**80.**	**80.**
		700, 800A.	**1257.**	**1581.**	**80.**	**80.**

*USE ONLY TRIP RATINGS SHOWN: Lower amperage trip ratings are either not available or do not have full interrupting capacity.
Door over molded case circuit breaker panel, (not standard) will be supplied at no addition in price, if specified by customer.
(Continued on p. 117)

Device	Maximum No. of Each Possible in Substation	Price-Device Mtd. and Wired Each	Instrument Transformers Required—(Price from Bottom Left of Table) System Voltage			
			208Y/120	240	480	480Y/277
A.C. Ammeter.....	1 each	**$ 715.**	3C	2C	2C	3C
A.C. Voltmeter.....	1 each	**715.**	..	..	(2P)*	(3P)*
A.C. Wattmeter—Indicating.....	1 each	**1800.**	3C	2C	2C (2P)*	3C (2P)
Power Factor Meter—Indicating.....	1 each	**1765.**	1C	1C	1C (2P)*	1C (2P)*
Watthour Meter (Stationary or Drawout 2 Element (3 Wire Service).....	1 each	**1625.**	—	2C	2C (2P)*	.....
2½ Element (4 Wire Service).....		**2175.**	3C	—	—	3C (2P)*
3 Element (4 Wire Service).....		**2175.**	3C	..	.....	3C (2P)*
Demand Register Attachment on above Watthour Meter.....		**500.**	..	..	.....	.....
Ground Detector Lamps (3 Lamps with Push Button Switch).....	3Ø, 3W only 1 set	**990.**	—	..	(3P)*	.....
Instrument Transfer Switch	As required	**365.**				
Potential Transformer	3 each	**750.**				
Current Transformers: 5- 800 Amp.	3 each	**540.**				
1000-2000 Amp.	3 each	**740.**				

C Current Transformer
P Potential Transformer
* Potential Transformers Normally Not Required
( ) Indicates number of PT's if voltage to instruments should not exceed 240V. (NEMA requirement for drawout switchgear)
— Not Applicable

Maximum of 5 devices including switches mounted on panel. Maximum of 3 current transformers.

The above devices are the maximum which can be mounted in a Model III transformer section with up to a 40½" I-LINE panel or a 48" QMB panel. Where full height panel is required, meters can be mounted in a 24" wide adjacent auxiliary section for which add **$790.** list.

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MOLDED CASE CIRCUIT BREAKERS (Continued from page 107)

Because of size these breakers cannot be mounted in panel type construction or individually mounted in front of the transformer. Main and branch breakers must be individually mounted in a section adjacent to the transformer section. For applications as a main or branch breaker from a 300 or 500 KVA transformer where all other devices are mounted in the front of the transformer section use price from table above.

Breaker Type	Trip Rating	Frame Size	List Price Each*	
			2 Pole	3 Pole
MA	1000A.	1000A.	**$ 4116.**	**$ 4425.**
PA	1600A. or Below	1600A.	**4940.**	**5715.**
PA	2000A.	2000A.	**5225.**	**6215.**
PC	2500A.	2500A.	**10875.**	**12800.**

*Price includes the breaker mounted in an adjacent section, line side bus connections, and either load side lugs for a branch device or load side bus connectors to a panel.

QMB FUSIBLE SWITCHES

Prices include quick-make, quick-break QMB Units arranged in panel construction, mounting of the switches, necessary mounting pan and bus connections. **Fuses not included—Use Current Limiting Fuses.**

Ampere Rating	250 Volt				600 Volt			
	Each Switch		Each Space		Each Switch		Each Space	
	2 Pole	3 Pole	2 Pole	3 Pole	2 Pole	3 Pole	2 Pole	3 Pole
30	**$ 87.**	**$112.**	**$ 27.**	**$ 27.**	**$156.**	**$186.**	**$ 56.**	**$ 56.**
60	**103.**	**140.**	**41.**	**41.**	**156.**	**186.**	**56.**	**56.**
100	**158.**	**196.**	**56.**	**56.**	**231.**	**295.**	**64.**	**64.**
200	**193.**	**268.**	**80.**	**80.**	**261.**	**342.**	**80.**	**80.**

NOTE: If 400 or 600 Amp. devices are required, contact local field office.

	Inches of Panel Height			
250V.	30A.=3″ 60A.=4½″ 100A.=6″ 200A.=9″	600V.	30A.=6″ 60A.=6″ 100A.=7½″ 200A.=9″	Twin Units Twin Units Twin Units Single Units

NOTE 1: Current limiting fuses should be used for proper short circuit capacity. Fuses are not furnished.
NOTE 2: Door not available over QMB switch units.
NOTE 3: For NEMA Class J or Class R fuse provisions—see table below.
NOTE 4: Maximum available panel height in transformer/low voltage section is 54″ for 200A. and below.

FUSE PROVISIONS

CLASS R FUSE PROVISIONS

Factory-installed. Permits installation of Class R fuses only. Price the QMB unit and add the following:

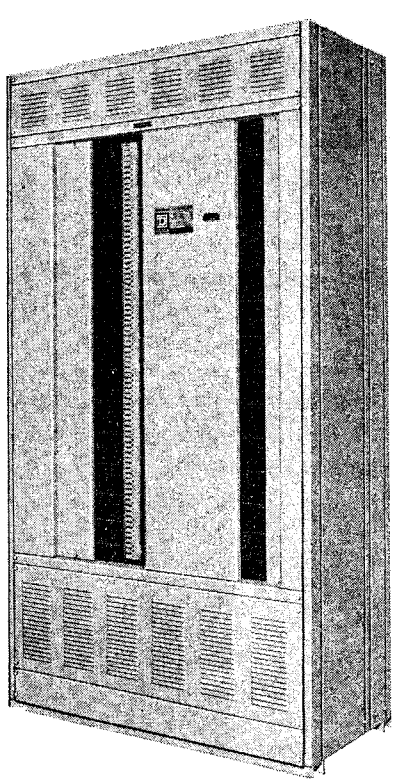
Ampere Rating	Class R Fuse Provisions	
	List Price Each Switch	
	2 Pole	3 Pole
30A.	**$ 9.**	**$ 9.**
60A.	**9.**	**9.**
100A.	**13.**	**13.**
200A.	**18.**	**18.**
400A.	**28.**	**28.**
600A.	**28.**	**28.**

NEMA CLASS J FUSE PROVISIONS

Price 600 volt QMB Unit and add the following:

Ampere Rating	Class J Fuse Provisions (available only on 600V. units)	
	List Price Each Switch	
	2 Pole	3 Pole
30A.	**$ 9.**	**$ 9.**
60A.	**9.**	**9.**
100A.	**13.**	**13.**
200A.	**18.**	**18.**
400A.	**28.**	**28.**
600A.	**59.**	**92.**

DISTRIBUTION SECTION



DESCRIPTION:

DISTRIBUTION SECTION—600V., I-LINE® branch molded case circuit breaker type. Furnished with two 49.5″ high circuit breaker mounting rows to contain FA thru MH breakers on the left side and FA, FH, FY, Q2 and Q2-H on the right side.

Voltage Rating	Ampere Rating	DIMENSIONS			Catalog Number	Price
		H	W	D		
600	1200	79.5	48	36	IDS-1200	**$1355.**
	1600				IDS-1600	**1556.**
	2000				IDS-2000	**1733.**
	2500				IDS-2500	**2100.**
	3000				IDS-3000	**2415.**

NOTE: FOR CROSSOVER BUS TO ADJACENT SECTION ADD:

Amperes	3-Wire	4-Wire
225	**$ 200.**	**$ 250.**
400	**215.**	**265.**
600	**225.**	**275.**
800	**275.**	**350.**
1000	**350.**	**425.**
1200	**425.**	**490.**
1600	**490.**	**575.**
2000	**600.**	**750.**
2500	**950.**	**950.**
3000	**915.**	**1140.**
4000	**1265.**	**1565.**

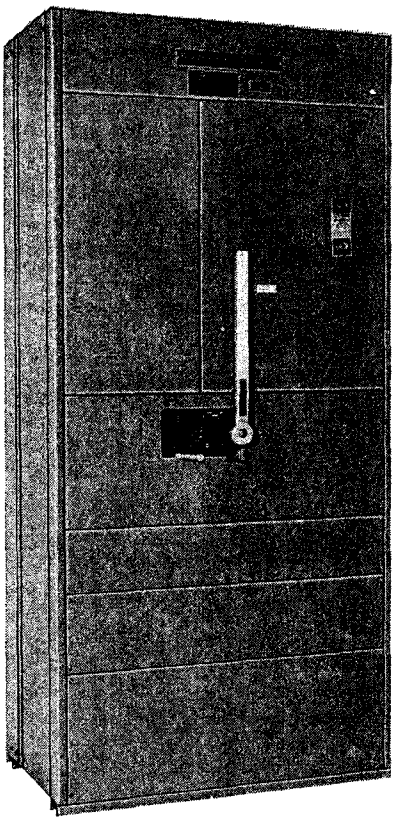
Reference page 99 of this digest for catalog numbers and prices of individual breakers.

DE CATALOG REFERENCE SECTION 6110.

SQD SLV_000895

BOLT-LOC® FUSIBLE SWITCHES
SINGLE THROW
LOAD BREAK
BOLTED PRESSURE CONTACT TYPE

Prices include switch with dead front operating handle, hinged door over fuse compartment, card holder, section and horizontal bus, main vertical bus and connections to 50,000A Sym. braced main bus. Fuses are not included. Fuse compartment door cannot be opened when switch is in "ON" position. Switches have provisions for mounting the following types of Class L Fuses (200,000 AIC): Economy, Type LCL, Bussman KRP-C Hi Cap, GE type CLF and Chase-Shawmut "Amp Trap". Space and mounting charges include same features as above except do not include the switches or operating handles. Quick-make, quick-break feature is standard on all switches.



Volts	Switch Rating (Amperes)	MANUALLY OPERATED—LIST PRICE EACH				DIMENSIONS		
		Each Main or Branch Switch Unit		Space & Mounting Provisions for Future Switch		H	W	D
		2P	3P	2P	3P		Inches	
240 ac	800	**$ 3756.**	**$ 4472.**	**$2108.**	**$2335.**	79.5	24	36
	1200	**4183.**	**4884.**	**2378.**	**2610.**	79.5	24	36
	1600	**4642.**	**5471.**	**2757.**	**3145.**	79.5	30	36
	2000	**5277.**	**6584.**	**3183.**	**3647.**	79.5	36	36
	2500	**6433.**	**7593.**	**3766.**	**4320.**	90.5	36	48
	3000	**7834.**	**9739.**	**4415.**	**5078.**	90.5	36	48
480 ac	800	**4211.**	**4689.**	**2108.**	**2335.**	79.5	24	36
	1200	**4974.**	**5405.**	**2378.**	**2610.**	79.5	24	36
	1600	**5305.**	**5897.**	**2757.**	**3145.**	79.5	30	36
	2000	**6219.**	**7190.**	**3183.**	**3647.**	79.5	36	36
	2500	**7404.**	**8531.**	**3766.**	**4320.**	90.5	36	48
	3000	**10544.**	**11975.**	**4415.**	**5078.**	90.5	36	48
600 ac	800	**4211.**	**4689.**	**2108.**	**2335.**	79.5	24	36
	1200	**4974.**	**5405.**	**2378.**	**2610.**	79.5	24	36
	1600	**5305.**	**5897.**	**2757.**	**3145.**	79.5	30	36
	2000	**6219.**	**7190.**	**3183.**	**3647.**	79.5	36	36
	2500	**7904.**	**8531.**	**3766.**	**4320.**	90.5	36	48
	3000	**10544.**	**11975.**	**4415.**	**5078.**	90.5	36	48

REVERSE FEED BOLT-LOC SWITCHES—To accommodate bottom feed service conductors.

Manually operated—
800 thru 3000 amperes at 240, 480 and 600 Volts AC.....price manually operated switch and add 10%.
Electric Trip—
800 thru 2500 amperes at 480 and 600 Volts AC.....price electric trip switch and add 10%.

BOLT-LOC FUSIBLE SWITCHES—ACCESSORIES

ELECTRIC TRIP (Not available on 240 V. Switch), requires Control Power Transformer below, add.	**$940.** list
CONTROL POWER TRANSFORMER required for all BOLT-LOC Switches with Ground Sensing Systems, add.	**140.** list

	FORM	LIST
Ground Fault Protection (includes sensor, solid state relay, monitor panel and control transformer) Installed and wired to electric trip mechanism. Electric trip mechanism must be specified and priced as a separate item.		
800—2000 Ampere (With sensor having 8" x 20" conductor window)	G4▲	**$2160.**
2500—3000 Ampere (With sensor having 11" x 26" conductor window)	G5▲	**2530.**

▲Complete the Form Letter designation by adding appropriate ground fault relay number 1, 2, 3 or 5 for desired time delay as follows: 1=.1 sec. delay; 2=.2 sec. delay; 3=.3 sec. delay; and 5=.5 sec. delay.

ORDERING INSTRUCTIONS

1. Select air interrupter switch (Include accessories as required).
2. Select transformer required and price for any listed modification.
3. Select as required secondary main disconnect and/or Select I-LINE distribution section with applicable ampere rating and select branch circuit breakers, considering voltage, ampere rating, number of poles, interrupting rating and system available fault current.
4. Use space only price for future breaker spaces on unused portions of I-LINE panel.

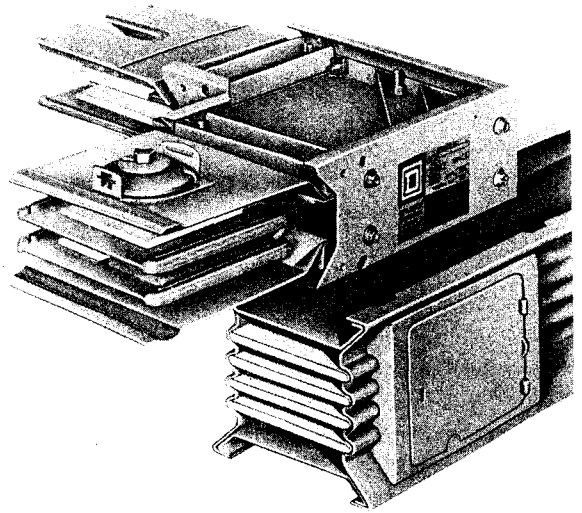
DE CATALOG REFERENCE: SECTION 6110

SQD SLV_000896

I-LINE® Busway

FEEDER • PLUG-IN • SERVICE ENTRANCE

- Fully Compatible Feeder and Plug-in Busway.
- Totally Enclosed, Low Impedance Design.
- Aluminum or Copper Conductors, Tin Plated and Fully Insulated with Class B Material.
- One Bolt Type Joint featuring VISI-TITE Torque Indicating Joint Bolt.
- New Integral Ground Bus (IGB) Option Available on 3∅, 3W or 3∅, 4W Busway.
- Stock Busway (see pgs. 120-122) includes Feeder, Plug-in and Service Entrance Components "In Stock" for Immediate Shipment.
- Custom Fabricated Busway (see pgs. 123-125) to Meet Requirements Not Adaptable to Stock Busway.
- Plug-in Units (pgs. 126-128) Feature Fusible or Circuit Breaker Devices 15 Amperes thru 1600 Amperes.



I-LINE® BUSWAY PHYSICAL DATA

PLUG-IN BUSWAY

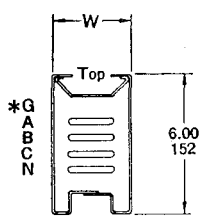


FIGURE A
(225A.—600A.)

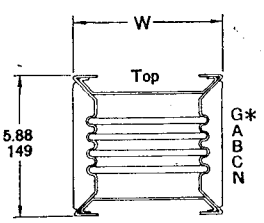


FIGURE B
(800A.—4000A.)

FEEDER BUSWAY

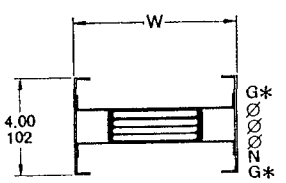


FIGURE C
(Indoor)

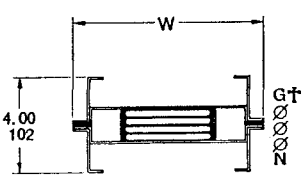


FIGURE D
(Wprf.)

ALUMINUM PLUG-IN BUSWAY

Aluminum Ampere Rating	Width W		Bus Bars Per Phase	Weight● 3-Pole	Weight● 4-Pole
	IN.	Fig.	IN.	Lbs./Ft.	Lbs./Ft.
225	2.25	A	One —.25x0.94	6.1	6.4
400	3.38	A	One —.25x2.00	7.5	7.9
600	4.75	A	One —.25x3.38	9.4	10.6
800	4.75	B	One —.25x3.38	12.1	12.9
1000	6.38	B	One —.25x5.00	14.3	15.8
1200	7.38	B	One —.25x6.00	15.8	17.6
1350	8.38	B	One —.25x7.00	17.2	19.4
1600	11.25	B	Two —.25x4.00	22.4	25.0
2000	13.25	B	Two —.25x5.00	26.0	28.9
2500	17.25	B	Two —.25x7.00	31.4	35.9
3000	20.12	B	Three—.25x5.00	38.0	41.5
4000	26.12	B	Three—.25x7.00	47.5	51.9

COPPER PLUG-IN BUSWAY

Copper Ampere Rating	Width W		Bus Bars Per Phase	Weight● 3-Pole	Weight● 4-Pole
	IN.	Fig.	IN.	Lbs./Ft.	Lbs./Ft.
225	2.25	A	One—.25x0.94	6.6	7.0
400	3.38	A	One—.25x2.00	12.1	13.9
600	3.38	A	One—.25x2.00	12.1	13.9
800	4.75	B	One—.25x3.38	18.8	22.1
1000	4.75	B	One—.25x3.38	18.8	22.1
1200	5.38	B	One—.25x4.00	22.7	27.0
1350	6.38	B	One—.25x5.00	24.6	29.4
1600	8.38	B	One—.25x7.00	31.4	38.3
2000	11.25	B	Two—.25x4.00	38.5	46.2
2500	13.25	B	Two—.25x5.00	46.1	55.7
3000	17.25	B	Two—.25x7.00	59.8	73.2

*Integral Ground Bus—50% Phase Capacity.
†Internal Ground Bus—50% Phase Capacity.

ALUMINUM FEEDER BUSWAY

Aluminum Ampere Rating	Width W Indoor		Width W Wprf.		Bus Bars Per Phase	Weight● 3-Pole	Weight● 4-Pole
	IN.	Fig.	IN.	Fig.	IN.	Lbs./Ft.	Lbs./Ft.
600	5.36	C	6.72	D	One —0.25x3.00	9.0	9.9
800	5.36	C	6.72	D	One —0.25x3.38	10.1	10.6
1000	6.98	C	8.34	D	One —0.25x4.00	11.8	12.7
1200	7.98	C	....	....	One —0.25x5.00	12.8	13.8
1350	8.98	C	10.34	D	One —0.25x6.00	13.3	14.4
1600	11.84	C	13.20	D	Two —0.25x3.38	15.9	17.7
2000	13.84	C	15.20	D	Two —0.25x4.50	17.9	20.4
2500	17.86	C	19.22	D	Two —0.25x6.00	22.0	25.8
3000	20.70	C	22.06	D	Three—0.25x4.50	27.5	30.3
4000	26.70	C	28.06	D	Three—0.25x6.50	35.5	41.1

COPPER FEEDER BUSWAY

Copper Ampere Rating	Width W Indoor		Width W Wprf.		Bus Bars Per Phase	Weight● 3-Pole	Weight● 4-Pole
	IN.	Fig.	IN.	Fig.	IN.	Lbs./Ft.	Lbs./Ft.
800	5.36	C	6.72	D	One —0.25x3.00	16.1	19.2
1000	5.36	C	6.72	D	One —0.25x3.00	17.2	20.7
1200	5.98	C	6.72	D	One —0.25x4.00	20.1	24.2
1350	6.98	C	8.34	D	One —0.25x4.50	21.6	25.9
1600	8.98	C	10.34	D	One —0.25x5.00	22.7	27.5
2000	11.84	C	13.20	D	Two —0.25x3.00	26.7	33.7
2500	13.84	C	15.20	D	Two —0.25x4.50	35.6	44.1
3000	17.86	C	19.22	D	Two —0.25x5.00	39.0	48.5
4000	26.70	C	28.06	D	Three—0.25x4.50	53.7	66.4
5000	26.70	C	28.06	D	Three—0.25x6.00	63.4	80.3

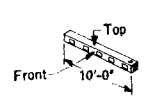
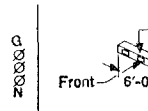
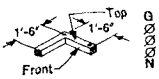
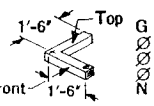
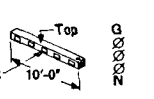
●All Weights Shown are Approximate.

SQD SLV_000897

I-LINE® BUSWAY

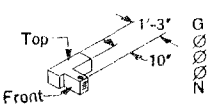
STOCK COMPONENTS

STRAIGHT LENGTHS AND FITTINGS: 225A.-3000A. PLUG-IN

STOCK BUSWAY Many additional items are available within 2-4 weeks on an "order only basis." Consult Factory with your requirements.		ALUMINUM										COPPER	
		STRAIGHT LENGTHS				ELBOWS				TAP BOX		STRAIGHT LENGTH	
													
No. of Poles and Voltage	Ampere Rating	10'-0" Length		6'-0" Length		Front Inside		Front Outside		Plug-In Type		10'-0" Length	
		Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price
3Ø, 3W. 600V.	225	AP-302-10	$ 390.	AP-302-6	$234.	AP-302-LFI	$423.	AP-302-LFO	$423.	PBTB-302	$337.	CP-302-10	$ 470.
	400	AP-304-10	480.	AP-304-6	288.	AP-304-LFI	450.	AP-304-LFO	450.	PBTB-304	562.	CP-304-10	710.
	600	AP-306-10	600.	AP-306-6	360.	AP-306-LFI	486.	AP-306-LFO	486.	PBTB-306	806.	CP-306-10	930.
	800	AP-308-10	820.	AP-308-6	492.					PTB-308	806.	CP-308-10	1340.
	1000	AP-310-10	930.	AP-310-6	558.					PTB-310	824.	CP-310-10	1420.
	1200	AP-312-10	1230.	.....	....					.....	....	.....	....
	1350	AP-313-10	1420.	.....	....	*Select elbow from table on page 121				PTB-313	843.	.....	....
	1600	AP-316-10	1750.	.....	....					PTB-316	853.	.....	....
	2000	AP-320-10	2100.	.....	....					.....	....	.....	....
	2500	AP-325-10	2540.	.....	....					.....	....	.....	....
	3000	AP-330-10	2920.	.....	....					.....	....	.....	....
3Ø, 4W. 100% N 277/480V.	225	AP-502-10	480.	AP-502-6	288.	AP-502-LFI	517.	AP-502-LFO	517.	PBTB-502	417.	CP-502-10	640.
	400	AP-504-10	600.	AP-504-6	360.	AP-504-LFI	553.	AP-504-LFO	553.	PBTB-504	641.	CP-504-10	1060.
	600	AP-506-10	820.	AP-506-6	492.	AP-506-LFI	619.	AP-506-LFO	619.	PBTB-506	916.	CP-506-10	1190.
	800	AP-508-10	960.	AP-508-6	576.					PTB-508	916.	CP-508-10	1740.
	1000	AP-510-10	1200.	AP-510-6	720.					PTB-510	938.	CP-510-10	2050.
	1200	AP-512-10	1500.	.....	....					.....	....	.....	....
	1350	AP-513-10	1720.	.....	....	*Select elbow from table on page 121				PTB-513	962.	.....	....
	1600	AP-516-10	2090.	.....	....					PTB-516	978.	.....	....
	2000	AP-520-10	2540.	.....	....					.....	....	.....	....
	2500	AP-525-10	3130.	.....	....					.....	....	.....	....
	3000	AP-530-10	3640.	.....	....					.....	....	.....	....
3Ø, 3W. +Integral Ground Bus (I.G.B.)	225	AP-302G-10	520.	AP-302G-6	312.	AP-302G-LFI	462.	AP-302G-LFO	462.	PBTB-302G	368.	CP-302G-10	670.
	400	AP-304G-10	610.	AP-304G-6	366.	AP-304G-LFI	489.	AP-304G-LFO	489.	PBTB-304G	593.	CP-304G-10	910.
	600	AP-306G-10	740.	AP-306G-6	444.	AP-306G-LFI	528.	AP-306G-LFO	528.	PBTB-306G	837.	CP-306G-10	1140.
	800	AP-308G-10	990.	AP-308G-6	594.					PTB-308G	837.	CP-308G-10	1570.
	1000	AP-310G-10	1100.	AP-310G-6	660.					PTB-310G	855.	CP-310G-10	1650.
	1200	AP-312G-10	1400.	.....	....					.....	....	.....	....
	1350	AP-313G-10	1590.	.....	....	*Select elbow from table on page 121				.....	....	.....	....
	1600	AP-316G-10	1950.	.....	....					.....	....	.....	....
	2000	AP-320G-10	2330.	.....	....					.....	....	.....	....
3Ø, 4W. 100% N +Integral Ground Bus (I.G.B.)	225	AP-502G-10	610.	AP-502G-6	366.	AP-502G-LFI	556.	AP-502G-LFO	556.	PBTB-502G	448.	CP-502G-10	840.
	400	AP-504G-10	730.	AP-504G-6	438.	AP-504G-LFI	592.	AP-504G-LFO	592.	PBTB-504G	672.	CP-504G-10	1260.
	600	AP-506G-10	960.	AP-506G-6	576.	AP-506G-LFI	661.	AP-506G-LFO	661.	PBTB-506G	947.	CP-506G-10	1400.
	800	AP-508G-10	1130.	AP-508G-6	678.					PTB-508G	947.	CP-508G-10	1970.
	1000	AP-510G-10	1370.	AP-510G-6	822.					PTB-510G	969.	CP-510G-10	2280.
	1200	AP-512G-10	1670.	.....	....					.....	....	.....	....
	1350	AP-513G-10	1890.	.....	....	*Select elbow from table on page 121				.....	....	.....	....
	1600	AP-516G-10	2290.	.....	....					.....	....	.....	....
	2000	AP-520G-10	2770.	.....	....					.....	....	.....	....

*800A.-3000A. Plug-in Busway is fully compatible with Indoor Feeder Busway.

TEE—PLUG-IN TYPE
225-1600 Ampere

STOCK BUSWAY (Use 3Ø, 3 W. unit only on 3Ø, 3 W. busway and use 3Ø, 4 W. unit only on 3Ø, 4 W. busway.)						
No. of Poles and Voltage	Ampere Rating		Without Ground Bus		With Ground Bus	
	Aluminum	Copper	Catalog Number	Price	Catalog Number	Price
3Ø, 3 W. 600V.	225	225	PTT-2-3W	$479.	PTT-2-3WG	$509.
	400	400	PTT-3-3WG	509.	PTT-3-3WG	509.
	.....	600	PTT-3-3WG	509.	PTT-3-3WG	509.
	600	.....	PTT-4-3WG	509.	PTT-4-3WG	509.
	800	800	†PTT-5-3W	537.	†PTT-5-3WG	568.
	.....	1000	†PTT-5-3W	537.	†PTT-5-3WG	568.
	1000	1350	†PTT-7-3W	765.	†PTT-7-3WG	796.
	1350	1600	†PTT-9-3W	812.	†PTT-9-3WG	843.
3Ø, 4 W. 277/480V. 100% N	225	225	PTT-2-4W	590.	PTT-2-4WG	620.
	400	400	PTT-3-4WG	620.	PTT-3-4WG	620.
	.....	600	PTT-3-4WG	620.	PTT-3-4WG	620.
	600	.....	PTT-4-4WG	620.	PTT-4-4WG	620.
	800	800	†PTT-5-4W	682.	†PTT-5-4WG	713.
	.....	1000	†PTT-5-4W	682.	†PTT-5-4WG	713.
	1000	1350	†PTT-7-4W	949.	†PTT-7-4WG	980.
	1350	1600	†PTT-9-4W	1070.	†PTT-9-4WG	1101.

†Plugs into opening on 800-300 ampere busway only.

ADAPTER JOINT CHANNEL SELECTION TABLE: 800A.-3000A. PLUG-IN AND 600A.-5000A. FEEDER

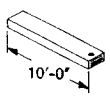
To Connect		Use Adapter Joint Channel Set Below
From	To	
Feeder Length 2'-0" thru 10'-0" and Service Entrance* (WPRF) Busway	Feeder Fittings and 1'-6" Straight Length	AJC-SL
	Plug-in Straight Length and Branch Run Adapter (Tee)	AJC-LP
Feeder Fittings and 1'-6" Straight Length	Feeder Fittings and 1'-6" Straight Length	AJC-SS
	Plug-in Straight Length and Branch Run Adapter (Tee)	AJC-SP

*Connection must be Indoor Bolt End to Weatherproof Slot End.

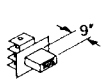
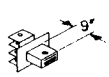
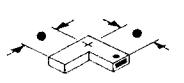
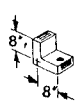
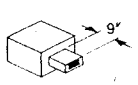
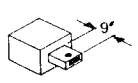
JOINT CHANNELS—used to enclose joint area after busway pieces are connected. Although joint channels are included with many busway devices, it is necessary to order adapter joint channel sets in some cases (as listed above).
For other cases, use standard joint channels which are shipped with each device.
Where required order 1 adapter joint channel set per joint. They will be furnished "no charge" if requested at time of order entry.

SQD SLV_000898

STRAIGHT LENGTHS: 800A.-3000A. FEEDER—INDOOR

STOCK BUSWAY Many additional items are available within 2-4 weeks on an "order only basis". Consult factory with your requirements.		ALUMINUM BUSWAY									
		 10'-0"		 7'-0"		 6'-0"		 2'-0"		 1'-6"	
No. of Poles and Voltage	Amp. Rating	10'-0" Length		7'-0" Length		6'-0" Length		2'-0" Length		1'-6" Length	
		Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price
3Ø, 3W. 600V.	800	AF-308-10	$ 820.	AF-308-7	$ 574.	AF-308-6	$ 492.	AF-308-2	$ 328.	AF-308-18	$ 328.
	1000	AF-310-10	930.	AF-310-7	651.	AF-310-6	558.	AF-310-2	372.	AF-310-18	372.
	1200	AF-312-10	1230.	AF-312-7	861.	AF-312-6	738.	AF-312-2	492.	AF-312-18	492.
	1300	AF-313-10	1420.	AF-313-7	994.	AF-313-6	852.	AF-313-2	568.	AF-313-18	568.
	1600	AF-316-10	1750.	AF-316-7	1225.	AF-316-6	1050.	AF-316-2	700.	AF-316-18	700.
	2000	AF-320-10	2100.	AF-320-7	1470.	AF-320-6	1260.	AF-320-2	840.	AF-320-18	840.
	2500	AF-325-10	2540.	AF-325-7	1778.	AF-325-6	1524.	AF-325-2	1016.	AF-325-18	1016.
	3000	AF-330-10	2920.	AF-330-7	2044.	AF-330-6	1752.	AF-330-2	1168.	AF-330-18	1168.
3Ø, 4W. 100% N 277/480V.	800	AF-508-10	960.	AF-508-7	672.	AF-508-6	576.	AF-508-2	384.	AF-508-18	384.
	1000	AF-510-10	1200.	AF-510-7	840.	AF-510-6	720.	AF-510-2	480.	AF-510-18	480.
	1200	AF-512-10	1500.	AF-512-7	1050.	AF-512-6	900.	AF-512-2	600.	AF-512-18	600.
	1350	AF-513-10	1720.	AF-513-7	1204.	AF-513-6	1032.	AF-513-2	688.	AF-513-18	688.
	1600	AF-516-10	2090.	AF-516-7	1463.	AF-516-6	1254.	AF-516-2	836.	AF-516-18	836.
	2000	AF-520-10	2540.	AF-520-7	1778.	AF-520-6	1524.	AF-520-2	1016.	AF-520-18	1016.
	2500	AF-525-10	3130.	AF-525-7	2191.	AF-525-6	1878.	AF-525-2	1252.	AF-525-18	1252.
	3000	AF-530-10	3640.	AF-530-7	2543.	AF-530-6	2184.	AF-530-2	1456.	AF-530-18	1456.
3Ø, 3W. 600V. +I.G.B.	800	AF-308G-10	990.	AF-308G-7	693.	AF-308G-6	594.	AF-308G-2	396.	AF-308G-18	396.
	1000	AF-310G-10	1100.	AF-310G-7	770.	AF-310G-6	660.	AF-310G-2	440.	AF-310G-18	440.
	1350	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3Ø, 4W. 277/480V. +I.G.B.	800	AF-508G-10	1130.	AF-508G-7	791.	AF-508G-6	678.	AF-508G-2	452.	AF-508G-18	452.
	1000	AF-510G-10	1370.	AF-510G-7	959.	AF-510G-6	822.	AF-510G-2	548.	AF-510G-18	548.
	1350	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

FITTINGS: 800A.-3000A. ALUMINUM FEEDER—INDOOR

STOCK BUSWAY Many additional items are available within 2-4 weeks on an "order only basis." Consult Factory with your requirements.		FLANGED ENDS				ELBOWS				TAP BOXES			
		 9"		 9"				 8" 8"		 9"		 9"	
No. of Poles and Voltage	Amp. Rating	with Slot End		with Bolt End		Flatwise		Edgewise		with Slot End		with Bolt End	
		Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
3Ø, 3W. 600V.	800	AF-308G-FEMS9	$389.	AF-308G-FEMB9	$389.	AF-308G-LFM10	$471.	AF-308G-LEM8	$438.	AF-308G-ETBMS	$979.	AF-308-ETBMB	$979.
	1000	AF-310G-FEMS9	441.	AF-310G-FEMB9	441.	AF-310G-LFM11	508.	AF-310G-LEM8	453.	AF-310G-ETBMS	1017.	AF-310-ETBMB	1017.
	1200	AF-312-FEMS9	487.	AF-312-FEMB9	487.	AF-312-LFM12	655.	AF-312-LEM8	573.	AF-312-ETBMS	1052.	AF-312-ETBMB	1052.
	1350	AF-313-FEMS9	525.	AF-313-FEMB9	525.	AF-313-LFM12	693.	AF-313-LEM8	598.	AF-313-ETBMS	1091.	AF-313-ETBMB	1091.
	1600	AF-316-FEMS9	589.	AF-316-FEMB9	589.	AF-316-LFM14	817.	AF-316-LEM8	642.	AF-316-ETBMS	1159.	AF-316-ETBMB	1159.
	2000	AF-320-FEMS9	705.	AF-320-FEMB9	705.	AF-320-LFM15	934.	AF-320-LEM8	689.	AF-320-ETBMS	1256.	AF-320-ETBMB	1256.
	2500	AF-325-FEMS9	844.	AF-325-FEMB9	844.	AF-325-LFM17	1129.	AF-325-LEM8	748.	AF-325-ETBMS	1494.	AF-325-ETBMB	1494.
	3000	AF-330-FEMS9	991.	AF-330-FEMB9	991.	AF-330-LFM18	1285.	AF-330-LEM8	798.	AF-330-ETBMS	1613.	AF-330-ETBMB	1613.
3Ø, 4W. 277/480V. 100% N	800	AF-508G-FEMS9	419.	AF-508G-FEMB9	419.	AF-508G-LFM10	561.	AF-508G-LEM8	524.	AF-508G-ETBMS	1114.	AF-508-ETBMB	1114.
	1000	AF-510G-FEMS9	499.	AF-510G-FEMB9	499.	AF-510G-LFM11	624.	AF-510G-LEM8	556.	AF-510G-ETBMS	1178.	AF-510-ETBMB	1178.
	1200	AF-512-FEMS9	540.	AF-512-FEMB9	540.	AF-512-LFM11	653.	AF-512-LEM8	716.	AF-512-ETBMS	1217.	AF-512-ETBMB	1217.
	1350	AF-513-FEMS9	576.	AF-513-FEMB9	576.	AF-513-LFM12	860.	AF-513-LEM8	745.	AF-513-ETBMS	1263.	AF-513-ETBMB	1263.
	1600	AF-516-FEMS9	675.	AF-516-FEMB9	675.	AF-516-LFM14	1004.	AF-516-LEM8	795.	AF-516-ETBMS	1344.	AF-516-ETBMB	1344.
	2000	AF-520-FEMS9	791.	AF-520-FEMB9	791.	AF-520-LFM15	1151.	AF-520-LEM8	855.	AF-520-ETBMS	1490.	AF-520-ETBMB	1490.
	2500	AF-525-FEMS9	961.	AF-525-FEMB9	961.	AF-525-LFM17	1403.	AF-525-LEM8	933.	AF-525-ETBMS	1820.	AF-525-ETBMB	1820.
	3000	AF-530-FEMS9	1132.	AF-530-FEMB9	1132.	AF-530-LFM18	1608.	AF-530-LEM8	1001.	AF-530-ETBMS	2006.	AF-530-ETBMB	2006.
3Ø, 3W. 600V. +I.G.B.	800	AF-308G-FEMS9	389.	AF-308G-FEMB9	389.	AF-308G-LFM10	471.	AF-308G-LEM8	438.	AF-308G-ETBMS	979.	.....	....
	1000	AF-310G-FEMS9	441.	AF-310G-FEMB9	441.	AF-310G-LFM11	508.	AF-310G-LEM8	453.	AF-310G-ETBMS	1017.	.....	....
	1350	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....
3Ø, 4W. 277/480V. +I.G.B.	800	AF-508G-FEMS9	419.	AF-508G-FEMB9	419.	AF-508G-LFM10	561.	AF-508G-LEM8	524.	AF-508G-ETBMS	1114.	.....	....
	1000	AF-510G-FEMS9	499.	AF-510G-FEMB9	499.	AF-510G-LFM11	624.	AF-510G-LEM8	556.	AF-510G-ETBMS	1178.	.....	....
	1350	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....

● Refer to last two digits of catalog number for length of flatwise elbow leg, example: AF-308G-LFM**10** would have a 10" elbow leg dimension.

HANGERS must be ordered separately by catalog number. (see listing on page 122 to select proper hanger). Hangers will be supplied "no charge" provided quantity ordered does not exceed 2 per 10 feet of busway ordered.

Price for additional hangers:

225A.—1350A. ..... $11. list each

1600A.—3000A. ..... 22. list each

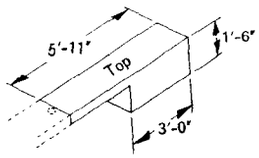
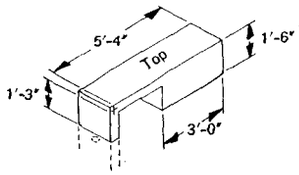
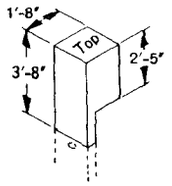
JOINT ASSEMBLY TOOL—Catalog number AT-1 joint assembly tool reduces the effort required to connect adjacent pieces of busway—800 thru 5000 ampere Feeder Busway and 800 thru 3000 ampere Plug-in Busway (not used on 225 thru 600 ampere Plug-in Busway). If desired order one or two per job. These will be furnished "no charge" if requested at time of order entry.

DE CATALOG REFERENCE: SECTION 5610

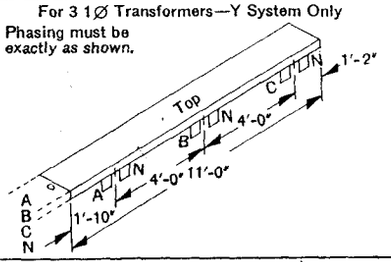
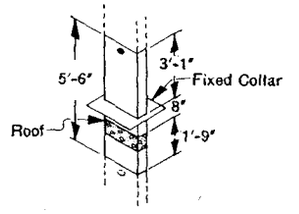
SQD SLV_000899

I-LINE® BUSWAY
STOCK SERVICE ENTRANCE COMPONENTS

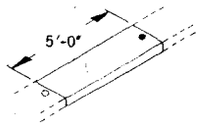
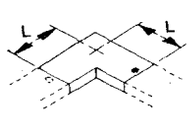
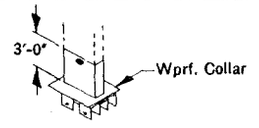
ALUMINUM WEATHERPROOF FEEDER:

STOCK BUSWAY	SERVICE HEAD—FLATWISE		ELBOW/SERVICE HEAD		SERVICE HEAD—VERTICAL	
Many additional items are available with in 2-4 weeks on an "order only basis" Consult factory with your requirements.	 (Integral Weather Seal Included)		 (Integral Weather Seal Included)			
No. of Poles and Voltage	Ampere Rating	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price
3Ø, 4W. 277/480V. 100% N	1350	AFW-513-SHF	**$2426.**	AFW-513-LESHF	**$3081.**	AFW-513-SHV	**$1728.**
	2000	AFW-520-SHF	**3088.**	AFW-520-LESHF	**3809.**	AFW-520-SHV	**2171.**
	3000	AFW-530-SHF	**3988.**	AFW-530-LESHF	**4794.**	AFW-530-SHV	**2782.**

NOTE: On service heads and transformer taps shown, standard 2/0-500 MCM (Al-Cu) lugs may be removed leaving NEMA standard drillings (1¾" spacing).

STOCK BUSWAY	TRANSFORMER TAP		5'-6" LENGTH WITH COLLAR	
Many additional items are available with in 2-4 weeks on an "order only basis". Consult factory with your requirements.	For 3 1Ø Transformers—Y System Only NOTE: Phasing must be exactly as shown. 		 (Integral Weather Seal Included)	
No. of Poles and Voltage	Ampere Rating	Catalog Number	Price	Catalog Number	Price
3Ø, 4W. 277/480V. 100% N	1350	AFW-513-TTF	**$3490.**	AFW-513-66FC	**$1377.**
	2000	AFW-520-TTF	**4993.**	AFW-520-66FC	**1916.**
	3000	AFW-530-TTF	**6962.**	.....	.....

NOTE: On service heads and transformer taps shown, standard 2/0-500 MCM (Al-Cu) lugs may be removed leaving NEMA standard drillings (1¾" spacing).

STOCK BUSWAY	5'-0" LENGTH		FLATWISE ELBOW			FLANGED END	
Many additional items are available with in 2-4 weeks on an "order only basis". Consult factory with your requirements.							
No. of Poles and Voltage	Ampere Rating	Catalog Number	Price	Catalog Number	"L"	Price	Catalog Number	Price
3Ø, 4W. 277/480V. 100% N	1350	AFW-513-5	**$1045.**	AFW-513-LF	18"	**$1143.**	AFW-513-36FEB	**$1074.**
	2000	AFW-520-5	**1535.**	AFW-520-LF	24"	**1744.**	AFW-520-36FEB	**1521.**
	3000	AFW-530-5	**2175.**	AFW-530-LF	30"	**2691.**	AFW-530-36FEB	**2164.**

END CLOSURES, WALL FLANGES, AND HANGERS: 225A.-3000A. (Specify Catalog Number and Quantity Required)

Ampere Rating		END CLOSURES			WALL FLANGES		HANGER (Catalog Numbers)					
		Catalog Number			Catalog Number		Flatwise		Edgewise		★Vertical	
Aluminum	Copper	Plug-in	Feeder	Price	*Feeder	Price	Plug-in	Feeder	●Plug-in	Feeder	Plug-in	Feeder
225	225	ACP-2-EC	.....	**$ 92.**	.....	....	HP-2-F	.....	HP-2-E	.....	HP-2-V	.....
400	400	ACP-3-EC	.....	**92.**	.....	....	HP-3-F	.....	HP-3-E	.....	HP-3-V	.....
....	600	ACP-3-EC	.....	**92.**	.....	.....	HP-3-F	.....	HP-3-E	.....	HP-3-V	.....
600	....	ACP-4-EC	ACF-5-EC	**92.**	ACFW-5-WF	**$104.**	HP-5-F	HF-5-F	HP-5-E	HF-5-E	HP-4-V	HF-5-V
800	800	ACP-5-EC	ACF-5-EC	**92.**	ACFW-5-WF	**104.**	HP-5-F	HF-5-F	HP-5-E	HF-9-E	HP-9-V	HF-5-V
....	1000	ACP-5-EC	ACF-5-EC	**92.**	ACFW-5-WF	**104.**	HP-5-F	HF-5-F	HP-5-E	HF-9-E	HP-9-V	HF-5-V
1000	1350	ACP-7-EC	ACF-7-EC	**92.**	ACFW-7-WF	**104.**	HP-7-F	HF-7-F	HP-7-E	HF-9-E	HP-9-V	HF-7-V
1200	....	ACP-8-EC	ACF-8-EC	**92.**	ACFW-8-WF	**104.**	HP-8-F	HF-8-F	HP-8-E	HF-9-E	HP-9-V	HF-8-V
1350	1600	ACP-9-EC	ACF-9-EC	**92.**	ACFW-9-WF	**104.**	HP-9-F	HF-9-F	HP-9-E	HF-9-E	HP-9-V	HF-9-V
1600	2000	ACP-12-EC	ACF-12-EC	**120.**	ACFW-12-WF	**104.**	HP-12-F	HF-12-F	HP-12-E	HF-12-E	HP-21-V	HF-12-F
2000	2500	ACP-14-EC	ACF-14-EC	**120.**	ACFW-14-WF	**104.**	HP-14-F	HF-14-F	HP-14-E	HF-14-E	HP-21-V	HF-14-F
2500	3000	ACP-18-EC	ACF-18-EC	**120.**	ACFW-18-WF	**104.**	HP-18-F	HF-18-F	HP-18-E	HF-18-E	HP-21-V	HF-18-F
3000	....	ACP-21-EC	ACF-21-EC	**153.**	ACFW-21-WF	**150.**	HP-21-F	HF-21-F	HP-21-E	HF-21-E	HP-21-V	HF-21-F

*Wall flanges for Feeder are usable on both indoor and weatherproof busway.
★Vertical Spring Hangers are also available for riser applications. Refer to page 125 for price.
●Not recommended mounting position. Plug-in units not floor operable when busway is mounted edgewise.

SQD SLV_000900

PRICING INSTRUCTIONS

FOR "NON-STOCK" I-LINE BUSWAY SYSTEMS (OR COMPONENTS).

● GENERAL PRICING INSTRUCTIONS

Prepare a layout sketch of the run showing all dimensions in feet and inches, all wall and floor locations and thicknesses and all fittings such as elbows, tees, crosses, flanged ends, end closures, cable tap boxes, expansion joints and reducers. Add all dimensions together and adjust the total to the higher whole foot. Multiply this total by the price per foot as determined by the type (plug-in or feeder) (aluminum or copper) (indoor or weatherproof), the ampere rating and the number of poles. To this add the labor only charges for each of the elbows, tees, crosses, flanged ends, expansion joints and reducers. To this add the price for each of the cable tap boxes, service heads, tap-off devices, transformer taps and end closures. Add for any special features such as special lugs, ground bus, etc. The sum of all these items is the price of the entire layout of busway. The price breakdown for each of the various components will be done at the factory. It is not normally necessary to obtain "Complete Device" prices for individual pieces of busway when entering an order.

● WEATHERPROOF CONSTRUCTION (FEEDER BUSWAY ONLY)

Multiply weatherproof footage only by weatherproof per foot price to determine total footage charge for weatherproof construction. Add charge for a weather seal if the busway passes through a building wall or roof from an interior to an exterior space. Insure that AFW and CFW prefix is specified as shown on page 124. If busway passes through a roof, floor or wall be sure to indicate its location and thickness. Add the "labor only" price for fittings and special features just as done for indoor runs.

● INTEGRAL GROUND BUS (I.G.B.)

Determine total busway footage which receives ground bus and multiply by ground bus per foot adder to determine total adder for ground bus. This price includes integral ground bus bonded to busway housing at each joint. Ground bus is available for both feeder and plug-in busway. When supplied with plug-in busway the ground bus is always located at the top of the housing (i.e. plug-in busway phasing is always G-A-B-C-N top to bottom). Plug-in units are available which connect to this integral ground bus; see listing which begins on page 126.

● HIGH SHORT CIRCUIT BRACING (PLUG-IN BUSWAY ONLY)

I-LINE plug-in busway is available with either standard short circuit bracing (types AP and CP) or high short circuit bracing (types APH and CPH). The table on page 124 lists maximum short circuit ratings for each busway type and rating. If type APH or CPH plug-in busway is required, determine total plug-in busway footage and multiply by the appropriate per foot price.

● BUSSED TRANSFORMER CONNECTION

Price busway footage to edge of transformer L.V. terminal (not edge of enclosure). Add charge for "Bussed Transformer Connection". Be sure to include labor only charge for all elbows, etc. even though they may be within transformer L.V. compartment.

● STANDARD STRAIGHT LENGTHS

The basic component of a busway system is a straight section with a "bolt end" on one end and a "slot end" on the other. Plug-in busway is available in standard lengths of 6, 8 and 10 feet. Feeder busway lengths are standard at 10 feet, but can be supplied from 21" to 120" in increments of 1" without special engineering. When ordering by catalog number, add suffix number to designate length. (e.g., 7 feet = AF-320-7, 73 inches = AF-320-73). Suffix numerals below 11 indicate length in feet, numerals over 10 indicate length in inches.

● FLANGED ENDS

A flanged end consists of flared bus extending beyond the busway housing, and a collar attached at the end of the housing. It is used for termination of the run at a switchboard, enclosed transformer, or similar device. The labor only charge includes forming and drilling of the flared bus and that portion of open bus (7") extending beyond the collar. It does not include busway footage up to the collar. For special configurations consult factory.

DE CATALOG REFERENCE: SECTION 5610

● ELBOWS

The elbow "labor only" charge applies to all types of 90° elbows within a particular rating of busway. The charge does not include any busway footage (i.e., A charge for the appropriate amount of busway footage would have to be added to the labor only charge to obtain a "complete device" charge). When ordering by catalog number add the complete suffix to designate type of elbow required. (i.e., AP-304-LFO = front outside elbow, AF-310G-LEM8 = edgewise elbow).

If elbow is other than 90°, double the labor only charge.

● INDOOR TAP BOXES

PLUG-IN (type PTB) cable tap boxes are available in ratings 225A through 1600A. 225A through 600A ratings use bolt-on style connection which may be used with any I-LINE plug-in busway. 800A through 1600A ratings use bolt-on style connection which may be used only with series 3 I-LINE plug-in busway with same number of poles (i.e., 3 pole PTB will not fit 4 pole busway and vice versa). The price is the total device price; no busway footage charge is required. If lugs are required other than standard Square D lugs, add non-standard lug charge from Additions Section. If tap box is to be used at the end of a run, order an end closure also for that end.

FEEDER (type AF and CF) busway cable tap boxes are integrally built into a short length of busway. The end cable tap box is assembled to one 9" leg of busway. The center cable tap box is attached to a 5'-0" length of busway. When ordering by catalog number, the complete suffix should read — ETBMB for an End Tap Box with a "bolt end" leg (to join an existing slot end from some adjacent fitting) or —ETBMS for an End Tap Box with slot end leg. Complete suffix for a Center Tap Box is —CTB. (e.g., AF-320-CTB). The "labor only" charge from price tables does not include any busway footage. Figure busway footage to the centerline of End Tap Boxes (to figure footage to the centerline, add 12" from the face of the box for ratings 600A through 2000A; 18" for ratings above 2000A). The busway footage for legs and tap box must be added to the labor only charge if a complete device charge is required.

GROUNDING PROVISION charge must be added when tap boxes are supplied with a ground; e.g., AF-308G-ETBMS.

● WEATHERPROOF SERVICE HEADS

Service heads are factory assembled and include Square D standard lugs. Price footage to end of busway run including dimension of service head. Add cable tap box charge.

● TEE AND CROSS

The labor charge for tees and crosses shown in the Price Table applies to all factory assembled types of 90° tee or cross fittings within a given rating. Dimensions and catalog number suffix of tee fittings will be found in catalog selection sheets. Legs of flatwise crosses are the same as flatwise tees. Refer to factory for edgewise cross dimensions. Plug-in type tees are also available; see page 120.

● UNFUSED REDUCER

Unfused reducers are used to reduce from a higher amperage busway to a lower amperage. Labor only prices are listed in table and do not include busway footage. Reducers are built into a straight length of busway. Price each rating of busway to the centerline of reducer and include the labor only price of the higher rating. NOTE: Local inspection rulings or National Electric Code Article 364 govern the use of unfused reducers.

● TRANSFORMER TAPS

Transformer taps are used to make cable connection to unenclosed transformers. The price does not include busway footage. Figure footage price to end of busway. Use standard dimensions. Price of taps includes lugs; if lugs other than standard Square D manufacture are required, add charges from Additions section. Note that taps need not be located directly above transformers for cable connections.

(CONTINUED ON PAGE 124)

SQD SLV_000901

FOOTAGE

Number of Poles▲ and Voltage	Ampere Rating	ALUMINUM BUSWAY FOOTAGE — INDOOR Catalog No. Feeder	Plug-in	Price Per Foot	WPRF Feeder Price Per Foot	APH Plug-in Price Per Foot	Ground Bus* Price Per Foot Adder	COPPER BUSWAY FOOTAGE — INDOOR Catalog No. Feeder	Plug-in	Price Per Foot	WPRF Feeder Price Per Foot	CPH Plug-in Price Per Foot	Ground Bus* Price Per Foot Adder
3 Pole 600 V.	225	.....	AP-302	$ 39.	.....	.....	$ 13.	.....	CP-302	$ 47.	.....	.....	$ 20.
	400	.....	AP-304	48.	.....	$ 60.	13.	.....	CP-304	71.	.....	$ 83.	20.
	600	.....	AP-306	60.	.....	71.	14.	.....	CP-306	93.	.....	104.	21.
	600	AF-306	.....	71.	$ 85.	.....	14.	.....	.....	.....	.....	.....	.....
	800	AF-308	AP-308	82.	96.	93.	17.	CF-308	CP-308	134.	$162.	148.	23.
	1000	AF-310	AP-310	93.	111.	104.	17.	CF-310	CP-310	142.	172.	154.	23.
	1200	AF-312	AP-312	123.	148.	134.	17.	CF-312	CP-312	184.	221.	196.	31.
	1350	AF-313	AP-313	142.	170.	153.	17.	CF-313	CP-313	215.	252.	227.	31.
	1600	AF-316	AP-316	175.	211.	187.	20.	CF-316	CP-316	251.	299.	267.	43.
	2000	AF-320	AP-320	210.	249.	221.	23.	CF-320	CP-320	316.	380.	332.	51.
	2500	AF-325	AP-325	254.	307.	267.	35.	CF-325	CP-325	401.	479.	411.	70.
	3000	AF-330	AP-330	292.	350.	306.	38.	CF-330	CP-330	477.	573.	492.	93.
	4000	AF-340	AP-340	398.	479.	.....	44.	CF-340	.....	620.	744.	.....	114.
	5000	●	.....	.....	.....	.....	.....	CF-350	.....	744.	893.	.....	145.
3Ø, 4W. 277/480 V. 100% Neutral	225	.....	AP-502	48.	.....	.....	13.	.....	CP-502	64.	.....	.....	20.
	400	.....	AP-504	60.	.....	71.	13.	.....	CP-504	106.	.....	120.	20.
	600	.....	AP-506	82.	.....	93.	14.	.....	CP-506	119.	.....	131.	21.
	600	AF-506	.....	82.	96.	.....	14.	.....	.....	.....	.....	.....	.....
	800	AF-508	AP-508	96.	118.	109.	17.	CF-508	CP-508	174.	214.	191.	23.
	1000	AF-510	AP-510	120.	143.	131.	17.	CF-510	CP-510	205.	246.	218.	23.
	1200	AF-512	AP-512	150.	180.	161.	17.	CF-512	CP-512	245.	294.	261.	31.
	1350	AF-513	AP-513	172.	209.	184.	17.	CF-513	CP-513	274.	331.	291.	31.
	1600	AF-516	AP-516	209.	247.	218.	20.	CF-516	CP-516	332.	398.	349.	43.
	2000	AF-520	AP-520	254.	307.	267.	23.	CF-520	CP-520	408.	492.	421.	51.
	2500	AF-525	AP-525	313.	374.	319.	35.	CF-525	CP-525	500.	603.	517.	70.
	3000	AF-530	AP-530	364.	435.	377.	38.	CF-530	CP-530	638.	765.	652.	93.
	4000	AF-540	AP-540	488.	583.	.....	44.	CF-540	.....	807.	967.	.....	114.
	5000	●	.....	.....	.....	.....	.....	CF-550	.....	977.	1170.	.....	145.

▲Consult factory for price of 2 pole busway.
*Integral ground bus bonded to busway housing at each joint.
●Price 5000 A. aluminum footage and fittings as two parallel runs of 2500 A. busway.

PRICING INSTRUCTIONS

(CONTINUED FROM PAGE 123)

● **EXPANSION FITTINGS**

Expansion fitting labor only charge does not include busway footage. The expansion fitting is built into a 5 foot straight length and cannot be ordered separately. Limit of expansion or contraction is ± 1½".

● **END CLOSURES**

End closures are required only where a "bolt end" or "slot end" of a standard busway length or fitting is left at the end of a run. End closures for busways Type AP and CP 225-600A. extend 4 inches beyond the end of the busway run. All other end closures extend 5 inches beyond the end of the busway run.

● **HANGERS**

All I-LINE busway is UL listed for 10 foot hanger spacing in the flatwise (normal) mounting position and in the vertical mounting position. I-LINE busway is UL listed for 10 foot hanger spacing in the edgewise mounting position except as follows:

Type AP 225A and CP 225A (Mounted edgewise) .....5 foot maximum spacing.

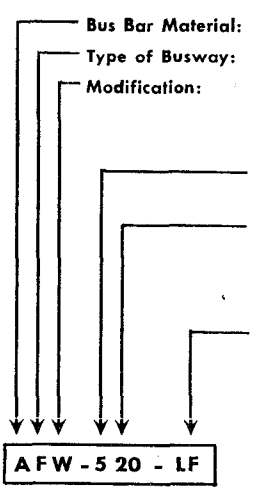
Type AP 400A and CP 400A, 600A (Mounted edgewise) .....requires Cat. #ACP-2-SC for 10 foot spacing.

Type AP 600A (Mounted edgewise) .....requires Cat. #ACP-3-SC for 10 foot spacing.

Support channels Cat. #ACP-2-SC and ACP-3-SC will be furnished at no charge if requested at time of order entry.
Order hangers separately unless order is accompanied by sketch.

● **CATALOG NUMBER SYSTEM**

I-LINE busway catalog numbers are made up of 3 basic parts (two or three letters) — (three numerals) — (one or more letters or numerals). The meaning of these letters and numerals is diagrammed below.



VISI-TITE® torque indicating joint bolts are standard on all I-LINE busway.

DE CATALOG REFERENCE: SECTION 5610

SQD SLV_000902

FITTINGS

Number of Poles and Voltage	AMPERE RATING	FLANGED END *	ELBOW Right Angle	TAP BOX or SERVICE HEAD ‡	TEE	CROSS	UNFUSED REDUCER	EXPANSION FTG.	END CLOSURES		TRANSFORMER TAPS			BUSSED XFMR CONN. †
									AL	CU	Price, Labor Only★			
		Price Labor Only	Price Labor Only▲	Price Labor Only●	Price Labor Only	Price Labor Only	Price Labor Only	Price Labor Only	Price Each	Price Each	One 3Ø XFMR Y or △	Three 1Ø XFMRS △	Three 1Ø XFMRS Y	Price Labor Only
3 Pole 600 V.	225	$197.	$306.	$337.	$373.	$434.	.....	$514.	$ 92.	$92.	.....	.....	.....	.....
	400	227.	306.	562.	373.	434.	$193.	580.	92.	92.	.....	.....	.....	.....
	600	292.	306.	806.	373.	434.	211.	630.	92.	92.	.....	.....	.....	.....
	600	292.	306.	806.	373.	434.	211.	630.	92.	92.	$355.	$852.	.....	$1742.
	800	315.	306.	806.	373.	434.	278.	823.	92.	92.	379.	916.	.....	1742.
	1000	358.	306.	824.	373.	434.	314.	879.	92.	92.	444.	1045.	.....	1909.
	1200	395.	409.	837.	516.	608.	523.	902.	92.	92.	488.	1133.	.....	1953.
	1350	419.	409.	843.	516.	608.	679.	916.	92.	92.	518.	1191.	.....	1983.
	1600	458.	409.	853.	516.	608.	752.	1235.	120.	92.	576.	1441.	.....	2088.
	2000	547.	409.	888.	516.	608.	954.	1347.	120.	120.	664.	1616.	.....	2227.
	2500	653.	409.	922.	516.	608.	1254.	1446.	120.	120.	794.	1873.	.....	2461.
	3000	772.	409.	956.	516.	608.	1478.	1814.	153.	120.	938.	2177.	.....	2761.
	4000	960.	516.	991.	608.	658.	1866.	2199.	153.	153.	1102.	2504.	.....	3505.
	5000	1121.	516.	1269.	608.	658.	2309.	2310.	.....	153.	1208.	2900.	.....	4688.
3Ø, 4W. 277/480 V. 100% Neutral	225	203.	373.	417.	434.	506.	.....	608.	92.	92.	.....	.....	.....	.....
	400	233.	373.	641.	434.	506.	266.	659.	92.	92.	.....	.....	.....	.....
	600	301.	373.	916.	434.	506.	291.	752.	92.	92.	.....	.....	.....	.....
	600	301.	373.	916.	434.	506.	291.	752.	92.	92.	377.	923.	$ 852.	$1914.
	800	334.	373.	916.	434.	506.	358.	907.	92.	92.	398.	989.	916.	1914.
	1000	396.	373.	938.	434.	506.	421.	1033.	92.	92.	480.	1139.	1045.	2088.
	1200	427.	516.	954.	608.	711.	719.	1232.	92.	92.	524.	1245.	1133.	2143.
	1350	447.	516.	962.	608.	711.	918.	1365.	92.	92.	553.	1315.	1191.	2179.
	1600	518.	516.	978.	608.	711.	995.	1655.	120.	92.	632.	1533.	1441.	2346.
	2000	600.	516.	1045.	608.	711.	1339.	1757.	120.	120.	719.	1746.	1616.	2438.
	2500	726.	516.	1116.	608.	711.	1652.	1901.	120.	120.	869.	2043.	1873.	2761.
	3000	859.	516.	1187.	608.	711.	1987.	2495.	153.	120.	1025.	2390.	2177.	3018.
	4000	1070.	608.	1252.	711.	816.	2592.	2869.	153.	153.	1208.	2773.	2504.	3990.
	5000	1336.	608.	1434.	711.	816.	3121.	3018.	.....	153.	1514.	3139.	2900.	5338.

*For Square D standard lugs on flanged end, add **$14.** per lug. For other lugs, add charge from "Additions" section.
★Price includes Square D standard lugs.
†Price includes bussed rigid and flexible connections to L.V. terminals. Price busway footage to L.V. terminal. Provide transformer detail drawings with order.
▲For elbows other than 90 degrees, double the labor only charge.
● Plug-in type tap box is available in ratings 225A. through 1600A. See listing on Page 120.
‡For Service Head construction other than Square D standard, double the labor only price.

ADAPTER CUBICLE

Ampere Rating	FUSIBLE SWITCH	CIRCUIT BREAKER		
		Standard	I-75,000	Current Limiting †
	Price (does not include busway footage)			
225	$1710.	$2173.	$2830.	$3563.
400	2059.	2567.	3234.	4098.
600	2421.	3811.	4195.	6906.
800	4337. ‡	4337.	4727.	7128.
1000	5023. ‡	5023.	5523.	7811.
1200	6030. ‡	6030.	6639.	9301.
1600	7332. ‡	7332.	7943.	9301.
2000	8580. ‡	8580.	8949.	10025.

Prices shown apply to adapter cubicles on both 3 pole and 3Ø, 4W. busway.

Adapter cubicles are used to join unlike ratings of busway in accordance with National Electric Code, Article 364.

†Includes Square D standard circuit breaker plus set of three co-ordinated current limiting fuses.

‡Device consists of magnetic-trip only MA or PA circuit breaker with provisions for current limiting fuses. Fuses are not included.

MISCELLANEOUS ADDITIONS

Integral Weather Seal (required when busway passes through exterior wall or roof) ..... **$227.**

Roof Flange Kit (Optional) ..... **488.**
Includes: Drip Hood (attaches to busway collar) .....
Roof Collar (attaches to roof) .....

Wall Flange (Optional) ..... Each
225 A. thru 2500 A. ..... **$104.**
3000 A. thru 5000 A. ..... **150.**

Spring Hanger—(Optional) for vertical riser applications ..... **59.**

Lugs other than Square D Standard ..... Each
(Applies to Transformer Taps, Tap Boxes, Service Heads, etc., when non-standard lugs are required)
1— 500 MCM Cable ..... **$31.**
1— 750 MCM Cable ..... **44.**
1—1000 MCM Cable ..... **50.**

Fire Barrier Feeder Busway (Included in each device as standard) ..... No Charge
Plug-in Busway (specify location of wall or floor) ..... **$227.**

Sway Brace Collar (Plug-in Busway) HP-1-SBC ..... **10.**

Grounding Provision (required when tap boxes are supplied with ground) ... **31.**

Bus Extension—Submit detailed information to factory for quotation

SHORT-CIRCUIT RATINGS—AMPERES

Nameplate Rating Amperes		FEEDER Busway				PLUG-IN Busway					
		NEMA Standard		Type AF & CF		NEMA Standard		Type AP & CP		Type APH & CPH	
Aluminum	Copper	Sym.	Asym.	Sym.	Asym.	Sym.	Asym.	Sym.	Asym.	Sym.	Asym.
225	225	.....	.....	.....	.....	14,000	15,000	20,000	23,000	.....	.....
400	400-600	.....	.....	.....	.....	22,000	25,000	22,000	25,000	45,000	50,000
600	.....	42,000	50,000	100,000	110,000	22,000	25,000	22,000	25,000	45,000	50,000
800	800	42,000	50,000	100,000	110,000	22,000	25,000	50,000	55,000	85,000	95,000
.....	1000	75,000	85,000	100,000	110,000	42,000	50,000	50,000	55,000	85,000	95,000
1000-1350	1200-1350	75,000	85,000	100,000	110,000	42,000	50,000	50,000	55,000	90,000	100,000
.....	1600	100,000	110,000	100,000	110,000	65,000	75,000	50,000	55,000	90,000	100,000
1600-2000	2000	100,000	110,000	150,000	165,000	65,000	75,000	100,000	110,000	135,000	150,000
2500	2500	150,000	165,000	150,000	165,000	65,000	75,000	100,000	110,000	135,000	150,000
.....	3000	150,000	165,000	150,000	165,000	85,000	100,000	100,000	110,000	135,000	150,000
3000	.....	150,000	165,000	200,000	225,000	85,000	100,000	135,000	150,000	175,000	200,000
4000	.....	200,000	225,000	200,000	225,000	.....	.....	135,000	150,000	175,000	200,000
.....	4000-5000	200,000	225,000	200,000	225,000	.....	.....	.....	.....	.....	.....

VISI-TITE® torque indicating joint bolts ard standard on all I-LINE busway.

DE CATALOG REFERENCE: SECTION 5610

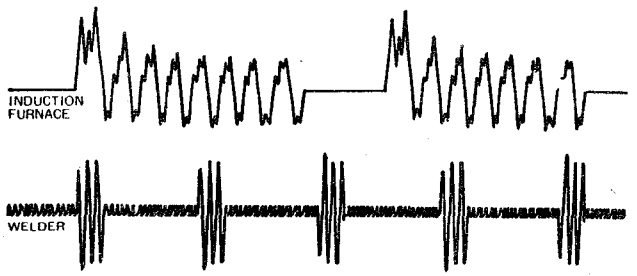
SQD SLV_000903

PLUG-IN UNIT—APPLICATION DATA

Industrial uses of plug-in busway frequently involve cycling of heavy duty loads such as welders, induction furnaces, molding machines and air compressors. The peak currents obtained and the duty cycle of the equipment involved affect the selection of plug-in busway and plug-in units.

Plug-in units used on **aluminum** busway must be selected in accordance with table below. **Equipment warranty is void** on installations which do not comply with this selection table.

TYPICAL WAVEFORMS



REVISED SELECTION TABLE FOR PLUG-IN UNITS USED ON ALUMINUM I-LINE BUSWAY
USE ONLY FOR PLUG-IN UNITS MANUFACTURED AFTER JANUARY 1, 1976
(For plug-in units manufactured prior to January 1, 1976, consult the nearest Square D sales office for proper application data.)

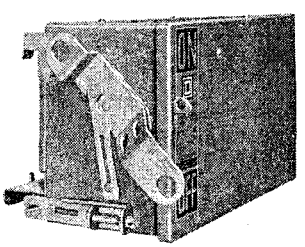
VOLTAGE	PLUG-IN UNIT AMPERE RATING‡	MOTOR—MAXIMUM 3Ø HORSEPOWER				RESISTANCE WELDER Maximum KVA		60 Hz INDUCTION DEVICE Heaters, Furnaces Die Cast and Molding Machines
		FUSIBLE SWITCH		CIRCUIT BREAKER				
		*Normal Duty	●Jogging, Plugging or Cycling Duty	*Normal Duty	●Jogging, Plugging or Cycling Duty	1Ø	3Ø	
230 V. AC	30	7½	Same As Normal Duty	...	...	5	8	FUSIBLE SWITCH or CIRCUIT BREAKER FRAME size must be at least **2 TIMES** device nameplate ampere rating (including internal motors, etc.)
	60	15		...	...	10	15	
	100	30		25	15	15	25	
	200/225	60†		50	30	30	50	
	400	125		100	60	60	100	
	600	200†		150	100	100	175	
460 V. AC	30	15	Same As Normal Duty	...	...	10	15	
	60	30		...	...	20	35	
	100	60†		50	30	30	50	
	200/225	125†		100	60	60	100	Fuse size or circuit breaker trip rating should be selected in accordance with NEC and good engineering practice
	400	250		250	125	125	200	
	600	400†		350	200	150	250	

*Based on 1981 NEC—Article 430. See Page 478 for details.
●Over 25 starts per hour, or over 5 starts per minute.
†Not horsepower rated. Must be used in conjunction with separate motor control device.
‡Based on using Square D catalog no. PJC-7201 compound on plug-in jaws.

PLUG-IN UNITS FUSIBLE

FLOOR-OPERABLE
QUICK-MAKE, QUICK-BREAK

Ampere Rating	Type of Connection	240 V. AC 3P-3 FUSE		120/208 V. AC 4P-3 FUSE		600 V. AC 3P-3 FUSE		277/480 V. AC 4P-3 FUSE	
		Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price
30	Plug-in	PQ-3203	$ 180.	PQ-4203	$ 215.	PQ-3603	$ 194.	PQ-4603	$ 225.
60		PQ-3206	194.	PQ-4206	225.	PQ-3606	209.	PQ-4606	235.
100		PQ-3210	289.	PQ-4210	316.	PQ-3610	296.	PQ-4610	344.
200		PQ-3220	501.	PQ-4220	559.	PQ-3620	523.	PQ-4620	589.
*200		*PS-3220	501.	*PS-4220	559.	*PS-3620	523.	*PS-4620	589.
400		PBQ-3240	1374.	PBQ-4240	1481.	PBQ-3640	1374.	PBQ-4640	1481.
600		PQ-3260	1981.	PQ-4260	2169.	PQ-3660	1981.	PQ-4660	2169.
800	Bolt-on	.....	.....	.....	.....	PTQ-3680†	3429.	PTQ-4680†	3563.
1000		.....	.....	.....	.....	PTQ-36100†	4071.	PTQ-46100†	4207.
1200		.....	.....	.....	.....	PTQ-36120†	6457.	PTQ-46120†	6548.
1600		.....	.....	.....	.....	PTQ-36160†	6457.	PTQ-46160†	6548.


Fusible Plug-in Unit

*For use on vertical riser applications only.

Fusible Switch Plug-in Units can be plugged in at any opening of aluminum or copper I-LINE plug-in busway. Plug-in units with 600 A. switches plug into any two adjacent openings spaced 24" apart. Units rated 400 A. require space of two openings.

For Grounding Provisions to match integral ground bus add **$31.** Add "G" to catalog number; e.g., PBQ-3640-G.

Class J Fuses—Add suffix "J" to catalog number (600 V. and 277/480 V. only) for Class J Fuse provisions. For 400 A. Switch add **$19.** For 600 A. switch add **$142.**

†This device uses bolt-on connection. It may be used only on Series 3 I-LINE plug in busway (800 A. through 3000 A.) with same number of poles; i.e., do not use 3 pole unit on 3Ø, 4W. busway. or 3Ø 4W. unit on 3 pole busway.

PLUG-IN UNITS CONTROL

COMBINATION STARTER/CONTACTOR—Line Voltage—Single Speed—Non-Reversing.

NEMA Size	Ampere Rating	FUSIBLE SWITCH (3 Pole)		Rating Amps. Trip†	CIRCUIT BREAKER (3 Pole)		Add for CONTROL TRANSFORMER
		STARTER*	CONTACTOR		STARTER*	CONTACTOR	
0	30	$ 700.	$ 676.	15-20	$ 719.	$ 695.	$114.
1	60	744.	719.	15-50	747.	725.	114.
2	100	943.	896.	35-80	1086.	1009.	161.
3	200	1533.	1454.	60-100	1410.	1332.	235.

*Price does not include overload relay thermal units. Order separately See Selection Index on Digest Page 436.
For Grounding Provisions to match integral ground Bus add **$31.** Specify on order.

COMBINATION FUSIBLE SWITCH (3Ø, 4W) AND LIGHTING CONTACTOR

Ampere† Rating	ELECTRICALLY HELD—460V.	MECHANICALLY HELD—460V.
	Price	Price
30	$ 682.	$ 735.
60	875.	1051.
100	1238.	1456.
200	2587.	2988.

†Lighting contactors do not include holding circuit interlock.

SQD SLV_000904

PLUG-IN UNITS CIRCUIT BREAKER

FLOOR-OPERABLE
STANDARD INTERRUPTING CAPACITY

Breaker	Trip Rating Amps.	240 V. AC 3 Pole		120/208 V. AC 3Ø, 4W.		480 V. AC 3 Pole		277/480 V. AC 3Ø, 4W.		600 V. AC 3 Pole		277/480 V. AC 3Ø, 4W.	
		Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price
FA	15	PFA-32015	$284.	PFA-32015-N	$324.	PFA-34015	$355.	PFA-34015-N	$396.	PFA-36015	$386.	PFA-36015-N	$427.
	20	PFA-32020	284.	PFA-32020-N	324.	PFA-34020	355.	PFA-34020-N	396.	PFA-36020	386.	PFA-36020-N	427.
	30	PFA-32030	284.	PFA-32030-N	324.	PFA-34030	355.	PFA-34030-N	396.	PFA-36030	386.	PFA-36030-N	427.
	40	PFA-32040	284.	PFA-32040-N	324.	PFA-34040	355.	PFA-34040-N	396.	PFA-36040	386.	PFA-36040-N	427.
	50	PFA-32050	284.	PFA-32050-N	324.	PFA-34050	355.	PFA-34050-N	396.	PFA-36050	386.	PFA-36050-N	427.
	60	PFA-32060	284.	PFA-32060-N	324.	PFA-34060	355.	PFA-34060-N	396.	PFA-36060	386.	PFA-36060-N	427.
	70	PFA-32070	339.	PFA-32070-N	379.	PFA-34070	389.	PFA-34070-N	429.	PFA-36070	431.	PFA-36070-N	475.
	90	PFA-32090	339.	PFA-32090-N	379.	PFA-34090	389.	PFA-34090-N	429.	PFA-36090	431.	PFA-36090-N	475.
	100	PFA-32100	339.	PFA-32100-N	379.	PFA-34100	389.	PFA-34100-N	429.	PFA-36100	431.	PFA-36100-N	475.

Breaker	Trip Rating Amps.	600 V. AC 3 Pole		277/480 V. AC 3Ø, 4W.		Breaker	Trip Rating Amps.	Type of Connection	600 V. AC 3 Pole		277/480 V. AC 3Ø, 4W.	
		Catalog No.	Price	Catalog No.	Price				Catalog No.	Price	Catalog No.	Price
KA	125	PKA-36125	$ 968.	PKA-36125-N	$1038.	MA	500	Plug-in	PMA-36500	$2845.	PMA-36500-N	$2983.
	150	PKA-36150	968.	PKA-36150-N	1038.		600		PMA-36600	2845.	PMA-36600-N	2983.
	175	PKA-36175	968.	PKA-36175-N	1038.		700	Bolt-on	PTMA-36700†	3429.	PTMA-36700-N†	3563.
							800		PTMA-36800†	3429.	PTMA-36800-N†	3563.
	200	PKA-36200	968.	PKA-36200-N	1038.		900		PTMA-36900†	4071.	PTMA-36900-N†	4207.
	225	PKA-36225	968.	PKA-36225-N	1038.		1000		PTMA-36100†	4071.	PTMA-36100-N†	4207.
LA	250	PBLA-36250	2000.	PBLA-36250-N	2106.	PA*	1000	Bolt-on	PTPA-36100†	6457.	PTPA-36100-N†	6548.
	300	PBLA-36300	2000.	PBLA-36300-N	2106.		1200		PTPA-36120†	6457.	PTPA-36120-N†	6548.
	350	PBLA-36350	2000.	PBLA-36350-N	2106.		1400		PTPA-36140†	6457.	PTPA-36140-N†	6548.
	400	PBLA-36400	2000.	PBLA-36400-N	2106.		1600		PTPA-36160†	6457.	PTPA-36160-N†	6548.

Circuit Breaker Plug-in Units can be plugged in at any opening of aluminum or copper I-LINE plug-in busway. All PMA plug-in units require two adjacent openings spaced 24" apart. PBLA plug-in units require the space of two openings. PTMA and PTPA plug-in units may be used only on Series 3 I-LINE plug-in busway (800A. through 3000 A.) with same number of poles; i.e., do not use 3 pole unit on 3Ø, 4W. busway, or 3Ø, 4W. unit on 3 pole busway.

For Grounding Provisions to match integral ground bus add **$31.** Add "G" to catalog number; e.g., PBLA-36400-GN.

†This device uses bolt-on connection. It may be used only on Series 3 I-LINE plug-in busway (800 A. through 3000 A.) with same number of poles; i.e., do not use 3 pole unit on 3Ø, 4W. busway, or 3Ø, 4W. unit on 3 pole busway.

Add Suffix " LB" to Catalog Number of circuit breaker trip ratings of 225 A. and above when units are to be supplied as lug to bus main breakers; e.g., PBLA-36400-LB.

FLOOR-OPERABLE

Breaker	Trip Rating Amps.	Type of Connection	I-75000* CIRCUIT BREAKER UNITS 600 V. AC 3 Pole		I-75000* CIRCUIT BREAKER UNITS 277/480 V. AC 3Ø, 4W.		CURRENT LIMITING CIRCUIT BREAKER UNITS▲ 600 V. AC 3 Pole		CURRENT LIMITING CIRCUIT BREAKER UNITS▲ 277/480 V. AC 3Ø, 4W.	
			Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price
FA	15	Plug-in	PFH-36015	$ 492.	PFH-36015-N	$ 532.	PFA-36015-CL	$1274.	PIF-34015-N	$1311.
	20		PFH-36020	492.	PFH-36020-N	532.	PFA-36020-CL	1274.	PIF-34020-N	1311.
	30		PFH-36030	492.	PFH-36030-N	532.	PFA-36030-CL	1274.	PIF-34030-N	1311.
	40		PFH-36040	492.	PFH-36040-N	532.	PFA-36040-CL	1274.	PIF-34040-N	1311.
	50		PFH-36050	492.	PFH-36050-N	532.	PFA-36050-CL	1274.	PIF-34050-N	1311.
	60		PFH-36060	492.	PFH-36060-N	532.	PFA-36060-CL	1274.	PIF-34060-N	1311.
	70		PFH-36070	533.	PFH-36070-N	576.	PFA-36070-CL	1274.	PIF-34070-N	1311.
	90		PFH-36090	533.	PFH-36090-N	576.	PFA-36090-CL	1274.	PIF-34090-N	1311.
	100		PFH-36100	533.	PFH-36100-N	576.	PFA-36100-CL	1274.	PIF-34100-N	1311.
KA	125	Plug-in	PKH-36125	1727.	PKH-36125-N	1794.	PKA-36125-CL	2940.	PIK-34125-N	3011.
	150		PKH-36150	1727.	PKH-36150-N	1794.	PKA-36150-CL	2940.	PIK-34150-N	3011.
	175		PKH-36175	1727.	PKH-36175-N	1794.	PKA-36175-CL	2940.	PIK-34175-N	3011.
	200		PKH-36200	1727.	PKH-36200-N	1794.	PKA-36200-CL	2940.	PIK-34200-N	3011.
	225		PKH-36225	1727.	PKH-36225-N	1794.	PKA-36225-CL	2940.	PIK-34225-N	3011.
LA	250	Plug-in	PBLH-36250	2770.	PBLH-36250-N	2875.	PBLA-36250-CL	3491.	PBLA-36250-NCL	3597.
	300		PBLH-36300	2770.	PBLH-36300-N	2875.	PBLA-36300-CL	3491.	PBLA-36300-NCL	3597.
	350		PBLH-36350	2770.	PBLH-36350-N	2875.	PBLA-36350-CL	3491.	PBLA-36350-NCL	3597.
	400		PBLH-36400	2770.	PBLH-36400-N	2875.	PBLA-36400-CL	3491.	PBLA-36400-NCL	3597.
MA	500	Plug-in	PMH-36500	3286.	PMH-36500-N	3428.	PMA-36500-CL	5241.	PMA-36500-NCL	5379.
	600		PMH-36600	3286.	PMH-36600-N	3428.	PMA-36600-CL	5241.	PMA-36600-NCL	5379.
	700	Bolt-on	PTMH-36700†	3877.	PTMH-36700-N†	4011.	PTMA-36700-CL†	5912.	PTMA-36700-NCL†	6047.
	800		PTMH-36800†	3877.	PTMH-36800-N†	4011.	PTMA-36800-CL†	5912.	PTMA-36800-NCL†	6047.
	900		PTMH-36900†	4409.	PTMH-36900-N†	4784.	PTMA-36900-CL†	6573.	PTMA-36900-NCL†	6710.
	1000		PTMH-36100†	4409.	PTMH-36100-N†	4784.	PTMA-36100-CL†	6573.	PTMA-36100-NCL†	6710.

†This device uses bolt-on connection. It may be used only on Series 3 I-LINE plug-in busway (800 A. through 3000 A.) with same number of poles; i. e., do not use 3 pole unit on 3Ø, 4W. busway, or 3Ø, 4W. unit on 3 pole busway.

*Trademark of Square D Company.

▲Includes Square D standard circuit breaker plus set of three coordinated current limiting fuses (except PIF and PIK units.)

For Grounding Provisions to match integral ground bus add **$31.** Add "G" to catalog number; e.g., PBLH-36400-GN.

ENCLOSURES ONLY FOR CIRCUIT BREAKER PLUG-IN UNITS

Breaker	Breaker Frame Size	3 Pole Enclosure		3Ø, 4W. Enclosure	
		Catalog No.	Price	Catalog No.	Price
FA	100 A.	PFA-100	$170.	PFA-100N	$210.

Breaker	Breaker Frame Size	3 Pole Enclosure		3Ø, 4W. Enclosure	
		Catalog No.	Price	Catalog No.	Price
KA	225 A.	PKA-225	$388.	PKA-225N	$449.

Complete enclosure less circuit breaker. Order circuit breaker of desired trip rating with prefix FAL, KAL, FHL, KHL.

DE CATALOG REFERENCE: SECTION 5630

SQD SLV_000905

PLUG-IN UNITS MISCELLANEOUS

E1 DISCOUNT

GROUND INDICATOR AND NEUTRALIZER PLUGS

250 V. AC—3 Pole		575 V. AC—3 Pole	
Catalog Number	Price	Catalog Number	Price
PGD-3200	$339.	PGD-3600	$339.

3Ø CAPACITOR UNITS

(Order plug-in units separately)

3Ø KVAR	240 V. AC		480 V. AC	
	Catalog No.	Price	Catalog No.	Price
2.5	.....	....	PC-3402	$ 639.
5	PC-3205	$1476.	PC-3405	954.
7.5	PC-3207	1849.	PC-3407	1161.
10	PC-3210	2155.	PC-3410	1292.
15	PC-3215	2830.	PC-3415	1550.
20	.....	....	PC-3420	1937.
25	.....	....	PC-3425	2410.
30	.....	....	PC-3430	2849.

1. Capacitor units do not plug into busway and must be used with plug-in switch or circuit breaker.

HOOKSTICKS

Length	Catalog No.	Price	Length	Catalog No.	Price
8′	5156-8	$101.	14′	5156-14	$181.

1Ø TRANSFORMER UNITS

(Order plug-in units separately)

1Ø KVA	PRIMARY VOLTAGE			
	240 V. AC		480 V. AC	
	Catalog No.	Price	Catalog No.	Price
1	PT-2200	$ 609.	PT-2400	$ 609.
1.5	PT-2201	655.	PT-2401	655.
2	PT-2202	711.	PT-2402	711.
3	PT-2203	843.	PT-2403	843.
5	PT-2205	1168.	PT-2405	1168.
7.5	PT-2207	1405.	PT-2407	1405.
10	PT-2210	1619.	PT-2410	1619.

1. Transformer units do not plug into busway and must be used with plug-in switch, circuit breaker or cable tap box.
2. Standard secondary voltage terminals are provided for 120 V. or 240 V. 1Ø, 2W. or 120/240, 1Ø, 3W. connection. Specify secondary voltage if other than standard.

GROUND CONNECTION KITS

Kits include ground stab, ground connector with lug, mounting screws and instruction sheets to add grounding provisions to I-LINE plug-in units to match plug-in busway integral ground bus.

Fusible Units		Circuit Breaker Units		Price
Ampere Rating	Catalog No.	Ampere Rating	Catalog No.	
30▲	PGK-9	15—100	PGK-1	$31.
60	PGK-1	.....	.....	
100	PGK-2	125—225	PGK-5	
200*	PGK-200	.....	.....	

▲Series 2 only.
*Series 5 only.

DE CATALOG REFERENCE: SECTION 5630

TYPE APD & SD BUSWAY (NOT I-LINE BUSWAY)

PLUG-IN UNITS

E1 DISCOUNT

FUSIBLE (TYPE "QMB") PLUG-IN UNITS

Ampere Rating	240 V. AC 3P-3 FUSE		120/208 V. AC 4P-3 FUSE	
	Catalog No.	Price	Catalog No.	Price
30	SD-3203	$ 277.	SD-4203	$ 316.
60	SD-3206	296.	SD-4206	335.
100	SD-3210	423.	SD-4210	488.
200	SD-3220	743.	SD-4220	835.
400	SD-3240	1751.	SD-4240	1890.
600	SD-3260	2434.	SD-4260	2657.

Ampere Rating	600 V. AC 3P-3 FUSE		277/480 V. AC 4P-3 FUSE	
	Catalog No.	Price	Catalog No.	Price
30	SD-3603	$ 277.	SD-4603	$ 316.
60	SD-3606	296.	SD-4606	335.
100	SD-3610	423.	SD-4610	488.
200	SD-3620	743.	SD-4620	835.
400	SD-3640	1751.	SD-4640	1890.
600	SD-3660	2434.	SD-4660	2657.

Fusible Switch Plug-in Units—30 A. to 200 A. can be plugged in at any opening of plug-in busway. The 400 A. and 600 A. units plug into two openings in the duct, 24″ apart.

CIRCUIT BREAKER PLUG-IN UNITS

Breaker	Trip Rating Amps.	600 V. AC 3 POLE		277/480 V. AC 3Ø, 4W.	
		Catalog No.	Price	Catalog No.	Price
FA	15	SD-75715	$ 386.	SD-75415	$ 427.
	20	SD-75720	386.	SD-75420	427.
	30	SD-75730	386.	SD-75430	427.
	40	SD-75740	386.	SD-75440	427.
	50	SD-75750	386.	SD-75450	427.
	70	SD-75770	431.	SD-75470	475.
	100	SD-75716	431.	SD-75416	475.
KA	125	SD-78717	968.	SD-78417	1038.
	150	SD-78718	968.	SD-78418	1038.
	175	SD-78719	968.	SD-78419	1038.
	200	SD-78726	968.	SD-78426	1038.
	225	SD-78727	968.	SD-78427	1038.
LA	250	SD-67728	2000.	SD-67428	2106.
	300	SD-67736	2000.	SD-67436	2106.
	350	SD-67738	2000.	SD-67438	2106.
	400	SD-67746	2000.	SD-67446	2106.

Circuit Breaker Plug-in Units can be plugged in at any opening of copper or aluminum plug-in busway. LA circuit breaker units plug into any 2 adjacent openings spaced 24″ apart.

FITTINGS

E2 DISCOUNT

Ampere Rating	ALUMINUM						COPPER					
	TAP BOX*		END CLOSURE		JOINT PACKAGE		TAP BOX*		END CLOSURE		JOINT PACKAGE	
	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price	Catalog No.	Price
225	APD-5040-CTB	$706.	APD-5040-EC	$138.	APD-504	$ 95.	SD-3855	$1015.	SD-1005-A	$138.	SD-45-P	$194.
400	APD-5040-CTB	706.	APD-5040-EC	138.	APD-504	95.	SD-3855	1015.	SD-1005-A	138.	SD-45-P	194.
600	APD-5060-CTB	916.	APD-5060-EC	171.	APD-506	150.	SD-3855	1015.	SD-1005-A	138.	SD-45-P	194.
800	APD-5100-CTB	1018.	APD-5100-EC	203.	APD-510	167.	SD-3451	1438.	SD-1001-A	203.	SD-41-P	258.
1000	APD-5100-CTB	1018.	APD-5100-EC	203.	APD-510	167.	SD-3451	1438.	SD-1001-A	203.	SD-41-P	258.

*TAP BOX may be installed between any two adjacent lengths of busway.

Catalog numbers shown may be used on both 3 pole and 3Ø, 4W busway.

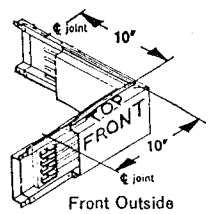
DE CATALOG REFERENCE: SECTION 5620/5640

SQD SLV_000906

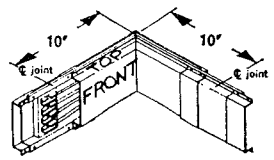
TOTALLY ENCLOSED PLUG-IN BUSWAY — 100 AMPERE

Square D 100-ampere plug-in busway is a flexible and economical indoor busway. Typical uses are (a) branch power feeders to panelboards or motors and (b) plug-in busway for small distributed loads. The electrical conductors are plated round aluminum or copper bars supported in a steel housing by molded insulators. All plug-in openings are usable and are polarized. Finish is gray baked enamel.

STRAIGHT LENGTHS AND FITTINGS



Front Outside



Front Inside

Straight Lengths—Available only in lengths listed. Normal mounting position is edgewise with neutral at the top.

Hangers—Busway is UL listed for 10-foot hanger spacing if mounted edgewise. For flatwise mounting (not UL listed) order two flatwise hangers for each 10 feet of busway. Add **$9.** each for **all** edgewise or flatwise hangers required.

Cable Tap Box—Plug-in type rated 100 amperes.

End Closure—Required at end of run.

Outlet Cover—Required to cover opening when plug-in unit is relocated.

Elbows and Tees—Built with aluminum conductors but usable with either copper or aluminum straight lengths. Order by catalog number. See drawings for proper catalog number based on top and front orientation.

STRAIGHT LENGTHS AND FITTINGS—100A. PLUG-IN BUSWAY

Component	3Ø, 3W. 600 V. Max.		★3Ø, 3W. + Gnd. 600 V. Max.		3Ø, 4W. 277/480 V.		★3Ø, 4W. + Gnd. 277/480 V.		1Ø, 3W. ▲120/240 V.		★1Ø, 3W. + Gnd. ▲120/240 V.	
	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
Straight Lengths—10 ft.	AP-13	**$102.**	AP-13G	**$134.**	AP-14	**$132.**	AP-14G	**$161.**	AP-14	**$132.**	AP-14G	**$161.**
Aluminum 5 ft.	AP-13-5	**71.**	AP-13-5G	**118.**	AP-14-5	**85.**	AP-14-5G	**124.**	.....	...	.....	...
3 ft.	AP-13-3	**63.**	AP-13-3G	**99.**	AP-14-3	**71.**	AP-14-3G	**104.**	.....	...	.....	...
Straight Lengths—Copper 10 ft.	CP-13	**180.**	CP-13G	**235.**	CP-14	**231.**	CP-14G	**282.**	.....	...	.....	...
Cable Tap Box (Plug-in 100A.)	PTB-14	**93.**	PTB-14 +	**93.** +	PTB-14	**93.**	PTB-14 +	**93.** +	PTB-14	**93.**	PTB-14 +	**93.** +
Ground Kit	.....	....	PGK-FA2	**12.**	.....	....	PGK-FA2	**12.**	.....	....	PGK-FA2	**12.**
End Closure	ACP-1-EC	**21.**	APC-1-EC	**21.**	ACP-1-EC	**21.**	ACP-1-EC	**21.**	ACP-1-EC	**21.**	ACP-1-EC	**21.**
Hangers—Edgwise	HP-1-E	**9.**	HP-1-E	**9.**	HP-1-E	**9.**	HP-1-E	**9.**	HP-1-E	**9.**	HP-1-E	**9.**
Flatwise	HP-1-F	**9.**	HP-1-F	**9.**	HP-1-F	**9.**	HP-1-F	**9.**	HP-1-F	**9.**	HP-1-F	**9.**
Elbows—Front Outside	AP-13-LFO	**120.**	AP-13-LFOG	**146.**	AP-14-LFO	**135.**	AP-14-LFOG	**152.**	AP-14-LFO	**135.**	AP-14-LFOG	**152.**
Front Inside	AP-13-LFI	**120.**	AP-13-LFIG	**146.**	AP-14-LFI	**135.**	AP-14-LFIG	**152.**	AP-14-LFI	**135.**	AP-14-LFIG	**152.**
Tees—Front Outside	AP-13-TFO	**166.**	AP-13-TFOG	**187.**	AP-14-TFO	**175.**	AP-14-TFOG	**197.**	AP-14-TFO	**175.**	AP-14-TFOG	**197.**
Front Inside	AP-13-TFI	**166.**	AP-13-TFIG	**187.**	AP-14-TFI	**175.**	AP-14-TFIG	**197.**	AP-14-TFI	**175.**	AP-14-TFIG	**197.**
Outlet Cover	ACP-1-OC	**9.**	ACP-1-OC	**9.**	ACP-1-OC	**9.**	ACP-1-OC	**9.**	ACP-1-OC	**9.**	ACP-1-OC	**9.**
Wall Flange—Slip-on	ACP-1-WF	**28.**	ACP-1-WF	**28.**	ACP-1-WF	**28.**	ACP-1-WF	**28.**	ACP-1-WF	**28.**	ACP-1-WF	**28.**

▲Use 1Ø, 3W. busway for 3Ø, 3W., 240V. grounded BØ system. For 480V. 3Ø, 3W. grounded BØ system, consult factory.
★50% capacity internal ground bus.

E2 DISCOUNT

PLUG-IN UNITS

CIRCUIT BREAKER ENCLOSURES

Enclosure Only (Price Circuit Breaker from Table Below)	3Ø 3W.		◐1Ø 3W. & 3Ø 4W.	
	Cat. No.	Price	Cat. No.	Price
QO Bkr—70A. Enclosure	PI-QO	**$ 37.**	PIN-QO	**$ 39.**
EH Bkr—100A. Enclosure*	.....	....	PIN-EH	**107.**
FA Bkr—50A. Enclosure	PI-50-FA	**104.**	PIN-50-FA	**118.**
FA Bkr—60-100A. Enclosure	PI-100-FA	**123.**	PIN-100-FA	**129.**

*Availability to be announced.

Floor Operator Attachment for PI-QO and PIN-QO enclosures, order number PI-1-QO at **$26.** each. For FA enclosures order operator number PI-1-FA at **$26.** each. For EH enclosures, order operator number PI-1-EH at **$26.** each.

◐Use 1Ø 3W. enclosures for 3Ø 3W., 240V. grounded BØ system. With PIN-QO, use breakers QO-215-H, QO-220-H and QO-230-H. For higher ratings, use FA enclosures and breakers.

E2 DISCOUNT

CIRCUIT BREAKERS

Breaker Only (Price Enclosure from Table above) Frame and Ampere Rating		Single Pole		Two Pole		Three Pole	
		Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
QO (1P.—120/240 V. AC) (2P.—120/240 V. AC) (3P.—240 V. AC)	—15A.	QO115	**$8.00**	QO215	**$18.20**	QO315	**$62.00**
	—20A.	QO120	**8.00**	QO220	**18.20**	QO320	**62.00**
	—30A.	QO130	**8.00**	QO230	**18.20**	QO330	**62.00**
	—40A.	QO140	**8.00**	QO240	**18.20**	QO340	**62.00**
	—50A.	QO150	**8.00**	QO250	**18.20**	QO350	**62.00**
	—60A.	.....	....	QO260	**18.20**	QO360	**62.00**
	—70A.	.....	....	QO270	**48.00**	.....	....

B1-2 DISCOUNT

PLUG-IN UNIT GROUND CONNECTION KITS

Kits include ground stab, lug, hardware and instructions to add grounding provisions to plug-in units for 100 ampere busway.

PLUG-IN UNIT	GROUND KIT		
	For Type ST Busway	For Type AP Busway	Price
Type	Catalog No.	Catalog No.	
PI-QO, PIN-QO	PGK-QO	PGK-QO2	**$12.**
PI-50-FA, PIN-50-FA PI-100-FA, PIN-100-FA PTB-14, PIN-EH	PGK-FA	PGK-FA2	

E2 DISCOUNT

CIRCUIT BREAKERS✣ •

Breaker Only (Price Enclosure from Table above) Frame and Ampere Rating		Single Pole		Two Pole		Three Pole	
		Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
FA (480 V. AC)	—15A.	FAL-14015	**$61.00**	FAL-24015	**$147.00**	FAL-34015	**$187.00**
	—20A.	FAL-14020	**61.00**	FAL-24020	**147.00**	FAL-34020	**187.00**
	—30A.	FAL-14030	**61.00**	FAL-24030	**147.00**	FAL-34030	**187.00**
	—40A.	FAL-14040	**61.00**	FAL-24040	**147.00**	FAL-34040	**187.00**
	—50A.	FAL-14050	**61.00**	FAL-24050	**147.00**	FAL-34050	**187.00**
	—60A.	FAL-14060	**61.00**	FAL-24060	**147.00**	FAL-34060	**187.00**
	—70A.	FAL-14070	**75.00**	FAL-24070	**189.00**	FAL-34070	**222.00**
	—90A.	FAL-14090	**75.00**	FAL-24090	**189.00**	FAL-34090	**222.00**
	—100A.	FAL-14100	**75.00**	FAL-24100	**189.00**	FAL-34100	**222.00**

•Use 600 V. FA breakers for 600 V. AC service and price from digest Page 60.

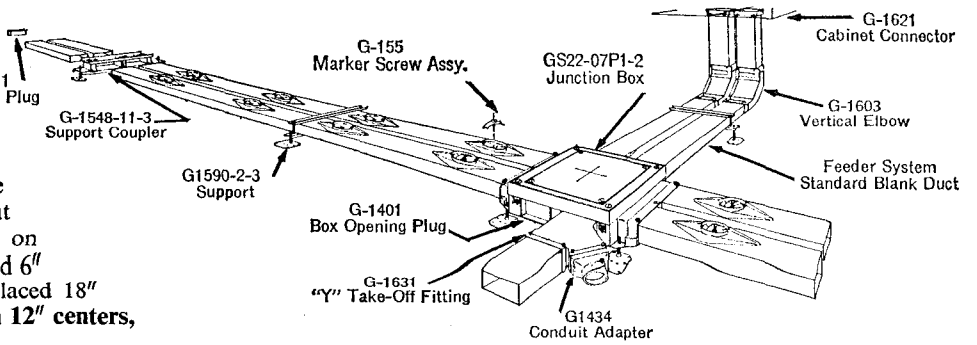
✣Order a PI-100-TP Top Plate if 2 or 3 single pole FAL breakers are used in one enclosure.

B1-1 DISCOUNT

SQD SLV_000907

UNDERFLOOR DUCT

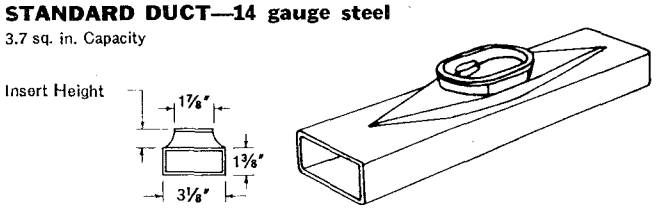
UNDERFLOOR DUCT



Square D offers Underfloor Duct in either standard or super duct widths and both sizes are available from stock with or without ellipsoid inserts—Inserts are spaced on 24″ centers with the first insert placed 6″ from the end and the last insert placed 18″ from the other end. **For inserts on 12″ centers, add 15% to the prices below.**

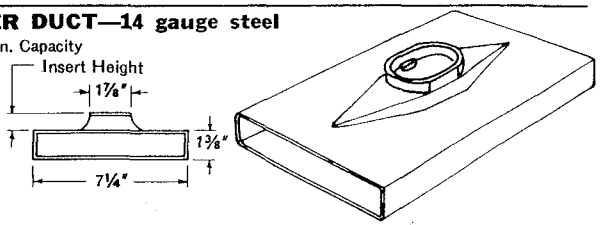
STANDARD DUCT—14 gauge steel

3.7 sq. in. Capacity



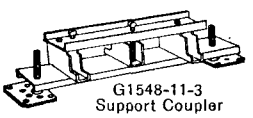
SUPER DUCT—14 gauge steel

8.9 sq. in. Capacity



Insert Height	Standard Duct 10′-0″ Sections: Catalog Number	Wt. Per 10′ Length	Price Per 10′ Length	Standard Per Foot: Catalog Type	Price Per Foot	Insert Height	Super Duct 10′-0″ Sections: Catalog Number	Wt. Per 10′ Length	Price Per 10′ Length	Super Per Foot: Catalog Type	Price Per Foot
Blank	GD100A	20.5 lbs.	**$45.00**	GD100	**$4.50**	Blank	GD200A	38.5 lbs.	**$90.00**	GD200	**$9.00**
⅞″	GD107A	19.7 lbs.	**45.00**	GD107	**4.50**	⅞″	GD207A	37.5 lbs.	**90.00**	GD207	**9.00**
1⅜″	GD113A	20.0 lbs.	**45.00**	GD113	**4.50**	1⅜″	GD213A	39.1 lbs.	**90.00**	GD213	**9.00**
1⅞″	GD117A	20.0 lbs.	**49.00**	GD117	**4.90**	1⅞″	GD217A	39.4 lbs.	**99.00**	GD217	**9.90**
2⅜″	GD123A	20.2 lbs.	**49.00**	GD123	**4.90**	2⅜″	GD223A	39.6 lbs.	**99.00**	GD223	**9.90**
2⅞″	GD127A	20.4 lbs.	**49.00**	GD127	**4.90**	2⅞″	GD227A	39.8 lbs.	**99.00**	GD227	**9.90**
3⅜″	GD133A	20.4 lbs.	**49.00**	GD133	**4.90**	3⅜″	GD233A	40.0 lbs.	**99.00**	GD233	**9.90**

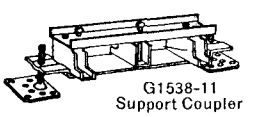
DUCT SUPPORT COUPLERS



G1548-11-3
Support Coupler

Bottom bridge is formed of channel for stronger support. Used wherever there is at least ½″ clearance under duct. Furnished with **3″** leveling legs and hold-down feet.

Catalog Number●	Duct Capacity	Weight Each	Price Each
G1548-1-3	1 Std.	1.7 lbs.	**$ 6.90**
G1548-11-3	2 Std.	2.6 lbs.	**9.00**
G1548-2-3	1 Super	2.6 lbs.	**9.00**
G1548-111-3	3 Std.	3.5 lbs.	**11.30**
G1548-12-3	1 Std./1 Super	3.5 lbs.	**11.30**
G1548-112-3	2 Std./1 Super	4.4 lbs.	**15.90**
G1548-22-3	2 Super	4.4 lbs.	**15.90**
G1548-122-3	1 Std./2 Super	5.3 lbs.	**18.10**
G1548-212-3	1 Std./2 Super	5.3 lbs.	**18.10**

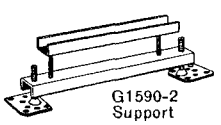


G1538-11
Support Coupler

Bottom bridge is flat to allow duct to be used in **2½″ Fill** on structural slab. Also used in deeper pours where duct must be within ⅛″ of form. Furnished with **2″** leveling legs and hold-down feet.

Catalog Number	Duct Capacity	Weight Each	Price Each
G1538-1	1 Std.	1.6 lbs.	**$ 6.90**
G1538-11	2 Std.	2.5 lbs.	**9.00**
G1538-2	1 Super	2.5 lbs.	**9.00**
G1538-111	3 Std.	3.4 lbs.	**11.30**
G1538-12	1 Std./1 Super	3.4 lbs.	**11.30**
G1538-112	2 Std./1 Super	4.4 lbs.	**15.90**
G1538-22	2 Super	4.4 lbs.	**15.90**
G1538-122	1 Std./2 Super	5.2 lbs.	**18.10**
G1538-212	1 Std./2 Super	5.2 lbs.	**18.10**

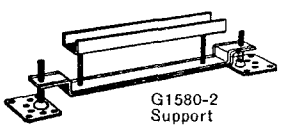
DUCT SUPPORTS



G1590-2
Support

Used with G-1548 series support coupler. Also has stronger bottom bridge and is furnished with **3″** leveling legs and hold-down feet.

Catalog Number●	Duct Capacity	Weight Each	Price Each
G1590-1-3	1 duct	.7 lbs.	**$ 6.90**
G1590-2-3	2 ducts	1.0 lbs.	**9.00**
G1590-3-3	3 ducts	1.5 lbs.	**11.30**
G1590-4-3	4 ducts	1.8 lbs.	**15.90**
G1590-5-3	5 ducts	2.0 lbs.	**18.10**



G1580-2
Support

Used with G-1538 series support coupler. Also has flat-bottom bridge and is furnished with **2″** leveling legs and hold-down feet.

Catalog Number	Duct Capacity	Weight Each	Price Each
*G1580-1	1 duct	.7 lbs.	**$ 6.90**
G1580-2	2 ducts	.9 lbs.	**9.00**
G1580-3	3 ducts	1.4 lbs.	**11.30**
G1580-112	2 Std./1 Super	2.0 lbs.	**15.90**
G1580-22	2 Super	2.0 lbs.	**15.90**
G1580-212	1 Std./2 Super	2.6 lbs.	**18.10**
G1580-122	1 Std./2 Super	2.6 lbs.	**18.10**

● For longer leg add suffix. e.g.: G1548-2-6 designates 6″ leveling leg. See Page 133 for lengths available.
*On orders shipped from warehouse stock, use support couplings as supports.

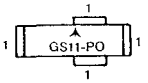
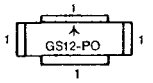
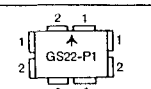
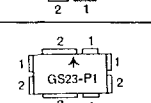
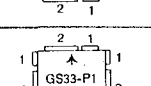
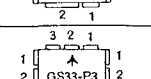
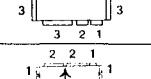
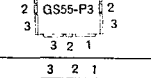
Shaded items are in warehouse stock.

DE CATALOG REFERENCE: SECTION 5200

SQD SLV_000908

SINGLE LEVEL JUNCTION BOXES

SINGLE LEVEL JUNCTION BOXES

Drawing	Description	Insert Height	*Catalog Number	Box Height Min.	Box Height Max.	Weight Each	Price Each
	1 Std. Duct by 1 Std. Duct 1 Service Box	7/8"	GS11-07PO-2	2 1/2"	3"	10.2 lbs.	$ 96.
		1 3/8"	GS11-13PO-2	2 3/4"	3 1/2"	10.6 lbs.	96.
		1 7/8"	GS11-17PO-2	3 1/4"	4"	11.0 lbs.	96.
		2 3/8"	GS11-23PO-2	3 3/4"	4 1/2"	11.4 lbs.	96.
		2 7/8"	GS11-27PO-2	4 1/4"	5"	11.8 lbs.	104.
		3 3/8"	GS11-33PO-2	4 3/4"	5 1/2"	12.2 lbs.	104.
	1 Std. Duct by 1 Super Duct 1 Service Box	7/8"	GS12-07PO-2	2 1/2"	3"	9.8 lbs.	128.
		1 3/8"	GS12-13PO-2	2 3/4"	3 1/2"	10.1 lbs.	128.
		1 7/8"	GS12-17PO-2	3 1/4"	4"	10.4 lbs.	128.
		2 3/8"	GS12-23PO-2	3 3/4"	4 1/2"	10.7 lbs.	128.
		2 7/8"	GS12-27PO-2	4 1/4"	5"	11.0 lbs.	137.
		3 3/8"	GS12-33PO-2	4 3/4"	5 1/2"	11.3 lbs.	137.
	1 Super Duct by 1 Super Duct 1 Service Box	7/8"	GS22-07PO-2	2 1/2"	3"	15.5 lbs.	159.
		1 3/8"	GS22-13PO-2	2 3/4"	3 1/2"	16.2 lbs.	159.
		1 7/8"	GS22-17PO-2	3 1/4"	4"	16.9 lbs.	159.
		2 3/8"	GS22-23PO-2	3 3/4"	4 1/2"	17.6 lbs.	159.
		2 7/8"	GS22-27PO-2	4 1/4"	5"	18.3 lbs.	173.
		3 3/8"	GS22-33PO-2	4 3/4"	5 1/2"	19.0 lbs.	173.
	2 Std. Duct by 2 Std. Duct 2 Service Box	7/8"	GS22-07P1-2	2 1/2"	3"	17.6 lbs.	159.
		1 3/8"	GS22-13P1-2	2 3/4"	3 1/2"	18.3 lbs.	159.
		1 7/8"	GS22-17P1-2	3 1/4"	4"	19.0 lbs.	159.
		2 3/8"	GS22-23P1-2	3 3/4"	4 1/2"	19.7 lbs.	159.
		2 7/8"	GS22-27P1-2	4 1/4"	5"	20.4 lbs.	173.
		3 3/8"	GS22-33P1-2	4 3/4"	5 1/2"	21.1 lbs.	173.
	Std. Std. by Std. Super 2 Service Box	7/8"	GS23-07P1-2	2 1/2"	3"	24.5 lbs.	225.
		1 3/8"	GS23-13P1-2	2 3/4"	3 1/2"	25.0 lbs.	225.
		1 7/8"	GS23-17P1-2	3 1/4"	4"	25.5 lbs.	225.
		2 3/8"	GS23-23P1-2	3 3/4"	4 1/2"	26.0 lbs.	225.
		2 7/8"	GS23-27P1-2	4 1/4"	5"	26.5 lbs.	249.
		3 3/8"	GS23-33P1-2	4 3/4"	5 1/2"	27.0 lbs.	249.
	Std. Super by Std. Super 2 Service Box	7/8"	GS33-07P1-2	2 1/2"	3"	35.0 lbs.	307.
		1 3/8"	GS33-13P1-2	2 3/4"	3 1/2"	35.5 lbs.	307.
		1 7/8"	GS33-17P1-2	3 1/4"	4"	36.0 lbs.	307.
		2 3/8"	GS33-23P1-2	3 3/4"	4 1/4"	36.6 lbs.	307.
		2 7/8"	GS33-27P1-2	4 1/4"	5"	37.3 lbs.	338.
		3 3/8"	GS33-33P1-2	4 3/4"	5 1/2"	38.0 lbs.	338.
	Std. Std. Std. by Std. Std. Std. 3 Service Box	7/8"	GS33-07P3-2	2 1/2"	3"	36.0 lbs.	307.
		1 3/8"	GS33-13P3-2	2 3/4"	3 1/2"	36.5 lbs.	307.
		1 7/8"	GS33-17P3-2	3 1/4"	4"	37.0 lbs.	307.
		2 3/8"	GS33-23P3-2	3 3/4"	4 1/2"	37.6 lbs.	307.
		2 7/8"	GS33-27P3-2	4 1/4"	5"	38.2 lbs.	338.
		3 3/8"	GS33-33P3-2	4 3/4"	5 1/2"	38.9 lbs.	338.
	Super Super by Super Super 2 Service Box	7/8"	GS44-07P1-2	2 1/2"	3"	52.5 lbs.	450.
		1 3/8"	GS44-13P1-2	2 3/4"	3 1/2"	53.0 lbs.	450.
		1 7/8"	GS44-17P1-2	3 1/4"	4"	53.5 lbs.	450.
		2 3/8"	GS44-23P1-2	3 3/4"	4 1/2"	54.0 lbs.	450.
		2 7/8"	GS44-27P1-2	4 1/4"	5"	54.6 lbs.	497.
		3 3/8"	GS44-33P1-2	4 3/4"	5 1/2"	55.3 lbs.	497.
	Std. Std. Super by Std. Std. Super 3 Service Box	7/8"	GS44-07P3-2	2 1/2"	3"	53.0 lbs.	450.
		1 3/8"	GS44-13P3-2	2 3/4"	3 1/2"	53.5 lbs.	450.
		1 7/8"	GS44-17P3-2	3 1/4"	4"	54.0 lbs.	450.
		2 3/8"	GS44-23P3-2	3 3/4"	4 1/2"	54.5 lbs.	450.
		2 7/8"	GS44-27P3-2	4 1/4"	5"	55.2 lbs.	497.
		3 3/8"	GS44-33P3-2	4 3/4"	5 1/2"	55.9 lbs.	497.
	Std. Super Super by Std. Super Super 2 Service Box	7/8"	GS55-07P1-2	2 1/2"	3"	80.8 lbs.	521.
		1 3/8"	GS55-13P1-2	2 3/4"	3 1/2"	81.0 lbs.	521.
		1 7/8"	GS55-17P1-2	3 1/4"	4"	81.5 lbs.	521.
		2 3/8"	GS55-23P1-2	3 3/4"	4 1/2"	82.2 lbs.	521.
		2 7/8"	GS55-27P1-2	4 1/4"	5"	82.8 lbs.	571.
		3 3/8"	GS55-33P1-2	4 3/4"	5 1/2"	83.5 lbs.	571.
	Super Std. Super by Super Std. Super 3 Service Box	7/8"	GS55-07P3-2	2 1/2"	3"	80.5 lbs.	521.
		1 3/8"	GS55-13P3-2	2 3/4"	3 1/2"	81.0 lbs.	521.
		1 7/8"	GS55-17P3-2	3 1/4"	4"	81.5 lbs.	521.
		2 3/8"	GS55-23P3-2	3 3/4"	4 1/2"	82.2 lbs.	521.
		2 7/8"	GS55-27P3-2	4 1/4"	5"	82.8 lbs.	571.
		3 3/8"	GS55-33P3-2	4 3/4"	5 1/2"	83.5 lbs.	571.
	Std. Super Super by Std. Super Super 3 Service Box	7/8"	GS55-07P7-2	2 1/2"	3"	80.8 lbs.	521.
		1 3/8"	GS55-13P7-2	2 3/4"	3 1/2"	81.0 lbs.	521.
		1 7/8"	GS55-17P7-2	3 1/4"	4"	81.5 lbs.	521.
		2 3/8"	GS55-23P7-2	3 3/4"	4 1/2"	82.2 lbs.	521.
		2 7/8"	GS55-27P7-2	4 1/4"	5"	82.8 lbs.	571.
		3 3/8"	GS55-33P7-2	4 3/4"	5 1/2"	83.5 lbs.	571.

*Suffix -2 designates length of leveling leg. Standard leveling leg is 2" long. For longer leg change suffix accordingly. See Page 133 for lengths available.

PANS FOR JUNCTION BOXES

PANS FOR JUNCTION BOXES

●TERRAZZO PANS FOR JUNCTION BOXES				▲CARPET PANS FOR JUNCTION BOXES			
Catalog Number	Height	Junction Box	Price Each	Catalog Number	Height	Junction Box	Price Each
G1356-5,-7	5/8", 7/8"	GH1, GH3	$120.	G301	1/4" to 5/8"	GH1, GH3	$41.
G212-5,-7	5/8", 7/8"	GS11, GS12, GT11, GT12	120.	G312	1/4" to 5/8"	GS11, GS12, GT11, GT12	41.
G222-5,-7	5/8", 7/8"	GS22, GT22, GH22	222.	G322	1/4" to 5/8"	GS22, GT22, GH22,	41.
G223-5,-7	5/8", 7/8"	GS23, GT23	239.	G323	1/4" to 5/8"	GS23, GT23	52.
G224-5,-7	5/8", 7/8"	GS24, GT24	274.	G324	1/4" to 5/8"	GS24, GT24	52.
G233-5,-7	5/8", 7/8"	GS33	291.	G333	1/4" to 5/8"	GS33	68.
G234-5,-7	5/8", 7/8"	GS34, GT34	327.	G334	1/4" to 5/8"	GS34, GT34	68.
G244-5,-7	5/8", 7/8"	GS44	359.	G344	1/4" to 5/8"	GS44	90.
G255-5,-7	5/8", 7/8"	GS55	410.	G355	1/4" to 5/8"	GS55	90.

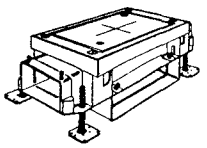
●Other height trims are available. Consult factory.
▲Standard carpet pans have extruded aluminum trims. Bronze trims are available. Consult factory.
Shaded items are in warehouse stock.

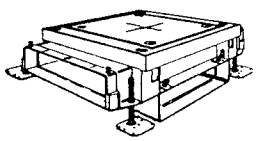
DE CATALOG REFERENCE: SECTION 5200

SQD SLV_000909

UNDERFLOOR DUCT

TWO LEVEL JUNCTION BOXES


GT11


GT12

GT22

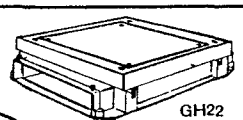
Description	Insert Height (Upper level duct)	*Catalog Number	Box Height Min.	Box Height Max.	Weight Each	Price Each
1 Std. Upper by 1 Std. Lower 1 Service Box	7/8"	GT11-07PO-3	4"	4½"	10.8 lbs.	$100.
	1⅜"	GT11-13PO-3	4¼"	5"	11.1 lbs.	100.
	1⅞"	GT11-17PO-3	4¾"	5½"	11.4 lbs.	100.
	2⅜"	GT11-23PO-3	5¼"	6"	11.7 lbs.	100.
	2⅞"	GT11-27PO-3	5¾"	6½"	12.0 lbs.	111.
	3⅜"	GT11-33PO-3	6¼"	7"	12.3 lbs.	111.
1 Std. Upper by 1 Super Lower 1 Service Box	7/8"	GT12-07PO-3	4"	4½"	10.4 lbs.	141.
	1⅜"	GT12-13PO-3	4¼"	5"	10.7 lbs.	141.
	1⅞"	GT12-17PO-3	4¾"	5½"	11.0 lbs.	141.
	2⅜"	GT12-23PO-3	5¼"	6"	11.3 lbs.	141.
	2⅞"	GT12-27PO-3	5¾"	6½"	11.6 lbs.	154.
	3⅜"	GT12-33PO-3	6¼"	7"	11.9 lbs.	154.
1 Super Upper by 1 Super Lower 1 Service Box	7/8"	GT22-07PO-3	4"	4½"	17.4 lbs.	171.
	1⅜"	GT22-13PO-3	4¼"	5"	18.1 lbs.	171.
	1⅞"	GT22-17PO-3	4¾"	5½"	18.8 lbs.	171.
	2⅜"	GT22-23PO-3	5¼"	6"	19.5 lbs.	171.
	2⅞"	GT22-27PO-3	5¾"	6½"	20.2 lbs.	189.
	3⅜"	GT22-33PO-3	6¼"	7"	20.9 lbs.	189.
2 Std. Upper by 2 Std. Lower 1 Service Box	7/8"	GT22-07P1-3	4"	4½"	19.1 lbs.	171.
	1⅜"	GT22-13P1-3	4¼"	5"	19.8 lbs.	171.
	1⅞"	GT22-17P1-3	4¾"	5½"	20.5 lbs.	171.
	2⅜"	GT22-23P1-3	5¼"	6"	21.2 lbs.	171.
	2⅞"	GT22-27P1-3	5¾"	6½"	22.9 lbs.	189.
	3⅜"	GT22-33P1-3	6¼"	7"	23.6 lbs.	189.

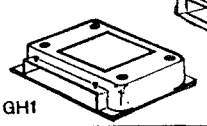
*Suffix -3 designates length of leveling leg. Standard leveling leg is 3" long. For longer leg change suffix accordingly. See Page 133 for lengths available.

HEADERDUCT

USE SUPER BLANK DUCT WITH FOLLOWING BOXES.

Boxes

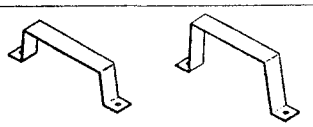

GH22


GH1

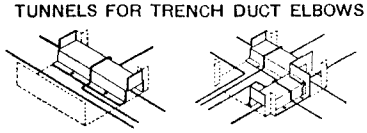
Catalog Number	Description	Box Height Min.	Box Height Max.	Weight Each	Price Each
*GH1-07-2.5	Access unit w/2½" grommet	2½"	3¼"	10 lbs.	$159.
*GH1-13-2.5	Access unit w/2½" grommet	3"	3¾"	11 lbs.	159.
*GH22-07-2.5	Cross box w/2½" grommet	2½"	3"	12 lbs.	159.
*GH22-13-2.5	Cross box w/2½" grommet	2¾"	3½"	13 lbs.	159.

HEADERDUCT AND TRENCHDUCT ACCESSORIES


G1429 G1421-C G1426



TUNNELS FOR TRENCH DUCT ELBOWS


Straight thru tunnel 90° elbow tunnel


Cell to Conduit Adapter

Leveling Screws Not Included. Order from Page 133


Trench Duct Support Channel

Tape

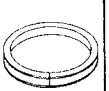
Description	Catalog Number	Weight Each	Price Each
Closing Cap for G1491 Afterset Inserts	G1429	.20 lbs.	$ 1.00
Marker Screw Assembly for Afterset Inserts	G1421-C	.25 lbs.	1.70
Marker Screw Assembly for Cell Floors	G1426	.25 lbs.	2.70
Tie Down Strap 1½" Leg	G1477-1.5	1.0	2.70
Tie Down Strap 3" Leg	G1477-3	1.0	2.70
90° tunnel for 12" floor trench tee or cross	RSV12-2ET	3.2	28.00
90° tunnel for 18" floor trench tee or cross	RSV18-2ET	5.1	35.00
Straight tunnel for 12" floor trench tee or cross	RSV12-2ST	2.9	18.00
Straight tunnel for 18" floor trench tee or cross	RSV18-2ST	3.8	23.00
1" Conduit Adapter for Cellular Floor	G1646	3.0 lbs.	16.00
1¼" Conduit Adapter for Use with Cellular Metal Floor. For ¾" Conduit, Use Bushings shown on Page 133	G1647	3.0 lbs.	16.00
Support Channel for 9" & 12" wide trench	G1500-T12	1.3 lbs.	11.30
Support Channel for 18" & 24" wide trench	G1500-T24	2.0 lbs.	13.60
Support Channel for 30" & 36" wide trench	G1500-T36	2.9 lbs.	15.90
2" Wide for Trench Cover Plate (180 ft/roll)	G1414	1.2 lbs.	26.00
3" Wide for Cell Floor (180 ft/roll)	G1415	3.0 lbs.	35.00

GROMMETS


G1492-36


G1492-4CR

METAL Description	Catalog Number	Weight Each	Price Each
2½" Dia. Grommet	G1492-2.5	.2	$ 5.20
3" Dia. Grommet	G1492-3	.3	5.20
4" Dia. Grommet	G1492-4	.4	11.40
3" x 6" Grommet	G1492-36	.5	19.00
4" Dia. x 2½" High with cable bushing	G1492-4CR	1.5	59.00



PLASTIC Description	Catalog Number	Weight Each	Price Each
2½" Dia. Grommet	G1472-2.5P	.03	$2.00
3" Dia. Grommet	G1472-3P	.03	2.00
4" Dia. Grommet	G1472-4P	.04	2.70
3" x 6" Grommet	G1472-36P	.04	2.70
3" x 7" Grommet	G1472-37P	.05	2.70

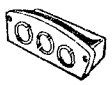
NOTE: For afterset insert, see page 138.

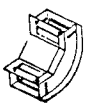
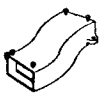
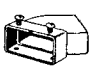
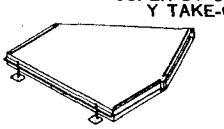
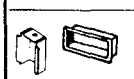
*Access units are available to accommodate up to 5" slabs. *Access units are also available with 3", 4" or 3"x6" openings and grommets. No price change.

Shaded items are in warehouse stock.

SQD SLV_000910

UNDERFLOOR DUCT ACCESSORIES

ITEM	Catalog Number	Weight Each	Price Each
 BOX OPENING PLUGS	STANDARD G1401	.15 lbs.	$ 1.00
	SUPER G1402	.30 lbs.	2.00
 DUCT END PLUGS	STANDARD G1411	.14 lbs.	1.00
	SUPER G1412	.28 lbs.	2.00
 2" CONDUIT ADAPTER AND CABINET CONNECTOR FOR 3" DIA. K.O.	STANDARD G1432	1.5 lbs.	10.90
 CONDUIT ADAPTER For three 1¼" conduits reduced to two ¾" and one 1" conduit.	SUPER G1433	2.0 lbs.	14.80
CONDUIT ADAPTERS 1¼" 2-1¼"  G1435  ½" ¾" 1" G1434, 36, 37, & 38	G1434	1.0 lbs.	8.20
	G1435	1.4 lbs.	10.90
	G1436	1.0 lbs.	8.20
	G1437	1.0 lbs.	8.20
	G1438	1.0 lbs.	8.20
REDUCER BUSHINGS 2" to 1½" 1¼" to ¾" 1¼" to 1"  G1455 G1457 G1458	G1455	.10 lbs.	3.80
	G1457	.7 lbs.	3.80
	G1458	.5 lbs.	3.80
 SLEEVE COUPLING	STANDARD G1463	.5 lbs.	3.50
	SUPER G1464	1.0 lbs.	7.00
 EXPANSION COUPLING	STANDARD G1465	2.0 lbs.	26.00
	SUPER G1466	4.0 lbs.	52.00
SEALING COMPOUND 1/10 gallon disposable container for caulking gun.	G1470	1.5 lbs.	2.00
INSERT TO CONDUIT ADAPTER 			
2" I.P.S. to ½"	G1480	.75 lbs.	5.50
2" I.P.S. to ¾"	G1481	.70 lbs.	5.50
2" I.P.S. to 1"	G1482	.60 lbs.	5.50
2" I.P.S. to 1¼"	G1483	.50 lbs.	5.50
2" I.P.S. to 1½"	G1484	.45 lbs.	5.50
 Ellipsoid to ¾"	G1485	.60 lbs.	5.50
Ellipsoid to 1"	G1486	.55 lbs.	5.50
Ellipsoid to 1¼"	G1487	.47 lbs.	5.50
Ellipsoid to 1½"	G1488	.38 lbs.	5.50
Ellipsoid to 2"	G1489	.28 lbs.	10.90
REDUCING COUPLING Super to Standard 	G1563	4.0 lbs.	33.00
 INSERT CLOSING CAP	G153A	.10 lbs.	.50
 MARKER SCREW ASSEMBLY	G155	.10 lbs.	2.00
Escutcheon Washers White	G1413	.02	.03
Order in multiples of 50 Red	G1413R	.02	.03
use with G155 or G1426 Blue	G1413B	.02	.03

ITEM	Catalog Number	Weight Each	Price Each
 VERTICAL ELBOWS	STANDARD G1603	2.2 lbs.	$16.00
	SUPER G1604	3.5 lbs.	32.00
OFFSET ELBOWS STANDARD 	G1605-075	3.2 lbs.	16.00
	G1605-150	3.2 lbs.	16.00
	G1605-200	3.2 lbs.	16.00
SUPER Leveling screws not included	G1606-150	6.0 lbs.	32.00
	G1606-200	6.0 lbs.	32.00
90° HORIZONTAL ELBOWS  Leveling screws not included	STANDARD G1611	7.0 lbs	32.00
	SUPER G1612	16.5 lbs.	64.00
 HORIZ. ADJUSTABLE ELBOW Allow a turn from 15° to 30°	STANDARD G1615	1.2 lbs.	8.00
	SUPER G1616	2.9 lbs.	16.00
 VERTICAL ADJUSTABLE ELBOW Used for offsetting duct runs where standard offsets are not applicable.	STANDARD G1617	2.0 lbs.	16.00
	SUPER G1618	4.0 lbs.	32.00
 HORIZONTAL ELBOWS 45° For Super 45° Turn Use Two G1616	STANDARD G1619	2.0 lbs.	16.00
 CABINET CONNECTORS	STANDARD G1621	.5 lbs.	6.00
Std hole req'd. 1⅞" x 3⅜". Super hole req'd. 1⅞" x 7¾". ▲Double super duct, back to back mtg.	SUPER G1622	.9 lbs.	12.00
	▲G1623	1.5 lbs.	22.00
 Y TAKE-OFF FITTING	STANDARD *G1631	2.7 lbs.	16.00
	†G1633	2.7 lbs.	16.00
*Use at box opening—30° take-off †Use as coupling—45° take-off	SUPER *G1632	4.7 lbs.	32.00
	†G1634	4.7 lbs.	32.00
SUPER BY SUPER BY SUPER Y TAKE-OFF FITTING  30°	SUPER G1637	9.0 lbs.	55.00
LEVELING LEGS 			
⅝" x 2"	G1910-2	.19 lbs.	1.40
⅝" x 3"	G1910-3	.21 lbs.	1.40
⅝" x 4"	G1910-4	.23 lbs.	1.50
⅝" x 6"	G1910-6	.27 lbs.	1.50
⅝" x 8"	G1910-8	.31 lbs.	1.70
⅝" x 10"	G1910-10	.35 lbs.	1.70
⅝" x 12"	G1910-12	.39 lbs.	1.90
⅝" x 14"	G1910-14	.43 lbs.	1.90
 BOX OPENING SEPARATOR Used With G1401 To Reduce Super Box Opening To Standard Opening	G1401-1	.30	2.50

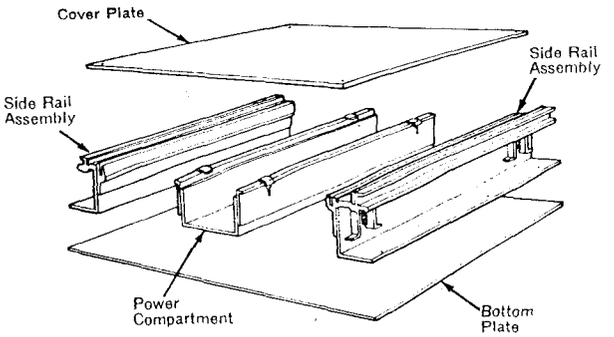
Shaded items are in warehouse stock.

DE CATALOG REFERENCE: SECTION 5200

SQD SLV_000911

RAIL-WAY™ TRENCH DUCT

STOCK SHIPMENT



RAIL-WAY™ TRENCH DUCT 12", 18" AND 24" WIDTHS

For maximum flexibility and availability directly from stock in three of the most popular trench duct sizes of 12", 18" and 24" widths; use 10 foot long trench duct side rail assemblies in conjunction with the other components as listed below to assemble a trench duct system to fit your job requirements. Side rail assemblies can be field cut to meet job conditions. Longitudinal slots in the side rail assembly for cover plate screws allow for random placement of cover plates. Cover plates are 2 foot long and can also be field cut as needed to fit odd length trench duct runs. Cover plates are shipped separately. Spacer bars are used to assure correct width and height of the trench duct run.

RAIL-WAY™ TRENCH DUCT SIDE RAILS

Item	Catalog Number	Description	Price Each
SIDE RAIL ASSEMBLY	RS-120	10'-0"L. Order two (2) side rail assemblies for each 10 foot length of Trench Duct required. Rails are adjustable from 2⅜"H. to 3⅜"H. Order cover plates, bottom plates, dividers and partitions from component list below. Components are priced and shipped separately.	$149.

RAIL-WAY™ TRENCH DUCT COMPONENT ASSEMBLIES

Description			Price
COVER PLATES	●RCP12-12	12"W 12"L	$ 43.
	●RCP12-24	12"W 24"L	54.
	●RCP18-12	18"W 12"L	59.
	●RCP18-24	18"W 24"L	74.
	RCP24-24	24"W 24"L	108.
BOTTOM PLATES	RB12-60	15"W x 60"L	38.
	RB18-60	21"W x 60"L	52.
	RB24-60	27"W x 60"L	76.
VERTICAL ELBOWS	●RVE12	12"W x 6"L x 6"H	83.
	●RVE18	18"W x 6"L x 6"H	97.
	RVE24	24"W x 6"L x 6"H	113.
RISER AND CABINET CONNECTOR (REMOVABLE FRONT)	RRC12	10"W x 3½"D x 46"-50"H (adj.)	111.
	RRC18	16"W x 3½"D x 46"-50"H (adj.)	136.
	RRC24	22"W x 3½"D x 46"-50"H (adj.)	164.
TEE — Order proper RTLB Series Bottom Plate (Order two tees to make one cross)	RT		107.
HORIZONTAL ELBOW — Order proper RTLB Series Plate	RL		107.
BOTTOM PLATE FOR TEE AND HORIZONTAL ELBOW	RTLB12	for 12" x 12" Tee or Horizontal Elbow	59.
	RTLB18	for 18" x 18" Tee or Horizontal Elbow	74.
	RTLB24	for 24" x 24" Tee or Horizontal Elbow	98.

Description			Price
U-COMPARTMENT 5'-0" x 3-½" Adjustable Barriers	RUC-60		$ 98.
Z-DIVIDER 5'-0" Adjustable Barrier and Support Strip	RZD-60		45.
END CLOSURE	●REC12	for 12"W Trench	23.
	●REC18	for 18"W Trench	40.
	REC24	for 24"W Trench	52.
SPACER BAR AND BARRIER ADJUSTMENT GAGE	RSB12	for 12"W Trench	45.
	RSB18	for 18"W Trench	63.
	RSB24	for 24"W Trench	86.
COVER LIFTER (SUCTION CUF DEVICE)	G1735-S		191.
	RG50	Grommetting Material (50 ft. rolls)	32.
	G1414	Tape for Trench Duct 2"W. (180 ft. rolls)	26.
	G1415	Tape for Cell Butt-Joints 3"W. (180 ft. rolls)	35.

All of the above listed items in warehouse stock. Other widths and depths available from factory. Trench duct with factory assembled bottom plates also available from factory. Factory assembled trench duct shipped in 10 ft. lengths as standard with cover plates shipped separately.

TRENCH DUCT TUB ASSEMBLIES●

Item	Description	12" WIDE TRENCH Catalog Number	12" WIDE TRENCH Price	18" WIDE TRENCH Catalog Number	18" WIDE TRENCH Price	Covers and/or Vertical Elbows for connecting Floor Trench to Lay-in Wall Duct—Order Separately
STRAIGHT LENGTH TUBS	6'-0"L x 2½" deep	RSV12-2100-072	$250.	RSV18-2100-072	$325.	3—24" Long Covers
	4'-3½"L x 2½" deep	RSV12-2100-051.5	165.	RSV18-2100-051.5	215.	2—24" Long Covers & 1—Wall Duct Vertical Elbow
	3'-3½"L x 2½" deep	RSV12-2100-039.5	128.	RSV18-2100-039.5	165.	1—24" & 1—12" Long Cover & 1—Wall Duct Vertical Elbow
	2'-0"L x 2½" deep	RSV12-2100-024	108.	RSV18-2100-024	140.	1—24" Long Cover
	1'-0"L x 2½" deep	RSV12-2100-012	83.	RSV18-2100-012	108.	1—12" Long Cover
	0'-3½" L x 2½" deep	RSV12-2100-003.5	38.	RSV18-2100-003.5	50.	1 Wall Duct Vertical Elbow
	45° hor. elbow	RHV12-245	256.	RHV18-245	328.	Covers are included and factory installed

*Depth of tub is adjustable from 2⅜" to 3⅜".

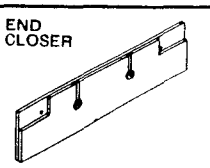
●For other Trench Duct Stock components, see page 135.

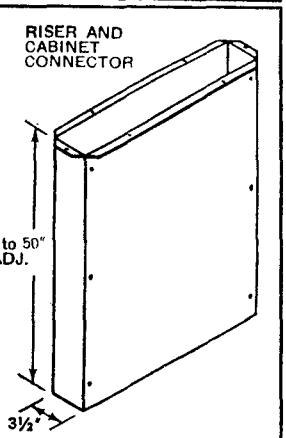
DE CATALOG REFERENCE: SECTION 5230

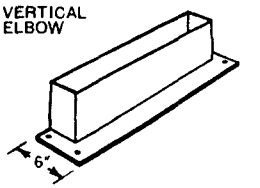
SQD SLV_000912

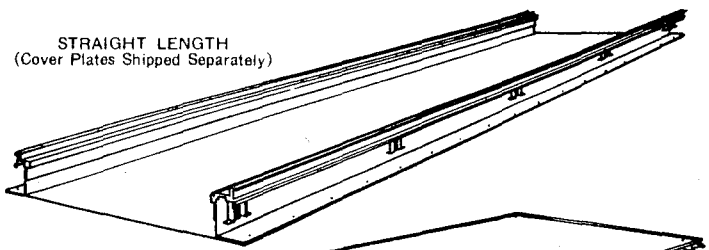
FACTORY SHIPMENT

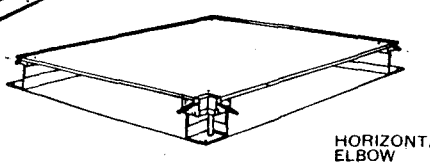
NOTES:
1. Standard length of trench duct is 10 ft. Cover plates are shipped separately.
2. Features of trench duct to be noted are as follows:
   a. Trench duct width is cover plate width.
   b. Tub width is trench duct width less 1¾".
   c. Overall width (bottom flange to flange) is 3" wider than trench duct width.
   d. Standard depth is adjustable from 2⅜" to 3¾". Also available as standard is depth adjustable from 3" to 4". Other depths available.
   e. Tees, crosses, horizontal elbows and reducers are shipped complete with cover plates assembled.
   f. Grey vinyl tile trim is furnished as standard. Aluminum is available when requested.
3. PRICES FOR ADDITIONS AND SPECIAL FEATURES:
   a. For each foot of adjustable partition add **$9.00** per foot of partition.
   b. For each 1" of depth beyond range of 3" to 4" add **$4.00** per foot of trench duct.
   c. For double tile trim on two sides of cover plate ONLY add **$15.00** per foot of trench duct.
   d. For double tile trim on all four sides of cover plate add **$45.00** per foot of trench duct.
   e. For "Clip-Cover" (screwless, latch spring cover) add **$15.00** per foot of trench duct.
   f. For support post add **$8.00** per foot of trench duct for each row of posts required.
   g. Underfloor duct connection into side without trench tunnels, add **$30.00** per connection.
   h. Underfloor duct connection into side with trench tunnels, add **$60.00** per connection.

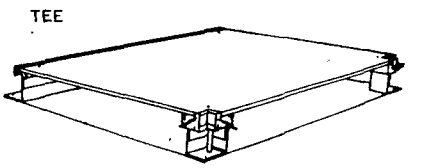




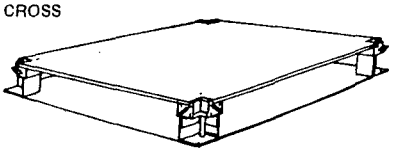








All cover plate corner notches are 1½" deep.



NOTE: All part numbers listed below are for 2½" deep, one compartment trench with vinyl tile trims.

ITEM	TUBS ONLY				★COVERS ONLY (5 Plates Per 10' Length)				✱COMPLETE DEVICE	
	Length	Width	Catalog Number	Price	Width	Length	Catalog Number	Price	Per 10' Length	Per Foot
Straight Length	10'-0"	9"	RSV 092100-120	**$345.**	9"	24"	RCP 09-24	**$ 45.**	**$ 570.**	**$ 57.**
		12"	RSV 122100-120	**410.**	12"		✱RCP 12-24	**54.**	**680.**	**68.**
		18"	RSV 182100-120	**510.**	18"		✱RCP 18-24	**74.**	**880.**	**88.**
		24"	RSV 242100-120	**620.**	24"		RCP 24-24	**108.**	**1160.**	**116.**
		27"	RSV 272100-120	**670.**	27"		RCP 27-24	**118.**	**1260.**	**126.**
		30"	RSV 302100-120	**710.**	30"		RCP 30-24	**138.**	**1140.**	**140.**
		36"	RSV 362100-120	**850.**	36"		RCP 36-24	**168.**	**1690.**	**169.**

★Straight length cover plates are shipped separately from tubs. Both tubs and covers must be ordered.

ITEM	COMPLETE DEVICE				ITEM	COMPLETE DEVICE			
	Width	Catalog Number	Labor Only	Complete Device		Width	Catalog Number	Labor Only	Complete Device
Tees†	9"	RTV 092100-014	**$170.**	**$222.**	**End Closures**	9"	REC-09	....	**$ 20.**
	12"	✱RTV 122100-017	**170.**	**256.**		12"	✱REC-12	....	**23.**
	18"	✱RTV 182100-023	**170.**	**328.**		18"	✱REC-18	....	**40.**
	24"	RTV 242100-029	**170.**	**457.**		24"	REC-24	....	**52.**
	27"	RTV 272100-032	**190.**	**526.**		27"	REC-27	....	**59.**
	30"	RTV 302100-035	**190.**	**615.**		30"	REC-30	....	**63.**
	36"	RTV 362100-041	**190.**	**803.**		36"	REC-36	....	**78.**
Vertical Elbows	9"	RVE 09	....	**76.**	**Horizontal† Elbows**	9"	RHV 092100-012	**$170.**	**222.**
	12"	✱RVE 12	....	**83.**		12"	✱RHV 122100-015	**170.**	**256.**
	18"	✱RVE 18	....	**97.**		18"	✱RHV 182100-021	**170.**	**328.**
	24"	RVE 24	....	**113.**		24"	RHV 242100-027	**170.**	**457.**
	27"	RVE 27	....	**120.**		27"	RHV 272100-030	**190.**	**526.**
	30"	RVE 30	....	**126.**		30"	RHV 302100-033	**190.**	**615.**
	36"	RVE 36	....	**141.**		36"	RHV 362100-039	**190.**	**803.**
Risers and Cabinet Connectors	...	RRC 09	....	**97.**	**Crosses†**	9"	RXV 092100-015	**300.**	**349.**
	...	✱RRC 12	....	**111.**		12"	✱RXV 122100-018	**300.**	**382.**
	...	✱RRC 18	....	**136.**		18"	✱RXV 182100-024	**300.**	**457.**
	...	RRC 24	....	**164.**		24"	RXV 242100-030	**300.**	**582.**
	...	RRC 27	....	**173.**		27"	RXV 272100-033	**340.**	**676.**
	...	RRC 30	....	**189.**		30"	RXV 302100-036	**340.**	**761.**
	...	RRC 36	....	**210.**		36"	RXV 362100-042	**340.**	**948.**
REDUCER 18" to 12"	12"	RRV 182100-012LR	....	**328.**	**REDUCER** 18" to 12"	12"	RRV 182100-012RR	....	**328.**

†See note 2e above.
✱12" & 18" Floor trench is stocked in warehouse. See page 134 for other components.

DE CATALOG REFERENCE: SECTION 5230

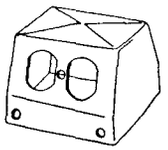
SQD SLV_000913

SERVICE FITTINGS

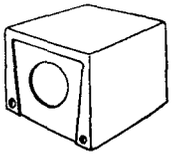
STANDARD SERVICE FITTINGS HAVE A BRUSHED ALUMINUM FINISH●

FOR HIGH POTENTIAL SERVICE*

G2-BA



G1-DA

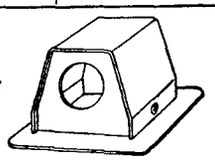


Dimensions: 4⅛" long; 4⅛" wide; 2¹⁵⁄₁₆" high.

Catalog Number	Accommodates	Weight Each	Price Each
G1-DA	One standard single receptacle—30 amp.	1.5 lbs.	**$26.**
G1-EA	One standard single receptacle—50 amp.	1.5 lbs.	**26.**
G2-BA	One standard duplex receptacle—20 amp.	1.5 lbs.	**26.**
G2-BB	Two standard duplex receptacles, back to back—20 amp.	1.5 lbs.	**26.**
G2-CA	One standard single receptacle—20 amp.	1.5 lbs.	**26.**
G2-CC	Two standard single receptacles, back to back—20 amps.	1.5 lbs.	**26.**
G2-DA	One 2410 4W. Twist lock receptacle.	1.5 lbs.	**26.**
G2-FA	One ⅞" dia. opening for flexible conduit.	1.5 lbs.	**26.**
G2-FF	Two ⅞" dia. opening for flexible conduit.	1.5 lbs.	**26.**

FOR HIGH POTENTIAL SERVICE*

G7

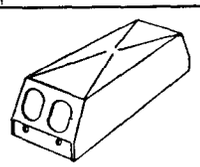


Dimensions: 2⅜" long; 2⅜" wide; 2⅜" high.

Catalog Number	Accommodates	Weight Each	Price Each
G7-CA	One single receptacle, #5258-15 amp. 125 volt 3 wire grounded U slot.	.75 lbs.	**$31.**
G7-CC	Two single receptacles, #5258-15 amp. 125 volt 3 wire grounded U slot. Back to back.	.75 lbs.	**31.**

FOR HIGH AND LOW* POTENTIAL SERVICE

G6

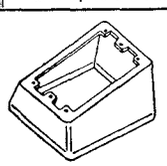


Dimensions: 10" long; 4" wide; 2¹⁵⁄₁₆" high.

Catalog Number	Accommodates	Weight Each	Price Each
G6	One standard duplex receptacle, 20 amp. and up to a 3 Amphenol★ connector.	2.1 lbs.	**$52.**

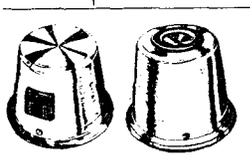
FOR HIGH OR LOW* POTENTIAL SERVICE

G10



Dimensions: 4⅝" long; 3⅝" wide; 2⅝" high.

Catalog Number	Accommodates	Weight Each	Price Each
G10	Receptacle or telephone jack or connecting block with appropriate cover plate which can be installed in a standard 2" x 4" wall box.	1.5 lbs.	**$31.**



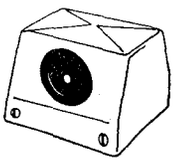
FOR HIGH OR LOW POTENTIAL SERVICE CYLINDRICAL FITTINGS

Dimensions: 2¾" Diameter Top; 3" High; 3⅞" Diameter Bottom.

Catalog Number	Includes	Weight Each	Price Each
G15LA-AL	One Bushed Opening —Satin Aluminum	1.5 lbs.	**$27.**
G15LA-BN	—Anodized Bronze	1.5 lbs.	**34.**
G15CC-AL	Two 15A., 125 V., 3 Wire Parallel U-Slot Receptacles —Satin Aluminum	1.5 lbs.	**$33.**
G15CC-BN	—Anodized Bronze	1.5 lbs.	**39.**

FOR LOW POTENTIAL SERVICE

G2-LA



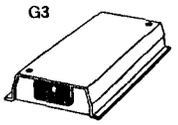
Dimensions: 4⅛" long; 4⅛" wide; 2¹⁵⁄₁₆" high.

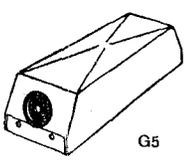
Catalog Number	Description	Weight Each	Price Each
G2-LA	One insulated bushing with ¾" dia. hole	1.5 lbs	**$26.**
G2-LL	Two insulated bushings with ¾" dia. hole	1.5 lbs.	**26.**
G2-GA	Opening for one modular connector.	1.5 lbs.	**26.**
G2-GG	Openings for two modular connectors.	1.5 lbs.	**26.**
G2-GL	Openings for one modular connector and one insulated bushing.	1.5 lbs.	**26.**
G2-BA	For SUTTLE 625B3 series duplex connectors	1.5 lbs.	**26.**
G2-CA	For SUTTLE 625B4 series single connectors	1.5 lbs.	**26.**

FOR LOW POTENTIAL SERVICE

Dimensions:
G3 7½" Long x 4¼" Wide x 1⅛" High.
G4 9½" Long x 4¼" Wide x 1⅝" High.
G5 10" Long x 4" Wide x 2¹⁵⁄₁₆" High.

G3



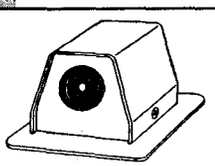


G5

Catalog Number	Accommodates	Weight Each	Price Each
G3	Single Amphenol★ connector.....	.6 lbs.	**$31.**
G4	Double Amphenol★ connector.....	1.1 lbs.	**34.**
G5-100	5 Amphenol★ connector.....	2.6 lbs.	**39.**

FOR LOW POTENTIAL SERVICE

G7



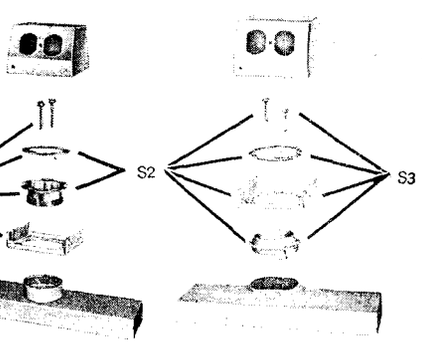
Dimensions: 2⅝" long; 2⅝" wide; 2⅜" high.

Catalog Number	Includes	Weight Each	Price Each
G7-LA	One split rubber bushing with 1" dia. opening with diaphragm.	.72 lbs.	**$31.**
G7-LL	Two split rubber bushings with 1" dia. openings with diaphragms. Back-to-back.	.72 lbs.	**31.**

ORDERING INSTRUCTIONS FOR SERVICE FITTINGS

ON PAGES 136 and 137

Order by catalog number and suffix



S1—Has components to adapt to any underfloor duct with 2" I.P.S. circular insert.

▲S2—Has components to adapt to any underfloor duct with 2" I.P.S. circular insert or ellipsoid inserts.

S3—Has components for only ellipsoid inserts. S3 furnished unless otherwise requested.

Example: G2BA-S3

All service fittings are stocked in brushed satin aluminum.

▲All fittings stocked in warehouse are Series 2.

Shaded items are in warehouse stock.

*Receptacles are not furnished with high potential fittings.

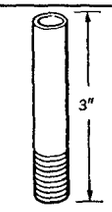
★Registered Trademark of Bunker Ramo Corporation.

●Bronze colored devices are available. Add 15% to aluminum prices.

DE CATALOG REFERENCE: SECTION 5240

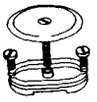
SQD SLV_000914

STANDPIPE ASSEMBLIES

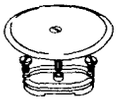


Pipe Size	Catalog Number*	Weight Each	Price Each
I.P.S.	ALUMINUM		
¾"	G702-075-3	0.4 lbs.	$25.
1"	G702-100-3	0.4 lbs.	28.
1¼"	G702-125-3	0.5 lbs.	28.
1½"	G702-150-3	0.5 lbs.	34.
2"	G702-200-3	0.5 lbs.	34.
I.P.S.	*BRONZE		
¾"	G701-075-3BN	1.3 lbs.	31.
1"	G701-100-3BN	1.4 lbs.	35.
1¼"	G701-125-3BN	1.5 lbs.	35.
1½"	G701-150-3BN	1.6 lbs.	41.
2"	G701-200-3BN	1.6 lbs.	41.

ABANDON OUTLET ASSEMBLIES



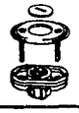
STANDARD SIZE Top Mounting Plate 3½" Diameter



OVERSIZED Top Mounting Plate 5" Diameter

Catalog Number*	Top Mounting Plate* Diameter	Top Mounting Plate* Material	Weight Each	Price Each
G201	3½"	Brass	0.6 lbs.	$14.20
G202	3½"	Aluminum	0.4 lbs.	10.20
G201BN	3½"	▲Bronze	0.4 lbs.	11.80
G205L	5"	Brass	0.8 lbs.	26.00
G206L	5"	Aluminum	0.5 lbs.	18.90
G206LBN	5"	▲Bronze	0.5 lbs.	23.50

FLUSH FLOOR SERVICE FITTINGS***●



TOP MOUNTING

Available in bronze, brass colored or aluminum finish only. Bevelled edge permits mounting above floor level. Can be used side by side or in any combination with other Square D service fittings. All high tension fittings shipped complete with devices as shown.

Catalog Number	Includes	Weight Each	Price Each
ALUMINUM G606B	One 15 amp. 125 volt, 3 wire parallel blade. U slot receptacle.	.5 lbs.	$34.
G606C	One 15 amp. 250 volt, 3 wire tandem blade. U slot receptacle.	.5 lbs.	36.
G606L	Accommodates one 47B, 47C or 47D telephone connecting block.	.5 lbs.	26.
BRASS G605B	One 15 amp. 125 volt, 3 wire parallel blade. U slot receptacle,	.5 lbs.	46.
G605C	One 15 amp. 250 volt, 3 wire tandem blade. U slot receptacle.	.5 lbs.	50.
G605L	Accommodates one 47B, 47C or 47D telephone connecting block.	.5 lbs.	40.
BRONZE G605BBN	One 15 amp. 125 volt, 3 wire parallel blade, U slot receptacle.	.5 lbs.	41.
G605CBN	One 15 amp. 250 volt, 3 wire tandem blade. U slot receptacle.	.5 lbs.	44.
G605LBN	Accommodates one 47B, 47C or 47D telephone connecting block.	.5 lbs.	34.



FLUSH MOUNTING (With ⅛" Floor Tile)

Available in bronze, brass colored or aluminum finish only. Square edge permits flush mounting in ⅛" tile floor. Can be used side by side or in any combination with other Square D service fittings. All high tension fittings shipped complete with devices as shown.

Catalog Number	Includes	Weight Each	Price Each
ALUMINUM G608B	One 15 amp. 125 volt, 3 wire parallel blade, U slot receptacle.	.5 lbs.	$34.
G608C	One 15 amp. 250 volt, 3 wire tandem blade, U slot receptacle.	.5 lbs.	36.
G608L	Accommodates one 47B, 47C or 47D telephone connecting block.	.5 lbs.	26.
BRASS G607B	One 15 amp. 125 volt, 3 wire parallel blade, U slot receptacle.	.5 lbs.	46.
G607C	One 15 amp. 250 volt, 3 wire tandem blade, U slot receptacle.	.5 lbs.	50.
G607L	Accommodates one 47B, 47C or 47D telephone connecting block.	.5 lbs.	46.
BRONZE G607BBN	One 15 amp. 125 volt, 3 wire parallel blade, U slot receptacle.	.5 lbs.	41.
G607CBN	One 15 amp. 250 volt, 3 wire tandem blade, U slot receptacle.	.5 lbs.	44.
G607LBN	Accommodates one 47B, 47C or 47D telephone connecting block.	.5 lbs.	34.



SPLIT BELL CAP

Available for both top and flush mounted flush floor fittings.

Catalog Number	Description	Weight Each	Price Each
ALUMINUM G6CP-AL	For use with: G606B, G608B G606C, G608C G606L, G608L	.4 lbs	$59.
BRASS G6CP-BR	For use with: G605B, G607B G605C, G607C G605L, G607L	.6 lbs.	75.
BRONZE G6CP-BN	For use with: G605BBN, G607BBN G605CBN, G607CBN G605LBN, G607LBN	.6 lbs.	65.

★See ordering instructions on page 136.
*Bronze service fittings are assembled with a combination of anodized parts and painted parts.
●Will accept 5358 receptacles.
▲Bronze finish on top mounting plate is anodized bronze.

Shaded items are in warehouse stock.

DE CATALOG REFERENCE: SECTION 5240

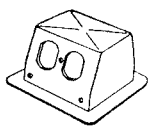
N-R-G FLOOR*

SERVICE FITTINGS

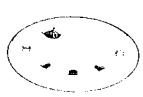
FITTINGS FOR USE WITH INRYCO DUAL PRESET INSERT

NOTE: Please exercise caution in selecting catalog numbers from those listed below. On jobs where the cellular floor was shipped prior to January 1981, select fittings designated as "1st generation." On jobs where the cellular floor was shipped after this date, select fittings designated as "2nd generation." The "2nd generation" fittings are the result of a design improvement.

	CATALOG NO.	DESCRIPTION	WT.	PRICE
MONUMENT FITTINGS	DPFB-MA	Aluminum finish, for 1st generation. For duplex receptacle and telephone.	2.0	**$52.00**
	DPFB-MABN	Same as above except bronze finish.	2.0	**59.00**
	DPFB-2MA	Aluminum finish, for 2nd generation. For duplex receptacle and telephone.	2.0	**52.00**
	DPFB-2MABN	Same as above except bronze finish.	2.0	**59.00**
	DPFB-2MCL	Aluminum finish, for 2nd generation. For Hubbell 8410 or long strap modular telephone connector. Telephone opening other side.	2.0	**52.00**
	DPFB-2MCLBN	Same as above except bronze finish.	2.0	**59.00**
	DPFB-2MDL	Aluminum finish, for 2nd generation. For Hubbell 2310 or 2410. Telephone opening other side.	2.0	**52.00**
	DPFB-2MDLBN	Same as above except bronze finish.	2.0	**59.00**
	DPFB-2MFL	Aluminum finish, for 2nd generation. For 3/8" or 1/2" flexible metal conduit. Telephone opening other side.	2.0	**52.00**
	DPFB-2MFLBN	Same as above except bronze finish.	2.0	**59.00**
FLUSH FLOOR FITTINGS	DPFB-SA	Aluminum finish, for 1st generation. For duplex receptacle and telephone.	.5	**48.00**
	DPFB-AB	Same as above except bronze finish.	.5	**53.00**
	DPFB-2SA	Aluminum finish, for 2nd generation. For duplex receptacle and telephone. Will accommodate triplex receptacle. Order catalog no. DPFB-TR15 as needed.	.5	**48.00**
	DPFB-2BN	Same as above except bronze finish.	.5	**53.00**
	DPFB-2SAT	Aluminum finish, for 2nd generation. Triplex receptacle and bracket furnished. Also telephone opening.	.7	**54.00**
	DPFB-2ABT	Same as above except bronze finish.	.7	**59.00**
CARPET FITTINGS	DPFB-C	For 1st generation. For duplex receptacle and telephone.	1.5	**48.00**
	DPFB-2C	For 2nd generation. For duplex receptacle and telephone.	1.5	**48.00**
	DPFB-2CT	For 2nd generation. Triplex receptacle and bracket included. Also telephone opening.	1.5	**53.00**
ABANDONING PLATES	DPFB-2AP	For 1st or 2nd generation. Aluminum finish.	.5	**26.00**
	DPFB-2APBN	Same as above except bronze finish.	.5	**31.00**
	DPFB-2SAP	Center plate for 2nd generation. Aluminum finish.	.2	**20.00**
	DPFB-2SAPBN	Same as above except bronze finish.	.2	**25.00**
	DPFB-MAAP	For 1st and 2nd generation monument fittings. Aluminum finish.	.5	**26.00**
	DPFB-MAAPBN	Same as above except bronze finish.	.5	**31.00**
ACCESSORIES	DPFB-TR15	For 2nd generation. Triplex receptacle and mounting bracket.	.5	**26.00**
	DPFB-2RA	Center plate for reactivating 2nd generation flush floor fitting. Aluminum finish.	.2	**20.00**
	DPFB-2RABN	Same as above except bronze finish.	.2	**25.00**



Housing Dimensions: 4⅛" long, 4⅛" wide; 2 15/16" high.



Floor Plate 5¾" Dia.





DPFB-2AP
6" Dia.



DPFP-2SAP
3⅞" Dia.



Triplex Receptacle & Bracket



DPFB-2RA
3⅞" Dia.

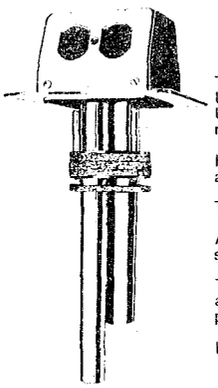
NOTES:
RECEPTACLES NOT FURNISHED WITH FITTINGS WITH THE EXCEPTION OF THE TRIPLEX RECEPTACLE. ALL FITTINGS FURNISHED WITH NECESSARY HARDWARE TO MOUNT ON THE INRYCO N-R-G BLOC®*

SHADED ITEMS ARE IN WAREHOUSE STOCK

*N-R-G BLOC AND N-R-G FLOOR ARE TRADEMARKS OF INRYCO, INC.

SQD SLV_000916

FIRE-GARD™ THRU-FLOOR SERVICE FITTINGS*



FIRE-GARD™ THRU FLOOR FITTINGS
Combination Power And Telephone Fitting

The FIRE-GARD™ service fitting outlet box is listed by Underwriters Laboratories and the fitting is classified by UL for fire resistance of up to and including a four hour fire rating.

Housings and trim plates are available in either brushed aluminum or bronze color.

The assembly is equipped with both ¾" and 1" EMT.

A 3" diameter core drilled hole is required to properly install the fittings.

The fitting is removable and reusable at another location and the hole then plugged with a FIRE-GARD abandoning plate to retain the fire rating of the floor.

Housing Dimensions: 4⅛" long; 4⅛" wide; 3" high

Catalog Number	Accommodates ●	Weight Each	Price Each
ALUMINUM			
G2BA-TF	One standard duplex receptacle—20 amp.	3.0 lbs.	**$86.**
G2BB-TF	Two standard duplex receptacles back to back —20 amp. each.	3.0 lbs.	**86.**
G2BL-TF	One standard duplex receptacle—20 amp. and one insulated bushing for low potential service.	3.0 lbs.	**86.**
G2LA-TF	One insulated bushing for low potential service.	3.0 lbs.	**86.**
G2FA-TF	One ⅞" dia. opening for flexible conduit and one blank side.	3.0 lbs.	**86.**
G2FL-TF	One ⅞" dia. opening for flexible conduit and one insulated brushed opening.	3.0 lbs.	**86.**
BRONZE			
G2BA-TFBN	One standard duplex receptacle—20 amp.	3.0 lbs.	**92.**
G2BB-TFBN	Two standard duplex receptacles back to back —20 amp each.	3.0 lbs.	**92.**
G2BL-TFBN	One standard duplex receptacle—20 amp. and one insulated bushing for low potential service.	3.0 lbs.	**92.**
G2LA-TFBN	One insulated bushing for low potential service.	3.0 lbs.	**92.**
G2FA-TFBN	One ⅞" dia. opening for flexible conduit and one blank side.	3.0 lbs.	**92.**
G2FL-TFBN	One ⅞" dia. opening for flexible conduit and one insulated brushed opening.	3.0 lbs.	**92.**

FIRE-GARD™ ABANDON OUTLET PLATE

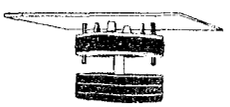


Plate Dimensions: 6"x6" square.

The FIRE-GARD™ abandon outlet plate is classified by Underwriters Laboratories for fire resistance of up to and including a four hour fire rating.

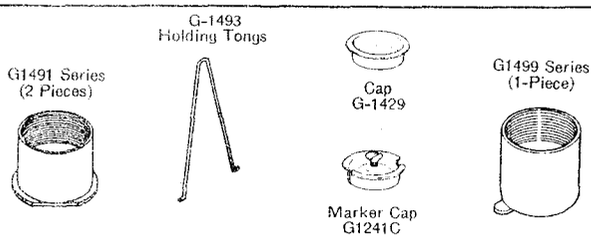
Cover plates are available in either brushed aluminum or anodized bronze.

Abandon outlet plates are designed to plug any 3-inch diameter core drilled hole restoring the floor to its original fire rating.

Both the FIRE-GARD service fitting and the abandon outlet plate are removable and reusable at another location.

Catalog Number	Description	Weight Each	Price Each
ALUMINUM			
G2AP-TF	FIRE-GARD—Abandon Outlet Plate	1.5 lbs.	**$38.**
BRONZE			
G2AP-TFBN	FIRE-GARD—Abandon Outlet Plate	1.5 lbs.	**43.**

AFTERSET INSERTS



Catalog Number		Insert Height	Weight Each	Price Each
G1491-07	G-1499-07	⅞"	0.2 lbs.	**$ 8.50**
G1491-13	G-1499-13	1⅜"	0.3 lbs.	**8.50**
G1491-17	G-1499-17	1⅞"	0.4 lbs.	**10.20**
G1491-23	G-1499-23	2⅜"	0.6 lbs.	**10.20**
G1491-27	G-1499-27	2⅞"	0.7 lbs.	**13.50**
G1491-33	G-1499-33	3⅜"	0.8 lbs.	**13.50**
	G-1499-37	3⅞"	0.9 lbs.	**14.50**
	G-1499-43	4⅜"	1.0 lbs.	**15.00**
	G-1499-47	4⅞"	1.1 lbs.	**15.50**
G1493	.....	....	0.1 lbs.	**2.20**
G1429	.....	....	0.2 lbs.	**1.00**
G1421C	.....	....	0.3 lbs.	**1.70**

●Receptacles are not furnished with fittings.

Shaded items are in warehouse stock.

ADAPTERS AND TOOLS

Catalog Number	Description	Weight Each	Price Each
★G113	Adapter for G1, G2, G4, G5, G6, G10, G11, G12 and G13	1.2 lbs.	**$ 5.90**
★G912-A	Adapter for Flush Fittings	0.2 lbs.	**8.30**
★G901-A	Adapter for Abandon Outlet Assemblies	0.2 lbs.	**5.90**
G1705-2.5	Hole Saw for installing 2⅜" Dia. Aftersets' or Grommets	0.5 lbs.	**92.00**
G1710	Insert Finder—Electronic	10.0 lbs.	**382.00**
G1711	Insert Finder—Magnetic	1.0 lbs.	**76.00**
G1735S	Trench Duct Cover Lifting Device (dual suction cups)	2.1 lbs.	**191.00**

★Adapters convert service fittings from Series 3 to Series 2.

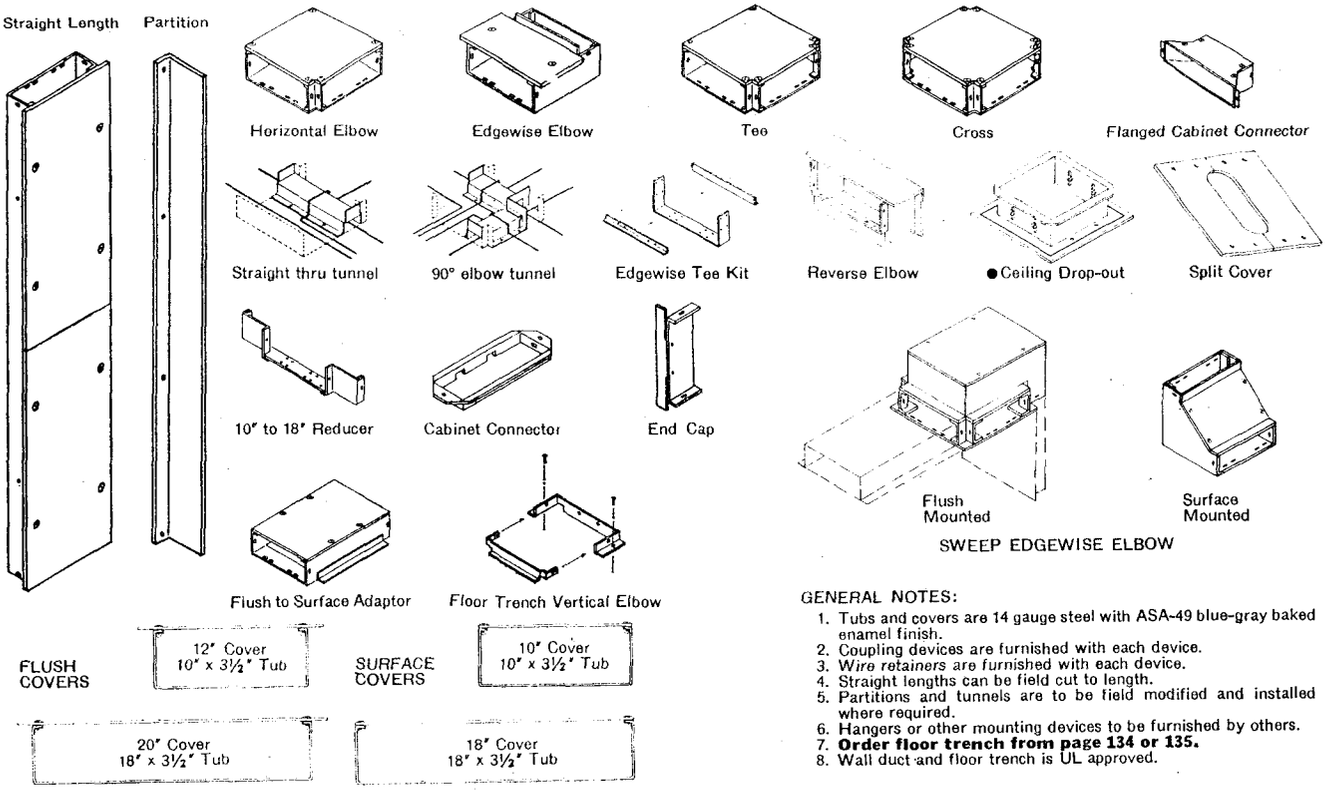
DE CATALOG REFERENCE: SECTION 5240

SQD SLV_000917

LAY-IN WALL DUCT

UL Approved For Enclosure Of Wiring To X-ray Machines.

Wall duct is used as a continuation of standard 12″ and 18″ wide floor trench. Wall duct can be run up the wall and across the ceiling to provide a continuous lay-in raceway system from control consoles and floor equipment to overhead apparatus. Covers are available for either flush or surface mounted installations.



GENERAL NOTES:

1. Tubs and covers are 14 gauge steel with ASA-49 blue-gray baked enamel finish.
2. Coupling devices are furnished with each device.
3. Wire retainers are furnished with each device.
4. Straight lengths can be field cut to length.
5. Partitions and tunnels are to be field modified and installed where required.
6. Hangers or other mounting devices to be furnished by others.
7. **Order floor trench from page 134 or 135.**
8. Wall duct and floor trench is UL approved.

LAY-IN WALL DUCT COMPONENTS

Component	FLUSH COVER Catalog Number	FLUSH COVER Weight Lbs.	FLUSH COVER Price	SURFACE COVER Catalog Number	SURFACE COVER Weight Lbs.	SURFACE COVER Price
5′-0″ Straight Length 10″W	RWT10-S60	39.2	**$118.**	RWT10-S60S	36.4	**$118.**
18″W	RWT18-S60	62.2	**153.**	RWT18-S60S	59.4	**153.**
1′-6″ Straight Length 10″W	RWT10-S18	16.4	**62.**	RWT10-S18S	16.3	**62.**
18″W	RWT18-S18	23.3	**83.**	RWT18-S18S	23.3	**83.**
Horizontal Elbow 10″W	RWT10-HE	9.3	**98.**	RWT10-HES	8.1	**98.**
18″W	RWT18-HE	24.9	**123.**	RWT18-HES	23.7	**123.**
Edgewise Elbow 10″W	RWT10-EE	7.5	**55.**	RWT10-EES	7.4	**55.**
18″W	RWT18-EE	11.1	**71.**	RWT18-EES	11.0	**71.**
Tee 10″W	RWT10-TE	8.5	**98.**	RWT10-TES	7.3	**98.**
18″W	RWT18-TE	24.1	**123.**	RWT18-TES	22.9	**123.**
Cross 10″W	RWT10-XE	1.3	**98.**	RWT10-XES	6.2	**98.**
18″W	RWT18-XE	1.8	**123.**	RWT18-XES	21.8	**123.**
Flanged Cabinet Connector 10″W	RWT10-CUC	8.0	**59.**	RWT10-CUCS	7.8	**59.**
Reverse Elbow 10″W	RWT10-REE	7.5	**55.**	RWT10-REES	7.4	**55.**
18″W	RWT18-REE	11.1	**71.**	RWT18-REES	11.0	**71.**
Sweep Edgewise Elbow 10″W	RWT10-SFEE	12.0	**98.**	RWT10-SSEES	11.8	**55.**
18″W	RWT18-SFEE	16.5	**123.**	RWT18-SSEES	16.3	**71.**

LAY-IN WALL DUCT ACCESSORIES

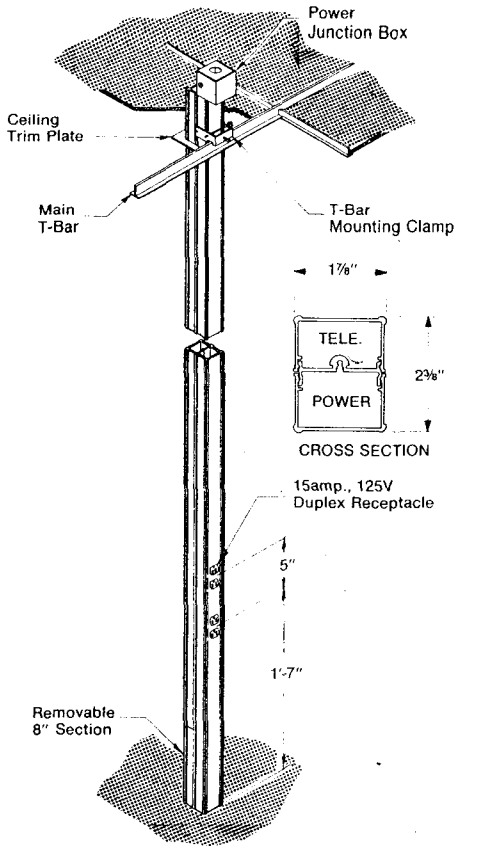
ACCESSORIES	Catalog Number	Weight Lbs.	Price	ACCESSORIES	Catalog Number	Weight Lbs.	Price
5′-0″ Partition	RWT-P60	5.4	**$18.**	Reducer Coupling—18″ to 10″	RWT-RC	2.1	**$28.**
★Straight through tunnel for elbows 10″W	RWT10-ST	2.9	**18.**	Cabinet Connector 10″W	RWT10-CC	1.3	**28.**
18″W	RWT18-ST	3.8	**23.**	18″W	RWT18-CC	2.4	**35.**
★90° Elbow tunnel for elbows 10″W	RWT10-ET	3.2	**28.**	End Cap 10″W	RWT10-EC	1.3	**14.**
18″W	RWT18-ET	5.1	**35.**	18″W	RWT18-EC	1.8	**18.**
Edgewise Tee Kit 10″W	RWT10-ETK	1.3	**28.**	Floor Trench Vertical Elbows for:			
18″W	RWT18-ETK	2.1	**35.**	12″ Floor to 10″ Wall Trench	RWT10-FTVE12	1.1	**28.**
Flush to Surface Adaptor 10″W	RWT10-FS	11.9	**69.**	12″ Floor to 18″ Wall Trench	RWT18-FTVE12	1.2	**35.**
18″W	RWT18-FS	16.4	**89.**	18″ Floor to 18″ Wall Trench	RWT18-FTVE18	1.3	**41.**
●Ceiling Drop-Out 12x12 Flush Cover 8″x8″	RWT-CDO	15.0	**109.**	Split Cover 10″W	RWT10-ACP	3.1	**14.**
				12″ Long—3x8 Opg. 18″W	RWT18-ACP	4.8	**18.**

NOTE: Other sizes of Wall Duct are not available.
★Tunnels form a 3″ wide compartment.
●Depth of Ceiling Drop-Out is adjustable from 4″ to 7″.

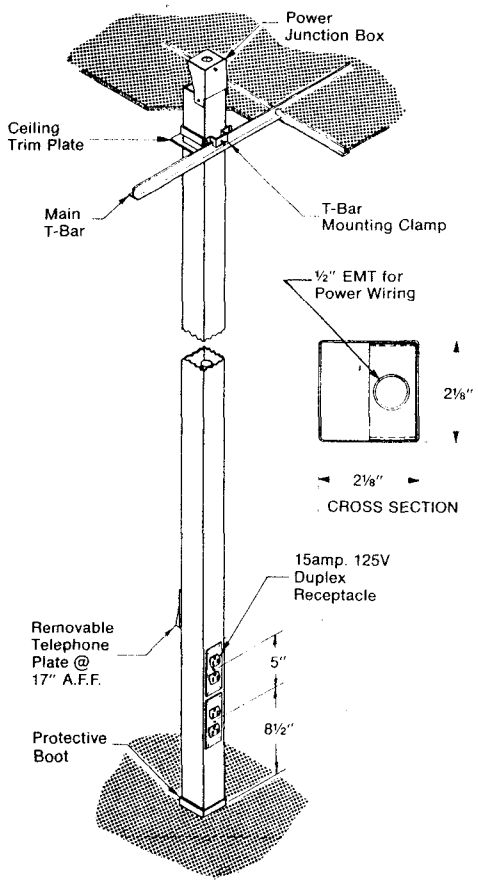
DE CATALOG REFERENCE: SECTION 5250

SQD SLV_000918

DESIGNER GROUP



STANDARD GROUP



SQUARE-Duct® Post DESIGNER GROUP

The new **"Designer Group" of SQUARE-Duct® Posts** presents a new, exciting, and attractive appearance to satisfy not only your overhead electrical and communications wiring needs, but also to satisfy the interior designer's imagination. Anodized color schemes can now be selected to match even the most provocative office interiors.

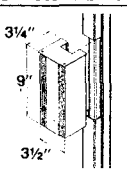
Designer Group stock finishes include anodized aluminum, anodized bronze, anodized black, and walnut wood grain. Each post contains two (2) prewired, 15 ampere, 125 volt duplex receptacles, two (2) removable sides for easy access into either the power or the communications compartments, a reversible base plate for either carpeted or tiled flooring, a T-bar ceiling mounting kit, and a top mounted power junction box.

STOCK "DESIGNER GROUP" SQUARE-Duct® Posts

*Catalog Number	Floor to Ceiling Height	Number of Duplex Receptacles	Exterior Color	Weight Lbs.	List Price
SDP-01-2-120	10'-0"	2	Walnut Wood Grain	14.0	**$181.**
SDP-02-2-120	10'-0"	2	Anodized Aluminum	14.0	**151.**
SDP-03-2-120	10'-0"	2	Anodized Bronze	14.0	**162.**
SDP-04-2-120	10'-0"	2	Anodized Black	14.0	**162.**
SDP-02-2-144	12'-0"	2	Anodized Aluminum	16.0	**172.**

*Available from warehouse stock.

STOCK THREE-FIVE AMPHENOL ENCLOSURE BOXES (field mounted)



*Catalog Number	Exterior Color	Weight Lbs.	List Price
SDP-01-TEL	Walnut Wood Grain	3.1	**$45.**
SDP-02-TEL	Anodized Aluminum	3.1	**45.**
SDP-03-TEL	Anodized Bronze	3.1	**45.**
SDP-04-TEL	Anodized Black	3.1	**45.**

*Available from warehouse stock.

DESIGNER GROUP Additional and Special Features:

1. Designer Group Posts are available in floor to ceiling heights ranging from 8'-6" to 16'-0". Add **$26.00** list for each additional two feet of height beyond 10'-0" (by special order only).
   Example: 14'-0" anodized bronze post price is **$214.00** list.
2. Designer Group Posts are also available in the following anodized colors: Light Tan, Pewter, Red, Blue, Chrome, and Gold (by special order only — Consult factory for price and delivery).
   Note: For quantities over 500, colors other than those listed are also available to match any color scheme or office interior (consult factory).
3. To add from 1 to 4 additional duplex receptacles per side add **$9.00** list for each duplex receptacle (by special order only).
4. For top mounted telephone junction box, catalog number SDP-JB, add **$15.00** list (available from warehouse stock).

SQUARE-Duct® Post STANDARD GROUP

The **"STANDARD GROUP" of SQUARE-Duct® Posts** is the attractive and economical alternative to the "Designer Group" of SQUARE-Duct Posts. Constructed from pre-finished, parchment painted steel, this post provides a different concept in separation of power and communications wiring. Power wiring is run in ½" EMT and the remaining area can be used for applications requiring telephone cables. The post can completely conceal 2-25 pair telephone connectors since the post sides are not removable.

Standard Group Posts contain either one or two pre-wired 15 ampere, 125 volt duplex receptacle(s), removable face plates for both power and telephone compartments, a T-bar ceiling mounting kit, a floor mounting kit for either carpeted or tiled flooring, and a top mounted power junction box.

STOCK "STANDARD GROUP" SQUARE-DUCT® Posts

*Catalog Number	Floor to Ceiling Height	Number of Duplex Receptacles	Exterior Color	Weight Lbs.	List Price
SDP-1-10	10'-0"	1	Parchment	16.0	**$81.**
SDP-2-10	10'-0"	2	Parchment	16.0	**97.**
PK-50-SP	Spray Paint	.....	Parchment	.....	**9.**

*Available from warehouse stock.

STANDARD GROUP Additions and Special Features:

1. For two (2) additional duplex receptacles add **$24.00** list (by special order only).
2. For top mounted telephone junction box add **$13.00** list (by special order only).

SQD SLV_000919

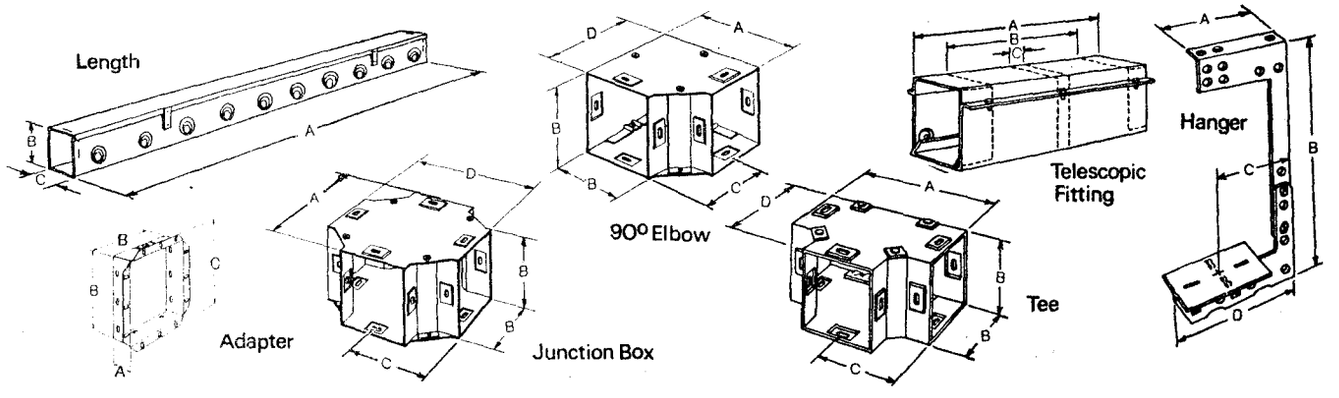
WIREWAY — LAY-IN

SQUARE-Duct

SQUARE-Duct combination wireway is usable as either Hinge Cover or Screw Cover Duct. It provides full lay-in features throughout its entire installation, eliminating threading and pulling of conductors. The cover has keyhole slots to accept captive screws locking the cover securely closed. The entire run may be sealed. SQUARE-Duct components are UL listed, File No. E6625 as steel enclosed wireway and auxiliary gutter. Knockouts match other Square D switches, breakers, service equipment, contactors and starters. Finish—Gray baked enamel.

		2½"x2½"			4"x4"			6"x6"			8"x8"		12"x12"	
		Catalog Number			Catalog Number			Catalog Number			Cat. No.		Cat. No.	
Component	Description	Knock-outs	Without Knock-outs	Price	Knock-outs	Without Knock-outs	Price	Knock-outs	Without Knock-outs	Price	Without Knock-outs	Price	Without Knock-outs	Price
Length	1 Foot	LD21	LD21WK	$ 9.00	LD41	LD41WK	$ 9.30	LD61	LD61WK	$19.00	LD81	$31.00	LD121	$43.00
	2 Foot	LD22	LD22WK	13.00	LD42	LD42WK	14.80	LD62	LD62WK	24.50	LD82	47.00	LD122	84.00
	3 Foot	LD23	LD23WK	18.00	LD43	LD43WK	22.40	LD63	LD63WK	33.00	LD83	72.00	LD123	125.00
	4 Foot	LD24	LD24WK	25.00	LD44	LD44WK	30.00	LD64	LD64WK	45.00	LD84	87.00	LD124	150.00
	5 Foot	LD25	LD25WK	30.00	LD45	LD45WK	32.00	LD65	LD65WK	49.00	LD85	98.00	LD125	174.00
	10 Foot	LD210	LD210WK	62.00	LD410	LD410WK	68.00	LD610	LD610WK	116.00	.....	.....	.....	.....
Cut-off Fitting	3 foot screw cover for cutting odd dimensions	LD23CF	.....	35.00	LD43CF	.....	41.00	LD63CF	.....	49.00	LD83CF	70.00	LD123CF	233.00
Elbow	90 degrees	LD290L	.....	22.00	LD490L	.....	27.00	LD690L	.....	29.00	LD88L	45.00	LD1290L	82.00
	90 degree sweep bend	.....	.....	.....	LD490LS	.....	43.00	LD690LS	.....	63.00	.....	.....	.....	.....
	45 degrees	LD245L	.....	22.00	LD445L	.....	27.00	LD645L	.....	29.00	LD845L	45.00	LD1245L	121.00
	22½ degrees	LD225L	.....	22.00	LD425L	.....	27.00	LD625L	.....	29.00	.....	.....	.....	.....
Tee	Branch from runs	LD2T	.....	26.00	LD4T	.....	30.00	LD6T	.....	33.00	LD88T	96.00	LD12T	126.00
Junction Box	For T, L or Cross (4 sides—1 opening each)	LD2J	.....	28.00	LD4J	.....	33.00	LD6J	.....	42.00	LD88J	96.00	LD12J	192.00
Pull Box	For T, L or Cross (2 sides—1 opening)	.....	.....	.....	LD4PB	.....	150.00	LD6PB	.....	189.00	.....	.....	.....	.....
	(2 sides—2 openings)													
Telescope	Slide Adjustment	LD2TF	.....	26.00	LD4TF	.....	29.00	LD6TF	.....	90.00	.....	.....	.....	.....
Transposition Section	Rotates wireway 90°	LD21TS	.....	38.00	LD41TS	.....	36.00	LD61TS	.....	32.00	.....	.....	.....	.....
▲Connector	Couples lengths and fittings	LD2C	.....	2.50	LD4C	.....	3.00	LD6C	.....	4.50	LD88C	7.10	LD12C	14.70
Hanger	Universal—drop or side	LD2H		5.40	LD4H	.....	7.50	LD6H	.....	12.00	LD88H	16.80	LD12H	46.00
Closing Plate	Seals openings	LD2CP	LD2CPWK	2.50	LD4CP	LD4CPWK	3.00	LD6CP	LD6CPWK	4.50	LD88E	5.80	LD12CP	14.00
Wire Retainer	Snap-in spring steel strap	LD2WR	.....	1.80	LD4WR	.....	2.00	LD6WR	.....	2.50	.....	.....	.....	.....
Adapter	Connects to panel square duct, etc.	LD22A	.....	8.20	LD44A	.....	13.00	LD66A	.....	15.00	LD88A	19.20	LD12A	58.00
Reducer	4"x4" to 2½"x2½"	.....	.....	.....	LD42R	.....	14.00	.....	.....	.....	.....	.....	.....	.....
	6" x 6" to 4" x 4"	.....	.....	.....	.....	.....	.....	LD64R	.....	28.00	.....	.....	.....	.....
	8" x 8" to 6" x 6"	.....	.....	.....	.....	.....	.....	.....	.....	.....	LD86R	32.00	.....	.....
	12" x 12" to 8" x 8"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	LD128R	47.00
Gusset Bracket	Mount for vertical wall (No hanger required)	LD2GB	.....	7.20	LD4GB	.....	9.50	LD6GB	.....	12.00	.....	.....	.....	.....
Nipple	4 inch	LD23N	.....	10.00	LD43N	.....	11.00	LD63N	.....	19.00	.....	.....	.....	.....
	6 inch	LD26N	.....	10.00	LD46N	.....	12.00	LD66N	.....	19.00	.....	.....	.....	.....
	9 inch	LD29N	.....	11.00	LD49N	.....	13.00	LD69N	.....	20.00	.....	.....	.....	.....
Partitions	Field Installable	.....	.....	.....	LD45B	.....	14.00	LD65B	.....	29.00	.....	.....	.....	.....

▲Connectors to adapt SQUARE-Duct to existing competitive duct are available. See page 133.



CONNECTORS REQUIRED EVERYWHERE EXCEPT WITH CLOSING PLATES, REDUCERS AND ADAPTERS

DIMENSIONS IN INCHES—SQUARE-Duct WIREWAY

2½"x2½"—Knockouts ½, ¾					4"x4"—Knockouts ½, ¾, 1, 1¼					6"x6"—Knockouts ½, ¾, 1, 1¼, 1½, 2					8"x8"—No Knockouts					12"x12"—No Knockouts				
Cat. No.	A	B	C	D	Cat. No.	A	B	C	D	Cat. No.	A	B	C	D	Cat. No.	A	B	C	D	Cat. No.	A	B	C	D
LD21	12	2⅜	2⅝	....	LD41	12	4⅛	4⅛	....	LD61	12	6⅛	6⅛	....	LD81	12	8	8	....	LD121	12	12	12	....
LD22	24	2⅜	2⅝	....	LD42	24	4⅛	....	....	LD62	24	6⅛	6⅛	....	LD82	24	8	8	....	LD122	24	12	12	....
LD23	36	2⅜	2⅝	....	LD43	36	4⅛	4⅛	....	LD63	36	6⅛	6⅛	....	LD83	36	8	8	....	LD123	36	12	12	....
LD24	48	2⅜	2⅝	....	LD44	48	4⅛	4⅛	....	LD64	48	6⅛	6⅛	....	LD84	48	8	8	....	LD124	48	12	12	....
LD25	60	2⅜	2⅝	....	LD45	60	4⅛	4⅛	....	LD65	60	6⅛	6⅛	....	LD85	60	8	8	....	LD125	60	12	12	....
LD210	120	2⅜	2⅝	....	LD410	120	4⅛	4⅛	....	LD610	120	6⅛	6⅛	....										
LD290L	4⅝	2⅜	3⁵⁄₁₆	4⅝	LD490L	6⅛	4⅛	3⁵⁄₁₆	6⅛	LD690L	8¾	6⅛	5¹¹⁄₁₆	8¾	LD88L	10¾	8⅛	6¹¹⁄₁₆	10¾	LD1290L	14¾	12⅛	8⅝	14¾
					LD490LS	9⅞	4⅛	7⅜	9⅞	LD690LS	14¹⁄₁₆	6⅛	11	14¹⁄₁₆	LD845L	5⅞	8⅛	....	5⅞	LD1245L	7½	12⅛	....	7½
LD245L	2⅞	2⅜	....	2⅞	LD445L	3½	4⅛	....	3½	LD645L	5	6⅛	....	5										
LD225L	2¾	2⅜	....	2⁵⁄₁₆	LD425L	2⅝	4⅛	....	2⅝	LD625L	3⅝	6⅛	....	3⅝										
LD2T	6⅝	2⅜	3⅜	4⅝	LD4T	8¹⁄₁₆	4⅛	4¹⁄₁₆	6⅛	LD6T	11⅜	6⅛	5¹¹⁄₁₆	8¾	LD88T	13⅜	8⅛	6¹¹⁄₁₆	10¾	LD12T	17³²⁄₃₂	12⅛	8⅝	14¾
LD2J	6⅝	2⅜	3⅜	6⅝	LD4J	8⅛	4⅛	4¹⁄₁₆	8⅛	LD6J	11⅜	6⅛	5¹¹⁄₁₆	11⅜	LD88J	13⅜	8⅛	6¹¹⁄₁₆	13⅜	LD12J	17³²⁄₃₂	12⅛	8⅝	17³²⁄₃₂
					LD4PB	14⅞	4⅛	....	14⅞	LD6PB	19¹¹⁄₁₆	6⅛	....	19¹¹⁄₁₆										
LD2TF	15	11½	½	....	LD4TF	15	11½	½	....	LD6TF	15	11½	½	....										
LD2H	4⅝	10	3⅜	4⅜	LD4H	4⅝	11⅝	3¹³⁄₁₆	6	LD6H	5⁷⁄₁₆	17	5¼	8⅛	LD88H	5⁷⁄₁₆	16⅞	5⅛	....	LD12H	....	....	....	....
LD22A*	1⅝	2⅜	3¹¹⁄₁₆	....	LD44A*	1⅝	3⅞	5¾	....	LD66A*	1⅝	5⅞	7¾	....	LD88A*	1⅝	7¹¹⁄₁₆	9⅞	....	LD12A*	1⅝	11¹³⁄₁₆	14¹⁵⁄₁₆	....

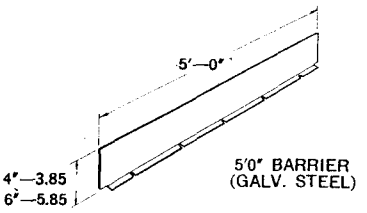
*No connectors required—Installed effective length (A) is ⅛".

DE CATALOG REFERENCE: SECTION 5100

SQD SLV_000920

SQUARE-Duct® PARTITIONS

Field installable partitions allow for separation of high and low potential services (N.E.C. Article 352-6). Conductors of light and power systems of 600 volts or less may occupy the same enclosure, however, conductors for signal or radio circuits may not occupy enclosure with 600 volt systems. SQUARE-Duct partitions are available in 5'-0" lengths for 4" and 6" wireway sizes, mounting hardware included. SQUARE-Duct Wireway straight lengths have mounting screw knockouts on 12" centers in 4"x4" and 6"x6" sizes.



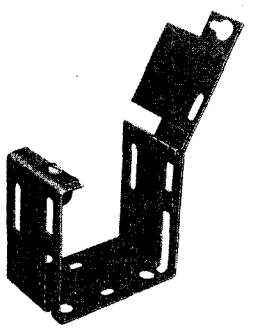
SQUARE-Duct PARTITIONS

Description	4"x4" Cat. No.	4"x4" Price	6"x6" Cat. No.	6"x6" Price
5'-0" Partition	LD45B	**$14.**	LD65B	**$29.**

CONDUCTOR TABLE
NO DERATING NECESSARY UP TO 30 CONDUCTORS OR 20% FILL—
N.E.C. 362-5

Conductor Size	Area of Conductor (Inches) Type T TW THW A	Type THHN THWN XHHW B	Maximum Number of Conductors All of One Size: 2½"x2½" Duct ‡1.25 in² A	B	4"x4" Duct ‡3.2 in² A	B	6"x6" Duct ‡7.2 in² A	B	8"x8" Duct ‡12.8 in² A	B	12"x12" Duct ‡28.8 in² A	B
14	.0135•	† .0087	*92	*143	*237	*368	*533	*827	*950	*1471	*2133	*3310
12	.0172•	† .0117	*72	*107	*186	*273	*428	*615	*744	*1094	*1674	*2461
10	.0224•	† .0184	*55	* 68	*142	*174	*321	*391	*570	* 695	*1285	*1565
8	.0471•	† .0373	26	* 33	* 68	* 85	*153	*193	*271	* 343	* 611	* 772
6	.0819	† .0519	15	24	* 39	* 61	* 87	*138	*156	* 246	* 351	* 555
4	.1087	.0845	11	14	29	* 38	* 66	* 85	*117	* 151	* 264	* 341
3	.1263	.0995	9	12	25	* 32	* 57	* 72	*101	* 128	* 228	* 289
2	.1473	.1182	8	10	21	27	* 48	* 61	* 87	* 108	* 195	* 243
1	.2027	.1590	6	8	15	20	* 35	* 45	* 63	* 80	* 142	* 181
0	.2367	.1893	5	6	13	17	30	* 38	* 54	* 67	* 121	* 152
00	.2781	.2265	4	5	11	14	25	* 31	* 46	* 56	* 103	* 127
000	.3288	.2715	3	4	9	11	21	26	* 39	* 47	* 87	* 106
0000	.3904	.3278	3	4	8	9	18	22	* 32	* 39	* 73	* 88
250MCM	.4877	.4026	2	3	6	8	14	18	26	* 31	* 59	* 71
300MCM	.5581	.4669	2	2	5	7	12	15	22	27	* 51	* 61
350MCM	.6291	.5307	2	2	5	6	11	13	20	24	* 45	* 54
400MCM	.6969	.5931	1	2	4	5	10	12	18	21	* 41	* 48
500MCM	.8316	.7163	1	1	4	4	8	10	15	18	* 34	* 40
600MCM	1.0261	.8792	1	1	3	3	7	8	12	14	28	* 32
700MCM	1.1575	1.0011	1	1	2	3	6	7	11	12	24	28
750MCM	1.2252	1.0623	1	1	2	3	5	6	10	12	23	27

***NOTE:** The 1981 National Electrical Code limits installation to 30 conductors in one wireway except where derated according to tables 310-16 through 310-18 N.E.C., or where special permission has been obtained from local authority enforcing the Code or where conductors in excess of 30 are for signalling circuits or are control wires between a motor and its starter and used only for starting duty, and other exceptions as noted in 520-5 (theaters), 620-32 (elevators), and 374-5 (auxiliary gutters).
†Areas for Type XHHW are .0131, .0167, .0216, .0456, and .0625 for sizes 14, 12, 10, 8 and 6 respectively.
•Areas for Type THW are .0206, .0251, .0311, and .0598 for sizes 14, 12, 10, and 8 respectively.
A-Type T, TW, and THW
B-Type THHN, THWN, and XHHW
Areas given in square inches.
‡These values represents 20% of the interior cross sectional area of the various sizes of wireway.



SQUARE-Duct® ADAPTER-CONNECTORS

The adapter connector permits SQUARE-Duct to be adapted to competitive wireway when it is necessary to extend an existing run. Connectors are available in 2½"x2½", 4"x4", 6"x6", and 8"x8" sizes which adapt to most competitive wireways. The table below is cross referenced by catalog number and manufacturer for easy selection.

SQUARE-Duct ADAPTER-CONNECTORS

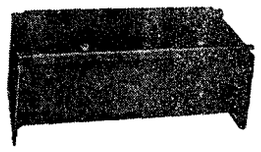
Catalog No.	List Price	Circle AW (Alwalt)	Burns	Columbia	Delta	General Duct	General Electric	General Metals	Hoffman Engr.	Keystone	Sun
LD2KC	**$3.50**		X	X	X	X	X	X	X	X	X
LD4KC	**4.40**			X	X					X	
LD4AC	**4.40**	X	X			X	X	X	X		X
LD6KC	**6.50**			X	X					X	
LD6AC	**6.50**	X	X			X	X	X	X		X
LD8AC	**9.20**	X	X	X	X	X	X	X	X	X	X

DE CATALOG REFERENCE: SECTION 5100

SQD SLV_000921

WIREWAY — LAY-IN

TYPE JIC

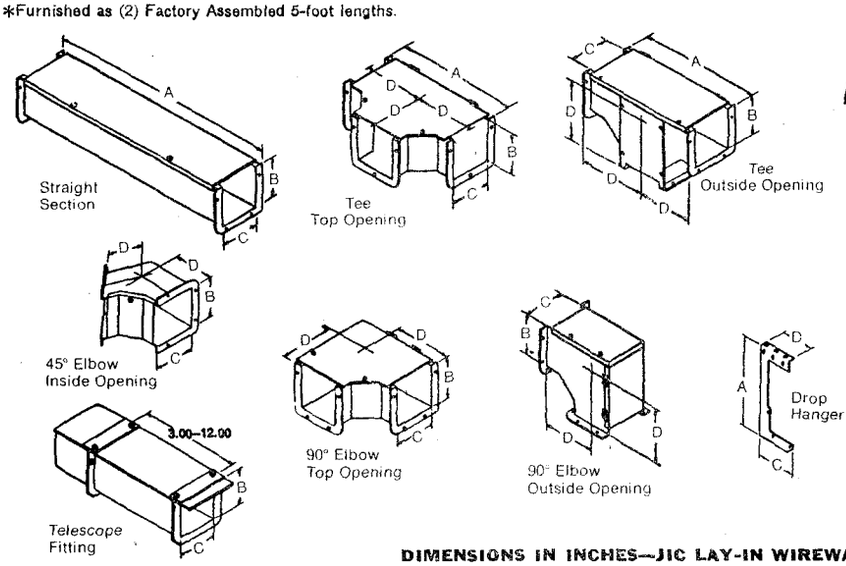


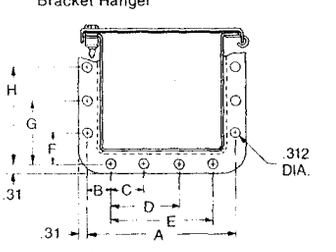
Type JIC Lay-in Wireway and fittings are used to protect runs of electrical wiring from oil, water, coolants, dirt or dust as well as physical damage. This wireway is manufactured to JIC and NMTBA standards for Industrial Control Equipment. Lengths and fittings are made of 14 gauge steel. Straight lengths have hinged covers with sponge neoprene gasket all around and are held closed with external screw clamps. All lengths and fittings are without knockouts. Lay-in Wireway finish is ASA-49 gray over a phosphatized surface. All JIC wireway is U.L. listed, File No. E6625 as steel enclosed wireway and auxiliary gutter.

JIC LAY-IN WIREWAY CONNECTOR KIT FURNISHED WITH EACH LENGTH AND FITTING

Description	2½" x 2½"		4" x 4"		6" x 6"		8" x 8"		12" x 12"	
	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
Straight Length—										
3 inch	LC203	$ 30.00	LC403	$ 32.00	LC603	$ 39.00	.....	.....	.....	.....
6 inch	LC206	30.00	LC406	32.00	LC606	43.00	.....	.....	.....	.....
1 foot	LC21	35.00	LC41	42.00	LC61	53.00	LC81	$ 82.00	LC121	$126.00
2 foot	LC22	53.00	LC42	58.00	LC62	72.00	LC82	116.00	LC122	222.00
3 foot	LC23	63.00	LC43	72.00	LC63	94.00	LC83	141.00	LC123	268.00
4 foot	LC24	72.00	LC44	82.00	LC64	120.00	LC84	168.00	LC124	318.00
5 foot	LC25	78.00	LC45	94.00	LC65	147.00	LC85	193.00	LC125	363.00
*10 foot	LC210	156.00	LC410	188.00	LC610	294.00	.....	.....	.....	.....
90° Elbow—Inside opening	LC-290-LI	62.00	LC-490-LI	75.00	LC-690-LI	89.00	LC-890-LI	133.00	LC-1290-LI	176.00
90° Elbow—Outside opening	LC-290-LO	62.00	LC-490-LO	75.00	LC-690-LO	89.00	LC-890-LO	133.00	LC-1290-LO	176.00
90° Elbow—Top opening	LC-290-LT	62.00	LC-490-LT	75.00	LC-690-LT	89.00	LC-890-LT	133.00	LC-1290-LT	176.00
45° Elbow—Inside opening	LC-245-LI	62.00	LC-445-LI	75.00	LC-645-LI	89.00	LC-845-LI	133.00	LC-1245-LI	176.00
45° Elbow—Outside opening	LC-245-LO	62.00	LC-445-LO	75.00	LC-645-LO	89.00	LC-845-LO	133.00	LC-1245-LO	176.00
45° Elbow—Top opening	LC-245-LT	62.00	LC-445-LT	75.00	LC-645-LT	89.00	LC-845-LT	133.00	LC-1245-LT	176.00
Cross	LC-2X	94.00	LC-4X	117.00	LC-6X	128.00	LC-8X	152.00	LC-12X	293.00
Tee—Top opening	LC-2TT	76.00	LC-4TT	87.00	LC-6TT	98.00	LC-8TT	144.00	LC-12TT	246.00
Tee—Outside opening	LC-2TO	76.00	LC-4TO	100.00	LC-6TO	116.00	LC-8TO	152.00	LC-12TO	246.00
Cut-off Fitting	LC-2CF	48.00	LC-4CF	57.00	LC-6CF	63.00	LC-8CF	89.00	LC-12CF	136.00
Panel Adapter	LC-2A	10.00	LC-4A	14.20	LC-6A	17.40	LC-8A	28.00	LC-12A	41.00
Swivel Nipple	LC-2S	60.00	LC-4S	70.00	LC-6S	90.00	LC-8S	140.00	LC-12S	180.00
Drop Hanger	LC-2DH	7.50	LC-4DH	9.70	LC-6DH	13.00	LC-8DH	23.70	LC-12DH	48.00
Bracket Hanger	LC-2BH	5.40	LC-4BH	6.40	LC-6BH	9.30	LC-8BH	23.10	LC-12BH	48.00
Box Adapter (Adapts LC to JD)	LC-2JD	32.00	LC-4JD	39.00	LC-6JD	48.00	LC-8JD	58.00	LC-12JD	83.00
Closing Plate	LC-2CP	11.30	LC-4CP	13.90	LC-6CP	16.40	LC-8CP	25.00	LC-12CP	35.00
Telescope fitting	LC-2TF	53.00	LC-4TF	54.00	LC-6TF	68.00	LC-8TF	100.00	LC-12TF	199.00
Reducer	.....	.....	LC-42R	39.00	LC-64R	49.00	LC-86R	54.00	LC-128R	60.00
Extra Connector Kit	LC-2C	8.90	LC-4C	10.80	LC-6C	12.30	LC-8C	16.60	LC-12C	19.00

*Furnished as (2) Factory Assembled 5-foot lengths.





Flange Detail JIC Lay-in Wireway

Duct Size	A	B	C	D	E	F	G	H	Hole Dia.
2½" x 2½"	3½	1¾	...	...	..	1 13/16	...	..	5/16
4" x 4"	5	1	3	...	..	3 5/16	...	..	5/16
6" x 6"	7	1	5	...	..	5 5/16	...	..	5/16
8" x 8"	9	1	3½	7	..	3 5/16	7 5/16	..	5/16
12" x 12"	13	1	3 11/16	7 3/8	11	3 5/16	7 5/16	11 5/16	5/16

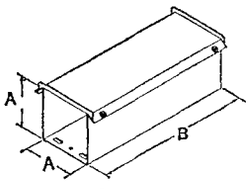
DIMENSIONS IN INCHES—JIC LAY-IN WIREWAY

2½" x 2½"					4" x 4"					6" x 6"					8" x 8"					12" x 12"				
Cat. No.	A	B	C	D	Cat. No.	A	B	C	D	Cat. No.	A	B	C	D	Cat. No.	A	B	C	D	Cat. No.	A	B	C	D
LC21	12.00	2.50	2.50	...	LC41	12.00	4.00	4.00	...	LC61	12.00	6.00	6.00	...	LC81	12.00	8.00	8.00	...	LC121	12.00	12.00	12.00	...
LC22	24.00	2.50	2.50	...	LC42	24.00	4.00	4.00	...	LC62	24.00	6.00	6.00	...	LC82	24.00	8.00	8.00	...	LC122	24.00	12.00	12.00	...
LC23	36.00	2.50	2.50	...	LC43	36.00	4.00	4.00	...	LC63	36.00	6.00	6.00	...	LC83	36.00	8.00	8.00	...	LC123	36.00	12.00	12.00	...
LC24	48.00	2.50	2.50	...	LC44	48.00	4.00	4.00	...	LC64	48.00	6.00	6.00	...	LC84	48.00	8.00	8.00	...	LC124	48.00	12.00	12.00	...
LC25	60.00	2.50	2.50	...	LC45	60.00	4.00	4.00	...	LC65	60.00	6.00	6.00	...	LC85	60.00	8.00	8.00	...	LC125	60.00	12.00	12.00	...
LC290LI	....	2.50	2.50	5.25	LC490LI	....	4.00	4.00	6.00	LC690LI	....	6.00	6.00	7.00	LC890LI	....	8.00	8.00	8.00	LC1290LI	....	12.00	12.00	10.00
LC290LO	....	2.50	2.50	5.12	LC490LO	....	4.00	4.00	5.87	LC690LO	....	6.00	6.00	6.87	LC890LO	....	8.00	8.00	7.87	LC1290LO	....	12.00	12.00	9.87
LC290LT	....	2.50	2.50	5.25	LC490LT	....	4.00	4.00	6.00	LC690LT	....	6.00	6.00	7.00	LC890LT	....	8.00	8.00	8.00	LC1290LT	....	12.00	12.00	10.00
LC245LI	....	2.50	2.50	3.75	LC445LI	....	4.00	4.00	4.00	LC645LI	....	6.00	6.00	4.50	LC845LI	....	8.00	8.00	5.00	LC1245LI	....	12.00	12.00	6.00
LC245LO	....	2.50	2.50	3.75	LC445LO	....	4.00	4.00	4.00	LC645LO	....	6.00	6.00	4.50	LC845LO	....	8.00	8.00	5.00	LC1245LO	....	12.00	12.00	6.00
LC245LT	....	2.50	2.50	3.75	LC445LT	....	4.00	4.00	4.00	LC645LT	....	6.00	6.00	4.50	LC845LT	....	8.00	8.00	5.00	LC1245LT	....	12.00	12.00	6.00
LC2TT	10.50	2.50	2.50	5.25	LC4TT	12.00	4.00	4.00	6.00	LC6TT	14.00	6.00	6.00	7.00	LC8TT	16.00	8.00	8.00	8.00	LC12TT	20.00	12.00	12.00	10.00
LC2TO	10.50	2.50	2.50	5.25	LC4TO	12.00	4.00	4.00	6.00	LC6TO	14.00	6.00	6.00	7.00	LC8TO	16.00	8.00	8.00	8.00	LC12TO	20.00	12.00	12.00	10.00
LC2DH	9.90	....	4.57	4.32	LC4DH	12.90	....	6.07	5.07	LC6DH	16.90	....	8.07	6.07	LC8DH	20.90	....	10.57	7.57	LC12DH	28.90	....	15.61	10.61
LC2BH	3.50	....	3.50	4.75	LC4BH	5.00	....	3.50	6.25	LC6BH	7.00	....	3.50	8.25	LC8BH	9.00	....	3.50	10.25	LC12BH	13.00	....	3.50	14.25
LC2TF	....	2.13	2.30	...	LC4TF	....	3.63	3.80	...	LC6TF	....	5.63	5.80	...	LC8TF	....	7.63	7.80	...	LC12TF	....	11.63	11.80	...
.....	....	....	....	....	LC42R	....	....	....	0.20	LC64R	....	....	....	0.20	LC86R	....	....	....	0.20	LC128R	....	....	....	0.20

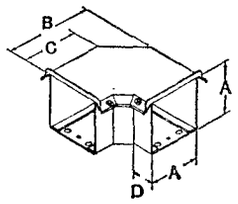
SQD SLV_000922

LAY-IN

Outdoor raintight gangable wireway and fittings are used to protect runs of electrical wiring against rain and sleet as well as physical damage. Unique drip shield cover protects wiring from weather exposure and maintains the "lay-in" feature for ease of wiring installation. Lengths and fittings are constructed of 16 gauge galvanneal steel with ASA-49 gray baked enamel finish over a phosphatized surface. Each length is provided with one-½", ¾", 1" and 1¼" concentric knockout pattern approximately 9" from each end and one-1¼", 1½", 2" and 2½" concentric knockout pattern approximately 6" from each end. Lengths and fittings Underwriters' Laboratories listed, File No. E6625 as Steel Enclosed Wireway and Auxiliary Gutter (horizontal mounting only).



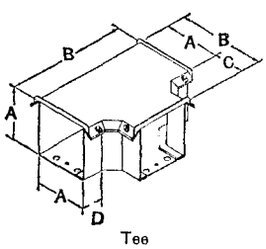
Straight Length



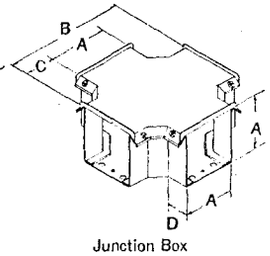
90° Elbow

RAINTIGHT LAY-IN WIREWAY

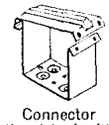
Description	4"x4" Catalog Number	4"x4" List Price	6" x 6" Catalog Number	6" x 6" List Price
1 Ft. Length	LDR-41	$ 31.00	LDR-61	$ 44.00
5 Ft. Length	LDR-45	73.00	LDR-65	106.00
10 Ft. Length	LDR-410	132.00	LDR-610	189.00
90° Elbow	LDR-490L	53.00	LDR-690L	67.00
Tee	LDR-4T	58.00	LDR-6T	73.00
Junction Box	LDR-4J	99.00	LDR-6J	116.00
Panel Adapter	LDR-44A	25.00	LDR-66A	28.00
Closing Plate	LDR-4CP	13.00	LDR-6CP	15.00
Gusset Bracket	LD-4GB	9.50	LD-6GB	12.00

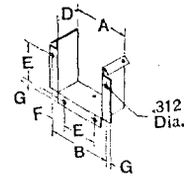


Tee

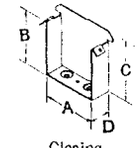


Junction Box

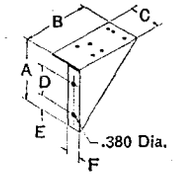

Connector (furnished with each length and fitting)



Panel Adapter



Closing Plate



Gusset Bracket (Wall Hanger)

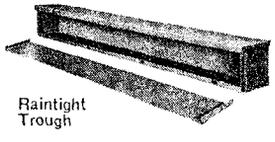
RAINTIGHT LAY-IN WIREWAY DIMENSIONS*

4" x 4" Catalog Number	A	B	C	D	E	F	G	6" x 6" Catalog Number	A	B	C	D	E	F	G
LDR-41	4.00	11.96	....	....	....	....	....	LDR-61	6.00	11.96	....	....	....	....	....
LDR-45	4.00	59.96	....	....	....	....	....	LDR-65	6.00	59.96	....	....	....	....	....
LDR-410	4.00	119.96	....	....	....	....	....	LDR-610	6.00	119.96	....	....	....	....	....
LDR-490L	4.00	7.53	4.10	1.65	....	....	....	LDR-690L	6.00	9.53	6.10	1.69	....	....	....
LDR-4T	4.00	9.58	2.59	1.65	7.53	....	....	LDR-6T	6.00	11.58	2.59	1.65	9.53	....	....
LDR-4J	4.00	9.58	2.59	1.65	....	....	....	LDR-6J	6.00	11.58	2.59	1.65	....	....	....
LDR-44A	4.14	5.02	3.29	2.00	3.00	1.01	.31	LDR-66A	6.14	7.02	5.29	2.00	5.00	1.01	.31
LDR-4CP	4.14	4.02	4.50	1.36	....	....	....	LDR-6CP	6.14	6.02	6.50	1.36	....	....	....
LD4GB	5.18	5.12	2.42	2.26	1.74	1.04	....	LD-6GB	7.18	7.12	2.42	4.26	1.74	1.04	....

*Dimensions are shown in inches.

RAINTIGHT TROUGHS

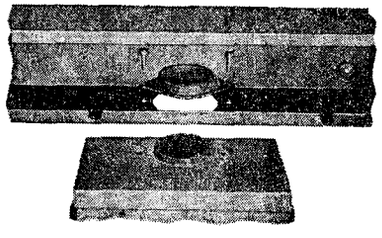
Raintight troughs are for ganging meter devices, panels, switches, etc. Each length is a completely enclosed section with a removable cover that has a provision for sealing. Two sizes of concentric knockouts (one ½, ¾, 1, 1¼ and two 1, 1¼, 2, 2½ per foot) are located along the bottom of the troughs on 3" centers. These knockouts provide easy ganging of service equipment. Finish: Gray baked enamel.


Raintight Trough

RAINTIGHT TROUGH STRAIGHT LENGTHS

Description	4" x 4" Cat. No.	4" x 4" Price	6" x 6" Cat. No.	6" x 6" Price	8" x 8" Cat. No.	8" x 8" Price
1 Foot Length	RD41	$32.00	RD61	$ 41.00	.....	....
2 Foot Length	RD42	41.00	RD62	50.00	RD82	$ 89.00
3 Foot Length	RD43	53.00	RD63	72.00	RD83	114.00
4 Foot Length	RD44	64.00	RD64	91.00	RD84	146.00
5 Foot Length	RD45	75.00	RD65	110.00	RD85	174.00

Box Coupling Device



BOX COUPLING FOR "RB" DEVICES

Designed for connecting wireway or other enclosures to units having the "RB" bolt-on conduit provisions. Provides bushed opening equal to 2" conduit. Eliminates the need for conduit nippling.	Cat. No.	Price
	BC200	$8.60

DE CATALOG REFERENCE: SECTION 5100

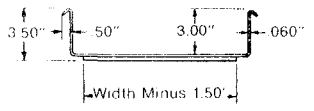
SQD SLV_000923

CABLE TRAY

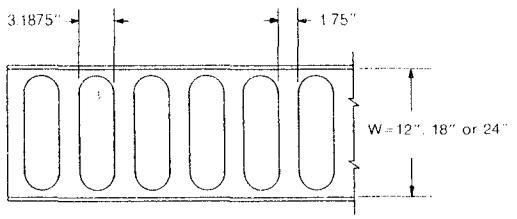
TROUGH-TYPE CTS

STOCK ITEMS

Type CTS, a general purpose galvanized steel trough cable tray, provides economical advantages for support of power cables, control wiring, telephone and communication cables. Trough Type CTS is a rigid one-piece construction fabricated from 16 gauge mill-galvanized steel per ASTM-A525. Ample support for even the smallest wires is provided by a solid support surface, 1¾" wide and only 3 3/16" apart. Louvered openings in the bottom allow easy drop-out for wiring. Ground continuity between sections is obtained with the use of standard connectors.



3" Loading Depth
Galvanized Steel



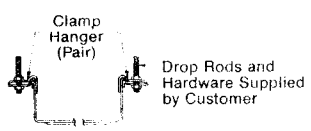
525 In.² Minimum Cross-Sectional Area

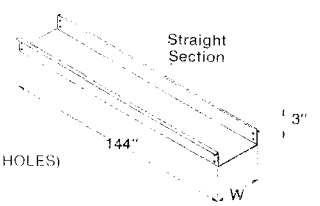
Description	12" Wide Cable Tray Trough-Type		18" Wide Cable Tray Trough-Type		24" Wide Cable Tray Trough-Type	
	Catalog Number	List Price	Catalog Number	List Price	Catalog Number	List Price
Straight Section 12'—0" Length	CTS-12SS-12-3	**114.**	CTS-18SS-12-3	**132.**	CTS-24SS-12-3	**163.**
Elbow—12" Radius						
45° Flat	CTS-124H-12-3	**36.**	CTS-184H-12-3	**50.**	CTS-244H-12-3	**58.**
90° Flat	CTS-129H-12-3	**49.**	CTS-189H-12-3	**63.**	CTS-249H-12-3	**78.**
90° Vertical (Outside)	CTS-1290-12-3	**54.**	CTS-1890-12-3	**71.**	CTS-2490-12-3	**78.**
90° Vertical (Inside)	CTS-129I-12-3	**54.**	CTS-189I-12-3	**71.**	CTS-249I-12-3	**78.**
Tee—12" Radius Horizontal	CTS-12HT-12-3	**129.**	CTS-18HT-12-3	**140.**	CTS-24HT-12-3	**190.**
Box Adaptor (Tray to Box)	CTS-12TB-3	**17.**	CTS-18TB-3	**17.**	CTS-24TB-3	**17.**
End Closure	CTS-12EC-3	**13.**	CTS-18EC-3	**14.**	CTS-24EC-3	**15.**
Drop Out	CTS-12DO-04	**16.**	CTS-18DO-04	**17.**	CTS-24DO-04	**19.**
Clamp Hanger (Pair)	CTSHCS	**11.**	CTSHCS	**11.**	CTSHCS	**11.**

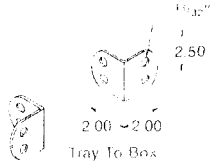
Fittings not shown, covers, solid bottoms, and barriers available — consult factory.

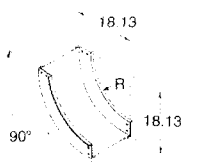
CONNECTORS—STANDARD STRAIGHT SECTIONS AND FITTINGS INCLUDE CONNECTOR KIT AND HARDWARE

Type	Description	Catalog Number	List Price
Reducer Splice Plates	6" Offset	CTS-06RSP-3	**19.**
	12" Offset	CTS-12RSP-3	**21.**
Extra Connector (Pair) Required For Field Cuts	Standard — Flat or Vertical	CTS-SSP-3	**12.**
	Adjustable — Flat	CTS-ASPF-3	**31.**
	Adjustable — Vertical	CTS-ASPV-3	**18.**

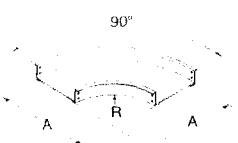






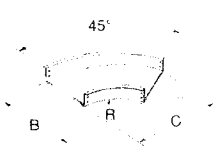


90° Vertical Inside Elbow

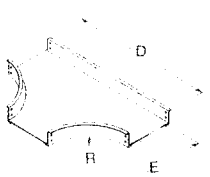


90° Flat Elbow

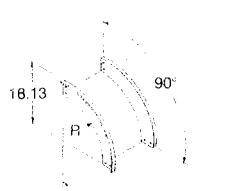
Width "W"	Dimensions In Inches					Radius "R"
	A	B	C	D	E	
12"	27.50	18.50	22.44	42.00	27.50	12.00
18"	33.50	24.50	26.69	48.00	33.50	12.00
24"	39.50	30.50	30.94	54.00	39.50	12.00



45° Flat Elbow



Flat Tee



90° Vertical Outside Elbow

ALLOWABLE LOADS—SIMPLE BEAM DATA-TYPE CTS (CABLE TRAY TROUGH—GALVANIZED STEEL)

Tray Width	12 inches			18 and 24 inches		
Span (Feet)	6	8	10	6	8	10
*W = Load (Lbs./Ft.)	214	120	77	224	126	81
Deflection (Inches)	.3852	.6720	1.0626	.2688	.4662	.7290
*K Factor	.0018	.0056	.0138	.0012	.0037	.0090

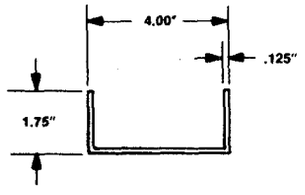
*K × *W may be used to calculate deflection of lighter loads.
Safety Factor = 1.5

SQD SLV_000924

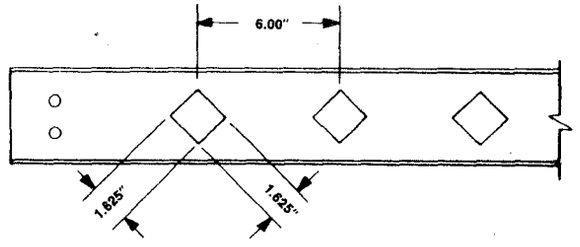
CHANNEL-TYPE CCA

STOCK ITEMS

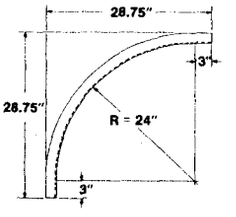
Cable channel is used primarily to support feeder cable(s), branch power cables or control cables. However, it also can be used to support hydraulic hose and tubing or air hose and tubing. Light but rigid cable channel offers lower total installed cost than a comparable cable and conduit system. Also, a cable channel system is easily modified by addition or removal of cable or cable channel sections.



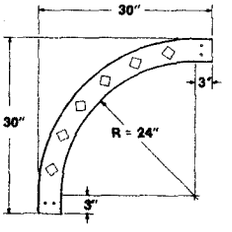
1.625" Loading Depth
6063-T6 Al Alloy



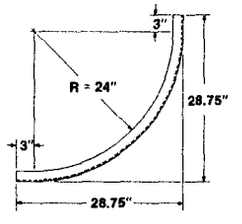
0.6503 in.² minimum cross sectional area



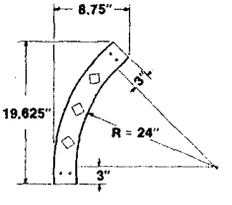
90° Vertical Outside Elbow



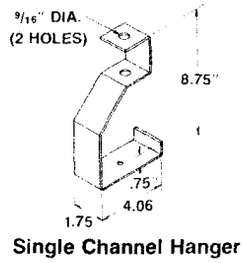
90° Horizontal Elbow



90° Vertical Inside Elbow

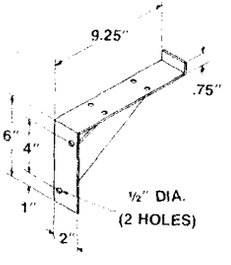


45° Horizontal Elbow

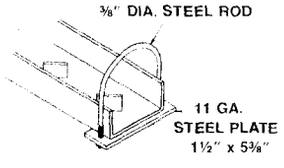


Single Channel Hanger

Description	4" Wide Aluminum Cable Channel 1⅝" Loading Depth	
	Catalog Number	List Price
Straight Sections 12' 0" Length	CCA-04SS-12-2	**$82.**
Elbow—24" Radius 45° Horizontal 90° Horizontal 90° Vertical (Outside) 90° Vertical (Inside)	 CCA-044H-24-2 CCA-049H-24-2 CCA-049O-24-2 CCA-049I-24-2	 **56.** **64.** **57.** **57.**
Adaptors Channel-to-Box Channel-to-Tray (Side) Channel-to-Tray (End)	 CCA-04CB-2 CCA-04CTS-2 CCA-04CTE-2	 **16.** **12.** **14.**
Cable Clamp (For 3" and 4" Cables—Contains "U" Bolt Bottom Plate and Lock Nuts)	CCA-04UB	**19.**
Hangers Single Channel Double Channel	 SCH-04 DCH-04	 **19.** **13.**
Wall Brackets Single Channel Double Channel	 SCWB-04 DCWB-04	 **10.** **14.**



Double Channel Wall Bracket



Channel U-Bolt Cable Clamp

CONNECTORS—EACH STRAIGHT SECTION AND ELBOW INCLUDES CONNECTOR AND MOUNTING HARDWARE

Type	Description	Catalog Number	List Price
Extra Connector Required For Field Cuts	Standard (Horizontal or Vertical)	CCA-SSP-2	**$13.**
	Adjustable—Horizontal	CCA-ASPF-2	**36.**
	Adjustable—Vertical	CCA-ASPV-2	**21.**

ALLOWABLE LOADS—SIMPLE BEAM DATA—TYPE CCA (CABLE CHANNEL—ALUMINUM)

Span (Feet)	6	8	10	12
*W=Load (Lbs./Ft.)	53	31	19	13
Deflection (Inches)	.7261	1.4043	2.2002	2.9939
*K Factor	.0137	.0453	.1158	.2303

*K × W may be used to calculate deflection of lighter loads
Safety Factor = 1.5

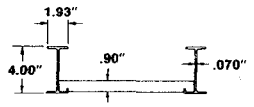
SQD SLV_000925

CABLE TRAY

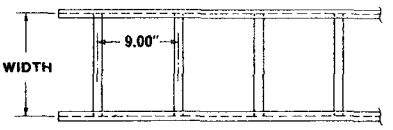
LADDER-TYPE CLA

STOCK ITEMS

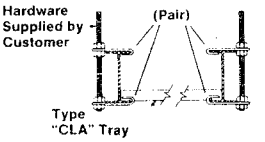
Type CLA, aluminum ladder cable tray, provides a light rigid medium-duty cable tray system that offers labor savings due to ease of installation. Maximum strength per pound is assured due to I-BEAM side rails with welded and interlocked rungs. The highly corrosion resistant 6063-T6 aluminum alloy allows indoor or outdoor use.

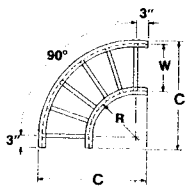


3" Loading Depth
6063-T6 Al Alloy

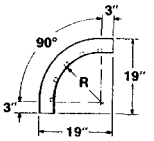


1.1144 in.² total cross sectional area of both side rails

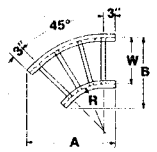




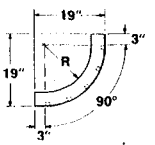
90° Horizontal Elbow



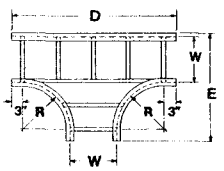
90° Vertical Outside Elbow



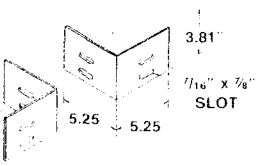
45° Horizontal Elbow



90° Vertical Inside Elbow



Horizontal Tee



Tray To Box

Width	45° Horizontal		90° Horizontal	Horizontal Tee		Radius
"W"	A	B	C	D	E	"R"
12"	22.875"	18.625"	28"	42"	28"	12"
18"	27.125"	24.625"	34"	48"	34"	12"
24"	31.375"	30.625"	40"	52"	40"	12"

Description	12" Wide Aluminum Ladder Cable Tray—3" Loading Depth—9" Rung Spacing		18" Wide Aluminum Ladder Cable Tray—3" Loading Depth 9" Rung Spacing		24" Wide Aluminum Ladder Cable Tray—3" Loading Depth—9" Rung Spacing	
	Catalog Number	List Price	Catalog Number	List Price	Catalog Number	List Price
Straight Section 12' 0" Length	CLA-12SS-12-3-9	$143.	CLA-18SS-12-3-9	$154.	CLA-24SS-12-3-9	$162.
Elbow—12" Radius						
45° Horizontal	CLA-124H-12-3-9	66.	CLA-184H-12-3-9	70.	CLA-244H-12-3-9	75.
90° Horizontal	CLA-129H-12-3-9	74.	CLA-189H-12-3-9	81.	CLA-249H-12-3-9	88.
90° Vertical (Outside)	CLA-129O-12-3-9	95.	CLA-189O-12-3-9	98.	CLA-249O-12-3-9	99.
90° Vertical (Inside)	CLA-129I-12-3-9	95.	CLA-189I-12-3-9	98.	CLA-249I-12-3-9	99.
Tee—12" Radius Horizontal	CLA-12HT-12-3-9	169.	CLA-18HT-12-3-9	180.	CLA-24HT-12-3-9	191.
Box Adapter (Tray-to-Box)	CLA-12TB-3	34.	CLA-18TB-3	34.	CLA-24TB-3	34.
End Closure	CLA-12EC-3	21.	CLA-18EC-3	23.	CLA-24EC-3	25.
Drop-Out	CLA-12DO-04	20.	CLA-18DO-04	24.	CLA-24DO-04	27.
Clamp Hanger (Pair)	CLA-HCS	11.	CLA-HCS	11.	CLA-HCS	11.

Fittings not shown, covers, expanded metal bottoms, solid bottoms, and barriers available—consult factory

CONNECTORS—STANDARD STRAIGHT SECTIONS AND FITTINGS INCLUDE CONNECTOR KIT AND HARDWARE

Type	Description	Catalog Number	List Price
Reducer Splice Plates	6" Offset	CLA-06RSP-3	$23.
	12" Offset	CLA-12RSP-3	25.
Extra Connector (Pair) Required for Field Cuts	Standard—Flat or Vertical	CLA-SSP-3	19.
	Adjustable—Flat	CLA-ASPF-3	61.
	Adjustable—Vertical	CLA-ASPV-3	46.

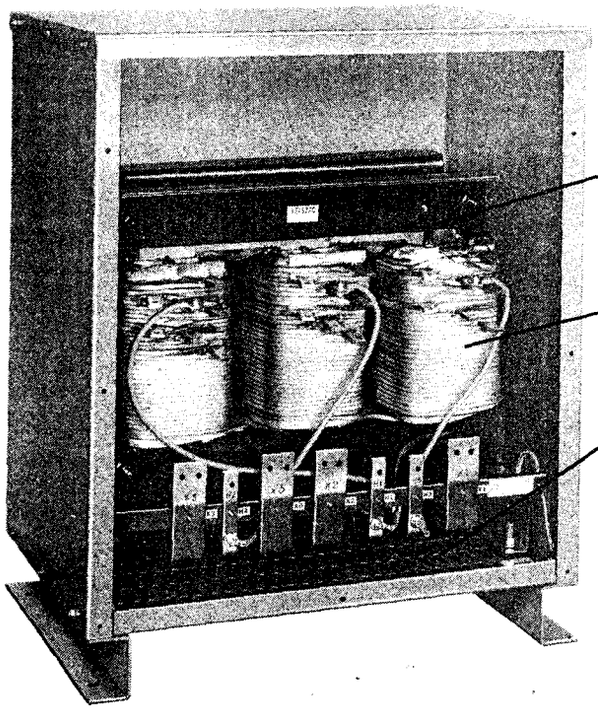
ALLOWABLE LOADS—SIMPLE BEAM DATA—TYPE CLA (CABLE TRAY LADDER—ALUMINUM)

Span (Foot)	6	8	10	12	14	16	18	20
*W-Load (Lbs/Ft)	377	212	136	95	69	53	43	34
Deflection (Inches)	.4901	.8904	1.4008	2.014	2.7324	3.5828	4.5838	5.5046
*K Factor	.0013	.0042	.0103	.0212	.0396	.0676	.1066	.1619

*K × W may be used to calculate deflection of lighter loads
Safety Factor = 1.5

SQD SLV_000926

SORGEL DRY TYPE TRANSFORMERS
YOU GET MORE FOR YOUR TRANSFORMER DOLLAR

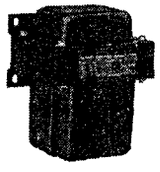


- **UL listed** through 500 KVA Three Phase, 167 KVA Single Phase, 600 Volts and below.
- Rigid, Bolted Core Clamps
- Wire Wound Coils
- Spacious, Cool Wiring Compartment Listed for 75° C Wire
- Heavy gauge sheet steel enclosure. Degreased, phosphatized, finished with outdoor enamel and baked.
- Drip-proof construction with baffled openings for ventilation.
- Enclosure bottom of heavy gauge steel with ventilating openings. Minimizes vibration noise and discourages entry of rodents. Provides firm anchor for conduit entry.
- Floor or wall mounting for all units through 112½ KVA, 3 ϕ and 167 KVA 1 ϕ.
- Core-and-coil assemblies internally isolated for quiet operation.
- Terminal board is in front and easily accessible. All terminals designed to UL requirements.
- See page 170 for complete connector kits.
- Flexible straps visibly ground enclosure and core-and-coil assemblies. Meets NEC.
- Outdoor units are available in all sizes.
- Universal tap arrangement, 2-2½% above and 4-2½% below normal primary voltage on larger sizes.

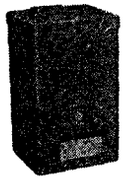
STOCK TRANSFORMER SOUND LEVELS

KVA	Design Sound Level	Guaranteed Sound Level	NEMA Standard Sound Levels
0-9	40	40	40
10-50	42	45	45
51-150	45	50	50
151-300	49	55	55
301-500	53	60	60

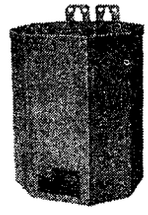
ENCLOSURES



STYLE A



STYLE B



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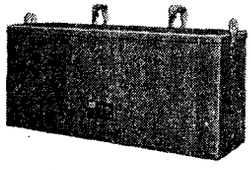
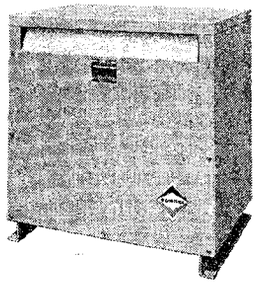
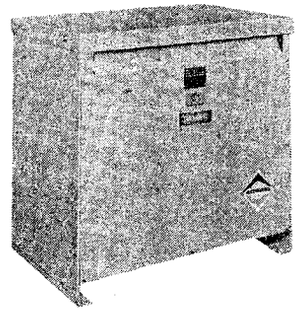


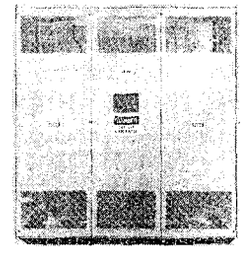
STYLE D



STYLE E



STYLE F



STYLE G

SQD SLV_000927

SORGEL DRY TYPE TRANSFORMERS ®

600 VOLTS AND BELOW

These general purpose transformers are detailed in Sorgel Bul. D-1D. Non-standard ratings not shown are available on special order. Enclosures phosphatized and finished with gray baked enamel to provide maximum corrosion resistance.

UL listed through 500 KVA Three Phase, 167 KVA Single Phase.

KVA	† Catalog Number	Price	Taps	Deg. C. Temp. Rise	♦ Dimensions Height	Width	Depth	Weight Pounds	Mounting	* Enclosure See Page 149	Wiring See Page 162
SINGLE PHASE		**240X480 VOLTS PRIMARY 120/240 VOLTS SECONDARY 60 HERTZ**									
.050	**50SV1A**	**$ 36.**	None	55	5 13/32	3	2 13/16	3	Wall	I(A)	5
.100	**100SV1A**	**42.**	None	55	5 27/32	3¾	3 7/16	5½	Wall	I(A)	5
.150	**150SV1A**	**52.**	None	55	6 11/32	3¾	3 7/16	6¾	Wall	I(A)	5
.250	**250SV1B**	**57.**	None	80	6 17/32	4½	4 1/16	8¼	Wall	I(A)	5
.500	**500SV1B**	**81.**	None	80	7 25/32	4½	4 1/16	11	Wall	I(A)	5
.750	**750SV1F**	**97.**	None	115	8½	5¼	4 11/16	17	Wall	I-(A)	5
1	**1S1F**	**125.**	None	115	9⅝	5¼	4 11/16	23	Wall	I-(A)	5
1.5	**1.5S1F**	**151.**	None	115	10	6¾	5 5/16	35	Wall	I-(A)	5
2	**2S1F**	**187.**	None	115	11½	6¾	5 5/16	52	Wall	I-(A)	5
3	**3S1F**	**239.**	None	115	14¼	7½	7¾	48	Wall	I-O(C)	5
5	**5S1F**	**325.**	None	115	15¾	9⅜	9	75	Wall	I-O(C)	5
7.5	**7S1F**	**456.**	None	115	16	12	10⅝	102	Wall	I-O(C)	5
10	**10S1F**	**566.**	None	115	19	12	10⅝	128	Wall	I-O(C)	5
15	**15S1H**	**760.**	None	150	23	16	15	190	Floor	I●(F)	1
25	**25S3H**	**992.**	6—2½%2+4—★	150	23	16	15	230	Floor	I●(F)	3
37.5	**37S3H**	**1375.**	6—2½%2+4—★	150	30	20	20	345	Floor	I●(F)	3
50	**50S3H**	**1670.**	6—2½%2+4—★	150	30	20	20	430	Floor	I●(F)	3
75	**75S3H**	**2170.**	6—2½%2+4—★	150	42	24	24	615	Floor	I●(E)	3
100	**100S3H**	**2825.**	6—2½%2+4—★	150	48	32	29½	905	Floor	I●(E)	3
167	**167S3H**	**4695.**	6—2½%2+4—★	150	48	32	29½	1050	Floor	I●(E)	3
SINGLE PHASE		**480 VOLTS PRIMARY 120/240 VOLTS SECONDARY 60 HERTZ**									
3	**3S40F**	**$ 239.**	2—5%FCBN	115	14¼	7½	7¾	48	Wall	I-O(C)	4
5	**5S40F**	**325.**	2—5%FCBN	115	15¾	9⅜	9	75	Wall	I-O(C)	4
7.5	**7S40F**	**456.**	2—5%FCBN	115	16	12	10⅝	102	Wall	I-O(C)	4
10	**10S40F**	**566.**	2—5%FCBN	115	19	12	10⅝	128	Wall	I-O(C)	4
15	**15S40H**	**760.**	2—5%FCBN	150	23	16	16	190	Floor	I-●(F)	18
SINGLE PHASE		**600 VOLTS PRIMARY 120/240 VOLTS SECONDARY 60 HERTZ**									
3	‡**3S4F**	**$ 260.**	2—5%FCBN	115	14¼	7½	7¾	48	Wall	I-O(C)	4
5	‡**5S4F**	**352.**	2—5%FCBN	115	15¾	9⅜	9	75	Wall	I-O(C)	4
7.5	‡**7S4F**	**486.**	2—5%FCBN	115	16	12	10⅝	102	Wall	I-O(C)	4
10	‡**10S4F**	**610.**	2—5%FCBN	115	19	12	10⅝	128	Wall	I-O(C)	4
15	‡**15S5H**	**820.**	4—2½%FCBN	150	23	16	15	190	Floor	I●(F)	19
25	‡**25S5H**	**1070.**	4—2½%FCBN	150	23	16	15	230	Floor	I●(F)	19
37.5	‡**37S5H**	**1485.**	4—2½%FCBN	150	30	20	20	345	Floor	I●(F)	19
50	‡**50S5H**	**1800.**	4—2½%FCBN	150	30	20	20	430	Floor	I●(F)	19
75	75S5H	**2350.**	4—2½%FCBN	150	42	24	24	615	Floor	I●(E)	19
100	100S5H	**3050.**	4—2½%FCBN	150	48	32	29½	905	Floor	I●(E)	19
167	167S5H	**5070.**	4—2½%FCBN	150	48	32	29½	1050	Floor	I●(E)	19

† Catalog numbers shown in bold type are available from redistribution center.

‡ Available from Atlanta Redistribution Center or Central Warehouse.

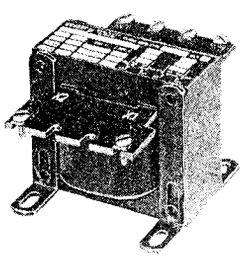
● Units can be converted for outdoor service with use of weathershields shown on Page 154.

★ When 240 volt connection is used, there will be 3—5% taps, 1 above and 2 below 240 volts.

* ENCLOSURE CODE—I = Indoor, O = Outdoor. Letters in parentheses indicate illustration on Page 149.

TAPS on transformers 225 KVA and larger may vary in 3% to 5% steps to obtain best design.

LUGS: Furnished by customer. (See page 170 for lug kits.)



MACHINE TOOL TRANSFORMERS

For more information, refer to pages 428 and 429.

♦ DO NOT USE FOR CONSTRUCTION; CONTACT SORGEL PLANT FOR CERTIFIED PRINTS.

SQD SLV_000928

SORGEL DRY TYPE TRANSFORMERS
600 VOLTS AND BELOW

General purpose dry type transformers for indoor installations. Core and coil assemblies are mounted on rubber isolation pads to reduce the sound level. Manufactured and tested to meet, or exceed, IEEE, NEMA and ANSI standards. Compact size permits installations near the load being supplied.

UL listed through 500 KVA Three Phase, 167 KVA Single Phase.

KVA	† Catalog Number	Price	Taps	Deg. C. Temp. Rise	◆ Dimensions Height	Width	Depth	Weight Pounds	Mounting	* Enclosure See Page 149	Wiring See Page 162
THREE PHASE			**480 VOLTS DELTA PRIMARY 208Y/120 VOLTS SECONDARY 60 HERTZ**								
3	**3T2F**	**$ 420.**	2—5%FCBN	115	13⅜	15 15/16	8 5/16	70	Wall	I-O(D)	31
6	**6T2F**	**490.**	2—5%FCBN	115	15⅞	16⅜	7½	115	Wall	I-O(D)	31
9	**9T2F**	**645.**	2—5%FCBN	115	15⅞	16	9 1/16	160	Wall	I-O(D)	31
15	**15T2F**	**970.**	2—5%FCBN	115	17⅜	20	8 1/16	210	Wall	I-O(D)	31
15	**15T68F**	**970.**	4—2½%2+2—	115	17⅜	20	8 1/16	210	Wall	I-O(D)	28
15	**15T3H**	**950.**	6—2½%2+4—	150	23	22¼	15	230	Floor	I●(F)	10
30	**30T3H**	**1310.**	6—2½%2+4—	150	23	22¼	15	285	Floor	I●(F)	10
45	**45T3H**	**1580.**	6—2½%2+4—	150	26	24	15	369	Floor	I●(F)	10
75	**75T3H**	**2375.**	6—2½%2+4—	150	30	30	20	590	Floor	I●(F)	10
112.5	**112T3H**	**3160.**	6—2½%2+4—	150	37	30	20	690	Floor	I●(E)	10
150	**150T3H**	**4120.**	6—2½%2+4—	150	42	36	24	1050	Floor	I●(E)	10
225	**225T3H**	**5500.**	6—2½%2+4—	150	42	36	24	1350	Floor	I●(E)	10
300	**300T3H**	**7080.**	6—2½%2+4—	150	48	48	29½	2000	Floor	I●(E)	10
500	**500T68H**	**11350.**	4—2½%2+2—	150	58	48	29½	2700	Floor	I●(E)	11
750	750T90H	**16985.**	4—3½%2+2—	150	90	72	54	5200	Floor	I (G)	11
1000	1000T77H	**21075.**	2—5%1+1—	150	90	72	54	6000	Floor	I (G)	16
THREE PHASE			**480 VOLTS DELTA PRIMARY 240 VOLTS DELTA SECONDARY 60 HERTZ**								
6	**6T5F**	**490.**	2—5%FCBN	115	15⅞	16⅜	7½	115	Wall	I-O(D)	29
9	**9T75F**	**645.**	4—2½%FCBN	115	15⅞	16	9 1/16	160	Wall	I-O(D)	30
15	**15T75F**	**970.**	4—2½%FCBN	115	17⅜	20	8 1/16	210	Wall	I-O(D)	30
15	**15T6H**	**950.**	6—2½%2+4—	150	23	22¼	15	230	Floor	I●(F)	14
30	**30T6H**	**1310.**	6—2½%2+4—	150	23	22¼	15	285	Floor	I●(F)	14
45	**45T6H**	**1580.**	6—2½%2+4—	150	26	24	15	369	Floor	I●(F)	14
75	**75T6H**	**2375.**	6—2½%2+4—	150	30	30	20	590	Floor	I●(F)	14
112.5	**112T6H**	**3160.**	6—2½%2+4—	150	37	30	20	690	Floor	I●(E)	14
150	**150T6H**	**4120.**	6—2½%2+4—	150	42	36	24	1050	Floor	I●(E)	14
225	**225T6H**	**5500.**	6—2½%2+4—	150	42	36	24	1350	Floor	I●(E)	14
300	**300T6H**	**7080.**	6—2½%2+4—	150	48	48	29½	2000	Floor	I●(E)	14
500	500T63H	**11350.**	4—2½%2+2—	150	58	48	29½	2700	Floor	I●(E)	15
750	750T91H	**16985.**	4—3½%2+2—	150	90	72	54	5200	Floor	I (G)	15
1000	1000T78H	**21075.**	2—5%1+1—	150	90	72	54	6000	Floor	I (G)	17
THREE PHASE			**■ 480 VOLTS DELTA PRIMARY 240/120 VOLTS SECONDARY 60 HERTZ, 3 PHASE, 4 WIRE**								
30	**30T6HCT**	**1375.**	6—2½%2+4—	150	23	22¼	15	285	Floor	I●(F)	20
45	**45T6HCT**	**1660.**	6—2½%2+4—	150	26	24	15	369	Floor	I●(F)	20
75	**75T6HCT**	**2495.**	6—2½%2+4—	150	30	30	20	590	Floor	I●(F)	20
112.5	112T6HCT	**3650.**	6—2½%2+4—	150	37	30	20	690	Floor	I●(E)	20
150	150T6HCT	**4760.**	6—2½%2+4—	150	42	36	24	1050	Floor	I●(E)	20
225	225T6HCT	**6350.**	6—2½%2+4—	150	42	36	24	1350	Floor	I●(E)	20
300	300T6HCT	**8175.**	6—2½%2+4—	150	48	48	29½	2000	Floor	I●(E)	20
500	500T63HCT	**11915.**	4—2½%2+2—	150	58	48	29½	2700	Floor	I●(E)	26
750	750T91HCT	**17835.**	4—3½%2+2—	150	90	72	54	5200	Floor	I (G)	26
1000	1000T78HCT	**22130.**	2—5%1+1—	150	90	72	54	6000	Floor	I (G)	27

■ CAUTION: Single phase load limited to maximum 5% of rated KVA. Contact Sorgel headquarters for other loading.

KVA	† Catalog Number	Price	Taps	Deg. C. Temp. Rise	◆ Dimensions Height	Width	Depth	Weight Pounds	Mounting	* Enclosure See Page 149	Wiring See Page 162
THREE PHASE			**600 VOLTS DELTA PRIMARY 208Y/120 VOLTS SECONDARY 60 HERTZ**								
6	**‡6T7F**	**515.**	2—5%FCBN	115	15⅞	16⅜	7½	115	Wall	I-O(D)	31
9	**‡9T7F**	**680.**	2—5%FCBN	115	15⅞	16	9 1/16	160	Wall	I-O(D)	31
15	**‡15T7F**	**1020.**	2—5%FCBN	115	17⅜	20	8 1/16	210	Wall	I-O(D)	31
15	15T8H	**1145.**	4—2½%FCBN	150	23	22¼	15	230	Floor	I●(F)	11
30	**‡30T8H**	**1375.**	4—2½%FCBN	150	23	22¼	15	285	Floor	I●(F)	11
45	**‡45T8H**	**1660.**	4—2½%FCBN	150	26	24	15	369	Floor	I●(F)	11
75	**‡75T8H**	**2495.**	4—2½%FCBN	150	30	30	20	590	Floor	I●(F)	11
112.5	112T8H	**3475.**	4—2½%FCBN	150	37	30	20	690	Floor	I●(E)	11
150	150T8H	**4535.**	4—2½%FCBN	150	42	36	24	1050	Floor	I●(E)	11
225	225T8H	**6050.**	4—2½%FCBN	150	42	36	24	1350	Floor	I●(E)	11
300	300T8H	**7785.**	4—2½%FCBN	150	48	48	29½	2000	Floor	I●(E)	11
500	500T8H	**12485.**	4—2½%FCBN	150	58	48	29½	2700	Floor	I●(E)	11
750	750T8H	**17835.**	4—2½%FCBN	150	90	72	54	5200	Floor	I (G)	11
1000	1000T88H	**22130.**	4—3½%FCBN	150	90	72	54	6000	Floor	I (G)	11

† **Catalog numbers shown in bold type are available from redistribution center.**
‡ **Available from Atlanta redistribution center or Central Warehouse.**
● Units can be converted for outdoor service with use of weathershields shown on Page 154.
* ENCLOSURE CODE—I=Indoor, O=Outdoor. Letters in parentheses indicate illustration on Page 149.
TAPS on transformers 225 KVA and larger may vary in 3% to 5% steps to obtain best design.
LUGS: Furnished by customer. (See page 170 for lug kits)

◆ **DO NOT USE FOR CONSTRUCTION; CONTACT SORGEL PLANT FOR CERTIFIED PRINTS.**

SQD SLV_000929

SORGEL DRY TYPE TRANSFORMERS
600 VOLTS AND BELOW

QUIET QUALITY® TRANSFORMERS
UL LISTED

Energy Saving *Watchdog*® Transformers — 115° C. and 80° C. Temperature Rise

SORGEL PREMIUM LINE —

- DESIGNED WITH LOW LOSSES FOR MINIMUM OPERATING COST.
- EXTRA LONG LIFE EXPECTANCY USING A 220°C. INSULATION SYSTEM DESIGNED FOR FULL LOAD OPERATION AT A MAXIMUM TEMPERATURE RISE OF 115°C. OR 80°C. ABOVE A 40°C. AMBIENT INSTEAD OF 150°C. RISE.
- CONTINUOUS EMERGENCY OVERLOAD CAPABILITY OF 15% ON 115°C. RISE AND 30% ON 80°C. RISE.
- CORE AND COIL ASSEMBLIES MOUNTED ON RUBBER ISOLATION PADS TO REDUCE SOUND TRANSMISSION.

See pages 158 and 159 for the high voltage equivalents.

115° C. RISE SINGLE PHASE — 240 x 480 VOLTS PRIMARY 120/240 VOLTS SECONDARY 60 HERTZ

KVA	† Catalog Number	Price	Taps	◆ Dimensions Height	Width	Depth	Weight Pounds	Mounting	*Enclosure See Page 149	Wiring See Page 162
25	**25S3HF**	**$1310.**	6—2½%2+4—★	30	20	20	345	Floor	I●(F)	3
37.5	**37S3HF**	**1585.**	6—2½%2+4—★	30	20	20	430	Floor	I●(F)	3
50	**50S3HF**	**2060.**	6—2½%2+4—★	37	20	20	485	Floor	I●(E)	3
75	75S3HF	**2875.**	6—2½%2+4—★	42	24	24	665	Floor	I●(E)	3
100	100S3HF	**3245.**	6—2½%2+4—★	48	32	29.5	1150	Floor	I●(E)	3

80° C. RISE SINGLE PHASE — 240 x 480 VOLTS PRIMARY 120/240 VOLTS SECONDARY 60 HERTZ

25	**25S3HB**	**1446.**	6—2½%2+4—★	30	20	20	345	Floor	I●(F)	3
37.5	**37S3HB**	**1754.**	6—2½%2+4—★	30	20	20	430	Floor	I●(F)	3
50	**50S3HB**	**2281.**	6—2½%2+4—★	42	24	24	615	Floor	I●(E)	3
75	75S3HB	**3160.**	6—2½%2+4—★	48	32	29.5	950	Floor	I●(E)	3
100	100S3HB	**3570.**	6—2½%2+4—★	60	40	36	1290	Floor	I●(E)	3

115° C. RISE THREE PHASE — 480 VOLTS DELTA PRIMARY 208Y/120 VOLTS SECONDARY 60 HERTZ

30	**30T3HF**	**1575.**	6—2½%2+4—	26	24	15	369	Floor	I●(F)	10
45	**45T3HF**	**2370.**	6—2½%2+4—	30	30	20	590	Floor	I●(F)	10
75	**75T3HF**	**3045.**	6—2½%2+4—	37	30	20	690	Floor	I●(E)	10
112.5	**112T3HF**	**3915.**	6—2½%2+4—	42	36	24	1050	Floor	I●(E)	10
150	**150T3HF**	**5225.**	6—2½%2+4—	42	36	24	1350	Floor	I●(E)	10
225	**225T3HF**	**7200.**	6—2½%2+4—	48	48	29.5	2000	Floor	I●(E)	10
300	**300T3HF**	**8770.**	6—2½%2+4—	48	48	29.5	2500	Floor	I●(E)	10
500	500T68HF	**12865.**	4—2½%2+2—	60	56	36	4200	Floor	I●(E)	11

80° C. RISE THREE PHASE — 480 VOLTS DELTA PRIMARY 208Y/120 VOLTS SECONDARY 60 HERTZ

30	**30T3HB**	**1735.**	6—2½%2+4—	26	24	15	369	Floor	I●(F)	10
45	**45T3HB**	**2610.**	6—2½%2+4—	30	30	20	590	Floor	I●(F)	10
75	**75T3HB**	**3350.**	6—2½%2+4—	37	30	20	690	Floor	I●(E)	10
112.5	**112T3HB**	**4310.**	6—2½%2+4—	42	36	24	1050	Floor	I●(E)	10
150	**150T3HB**	**5750.**	6—2½%2+4—	42	36	24	1350	Floor	I●(E)	10
225	**225T3HB**	**7920.**	6—2½%2+4—	48	48	29.5	2000	Floor	I●(E)	10
300	**300T3HB**	**9650.**	6—2½%2+4—	58	48	29.5	2875	Floor	I●(E)	10
500	500T90HB	**14150.**	4—3½%2+2—	60	56	36	4600	Floor	I●(E)	11

†Catalog numbers shown in bold type are available from redistribution center.
LUGS: Furnished by customer. (See page 170 for lug kits.)

*ENCLOSURE CODE—I = Indoor, O = Outdoor. Letters in parentheses indicate illustration on Page 149.

● Units can be converted for outdoor service with use of weathershields. Consult factory for size, or match enclosure size with Pages 150 & 151 for equivalent KVA weathershields in table Page 154.

★When 240 volt connection is used, there will be 3—5% taps, 1 above and 2 below 240 volts.

◆ DO NOT USE FOR CONSTRUCTION; CONTACT SORGEL PLANT FOR CERTIFIED PRINTS.

SQD SLV_000930

THREE PHASE AUTOTRANSFORMERS
480Y/277 VOLTS, 3 PHASE, 4 WIRE TO 208Y/120 VOLTS (Cannot be used on 3-wire 480 volt system)

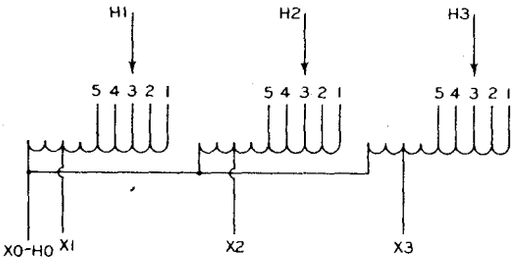
KVA	Catalog Number	Price H-150	Degree C Temp. Rise	◆ Dimensions Height	Width	Depth	Weight	Enclosure*	Wall Mounting Brackets Catalog Number	Weathershields Catalog Number	Average X/R	Average %Z
30	**30T89HAT**	**$1150.**	150	23	22¼	15	250	●(E)	WMB361-362	WS360	1.0	3.0
45	**45T89HAT**	**1350.**	150	23	22¼	15	275	●(E)	WMB361-362	WS360	1.07	3.2
75	**75T89HAT**	**1700.**	150	26	24	15	360	●(E)	WMB361-362	WS362-365	1.1	3.1
112.5	**112T89HAT**	**2300.**	150	30	30	20	605	●(E)	WMB363-364	WS364	1.0	2.6
150	**150T89HAT**	**3400.**	150	42	36	24	750	●(E)	NOT AVAILABLE	WS366	1.7	3.4
225	**225T89HAT**	**4200.**	150	42	36	24	1065	●(E)	NOT AVAILABLE	WS366	1.3	2.2
300	**300T89HAT**	**4700.**	150	42	36	24	1160	●(E)	NOT AVAILABLE	WS366	1.51	2.4

All transformers are floor mounting type, available from Redistribution Center.
* Enclosure code — 1 = Indoor. Letters in parentheses indicate illustration on Page 149.
● Units can be converted to outdoor service with use of weathershields.
LUGS: FURNISHED BY CUSTOMER. (See page 170 for lug kits.)

AUTOTRANSFORMER ADVANTAGES OVER THE SAME KVA INSULATING TRANSFORMER.

1. Lower purchase price.
2. Lower operating cost due to lower losses.
3. Smaller size; easier to install.
4. Better voltage regulation.
5. Lower sound levels.
6. Three-legged core construction keeps third harmonic current at a negligible value.

Wiring diagram
TAPS 4-2½%2+ & 2−



APPLICATION CAUTIONS

1. Cannot be used where isolation is required. (Computers, solid state controls, etc.) For this purpose use a Sorgel shielded, isolation transformer as listed on page 155.
2. Remember the lower impedance when making a short circuit study.
3. Check local codes for any existing ordinances against autotransformers. Most of these may be based on obsolete objections to their use. Sorgel headquarters sales personnel will be glad to help if necessary.

BUCK AND BOOST

These are two-winding transformers with a 120 x 240 high voltage winding. Low voltage windings can be either 12/24 or 16/32 volts. By special interconnection of these windings, an autotransformer is obtained. When used this way for bucking or boosting small voltage changes, the KVA load they can carry is large compared to their physical size. **See Sorgel Bul. B-B1, B-B2, or B-B3 for application information. NOTE: WHEN USED TO SUPPLY A 3 PHASE, 4-WIRE LOAD, THE SOURCE MUST BE 3 PHASE, 4-WIRE.**

120 X 240 VOLTS PRIMARY, 1 PHASE, 60 HERTZ

KVA	Catalog Numbers 12/24 V. Secondary	Catalog Numbers 16/32 V. Secondary	Price	Deg. C Temp. Rise	◆ Dimensions Height	Width	Depth	Lbs. Wgt.	Mounting	Enclosure See Page 149
.25	**250SV43B**	**250SV46B**	**$ 68.**	80	7 1/16	4 5/16	4⅛	12	Wall	B
.50	**500SV43B**	**500SV46B**	**88.**	80	7 1/16	4⅞	4⅝	13	Wall	B
.75	**750SV43B**	**750SV46B**	**115.**	80	8⅜	6	5½	20	Wall	B
1.0	**1S43B**	**1S46B**	**142.**	80	9⅜	6	5½	26	Wall	B
1.5	**1.5S43B**	**1.5S46B**	**174.**	80	10½	6⅜	6⅛	36	Wall	B
2.0	**2S43B**	**2S46B**	**224.**	80	11½	6⅜	6⅛	40	Wall	B
3.0	**3S43F**	**3S46F**	**310.**	115	14¼	7½	7¾	48	Wall	C

All Buck and Boost are available from Redistribution Center.

◆ **DO NOT USE FOR CONSTRUCTION: CONTACT SORGEL PLANT FOR CERTIFIED PRINTS.**

SQD SLV_000931

ACCESSORIES AND SPECIAL FEATURES

NOTE: CATALOG NUMBERS ARE FOR STOCK 150°C TRANSFORMERS ONLY. CHECK FACTORY FOR SPECIAL TRANSFORMER ACCESSORIES.

SINGLE PHASE — 600 VOLTS AND BELOW

KVA	† Weathershields		** † Wall Mounting Brackets		†† Ceiling Mounting Brackets	
	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price
15-25	**WS361**	★ **$ 50.**	**WMB361-362**	★ **$ 48.**	CMB361	**$ 96.**
37.5-50	**WS363**	**96.**	**WMB363-364**	★ **48.**	CMB363	**96.**
75	**WS362-365**	**96.**	WMB365	**98.**	CMB365	**96.**
100-167	WS367	**220.**	WMB367	**254.**	CMB367	**254.**

THREE PHASE — 600 VOLTS AND BELOW

KVA	† Weathershields		** † Wall Mounting Brackets		†† Ceiling Mounting Brackets	
	Catalog Number	Price	Catalog Number	Price	Catalog Number	Price
15-30	**WS360**	**$ 96.**	**WMB361-362**	★ **$ 48.**	CMB360	**$ 91.**
45	**WS362-365**	**96.**	**WMB361-362**	★ **48.**	CMB362	**91.**
75-112	**WS364**	**96.**	**WMB363-364**	★ **48.**	CMB364	**91.**
150-225	**WS366**	**220.**	Not Available	—	CMB366	**240.**
300-500	**WS368**	**394.**	Not Available	—	Not Available	—

SPECIAL VOLTAGE AND ISOLATING TRANSFORMERS—SINGLE PHASE

Any two-winding transformer is an "isolating" transformer. The primary winding is isolated and insulated from the secondary winding.

Some electrical equipment requires complete electrical isolation from the normal supply source. Additionally, critical equipment might require an electrostatic shield be furnished between the primary and secondary to attenuate some of the source line interference and "hash" or undesirable frequencies. See Sorgel Bul. D-1J for technical details of shielded transformers.

Examples of some applications are electronic motor controls, X-ray machines and computers. See pages 163 & 164 for hospital applications.

Electrostatic Shield is indicated by the letters IS at the end of the catalog number. **UL LISTED**

KVA	† Catalog Number	Price	Taps	Deg. C. Temp. Rise	◆ Dimensions Height	Width	Depth	Weight Pounds	Mounting	Enclosure See Page 149
1.5	1.5S( )F	**$ 327.**	None	115	13	6½	6	38	Wall	I-O (B)
1.5	1.5S( )FIS	**367.**	None	115	13	6½	6	38	Wall	I-O (B)
2	2S( )F	**353.**	None	115	15	8	7½	40	Wall	I-O (B)
2*	**2S( )FIS**	**396.**	None	115	15	8	7½	40	Wall	I-O (B)
3	3S( )F	**374.**	None	115	15	8	7½	45	Wall	I-O (B)
3*	**3S( )FIS**	**414.**	None	115	15	8	7½	45	Wall	I-O (B)
5	5S( )F	**505.**	None	115	19½	10½	9½	80	Wall	I-O (B)
5*	**5S( )FIS**	**550.**	None	115	19½	10½	9½	80	Wall	I-O (B)
7.5	7S( )F	**673.**	None	115	19½	10½	9½	105	Wall	I-O (B)
7.5*	**7S( )FIS**	**720.**	None	115	19½	10½	9½	105	Wall	I-O (B)
10	10S( )F	**829.**	None	115	19½	10½	9½	140	Wall	I-O (B)
10*	**10S( )FIS**	**899.**	None	115	19½	10½	9½	140	Wall	I-O (B)
15	15S( )F	**1139.**	None	115	21½	13½	12	250	Wall	I-O (B)
15	15S( )FIS	**1279.**	None	115	21½	13½	12	250	Wall	I-O (B)
25	25S( )H	**1534.**	None	150	31	16	16	225	Floor	I● (E)
25	25S( )HIS	**1741.**	None	150	31	16	16	225	Floor	I● (E)

Code	Primary	Secondary	Wiring See Page 162
6	120x240	120/240	1
7	208	120/240	6
8	277	120/240	6
9	208	208	7
10	208	240	7

TO COMPLETE CATALOG NUMBER

To complete the catalog number, select the voltage required from chart. Insert the voltage code number in place of the ( ) in the catalog number.

† **Catalog numbers shown in bold type are available from redistribution center.**
* ***In stock only with shield. Voltage codes 6 and 7 only.***
● Units can be converted to outdoor service with use of weathershields shown in accessories above.
LUGS: Furnished by customer. (See page 170 for lug kits)
★ Supplied No Charge only if requested at the time of order.
†† Base channels are supplied for ceiling mounting — trapeze hangers must be furnished by user.
** *Wall mounting brackets may be prohibited in some California areas requiring 12" spacing from wall.*

◆ **DO NOT USE FOR CONSTRUCTION; CONTACT SORGEL PLANT FOR CERTIFIED PRINTS.**

SQD SLV_000932

‡SPECIAL VOLTAGE AND ISOLATING TRANSFORMERS — THREE PHASE

KVA	† Catalog Number	Price	Taps	Deg. C. Temp. Rise	♦ Dimensions Height	Width	Depth	Weight Pounds	Mounting	* Enclosure See Page 149	Wiring See Page 162
THREE PHASE			**480 VOLTS DELTA PRIMARY 480Y/277 VOLTS SECONDARY 60 HERTZ**								
15	15T76H	**$1145.**	4—2½%2+ & 2—	150	23	22¼	15	230	Floor	I ● (F)	11
30	**30T76H**	**1375.**	4—2½%2+ & 2—	150	23	22¼	15	285	Floor	I ● (F)	11
45	**45T76H**	**1660.**	4—2½%2+ & 2—	150	26	24	15	369	Floor	I ● (F)	11
75	**75T76H**	**2495.**	4—2½%2+ & 2—	150	30	30	20	590	Floor	I ● (F)	11
112½	112T76H	**3475.**	4—2½%2+ & 2—	150	37	30	20	690	Floor	I ● (E)	11
150	150T76H	**4535.**	4—2½%2+ & 2—	150	42	36	24	1050	Floor	I ● (E)	11
225	225T76H	**6050.**	4—2½%2+ & 2—	150	42	36	24	1350	Floor	I ● (E)	11
300	300T76H	**7785.**	4—2½%2+ & 2—	150	48	48	29½	2000	Floor	I ● (E)	11
500	500T76H	**12485.**	4—2½%2+ & 2—	150	58	48	29½	2700	Floor	I ● (E)	11
THREE PHASE			**600 VOLTS DELTA PRIMARY 240 VOLTS DELTA SECONDARY 60 HERTZ**								
15	15T10H	**1145.**	4—2½%FCBN	150	23	22¼	15	230	Floor	I ● (F)	15
30	30T10H	**1445.**	4—2½%FCBN	150	23	22¼	15	285	Floor	I ● (F)	15
45	45T10H	**1740.**	4—2½%FCBN	150	26	24	15	369	Floor	I ● (F)	15
75	75T10H	**2615.**	4—2½%FCBN	150	30	30	20	590	Floor	I ● (F)	15
112½	112T10H	**3475.**	4—2½%FCBN	150	37	30	20	690	Floor	I ● (E)	15
150	150T10H	**4535.**	4—2½%FCBN	150	42	36	24	1050	Floor	I ● (E)	15
225	225T10H	**6050.**	4—2½%FCBN	150	42	36	24	1350	Floor	I ● (E)	15
300	300T10H	**7785.**	4—2½%FCBN	150	48	48	29½	2000	Floor	I ● (E)	15
500	500T10H	**12485.**	4—2½%FCBN	150	58	48	29½	2700	Floor	I ● (E)	15
THREE PHASE			**208 VOLTS DELTA PRIMARY 480Y/277 VOLTS SECONDARY 60 HERTZ**								
15	15T64H	**1145.**	2—5%FCBN	150	23	22¼	15	230	Floor	I ● (F)	32
30	30T64H	**1445.**	2—5%FCBN	150	23	22¼	15	285	Floor	I ● (F)	32
45	45T64H	**1740.**	2—5%FCBN	150	26	24	15	369	Floor	I ● (F)	32
75	75T64H	**2615.**	2—5%FCBN	150	30	30	20	590	Floor	I ● (F)	32
112½	112T64H	**3475.**	2—5%FCBN	150	37	30	20	690	Floor	I ● (E)	32
150	150T64H	**4535.**	2—5%FCBN	150	42	36	24	1050	Floor	I ● (E)	32
225	225T64H	**6050.**	2—5%FCBN	150	42	36	24½	1350	Floor	I ● (E)	32
300	300T64H	**7785.**	2—5%FCBN	150	48	48	29½	2000	Floor	I ● (E)	32
500	500T64H	**12485.**	2—5%FCBN	150	58	48	29½	2700	Floor	I ● (E)	32
THREE PHASE			**240 VOLTS DELTA PRIMARY 208Y/120 VOLTS SECONDARY 60 HERTZ**								
15	15T12H	**1145.**	4—2½%2+ & 2—	150	23	22¼	15	230	Floor	I ● (F)	11
30	**30T12H**	**1445.**	4—2½%2+ & 2—	150	23	22¼	15	285	Floor	I ● (F)	11
45	**45T12H**	**1740.**	4—2½%2+ & 2—	150	26	24	15	369	Floor	I ● (F)	11
75	**75T12H**	**2615.**	4—2½%2+ & 2—	150	30	30	20	590	Floor	I ● (F)	11
112½	112T12H	**3475.**	4—2½%2+ & 2—	150	37	30	20	690	Floor	I ● (E)	11
150	150T12H	**4535.**	4—2½%2+ & 2—	150	42	36	24	1050	Floor	I ● (E)	11
225	225T11H	**6050.**	2—5%FCBN	150	42	36	24	1350	Floor	I ● (E)	16
300	300T11H	**7785.**	2—5%FCBN	150	48	48	29½	2000	Floor	I ● (E)	16
500	500T11H	**12485.**	2—5%FCBN	150	58	48	29½	2700	Floor	I ● (E)	16

SHIELDED ISOLATION TRANSFORMERS

KVA	† Catalog Number	Price	Taps	Deg. C. Temp. Rise	♦ Dimensions Height	Width	Depth	Weight Pounds	Mounting	* Enclosure See Page 149	Wiring See Page 162
THREE PHASE			**480 VOLTS DELTA PRIMARY 208Y/120 VOLTS SECONDARY 60 HERTZ WITH ELECTROSTATIC SHIELD. DETAILS IN BUL. D-1J**								
9	9T2FIS	**975.**	2—5%FCBN	115	18½	16½	9½	190	Wall	I-O (D)	31
15	15T3HIS	**1205.**	6—2½%2+4—	150	23	22¼	15	230	Floor	I-● (F)	10
30	**30T3HIS**	**1515.**	6—2½%2+4—	150	23	22¼	15	285	Floor	I ● (F)	10
45	**45T3HIS**	**1825.**	6—2½%2+4—	150	26	24	15	369	Floor	I ● (F)	10
75	**75T3HIS**	**2745.**	6—2½%2+4—	150	30	30	20	590	Floor	I ● (F)	10
THREE PHASE			**208 VOLTS DELTA PRIMARY 208Y/120 VOLTS SECONDARY 60 HERTZ WITH ELECTROSTATIC SHIELD. DETAILS IN BUL. D-1J**								
9	9T85FIS	**975.**	2—5%FCBN	115	18½	16½	9½	190	Wall	I-O (D)	31
15	15T85HIS	**1205.**	2—5%FCBN	150	23	22¼	15	230	Floor	I-● (F)	16
30	**30T85HIS**	**1515.**	2—5%FCBN	150	23	22¼	15	285	Floor	I ● (F)	16
45	**45T85HIS**	**1825.**	2—5%FCBN	150	26	24	15	369	Floor	I ● (F)	16
75	**75T85HIS**	**2745.**	2—5%FCBN	150	30	30	20	590	Floor	I ● (F)	16

† **CATALOG NUMBERS SHOWN IN BOLD TYPE ARE AVAILABLE FROM REDISTRIBUTION CENTER.**

● Units can be converted to outdoor service with use of weathershields shown on Page 154.

* Enclosure Code — I = Indoor, O = Outdoor. Letters in parentheses indicate illustration on Page 149.

‡ **Any variation from the above listings contact the factory for pricing. Special KVA sizes use next larger standard KVA pricing.**
For single phase special voltage transformers see page 154.
TAPS on transformers 225 KVA and larger may vary in 3% to 5% steps to obtain best design.
LUGS: FURNISHED BY CUSTOMER. (See page 170 for lug kits)

♦ **DO NOT USE FOR CONSTRUCTION; CONTACT SORGEL PLANT FOR CERTIFIED PRINTS.**

SQD SLV_000933

SORGEL DRY TYPE TRANSFORMERS

SINGLE AND THREE PHASE
600 VOLTS AND BELOW

NON-VENTILATED

There are certain applications where it is desirable to use a dry type non-ventilated transformer versus the standard unit which has openings in its enclosure to allow air to flow directly over the core and coil. Examples of such applications are areas where airborne combustible or conductive particles are present, where transformer is subject to spray from any direction, or dust conditions are extreme.

The appearance of these units will be the same as shown in photos E and F (on Page 149) except that ventilating openings will not be present.

Note that the small transformers, 10KVA and below in single phase and 9KVA and below in three phase, are furnished non-ventilated normally and at standard price. (See pages 150 & 151.)

Contact Sorgel plant for totally enclosed, non-ventilated transformers through 2000KVA and 15,000 volts.

KVA	† Catalog Number	Price	* Taps	Deg. C. Temp. Rise	♦ Dimensions Height	Width	Depth	Weight Pounds	Mounting	** Enclosure See Page 149	Wiring See Page 162
SINGLE PHASE			**240x480 VOLTS PRIMARY 120/240 VOLTS SECONDARY 60 HERTZ**								
15.	15S2FNV	**$1052.**	2—5%FCBN	115	21½	13½	12	250	Wall	I-O (C)	2
25.	25S3HNV	**1554.**	6—2½%2+4—	150	37	20	20	320	Floor	I-O (E)	3
37.5	37S3HNV	**1889.**	6—2½%2+4—	150	37	20	20	445	Floor	I-O (E)	3
50.	50S3HNV	**2347.**	6—2½%2+4—	150	42	24	24	600	Floor	I-O (E)	3
75.	75S3HNV	**2975.**	6—2½%2+4—	150	48	32	29½	880	Floor	I-O (E)	3
100.	100S3HNV	**4000.**	6—2½%2+4—	150	60	40	36	1200	Floor	I-O (E)	3
SINGLE PHASE			**600 VOLTS PRIMARY 120/240 VOLTS SECONDARY 60 HERTZ**								
15.	15S4FNV	**1150.**	2—5%FCBN	115	21½	13½	12	250	Wall	I-O (C)	18
25.	25S5FNV	**1670.**	4—2½%FCBN	115	21½	13½	12	330	Wall	I-O (C)	19
37.5	37S5HNV	**2030.**	4—2½%FCBN	150	37	20	20	445	Floor	I-O (E)	19
50.	50S5HNV	**2525.**	4—2½%FCBN	150	42	24	24	600	Floor	I-O (E)	19
75.	75S5HNV	**3200.**	4—2½%FCBN	150	48	32	29½	880	Floor	I-O (E)	19
100.	100S5HNV	**4400.**	4—2½%FCBN	150	60	40	36	1200	Floor	I-O (E)	19
THREE PHASE			**480 VOLTS DELTA PRIMARY 208Y/120 VOLTS SECONDARY 60 HERTZ**								
15.	**15T68F**	**970.**	4—2½%2+2—	115	17⅜	20	8 1/16	210	Wall	I-O (D)	28
30.	30T3HNV	**1700.**	6—2½%2+4—	150	37	30	20	480	Floor	I-O (E)	10
45.	45T3HNV	**2600.**	6—2½%2+4—	150	37	30	20	650	Floor	I-O (E)	10
75.	75T3HNV	**4000.**	6—2½%2+4—	150	42	36	24	870	Floor	I-O (E)	10
112.5	112T3HNV	**5400.**	6—2½%2+4—	150	42	36	24	1100	Floor	I-O (E)	10
150.	150T3HNV	**6500.**	6—2½%2+4—	150	48	48	29½	1575	Floor	I-O (E)	10
225.	225T3HNV	**7900.**	6—2½%2+4—	150	48	48	29½	2100	Floor	I-O (E)	10
300.	300T3HNV	**10500.**	6—2½%2+4—	150	58	48	29½	2700	Floor	I-O (E)	10
THREE PHASE			**480 VOLTS DELTA PRIMARY 240 VOLTS DELTA SECONDARY 60 HERTZ**								
15.	**15T75F**	**970.**	4—2½%FCBN	115	17⅜	20	8 1/16	210	Wall	I-O (D)	30
30.	30T6HNV	**1700.**	6—2½%2+4—	150	37	30	20	480	Floor	I-O (E)	14
45.	45T6HNV	**2600.**	6—2½%2+4—	150	37	30	20	650	Floor	I-O (E)	14
75.	75T6HNV	**4000.**	6—2½%2+4—	150	42	36	24	870	Floor	I-O (E)	14
112.5	112T6HNV	**5400.**	6—2½%2+4—	150	42	36	24	1100	Floor	I-O (E)	14
150.	150T6HNV	**6500.**	6—2½%2+4—	150	48	48	29½	1575	Floor	I-O (E)	14
225.	225T6HNV	**7900.**	6—2½%2+4—	150	48	48	29½	2100	Floor	I-O (E)	14
300.	300T6HNV	**10500.**	6—2½%2+4—	150	58	48	29½	2700	Floor	I-O (E)	14
THREE PHASE			**600 VOLTS DELTA PRIMARY 208Y/120 VOLTS SECONDARY 60 HERTZ (240 VOLTS DELTA SECONDARY AT SAME PRICE)**								
15.	15T8FNV	**1075.**	4—2½%FCBN	115	18½	16½	9½	250	Wall	I-O (D)	11
30.	30T8HNV	**1900.**	4—2½%FCBN	150	37	30	20	480	Floor	I-O (E)	11
45.	45T8HNV	**2900.**	4—2½%FCBN	150	37	30	20	650	Floor	I-O (E)	11
75.	75T8HNV	**4400.**	4—2½%FCBN	150	42	36	24	870	Floor	I-O (E)	11
112.5	112T8HNV	**5900.**	4—2½%FCBN	150	42	36	24	1100	Floor	I-O (E)	11
150.	150T8HNV	**7100.**	4—2½%FCBN	150	48	48	29½	1575	Floor	I-O (E)	11
225.	225T8HNV	**8700.**	4—2½%FCBN	150	48	48	29½	2100	Floor	I-O (E)	11
300.	300T8HNV	**11500.**	4—2½%FCBN	150	58	48	29½	2700	Floor	I-O (E)	11

†CATALOG NUMBERS SHOWN IN BOLD TYPE ARE AVAILABLE FROM REDISTRIBUTION CENTER.

*Where 2-2½% FCAN and FCBN Taps are shown, add suffix (BN) to catalog number for 4-2½% FCBN, price remains the same.

**ENCLOSURE CODE — I = Indoor, O = Outdoor. Letters in parentheses indicate illustration on Page 149.

TAPS on transformers 150 KVA and larger may vary in 3% to 5% steps to obtain best design.

LUGS: Furnished by customer. (See page 170 for lug kits.)

♦DO NOT USE FOR CONSTRUCTION; CONTACT SORGEL PLANT FOR CERTIFIED PRINTS.

SQD SLV_000934

UL LISTED
SUITABLE FOR USE AS SERVICE EQUIPMENT

MINI POWER-ZONE
INDOOR/OUTDOOR PACKAGED POWER SUPPLY

TYPE MPZ

The Square D Mini Power-Zone™ power supply provides the answer to requirements for a portable, compact, package power supply for small loads. It is suitable for both indoor and outdoor use with its weather-resistant enclosure and sand-epoxy encapsulated transformer, operating at a maximum full load temperature rise of 115°C.

All sizes are furnished complete from warehouse stock with Square D primary and secondary main circuit breakers sized in accordance with National Electrical Code requirements.

Since the Mini Power-Zone is furnished as a complete package, considerable savings in installation time and costs can be realized.

Feeder circuit breakers are standard Square D, QO plug-on type which may be ordered, as required, from your local Square D distributor's stock. **(No tandem breakers permitted.)**

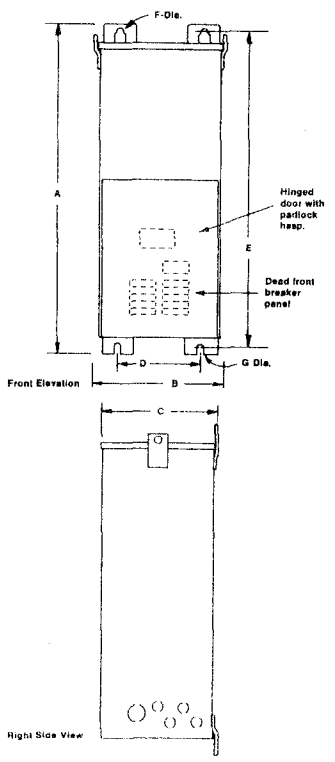
If ground fault protection is required, QWIK-GARD circuit breakers may be used in all sizes except the 5 KVA, single phase.

MINI POWER ZONE — SINGLE PHASE

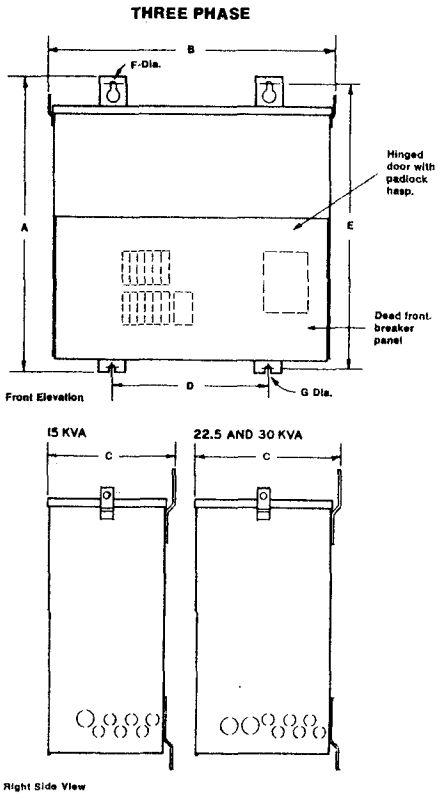
KVA	Catalog Number	Price	High Voltage	Low Voltage	Taps	Weight Lbs.	◆ A	◆ B	◆ C	◆ D	◆ E	◆ F	◆ G	Primary Main Circuit Breaker	Secondary Main Circuit Breaker	Feeder Breakers: Maximum Number 1 Pole or 2 Pole	Feeder Breakers: Maximum Amps
5	**MPZ 5S40F**	**$ 786.**	480	240/120	2-5% FCBN	95	25.5	9.625	8.875	6.0	24.187	.625	.562	FAL24020 20 Amps.	QO225 25 Amps.	4 or 2	20
10	**MPZ 10S40F**	**1005.**	480	240/120	2-5% FCBN	167	34.0	12.375	11.875	8.0	32.625	.625	.562	FAL24040 40 Amps.	QO250 50 Amps.	8 or 4	40
15	**MPZ 15S40F**	**1206.**	480	240/120	2-5% FCBN	202	34.0	12.375	11.875	8.0	32.625	.625	.562	FAL24060 60 Amps.	Q1280 80 Amps.	12 or 6	60
25	**MPZ 25S40F**	**1818.**	480	240/120	2-5% FCBN	358	41.5	15.625	14.625	9.0	40.125	.625	.562	FAL24100 100 Amps.	Q2L-2125 125 Amps.	20 or 10	100
MINI POWER ZONE — THREE PHASE																Maximum Number 1 Pole or 3 Pole	
15	**MPZ 15T2F**	**2006.**	480▲	208Y/120	2-5% FCBN	310	31	25.75	9.375	14.0	29.75	.625	.562	FAL34040 40 Amps.	Q1-360 60 Amps.	12 or 4	40
22.5	**MPZ 22T2F**	**2570.**	480▲	208Y/120	2-5% FCBN	555	35.875	29.875	13.625	16.0	34.5	.625	.562	FAL34070 70 Amps.	Q1-380 80 Amps.	18 or 6	60
30	**MPZ 30T2F**	**3183.**	480▲	208Y/120	2-5% FCBN	625	36.875	29.875	13.625	16.0	35.5	.625	.562	FAL34090 90 Amps.	FAL34100 100 Amps.	24 or 8	80

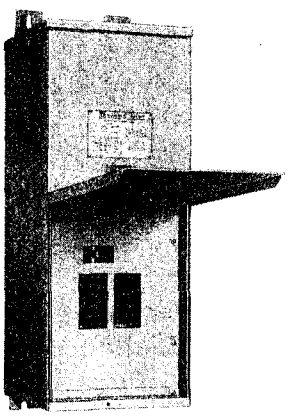
Basic assemblies include main primary and secondary breakers. Order required QO plug-in feeder breakers, QWIK-GARD breakers, or QOFP filler plates for blank spaces from the Square D Catalog Digest through your local Square D Distributor.

SINGLE PHASE

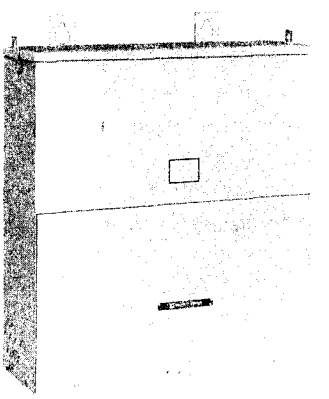


THREE PHASE





5 KVA Single Phase



15 KVA Three Phase

MINI POWER-ZONE — Trademark of Square D Company
QWIK-GARD — Registered Trademark of Square D Company
QO — Registered Trademark of Square D Company

◆ DO NOT USE FOR CONSTRUCTION; CONTACT SORGEL PLANT FOR CERTIFIED PRINTS.

SQD SLV_000935

601 VOLTS THRU 15,000 VOLTS

All transformers are built with 220°C. insulation and 150°C. temp. rise. For 115°C. rise add 10% to price and F to catalog number. For 80°C. rise add 20% to price and B to catalog number, and check with factory for dimensional changes.

Standard high voltage taps: 4 - 2½%, 2AN & 2BN. For 4 - 2½ FCBN, add BN to catalog number.

KVA	Catalog Number	Price	♦ Dimensions Height	Width	Depth	Weight Pounds	Mounting	Enclosure See Page 149
2.4 KV VOLTAGE CLASS 60 HERTZ 150°C RISE								
167	167S( )H	**$6300.**	60	40	36	1600	Floor	E
250	250S( )H	**8750.**	60	56	36	2200	Floor	E
333	333S( )H	**10500.**	60	56	36	3200	Floor	E
5 KV VOLTAGE CLASS 60 HERTZ 150°C RISE								
167	167S( )H	**$6600.**	60	40	36	1600	Floor	E
250	250S( )H	**9200.**	60	56	36	2200	Floor	E
333	333S( )H	**11000.**	60	56	36	3200	Floor	E
8.66 KV VOLTAGE CLASS 60 HERTZ 150°C RISE								
167	167S( )H	**$8100.**	60	40	36	2200	Floor	E
250	250S( )H	**10950.**	60	56	36	3200	Floor	E
333	333S( )H	**13000.**	60	56	36	3600	Floor	E
15 KV VOLTAGE CLASS 60 HERTZ 150°C RISE								
167	167S( )H	**$9000.**	60	40	36	2200	Floor	E
250	250S( )H	**12000.**	60	56	36	3200	Floor	E
333	333S( )H	**14000.**	60	56	36	3600	Floor	E

KV Class	Code	Primary	Secondary	Wiring Diagram See Page 162
2.4	14	2400	120/240	21
	25	2400	277	22
5	13	2400/4160Y	120/240	21
	15	4800	120/240	21
	16	4160	120/240	21
	24	2400/4160Y	277	22
	26	4800	277	22
	27	4160	277	22
8.66	17	4160/7200Y	120/240	21
	18	7200	120/240	21
	28	4160/7200Y	277	22
	29	7200	277	22
15	19	7200/12470Y	120/240	21
	20	7620/13200Y	120/240	21
	21	12470	120/240	21
	22	13200	120/240	21
	23	13800	120/240	21
	30	7200/12470Y	277	22
	31	7620/13200Y	277	22
	32	12470	277	22
	33	13200	277	22
	34	138000	277	22

Special Notes

1. Lightning arresters required on 5Kv. and above. Use nearest rating which is higher than supply voltage, whether grounded or ungrounded add for (2): 6Kv = $420; 9Kv = $495; 12Kv = $643; 15Kv = $816. (Distribution Class)
2. For 8.66 Kv. and 15Kv. transformers requiring **bottom** entrance, exit, or both, to ascertain if separate compartment is required for adequate termination space and clearance, check Sorgel, Milwaukee.
3. If transformer requires a 90" high enclosure for switchgear line-up, or if special enclosure is required, contact Sorgel plant.

TO COMPLETE CATALOG NUMBER

To complete the catalog numbers on this page, select the voltage you require from the chart above. Insert the voltage code number in place of the ( ) in the catalog number. Ex.: the correct catalog number for a 167 KVA, 2400/4160Y-120/240, 1 phase 60 Hz unit is 167S13H. The unit would be supplied with 2-2½% above and 2-2½% below normal taps on the primary.

SINGLE PHASE AND THREE PHASE BASIC IMPULSE LEVELS

Voltage Class	NEMA Standard
250-1200	10 Kv
2500	20 Kv
5000	30 Kv
8700	45 Kv
15,000	60 Kv

SINGLE PHASE AND THREE PHASE SOUND LEVELS

KVA	NEMA Standard DB
51-150	55
151-300	58
301-500	60
501-700	62
701-1000	64
1001-1500	65
1501-2000	66
2001-3000	68

♦ DO NOT USE FOR CONSTRUCTION: CONTACT SORGEL PLANT FOR CERTIFIED PRINTS.

SQD SLV_000936

SORGEL DRY TYPE TRANSFORMERS
OVER 600 VOLTS — THREE PHASE

601 VOLTS THRU 15,000 VOLTS

All transformers are built with 220°C. insulation and 150°C. temp. rise. For 115°C. rise add 10% to price and F to catalog number. For 80°C. rise add 20% to price and B to catalog number. Check with Sorgel plant for dimensional changes.

Standard high voltage taps: 4 - 2½%, 2AN & 2BN. For 4 - 2½% FCBN, add BN to catalog number.

KVA	Catalog Number	Price	◆ Dimensions Height	Width	Depth	Weight Pounds	Mounting	Enclosure See Page 149
2.4 KV & 5 KV VOLTAGE CLASS 60 HERTZ 150°C RISE								
225	225T( )H	**$ 8850.**	48	48	29½	1900	Floor	E
300	300T( )H	**11975.**	60	56	36	2400	Floor	E
500	500T( )H	**17000.**	90	72	54	3600	Floor	G
750 †	750T( )H	**22500.**	90	72	54	5200	Floor	G
1000 †	1000T( )H	**27000.**	90	84	54	6100	Floor	G
1500 †	1500T( )H	**31500.**	90	84	54	7200	Floor	G
2000 †	2000T( )H	**36000.**	90	84	54	8700	Floor	G
2500 †	2500T( )H	**42500.**	90	84	54	10400	Floor	G
8.66 KV VOLTAGE CLASS 60 HERTZ 150°C RISE								
225	225T( )H	**$11500.**	60	56	36	2600	Floor	E
300	300T( )H	**15000.**	90	56	54	3500	Floor	G
500	500T( )H	**19500.**	90	72	54	4200	Floor	G
750 †	750T( )H	**24900.**	90	72	54	5600	Floor	G
1000 †	1000T( )H	**28750.**	90	84	54	6100	Floor	G
1500 †	1500T( )H	**32900.**	90	84	54	7300	Floor	G
2000 †	2000T( )H	**37100.**	90	84	54	9200	Floor	G
2500 †	2500T( )H	**43250.**	90	84‡	54	10400	Floor	G
3000 †	3000T( )H	**51250.**	118	96	54	14200	Floor	G
15 KV VOLTAGE CLASS 60 HERTZ 150°C RISE								
225	225T( )H	**$12100.**	90	56	54	3000	Floor	G
300	300T( )H	**16100.**	90	56	54	3500	Floor	G
500	500T( )H	**21000.**	90	72	54	4200	Floor	G
750 †	750T( )H	**26850.**	90	72	54	5600	Floor	G
1000 †	1000T( )H	**31000.**	90	84	54	6100	Floor	G
1500 †	1500T( )H	**35500.**	90	84	54	7300	Floor	G
2000 †	2000T( )H	**40000.**	90	84	54	9200	Floor	G
2500 †	2500T( )H	**46500.**	90	84‡	54	10400	Floor	G
3000 †	3000T( )H	**55000.**	118	96	54	14200	Floor	G

† Dimensions and prices listed for 480 volt secondary only. For 240 volt or 208 volt, contact Sorgel Plant.

‡ For 80° C. Rise, width = 96" for 2500 KVA.

For units larger than 3000 KVA contact Sorgel plant.

Special Notes

1. Lightning arresters required on 5Kv. and above. Use nearest rating which is higher than supply voltage, whether grounded or ungrounded add for (3): 6Kv = $618; 9Kv = $742; 12Kv = $964; 15Kv = $1225. (Distribution Class)
2. For 8.66 Kv. and 15Kv. transformers requiring **bottom** entrance, exit, or both, to ascertain if separate compartment is required for adequate termination space and clearance, contact Sorgel plant.
3. If transformer requires a 90" high enclosure for switchgear line-up, or if special enclosure is required, contact Sorgel plant.

◆ Do not use for construction; contact Sorgel plant for certified prints.

KV Class	Code	Primary	Secondary	Wiring Diagram See Page 162
2.4	13	2400Δ	208Y/120	23
	14	2400Δ	480Y/277	23
	15	2400Δ	240Δ	24
	16	2400Δ	480Δ	24
	17	2400Δ	600Δ	24
5	18	4160Δ	208Y/120	23
	19	4160Δ	480Y/277	23
	20	4160Δ	240Δ	24
	21	4160Δ	480Δ	24
	22	4160Δ	600Δ	24
	23	4160Y/2400	240Δ	25
	25	4160Y/2400	480Δ	25
	26	4160Y/2400	600Δ	25
	27	4800Δ	208Y/120	23
	28	4800Δ	480Y/277	23
	29	4800Δ	240Δ	24
	30	4800Δ	480Δ	24
	31	4800Δ	600Δ	24
8.66	32	7200Δ	208Y/120	23
	33	7200Δ	480Y/277	23
	34	7200Δ	240Δ	24
	35	7200Δ	480Δ	24
	36	7200Δ	600Δ	24
15	37	12000Δ	208Y/120	23
	38	12000Δ	480Y/277	23
	39	12000Δ	240Δ	24
	40	12000Δ	480Δ	24
	41	12000Δ	600Δ	24
	42	12470Δ	208Y/120	23
	43	12470Δ	480Y/277	23
	44	12470Δ	240Δ	24
	45	12470Δ	480Δ	24
	46	12470Δ	600Δ	24
	47	12470Y/7200	240Δ	25
	48	12470Y/7200	480Δ	25
	49	12470Y/7200	600Δ	25
	50	13200Δ	208Y/120	23
	51	13200Δ	480Y/277	23
	52	13200Δ	240Δ	24
	53	13200Δ	480Δ	24
	54	13200Δ	600Δ	24
	55	13200Y/7620	240Δ	25
	56	13200Y/7620	480Δ	25
	57	13200Y/7620	600Δ	25
	58	13800Δ	208Y/120	23
	59	13800Δ	480Y/277	23
	60	13800Δ	240Δ	24
	61	13800Δ	480Δ	24
	62	13800Δ	600Δ	24

TO COMPLETE CATALOG NUMBER

To complete the three phase catalog numbers, select the voltage you require from the chart above. Insert the voltage code number in place of the ( ) in the catalog number.

Ex.: 1000 KVA, 3 phase, 60 Hz, 150°C. temp. rise, 60 Kv. BIL, 64 DB sound level, ventilated encl., 13.2 Kv. Delta - 480Y/277 = 1000T51H with 2 - 2½% taps, 2AN & 2BN.

SQD SLV_000937

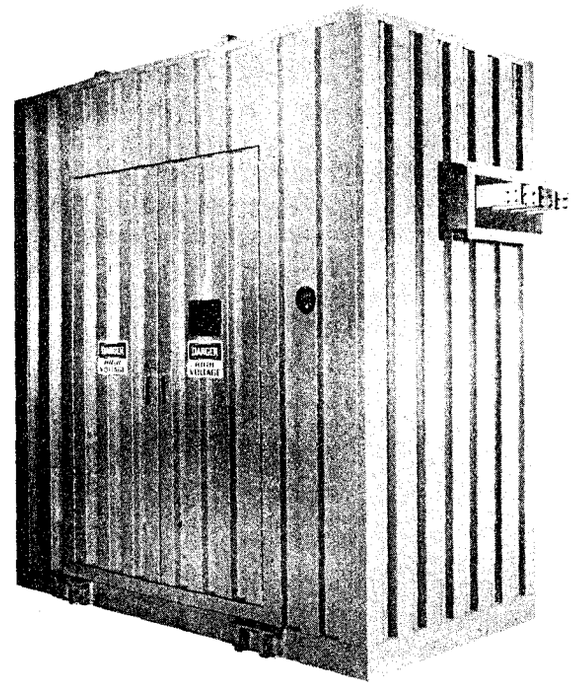
SORGEL DRY TYPE TRANSFORMERS
SINGLE AND THREE PHASE

TOTALLY ENCLOSED — NON-VENTILATED DRY TYPE TRANSFORMERS INDOOR OR OUTDOOR

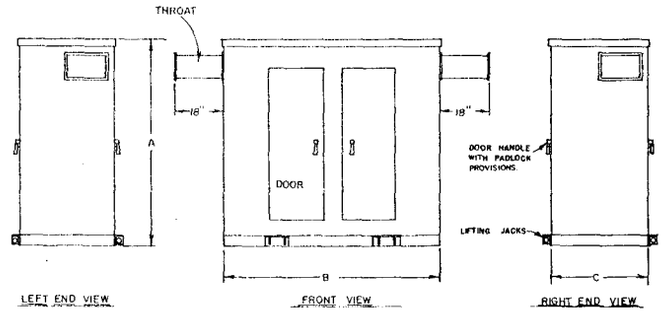
Totally enclosed non-ventilated dry type transformers are available as suitable substitutes for Askarel Transformers thru 2000 KVA, 15000 volts, and 95 KV B.I.L.

These units have very high efficiencies (very low losses and low cost of operation) and are maintenance free. (No liquids to periodically monitor and replace, and no fire hazard.)

Meet all National Electrical Code and OSHA Requirements.



CONSULT LOCAL FIELD OFFICE OR SORGEL PLANT FOR PRICING



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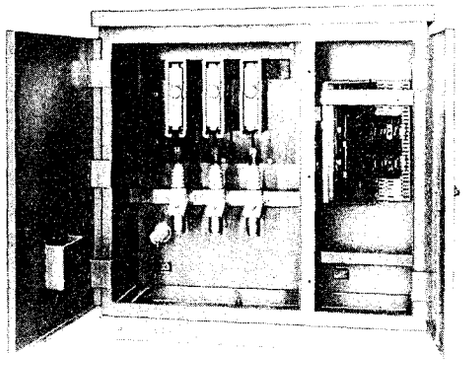
KVA	♦ A	♦ B	♦ C	Approx. Weight
500	90	84	54	6000
750	90	96	54	7000
1000	118	112	55	12500
1500	118	112	55	15000
2000	118	112	55	17000

DRY TYPE PAD MOUNTED

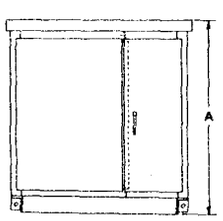
"Pad Mounted" transformers are suitable for outdoor slab or roof mounting. They have tamperproof enclosures and are equipped with primary and secondary terminal chambers which are accessible through hinged doors.

CONSULT LOCAL FIELD OFFICE OR SORGEL PLANT FOR PRICING

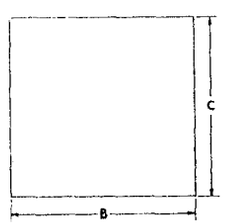


THREE PHASE PAD MOUNTED TYPE TRANSFORMERS

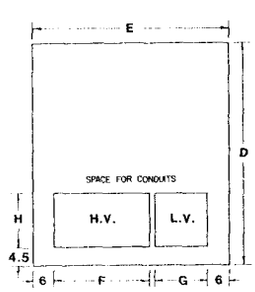
KVA	Voltage Class	♦ Dimensions and Weights for Units with 150°C Temperature Rise								
		A	B	C	D	E	F	G	H	WT
45	600 V—15 KV	52	48	46	52	54	26¼	14¼	14½	1700
75	600 V—15 KV	52	48	46	52	54	26¼	14¼	14½	2100
112.5	600 V—15 KV	52	48	46	52	54	26¼	14¼	14½	2400
150	600 V—15 KV	60	60	56	62	66	34¼	18¼	20½	3700
225	600 V—5 KV	60	60	56	62	66	34¼	18¼	20½	4000
300	600 V—5 KV	60	60	56	62	66	34¼	18¼	20½	4200
225	8.6 KV—15 KV	73	72	72	78	78	34¼	30¼	20½	5200
300	8.6 KV—15 KV	73	72	72	78	78	34½	30¼	20½	5600
500	600 V—15 KV	73	72	72	78	78	34¼	30¼	20½	7000



FRONT VIEW



BASE DIMENSION



PAD DETAIL

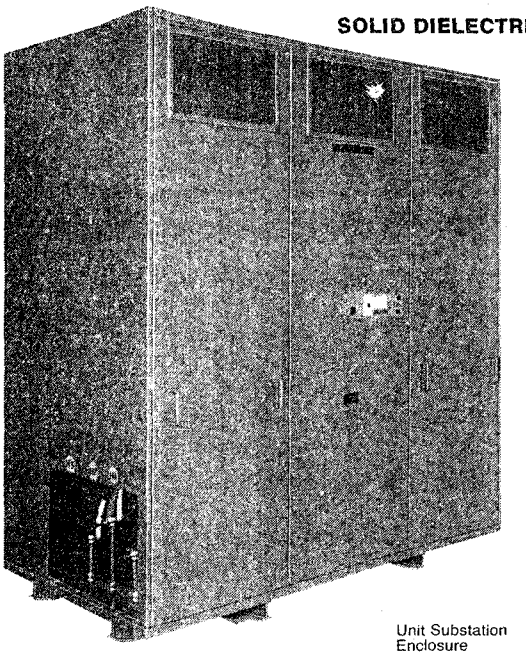
♦ Do not use for construction; contact factory for certified prints.

ACCESSORIES

The use of some of the accessories listed may require larger enclosures • Lightning Arrestors • Potheads • Primary Bushing Wells for Dead Front Terminators • Hook-Stick Operated Switch • Primary Circuit Breaker (On 600 volts or less) • Secondary Circuit Breakers • Secondary Fuses

SQD SLV_000938

SOLID DIELECTRIC 80°C RISE NON-LIQUID TRANSFORMER



Unit Substation Enclosure

FEATURES:

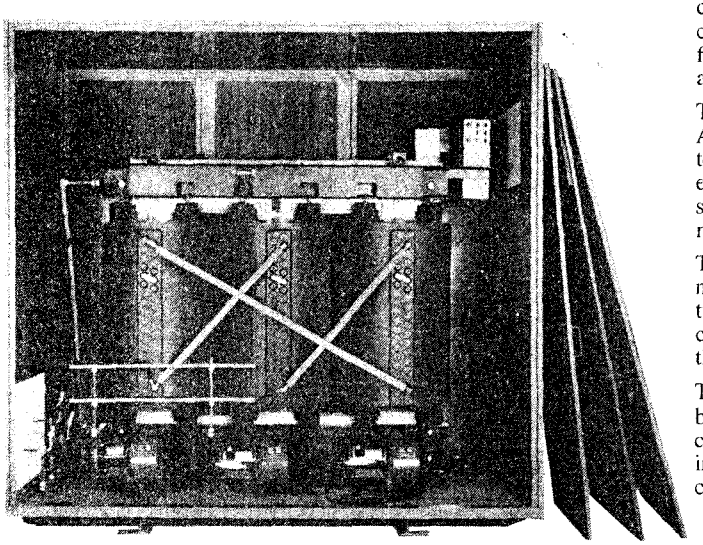
- High Short Circuit Strengths
- Immediate Switch-On
- Low Copper Losses
- Environmentally Safe
- Atmospheric Protection
- Impulse Voltage Strength
- Partial Discharge Tested
- High Overload Capability
- Non Flammable
- Standard Ratings
- Maintenance Free

RATINGS:

- 5 kV, 8.7 kV, 15 kV, 25 kV and 34.5 kV with two 2½% FCAN and two 2½% FCBN taps
- 60, 95, 110, 125, 150 and 175 kV BIL levels
- 500 through 5000 kVA

ENCLOSURES:

- Ventilated Indoor or Ventilated Outdoor
- Throats, Flanges and Terminal Chambers Optional

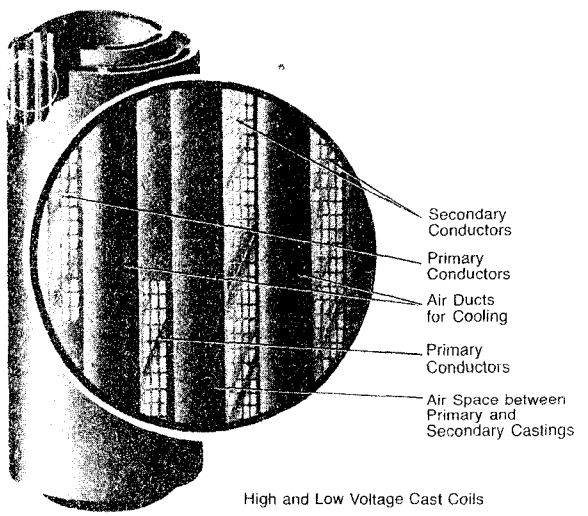


Power-Cast™ Transformers are fabricated with a solid dielectric completely encapsulating the primary and secondary coils. The copper windings are permanently embedded between layers of fiberglass cloth and impregnated in a vacuum molding process with a high temperature resin.

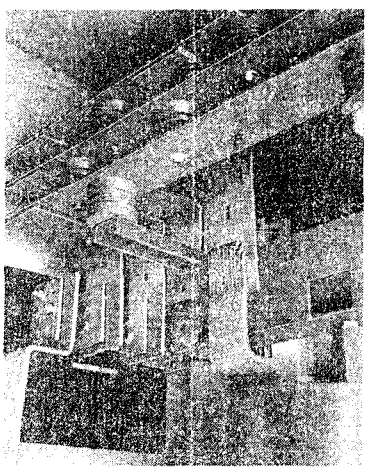
The result is a power transformer of unsurpassed characteristics. Among the benefits of this design are: Impulse ratings comparable to oil-filled transformers, superior dynamic short circuit strength, exceptional short-time thermal overload capability, outstanding resistance to moisture and atmospheric contaminants, and a low maintenance factor.

The unique proven design and proprietary manufacturing techniques used in the Power-Cast transformer were developed nearly two decades ago, and have been continuously employed in the construction of power transformers now in operation in all parts of the world.*

The primary and secondary coils are vacuum cast. Space is left between the primary and secondary coil assemblies to assure air circulation and heat dissipation. In larger units, air ducts are cast into the coil assemblies for the same purpose, as can be seen in the cut-away view shown.



High and Low Voltage Cast Coils

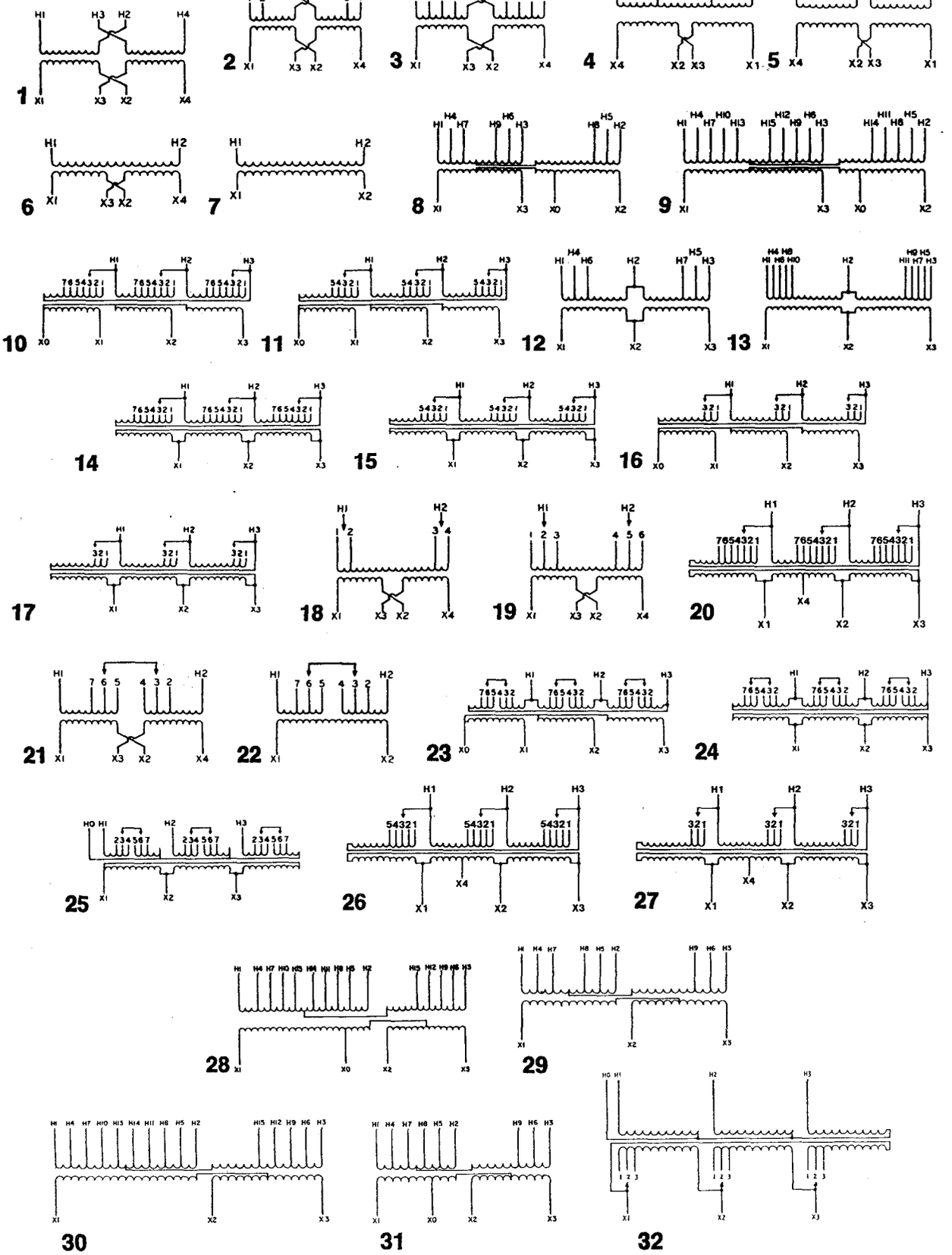


Typical Secondary Buswork

* Power-Cast transformers are built under a license from the May & Christe Company of West Germany.

SQD SLV_000939

WIRING DIAGRAMS



▲SORGEL Diamond Design is a Registered Trademark of Square D Company.

HOSPITAL ISOLATING PANELS

Catalog numbers shown in bold type are available from factory stock.

OPERATING ROOM POWER AND LIGHTING PANELS — UL LISTED

KVA	Primary Voltage	Secondary Voltage	Primary Circuit Breaker	Secondary Circuit Breakers	Interior Catalog Number	Price	Std. Trim Catalog Number	Price	*Accessory Trim Catalog Number	Price	Flush Back Box Catalog Number	Price	Surface Back Box Catalog Number	Price	** Total Price
3	120	120	30 A.	8-20 A.	**3HIS11DDI**	**$2772.**	**OR2435**	**$350.**	**OR24350**	**$350.**	**53013BB**	**$160.**	**53017BB**	**$160.**	**$3282.**
3	208	120	20 A.	8-20 A.	**3HIS21DDI**	**2772.**	**OR2435**	**350.**	**OR24350**	**350.**	**53013BB**	**160.**	**53017BB**	**160.**	**3282.**
3	240	120	20 A.	8-20 A.	3HIS31DDI	**2772.**	OR2435	**350.**	OR24350	**350.**	53013BB	**160.**	53017BB	**160.**	**3282.**
3	277	120	20 A.	8-20 A.	**3HIS41DDI**	**2842.**	**OR2435**	**350.**	**OR24350**	**350.**	**53013BB**	**160.**	**53017BB**	**160.**	**3352.**
5	120	120	60 A.	8-20 A.	**5HIS11DDI**	**2842.**	**OR2435**	**350.**	**OR24350**	**350.**	**53013BB**	**160.**	**53017BB**	**160.**	**3352.**
5	208	120	30 A.	8-20 A.	**5HIS21DDI**	**2842.**	OR2435	**350.**	OR24350	**350.**	53013BB	**160.**	53017BB	**160.**	**3352.**
5	240	120	30 A.	8-20 A.	5HIS31DDI	**2842.**	**OR2435**	**350.**	**OR24350**	**350.**	**53013BB**	**160.**	**53017BB**	**160.**	**3352.**
5	277	120	30 A.	8-20 A.	**5HIS41DDI**	**2956.**	**OR2435**	**350.**	**OR24350**	**350.**	**53013BB**	**160.**	**53017BB**	**160.**	**3466.**

* Order accessory trims, only when ordering accessory modules.
** Total price includes 1-Interior, 1-Trim and 1-Back Box.
▲ Panels include 2Ma LIM, for information on 5Ma LIM, contact factory.

ICU/CCU, CORONARY CARE AND INTENSIVE CARE PANELS — UL LISTED

KVA	Primary Voltage	Secondary Voltage	Primary Circuit Breaker	Secondary Circuit Breakers	Interior Catalog Number	Price	Std. Trim Catalog Number	Price	*Accessory Trim Catalog Number	Price	Flush Back Box Catalog Number	Price	Surface Back Box Catalog Number	Price	** Total Price
3	120	120	30 A.	8-20 A.	**3HIS11CDDI**	**$3287.**	**IC2444**	**$447.**	**IC24440**	**$447.**	**53014BB**	**$160.**	**53018BB**	**$160.**	**$3894.**
3	208	120	20 A.	8-20 A.	**3HIS21CDDI**	**3287.**	**IC2444**	**447.**	**IC24440**	**447.**	**53014BB**	**160.**	**53018BB**	**160.**	**3894.**
3	240	120	20 A.	8-20 A.	3HIS31CDDI	**3287.**	IC2444	**447.**	**IC24440**	**447.**	53014BB	**160.**	53018BB	**160.**	**3894.**
3	277	120	20 A.	8-20 A.	**3HIS41CDDI**	**3402.**	**IC2444**	**447.**	IC24440	**447.**	**53014BB**	**160.**	**53018BB**	**160.**	**4009.**
5	120	120	60 A.	8-20 A.	**5HIS11CDDI**	**3402.**	**IC2444**	**447.**	**IC24440**	**447.**	**53014BB**	**160.**	**53018BB**	**160.**	**4009.**
5	208	120	30 A.	8-20 A.	**5HIS21CDDI**	**3402.**	**IC2444**	**447.**	**IC24440**	**447.**	**53014BB**	**160.**	**53018BB**	**160.**	**4009.**
5	240	120	30 A.	8-20 A.	5HIS31CDDI	**3402.**	IC2444	**447.**	IC24440	**447.**	53014BB	**160.**	53018BB	**160.**	**4009.**
5	277	120	30 A.	8-20 A.	**5HIS41CDDI**	**3489.**	**IC2444**	**447.**	**IC24440**	**447.**	**53014BB**	**160.**	**53018BB**	**160.**	**4096.**

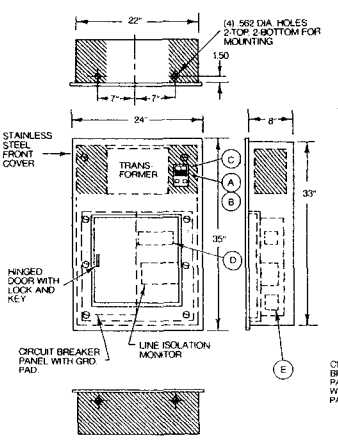
* Order accessory trims, only when ordering accessory modules.
** Total price includes 1-Interior, 1-Trim and 1-Back Box.
▲ Panels include 2Ma LIM, for information on 5Ma LIM, contact factory.

OPTIONAL ACCESSORIES MOUNTED IN ISOLATING PANEL

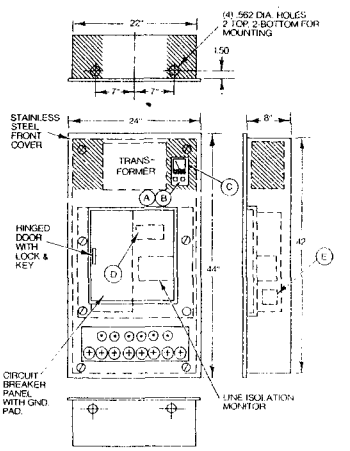
Catalog Numbers Accessory Modules	Description	Price Adder
ORIC-A	Audible & Visual Alarm Indication mounted on front trim	**$295.**
ORIC-B	Visual Alarm only, no Audible, mounted on front trim	**86.**
▲ ORIC-AC	Audible & Visual Indication with micro-ammeter mounted on front trim	**506.**
Accessory Letters	Description	Price Adder
A	Audible & Visual Alarm Indication mounted on front trim	**$295.**
B	Visual Alarm only, no Audible, mounted on front trim	**86.**
AC	Audible & Visual Indication with micro-ammeter mounted on front trim	**506.**
* D	GIT-11, Ground Integrity Tester, mounted behind door	**1056.**
* E	Provisions for operating 4 or more IA-1C, remote indicator alarms	**382.**
* F	Standard 3 KVA or 5 KVA Panels supplied with 10 Secondary Circuit Breakers (6 singles, 2 tandems)	**167.**

Accessory letters must be used as suffixes when D, E, or F are required, refer to example #2. Use accessory modules in all other cases, see example #1.
* Not U.L. listed, not available on x-ray panels.
▲ Includes 2Ma LIM, for information on 5Ma LIM, contact factory.

OPERATING ROOM POWER AND LIGHTING PANELS



ICU/CCU PANELS



SHADED AREAS DENOTE POSSIBLE CONDUIT ENTRANCE.
DO NOT USE FOR CONSTRUCTION; CONTACT FACTORY FOR CERTIFIED PRINTS.

EXAMPLES FOR PRICING AND ORDERING

EXAMPLE #1

REQUIREMENT: Quantity 1 ICU/CCU Panel
3 KVA 120-120
Alarm on Trim
Flush Mounted

Quantity	Catalog Numbers	Price
1	3HIS11CDDI	**$3287.**
1	IC24440	**447.**
1	53014BB	**160.**
1	ORIC-A	**295.**
	Total	**4189.**

EXAMPLE #2

When accessories D, E or F are required, use the interior catalog number (omitting the letter I) and add the accessory letters as a suffix. By adding the accessories A and D (GIT-11) to the catalog number it would be:

REQUIREMENT: Quantity 1 ICU/CCU Panel
3 KVA 120-120
Alarm on Trim
Flush Mounted
GIT-11 behind door

CATALOG NUMBER: 3HIS11CDD-AD

The catalog number in the example above includes backbox, trim, interior, and accessories.

To compute the list price for a panel having accessories D, E, or F, add the list price for the interior, trim and backbox, to the accessory.

Quantity	Catalog Number Accessory Letter	Price
1	3HIS11CDDI	**$3287.**
1	IC2444	**447.**
1	53014BB	**160.**
1	Accessory Letter (A)	**295.**
1	Accessory Letter (D)	**1056.**
	Total	**5245.**

SQD SLV_000941

HOSPITAL ISOLATING PANELS

Catalog numbers shown in bold type are available from factory stock.

HORIZONTAL ICU/CCU PANELS

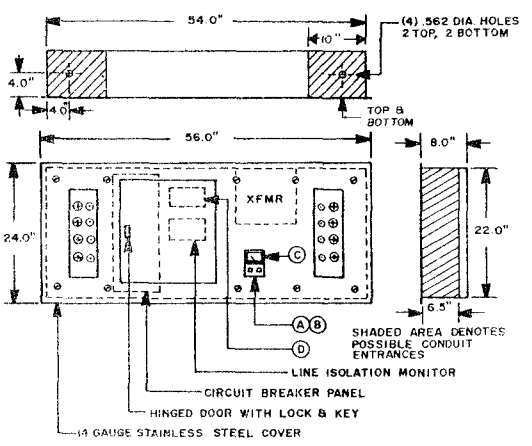
KVA	Primary Voltage	Secondary Voltage	Primary Circuit Breaker	Secondary Circuit Breakers	Catalog Number	Price	Std. Trim Catalog Number	Price	* Accessory Trim Catalog Number	Price	Flush Back Box Catalog Number	Price	Surface Back Box Catalog Number	Price	** Total Price
3	120	120	30 A.	8-20 A.	3HIS11CDHI	**$3460.**	IHC5624	**$562.**	IHC56240	**$562.**	53022BB	**$304.**	53024BB	**$304.**	**$4326.**
3	208	120	20 A.	8-20 A.	3HIS21CDHI	**3460.**	IHC5624	**562.**	IHC56240	**562.**	53022BB	**304.**	53024BB	**304.**	**4326.**
3	240	120	20 A.	8-20 A.	3HIS31CDHI	**3460.**	IHC5624	**562.**	IHC56240	**562.**	53022BB	**304.**	53024BB	**304.**	**4326.**
3	277	120	20 A.	8-20 A.	3HIS41CDHI	**3545.**	IHC5624	**562.**	IHC56240	**562.**	53022BB	**304.**	53024BB	**304.**	**4516.**
5	120	120	60 A.	8-20 A.	5HIS11CDHI	**$3562.**	IHC5624	**$562.**	IHC56240	**$562.**	53022BB	**$304.**	53024BB	**$304.**	**$4428.**
5	208	120	30 A.	8-20 A.	5HIS21CDHI	**3562.**	IHC5624	**562.**	IHC56240	**562.**	53022BB	**304.**	53024BB	**304.**	**4428.**
5	240	120	30 A.	8-20 A.	5HIS31CDHI	**3562.**	IHC5624	**562.**	IHC56240	**562.**	53022BB	**304.**	53024BB	**304.**	**4428.**
5	277	120	30 A.	8-20 A.	5HIS41CDHI	**3650.**	IHC5624	**562.**	IHC56240	**562.**	53022BB	**304.**	53024BB	**304.**	**4516.**

* Order accessory trims, only when ordering accessory modules.
** Total price includes 1-Interior, 1-Trim and 1-Back Box.
▲ Panels include 2Ma LIM, for information on 5MA LIM, contact factory.

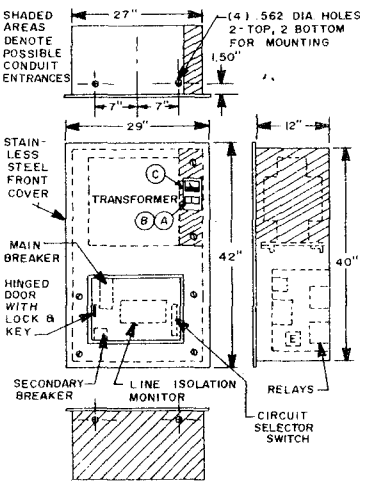
X-RAY PANELS (UL LISTED)

KVA	Primary Voltage	Secondary Voltage	Primary Circuit Breaker	Secondary Circuits †	Interior Catalog Number	Price	XFMR	Price	Std. Trim Catalog Number	Price	* Accessory Trim Catalog Number	Price	Flush Back Box Catalog Number	Price	Surface Back Box Catalog Number	Price	** Total Price
15	208	208	90 A.		**15HIS22DDI**	**$4470.**	**15XR22**	**$2749.**	**XR2942**	**$702.**	**XR29420**	**$702.**	**53015BB**	**$621.**	**53019BB**	**$621.**	**$8542.**
15	208	240	90 A.	1-60 Amp.	**15HIS23DDI**	**4470.**	**15XR23**	**2749.**	**XR2942**	**702.**	**XR29420**	**702.**	**53015BB**	**621.**	**53019BB**	**621.**	**8542.**
15	240	208	90 A.	Sec-ondary	15HIS32DDI	**4470.**	15XR32	**2749.**	XR2942	**702.**	XR29420	**702.**	53015BB	**621.**	53019BB	**621.**	**8542.**
15	240	240	90 A.	Circuit	15HIS33DDI	**4470.**	**15XR33**	**2749.**	XR2942	**702.**	**XR29420**	**702.**	**53015BB**	**621.**	**53019BB**	**621.**	**8542.**
15	277	208	90 A.	Breaker	**15HIS42DDI**	**4556.**	**15XR42**	**2749.**	**XR2942**	**702.**	**XR29420**	**702.**	**53015BB**	**621.**	**53019BB**	**621.**	**8628.**
15	277	240	90 A.		**15HIS43DDI**	**4556.**	**15XR43**	**2749.**	**XR2942**	**702.**	**XR29420**	**702.**	**53015BB**	**621.**	**53019BB**	**621.**	**8628.**
25	208	208	125 A.		**25HIS22DDI**	**$4545.**	**25XR22**	**$2889.**	**XR2942**	**$702.**	**XR29420**	**$702.**	**53015BB**	**$621.**	**53019BB**	**$621.**	**$8757.**
25	208	240	125 A.	1-60 Amp.	**25HIS23DDI**	**4545.**	**25XR23**	**2889.**	**XR2942**	**702.**	**XR29420**	**702.**	**53015BB**	**621.**	**53019BB**	**621.**	**8757.**
25	240	208	125 A.	Sec-ondary	25HIS32DDI	**4545.**	25XR32	**2889.**	XR2942	**702.**	XR29420	**702.**	53015BB	**621.**	53019BB	**621.**	**8757.**
25	240	240	125 A.	Circuit	25HIS33DDI	**4545.**	25XR33	**2889.**	XR2942	**702.**	XR29420	**702.**	53015BB	**621.**	53019BB	**621.**	**8757.**
25	277	208	125 A.	Breaker	**25HIS42DDI**	**4625.**	**25XR42**	**2889.**	**XR2942**	**702.**	**XR29420**	**702.**	**53015BB**	**621.**	**53019BB**	**621.**	**8837.**
25	277	240	125 A.		**25HIS43DDI**	**4625.**	**25XR43**	**2889.**	**XR2942**	**702.**	**XR29420**	**702.**	**53015BB**	**621.**	**53019BB**	**621.**	**8837.**

** Total price includes 1-Interior, 1-Trim, 1-Transformer and 1-Back Box.
† Up to eight outlets can be controlled from these panels — no branch circuit should exceed 150 ft. in length.
†† Accessories D, E, F not available on x-ray panels.
▲ Panels include 2Ma LIM, for information on 5Ma LIM, contact factory.



Horizontal ICU/CCU Panel



X-Ray Panel

Shaded Areas Denote Possible Conduit Entrance

MODULAR MEDICAL WALLS

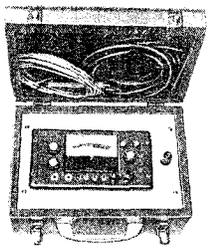
SQUARE D MANUFACTURES A COMPLETE LINE OF MODULAR MEDICAL WALLS, PATIENT CONSOLES, MEDICAL SERVICE COLUMNS AND RELATED EQUIPMENT FOR GENERAL CARE, INTENSIVE CARE AND CORONARY CARE AREAS.

IN ADDITION SURGICAL FACILITY PANELS, INCORPORATING EQUIPMENT REQUIRED FOR OPERATING ROOM USE ARE OFFERED. THESE ARE SPECIAL BUILT ITEMS INCLUDING A VARIETY OF EQUIPMENT TO MEET EACH HOSPITAL'S SPECIFIC NEED.

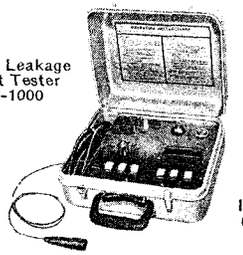
FOR MORE APPLICATION AND DESIGN INFORMATION, CONTACT YOUR LOCAL SQUARE D OFFICE.

SQD SLV_000942

ROUTINE MAINTENANCE
MADE EASIER
WITH SQUARE D
TEST EQUIPMENT



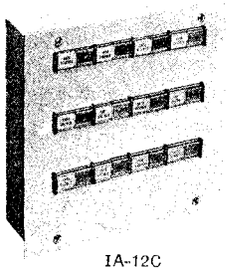
Portable Ground
Integrity Tester
GIT-11P



Portable Leakage
Current Tester
LCM-1000



Isolation System/
Ground Analyzer
GFL-1000



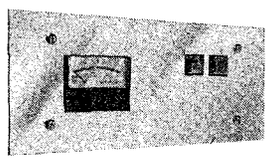
IA-12C

Nurse's Station
Indicator-Alarm
Annunciator

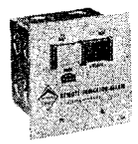
Pricing Formula for Annunciator Stations:

Multiply the number of circuits by $278. and add $798. for a flush or surface mounting enclosure.

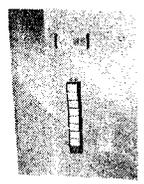
Add $1192. for desk top mounting.



MM-IA



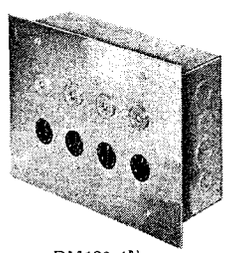
IA-1C



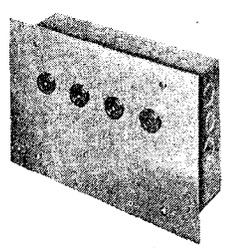
8CI-IA



XR-IA



RM120-4N



GS120-4N

ACCESSORY EQUIPMENT

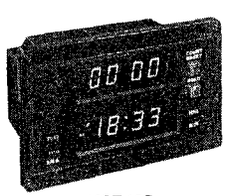
Type	Catalog Number	Description	Price	Dimensions in Inches — Trim H	Trim W	Back Box H	Back Box W	Back Box D
**Ground Slave Module	**GS-120-4NI (UL LISTED)**	Four Ground Jacks, and Ground Bus	**$ 362.**	9½	13½	8	12	4
**Power-Ground Module	**RM-120-4NI (UL LISTED)**	Four Ground Jacks, Four Power Receptacles and Ground Bus	**571.**	9½	13½	8	12	4
**Master Ground Module	**GS-120-OI**	18 Pt. Terminal Bus in Enclosure with Stainless Steel Cover	**207.**	9½	13½	8	12	4
Backbox	**53007 BB**	Backbox for XR, GS, RM, 8CI and Wall Mounted Clocks	**65.**	...	...	8	12	4
Backbox	**53008BB**	Backbox for MM-IA	**60.**	...	...	4	12	4
Remote Indicator Alarm	**IA-1C**	Red and Green Lights, Silence Switch, Audible Alarm	**295.**	4⅝	4⅝	Not Supplied		
Portable Ground Integrity Tester	**GIT-11P**	Ground Integrity Tester	**1126.**	...	...	7	10⅛	6
**X-Ray-Indicator Module	**XR-IAI**	X-Ray Receptacle and Indicator Module	**882.**	14	10	12	8	4
**Supervisory Module for X-Ray Panel	**8CI-IAI**	Remote Push Button Station with Indicator Alarm	**777.**	13	11	12	10	6
*▲Indicator and Micro-Ammeter Module	**MM-IAI**	Indicator Alarm and Micro-Ammeter	**1098.**	5½	13½	4	12	4
Portable Leakage Current Tester	**LCM-1000**	Digital Leakage Current Tester	**2483.**	...	...	14¼	13½	6
Ground Cord Assembly	**P751N**	15 Ft. Ground Cord Assembly with Lug	**64.**	...	...	...	...	...
Ground Cord Assembly	**P752N**	15 Ft. Ground Cord Assembly with Clip	**64.**	...	...	...	...	...
Ground Cord Assembly	**P753N**	15 Ft. Ground Cord Assembly with Insulated Clip	**64.**	...	...	...	...	...
Dual Display Clock/Timer	**MCT-12B**	Clock and Timer with Separated Displays	**686.**	4¼	7	Not Supplied		
Single Display Clock/Timers	**MCT-11B**	Clock and Timer with One Display	**629.**	4¼	7	Not Supplied		
Auxiliary Control Units	**MCT-CT**	Remote Control Unit for MCT-11B & MCT-12B (optional)	**357.**	4½	4½	Not Supplied		
Battery Pack	**MCT-BP**	Rechargeable Battery Pack for MCT-11B & MCT-12B (optional)	**94.**	...	...	...	...	...
*Clock Timer Trim	**MCT95135**	Walnut Trim for MCT-11B & MCT12B	**21.**	9½	13½	8	12	4
***Surgical Chronometer	**MCT-14B**	Clock & Three Separate Timers	**1548.**	16½	13½	15	12	4
Auxiliary Control Unit	**MCT-4RC**	Control for MCT-14B	**538.**	13½	5½	12	4	4
▲ISO-Gard	**IGD-120-2TB**	†ISO-Gard LIM with Terminal Strip	**1623.**	4¼	7	...	...	...
▲ISO-Gard	**IGD-208-2TB**	†ISO-Gard LIM with Terminal Strip	**1623.**	4¼	7	...	...	...
▲ISO-Gard	**IGD-240-2TB**	†ISO-Gard LIM with Terminal Strip	**1623.**	4¼	7	...	...	...
Isolation System/ Ground Analyzer	GFL-1000	Complete Digital System Analyzer	**6810.**	...	...	14	14½	6

**Backbox must be ordered separately, for pricing see catalog number 53007BB.
▲2 ma; for 5 ma, consult factory
*Backbox must be ordered separately, for pricing see 53008BB
***To operate, one MCT-4RC must be purchased.

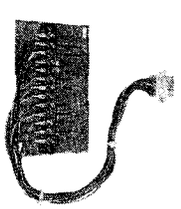
TIMERS

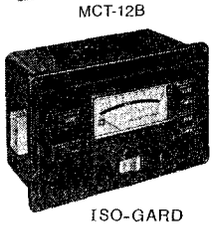


MCT-11B



MCT-12B

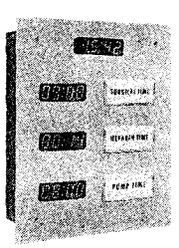




ISO-GARD



P751N



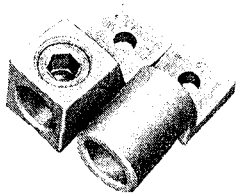
MCT-14B

†ISO-GARD is a Registered Trademark of Square D Company

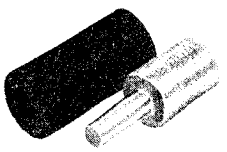
SQD SLV_000943

NEW VERSATILE ELECTRICAL COMPRESSION CONNECTORS

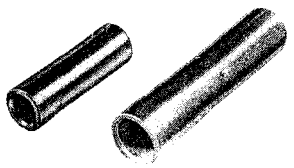
A DESIGN CONCEPT DEVELOPED TO PROVIDE COMPRESSION TOOL USERS WITH MAXIMUM VERSATILITY, EFFICIENCY AND CONVENIENCE



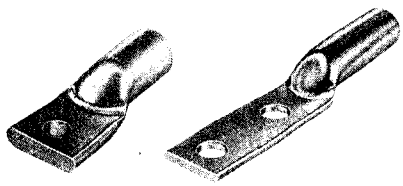
Equipment Terminals



Conductor Adaptors



Aluminum or Copper Splices



Aluminum or Copper Terminals

The engineering creativity which conceived the industry's all-in-one full range compression tool — VERSA-CRIMP — has developed yet another breakthrough . . . U.L. Listed, NEMA classified compression connectors . . . for use with VERSA-CRIMP® and CONVENTIONAL DIE-TYPE TOOLS.

VERSAtile COMPRESSION CONNECTORS

- Allow U.L. Listed connections with Blackburn, Burndy, Kearney and Thomas & Betts die or indent type tools (of course VERSA-CRIMP tools also).
- Provide die or indent type tool users with equipment terminals which are size-for-size replacements for original equipment set-screw mechanical lugs, when recommended by the equipment manufacturer.
- For equipment replacement, are U.L. Listed for both concentric and compact conductors.
- Eliminate tool-connector match-up requirements as with other manufacturers' connectors.
- Provide additional price advantages for VERSA-CRIMP system users through expanded selectivity.
- ALUMINUM or COPPER specifically designed for use with conventional die or indent type tools AND the only all-in-one full range VERSA-CRIMP compression crimping tool.

VERSAtile CONNECTORS ARE RANGE-TAKING WHEN USED WITH VERSA-CRIMP COMPRESSION TOOLS.

The unique action of VERSA-CRIMP compression tools and system design of connectors, makes possible the application of a variety of conductor sizes within one common connector. Thus making the VERSA-CRIMP system the only compression system which can provide comparable range-taking conveniences in compression connections previously limited to only mechanical set-screw type lugs or bolted connections.



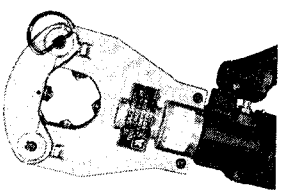
This VCAS-44 Aluminum Sleeve typifies the VERSA-CRIMP system's range-taking capabilities. It has a conductor range of #10 SOLID (crimped on right) through 1/0 STR AL/Cu (crimped on left). There are 8 conductor sizes within a #10 to 1/0 range and all combinations within can be handled by **one tool** and **one connector.**

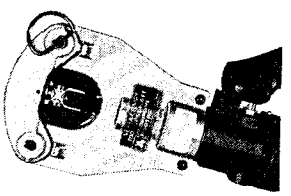
(Refer to connector selection tables for specific wire ranges.)

VERSA-CRIMP is a Registered Trademark of Square D Company

ALL-IN-ONE FULL RANGE TOOLS

Contrasting die-type "distance travel" systems, the VERSA-CRIMP pressure-response system utilizes four self-contained crimping nibs. These nibs advance from . . .



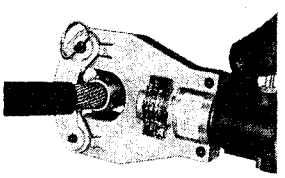


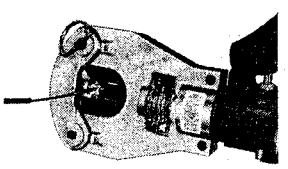
the largest opening to smallest opening,

in a continuous action, until the combined pressure of conductor and connector mass interacts upon a preset hydraulic relief valve.

It is through this difference in design principle, which enables **only** VERSA-CRIMP tools to handle the complete job of the entire tool-range without a single change of compressing die-sets or tool alterations.

The VERSA-CRIMP VC6-FT tool for example, performs in a very wide range of #10 STR AL through 750 MCM AL, or . . .





from this large to this small.

VERSA-CRIMP tools and VERSAtile connectors will provide
- Versatility in Applications
- On-The-Job Efficiencies
- Minimized Down-Time
- Reduced Inventories
- Savings in Time and Money
- U.L. Listed Connectors

When you want compression, think Square D Company.

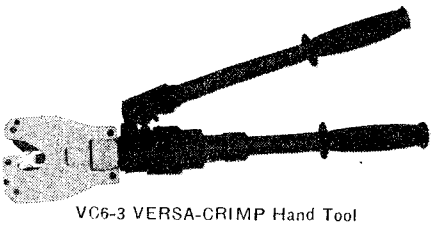
SQD SLV_000944

HYDRAULIC COMPRESSION HAND TOOLS

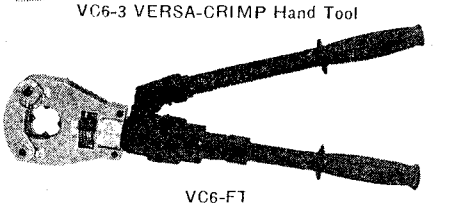
Catalog Number	Description	Tool Wt. Lbs.	Conductor Range	Net Price Each
VC6-3	Universal Die with Neoprene Covered Body only	10.5	#10 to 500 MCM Copper or Aluminum	$665.00
VC6-3D	Same as VC6-3, plus a neoprene covered head	11.0	Same as VC6-3	715.00
VC6-FT	Universal Die with Neoprene Covered Body only	11.0	#10-750 MCM Al #10-500 MCM Cu	792.00
VC6-FTV	Same as VC6-FT, except with rotatable die for use with Type VACC Parallel Connectors	11.0	#10-750 MCM Al #10-500 MCM Cu or 4/0-4/0 STR. Al max. for VACC connectors	852.00
VC-7	Universal Die with Neoprene Covered Body only	10.5	#6 to 500 MCM **Copper only**	665.00
VC7-D	Same as VC7, plus a neoprene covered head	11.0	#6 to 500 MCM **Copper only**	715.00
VC7-FT	Universal Die with Neoprene Covered Body only	11.0	#6-750 MCM **Copper Only**	792.00

Notes: (1) Plastic Nylon Carrying Case, Crimp Test Gage set, and service manual included in tool net price. (2) All hand tools are supplied with neoprene covered handles. (3) All VC7 series tools have copper colored head covers.

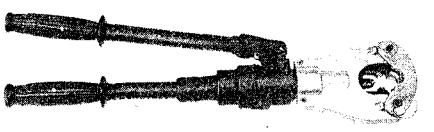
DD4 DISCOUNT



VC6-3 VERSA-CRIMP Hand Tool



VC6-FT

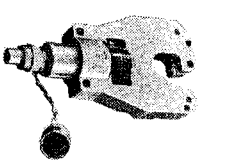


VC6-FTV

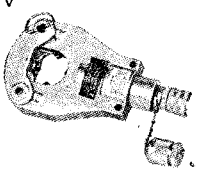
REMOTE HYDRAULIC COMPRESSION TOOLS POWER SOURCES AND ACCESSORIES

Catalog Number	Description	Conductor Range	Net Price Each
*VC6R	VC6 remote head only with ⅜" male quick coupler. For use with any pump with a relief valve set at 10,400 PSI.	#10 to 500 MCM Copper or Aluminum	$495.00
VC6-FTR	VC6-FT remote head only with ⅜" male quick coupler. For use with any pump with a relief valve set at 10,400 PSI.	#10-750 MCM Al #10-500 MCM Cu	600.00
VC6-FTVR	VC6-FTV remote head only with ⅜" male quick coupler. For use with any pump with a relief valve set at 10,400 PSI.	#10-750 MCM Al #10-500 MCM Cu or 4/0-4/0 STR. Al max. for VACC connectors.	676.00
*VC7R	VC7 remote head only with ⅜" male quick coupler. For use with any pump with a relief valve set at 10,400 PSI.	#6 to 500 MCM **Copper only**	495.00
VC7-FTR	VC7-FT remote head only with ⅜" male quick coupler. For use with any pump with a relief valve set at 10,400 PSI.	#6-750 MCM **Copper only**	600.00
VC8C	VC8 remote head only with ⅜" male quick coupler. Kit includes, inline pressure gauge, and steel carrying case. For use with any pump with a relief valve set at 10,400 PSI.	350-1000 MCM STR. Al 500-1500 MCM STR. Cu	858.00
**VC3W-6	6 ft. wire bound rubber hose with female couplers on each end.		83.00
**VC3W-10	10 ft. wire bound rubber hose with female couplers on each end.		90.00
**VC3W-15	15 ft. wire bound rubber hose with female couplers on each end.		105.00
PW115V	115 Volt AC 11.5 Amp ½ H.P. electric motor driven pump. ⅜" male quick coupler, steel carrying case. 10,400 PSI relief valve.		1075.00
PW12V	12 Volt DC 45 Amp electric battery powered motor-driven pump. ⅜" male quick coupler, steel carrying case and battery cables. 10,400 PSI. Note: Battery not included.		1080.00
VCVE	Electric control for PW115V or PW12V power units and remote tool heads.		250.00
VCEP-12	12 ft. wire hand control for PW115V or PW12V.		***
VCHP	Manually hand operated 10,400 PSI pump with ⅜" male quick coupler.		330.00
VCFP	Manually foot operated 10,400 PSI pump with ⅜" male quick coupler.		330.00
VCLPG	Line pressure gauge complete with ⅜" quick couplers and metal carrying case. For use in checking operating pressure on all power tools.		195.00
VC6G	Silver gauge and 20 slugs for test-crimping VC6-2A tools and VC6-3 tools not specifying red gauge.		8.10
VC6-FTG	Red gauge and 20 slugs for test-crimping VC6-FT and VC6-FTV tools, and any tools specifying red gauge.		8.10
VC7G	Same as VC6G except for checking VC7 and VC7-FT tools.		9.35
VCMCC	Heavy duty metal carrying case with 7 storage compartments for all Versa Crimp hand tools.		75.00
VC67SC	Heavy duty metal carrying case for VC6R and VC7R remote heads.		55.00
VCB-6	Protective nylon bag for hose, control and VC6R or VC7R head.		21.45

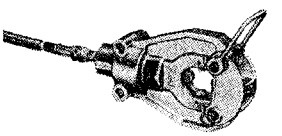
*Add suffix "D" for insulated head for VC6R and VC7R, add **$45.** to price shown.
Add suffix "E" for electrical cord and plug, add **$5.00 to price shown.
***Contact factory



VC6R Remote Head



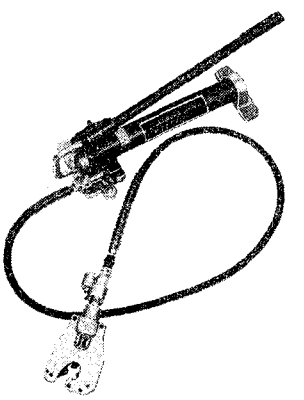
VC6FTR Remote Head



VC8 Remote Head



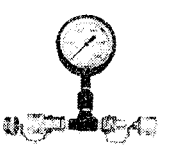
VC6-FTVR Remote Head



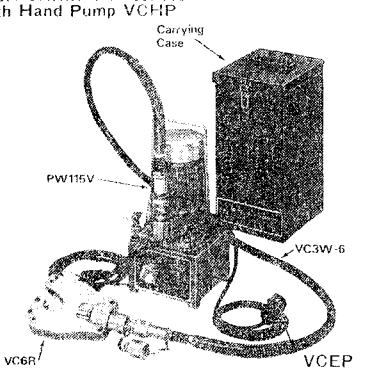
VERSA-CRIMP Remote Head with Hand Pump VCHP



VC3W Hose



VCLPG Gauge



DD2 DISCOUNT

VERSA-CRIMP is a Registered Trademark of Square D Company.

SQD SLV_000945

SQUARE D CONNECTORS

DISTRIBUTION EQUIPMENT CROSS-REFERENCE

TYPE VCEL

The following shows general information on which SQUARE D devices Type VCEL Equipment Compression Lugs may be interchanged with original equipment mechanical screw-type lugs. Specific details and catalog numbers of which VCEL lugs may be used on MAINS, SOLID NEUTRAL and EQUIPMENT GROUND TERMINALS are contained in D.E. Product Data Bulletin D-379, or additional applications may be determined by contacting the product headquarters of equipment involved.

Catalog No.	Series No.
Double-Throw Safety Switches	
82253, & F	A1
82254, & F	—
82263, & F	A1
82263R	B1
82264, F & RB	—
82343, & F	A1
82343RB	B1
82344, F & RB	—
82353, & F	A1
82354, & F	—
82444F	—
82454F	—
92443, & F	—
92444	—
92453, & F	—
92454	—
EZ METER-PAK Meter Centers	
EZM225N & NR	1
EZM226N & NR	1
EZM325N & NR	1
EZM326N & NR	1
EZM22400N & NR	1
EZM22600N & NR	1
EZM22800N & NR	1
EZM221000N	3
EZM221000NR	1
EZM221200N	3
EZM221200NR	1
EZM221600N	2
EZM32400N & NR	1
EZM32600N & NR	1
EZM32800N & NR	1
EZM321000N	3
EZM321000NR	1
EZM321200N	3
EZM321200NR	1
EZM321600N	2
EZM3800TB & TBR	2
EZM31600TB & TBR	1
EZM4800TB & TBR	2
EZM41600TB & TBR	1
Heavy Duty Safety Switches Single Throw-Fusible	
H223, N & NRB	D2
H223A, AWK, DS, NA NAWK & NDS	D4
H224, N, NRB & RB	D2
H224A, AWK, DS, NA NAWK & NDS	D4
H225, A, AWK, DS, N, NA, NAWK, NDS, NR & R	D2
H226, AWK, DS, N, NAWK, NDS, NR & R	D2
H263, A, AWK & DS	D4
H264A & AWK	D4
H265, A, AWK, DS & R	D2
H266, AWK, DS & R	D2
H323, N, NRB & RB	D3
H323A, AWK, DS, NA, NAWK & NDS	D4
H324, N, NRB & RB	D2
H324A, AWK, DS, NA, NAWK & NDS	D4
H325, A, AWK, DS, N, NA, NAWK, NDS, NR & R	D2
H326, AWK, DS, N, NAWK, NDS, NR & R	D2
H363, N, NRB & RB	D3
H363A, AWK, DS, NA, NAWK & NDS	D4
H364, N, NRB & RB	D2
H364A, AWK, DS, NA, NAWK & NDS	D4
H365, A, AWK, DS, N, NA & NAWK	D2
H465AWK	D2
H466	D2
I-LINE Panelboard Main Lugs	
HCM-1438-2N	1
HCM-2347-2N	1
HCM-3256-2N	1
HCM-5074-2N	1
HCM-6892-2N	1
HCN-1436-2N	1
HCN-2345-2N	1
HCN-3254-2N	1
HCN-4163-2N	1
HCN-5072-2N	1
HCN-6890-2N	1
Heavy Duty Safety Switches Single Throw-Not Fusible	
HU263, A, AWK, & DS	D4
HU264, A, AWK, & DS	D4
HU265, A, AWK, DS, & R	D2
HU266, AWK, DS, & R	D2
HU363, A, AWK, & DS	D4
HU363RB	D3
HU364, A, AWK, & DS	D4
HU364RB	D2
HU365, A, AWK, DS, & R	D2
HU366, AWK, DS, & R	D2
HU463, A, & AWK	D4
HU464, A, & AWK	D4
HU465, A, & AWK	D2
HU466	D2
NQO Panelboard Main Lugs	
NQO-123	1
NQO-124	1
NQO-203-1	1
NQO-203-2	1
NQO-204	1
NQO-303	1
NQO-303-4	3
NQO-304-1	1
NQO-304-2	1
NQO-304-4	3
NQO-423	1
NQO-423-4	3
NQO-424	1
NQO-424-4	3
NQO-523	1
NQO-544	1
NQO-826-143	1
NQO-826-144	1
NQO-832-203	1
NQO-832-204	1
NQO-840-303	1
NQO-840-304	1
NQO-849-423	1
NQO-849-424	1
NQOB Panelboard Main Lugs	
NQOB-123	2
NQOB-124	2
NQOB-203-1	2
NQOB-203-2	2
NQOB-204	2
NQOB-303	2
NQOB-304-1	2
NQOB-304-2	2
NQOB-423	2
NQOB-424	2
PAE Enclosed Circuit Breakers	
PAE260000NR & NS	—
PAE26600NR & NS	—
PAE26700NR & NS	—
PAE26800NR & NS	—
PAE261000NR & NS	—
PAE261200NR & NS	—
PAE261400NR & NS	—
PAE261600NR & NS	—
PAE261800NR & NS	—
PAE262000NR & NS	—
PAE360000NR & NS	—
PAE36600NR & NS	—
PAE36700NR & NS	—
PAE36800NR & NS	—
PAE361000NR & NS	—
PAE361200NR & NS	—
PAE361400NR & NS	—
PAE361600NR & NS	—
PAE361800NR & NS	—
PAE362000NR & NS	—
I-LINE Busway-Fusible Switch Plug-In Units	
PQ-3210	1
PQ-3220	5
PS-3220	5
PBQ-3240	5
PBQ-3240-G	5
PQ-3610	1
PQ-3620	5
PS-3620	5
PBQ-3640	5
PBQ-3640-G	5
PQ-4210	1
PQ-4220	5
PS-4220	5
PBQ-4240	5
PBQ-4240-G	5
PQ-4610	1
PQ-4620	5
PS-4620	5
PBQ-4640	5
PBQ-4640-G	5
I-LINE Busway-Cable Tap Boxes	
PBTB-302	5
PBTB-302-G	5
PTB-308	1
PTB-308-G	1
PTB-310	1
PTB-310-G	1
PBTB-502	5
PBTB-502-G	5
PTB-508	1
PTB-508-G	1
PTB-510	1
PTB-510-G	1
QMB Panelboards Main Lugs Fusible Main Switches and Branch Switches	
QMB-210-T	4
QMB-310-T	4
QMB-1832-2	4
QMB-2210-M	4
QMB-2220, & M	4
QMB-2240, & M	4
QMB-2444-4	4
QMB-2610-M	4
QMB-2620, & M	4
QMB-2640, & M	4
QMB-2744-2	4
QMB-3210-M	4
QMB-3220, & M	4
QMB-3240, & M	4
QMB-3610-M	4
QMB-3620, & M	4
QMB-3640, & M	4
QMB-3656-4	4
QMB-3956-2	4
QMB-4868-4	4
QMB-4868-6	4
QMB-6080-6	4
QMB-7292-6	4
QMB-7592-2	4
Sorgel Dry Type Transformers Single Phase - 15 to 100 KVA	
15S1H	—
15S5H	—
15S40H	—
25S3H	—
25S3HB	—
25S3HF	—
25S5H	—
37S3H	—
37S3HB	—
37S3HF	—
37S5H	—
50S3H	—
50S3HB	—
50S3HF	—
50S5H	—
75S3H	—
75S5H	—
100S3H	—
100S5H	—
Sorgel Dry Type Transformers Three Phase - 15 to 150 KVA	
15T2F	—
15T7F	—
15T68F	—
15T75F	—
30T3H	—
30T3HB	—
30T3HF	—
30T3HIS	—
30T6H	—
30T6HCT	—
30T8H	—
30T12H	—
30T76H	—
30T85HIS	—
30T89HAT	—
45T3H	—
45T3HB	—
45T3HF	—
45T3HIS	—
45T6H	—
45T6HCT	—
45T8H	—
45T12H	—
45T76H	—
45T85HIS	—
45T89HAT	—
75T3H	—
75T3HB	—
75T3HF	—
75T3HIS	—
75T6H	—
75T6HCT	—
75T8H	—
75T12H	—
75T76H	—
75T85HIS	—
75T89HAT	—
112T3H	—
112T3HB	—
112T3HF	—
112T6H	—
112T89HAT	—
150T3H	—
150T3HB	—
150T3HF	—
150T6H	—
150T89HAT	—

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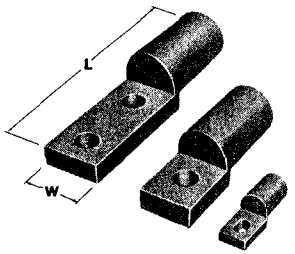
SQD SLV_000946

ALUMINUM COMPRESSION EQUIPMENT TERMINAL

FOR USE WITH VERSA-CRIMP® AND CONVENTIONAL COMPRESSION TOOLS
For Aluminum or Copper Conductors
Patented — UL LISTED **TIN PLATED ALUMINUM**

TYPE VCEL



Type VCEL
Versatile Compression
Equipment Terminals

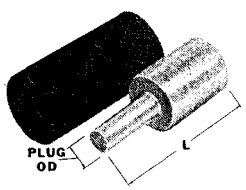
Aluminum or Copper Conductors		No. Pad Holes	Pad Bolt Dia.	Dimensions		Std. Pkg.	Catalog Number	Net Price/100	
Conventional Wire Size	VERSA-CRIMP System Range			L	W			Std. Pkg.	10 or More Std. Pkgs.
1/0 STR. AL/CU	#8 — 1/0 STR. AL/CU	1	1/4	1 3/4	39/64	12	VCEL-021-14S1	$189.45	$166.25
1/0 STR. AL/CU	#8 — 1/0 STR. AL/CU	1	5/16	1 3/4	39/64	12	VCEL-021-516H1	205.40	182.25
1/0 STR. AL/CU	#8 — 1/0 STR. AL/CU	1	3/8	1 3/4	7/16	12	VCEL-021-38H1	212.85	186.95
2/0 STR. AL/CU	#1 — 2/0 STR. AL/CU	1	5/16	2 17/64	1	12	VCEL-022-516H1	272.60	242.55
2/0 STR. AL/CU	#1 — 2/0 STR. AL/CU	1	3/8	2 17/64	1	12	VCEL-022-38H1	286.75	258.25
4/0 STR. AL/CU	2/0 — 4/0 STR. AL/CU	1	5/16	2 17/64	1	12	VCEL-024-516H1	362.35	317.50
4/0 STR. AL/CU	2/0 — 4/0 STR. AL/CU	1	3/8	2 17/64	1	12	VCEL-024-38H1	366.50	334.35
300 MCM AL/CU	#4 — 300 MCM AL/CU	1	5/16	2 17/64	1	12	VCEL-030-516H1	438.80	393.80
300 MCM AL/CU	#4 — 300 MCM AL/CU	1	3/8	2 17/64	1	12	VCEL-030-38H1	441.50	410.40
350 MCM AL	250 — 350 MCM AL	1	5/16	2 17/64	1	12	VCEL-035-516H1	451.60	419.95
350 MCM AL	250 — 350 MCM AL	1	3/8	2 17/64	1	12	VCEL-035-38H1	457.90	426.25
500 MCM AL/CU	2/0 — 500 MCM AL/CU	1	3/8	3 13/32	1 3/16	12	VCEL-050-38H1	858.75	760.30
500 MCM AL/CU	2/0 — 500 MCM AL/CU	1	1/2	3 13/32	1 3/16	12	VCEL-050-12H1	861.85	801.35
600 MCM AL	400 — 600 MCM AL	1	1/2	3 21/32	1 5/16	12	VCEL-060-12H1	960.70	884.10
600 MCM AL	400 — 500 MCM CU	2	1/2	3 21/32	1 5/16	12	VCEL-060-12H2	1020.00	945.75
750 MCM AL	500 — 750 MCM AL	1	1/2	3 21/32	1 5/16	12	VCEL-075-12H1	1013.00	935.25
750 MCM AL	— 500 MCM CU	2	1/2	5 3/32	1 5/16	12	VCEL-075-12H2	1058.00	983.90

Note: All two hole terminals are on 1¾" centers.

ALUMINUM COMPRESSION EQUIPMENT ADAPTER

FOR USE WITH VERSA-CRIMP® AND CONVENTIONAL COMPRESSION TOOLS
For Aluminum Stranded Conductors Only
UL LISTED **TIN PLATED ALUMINUM**

TYPE CEP



Type CEP
Versatile Compression
Aluminum Cable Adapters

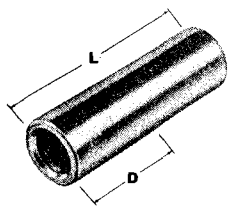
Aluminum Conductor Only		Dimensions		Std. Pkg.	Catalog Number	Net Price/100	
Conventional Wire Size	VERSA-CRIMP System Range	L	Plug O.D.			Std. Pkg.	10 or More Std. Pkgs.
#2 STR. AL	#4 — #2 STR. AL	1 27/32	9/32	12	CEP-2	$ 344.65	$ 275.45
1/0 STR. AL	#2 — 1/0 STR. AL	2	9/32	12	CEP-1/0	414.55	331.65
2/0 STR. AL	#1 — 2/0 STR. AL	2 5/32	11/32	12	CEP-2/0	601.40	499.00
4/0 STR. AL	2/0 — 4/0 STR. AL	2 17/32	7/16	12	CEP-4/0	739.80	592.75
300 MCM AL	4/0 — 300 MCM AL	2 21/32	17/32	12	CEP-300	842.45	680.65
350 MCM AL	250 — 350 MCM AL	3 11/32	9/16	12	CEP-350	925.80	741.25
500 MCM AL	350 — 500 MCM AL	3 3/8	11/16	12	CEP-500	1207.00	964.00
600 MCM AL	400 — 600 MCM AL	3 29/32	23/32	12	CEP-600	1622.00	1296.00
750 MCM AL	500 — 750 MCM AL	4	13/16	12	CEP-750	1649.00	1319.00

Note: Insulation cover supplied with each adaptor. Cover not sold separately.

ALUMINUM COMPRESSION SPLICE

FOR USE WITH VERSA-CRIMP® AND CONVENTIONAL COMPRESSION TOOLS
For Aluminum To Aluminum or Aluminum To Copper Conductors
UL LISTED **TIN PLATED ALUMINUM**

TYPE VACS



Type VACS
Versatile Compression Sleeves

Aluminum or Copper Conductor		Dimensions		Std. Pkg.	Catalog Number	Net Price/100	
Conventional Wire Size	VERSA-CRIMP System Range	L	D			Std. Pkg.	10 or More Std. Pkgs.
#8 STR. AL/CU		1 7/8	7/8	50	VACS-8	$144.75	$116.45
#6 STR. AL/CU		1 7/8	7/8	50	VACS-6	174.70	140.30
#4 STR. AL/CU		2 1/8	1	50	VACS-4	185.10	147.70
#2 STR. AL/CU	#6 — #2 STR. AL/CU	2 3/8	1 1/8	50	VACS-2	285.10	228.40
#1 STR. AL/CU	#4 — #1 STR. AL/CU	2 3/8	1 1/8	50	VACS-1	388.05	310.45
1/0 STR. AL/CU	#8 — 1/0 STR. AL/CU	2 11/16	1 5/16	50	VACS-1/0	491.00	392.50
2/0 STR. AL/CU	#4 — 2/0 STR. AL/CU	2 11/16	1 5/16	25	VACS-2/0	519.60	416.40
3/0 STR. AL/CU	#4 — 3/0 STR. AL/CU	2 11/16	1 5/16	25	VACS-3/0	598.50	479.10
4/0 STR. AL/CU	#2 — 4/0 STR. AL/CU	3 3/8	1 5/8	25	VACS-4/0	661.10	516.35
250 MCM AL/CU	1/0 — 250 MCM AL/CU	3 3/8	1 5/8	25	VACS-250	668.65	534.30
300 MCM AL/CU	1/0 — 300 MCM AL/CU	3 3/8	1 5/8	10	VACS-300	707.50	565.70
350 MCM AL/CU	2/0 — 350 MCM AL/CU	5	2 7/16	10	VACS-350	743.25	594.00
400 MCM AL/CU	3/0 — 400 MCM AL/CU	5	2 7/16	10	VACS-400	976.10	780.60
500 MCM AL/CU	4/0 — 500 MCM AL/CU	5	2 7/16	10	VACS-500	1213.00	970.00
600 MCM AL	350 — 600 MCM AL — 500 MCM CU	6	2 15/16	10	VACS-600	1743.00	1394.00
750 MCM AL	500 — 750 MCM AL — 500 MCM CU	6	2 15/16	10	VACS-750	1791.00	1432.00
1000 MCM AL	750 — 1000 MCM AL	6	3 1/8	10	VACS-1000	2387.00	1910.00

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SQD SLV_000947

ALUMINUM COMPRESSION TERMINAL

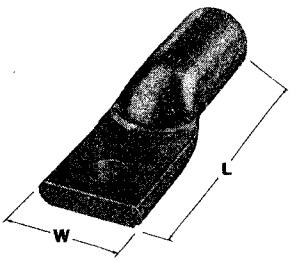
TYPE VACL

FOR USE WITH VERSA-CRIMP® AND CONVENTIONAL COMPRESSION TOOLS
For Aluminum or Copper Conductors
TIN PLATED ALUMINUM — **UL LISTED**

Aluminum or Copper Conductor		No. Pad Holes	Pad Bolt Dia.	Dimensions L	Dimensions W	Std. Pkg.	Catalog Number	Net Price/100 Std. Pkg.	Net Price/100 10 or More Std. Pkgs.
Conventional Wire Size	VERSA-CRIMP System Range								
#8 STR. AL/CU		1	#10	1 7/8	1/2	50	VACL-8-10	$131.40	$104.45
		1	1/4			50	VACL-8-14		
#6 STR. AL/CU		1	#10			50	VACL-6-10	165.65	132.90
		1	1/4			50	VACL-6-14		
#4 STR. AL/CU		1	1/4	2 5/16	1 3/16	50	VACL-4-14	174.70	140.30
		1	5/16			50	VACL-4-516		
		1	3/8			50	VACL-4-38		
#2 STR. AL/CU	#6 — #2 STR. AL/CU	1	1/4	2 1/2	7/8	50	VACL-2-14	202.90	162.70
		1	5/16			50	VACL-2-516		
		1	3/8			50	VACL-2-38		
#1 STR. AL/CU	#4 — #1 STR. AL/CU	1	5/16	2 3/4	3/4	50	VACL-1-516	253.75	202.90
		1	3/8			50	VACL-1-38		
1/0 STR. AL/CU	#8 — 1/0 STR. AL/CU	1	5/16	2 15/16		50	VACL-1/0-516	283.50	226.85
		1	3/8			50	VACL-1/0-38		
		1	1/2			50	VACL-1/0-12		
		2	3/8	4		25	VACL-1/0-38B	358.15	286.60
		2	1/2	4 7/8	1 3/16	25	VACL-1/0-12BN		
2/0 STR. AL/CU	#4 — 2/0 STR. AL/CU	1	3/8	2 15/16		25	VACL-2/0-38	371.60	300.00
		1	1/2	3 1/8		25	VACL-2/0-12		
		2	1/2	4 7/8		25	VACL-2/0-12BN	534.30	426.80
3/0 STR. AL/CU	#4 — 3/0 STR. AL/CU	1	3/8	3		25	VACL-3/0-38	497.00	397.00
		1	1/2	3 3/16	1 1/16	25	VACL-3/0-12		
		2	1/2	4 15/16		25	VACL-3/0-12BN	665.65	532.85
4/0 STR. AL/CU	#2 — 4/0 STR. AL/CU	1	3/8	3 15/16		25	VACL-4/0-38	546.75	464.15
		1	1/2	3 1/2	1 3/16	25	VACL-4/0-12		
		2	1/2	5 1/4		25	VACL-4/0-12BN	707.50	565.65
250 MCM AL/CU	1/0 — 250 MCM AL/CU	1	1/2	3 3/16	1 1/4	25	VACL-250-12	598.50	479.00
		2		5 5/16		25	VACL-250-12BN	725.30	580.60
300 MCM AL/CU	1/0 — 300 MCM AL/CU	1	1/2	3 3/4	1 3/8	10	VACL-300-12	665.65	532.85
		2		5 1/2		10	VACL-300-12BN	747.75	598.50
350 MCM AL/CU	2/0 — 350 MCM AL/CU	1	1/2	4 1/16	1 1/2	10	VACL-350-12	716.40	573.10
		2		5 13/16		10	VACL-350-12BN	764.15	612.00
400 MCM AL/CU	3/0 — 400 MCM AL/CU	1	1/2	4 1/4	1 5/8	10	VACL-400-12	998.55	798.50
		2		6		10	VACL-400-12BN	1071.00	856.00
500 MCM AL/CU	4/0 — 500 MCM AL/CU	1	1/2	4 11/16		10	VACL-500-12	1379.00	1103.00
		1	5/8	5 3/16	1 11/16	10	VACL-500-58		
		2	1/2	6 7/16		10	VACL-500-12BN	1529.00	1223.00
600 MCM AL	350 — 600 MCM AL	1	5/8	5 3/4	1 7/8	10	VACL-600-58	1468.00	1174.00
	500 MCM CU	2	1/2	7		10	VACL-600-12BN	1631.00	1304.00
750 MCM AL	500 — 750 MCM AL	1	1/2	5 1/4		10	VACL-750-12	1590.00	1273.00
	500 MCM CU	1	5/8	5 3/4	1 15/16	10	VACL-750-58		
		2	1/2	7		10	VACL-750-12BN	1683.00	1346.00
1000 MCM AL	750 — 1000 MCM AL	1	5/8	6 9/16	2 5/8	10	VACL-1000-58	2388.00	1910.00
		2	1/2	7 13/16		10	VACL-1000-12BN	2556.00	2044.00

Note: All two hole terminals are on 1 3/4" centers — except Catalog No. VACL-1/0-38B which are on 1 1/16" centers.

DD4 DISCOUNT

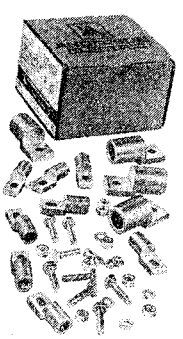


Type VACL
Versatile Compression Terminals

LUG KITS

TRANSFORMER LUG KIT
VERSATILE COMPRESSION LUGS AND MECHANICAL SET-SCREW TYPES

SORGEL Transformer KVA Sizes	Tool Type	Terminal Lugs Qty.	Terminal Lugs Catalog Number	Hardware Included Qty.	Hardware Included Type	Kit Catalog* Number	Net Price Per Kit
VERSATILE Compression Equipment Lugs							
15-37 1/2 1φ 15-45 3φ	VC6 (All)	8 4	VCEL-021-14S1 VCEL-030-516H1	8	1/4"x1" Cap Screws	VCEL-SK1	$ 33.00
50-75 1φ 75-112 1/2 3φ		12	VCEL-030-516H1	8 8	1/4"x1" Cap Screws 1/4"x2" Cap Screws	VCEL-SK2	54.80
100-167 1φ 150-300 3φ	VC6FT	3 22	VCEL-030-516H1 VCEL-075-12H1	3 16	1/4"x3/4" Cap Screws 3/8"x2" Cap Screws	VCEL-SK3	238.40
500 3φ	VC6FT VC8	29	VCEL-075-12H1	18	3/8"x2" Cap Screws	VCEL-SK4	296.25
Mechanical Set — Screw Type Lugs							
15-37 1/2 1φ 15-45 3φ	—	8 4	DA-2 DA-250	8	1/4"x3/4" Cap Screws	DA-SK1	$10.10
50-75 1φ 75-112 1/2 3φ	—	12	DA-250	8 8	1/4"x3/4" Cap Screws 1/4"x1 3/4" Cap Screws	DA-SK2	19.55
100-167 1φ 150-300 3φ	—	3 22	DA-250 DA-600	3 16	1/4"x3/4" Cap Screws 3/8"x2" Cap Screws	DA-SK3	76.90
500 3φ	—	29	DA-600	18	3/8"x2" Cap Screws	DA-SK4	105.00



Transformer Lug Kits
Compression Type

*TYPE VCEL-SK = **DD4 DISCOUNT** TYPE DA-SK = **DD4 DISCOUNT**

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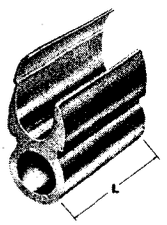
SQD SLV_000948



Type VACC
VERSA-CRIMP
Aluminum Parallel Connectors

ALUMINUM COMPRESSION PARALLEL CONNECTOR

FOR USE WITH VERSA-CRIMP® TYPE VC6-FTV/FTVR TOOLS ONLY
For Aluminum To Aluminum or Aluminum To Copper Conductors
UL LISTED PATENT PENDING TIN PLATED ALUMINUM

TYPE VACC

Concentric Conductor Stranded Aluminum or Copper		Compact Conductor Stranded Aluminum		L	Std. Pkg.	Catalog Number	Net Price/100	
Main	Tap	Main	Tap				Std. Pkg.	10 or More Std. Pkgs.
#6 — #2	#6 — 1/0	#6 — #2	#6 — 1/0	1⅞	25	VACC-0210	$119.10	$100.30
#6 — 1/0	#6 — 1/0	#4 — 1/0	#6 — 1/0	1⅞	25	VACC-1010	127.90	106.55
#6 — 1/0	#4 — 4/0	#4 — 1/0	#2 — 4/0	2½	25	VACC-1040	144.15	112.80
1/0 — 4/0	#4 — 4/0	1/0 — 4/0	#2 — 4/0	2½	25	VACC-4040	150.40	119.10

Note: For use with VERSA-CRIMP Type VC6-FTV/FTVR Tools only.



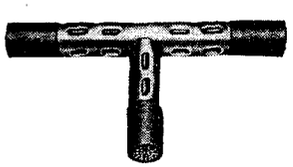
Type VCAT
VERSA-CRIMP Aluminum Tees

ALUMINUM COMPRESSION TEE

FOR USE WITH VERSA-CRIMP® TOOLS ONLY
FOR ALUMINUM TO ALUMINUM OR ALUMINUM TO COPPER
CONDUCTOR TIN PLATED ALUMINUM
UL LISTED

TYPE VCAT

Aluminum or Copper Conductor Main	Tap	Tool Type	Std. Pkg.	Catalog Number	Net Price For Each Std. Pkg.	10 or More Std. Pkgs.
#6 STR. — 1/0 STR.	#6 STR. — 1/0 STR.	VC6 (All)	6	VCAT-1/0-1/0	$ 9.00	$ 6.30
#2 STR. — 4/0 STR.	#6 STR. — 1/0 STR.		6	VCAT-4/0-1/0	9.00	6.30
	#2 STR. — 4/0 STR.		6	VCAT-4/0-4/0	9.30	6.80
1/0 STR. — 300 MCM	#6 STR. — 1/0 STR.		6	VCAT-300-1/0	11.45	8.20
	#2 STR. — 4/0 STR.		6	VCAT-300-4/0	12.80	9.45
	1/0 STR. — 300 MCM		6	VCAT-300-300	13.50	9.90
4/0 STR. — 500 MCM	#6 STR. — 1/0 STR.		6	VCAT-500-1/0	15.20	10.90
	#2 STR. — 4/0 STR.		6	VCAT-500-4/0	16.25	11.50
	1/0 STR. — 300 MCM		6	VCAT-500-300	17.95	12.20
	4/0 STR. — 500 MCM		6	VCAT-500-500	19.40	13.90
500 — 750 MCM AL 500 MCM CU	#6 STR. — 1/0 STR.	VC6FT	6	VCAT-750-1/0	15.90	11.45
	#2 STR. — 4/0 STR.		6	VCAT-750-4/0	16.85	11.95
	1/0 STR. — 300 MCM		6	VCAT-750-300	19.40	14.35
	4/0 STR. — 500 MCM		6	VCAT-750-500	20.20	14.75
	500 — 750 MCM AL 500 MCM CU		6	VCAT-750-750	21.40	16.10
250 — 500 MCM	250 — 500 MCM	VC8	6	VCAT-8050-8050	19.45	15.85
500 — 750 MCM	250 — 500 MCM		6	VCAT-8075-8050	20.20	16.65
	500 — 750 MCM		6	VCAT-8075-8075	21.45	18.00
750 — 1000 MCM	250 — 500 MCM		2	VCAT-8100-8050	22.50	19.00
	500 — 750 MCM		2	VCAT-8100-8075	23.70	20.20
	750 — 1000 MCM		2	VCAT-8100-8100	25.00	21.45



Type VCCT
VERSA-CRIMP Copper Tees

COPPER COMPRESSION TEE

FOR USE WITH VERSA-CRIMP® OR CONVENTIONAL COMPRESSION TOOLS
FOR COPPER STRANDED CONDUCTOR
UL LISTED TIN PLATED COPPER

TYPE VCCT

Copper Conductor Conventional Wire Size		VERSA-CRIMP System Range		Catalog Number	Net Price Each	
Main	Tap	Main	Tap		Std. Pkg.	10 or More Std. Pkgs.
1/0 STR.	1/0 STR.	#6 — 1/0 STR.	#6 — 1/0 STR.	VCCT-1/0-1/0	$10.05	$ 8.20
4/0 STR.	1/0 STR.	#1 — 4/0 STR.	#6 — 1/0 STR.	VCCT-4/0-1/0	10.05	8.20
4/0 STR.	4/0 STR.	#1 — 4/0 STR.	#1 — 4/0 STR.	VCCT-4/0-4/0	10.75	8.70
350 MCM	1/0 STR.	3/0 — 350 MCM	#6 — 1/0 STR.	VCCT-350-1/0	13.90	11.15
350 MCM	350 MCM	3/0 — 350 MCM	3/0 — 350 MCM	VCCT-350-350	16.60	13.35
500 MCM	1/0 STR.	4/0 — 500 MCM	#6 — 1/0 STR.	VCCT-500-1/0	18.00	15.40
500 MCM	4/0 STR.	4/0 — 500 MCM	#1 — 4/0 STR.	VCCT-500-4/0	20.25	16.80
500 MCM	500 MCM	4/0 — 500 MCM	4/0 — 500 MCM	VCCT-500-500	23.80	19.55

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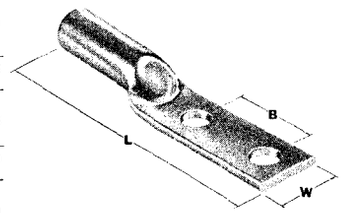
SQD SLV_000949

COPPER COMPRESSION TERMINAL (LONG BARREL)

TYPE VHCL

FOR USE WITH VERSA-CRIMP® AND CONVENTIONAL COMPRESSION TOOLS
For Copper Stranded Conductor
TIN PLATED COPPER — UL LISTED

Copper Conductor		No. Pad Holes	Pad Bolt Dia.	Dimensions W	L	B	Std. Pkg.	Catalog Number	Net Price/100 Std. Pkg.	10 or More Std. Pkgs.
Conventional Wire Sizes*	VERSA-CRIMP® System Range									
#6 STR. CU	—	1	#8-10	7/16	1 15/16	—	50	VHCL-6-10/8		
		1	1/4	1/2	2 1/8	—	50	VHCL-6-14	$ 57.90	$ 46.05
		1	5/16	1/2	2 1/8	—	50	VHCL-6-516		
		2	#8-10	7/16	2 3/8	5/8	50	VHCL-6-10/8B	159.00	127.75
		2	1/4	1/2	2 3/8	5/8	50	VHCL-6-14B		
#4 STR. CU	—	1	#8-10	1/2	2	—	50	VHCL-4-10/8		
		1	1/4	1/2	2 3/16	—	50	VHCL-4-14	75.80	60.90
		1	5/16	5/8	2 1/4	—	50	VHCL-4-516		
		1	3/8	5/8	2 3/8	—	50	VHCL-4-38		
		2	#8-10	1/2	2 1/16	5/8	50	VHCL-4-10/8B	169.40	135.25
		2	1/4	1/2	2 1/16	5/8	50	VHCL-4-14B		
#2 STR. CU	#6 — #2 STR. CU	1	1/4	5/8	2 3/8	—	50	VHCL-2-14		
		1	5/16		2 7/16	—	50	VHCL-2-516	145.60	117.35
		1	3/8		2 1/2	—	50	VHCL-2-38		
		2	1/4		3	5/8	50	VHCL-2-14B	199.10	159.00
		2	5/16		3 3/16	7/8	50	VHCL-2-516B		
#1 STR. CU	#6 — #1 STR. CU	1	1/4	1 1/16	2 5/16	—	10	VHCL-1-14		
		1	5/16		2 5/8	—	10	VHCL-1-516	164.90	124.80
		1	3/8		2 11/16	—	10	VHCL-1-38		
		2	5/16		3 1/2	7/8	10	VHCL-1-516B	221.40	176.80
1/0 STR. CU	#6 — 1/0 STR. CU	1	1/4	3/4	2 5/8	—	10	VHCL-1/0-14		
		1	5/16		2 11/16	—	10	VHCL-1/0-516	164.90	132.25
		1	3/8		2 13/16	—	10	VHCL-1/0-38		
		2	5/16		3 9/16	7/8	10	VHCL-1/0-516B	249.55	199.10
2/0 STR. CU	#4 — 2/0 STR. CU	1	5/16	1 3/16	2 7/8		10	VHCL-2/0-516		
		1	3/8		3		10	VHCL-2/0-38	193.15	154.50
		1	1/2		3 1/4		10	VHCL-2/0-12		
		2	5/16		3 3/4	7/8	10	VHCL-2/0-516B		
		2	3/8		3 7/8	1	10	VHCL-2/0-38B	260.00	208.00
		2	1/2		5 1/16	1 3/4	10	VHCL-2/0-12BN		
3/0 STR. CU	#2 — 3/0 STR. CU	1	3/8	1 5/16	3	—	10	VHCL-3/0-38	227.35	181.25
		1	1/2		3 1/4	—	10	VHCL-3/0-12		
		2	5/16		3 3/4	7/8	10	VHCL-3/0-516B		
		2	3/8		3 15/16	1	10	VHCL-3/0-38B	301.60	240.70
		2	1/2		5 1/8	1 3/4	10	VHCL-3/0-12BN		
4/0 STR. CU	#1 — 4/0 STR. CU	1	3/8	1	3 1/4	—	10	VHCL-4/0-38	260.00	208.00
		1	1/2		3 1/2	—	10	VHCL-4/0-12		
		2	5/16		4	7/8	10	VHCL-4/0-516B		
		2	3/8		4 1/8	1	10	VHCL-4/0-38B	350.65	282.25
		2	1/2		5 5/16	1 3/4	10	VHCL-4/0-12BN		
250 MCM CU	1/0 — 250 MCM CU	1	3/8	1 1/8	3 7/16	—	10	VHCL-250-38	304.60	245.15
		1	1/2		3 9/16	—	10	VHCL-250-12		
		2	3/8		4 1/4	1 1/16	10	VHCL-250-38B	395.20	316.50
		2	1/2		5 3/8	1 3/4	10	VHCL-250-12BN		
300 MCM CU	2/0 — 300 MCM CU	1	3/8	1 13/16	3 15/16	—	10	VHCL-300-38	350.65	282.50
		1	1/2		4	—	10	VHCL-300-12		
		2	3/8		4 1/16	1 1/16	10	VHCL-300-38B	490.30	393.75
		2	1/2		5 3/16	1 3/4	10	VHCL-300-12BN		
350 MCM CU	3/0 — 350 MCM CU	1	3/8	1 5/16	4	—	10	VHCL-350-38	364.00	292.75
		1	1/2		4 1/16	—	10	VHCL-350-12		
		2	3/8		4 3/4	1 1/16	10	VHCL-350-38B	509.60	408.60
		2	1/2		5 7/8	1 3/4	10	VHCL-350-12BN		
400 MCM CU	4/0 — 400 MCM CU	1	1/2	1 3/8	4 5/16	—	10	VHCL-400-12	432.40	346.20
		1	5/8		4 9/16	—	10	VHCL-400-58		
		2	3/8		5 1/16	1 1/16	10	VHCL-400-38B	594.30	475.40
		2	1/2		6 1/16	1 3/4	10	VHCL-400-12BN		
500 MCM CU	4/0 — 500 MCM CU	1	1/2	1 1/2	4 5/8	—	10	VHCL-500-12	527.50	421.95
		1	5/8		4 3/4	—	10	VHCL-500-58		
		2	3/8		5 1/4	1 1/16	10	VHCL-500-38B	735.50	586.90
		2	1/2		6 1/4	1 3/4	10	VHCL-500-12BN		
600 MCM CU	250 — 600 MCM CU	1	5/8	1 11/16	5 5/16	—	6	VHCL-600-58	965.80	772.65
		2	3/8		5 7/8	1 1/8	6	VHCL-600-38	1047.00	839.50
		2	1/2		6 13/16	1 3/4	6	VHCL-600-12BN		
750 MCM CU	500 — 750 MCM CU	1	5/8	1 15/16	6 1/16	—	6	VHCL-750-58	995.50	817.25
		2	3/8		6 5/16	1 1/8	6	VHCL-750-38B	1203.00	965.80
		2	1/2		7 1/4	1 3/4	6	VHCL-750-12BN		
800 MCM CU	500 — 800 MCM CU	1	5/8	2	6 3/16	—	6	VHCL-800-58	1017.00	854.35
		2	3/8		6 7/16	1 1/8	6	VHCL-800-38B	1701.00	1366.00
		2	1/2		7 1/8	1 3/4	6	VHCL-800-12BN		
1000 MCM CU	750 — 1000 MCM CU	1	5/8	2 3/16	6 11/16	—	6	VHCL-1000-58	2102.00	1679.00
		2	3/8		6 9/16	1 1/8	6	VHCL-1000-38B		
		2	1/2		7	1 1/4	6	VHCL-1000-12B	2265.00	1812.00
		2	1/2		7 9/16	1 3/4	6	VHCL-1000-12BN		
		4	3/8		6 3/4	1 1/8	6	VHCL-1000-38C	2377.00	1932.00
1500 MCM CU	1000 — 1500 MCM CU	1	3/8	2 11/16	7 1/16	—	3	VHCL-1500-34	3334.00	2673.00
		2	1/2		7 7/16	1 3/8	3	VHCL-1500-12B		
		2	1/2		7 13/16	1 3/4	3	VHCL-1500-12BN	3862.00	3119.00
		4	1/2		7 7/16	1 3/8	3	VHCL-1500-12C		
		4	1/2		7 13/16	1 3/4	3	VHCL-1500-12CN	4011.00	3268.00



Type VHCL
Versatile Compression Terminals

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SQD SLV_000950

COPPER COMPRESSION TERMINAL (SHORT BARREL)

FOR USE WITH VERSA-CRIMP® AND CONVENTIONAL COMPRESSION TOOLS
For Copper Stranded Conductor

TYPE VHCS

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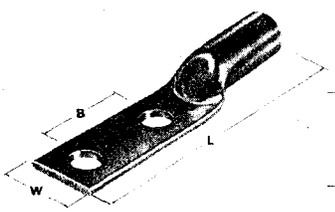

Type VHCS
Versatile Compression Terminals

Copper Conductor		No. Pad Holes	Pad Bolt Dia.	Dimensions W	Dimensions L	Dimensions B	Std. Pkg.	Catalog Number	Net Price/100 Std. Pkg.	Net Price/100 10 or More Std. Pkgs.
Conventional Wire Sizes	VERSA-CRIMP System Range									
#6 STR. CU	—	1	#8-10	7/16	1 5/8	....	50	VHCS-6-10/8		
		1	1/4	1/2	1 13/16	....	50	VHCS-6-14	$ 53.50	$ 43.15
		1	5/16	1/2	1 13/16	....	50	VHCS-6-516		
		2	#8-10	7/16	2 5/16	5/8	50	VHCS-6-10/8B	142.60	114.35
		2	1/4	1/2	2 5/16	5/8	50	VHCS-6-14B		
#4 STR. CU	—	1	#8-10	1/2	1 11/16	....	50	VHCS-4-10/8		
		1	1/4	1/2	1 7/8	....	50	VHCS-4-14	69.80	56.45
		1	5/16	5/8	1 15/16	....	50	VHCS-4-516		
		1	3/8	5/8	2 1/16	....	50	VHCS-4-38		
		2	#8-10	1/2	2 3/4	5/8	50	VHCS-4-10/8B	150.00	121.85
		2	1/4	1/2	2 3/4	5/8	50	VHCS-4-14B		
#2 STR. CU	#6 — #2 STR. CU	1	1/4	5/8	2	....	50	VHCS-2-14		
		1	5/16		2 1/16	....	50	VHCS-2-516	133.70	106.85
		1	3/8		2 1/8	....	50	VHCS-2-38		
		2	1/4		2 5/8	5/8	50	VHCS-2-14B	179.80	148.60
		2	5/16		2 15/16	7/8	50	VHCS-2-516B		
#1 STR. CU	#6 — #1 STR. CU	1	1/4	11/16	2 1/16	....	10	VHCS-1-14		
		1	5/16		2 1/8	....	10	VHCS-1-516	142.60	114.45
		1	3/8		2 3/16	....	10	VHCS-1-38		
		2	5/16		3	7/8	10	VHCS-1-516B	199.00	160.50
1/0 STR. CU	#6 — 1/0 STR. CU	1	1/4	3/4	2 1/16	....	10	VHCS-1/0-14		
		1	5/16		2 3/16	....	10	VHCS-1/0-516	150.00	121.85
		1	3/8		2 5/16	....	10	VHCS-1/0-38		
		2	5/16		3 1/16	7/8	10	VHCS-1/0-516B	224.25	181.25
2/0 STR. CU	#4 — 2/0 STR. CU	1	5/16	13/16	2 5/16	....	10	VHCS-2/0-516		
		1	3/8		2 7/16	....	10	VHCS-2/0-38	176.80	141.15
		1	1/2		2 11/16	....	10	VHCS-2/0-12		
		2	5/16		3 3/16	7/8	10	VHCS-2/0-516B		
		2	3/8		3 5/16	1	10	VHCS-2/0-38B	252.60	208.05
		2	1/2		4 1/2	1 3/4	10	VHCS-2/0-12BN		
3/0 STR. CU	#2 — 3/0 STR. CU	1	3/8	15/16	2 1/2		10	VHCS-3/0-38	208.05	166.40
		1	1/2		2 3/4		10	VHCS-3/0-12		
		2	5/16		3 1/4	7/8	10	VHCS-3/0-516B		
		2	3/8		3 7/16	1	10	VHCS-3/0-38B	304.60	245.20
		2	1/2		4 5/8	1 3/4	10	VHCS-3/0-12BN		
4/0 STR. CU	#1 — 4/0 STR. CU	1	3/8	1	2 5/8		10	VHCS-4/0-38	237.70	193.15
		1	1/2		2 7/8		10	VHCS-4/0-12		
		2	5/16		3 3/8	7/8	10	VHCS-4/0-516B		
		2	3/8		3 1/2	1	10	VHCS-4/0-38B	334.30	267.50
		2	1/2		4 11/16	1 3/4	10	VHCS-4/0-12BN		
250 MCM CU	1/0 — 250 MCM CU	1	3/8	1 1/8	2 7/8		10	VHCS-250-38	282.25	222.95
		1	1/2		3		10	VHCS-250-12		
		2	3/8		3 11/16	1 1/16	10	VHCS-250-38B	378.85	304.60
		2	1/2		4 13/16	1 3/4	10	VHCS-250-12BN		
300 MCM CU	2/0 — 300 MCM CU	1	3/8	1 3/16"	3		10	VHCS-300-38	319.45	252.60
		1	1/2		3 1/16		10	VHCS-300-12		
		2	3/8		3 3/4	1 1/16	10	VHCS-300-38B	468.05	378.85
		2	1/2		4 7/8	1 3/4	10	VHCS-300-12BN		
350 MCM CU	3/0 — 350 MCM CU	1	3/8	1 5/16	3 1/8		10	VHCS-350-38	341.70	274.85
		1	1/2		3 3/16		10	VHCS-350-12		
		2	3/8		3 7/8	1 1/16	10	VHCS-350-38B	482.90	393.75
		2	1/2		5	1 3/4	10	VHCS-350-12BN		
400 MCM CU	4/0 — 400 MCM CU	1	1/2	1 3/8	3 3/8		10	VHCS-400-12	393.75	319.45
		1	5/8		3 5/8		10	VHCS-400-58		
		2	3/8		4 1/8	1 1/16	10	VHCS-400-38B	572.00	468.00
		2	1/2		5 1/8	1 3/4	10	VHCS-400-12BN		
500 MCM CU	4/0 — 500 MCM CU	1	1/2	1 1/2	3 3/4		10	VHCS-500-12	482.90	393.75
		1	5/8		3 7/8		10	VHCS-500-58		
		2	3/8		4 3/8	1 1/16	10	VHCS-500-38B	697.70	564.65
		2	1/2		5 3/8	1 3/4	10	VHCS-500-12BN		
600 MCM CU	250 — 600 MCM CU	1	5/8	1 11/16	4 1/4		6	VHCS-600-58	891.50	713.25
		2	3/8		4 5/16	1 1/8	6	VHCS-600-38B	995.50	794.90
		2	1/2		5 1/2	1 3/4	6	VHCS-600-12BN		
750 MCM CU	500 — 750 MCM CU	1	5/8	1 15/16	4 13/16		6	VHCS-750-58	928.65	742.90
		2	3/8		5 1/16	1 1/8	6	VHCS-750-38B	1077.00	869.15
		2	1/2		5 7/8	1 3/4	6	VHCS-750-12BN		
800 MCM CU	500 — 800 MCM CU	1	5/8	2	4 7/8		6	VHCS-800-58	1514.00	1210.00
		2	3/8		5 1/8	1 1/8	6	VHCS-800-58B	1700.00	1366.00
		2	1/2		5 15/16	1 3/4	6	VHCS-800-12BN		
1000 MCM CU	750 — 1000 MCM CU	1	5/8	2 3/16	5 9/16		6	VHCS-1000-58	1930.00	1544.00
		2	3/8		5 5/8	1 1/8	6	VHCS-1000-38B		
		2	1/2		5 7/8	1 1/4	6	VHCS-1000-12B	2153.00	1722.00
		2	1/2		6 7/16	1 3/4	6	VHCS-1000-12BN		
		4	3/8		5 7/16	1 1/8	6	VHCS-1000-38C	2377.00	1930.00
1500 MCM CU	1000 — 1500 MCM CU	1	3/4	2 11/16	5 7/8		3	VHCS-1500-34	3343.00	2673.00
		2	1/2		6 1/4	1 3/8	3	VHCS-1500-12B		
		2	1/2		6 5/8	1 3/4	3	VHCS-1500-12BN	3862.00	3119.00
		4	1/2		6 1/4	1 3/8	3	VHCS-1500-12C		
		4	1/2		6 5/8	1 3/4	3	VHCS-1500-12CN	4011.00	3268.00

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SQD SLV_000951

COPPER COMPRESSION SPLICE (SHORT BARREL)

TYPE VHSS

FOR USE WITH VERSA-CRIMP® AND CONVENTIONAL COMPRESSION TOOLS
For Copper Stranded Conductor
TIN PLATED COPPER

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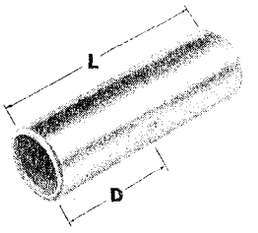
Copper Conductor		Dimensions				Net Price/100	
Conventional Wire Sizes*	VERSA-CRIMP System Range	D	L	Std. Pkg.	Catalog Number	Std. Pkg.	10 or More Std. Pkgs.
#6 STR. CU		13/16	1 3/4	50	VHSS-6	$ 118.90	$ 89.15
#4 STR. CU		13/16	1 3/4	50	VHSS-4	141.15	112.95
#2 STR. CU	#6 — #2 STR. CU	7/8	1 7/8	25	VHSS-2	170.90	136.70
#1 STR. CU	#6 — #1 STR. CU	7/8	1 7/8	10	VHSS-1	205.05	163.45
1/0 STR. CU	#6 — 1/0 STR. CU	7/8	1 7/8	10	VHSS-1/0	222.85	178.25
2/0 STR. CU	#4 — 2/0 STR. CU	15/16	2	10	VHSS-2/0	237.70	190.10
3/0 STR. CU	#2 — 3/0 STR. CU	1	2 1/8	10	VHSS-3/0	274.85	219.95
4/0 STR. CU	#1 — 4/0 STR. CU	1	2 1/8	10	VHSS-4/0	298.60	239.20
250 MCM CU	1/0 — 250 MCM CU	1 1/16	2 1/4	6	VHSS-250	338.75	270.50
300 MCM CU	2/0 — 300 MCM CU	1 1/16	2 1/4	6	VHSS-300	377.35	301.60
350 MCM CU	3/0 — 350 MCM CU	1 1/8	2 3/8	6	VHSS-350	387.85	310.50
400 MCM CU	4/0 — 400 MCM CU	1 1/16	2 1/2	6	VHSS-400	482.90	386.30
500 MCM CU	4/0 — 500 MCM CU	1 3/8	2 7/8	6	VHSS-500	592.80	473.95
600 MCM CU	250 — 600 MCM CU	1 3/8	2 7/8	6	VHSS-600	843.90	676.00
750 MCM CU	500 — 750 MCM CU	1 5/8	3 3/8	6	VHSS-750	983.00	785.00
800 MCM CU	500 — 800 MCM CU	1 5/8	3 3/8	6	VHSS-800	1099.00	879.00
1000 MCM CU	750 — 1000 MCM CU	1 7/8	3 7/8	6	VHSS-1000	1328.00	1063.00
1500 MCM CU	1000 — 1500 MCM CU	2	4 1/8	3	VHSS-1500	1552.00	1254.00



Type VHSS
Versatile Compression Sleeves

COPPER COMPRESSION SPLICE (LONG BARREL)

TYPE VHS

FOR USE WITH VERSA-CRIMP® AND CONVENTIONAL COMPRESSION TOOLS
For Copper Stranded Conductor
TIN PLATED COPPER

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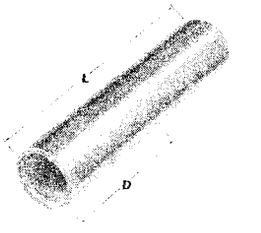
Copper Conductor		Dimensions				Net Price/100	
Conventional Wire Sizes*	VERSA-CRIMP System Range	D	L	Std. Pkg.	Catalog Number	Std. Pkg.	10 or More Std. Pkgs.
#6 STR. CU		1 1/8	2 3/8	50	VHS-6	$ 129.25	$ 104.00
#4 STR. CU		1 1/8	2 3/8	50	VHS-4	154.50	123.35
#2 STR. CU	#6 — #2 STR. CU	1 1/8	2 5/8	25	VHS-2	188.70	150.00
#1 STR. CU	#6 — #1 STR. CU	1 3/8	2 7/8	10	VHS-1	222.85	178.25
1/0 STR. CU	#6 — 1/0 STR. CU	1 3/8	2 7/8	10	VHS-1/0	245.20	196.15
2/0 STR. CU	#4 — 2/0 STR. CU	1 1/2	3 1/8	10	VHS-2/0	259.90	208.05
3/0 STR. CU	#2 — 3/0 STR. CU	1 1/2	3 1/8	10	VHS-3/0	303.15	242.20
4/0 STR. CU	#1 — 4/0 STR. CU	1 5/8	3 3/8	10	VHS-4/0	319.45	256.15
250 MCM CU	1/0 — 250 MCM CU	1 5/8	3 3/8	6	VHS-250	364.00	291.25
300 MCM CU	2/0 — 300 MCM CU	2	4 1/8	6	VHS-300	408.60	326.85
350 MCM CU	3/0 — 350 MCM CU	2	4 1/8	6	VHS-350	430.85	344.70
400 MCM CU	4/0 — 400 MCM CU	2 1/8	4 3/8	6	VHS-400	521.55	424.60
500 MCM CU	4/0 — 500 MCM CU	2 1/4	4 5/8	6	VHS-500	649.30	520.10
600 MCM CU	250 — 600 MCM CU	2 11/16	5 1/2	6	VHS-600	925.75	739.45
750 MCM CU	500 — 750 MCM CU	2 7/8	5 7/8	6	VHS-750	1075.00	860.00
800 MCM CU	500 — 800 MCM CU	2 15/16	6	6	VHS-800	1262.00	1039.00
1000 MCM CU	750 — 1000 MCM CU	3	6 1/8	6	VHS-1000	1457.00	1166.00
1500 MCM CU	1000 — 1500 MCM CU	3 3/16	6 1/2	3	VHS-1500	2227.00	1856.00



Type VHS
Versatile Compression Sleeves

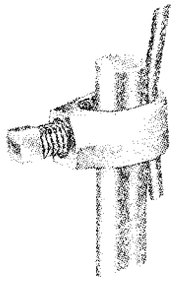
GROUND CLAMPS

TYPE GC

COPPER GROUND WIRE TO GROUND ROD
COPPER

UL LISTED

Ground Wire Range		Ground Rod	Standard Package	Catalog Number	Net Price Per 100	
Min.	Max.				Std. Pkg.	10 or More Std. Pkgs.
#8 SOL.	#4 STR.	1/2"	100	GC-4	$166.45	$129.45
#8 SOL.	#4 STR.	5/8"	100	GC-5	190.20	152.20
#8 SOL.	#4 STR.	3/4"	100	GC-6	231.30	185.00



Type GC
Ground Clamp to Rod

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SQD SLV_000952

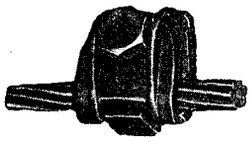


Figure 1
Type GC-141
Ground Clamps

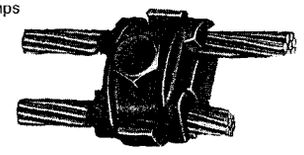


Figure 2
Type GC-143
Ground Clamps

BRONZE GROUND CLAMPS

Galvanized Steel Hardware

For One or Two Conductors to ¼" Flat Surface

TYPES GC-141/-143

Conductor Range		Fig. No.	Bolt Dia.	Std. Pkg.	Catalog Number	Net Price Each		
Min.	Max.					1-3	4-9	10-19
#6 SOL.	2/0 STR.	1	½	9	GC-141-G1	**$ 7.15**	**$ 5.95**	**$ 5.00**
#4 SOL.	300 MCM	1	½	6	GC-141A-G2	**15.05**	**12.55**	**10.60**
300 MCM	500 MCM	1	½	3	GC-141-G3	**19.00**	**15.85**	**13.40**
#4 SOL.	2/0 STR.	2	⅜	9	GC-143-G1	**10.05**	**8.35**	**7.05**
#4 SOL.	300 MCM	2	½	6	GC-143A-G2	**16.65**	**13.86**	**11.70**
300 MCM	500 MCM	2	½	3	GC-143-G3	**31.15**	**25.95**	**21.95**

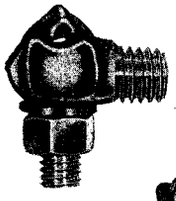


Figure 1

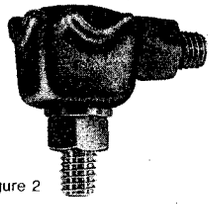


Figure 2

Types GTCL/GTCS
Transformer
Ground Clamps

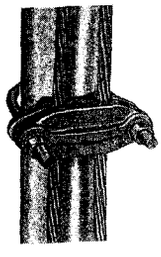
BRONZE GROUND CLAMPS

Bronze Hardware

For Copper Conductors to Transformer Tanks

TYPES GTCL/GTCS

Conductor Range		Fig. No.	Bolt Dia.	Std. Pkg.	Catalog Number	Net Price/100	
Min.	Max.					Std. Pkg.	10 or More Std. Pkgs.
#10 SOL.	#1 STR.	1	⅜	50	GTCL-23A	**$177.80**	**$161.75**
#10 SOL.	#1 STR.	2	⅜	50	GTCS-21	**236.20**	**214.75**
#8 SOL.	2/0 STR.	2	⅜	25	GTCS-34A	**414.35**	**367.00**
#6 SOL.	250 MCM	2	½	12	GTCS-41	**576.20**	**495.65**



Type GC-110
Ground Clamps

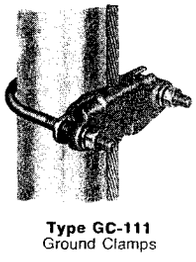
BRONZE GROUND CLAMPS

Bronze Hardware

For One, Two or Three Copper Conductors to Rod, Tube or Pipe

TYPES GC-110/-111

Conductor Range		Fig. No.	Ground		Bolt Dia.	Std. Pkg.	Catalog Number	Net Price Each		
Min.	Max.		Rod Tube	Pipe IPS				1-3	4-9	10-19
#4 SOL.	2/0 STR.	1	¾	½	⅜	6	GC-110-21D	**$26.15**	**$21.80**	**$18.40**
2/0 STR.	250 MCM	1	¾	½	⅜	3	GC-110-22D	**30.10**	**25.10**	**21.20**
#4 SOL.	2/0 STR.	1	¾	½	⅜	3	GC-110-31D	**30.10**	**25.10**	**21.20**
2/0 STR.	250 MCM	1	1	¾	⅜	3	GC-110-32D	**34.85**	**29.05**	**24.55**
#4 SOL.	2/0 STR.	1	1¼	1	⅜	3	GC-110-41C	**35.65**	**29.70**	**25.10**
2/0 STR.	250 MCM	1	1¼	1	⅜	3	GC-110-42D	**43.55**	**36.30**	**30.70**
#4 SOL.	2/0 STR.	1	1½	1¼	⅜	2	GC-110-51C	**37.20**	**31.00**	**26.25**
2/0 STR.	250 MCM	1	1½	1¼	⅜	2	GC-110-52D	**46.75**	**38.95**	**32.90**
250 MCM	500 MCM	1	1½	1¼	⅜	1	GC-110-53D	**73.65**	**61.40**	**51.90**
#4 SOL.	2/0 STR.	1	2	1½	⅜	2	GC-110-61C	**39.60**	**33.00**	**27.90**
2/0 STR.	250 MCM	1	2	1½	⅜	1	GC-110-62C	**49.90**	**41.60**	**35.15**
250 MCM	500 MCM	1	2	1½	½	1	GC-110-63D	**80.80**	**67.30**	**56.90**
#4 SOL.	2/0 STR.	1	—	2	⅜	2	GC-110-81C	**44.35**	**36.95**	**31.25**
2/0 STR.	250 MCM	1	—	2	⅜	1	GC-110-82C	**58.10**	**48.40**	**40.90**
250 MCM	500 MCM	1	—	2	½	1	GC-110-83D	**89.50**	**74.60**	**63.05**
#8 SOL.	#4 STR.	2	½-⅝	¼-⅜	⅜	6	GC-111-2A	**13.45**	**11.20**	**9.50**
#4 SOL.	2/0 STR.	2	½-⅝	¼-⅜	⅜	6	GC-111-2B	**14.25**	**11.90**	**10.05**
2/0 SOL.	250 MCM	2	½-⅝	¼-⅜	⅜	6	GC-111-2C3	**15.05**	**12.55**	**10.60**
250 MCM	500 MCM	2	½-⅝	¼-⅜	½	3	GC-111-2D	**22.95**	**19.15**	**16.20**
#8 SOL.	#4 STR.	2	⅝-1	⅜-¾	⅜	6	GC-111-3A	**19.00**	**15.85**	**13.40**
#4 SOL.	2/0 STR.	2	⅝-1	⅜-¾	⅜	6	GC-111-3B	**19.80**	**16.50**	**13.95**
2/0 SOL.	250 MCM	2	⅝-1	⅜-¾	⅜	3	GC-111-3C3	**21.40**	**17.80**	**15.05**
250 MCM	500 MCM	2	⅝-1	⅜-¾	½	3	GC-111-3D	**31.70**	**26.40**	**22.30**
#8 SOL.	#4 STR.	2	1-1¼	¾-1	⅜	6	GC-111-4A	**19.80**	**16.50**	**13.95**
#4 SOL.	2/0 STR.	2	1-1¼	¾-1	⅜	6	GC-111-4B	**20.60**	**17.15**	**14.50**
2/0 SOL.	250 MCM	2	1-1¼	¾-1	½	3	GC-111-4C	**21.40**	**17.80**	**15.05**
250 MCM	500 MCM	2	1-1¼	¾-1	½	3	GC-111-4D	**33.25**	**27.70**	**23.45**
#8 SOL.	#4 STR.	2	1¾	1¼	⅜	6	GC-111-5A	**19.80**	**16.50**	**13.95**
#4 SOL.	2/0 STR.	2	1¾	1¼	⅜	6	GC-111-5B	**21.40**	**17.80**	**15.05**
2/0 SOL.	250 MCM	2	1¾	1¼	½	3	GC-111-5C	**22.20**	**18.50**	**15.60**
250 MCM	500 MCM	2	1¾	1¼	½	3	GC-111-5D	**38.00**	**31.70**	**26.80**
#8 SOL.	#4 STR.	2	2	1½	⅜	6	GC-111-6A	**21.40**	**17.80**	**15.05**
#4 SOL.	2/0 STR.	2	2	1½	⅜	6	GC-111-6B	**22.20**	**18.50**	**15.60**
2/0 SOL.	250 MCM	2	2	1½	½	3	GC-111-6C	**23.75**	**19.80**	**16.75**
250 MCM	500 MCM	2	2	1½	½	3	GC-111-6D	**38.00**	**31.70**	**26.80**



Type GC-111
Ground Clamps

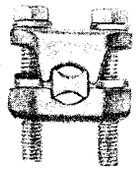
SQD SLV_000953

TYPE KA-GP — ALUMINUM PARALLEL CONNECTOR

Tin Plated Body — Zinc Chromated Steel Hardware
For AL to AL or AL to CU Conductors — **UL LISTED**

Conductor Range		Bolt Dia.	Std. Pkg.	Catalog Number	Net Price Each	
Main	Tap				Std. Pkg.	100 & Over
#6 — 1/0 STR.	#6 — 1/0 STR.	3/8	25	KA-1-GP	**$ 6.80**	**$ 6.20**
#1 STR. — 400 MCM	#6 — 1/0 STR.	3/8	25	KA-2-GP	**9.10**	**8.60**
1/0 STR. — 400 MCM	#2 STR. — 400 MCM	1/2	12	KA-4-GP	**10.80**	**10.20**
300-1000 MCM	#6 — 1/0 STR.	1/2	12	KA-5-GP	**12.65**	**12.00**
300-1000 MCM	1/0 STR. — 400 MCM	1/2	6	KA-6-GP	**18.00**	**16.75**
300-1000 MCM	300-1000 MCM	5/8	6	KA-7-GP	**25.30**	**23.90**

Note: For sealant filled (—XB) contact factory for price.

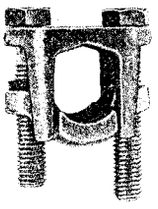


Type KA-GP
Aluminum Parallel Connectors

TYPE K — BRONZE PARALLEL CONNECTOR

Bronze Hardware — Without Spacer
For Copper Conductors — **UL LISTED**

Conductor Range		Bolt Dia.	Std. Pkg.	Catalog Number	Net Price Each	
Main	Tap				Std. Pkg.	10 or More Std. Pkgs.
#4 — 1/0 STR.	#8 SOL. — 1/0 STR.	5/16	25	K-1	**$ 3.95**	**$ 3.60**
#3 — 2/0 STR.	#8 SOL. — 2/0 STR.	3/8	25	K-2	**4.20**	**3.75**
#1 — 4/0 STR.	#8 SOL. — 4/0 STR.	3/8	25	K-3	**6.00**	**5.40**
2/0 STR. — 350 MCM	#8 SOL. — 350 MCM	1/2	10	K-4	**11.05**	**10.50**
3/0 STR. — 500 MCM	#8 SOL. — 500 MCM	1/2	10	K-5	**13.00**	**12.20**
350-800 MCM	#8 SOL. — 800 MCM	1/2	10	K-6	**17.65**	**16.65**
450-1000 MCM	#8 SOL. — 1000 MCM	5/8	5	K-7	**24.90**	**23.55**

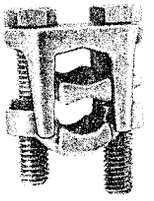


Type K
Bronze Parallel Connectors

TYPE KR — BRONZE PARALLEL CONNECTOR

Bronze Hardware — With Spacer
For Copper Conductors — **UL LISTED**

Conductor Range		Bolt Dia.	Std. Pkg.	Catalog Number	Net Price Each	
Main	Tap				Std. Pkg.	10 or More Std. Pkgs.
#4 — 1/0 STR.	#8 SOL. — 1/0 STR.	5/16	25	KR-1	**$ 4.20**	**$ 3.75**
#3 — 2/0 STR.	#6 SOL. — 2/0 STR.	3/8	25	KR-2	**4.45**	**4.00**
1/0 — 4/0 STR.	#6 SOL. — 4/0 STR.	3/8	25	KR-3	**6.50**	**6.00**
2/0 STR. — 350 MCM	#4 STR. — 350 MCM	1/2	10	KR-4	**12.50**	**11.70**
3/0 STR. — 500 MCM	#4 STR. — 500 MCM	1/2	10	KR-5	**14.45**	**13.65**
350-800 MCM	#2 STR. — 800 MCM	1/2	10	KR-6	**19.65**	**18.55**
450-1000 MCM	1/0 STR. — 1000 MCM	5/8	5	KR-7	**27.80**	**26.30**

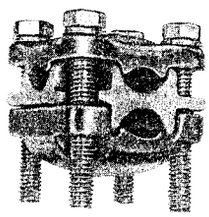


Type KR
Bronze Parallel Connectors

TYPE XP — BRONZE CROSS CONNECTOR

Bronze Hardware
For Cross, Tee, Parallel or End to End Copper Conductor Connections — **UL LISTED**

Conductor Range		Bolt Dia.	Std. Pkg.	Multi Pkg.	Catalog Number	Net Price Each	
Main	Tap					Std. Pkg. to 99	100 & Over
#6 — #2 STR.	#6 — #2 STR.	5/16	12	48	XP-018018	**$10.65**	**$ 8.60**
#1 — 4/0 STR.	#6 — #2 STR.	5/16	12	48	XP-024018	**12.20**	**9.80**
#1 — 4/0 STR.	#1 — 4/0 STR.	3/8	9	36	XP-024024	**15.45**	**12.50**
4/0 — 500 MCM	#6 — #2 STR.	5/16	6	24	XP-050018	**21.65**	**17.55**
4/0 — 500 MCM	#1 — 4/0 STR.	3/8	6	24	XP-050024	**23.50**	**19.00**
4/0 — 500 MCM	4/0 — 500 MCM	3/8	6	24	XP-050050	**32.05**	**25.95**
500-1000 MCM	#6 — #2 STR.	5/16	3	12	XP-100018	**39.55**	**32.00**
500-1000 MCM	#1 — 4/0 STR.	3/8	3	12	XP-100024	**41.80**	**33.00**
500-1000 MCM	4/0 — 500 MCM	3/8	3	12	XP-100050	**48.60**	**42.10**
500-1000 MCM	500-1000 MCM	3/8	3	12	XP-100100	**61.10**	**48.85**



Type XP
Bronze Cross Connectors

SQD SLV_000954

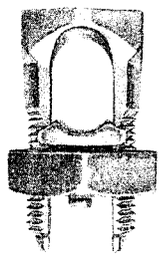
BRONZE PARALLEL CONNECTOR

Bronze Hardware — Without Spacer

For Copper Conductors

TYPE C

UL LISTED



Type C
Bronze Parallel Connectors

Conductor Range		Bolt Dia.	Std. Pkg.	Catalog Number	Net Price/100	
Main	Tap				Std. Pkg.	10 or More Std. Pkgs.
#12 SOL. — #10 STR.	#14 SOL. — #10 STR.	7/16	100	C-10	**$ 89.80**	**$ 78.10**
#10 SOL. — #8 STR.	#14 SOL. — #8 STR.	1/2	100	C-8	**100.50**	**87.40**
#10 SOL. — #8 STR.	#14 SOL. — #8 STR.	1/2	100	C-8L	**102.70**	**91.40**
#10 — #6 SOL.	#12 — #6 SOL.	21/32	100	C-6	**109.15**	**94.90**
#10 — #6 SOL.	#12 — #6 SOL.	21/32	100	C-6L	**116.40**	**101.25**
#8 — #4 SOL.	#12 — #4 SOL.	23/32	100	C-4	**132.85**	**115.25**
#8 — #4 SOL.	#12 — #4 SOL.	23/32	100	C-4L	**141.80**	**123.30**
#8 SOL. — #4 STR.	#12 SOL. — #4 STR.	23/32	100	C-4S	**132.85**	**115.50**
#8 SOL. — #4 STR.	#12 SOL. — #4 STR.	23/32	100	C-4S-L	**141.80**	**123.30**
#6 — #2 SOL.	#10 — #2 SOL.	25/32	100	C-2	**191.20**	**166.20**
#6 — #2 SOL.	#10 — #2 SOL.	25/32	100	C-2L	**198.30**	**172.45**
#4 SOL. — #2 STR.	#10 SOL. — #2 STR.	7/8	100	C-1	**213.10**	**185.40**
#4 SOL. — #1 STR.	#10 SOL. — #1 STR.	7/8	100	C-1L	**224.55**	**190.10**
#2 SOL. — 1/0 STR.	#10 SOL. — 1/0 STR.	1	50	C-1/0	**274.60**	**238.50**
#2 SOL. — 2/0 STR.	#10 SOL. — 2/0 STR.	1 3/16	25	C-2/0	**443.70**	**385.80**
1/0 — 3/0 STR.	#10 SOL. — 3/0 STR.	1 5/16	25	C-3/0	**605.10**	**526.25**
2/0 — 250 MCM	#8 SOL. — 250 MCM	1 5/16	25	C-4/0	**708.30**	**615.00**
4/0 — 350 MCM	#8 SOL. — 350 MCM	1 21/32	1	C-350	**1307.00**	**1136.50**
250-500 MCM	#8 SOL. — 500 MCM	1 3/4	1	C-500	**1697.10**	**1475.75**
350-750 MCM	#8 SOL. — 750 MCM	2 1/4	1	C-750	**2860.10**	**2486.95**
500-1000 MCM	#8 SOL. — 1000 MCM	2 17/32	1	C-1000	**3907.10**	**3400.00**

Suffix "L" designates extra length.

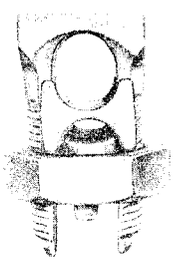
BRONZE PARALLEL CONNECTOR

Tin Plated — With Spacer

For Copper Conductors

TYPE CPS

UL LISTED



Type CPS
Bronze Parallel Connectors

Conductor Range		Bolt Dia.	Std. Pkg.	Catalog Number	Net Price/100	
Main	Tap				Std. Pkg.	10 or More Std. Pkgs.
#10 — #6 SOL.	#12 — #6 SOL.	21/32	100	CPS-6	**$ 137.85**	**$ 119.90**
#8 — #4 SOL.	#12 — #4 SOL.	23/32	100	CPS-4	**167.20**	**145.35**
#6 — #2 SOL.	#12 — #2 SOL.	25/32	100	CPS-2	**233.80**	**203.00**
#4 SOL. — #2 STR.	#10 SOL. — #2 STR.	7/8	100	CPS-1	**252.15**	**213.30**
#2 SOL. — 1/0 STR.	#8 SOL. — 1/0 STR.	1	50	CPS-1/0	**319.15**	**278.10**
#2 SOL. — 2/0 STR.	#6 SOL. — 2/0 STR.	1 3/16	25	CPS-2/0	**533.25**	**449.30**
2/0 SOL. — 4/0 STR.	#4 SOL. — 4/0 STR.	1 5/16	25	CPS-4/0	**876.65**	**762.20**
4/0 SOL. — 350 MCM	#2 SOL. — 350 MCM	1 21/32	1	CPS-350	**1606.45**	**1397.00**

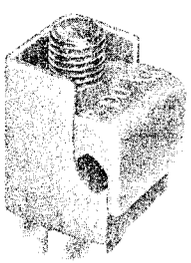
BRONZE PARALLEL CONNECTOR

Bronze Hardware — Vise Type

For Copper Conductors

TYPE DG

UL LISTED



Type DG
Vise Type Parallel Connectors

Conductor Range		Bolt Dia.	Std. Pkg.	Catalog Number	Net Price/100	
Main	Tap				Std. Pkg.	10 or More Std. Pkgs.
#10 SOL. — #8 STR.	#14 SOL. — #8 STR.	9/16	100	DG-8	**$162.25**	**$144.15**
#8 — #4 SOL.	#12 — #4 SOL.	9/16	100	DG-6	**181.95**	**160.40**
#8 SOL. — #4 STR.	#12 SOL. — #4 STR.	11/16	100	DG-4	**208.85**	**180.70**
#6 — #2 SOL.	#10 — #2 SOL.	3/4	100	DG-2	**219.55**	**195.85**
#4 SOL. — #1 STR.	#10 SOL. — #1 STR.	3/4	100	DG-1	**240.80**	**216.90**
#2 SOL. — 1/0 STR.	#10 SOL. — 1/0 STR.	25/32	50	DG-1/0	**335.90**	**289.30**
#2 SOL. — 2/0 STR.	#10 SOL. — 2/0 STR.	29/32	25	DG-2/0	**382.45**	**361.80**
1/0 — 4/0 STR.	#10 SOL. — 4/0 STR.	29/32	25	DG-4/0	**581.35**	**519.50**

SQD SLV_000955

TYPE DA/DU

ALUMINUM SET SCREW TERMINAL

Tin Plated Aluminum
For Aluminum or Copper Conductors

UL LISTED

Conductor Range AL or CU	Fig. No.	Pad Bolt Size	Dimensions L	D	K	W	T	Std. Pkg.	Cat. No.	Net Price/100 Std. Pkg.	10 or More Std. Pkgs.
#14 SOL. — #6 STR.	1	#10	1 1/16	1 1/16	1/4	1/2	.093	100	DA-6	$ 55.15	$ 37.40
#14 SOL. — #2 STR.	1	#10	1 5/32	1 1/16	5/16	1/2	.100	100	DA-2	70.45	47.20
#14 SOL. — 1/0 STR.	1	#10	1 15/32	2 7/32	7/16	5/8	.187	50	DA-0	97.40	65.60
#14 SOL. — 2/0 STR.	1	#10	1 15/32	2 7/32	7/16	5/8	.187	50	DA-20	100.45	67.00
#6 SOL. — 250 MCM	2	1/4	2	1	15/32	1	.250	25	DA-250	239.90	160.10
#6 SOL. — 300 MCM	2	1/4	2	1	15/32	1	.250	25	DA-300	282.05	188.30
#6 SOL. — 350 MCM	2	3/8	2 1/4	1 1/8	1/2	1 1/8	.250	25	DA-350	311.80	208.00
#4 SOL. — 500 MCM	2	3/8	2 13/16	1 19/32	7/8	1 1/2	.312	18	DA-500	592.40	395.50
#2 SOL. — 600 MCM	2	3/8	3 1/8	1 3/4	25/32	1 1/2	.438	12	DA-600	650.25	433.60
300 — 800 MCM	2	1/2	3 1/2	2	7/8	1 1/2	.438	3	DA-800	701.00	467.40
500 — 1000 MCM	2	1/2	3 1/2	2	7/8	1 1/2	.438	3	DA-1000	909.65	607.10
One #4 STR. — 600 MCM or Two 1/0 STR. — 250 MCM	3	3/8	2 13/16	1 1/2	5/8	1 3/8	.312	10	DA-600-S	710.90	474.40
Two #6 SOL. — 250 MCM	4	5/16	2 9/16	1 9/16	7/8	1 5/8	5/16	10	DU-250	671.75	385.70
Two #6 SOL. — 350 MCM	4	1/2	2 7/8	1 3/4	7/8	1 15/16	1/4	5	DU-350	856.70	533.75
Two #2 SOL. — 600 MCM	4	1/2	3 3/16	1 13/16	5/8	2 13/32	7/16	4	DU-600-S	1325.75	787.60
Two 300 — 800 MCM	4	1/2	3 1/2	2 7/8	7/8	2 7/8	7/16	3	DU-800	1580.90	987.80



Figure 1

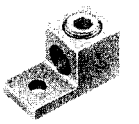


Figure 2

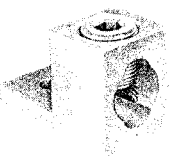


Figure 3

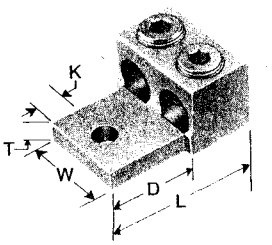


Figure 4
Type DA/DU Terminals

TYPE ZCA

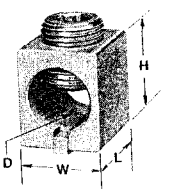
ALUMINUM RECTANGULAR TERMINAL

Tin Plated Aluminum For Aluminum or Copper Conductors

UL RECOGNIZED COMPONENT

Conductor Range AL or CU	Bolt Size	Dimensions D	W	L	H	Std. Pkg.	Cat. No.	Net Price/100 Std. Pkg.	5 or More Std. Pkgs.
#12 — #2 STR. AL or #14 — #2 STR. CU	10-32	.229†	15/32	15/32	9/16	100	ZCA-60	$27.20	$25.05
#14 — 1/0 STR. AL/CU	10-32	.229	.570	.625	.670	50	ZCA-110	38.70	35.35

† Square Boss in bottom (.229) tapped for #10-32 Screw.



Type ZCA Terminals

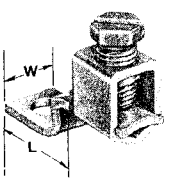
TYPE ZCF

COPPER SET SCREW TERMINAL

With Pressure Bar and V-Bottom Offset Tang
For Copper Conductors

UL LISTED

Conductor Range	Bolt Size	Dimensions W	L	Std. Pkg.	Cat. No.	Net Price/100 Std. Pkg.	5 or More Std. Pkgs.
#14 SOL. — #6 STR.	#10	.375	.468	100	ZCF-35	$ 50.60	$ 38.35
#14 SOL. — #4 STR.	1/4	.500	.531	100	ZCF-70	79.50	53.20
#2 SOL. — 1/0 STR.	1/4	.620	.812	50	ZCF-125	155.70	104.30
#4 SOL. — 3/0 STR.	3/8	.75	.94	25	ZCF-175	284.60	189.90
#2 SOL. — 4/0 STR.	5/16	1.00	1.156	25	ZCF-225	366.90	244.60



Type ZCF Terminals

TYPE ZFT

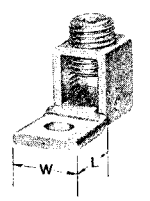
COPPER SET SCREW TERMINAL

For Copper Conductors

UL LISTED

Conductor Range	Bolt Size	Dimensions W	L	Std. Pkg.	Cat. No.	Net Price/100 Std. Pkg.	5 or More Std. Pkgs.
#14 SOL. — #6 STR.	#10	.375	.500	100	ZFT-65**	$ 58.30	$38.65
#14 SOL. — #4 STR.	1/4	.500	.687	100	ZFT-70**	79.65	53.20
#6 SOL. — 1/0 STR.	1/4	.625	.531	50	ZFT-90	137.20	91.60

** Slot-head setscrews are used.



Type ZFT Terminals

SQD SLV_000956

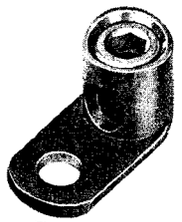


Figure 1



Figure 2

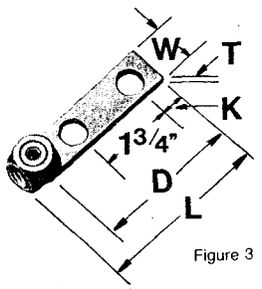


Figure 3

Type LU Terminals

BRONZE TERMINAL

For Single Copper Conductor to Flat

UL LISTED — **Plated Steel Hardware**

TYPE LU

Conductor Range	Fig. No.	Pad Bolt Size	Dimensions L	D	K	W	T	Std. Pkg.	Cat. No.	Net Price/100 Std. Pkg.	10 or More Std. Pkgs.
#14 SOL. — #8 STR.	1	#10	1 3/16	1/2	3/16	1 3/32	.085	100	LU-08	$ 74.90	$ 47.55
#14 SOL. — #4 STR.	1	#12	1 5/32	1 1/16	1/4	9/16	.100	100	LU-04	98.85	67.50
#6 SOL. — 1/0 STR.	1	5/16	1 1/2	7/8	5/16	3/4	7/64	50	LU-1/0	204.95	128.10
#4 SOL. — 1/0 STR.	3	5/16	2 7/8	2 3/8	7/16	3/4	1/4	50	LU-1/0-2	289.10	215.45
1/0 STR. — 4/0 STR.	2	3/8	1 15/16	1 3/8	1/2	15/16	3/16	25	LU-4/0	459.30	287.05
1/0 STR. — 4/0 STR.	2	1/2	2 1/16	1 1/2	9/16	1	1/4	25	LU-4/0-N	459.30	287.05
1/0 STR. — 4/0 STR.	3	3/8	3	2 1/2	7/16	15/16	1/4	25	LU-4/0-2	505.20	430.85
1/0 STR. — 4/0 STR.	3	1/2	4 1/16	3 5/16	5/8	15/16	1/4	25	LU-4/0-2N	505.20	430.85
2/0 STR. — 300 MCM	2	3/8	2 3/16	1 1/2	1/2	1 1/16	1/4	25	LU-300	465.00	293.25
2/0 STR. — 300 MCM	2	1/2	2 5/16	1 5/8	9/16	1 1/16	1/4	25	LU-300-N	465.00	293.25
2/0 STR. — 300 MCM	3	3/8	3 3/16	2 5/16	7/16	1 1/16	1/4	25	LU-300-2	511.95	443.90
2/0 STR. — 300 MCM	3	1/2	4 1/8	3 1/2	5/8	1 1/16	1/4	25	LU-300-2N	511.95	443.90
4/0 STR. — 500 MCM	2	3/8	2 5/8	1 5/8	1/2	1 3/8	1/4	18	LU-500	1062.00	663.70
4/0 STR. — 500 MCM	2	1/2	2 5/8	1 5/8	9/16	1 3/8	1/4	18	LU-500-N	1062.00	663.70
4/0 STR. — 500 MCM	3	3/8	3 3/8	2 1/2	7/16	1 3/8	1/4	18	LU-500-2	1285.05	802.70
4/0 STR. — 500 MCM	3	1/2	4 1/2	3 5/8	5/8	1 3/8	1/4	18	LU-500-2N	1285.05	802.70
500 — 1000 MCM	2	1/2	3 5/8	2 1/4	3/4	2	3/8	6	LU-1000*	3247.95	2032.35
500 — 1000 MCM	3	1/2	5	3 11/16	9/16	2	3/8	6	LU-1000-2*	3585.60	2366.60
500 — 1000 MCM	3	1/2	5 5/16	3 7/8	5/8	2	3/8	6	LU-1000-2N*	3585.60	2366.60

* Not UL Listed.

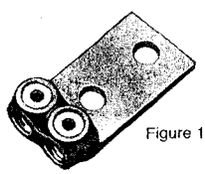


Figure 1

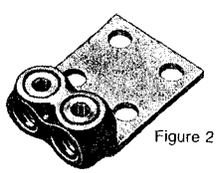


Figure 2

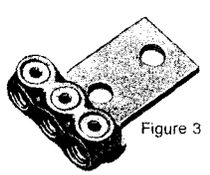


Figure 3

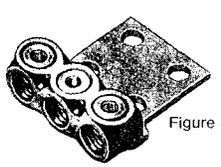


Figure 4

Type LU2/LU3 Terminals

BRONZE TERMINAL

For Double and Triple Copper Conductors to Flat

UL LISTED — **Plated Steel Hardware**

TYPE LU2/LU3

Conductor Range	Fig. No.	Pad Bolt Size	Dimensions L	D	K	W	T	Std. Pkg.	Cat. No.	Net Price/Each Std. Pkg.	10 or More Std. Pkgs.
#4 SOL. — 1/0 STR.	1	1/2	4	3 9/16	5/8	1 1/2	1/4	12	LU2-1/0-2N	$ 12.15	$ 9.25
#4 SOL. — 1/0 STR.	3	1/2	4	3 9/16	5/8	2	1/4	12	LU3-1/0-2N	15.05	12.15
2/0 STR. — 300 MCM	1	1/2	4 1/8	3 1/2	5/8	2	1/4	12	LU2-300-2N	22.25	14.00
2/0 STR. — 300 MCM	3	1/2	4 1/8	3 1/2	5/8	2	1/4	12	LU3-300-2N	27.20	22.25
4/0 STR. — 500 MCM	1	1/2	4 1/2	3 7/8	5/8	2 1/2	1/2	12	LU2-500-2N	35.85	27.20
4/0 STR. — 500 MCM	3	1/2	4 1/2	3 5/8	5/8	2 1/2	1/4	12	LU3-500-2N	47.60	39.40
4/0 STR. — 500 MCM	2	1/2	4 1/2	3 3/4	5/8	3	3/8	12	LU2-500-4N	50.15	40.00
4/0 STR. — 500 MCM	4	1/2	4 1/2	3 5/8	5/8	3	1/4	12	LU3-500-4N	52.90	43.75
500 — 1000 MCM	2	1/2	5 3/16	3 7/8	5/8	3 1/4	3/8	4	LU2-1000-4N*	68.00	55.65
500 — 1000 MCM	4	1/2	5 3/16	3 7/8	5/8	3 1/4	3/8	4	LU3-1000-4N*	85.85	61.65

* Not UL Listed.

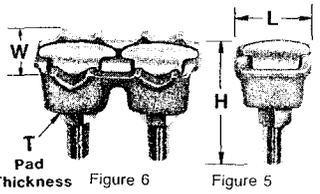


Figure 6 Figure 5

Type TLD/TLS Tap Lugs

BRONZE TERMINAL TAP LUG

For Single and Double Copper Conductors to Flat

UL LISTED — **Bronze Hardware**

TYPE TLS/TLD

Conductor Range	Fig. No.	Bolt Size	Dimensions L	H	W	T	Std. Pkg.	Catalog Number	Net Price/Each Std. Pkg. to 99	100 & Over
For Single Copper Connector										
#10 SOL. — #1 STR.	5	3/8	1 1/8	1 15/16	7/8	1/4	25	TLS-22	$ 3.30	$ 2.55
#8 SOL. — 2/0 STR.	5	1/2	1 1/2	2 3/8	1 1/16	1/4	25	TLS-32	4.25	3.55
#6 SOL. — 250 MCM	5	1/2	1 5/8	2 5/8	1 5/16	1/4	20	TLS-42	5.00	4.20
#2 SOL. — 350 MCM	5	1/2	1 11/16	2 3/4	1 5/16	1/4	20	TLS-52	5.90	4.35
1/0 SOL. — 500 MCM	5	1/2	1 3/4	3 1/32	1 11/16	1/4	10	TLS-62	8.20	6.00
350 — 750 MCM	5	1/2	2 1/4	3 3/4	1 7/8	3/4	10	TLS-72-L	11.55	9.70
2/0 — 1000 MCM	5	1/2	2 1/4	4 1/16	2 1/16	3/4	5	TLS-86-L	13.40	11.40
For Single or Double Copper Conductors										
#10 SOL. — #1 STR.	6	3/8	2 3/8	1 15/16	1 1/8	1/4	12	TLD-22**	4.90	4.10
#8 SOL. — 2/0 STR.	6	1/2	3 1/4	2 3/8	1 1/2	1/4	12	TLD-32*	7.05	5.90
#6 SOL. — 250 MCM	6	1/2	3 3/8	2 5/8	1 5/8	1/4	6	TLD-42*	9.15	7.65
#2 SOL. — 350 MCM	6	1/2	3 1/2	2 3/4	1 3/4	1/4	6	TLD-52*	11.30	9.50
1/0 SOL. — 500 MCM	6	1/2	4	3 1/32	1 11/16	1/4	6	TLD-62*	14.15	11.85
350 — 750 MCM	7	1/2	4	3 3/4	1 7/8	3/4	6	TLD-72-L	18.50	15.60
2/0 SOL. — 1000 MCM	7	1/2	3 3/4	4 1/16	1 3/4	3/4	3	TLDN-86-L	26.95	19.30

* Can be mounted side by side on NEMA 1 3/4" hole centers drilled for 1/2" bolts.
** Except TLD-22 which has 1 1/4" center hole spacing.
Figure 7 is same as figure 6, except the two halves of lug are at 90°

SQD SLV_000957

SQUARE D CONNECTORS
INDUSTRIAL AND CONTRACTOR COMPONENTS

TYPE VCEL

VERSA-CRIMP AND CONVENTIONAL COMPRESSION TOOL AND DIE INFORMATION

Catalog Number	VERSA-CRIMP Tooling: AL or CU Wire Range	VC6	VC6-FT	VC8C	Conventional AL or CU Wire Size	Burndy Tooling: Y35 & Y39 Die	Y35 & Y39 Crimps	MD-6 Die	MD-6 Crimps	Kearney Tooling: WH1 & WH2 Die	WH1 & WH2 Crimps	Thomas & Betts Tooling: TBM5 & TBM8 Die	TBM5 & TBM8 Crimps	HYD Die	HYD Crimps
		No. of Crimps													
VCEL-021-14S1	#8 — 1/0 STR. AL/CU	1	1	—	1/0 STR. AL/CU	U25ART	1	W241	2 O/L	—	—	Tan	2	45	1
VCEL-022-516H1	#1 — 2/0 STR. AL/CU	2	2	—	2/0 STR. AL/CU	U30ART	1	—	—	29/32 or 1	1	—	—	76H or 83H	2
VCEL-024-516H1	2/0 — 4/0 STR. AL/CU	2	2	—	4/0 STR. AL/CU	U30ART	1	—	—		1	—	—		2
VCEL-030-516H1	#4 — 300 MCM AL/CU	2	2	—	300 MCM AL/CU	U30ART	1	—	—		1	—	—		2
VCEL-050-12H1	2/0 — 500 MCM AL/CU	2	2	—	500 MCM AL/CU	U32ART	2	—	—	1⅛-1 or 1⅛-2	2	—	—	94H	3
											2				
VCEL-060-12H1	400 — 600 MCM AL — 500 MCM CU	—	2	2AL	600 MCM AL	UM or U34ART	2	—	—	1¼	2	—	—	106H	3
VCEL-060-12H2					600 MCM AL		2	—	—	1¼ *	2	—	—	106H	3
VCEL-075-12H1	500 — 750 MCM AL — 500 MCM CU	—	2	2AL	750 MCM AL		2	—	—		2	—	—		3
VCEL-075-12H2					750 MCM AL		2	—	—		2	—	—		3

AL — Aluminum nibs for VC8C. *WH-2 tool only. Note: Overlap crimps where necessary.

TYPE CEP

VERSA-CRIMP AND CONVENTIONAL COMPRESSION TOOL AND DIE INFORMATION

Catalog Number	VERSA-CRIMP Tooling: Aluminum Wire Range	VC6	VC6-FT	VC8C	Conventional Aluminum Wire Size	Burndy Tooling: Y35 & Y39 Die	Y35 & Y39 Crimps	MY29-3 Die	MY29-3 Crimps	Kearney Tooling: WH1 & WH2 Die	WH1 & WH2 Crimps	Thomas & Betts Tooling: TBM5 & TBM8 Die	TBM5 & TBM8 Crimps	HYD Die	HYD Crimps
		No. of Crimps													
CEP-2	#4 — #2 STR.	1	1	—	#2 STR.	U2CART	1	#2	2	—	—	Pink	2	42H	2
CEP-1/0	#2 — 1/0 STR.	1	1	—	1/0 STR.	U25ART	1	1/0	2	—	—	Gold	2	45	1
CEP-2/0	#1 — 2/0 STR.	2	2	—	2/0 STR.	U30ART	2	—	—	29/32 or 1	1	—	—	76H	2
CEP-4/0	2/0 — 4/0 STR.	2	2	—	4/0 STR.		2	—	—		1	—	—		2
CEP-300	4/0 — 300 MCM	2	2	—	300 MCM		2	—	—		1	—	—		2
CEP-350	250 — 350 MCM	2	2	—	350 MCM	U32ART	2	—	—	1⅛-1 or 1⅛-2	2	—	—	94H	3
CEP-500	350 — 500 MCM	2	2	—	500 MCM	U32ART	2	—	—		2	—	—	94H	3
CEP-600	400 — 600 MCM	—	3	2AL	600 MCM	U34ART	3	—	—	1¼ *	2	—	—	106H	3
CEP-750	500 — 750 MCM	—	3	2AL	750 MCM	U34ART	3	—	—	1¼ *	2	—	—	106H	3

AL — Aluminum nibs for VC8C. *WH-2 tool only. Note: Overlap crimps where necessary.

TYPES VACL/VACS

VERSA-CRIMP AND CONVENTIONAL COMPRESSION TOOL AND DIE INFORMATION

Catalog Types VACL/VACS	VERSA-CRIMP Tooling: AL or CU Wire Range	VC6	VC6-FT	VC8C	Conventional AL or CU Wire Size	Burndy: Index	Y34A Die	Y35/Y39 Die	Y48B Die	Y486RB Die	MY-29-3	Blackburn: OD-58 Die	JB-12A Die	Kearney: Die	0-52	WH-1 PH-1	WH-2 PH-2	Thomas & Betts: TBM-5 & 8 Die	Hyd Die
-8					#8 STR.	374	—	U8CABT	—	—	X	BY17C	B73CH	¼	X	—	—	Blue	24
-6					#6 STR.	346	A6CAB	U6CABT	—	—	X	BY19C	B74CH	5/16	X	X	X	Gray	29
-4					#4 STR.	375	A4CAB	U4CABT	C4CAB	—	X	BY21C	** U4CABT	⅜	X	X	X	Green	37
-2	#6 — #2 STR.	X	X	—	#2 STR.	348	A2CAB	U2CABT	—	—	X	BY23C	B06CH	½	X	X	X	Pink	45
-1	#4 — #1 STR.	X	X	—	#1 STR.	471	A1CAR	U1CART	—	—	X	BY23C	B06CH	½	X	X	X	Gold	45
-1/0	#8 — 1/0 STR.	X	X	—	1/0 STR.	296	A25AR	U25ART	—	—	X	BY25C	** U25ART	9/16	X	X	X	Tan	50
-2/0	#4 — 2/0 STR.	X	X	—	2/0 STR.	297	A26AR	U26ART	—	—	X	BY31C	B09CH	⅝-1	X	X	X	Olive	54/54H
-3/0	#4 — 3/0 STR.	X	X	—	3/0 STR.	467	A27AR	U27ART	—	—	X	BY27	B26CH	11/16	X	X	X	Ruby	62
-4/0	#2 — 4/0 STR.	X	X	—	4/0 STR.	298	A28AR	U28ART	C28AR	F28AR	X	BY35C	B10CHI	.781	X	X	X	White†	71H
-250	1/0 — 250 MCM	X	X	—	250 MCM	324	A29AR	U29ART	C29AR	F29AR	—	BY37C	B11CH	.840	X	X	X	Red†	76/76H
-300	1/0 — 300 MCM	X	X	—	300 MCM	470	A30AR	U30ART	C30AR	F30AR	—	—	B61EA	29/32	—	X	X	Blue†	87H
-350	2/0 — 350 MCM	X	X	—	350 MCM	299	—	U31ART	C31AR	F31AR	—	—	B12CHI	1⅛-1	—	X	X	Brown†	94H
-400	3/0 — 400 MCM	X	X	—	400 MCM	472	—	U32ART	C32AR	F32AR	—	—	B80EA	1⅛-1	—	X	X	—	99H
-500	4/0 — 500 MCM	X	X	—	500 MCM	472	—	U32ART	C32AR	F32AR	—	—	B80EA	or 1⅛-2	—	X	X	—	96/96H
-600	350 — 600 MCM	—	X	X	600 MCM	300	—	U34ART	C34AR	F34AR	—	—	B20AH	1 5/16	—	—	X	—	106H
-750	500 — 750 MCM	—	X	X	750 MCM	300	—	U34ART	C34AR	F34AR	—	—	B20AH	1 5/16	—	—	X	—	106H
-1000	750 — 1000 MCM	—	—	X	1000 MCM	302	—	—	C44AR	F44AR	—	—	—	—	—	—	—	—	—

**Burndy's Y35 and Blackburn's JB-12A dies are interchangeable.
†Thomas & Betts TBM-8 tool only.

VERSA-CRIMP is a Registered Trademark of Square D Company

SQD SLV_000958

VERSA-CRIMP AND CONVENTIONAL COMPRESSION TOOL AND DIE INFORMATION

Catalog Types VCCT/ VHCL/VHS VHCS/VHSS	VERSA-CRIMP Tooling						Conventional Copper Wire Sizes	Burndy							Kearney	Thomas & Betts	
	Copper Wire Range	VC6	VC6-FT	VC7	VC7-FT	*VC8C		MY29-3 No.	Y34A Die●	Y34B Die●	Y35-Y39 Y45 Die	Y44B Die●	Y48B Die●	Y486RB Die●	"O" & "WH" Die	TBM-5 & 8 Die	Hyd. Die
-6							#6 STR.	#6	A6CD	B6CD	U5CRT	—	—	—	—	Blue	24
-4							#4 STR.	#4	A4CD	B4CD	U4CRT	—	—	—	5/16	Gray	29
-2	#6 — #2 STR.	X	X	X	X	—	#2 STR.	#2	A2CD	B2CD	U2CRT	—	—	—	3/8	Brown	33
-1	#6 — #1 STR.	X	X	X	X	—	#1 STR.	#1	A1CD	B1CD	U1CRT	—	—	—	—	Green	37
-1/0	#6 — 1/0 STR.	X	X	X	X	—	1/0 STR.	1/0	A25D	B25D	U25CRT	E25D	—	—	1/2	Pink	42H/42
-2/0	#4 — 2/0 STR.	X	X	X	X	—	2/0 STR.	2/0	A26D	B26D	U26CRT	E26D	—	—	9/16	Black	45
-3/0	#2 — 3/0 STR.	X	X	X	X	—	3/0 STR.	3/0	A27D	B27D	U27CRT	E27D	—	—	9/16	Orange	50
-4/0	#1 — 4/0 STR.	X	X	X	X	—	4/0 STR.	4/0	A28D	B28D	U28RT	E28D	C28D	F28D	5/8-1	Purple	54
-250	1/0 — 250 MCM	X	X	X	X	—	250 MCM	250	A29D	B29D	U29RT	E29D	C28D	F29D	11/16	Yellow	60
-300	2/0 — 300 MCM	X	X	X	X	—	300 MCM	—	A30D	B30D	U30RT	E30D	C30D	F30D	781	White†	66H/66
-350	3/0 — 350 MCM	X	X	X	X	—	350 MCM	—	A31D	B31D	U31RT	E31D	C31D	F31D	840	Red†	71H/71
-400	4/0 — 400 MCM	X	X	X	X	—	400 MCM	—	A32D	B32D	U32RT	E32D	C32D	F32D	—	Blue†	76H/76
-500	4/0 — 500 MCM	X	X	X	X	X	500 MCM	—	A34D	N/Req.	U34RT	E34D	C34D	F34D	1/1-2	Brown†	87H/87
-600	250 — 600 MCM	—	—	—	X	X	600 MCM	—	—	—	U36RT	E36D	C36D	F36D	—	—	94H/94
-750	500 — 750 MCM	—	—	—	X	X	750 MCM	—	—	—	—	E39D	C39D	F39D	—	—	106H/106
-800	500 — 800 MCM	—	—	—	—	X	800 MCM	—	—	—	—	E40D	C40D	F40D	—	—	107H/107
-1000	750 — 1000 MCM	—	—	—	—	X	1000 MCM	—	—	—	—	N/Req.	C44D	F44D	—	—	125H/125
-1500	1000 — 1500 MCM	—	—	—	—	X	1500 MCM	—	—	—	—	—	C46D	F46D	—	—	—

*VC8C crimping range is 500-1500 MCM CU. †TBM-8 tool only. ●Use -PR indentor.

ΩHMEGA™ INSULATION AND CONTINUITY TESTERS

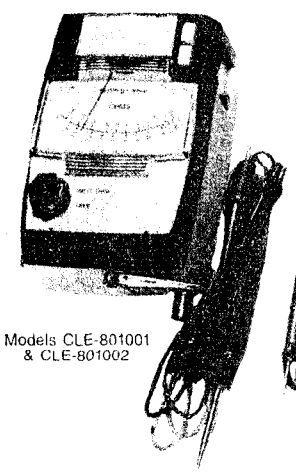
The **ΩHMEGA™** testers combine the features of a megohmmeter and a continuity tester in one compact, portable instrument and is available as either a manually (hand cranked) operated or battery operated model.

WHY TEST FOR INSULATION RESISTANCE? The purpose of insulating materials is to provide electrical separation between items of different potential, provide separation of energized electrical circuits or devices and ground, and to direct current along a specific path to produce useful work. For these reasons it is desirable to have insulating material that has, and will maintain, a high resistance value.

When breakdowns occur in this material, the current returns back to the source of power via unwanted and unknown paths, wasting valuable energy and creating a hazardous condition for equipment and personnel.

Insulation resistance decreases gradually due to a general wearing down process which can be attributed to vibration, dirt, moisture, chemicals and expansion due to temperature variations.

Insulation resistance tests are made with direct current (DC voltage) and are non destructive, quite unlike the high voltage breakdown or AC "HiPot" test. Insulation resistance measurements assist in determining if high voltages can safely be applied to a device. They are beneficial in the detection and diagnosis of deteriorating conditions or the presence of moisture or other contaminants, and assist in preventing the premature breakdown of electrical equipment.



Models CLE-801001 & CLE-801002



Model CLE-801003

ΩHMEGA™ INSULATION AND CONTINUITY TESTERS

Type	Description			Catalog Number	Price
	Output Voltage	Insulation Resistance Range	Continuity Range		
Manually Operated	0-500 Vdc	0-100 megohms	0-100Ω	CLE-801001	**$323.**
	0-1000 Vdc	0-200 megohms	0-100Ω	CLE-801002	**413.**
Battery Operated	0-500 Vdc	0-100 megohms	0-100Ω	CLE-801003*	**206.**

* Live circuit indication, 0-600 Vac.

PD5 DISCOUNT

PANEL METERS

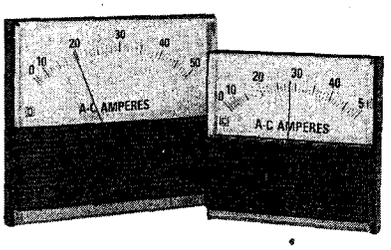
2% ACCURACY — 4½" and 3½" — 90° scale

The Square D Panel Meter features easily interchanged dials within any family of transformer rated meters (see the "exploded view" photos by the Tables that follow). For example, a 0-200A AC Ammeter can be made into a 0-1000A meter just by removing the 200A scale and replacing it with a 1000A scale. And, this can be done without exposing the pointer to possible damage! This simplifies stocking of the correct size meter to match various CT ratios (or in the case of Voltmeters and DC Ammeters, various VT ratios and Metering shunts).

AC Panel Meters are rugged, high torque, pivot-&-jewel meters that measure AC current by using the attraction/repulsion of a moving and a stationary iron vane centered in a wound field coil. An outstanding feature of these meters is their insensitivity to input distortion, making them very useful in situations where AC input is not a pure sine wave.

DC Panel Meters are built with a frictionless taut band expansion, assuring utmost sensitivity with excellent resistance to shock and vibration. All Panel instruments shown are accurate to within ±2% of full scale reading at 60 Hz.

All scales are zero-left, except as noted. Additional scales and other types of meters including microammeters, rectifier type meters, etc., are available on special order. Consult Clearwater Marketing Headquarters for additional information.

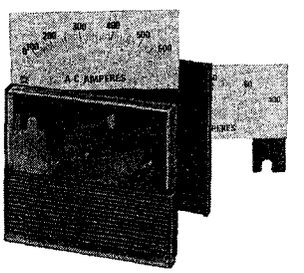


AC AMMETERS — TRANSFORMER RATED

5 AMP. MOVEMENT WITH SCALES* AS INDICATED FOR USE WITH XXX:5 CT

Range (Amps.)	4½ Inch		3½ Inch	
	Catalog Number	Price	Catalog Number	Price
0-50	●CLE8-A4A500	**$33.00**	●CLE8-A3A500	**$30.00**
0-75	CLE8-A4A750	**33.00**	●CLE8-A3A750	**30.00**
0-100	●CLE8-A4A101	**33.00**	●CLE8-A3A101	**30.00**
0-150	CLE8-A4A151	**33.00**	●CLE8-A3A151	**30.00**
0-200	●CLE8-A4A201	**33.00**	●CLE8-A3A201	**30.00**
0-300	CLE8-A4A301	**33.00**	●CLE8-A3A301	**30.00**
0-400	●CLE8-A4A401	**33.00**	●CLE8-A3A401	**30.00**
0-500	CLE8-A4A501	**33.00**	CLE8-A3A501	**30.00**
0-600	●CLE8-A4A601	**33.00**	●CLE8-A3A601	**30.00**
0-800	●CLE8-A4A801	**33.00**	●CLE8-A3A801	**30.00**
0-1000	CLE8-A4A102	**33.00**	CLE8-A3A102	**30.00**
0-1200	●CLE8-A4A122	**33.00**	●CLE8-A3A122	**30.00**
0-1500	CLE8-A4A152	**33.00**	CLE8-A3A152	**30.00**
0-1600	●CLE8-A4A162	**33.00**	●CLE8-A3A162	**30.00**
0-1kA	●CLE8-A4A1K	**33.00**	●CLE8-A3A1K	**30.00**
0-1.2kA	●CLE8-A4A12K	**33.00**	●CLE8-A3A12K	**30.00**
0-1.5kA	●CLE8-A4A15K	**33.00**	●CLE8-A3A15K	**30.00**
0-2kA	●CLE8-A4A2K	**33.00**	●CLE8-A3A2K	**30.00**
0-3kA	●CLE8-A4A3K	**33.00**	●CLE8-A3A3K	**30.00**
0-4kA	●CLE8-A4A4K	**33.00**	●CLE8-A3A4K	**30.00**

* Separate Scales in a package of 10 are available. To order the 10 pack, add suffix "S" to Panel Meter catalog number. Example: CLE8-A4A500S Price - $20.00.
● Designated Stock Item.

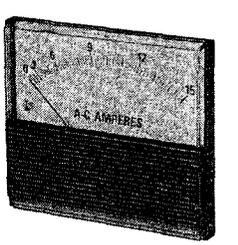


Catalog No. CLE8-A4A601

AC AMMETERS — SELF CONTAINED

Range (Amps.)	4½ Inch		3½ Inch	
	Catalog Number	Price	Catalog Number	Price
0-1	●CLE8-B4A1	**$33.00**	●CLE8-B3A1	**$30.00**
0-5	●CLE8-B4A5	**33.00**	●CLE8-B3A5	**30.00**
0-10	●CLE8-B4A10	**33.00**	●CLE8-B3A10	**30.00**
0-15	●CLE8-B4A15	**36.00**	●CLE8-B3A15	**33.00**
0-20	●CLE8-B4A20	**36.00**	●CLE8-B3A20	**33.00**
0-30	●CLE8-B4A30	**36.00**	●CLE8-B3A30	**33.00**

● Designated Stock Item.



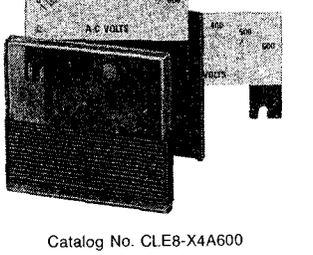
Catalog No. CLE8-B4A15

AC VOLTMETERS — TRANSFORMER RATED

150 VOLT METER WITH SCALE* AS INDICATED FOR USE WITH XXX—120 VT

Range (Volts)	4½ Inch		3½ Inch	
	Catalog Number	Price	Catalog Number	Price
0-600	●CLE8-X4A600	**$36.00**	●CLE8-X3A600	**$33.00**
0-750	CLE8-X4A750	**36.00**	CLE8-X3A750	**33.00**
0-3000	●CLE8-X4A3000	**36.00**	●CLE8-X3A3000	**33.00**
0-5000	●CLE8-X4A5000	**36.00**	●CLE8-X3A5000	**33.00**
0-6kV	●CLE8-X4A6K	**36.00**	●CLE8-X3A6K	**33.00**
0-9kV	●CLE8-X4A9K	**36.00**	●CLE8-X3A9K	**33.00**
0-15kV	●CLE8-X4A15K	**36.00**	●CLE8-X3A15K	**33.00**
0-18kV	●CLE8-X4A18K	**36.00**	●CLE8-X3A18K	**33.00**

* Separate Scales in a package of 10 are available. To order the 10 pack, add suffix "S" to Panel Meter catalog number. Example: CLE8-X4A600S Price - $20.00.
● Designated Stock Item.

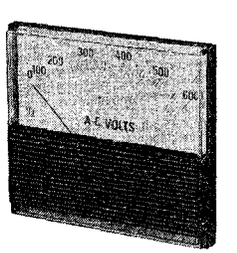


Catalog No. CLE8-X4A600

AC VOLTMETERS — SELF CONTAINED

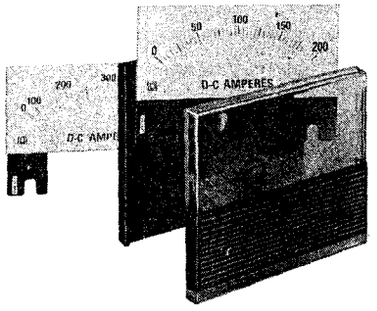
Range (Volts)	4½ Inch		3½ Inch	
	Catalog Number	Price	Catalog Number	Price
0-150	●CLE8-V4A150	**$36.00**	●CLE8-V3A150	**$33.00**
0-300	●CLE8-V4A300	**38.00**	●CLE8-V3A300	**35.00**
0-500	●CLE8-V4A500	**47.00**	●CLE8-V3A500	**44.00**
0-600	●CLE8-V4A600	**47.00**	●CLE8-V3A600	**44.00**

● Designated Stock Item.

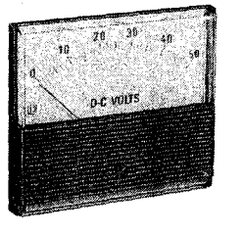


Catalog No. CLE8-V4A600

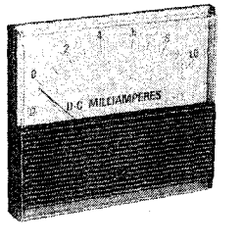
SQD SLV_000960



Catalog No. CLE8-A4D201



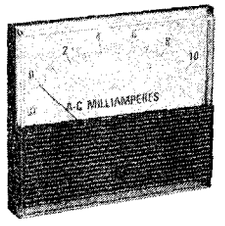
Catalog No. CLE8-V4D50



Catalog No. CLE8-M4D001



Catalog No. CLE8-N4D100C



Catalog No. CLE8-N4A010

DC AMMETERS — SHUNT RATED

50MV Movement with Scales* as indicated for use with external 50MV shunt

Range (Amps)	4½ Inch		3½ Inch	
	Catalog Number	Price	Catalog Number	Price
0-15	CLE8-A4D150	**$35.00**	CLE8-A3D150	**$32.00**
0-20	CLE8-A4D200	**35.00**	CLE8-A3D200	**32.00**
0-25	CLE8-A4D250	**35.00**	CLE8-A3D250	**32.00**
0-30	CLE8-A4D300	**35.00**	CLE8-A3D300	**32.00**
0-50	CLE8-A4D500	**35.00**	CLE8-A3D500	**32.00**
0-75	CLE8-A4D750	**35.00**	CLE8-A3D750	**32.00**
0-100	CLE8-A4D101	**35.00**	CLE8-A3D101	**32.00**
0-150	CLE8-A4D151	**35.00**	CLE8-A3D151	**32.00**
0-200	CLE8-A4D201	**35.00**	CLE8-A3D201	**32.00**
0-300	CLE8-A4D301	**35.00**	CLE8-A3D301	**32.00**
0-500	CLE8-A4D501	**35.00**	CLE8-A3D501	**32.00**
0-750	CLE8-A4D751	**35.00**	CLE8-A3D751	**32.00**
0-1000	CLE8-A4D102	**35.00**	CLE8-A3D102	**32.00**
0-1200	CLE8-A4D122	**35.00**	CLE8-A3D122	**32.00**
0-1500	CLE8-A4D152	**35.00**	CLE8-A3D152	**32.00**
0-2000	CLE8-A4D202	**35.00**	CLE8-A3D202	**32.00**

Separate scales in a package of 10 are available. To order the 10 pack, add suffix "S" to Panel Meter catalog number. Example: CLE8-A4D150S Price - $20.00.

DC VOLTMETERS

Range (Volts)	4½ Inch		3½ Inch	
	Catalog Number	Price	Catalog Number	Price
0-10	●CLE8-V4D10	**$35.00**	●CLE8-V3D10	**$34.00**
0-30	●CLE8-V4D30	**35.00**	●CLE8-V3D30	**34.00**
0-50	●CLE8-V4D50	**35.00**	●CLE8-V3D50	**34.00**
0-150	●CLE8-V4D150	**38.00**	●CLE8-V3D150	**36.00**
0-300	●CLE8-V4D300	**39.00**	●CLE8-V3D300	**36.00**

● Designated Stock Item.

DC MILLIAMMETERS

Range (MA)	4½ Inch		3½ Inch	
	Catalog Number	Price	Catalog Number	Price
0-1	CLE8-M4D001	**$34.00**	CLE8-M3D001	**$32.00**
1-0-1	CLE8-M4D001C	**34.00**	CLE8-M3D001C	**32.00**
0-5	●CLE8-M4D005	**34.00**	●CLE8-M4D005	**32.00**
0-10	●CLE8-M4D010	**34.00**	●CLE8-M3D010	**32.00**
0-50	●CLE8-M4D050	**34.00**	●CLE8-M3D050	**32.00**
0-100	●CLE8-M4D100	**34.00**	●CLE8-M3D100	**32.00**
0-500	●CLE8-M4D500	**34.00**	●CLE8-M3D500	**32.00**

● Designated Stock Item.

DC MILLIVOLTMETERS

Range (MV)	4½ Inch		3½ Inch	
	Catalog Number	Price	Catalog Number	Price
50	●CLE8-N4D050	**$35.00**	●CLE8-N3D050	**$33.00**
50-0-50	●CLE8-N4D050C	**35.00**	●CLE8-N3D050C	**33.00**
100	●CLE8-N4D100	**35.00**	●CLE8-N3D100	**33.00**
100-0-100	●CLE8-N4D100C	**35.00**	●CLE8-N3D100C	**33.00**

● Designated Stock Item.

AC MILLIAMMETERS

Range (MA)	4½ Inch		3½ Inch	
	Catalog Number	Price	Catalog Number	Price
1	●CLE8-M4A001	**$33.00**	●CLE8-M3A001	**$30.00**
5	●CLE8-M4A005	**33.00**	●CLE8-M3A005	**30.00**
10	●CLE8-M4A010	**33.00**	●CLE8-M3A010	**30.00**
50	●CLE8-M4A050	**33.00**	●CLE8-M3A050	**30.00**
100	●CLE8-M4A100	**33.00**	●CLE8-M3A100	**30.00**
200	●CLE8-M4A200	**33.00**	●CLE8-M3A200	**30.00**
500	●CLE8-M4A500	**33.00**	●CLE8-M3A500	**30.00**

● Designated Stock Item.

SQD SLV_000961

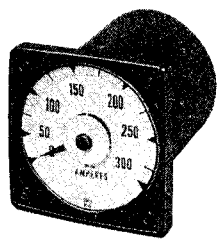
SWITCHBOARD INSTRUMENTS

4½% RECTANGULAR — LONG SCALE — 250° (OTHER SCALES AVAILABLE)

EA1AF A.C. AMMETERS — TRANSFORMER RATED — 5 AMPERES

Accuracy: ± 1% — Individually Calibrated Pivot-Jewel Construction

Standard Scale (Amperes)	Catalog No.	Price	Standard Scale (Amperes)	Catalog No.	Price	Standard Scale (Amperes)	Catalog No.	Price
0-10	EA1AF-10	**$202.**	0-300	●EA1AF-300	**$202.**	0-2500	EA1AF-2500	**$202.**
0-15	EA1AF-15	**202.**	0-400	●EA1AF-400	**202.**	0-2.5kA	EA1AF-2.5K	**202.**
0-20	EA1AF-20	**202.**	0-500	EA1AF-500	**202.**	0-3000	●EA1AF-3000	**202.**
0-25	EA1AF-25	**202.**	0-600	●EA1AF-600	**202.**	0-3.0kA	EA1AF-3K	**202.**
0-30	EA1AF-30	**202.**	0-800	●EA1AF-800	**202.**	0-4000	EA1AF-4000	**202.**
0-40	EA1AF-40	**202.**	0-1000	EA1AF-1000	**202.**	0-4.0kA	EA1AF-4K	**202.**
0-50	●EA1AF-50	**202.**	0-1.0kA	EA1AF-1K	**202.**	0-5000	EA1AF-5000	**202.**
0-60	EA1AF-60	**202.**	0-1200	●EA1AF-1200	**202.**	0-5.0kA	EA1AF-5K	**202.**
0-75	EA1AF-75	**202.**	0-1.2kA	EA1AF-1.2K	**202.**	0-6000	EA1AF-6000	**202.**
0-80	EA1AF-80	**202.**	0-1500	EA1AF-1500	**202.**	0-6.0kA	EA1AF-6K	**202.**
0-100	●EA1AF-100	**202.**	0-1.5kA	EA1AF-1.5K	**202.**	0-7000	EA1AF-7000	**202.**
0-150	●EA1AF-150	**202.**	0-1600	●EA1AF-1600	**202.**	0.7.0kA	EA1AF-7K	**202.**
0-200	●EA1AF-200	**202.**	0-2000	●EA1AF-2000	**202.**	0-8000	EA1AF-8000	**202.**
0-250	EA1AF-250	**202.**	0-2.0kA	EA1AF-2K	**202.**	0-8.0kA	EA1AF-8K	**202.**



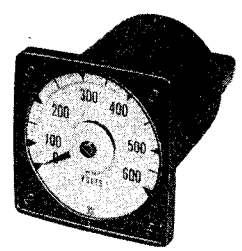
Type EA1AF

● Designated Stock Item.

EA1VB A.C. VOLTMETER — TRANSFORMER RATED — 150 VOLTS

Accuracy: ± 1% — Individually Calibrated Pivot-Jewel Construction

Standard Scale (Volts)	Catalog No.*	Price	Standard Scale (Volts)	Catalog No.*	Price	Standard Scale (Volts)	Catalog No.*	Price
0-300	EA1VB-X300	**$219.**	0-3000	EA1VB-X3000	**$219.**	0-15kV	EA1VB-X15kV	**$219.**
0-360	EA1VB-X360	**219.**	0-4000	EA1VB-X4000	**219.**	0-18kV	EA1VB-X18kV	**219.**
0-500	EA1VB-X500	**219.**	0-5000	EA1VB-X5000	**219.**	0-40kV	EA1VB-X40kV	**219.**
0-525	EA1VB-X525	**219.**	0-5250	●EA1VB-X5250	**219.**	0-45kV	EA1VB-X45kV	**219.**
0-550	EA1VB-X550	**219.**	0-6000	EA1VB-X6000	**219.**	0-86kV	EA1VB-X86kV	**219.**
0-600	●EA1VB-X600	**219.**	0-7200	EA1VB-X7200	**219.**	0-90kV	EA1VB-90kV	**219.**
0-750	EA1VB-X750	**219.**	0-7500	EA1VB-X7500	**219.**	0-100kV	EA1VB-100kV	**219.**
0-800	EA1VB-X900	**219.**	0-9000	EA1VB-X9000	**219.**	0-150kV	EA1VB-150kV	**219.**
0-1000	EA1VB-X1000	**219.**	0-10kV	EA1VB-X10kV	**219.**			
0-1500	EA1VB-X1500	**219.**	0-13kV	EA1VB-X13kV	**219.**			



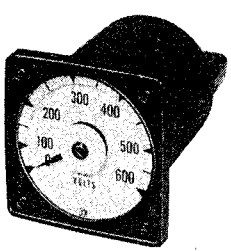
Type EA1VB

* Voltage Transformers are not supplied with instruments. Order separately.
● Designated Stock Item.

EA1V A.C. VOLTMETER

Accuracy: ±1% — Individually Calibrated Pivot-Jewel Construction

Type	Standard Scale (Volts)	Voltage Rating	VT Ratio	Catalog Number	Price Each
Self-Contained	0-150	150	.....	EA1VB-S150	**$219.**
	0-250	250	.....	EA1VC-S250	**235.**
	0-300	300	.....	●EA1VD-S300	**235.**
	0-600	600	.....	●EA1VE-S600	**265.**
Transformer Rated	0-600	250	2.4:1	●EA1VC-X600	**235.**



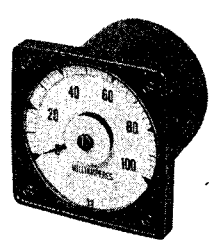
Type EA1V

● Designated Stock Item.

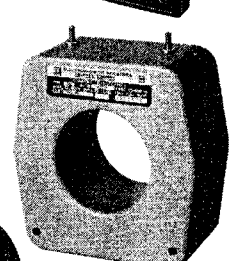
ED1A D.C. MILLIAMMETERS, SELF-CONTAINED — D.C. AMMETERS, SHUNT RATED

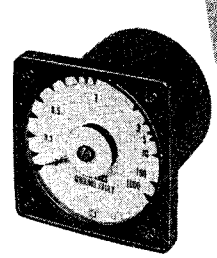
Accuracy: ±1% — Individually Calibrated Pivot-Jewel Construction

Type	Standard Scale (Amperes)	Catalog No.	Price	Stardard Scale (Amperes)	Catalog No.	Price	Standard Scale (Amperes)	Catalog No.	Price
Self-Contained	0-1mA	ED1A-001	**$226.**	0-40mA	ED1A-040	**$226.**	0-300mA	ED1A-300	**$226.**
	0-2mA	ED1A-002	**226.**	0-50mA	ED1A-050	**226.**	0-400mA	ED1A-400	**226.**
	0-5mA	ED1A-005	**226.**	0-100mA	ED1A-100	**226.**	0-450mA	ED1A-450	**226.**
	0-10mA	ED1A-010	**226.**	0-150mA	ED1A-150	**226.**	0-500mA	ED1A-500	**226.**
	0-20mA	ED1A-020	**226.**	0-200mA	ED1A-200	**226.**			
	0-30mA	ED1A-030	**226.**	0-250mA	ED1A-250	**226.**			
*Shunt Rated (DC Ammeters)	0-15	ED1A-S15	**220.**	0-150	ED1A-S150	**220.**	0-1100	ED1A-S1100	**220.**
	0-20	ED1A-S20	**220.**	0-200	ED1A-S200	**220.**	0-1200	ED1A-S1200	**220.**
	0-25	ED1A-S25	**220.**	0-250	ED1A-S250	**220.**	0-1300	ED1A-S1300	**220.**
	0-30	ED1A-S30	**220.**	0-300	ED1A-S300	**220.**	0-1400	ED1A-S1400	**220.**
	0-35	ED1A-S35	**220.**	0-350	ED1A-S350	**220.**	0-1500	ED1A-S1500	**220.**
	0-40	ED1A-S40	**220.**	0-400	ED1A-S400	**220.**	0-1600	ED1A-S1600	**220.**
	0-45	ED1A-S45	**220.**	0-450	ED1A-S450	**220.**	0-1700	ED1A-S1700	**220.**
	0-50	ED1A-S50	**220.**	0-500	ED1A-S500	**220.**	0-1800	ED1A-S1800	**220.**
	0-60	ED1A-S60	**220.**	0-550	ED1A-S550	**220.**	0-1900	ED1A-S1900	**220.**
	0-65	ED1A-S65	**220.**	0-600	ED1A-S600	**220.**	0-2000	ED1A-S2000	**220.**
	0-70	ED1A-S70	**220.**	0-650	ED1A-S650	**220.**	0-2200	ED1A-S2200	**220.**
	0-75	ED1A-S75	**220.**	0-700	ED1A-S700	**220.**	0-2400	ED1A-S2400	**220.**
	0-80	ED1A-S80	**220.**	0-800	ED1A-S800	**220.**	0-2600	ED1A-S2600	**220.**
	0-85	ED1A-S85	**220.**	0-850	ED1A-S850	**220.**	0-2800	ED1A-S2800	**220.**
	0-90	ED1A-S90	**220.**	0-900	ED1A-S900	**220.**	0-3000	ED1A-S3000	**220.**
	0-95	ED1A-S95	**220.**	0-950	ED1A-S950	**220.**			
	0-100	ED1A-S100	**220.**	0-1000	ED1A-S1000	**220.**			



Type ED1A





Type EA1GG/GF1

* Shunts are user supplied.

EA1GG/GF1 GROUND FAULT INDICATING SYSTEM

Indicates Ground Faults, Ground Leakage Currents and Phase Unbalance.

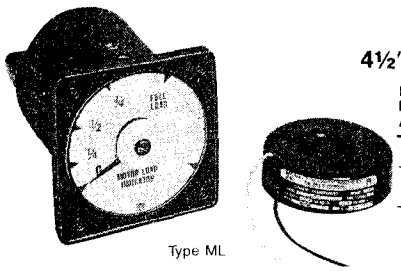
Catalog Number — **EA1GG/GFI**	Price Each — **$351.**
Catalog Number — **EA1GG/GFI-002***	Price Each — **353.**

* Supplied with MB-17 mounting bracket.

SQD SLV_000962

SWITCHBOARD INSTRUMENTS

4½" RECTANGULAR — LONG SCALE — 250° (OTHER SCALES AVAILABLE)



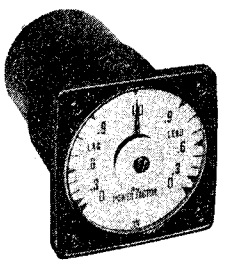
Type ML

MOTOR LOAD INDICATOR SYSTEM
For monitoring loads of 5 to 200 H.P. motors. Consists of an overload protected A.C. Ammeter, calibrated in percent of load and a current transformer.

ML

230 Volts, 3 Phase, 60 Hz				460 Volts, 3 Phase, 60 Hz			
Horse-power*	Transformer Ratio	Catalog Number	Price Each	Horse-power*	Transformer Ratio	Catalog Number	Price Each
5	100:5	ML-5N101	**$272.**	5	100:5	ML-5N101	**$272.**
7½	100:5	ML-5N101	**272.**	7½	100:5	ML-5N101	**272.**
10	100:5	ML-5N101	**272.**	10	100:5	ML-5N101	**272.**
15	100:5	ML-5N101	**272.**	15	100:5	ML-5N101	**272.**
20	150:5	ML-5N151	**272.**	20	100:5	ML-5N101	**272.**
25	100:5	ML-5N101	**272.**	25	100:5	ML-5N101	**272.**
30	100:5	ML-5N101	**272.**	30	100:5	ML-5N101	**272.**
40	150:5	ML-5N151	**272.**	40	150:5	ML-5N151	**272.**
50	200:5	ML-5N201	**283.**	50	100:5	ML-5N101	**272.**
75	300:5	ML-5N301	**283.**	75	150:5	ML-5N151	**272.**
100	400:5	ML-5N401	**283.**	100	200:5	ML-5N201	**283.**
125	500:5	ML-5N501	**283.**	125	200:5	ML-5N201	**283.**
150	500:5	ML-5N501	**283.**	150	300:5	ML-5N301	**283.**
200	.....	.....	**283.**	200	400:5	ML-5N401	**283.**

* Squirrel-Cage and Synchronous Motors with Code Letters B to E, operating at usual speeds.
Instructions for wiring to achieve proper indication on various full load ampere ratings are included with the device and in EI Catalog Section D1. Scales calibrated in amperes are available — consult factory.



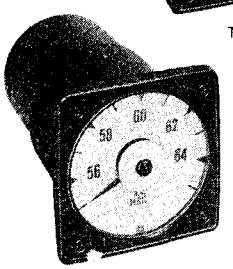
Type EA1P

POWER FACTOR METER — Self-Contained
Accuracy: ± 1% — Individually Calibrated, Pivot-Jewel Construction

EA1P

	Rating @ 5 Amperes, 60 Hz							
Volts	Scale Lag-Lead	Circuit	Catalog Number	Price Each	Scale Lag-Lead	Circuit	Catalog Number	Price Each
120	.5-1-.5	3φ 3W	●EA1PU-.5-120*	**$459.**	0-1-0	3φ 4W	●EA1PU-1-120*	**$459.**
208	.5-1-.5	3φ 4W	EA1PU-.5-208*	**472.**	0-1-0	3φ 4W	EA1PU-1-208*	**472.**
240	.5-1-.5	3φ 3W	EA1PU-.5-240	**479.**	0-1-0	3φ 3W	EA1PU-1-240	**479.**

Potential connects phase to phase.
* V.T. Transformer required but not supplied with instrument.
● Designated Stock Item.



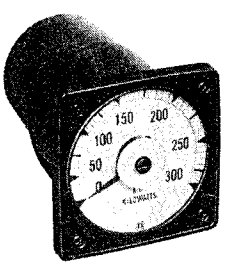
Type EA1FG

FREQUENCY METER — Self-Contained
Accuracy: ± 1% — Individually Calibrated, Pivot-Jewel Construction

EA1FG

Scale Hz	Center Freq. (Hz)	Catalog Number	Price Each	Scale Hz	Center Freq. (Hz)	Catalog Number	Price Each
45-55	50	EA1FG-55	**$612.**	58-62	60	EA1FG-62	**$661.**
45-65	55	EA1FG-65	**574.**	59-61	60	EA1FG-61	**740.**
48-52	50	EA1FG-52	**661.**	350-450	400	EA1FG-450	**574.**
49-51	50	EA1FG-51	**740.**	370-430	400	EA1FG-430	**612.**
50-70	60	EA1FG-70	**574.**	380-420	400	EA1FG-420	**661.**
55-65	60	●EA1FG-65A	**612.**	390-410	400	EA1FG-410	**740.**

● Designated Stock Item.



Type EA1WG

A.C. WATTMETER — Self-Contained
Accuracy: ± 1%
Pivot-Jewel Construction

EA1WG

No. of Elem.	Amps	Volts	Hz	Circuit	Catalog Number*	Price Each
1	5	120	60	1φ2W	EA1WG-1-2	**$415.**
2	5	120	60	3φ3W	EA1WG-3-3	**542.**
2½	5	120	60	3φ4W	EA1WG-3-4	**581.**

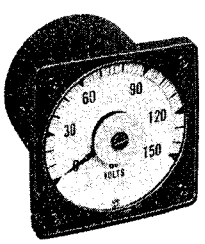
* Specify V.T. ratio, C.T. ratio and Full Scale Value. Order transformer separately.

A.C. VARMETER — Self-Contained
Accuracy: ± 1%
Pivot-Jewel Construction

EA1XG

No. of Elem.	Amps	Volts	Hz	Circuit	Catalog Number*	Price Each
1	5	120	60	1φ2W	EA1XG-1-2	**$415.**
2	5	120	60	3φ3W	EA1XG-3-3△	**542.**
2½	5	120	60	3φ4W	EA1XG-3-4▲	**581.**

△ Requires Phase Shift Transformer 22030-1. Price **$103.**
▲ Requires Phase Shift Transformer 22030-2. Price **$103.**



Type ED1V

D.C. VOLTMETER
Accuracy: ± 1% — Individually Calibrated, Pivot-Jewel Construction

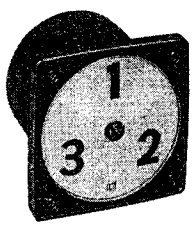
ED1V

ZERO LEFT

Scale and Rating	Catalog Number	Price Each	Scale and Rating	Catalog Number	Price Each
0-15	ED1V-15	**$241.**	0-150	ED1V-150	**$241.**
0-30	ED1V-30	**241.**	0-300	ED1V-300	**241.**
0-50	ED1V-50	**241.**	0-400	ED1V-400	**241.**
0-75	ED1V-75	**241.**	0-500	ED1V-500	**241.**
0-100	ED1V-100	**241.**	0-600	ED1V-600	**241.**

ZERO CENTER

Scale and Rating	Catalog Number	Price Each	Scale and Rating	Catalog Number	Price Each
150-0-150	ED1V-150-150	**$246.**	600-0-600	ED1V-600-600	**$246.**
300-0-300	ED1V-300-300	**246.**	.....	.....	....



Type EAGDJ

GROUND DETECTOR INDICATOR
A single unit instrument which gives a visual indication of a Ground Fault on any one phase of a three phase ungrounded system

EAGDJ

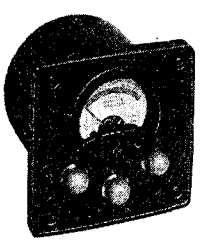
Catalog Number	Price Each
●EAGDJ	**$166.**

PHASE SEQUENCE INDICATOR
A single unit instrument which offers instant visual determination of correct phase rotation on a three phase ungrounded system

EAP1J

Catalog Number	Price Each
●EAP1J	**$272.**

● Designated Stock Item

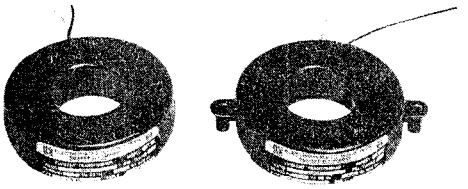


Type EAP1J

SQD SLV_000963

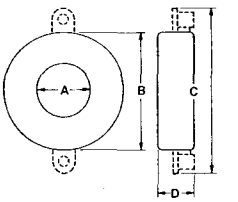
CURRENT TRANSFORMERS

600 VOLT CLASS — INDOOR TYPES



Model 5N Model 54

Model	Dimensions			
	A	B	C	D
2N	1⅛	2⅜	....	15/16
5N	1 3/16	3½	....	1 1/16
54	1 9/16	3½	4 9/16	1 1/16



PANEL AMMETERS AND SOLID STATE RELAYS

MODEL 2N **Rating Factor: 1.0 @ 30°C. Accuracy: 50-80A ± 2%. 100-300A ± 1%**

Current Rating (Amperes)	Burden VA @60 Hz	Burden VA @400 Hz	Catalog Number	Price Each
50:5	1.0	2.0	•2N500	**$14.60**
60:5	1.0	2.0	2N600	**14.60**
75:5	1.5	3.0	•2N750	**14.60**
80:5	1.5	3.0	2N800	**14.60**
100:5	2.0	4.0	•2N101	**14.60**
120:5	2.5	5.0	2N121	**14.60**
125:5	2.5	5.0	2N1250	**14.60**
150:5	2.5	5.0	•2N151	**14.60**
200:5	2.5	5.0	•2N201	**14.60**
250:5	2.5	5.0	2N251	**14.60**
300:5	2.5	5.0	•2N301	**14.60**

• Designated Stock Item.

USE WITH AMMETERS, WATTMETERS AND SMALL RELAYS

MODEL 5N **Rating Factor: 1.0 @ 30°C. Accuracy: 1% at rated current and VA**

Current Rating (Amperes)	Burden VA @60 Hz	Burden VA @400 Hz	* Catalog Number	Price Each
100:5	2.0	4.0	•5N101	**$17.20**
150:5	2.5	5.0	•5N151	**17.20**
200:5	5.0	12.5	•5N201	**17.20**
250:5	5.0	12.5	5N251	**17.20**
300:5	5.0	12.5	•5N301	**17.20**
400:5	12.5	25.0	•5N401	**19.20**
500:5	12.5	25.0	•5N501	**19.20**
600:5	25.0	50.0	•5N601	**19.20**

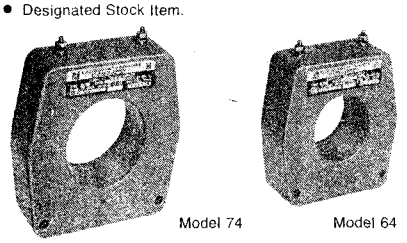
* Order MB-1 mounting brackets, add **$2.00** per set.
• Designated Stock Item.

USE WITH AMMETERS, WATTMETERS AND SMALL RELAYS

MODEL 54 **Rating Factor: 1.0 @ 30°C. Accuracy: 1% at rated current and VA**

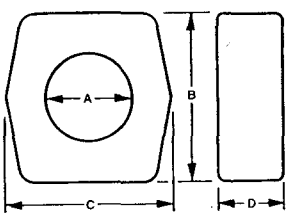
Current Rating (Amperes)	Burden VA @60 Hz	Burden VA @400 Hz	* Catalog Number	Price Each
100:5	2.0	4.0	•54-101	**$18.40**
150:5	2.5	5.0	•54-151	**18.40**
200:5	5.0	12.5	•54-201	**18.40**
250:5	5.0	12.5	54-251	**18.40**
300:5	5.0	12.5	•54-301	**18.40**
400:5	12.5	25.0	•54-401	**20.40**
500:5	12.5	25.0	•54-501	**20.40**
600:5	25.0	50.0	•54-601	**20.40**

* Mounting Ears Readily Removeable.
• Designated Stock Item.



Model 74 Model 64

Model	Dimensions A	B	C	D
64	1 15/16	4 3/16	4 3/16	1½
65	1 15/16	4 3/16	4 3/16	2 3/16
66	1 15/16	4 3/16	4 3/16	3 1/16
74	2 1 1/32	4 11/16	4 11/16	1⅝
75	2 1 1/32	4 11/16	4 11/16	2⅜
76	2 1 1/32	4 11/16	4 11/16	3¼



METERING & SIMILAR APPLICATIONS

MODEL 64 **Rating Factor: 1.33 @ 30°C; 1.0 @ 55°C. Operating Freq.: 25-400 Hz.**

Current Rating (Amperes)	ANSI Accuracy Class — 60 Hz. Metering Class B-0.1	B-0.5	B-2.0	* Catalog Number	Price Each
100:5	1.2			•64-101	**$21.30**
150:5	1.2			•64-151	**21.30**
200:5	1.2			•64-201	**21.30**
250:5	0.6	1.2		•64-251	**21.30**
300:5	0.6	1.2		•64-301	**21.30**
400:5	0.3	1.2		•64-401	**25.00**
500:5	0.3	0.6		•64-501	**25.00**
600:5	0.3	0.6		•64-601	**25.00**
750:5	0.3	0.6	1.2	64-751	**25.00**

* Order MB-10 mounting brackets, add **$2.00** per set.
• Designated Stock Item.

METERING & SIMILAR APPLICATIONS

MODEL 65 **Rating Factor: 1.33 @ 30°C; 1.0 @ 55°C. Operating Freq.: 25-400 Hz.**

Current Rating (Amperes)	ANSI Accuracy Class — 60 Hz. Metering Class B-0.1	B-0.5	B-2.0	* Catalog Number	Price Each
100:5	1.2			65-151	**$30.00**
200:5	1.2	1.2		65-201	**30.00**
250:5	0.6	0.6		65-251	**30.00**
300:5	0.3	1.2		65-301	**30.00**
400:5	0.3	0.6		65-401	**35.00**
500:5	0.3	0.6	1.2	65-501	**35.00**
600:5	0.3	0.3	1.2	65-601	**35.00**
750:5	0.3	0.3	0.6	65-751	**35.00**

* Order MB-11 mounting brackets, add **$2.00** per set.

METERING & SIMILAR APPLICATIONS

MODEL 66 **Rating Factor: 1.33 @ 30°C; 1.0 @ 55°C. Operating Freq.: 25-400 Hz.**

Current Rating (Amperes)	ANSI Accuracy Class — 60 Hz. Relay Class	Metering Class B-0.1	B-0.5	B-2.0	* Catalog Number	Price Each
100:5		1.2	1.2		66-151	**$40.00**
200:5		1.2	1.2		66-201	**40.00**
250:5	C10	0.6	0.6		66-251	**40.00**
300:5	C10	0.3	0.6		66-301	**40.00**
400:5	C10	0.3	0.6	1.2	66-401	**46.00**
500:5	C20	0.3	0.3	1.2	66-501	**46.00**
600:5	C20	0.3	0.3	1.2	66-601	**46.00**
750:5	C10	0.3	0.3	0.6	66-751	**46.00**

* Order MB-12 mounting brackets, add **$2.00** per set.

METERING & SIMILAR APPLICATIONS

MODEL 74 **Rating Factor: 1.33 @ 30°C; 1.0 @ 55°C. Operating Freq.: 25-400 Hz.**

Current Rating (Amperes)	ANSI Accuracy Class — 60 Hz. Metering Class B-0.1	B-0.5	B-2.0	* Catalog Number	Price Each
200:5	1.2			74-201	**$28.00**
250:5	1.2	1.2		74-251	**28.00**
300:5	0.6	1.2		•74-301	**28.00**
400:5	0.6	1.2		•74-401	**28.00**
500:5	0.3	0.6		•74-501	**28.00**
600:5	0.3	0.6		•74-601	**28.00**
750:5	0.3	0.6	1.2	•74-751	**28.00**
800:5	0.3	0.3	1.2	•74-801	**28.00**
1000:5	0.3	0.3	1.2	•74-102	**34.00**
1200:5	0.3	0.3	0.6	•74-122	**34.00**
1500:5	0.3	0.3	0.6	74-152	**39.00**
1600:5	0.3	0.3	0.6	74-162	**39.00**

* Order MB-16 mounting brackets, add **$2.00** per set.
• Designated Stock Item.

METERING & SIMILAR APPLICATIONS

MODEL 75 **Rating Factor: 1.33 @ 30°C; 1.0 @ 55°C. Operating Freq.: 25-400 Hz.**

Current Rating (Amperes)	ANSI Accuracy Class — 60 Hz. Metering Class B-0.1	B-0.5	B-2.0	* Catalog Number	Price Each
200:5	1.2	1.2		75-201	**$39.00**
250:5	1.2	1.2		75-251	**39.00**
300:5	0.6	1.2		75-301	**39.00**
400:5	0.6	1.2		75-401	**39.00**
500:5	0.3	0.6	1.2	75-501	**39.00**
600:5	0.3	0.3	1.2	75-601	**39.00**
750:5	0.3	0.3	0.6	75-751	**39.00**
800:5	0.3	0.3	0.6	75-801	**39.00**
1000:5	0.3	0.3	0.6	75-102	**45.00**
1200:5	0.3	0.3	0.3	75-122	**45.00**
1500:5	0.3	0.3	0.3	75-152	**51.00**
1600:5	0.3	0.3	0.3	75-162	**51.00**

* Order MB-17 mounting brackets, add **$2.00** per set.

METERING & SIMILAR APPLICATIONS

MODEL 76 **Rating Factor: 1.33 @ 30°C; 1.0 @ 55°C. Operating Freq.: 25-400 Hz.**

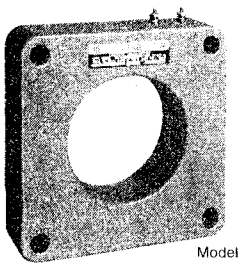
Current Rating (Amperes)	ANSI Accuracy Class — 60 Hz. Relay Class	Metering Class B-0.1	B-0.5	B-2.0	* Catalog Number	Price Each
200:5	C10	1.2	1.2		76-201	**$46.00**
250:5	C10	1.2	1.2		76-251	**46.00**
300:5	C10	0.6	0.6		•76-301	**46.00**
400:5	C10	0.3	0.6	1.2	•76-401	**46.00**
500:5	C10	0.3	0.3	1.2	76-501	**46.00**
600:5	C10	0.3	0.3	0.6	76-601	**46.00**
750:5	C20	0.3	0.3	0.6	76-751	**46.00**
800:5	C20	0.3	0.3	0.6	•76-801	**46.00**
1000:5	C10	0.3	0.3	0.6	76-102	**58.00**
1200:5	C20	0.3	0.3	0.3	76-122	**58.00**
1500:5	C20	0.3	0.3	0.3	76-152	**70.00**
1600:5	C20	0.3	0.3	0.3	76-162	**70.00**

* Order MB-18 mounting brackets, add **$2.00** per set.
• Designated Stock Item.

SQD SLV_000964

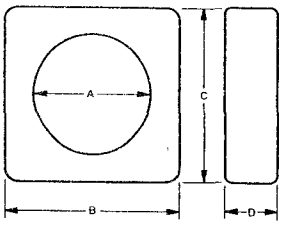
CURRENT TRANSFORMERS

600 VOLT CLASS — INDOOR TYPES



Model 100

Model	Dimensions A	B	C	D
100	4	7	7	2⅛
110	4	7	7	2⅛
120	5¾	8½	8½	2⅛
130	5¾	8½	8½	2⅞
140	8⅛	11	13	3
170	4¼	6¾	6¾	1⁵⁄₁₆



RELAYING & METERING APPLICATIONS

MODEL 100 **Rating Factor: 1.33 @ 30°C; 1.0 @ 55°C. Operating Frequency: 25-400 Hz.**

Current Rating (Amperes)	ANSI Accuracy Class — 60 Hz. Relay Class	Metering Class B-0.1	B-0.5	B-2.0	* Catalog Number	Price Each
200:5	C10	1.2	2.4		100-201	$ 59.
300:5	C10	0.6	1.2		100-301	59.
400:5	C20	0.3	0.6	2.4	●100-401	59.
500:5	C20	0.3	0.6	2.4	100-501	59.
600:5	C20	0.3	0.3	1.2	●100-601	59.
800:5	C20	0.3	0.3	1.2	●100-801	59.
1000:5	C50	0.3	0.3	0.6	●100-102	73.
1200:5	C50	0.3	0.3	0.6	●100-122	73.
1500:5	C50	0.3	0.3	0.3	●100-152	85.
1600:5	C50	0.3	0.3	0.3	●100-162	85.
2000:5	C50	0.3	0.3	0.3	●100-202	85.
2500:5	C50	0.3	0.3	0.3	100-252	102.
3000:5	C50	0.3	0.3	0.3	100-302	102.

* Order MB-31 mounting brackets, add **$4.80** per set.
● Designated Stock Item.

RELAYING & METERING APPLICATIONS

MODEL 110 **Rating Factor: 1.33 @ 30°C; 1.0 @ 55°C. Operating Frequency: 25-400 Hz.**

Current Rating (Amperes)	ANSI Accuracy Class — 60 Hz. Relay Class	Metering Class B-0.1	B-0.5	B-2.0	* Catalog Number	Price Each
200:5	C20	1.2	2.4		●110-201	$ 83.
300:5	C20	0.6	1.2		110-301	83.
400:5	C50	0.3	0.3	2.4	●110-401	83.
500:5	C50	0.3	0.3	1.2	110-501	83.
600:5	C50	0.3	0.3	1.2	●110-601	83.
800:5	C50	0.3	0.3	0.3	●110-801	94.
1000:5	C50	0.3	0.3	0.3	110-102	103.
1200:5	C50	0.3	0.3	0.3	●110-122	103.
1500:5	C100	0.3	0.3	0.3	110-152	110.
1600:5	C100	0.3	0.3	0.3	●110-162	110.
2000:5	C100	0.3	0.3	0.3	110-202	110.
2500:5	C100	0.3	0.3	0.3	110-252	124.
3000:5	C100	0.3	0.3	0.3	110-302	124.

* Order MB-32 mounting brackets, add **$4.80** per set.
● Designated Stock Item.

RELAYING & METERING APPLICATIONS

MODEL 120 **Rating Factor: 1.33 @ 30°C; 1.0 @ 55°C. Operating Frequency: 25-400 Hz.**

Current Rating (Amperes)	ANSI Accuracy Class — 60 Hz. Relay Class	Metering Class B-0.1	B-0.5	B-2.0	* Catalog Number	Price Each
200:5	C10	1.2	2.4		120-201	$ 64.
300:5	C10	0.6	1.2		120-301	64.
400:5	C20	0.6	0.6		120-401	64.
500:5	C20	0.3	0.3	2.4	120-501	64.
600:5	C20	0.3	0.3	1.2	120-601	64.
800:5	C20	0.3	0.3	1.2	●120-801	68.
1000:5	C50	0.3	0.3	0.6	120-102	75.
1200:5	C50	0.3	0.3	0.6	●120-122	75.
1500:5	C50	0.3	0.3	0.3	●120-152	79.
1600:5	C50	0.3	0.3	0.3	●120-162	79.
2000:5	C50	0.3	0.3	0.3	●120-202	79.
2500:5	C50	0.3	0.3	0.3	●120-252	94.
3000:5	C50	0.3	0.3	0.3	●120-302	94.
4000:5	C50	0.3	0.3	0.3	●120-402	118.

* Order MB-31 mounting brackets, add **$4.80** per set.
● Designated Stock Item.

RELAYING & METERING APPLICATIONS

MODEL 130 **Rating Factor: 1.33 @ 30°C; 1.0 @ 55°C. Operating Frequency: 25-400 Hz.**

Current Rating (Amperes)	ANSI Accuracy Class — 60 Hz. Relay Class	Metering Class B-0.1	B-0.5	B-2.0	* Catalog Number	Price Each
200:5	C10	1.2	2.4		130-201	$107.
300:5	C20	0.6	1.2		130-301	107.
400:5	C20	0.6	0.6	2.4	130-401	107.
500:5	C50	0.6	0.6	2.4	130-501	107.
600:5	C50	0.3	0.6	1.2	130-601	107.
800:5	C50	0.3	0.3	1.2	130-801	118.
1000:5	C100	0.3	0.3	0.3	130-102	118.
1200:5	C100	0.3	0.3	0.3	●130-122	131.
1500:5	C100	0.3	0.3	0.3	●130-152	131.
1600:5	C100	0.3	0.3	0.3	130-162	131.
2000:5	C100	0.3	0.3	0.3	130-202	131.
2500:5	C100	0.3	0.3	0.3	130-252	131.
3000:5	C100	0.3	0.3	0.3	130-302	131.
4000:5	C100	0.3	0.3	0.3	130-402	149.

* Order MB-32 mounting brackets, add **$4.80** per set.
● Designated Stock Item.

RELAYING & METERING APPLICATIONS

MODEL 140 **Rating Factor: 1.33 @ 30°C; 1.0 @ 55°C. Operating Frequency: 25-400 Hz.**

Current Rating (Amperes)	ANSI Accuracy Class — 60 Hz. Relay Class	Metering Class B-0.1	B-0.5	B-2.0	* Catalog Number	Price Each
50:5					●140-500	$137.
100:5					140-101	137.
400:5	C20	0.6	0.6	2.4	140-401	137.
500:5	C20	0.3	0.6	2.4	140-501	137.
600:5	C20	0.3	0.6	1.2	140-601	137.
800:5	C50	0.3	0.3	0.6	140-801	137.
1000:5	C50	0.3	0.3	0.6	●140-102	147.
1200:5	C100	0.3	0.3	0.3	140-122	147.
1500:5	C100	0.3	0.3	0.3	140-152	173.
2000:5	C100	0.3	0.3	0.3	●140-202	173.
2500:5	C100	0.3	0.3	0.3	●140-252	173.
3000:5	C100	0.3	0.3	0.3	●140-302	173.
4000:5	C100	0.3	0.3	0.3	●140-402	184.
5000:5	C100	0.3	0.3	0.3	●140-502	216.
6000:5	C100	0.3	0.3	0.3	●140-602	258.

* Order MB-32 mounting brackets, add **$4.80** per set.
● Designated Stock Item.

RELAYING & METERING APPLICATIONS

MODEL 170 **Rating Factor: 1.33 @ 30°C; 1.0 @ 55°C. Operating Frequency: 25-400 Hz.**

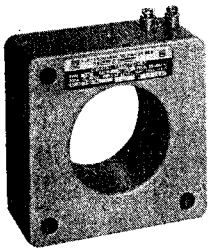
Current Rating (Amperes)	ANSI Accuracy Class — 60 Hz. Relay Class	Metering Class B-0.1	B-0.5	B-2.0	* Catalog Number	Price Each
200:5		1.2			170-201	$ 44.
250:5		0.6			170-251	44.
300:5		0.6	1.2		170-301	44.
400:5		0.6	0.6		●170-401	44.
500:5		0.6	0.6		●170-501	44.
600:5		0.6	0.6		●170-601	44.
750:5	C10	0.3	0.6		170-751	44.
800:5	C10	0.3	0.3	1.2	●170-801	44.
900:5	C10	0.3	0.3	1.2	170-901	60.
1200:5	C10	0.3	0.3	0.6	●170-122	60.
1500:5		0.3	0.3	1.2	●170-152	75.
1600:5		0.3	0.3	1.2	●170-162	75.
2000:5		0.3	0.3	0.6	●170-202	75.
2500:5		0.3	0.3	0.3	●170-252	86.
3000:5		0.3	0.3	0.3	●170-302	86.
3500:5		0.3	0.3	0.3	170-352	100.

* Order MB-30 mounting brackets, add **$4.80** per set.
● Designated Stock Item.

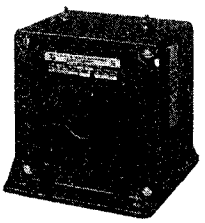
SQD SLV_000965

CURRENT TRANSFORMER

600 VOLT CLASS — INDOOR TYPE

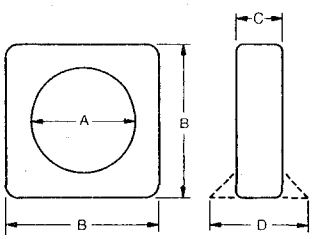


Model 180



Model 240

Model	Dimensions			
	A	B	C	D
180	2½	4½	2⅛	....
240 (50:5-100:5)	1 5/16	5¼	4¾	6½
240 (150:5-600:5)	1 5/16	5¼	3¾	5½



RELAYING OR METERING APPLICATIONS

MODEL 180 **Rating Factor: 1.33 @ 30°C; 1.0 @ 55° C.**
Operating Frequency: 25-400 Hz.

Current Rating (Amperes)	ANSI Accuracy Class — 60Hz					* Catalog Number	Price Each
	Metering Class						
	B-0.1	B-0.2	B-0.5	B-1.0	B-2.0		
100:5	1.2	2.4				●180-101	**$35.**
150:5	1.2	1.2				●180-151	**35.**
200:5	1.2	1.2	2.4			●180-201	**35.**
250:5	1.2	1.2	2.4			180-251	**35.**
300:5	0.6	0.6	1.2			●180-301	**35.**
400:5	0.6	0.6	1.2	2.4	2.4	●180-401	**35.**
500:5	0.3	0.3	0.6	1.2	2.4	180-501	**35.**
600:5	0.3	0.3	0.6	1.2	1.2	●180-601	**35.**
750:5	0.3	0.3	0.6	1.2	1.2	180-751	**35.**
800:5	0.3	0.3	0.6	1.2	1.2	●180-801	**35.**
1000:5	0.3	0.3	0.3	0.3	0.6	●180-102	**47.**
1200:5	0.3	0.3	0.3	0.3	0.6	●180-122	**47.**
1500:5	0.3	0.3	0.3	0.3	0.3	180-152	**52.**
2000:5	0.3	0.3	0.3	0.3	0.3	●180-202	**52.**

* Order MB-9 mounting brackets, add **$2.60** per set.
● Designated Stock Item.

RELAYING OR METERING APPLICATIONS

MODEL 240 **Rating Factor: 1.33 @ 30°C; 1.0 @ 55° C.**
Operating Frequency: 25-400 Hz.

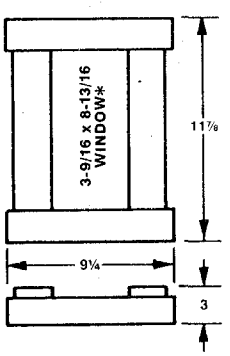
Current Rating (Amperes)	ANSI Accuracy Class — 60Hz							Catalog Number	Price Each
	Relay Class	Metering Class							
		B-0.1	B-0.2	B-0.5	B-1.0	B-2.0	B-4.0		
50:5	C10	2.4	2.4					●240-500	**$94.**
75:5	C20	2.4	2.4	2.4				240-750	**94.**
100:5	C20	2.4	2.4	2.4	2.4			240-101	**94.**
150:5	C20	0.6	0.6	1.2				240-151	**94.**
200:5	C20	0.6	0.6	0.6	1.2	2.4		240-201	**94.**
250:5	C50	0.3	0.6	0.6	1.2	2.4		240-251	**94.**
300:5	C50	0.3	0.3	0.3	0.6	1.2	2.4	240-301	**94.**
400:5	C50	0.3	0.3	0.3	0.6	1.2	2.4	240-401	
500:5	C100	0.3	0.3	0.3	0.3	0.6	1.2	240-501	**94.**
600:5	C100	0.3	0.3	0.3	0.3	0.3	0.6	240-601	**94.**

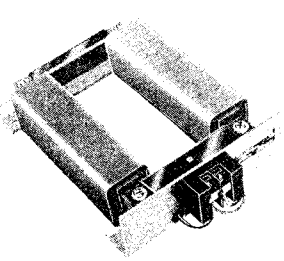
● Designated Stock Item.

GROUND FAULT, RELAYING AND METERING

MODEL 270 **Rating Factor: 1.33**
Operating Frequency 60 Hz.

Current Rating (Amperes)	ANSI Accuracy Class — 60 Hz					Catalog Number	Price Each
	B-0.1 2.5VA	B-0.2 5VA	B-0.5 12.5VA	B-1.0 25VA	B-2.0 50VA		
800:5	1.2	2.4				270-801	**$207.**
1000:5	1.2	1.2	2.4			●270-102	**228.**
1200:5	1.2	1.2	2.4			●270-122	**228.**
1500:5	1.2	1.2	2.4			270-152	**228.**
1600:5	1.2	1.2	2.4			●270-162	**228.**
2000:5	1.2	1.2	1.2	2.4		●270-202	**242.**
2500:5	1.2	1.2	1.2	2.4		270-252	**242.**
3000:5	1.2	1.2	1.2	1.2	2.4	●270-302	**256.**
4000:5	1.2	1.2	1.2	1.2	1.2	270-402	**272.**
5000:5	1.2	1.2	1.2	1.2	1.2	270-502	**302.**





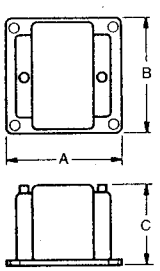
Model 270

* Window length may be increased, optional.
Window width may be increased or decreased, optional
Other ratios available.
● Designated Stock Item.

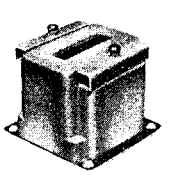
POTENTIAL TRANSFORMERS

MODELS 450 & 460 **FOR USE IN ALL TYPES OF INDICATING AND RECORDING INSTRUMENTS AND PROTECTIVE RELAY SYSTEMS**

Primary Voltage	Winding Ratio	Model 450▲ Accuracy 0.3W, X, M & Y; 1.2 Z		Model 460◐ Accuracy 0.6W; 1.2 X	
		Catalog Number	Price Each	Catalog Number	Price Each
120/208Y	1:1	450-120	**$161.**	●460-120	**$119.**
240/416Y	2:1	450-240	**161.**	460-240	**119.**
288/500Y	2.4:1	●450-288	**161.**	●460-288	**119.**
300/520Y	2.5:1	450-300	**166.**	460-300	**124.**
480/480Y	4:1	●450-480	**166.**	●460-480	**124.**
600/600Y	5:1	450-600	**166.**	460-600	**124.**



Model	Dimensions		
	A	B	C
450	6	7⅛	5⅞
460	4¾	4½	3⅞



Model 460

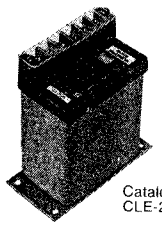
▲Thermal Rating: 750VA @ 30° C; 500 VA @ 55°C.
◐Thermal Rating: 150 VA @ 30°C; 100 VA @ 55°C.
● Designated Stock Item

SQD SLV_000966

0.25% ELECTRICAL TRANSDUCERS

0.25% of reading accuracy is provided by the CLE-20000 series of transducers. 0-1.0mA dc available on all types as well as 0-10V dc output on watt and var transducers. All are designed to withstand SWC testing IEEE STD 472. In-line test jacks provided on watt and var 0-1mA output models and available as option on voltage and current models. Designed to permit customer service.

CLASS 8410



Catalog No.
CLE-201001

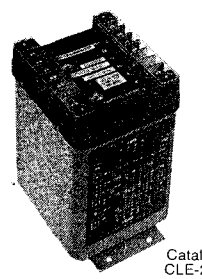
CURRENT AND VOLTAGE TRANSDUCERS

Current Transducer				Voltage Transducer			
Transducer Rated		Catalog Number	Price	Transducer Rated		Catalog Number	Price
Input	Output			Input	Output		
5A AC	1mA dc	CLE-202001▲	**$76.**	150V AC	1mA dc	CLE-201001▲	**$76.**

CURRENT TRANSDUCER
Input Range ..... 0-6.5A AC
Rated Input For 1.0mA dc Output 5A
Burden ..... Less Than 0.15VA
Calibration Adjustment ..... ±10% Full Scale
Load Resistance 0-10KΩ

VOLTAGE TRANSDUCER
Input Range ..... 0-180V AC
Rated Input For 1.0mA dc Output 150V
Burden ..... Less Than 1.5VA
Calibration Adjustment ..... ±10% Full Scale
Load Resistance 0-10KΩ

▲Available with in-line test jack used on Watt and Var. Add "T" to end of Catalog No. and add $5.00 to price.



Catalog No.
CLE-205003

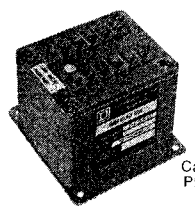
WATT AND VAR TRANSDUCERS

Descriptions			Watt Transducers			Var Transducers★		
System	Number of Elements	Rated Input	Catalog Number		Price	Catalog Number		Price
			RO = ±1mA dc	RO = ±10V dc		RO = ±1mA dc	RO = ±10V dc	
1ϕ, 2W	1	500 watts	CLE-204000	CLE-204005	**$281.**	CLE-205000	CLE-205005	**$293.**
3ϕ, 3W	1½	1000 watts	CLE-204001	CLE-204006	**281.**	CLE-205001	CLE-205006	**293.**
	2	1000 watts	CLE-204002	CLE-204007	**356.**	CLE-205002	CLE-205007	**374.**
3ϕ, 4W	2½	1500 watts	CLE-204003	CLE-204008	**356.**	CLE-205003	CLE-205008	**374.**
	3	1500 watts	CLE-204004	CLE-204009	**481.**	CLE-205004	CLE-205009	**497.**

★Var Transducers have self-contained phase shifter.

WATT AND VAR TRANSDUCERS
Potential Range ..... 0-150V AC (120V nominal) 0.1VA Burden
Current Range ..... 0-10A AC (5A nominal) 0.2VA Burden
Calibration Adjustment ..... ±2% Full Scale
Rated Output (RO) ..... ±1mA dc or ±10V dc
Load Resistance ..... 0-10K For 1mA RO
2KΩ-∞ For 10V RO

PE2 DISCOUNT



Catalog No.
PR-201-UV

SOLID STATE INDUSTRIAL RELAYS

Protective Relays feature 100% solid state sensing and mechanical output relay contacts contained in non-conductive fiberglass reinforced polyester cases for surface or through-the-door mounting. All relays have top mounted terminals with #6 screw connectors to accept spade or ring type terminals.

CLASS 8430

Type	Input	Trip Points		Time Delay	Catalog Number	Price
		Under Function	Over Function			
❶Transducer Relays	0-1mA dc (Control Volt. 120 or 277V AC or 24V dc)	0-0.94mA or 0.2-1.0mA		0.25-10 sec.	PR-101-TR	**$158.**
		0-0.94mA and 0.2-1.0mA		0.25-10 sec.	PR-201-TR	**183.**
❷Remote Control Transmitter	120V AC ±10% @ 50Hz or 60Hz	.....	.....	.....	CLE-306001	**152**
❸Phase Loss/ Phase Reversal Relay	1-5A 3ϕ (Control Voltage 120 V AC)	.....	.....	0.1-8 sec.	PR-101-PLR	**265.**
Under Voltage Relays 1ϕ	240V AC @ 60 Hz	175-215V AC	.....	0.1-6 sec.	PR-101-UV	**151.**
	120V AC @ 60 Hz	90-110V AC	.....	0.1-6 sec.	PR-201-UV	**151.**
Over Voltage Relay 1ϕ	120V AC (150V AC @ 60Hz maximum continuous)	.....	130-150V AC	1 sec. fixed	PR-101-OV	**119.**
❹Over/Under Voltage Relay 1ϕ	120V AC (150V AC @ 60 Hz maximum continuous)	99-125V AC	110-140V AC	2 sec. fixed	PR-101-OUV	**157.**
Over/Under Frequency Relays 1ϕ	120V AC @ 60Hz	53-58Hz	62-67Hz	1 sec. fixed	PR-101-OUF	**233.**
	120V AC @ 50Hz	45-48Hz	52-55Hz	1 sec. fixed	PR-201-OUF	**233.**
	120V AC @ 400Hz	350-380Hz	420-450Hz	1 sec. fixed	PR-301-OUF	**233.**

NOTES: ❶ Transducer Relays operate from the constant current output of 0-1mA dc transducers.
❷ Remote Control Transmitter provides three switch selectable constant current outputs (0.5mA, 0.75mA and 1.0mA) to operate up to three PR-101-TR transducer relays from a remote location.
❸ Phase Loss/Phase Reversal Relay (current and phase sensing). Provides protection for three phase motors and motor driven equipment in the event of an improper phase sequence or loss of one or two phases. C.T.'s are not supplied with relay.
❹ Over/Under Voltage Relay is energized with normal input voltage of 120V AC. Contacts transfer with over voltage or under voltage condition.

PE1 DISCOUNT

SQD SLV_000967

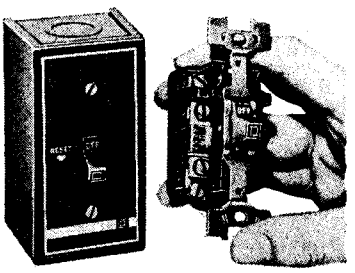
FRACTIONAL HORSEPOWER MANUAL STARTERS

WITH MELTING ALLOY TYPE THERMAL OVERLOAD RELAY

CLASS 2510 2512

Type F fractional horsepower starters provide overload protection as well as manual "on-off" control for small motors in a variety of industrial and commercial installations. Available in one or two pole versions, these devices are suitable for use with ac single phase motors to 1 hp. Two pole starters can also be used with dc motors to ¾ hp. Typical applications include fans, conveyors, pumps, and small machine tools.

- 1 or 2 Pole
- Optional Pilot Light
- 115-230 Volts
- Reliable Overload Construction
- Complete Line — available with toggle or key operator in wide range of enclosures



Type FG-2 Type FO-2

SINGLE-UNIT TYPES

Type of Operator	No. of Poles	Features	General Purpose Enclosure Surface Mounting NEMA Type 1 — Standard Type	Standard * Price	Oversized △ Type	Oversized * Price	General Purpose Flush Mounting (Without Pull Box) — Gray Flush Plate Type	Gray Flush Plate * Price	Standard Stainless Steel Flush Plate Type	Standard Stainless Steel Flush Plate * Price	Jumbo Stainless Steel Flush Plate Type	Jumbo Stainless Steel Flush Plate * Price	Watertight and Dusttight Enclosure NEMA Type 4 Type	Watertight and Dusttight Enclosure NEMA Type 4 * Price	Class I Groups B, C, & D & Class II Groups E, F & G Enclosure NEMA Types 7 & 9 Type	Class I Groups B, C, & D & Class II Groups E, F & G Enclosure NEMA Types 7 & 9 * Price	Open Type Type	Open Type * Price	Number of Thermal Units Required *
BASIC STARTER — CLASS 2510																			
Toggle	1	Standard	FG-1	$24.	FGJ-1	$28.	FF-1	$22.	FS-1	$24.	.....	.....	.....	.....	.....	.....	FO-1	$20.	1
		With Pilot Light	FG-1P	36.	FGJ-1P	40.	FF-1P	34.	FS-1P	36.	FSJ-1P	$42.	.....	.....	.....	.....	FO-1P	32.	
	2	Standard	FG-2	28.	FGJ-2	32.	FF-2	26.	FS-2	28.	.....	.....	.....	.....	.....	.....	FO-2	24.	1
		With Pilot Light	FG-2P	40.	FGJ-2P	44.	FF-2P	38.	FS-2P	40.	FSJ-2P	46.	.....	.....	.....	.....	FO-2P	36.	
Key	1	Standard	FG-3	32.	FGJ-3	36.	FF-3	30.	FS-3	32.	.....	.....	.....	.....	.....	.....	FO-3	28.	1
		With Pilot Light	FG-3P	44.	FGJ-3P	48.	FF-3P	42.	FS-3P	44.	FSJ-3P	50.	.....	.....	.....	.....	FO-3P	40.	
	2	Standard	FG-4	36.	FGJ-4	40.	FF-4	34.	FS-4	36.	.....	.....	.....	.....	.....	.....	FO-4	32.	1
		With Pilot Light	FG-4P	48.	FGJ-4P	52.	FF-4P	46.	FS-4P	48.	FSJ-4P	54.	.....	.....	.....	.....	FO-4P	44.	
STARTER WITH HANDLE GUARD/LOCK-OFF — CLASS 2510																			
Toggle	1	Standard	FG-5	$28.	FGJ-5	$32.	◐		◐	....	◐	....	FW-1‡	$ 90.	FR-1‡	$ 98.	.....	....	1
		With Pilot Light	FG-5P	40.	FGJ-5P	44.	◐		◐	....	◐	....	FW-1P‡	122.	.....	.....	.....	....	
		With (2) ¾" P.T.	.....	....	.....	....	.....	....	.....	....	.....	....	FW-1H	98.	FR-1H	106.	.....	....	
		With (2) ¾" P.T. and Pilot Light	.....	....	.....	....	.....	....	.....	....	.....	....	FW-1PH	130.	....	....	.....	....	
	2	Standard	FG-6	32.	FGJ-6	36.	◐		◐	....	◐	....	FW-2‡	$ 94.	FR-2‡	102.	.....	....	1
		With Pilot Light	FG-6P	44.	FGJ-6P	48.	◐		◐	....	◐	....	FW-2P‡	126.	.....	.....	.....	....	
		With (2) ¾" P.T.	.....	....	.....	....	.....	....	.....	....	.....	....	FW-2H	102.	FR-2H	112.	.....	....	
		With (2) ¾" P.T. and Pilot Light	.....	....	.....	....	.....	....	.....	....	.....	....	FW-2PH	134.	....	....	.....	....	

DUPLEX UNITS

Type of Operator	No. of Poles	Features	General Purpose Enclosure Surface Mounting NEMA Type 1 Type	General Purpose Enclosure Surface Mounting NEMA Type 1 Price*	General Purpose Flush Mounting (Without Pull Box) — Gray Flush Plate for Wall or Cavity Mounting Type	Gray Flush Plate for Wall or Cavity Mounting Price*	Stainless Steel Flush Plate for Wall or Cavity Mounting Type	Stainless Steel Flush Plate for Wall or Cavity Mounting Price*	Jumbo Stainless Steel Flush Plate for Wall or Cavity Mounting Type	Jumbo Stainless Steel Flush Plate for Wall or Cavity Mounting Price*	Number of Thermal Units Required *
ONE STARTER IN DUPLEX ENCLOSURE — CLASS 2510											
Toggle	2	Standard	FG-02	$44.	.....	....	.....	....	.....	....	1
		With Pilot Light	FG-02P	56.	.....	....	.....	....	.....	....	
Key	2	With Pilot Light	FG-04P	64.	.....	....	.....	....	.....	....	1
TWO STARTERS IN ONE ENCLOSURE — CLASS 2510											
Toggle	2 Each Str.	Standard	FG-22	$ 68.	FF-22■	$ 64.	.....	....	.....	....	2
		With Pilot Light on Each	FG-22P	112.	FF-22P■	108.	FS-22P■	$112.	.....	....	
Key	2 Ea. Str.	With Pilot Light on Each	FG-44P	128.	FF-44P■	124.	FS-44P■	128.	.....	....	2
STARTER AND "AUTO-OFF-HAND" SPDT SELECTOR SWITCH (AC ONLY) — CLASS 2510											
Toggle	1	Standard	FG-71	$62.	FF-71■	$58.	.....	....	.....	....	1
		With Pilot Light	FG-71P	74.	FF-71P■	70.	FS-71P■	$74.	.....	....	
	2	Standard	FG-72	66.	FF-72■	62.	.....	....	.....	....	1
		With Pilot Light	FG-72P	78.	FF-72P■	74.	FS-72P■	78.	.....	....	
Key	2	With Pilot Light	FG-74P	86.	FF-74P■	82.	FS-74P■	86.	.....	....	1

TWO SPEED STARTERS — CLASS 2512★

Toggle	1	With Mechanical Interlock:									
		Standard	FG-11	$ 88.	FF-11■	$ 84.	.....	....	.....	....	2
		With 2 Pilot Lights	FG-11P	132.	FF-11P■	128.	.....	....	.....	....	
		With HIGH-OFF-LOW Selector Switch:									
		With 2 Pilot Lights	.....	....	.....	....	FS-101P	$132.	FSJ-101P	$144.	
	2	With Mechanical Interlock:									
		Standard	FG-22	96.	FF-22■	92.	.....	....	.....	....	2
		With 2 Pilot Lights	FG-22P	140.	FF-22P■	136.	.....	....	.....	....	
		With HIGH-LOW-OFF Selector Switch:									
		With 2 Pilot Lights	.....	....	.....	....	FS-202P	140.	FSJ-202P	152.	

*** Prices do not include thermal units. See ordering information for selection.**
‡ Furnished with one ¾" pipe tap in bottom (reversible for top feed).
△ Separate oversized enclosure only also available; Class 9991 Type FE-1 **$8.00** list D1B.

◐ Order basic starter plus separate handle guard kit.
★ To order starter for replacement in Class 2512 device, add suffix letter "T" to type number of toggle operated starter and add **$4.00** to price. (Example: Class 2512 Type FG-22 contains two 2510 FO-2T starters, **$28.00** each.)
■ Devices manufactured after Jan. 1981 date code AL have been modified to fit a standard duplex box.

FOR ORDERING INFORMATION — See Page 191.
DIMENSIONS — See Page 193.
ACCESSORIES AND APPLICATION DATA — See Page 191.

SQD SLV_000968

FRACTIONAL HORSEPOWER MANUAL STARTERS
WITH MELTING ALLOY TYPE THERMAL OVERLOAD RELAY

CLASS 2510 2512

APPLICATION DATA — TYPE F

Voltage Rating — 230 volts maximum ac (1 or 2 pole) or dc (2 pole only).

Horsepower Ratings —

	Maximum Horsepower		
	AC Single Phase		DC 2 Pole Only
Volts	1 Pole	2 Pole	
115-230	1	1	¾

Continuous Current Rating — 16 amperes.

Overload Trip Assembly — Motor protection is provided by a Type A thermal unit which must be installed before the starter will operate. The thermal unit incorporates a heater winding through which the load current flows, a solder pot, and a ratchet wheel. Melting of the eutectic solder on a prolonged overload condition releases the ratchet wheel, actuating a trip mechanism which opens the starter contacts. This mechanism is trip-free, so that the contacts will open even if the handle is held in the ON position. After the solder has cooled the mechanism can be reset by pushing the handle to its extreme OFF position.

Pilot Light — Red or green neon pilot light units are available *factory installed* in NEMA Type 1 surface and flush mounting and NEMA Type 4 enclosures or as a *field modification* kit for NEMA Type 1 enclosures and gray flush plates. The pilot lights are permanently encased in a red or green plastic module that does not increase enclosure size. Bulbs are not replaceable. Class 9999 pilot light accessory kits (shown in table at right), include a clear lens for enclosure cover and appropriate nameplate for field addition to Class 2510 starters. For 2512, a special nameplate is required. Refer to type numbers FN-40 through FN-45 in table on page 193.

Handle Guard/Lock-off — An optional handle guard on NEMA 1 enclosed starters prevents accidental operation of the toggle operator and also allows the toggle operator to be padlocked in either the on or the off position. This handle guard can be factory installed on NEMA Type 1 enclosed starters (see listing on page 190) and is also available in kit form for field installation on NEMA Type 1 surface and flush mounting enclosures (see accessory table below). Standard NEMA 4 and NEMA 7 & 9 enclosures include provision for padlocking in the OFF position.

Two Speed — Class 2512 Type F two speed manual starters are designed for control of small single phase ac motors having separate windings for high and low speed operation. Two toggle operated starters are used, with overload protection included for each motor winding. On devices with stainless steel flush plate the toggle operators are normally left ON, and are used only for resetting the overload trip mechanism. A HIGH-OFF-LOW selector switch on these versions is used to stop the motor or run it in the desired speed. Surface mounting devices, and those with gray flush plate, utilize a mechanical interlock which allows direct control of the motor by means of the toggle operators.

Dimensions — See page 193 or Control Catalog Class 2510, 2511 & 2512.

ACCESSORIES

Description	Class & Type	Price
Red Neon Pilot Light (115/230 VAC)	9999 PL-10	**$12.00**
Green Neon Pilot Light (115/230 VAC)	9999 PL-10G	**12.00**
Handle Guard Kit with Padlock Provision	2510 FL-1	**4.00**
Additional Key for Key Operated Devices	2510 FK-1	**1.20**
Replacement Nameplates	See Page 193	

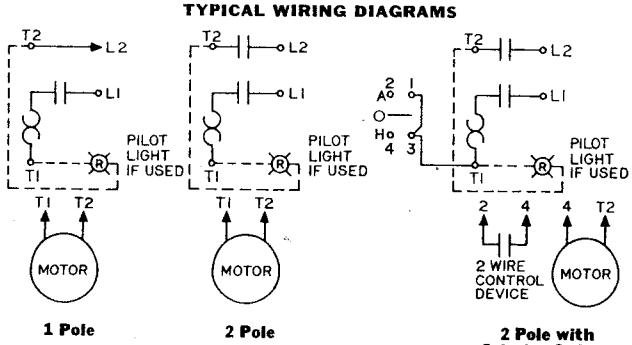
ORDERING INFORMATION REQUIRED

1. Class and type number of device.
2. Quantity and type number of thermal units.

THERMAL UNITS

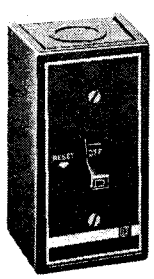
Starters will not operate without properly installed thermal unit. Thermal unit must be installed so that markings face the front of starter. Thermal units should be ordered separately. See Selection Index on Page 466 or refer to "Overload and Short Circuit Protector" in the Control Catalog. Standard trip thermal units are priced at **$6.00** each (D1A discount).

TYPICAL WIRING DIAGRAMS

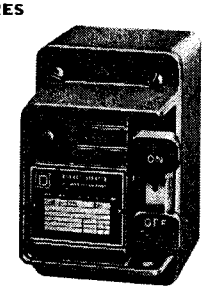


1 Pole — 2 Pole — 2 Pole with Selector Switch

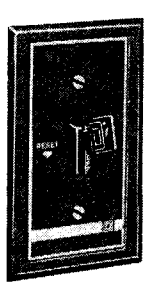
ENCLOSURES



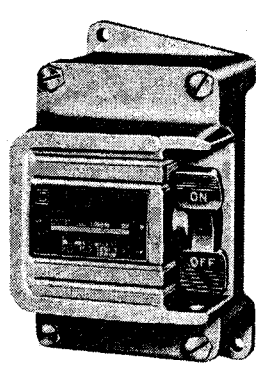
NEMA 1



NEMA 4
Watertight
Die Cast Zinc Enclosure



Flush Mounting



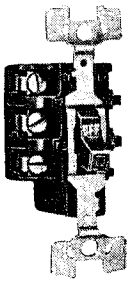
NEMA 7 & 9
Explosion Proof
Cast Aluminum Enclosure

SQD SLV_000969

AC MANUAL MOTOR STARTING SWITCHES

WITHOUT OVERLOAD PROTECTION

CLASS
2510
2511
2512



Type KO-2



Type KG-1A

Type K motor starting switches provide manual "on-off" control of single or three phase ac motors, where overload protection is not required or is provided separately. Compact construction and a 600 volt rating make these switches suitable for a wide range of industrial and commercial uses. Typical applications include small machine tools, pumps, fans, conveyors, and many other types of electrical machinery. They can also be used on non-motor loads such as resistance heaters.

- 2 or 3 Pole.
- Optional Pilot Light.
- Handle Guard/Lock-Off Feature — Standard.
- Small Size — Open Type Fits Standard Single Gang Switch Box.
- Complete Line — Available with Toggle or Key Operator in Wide Range of Enclosures.

NON-REVERSING — CLASS 2510

Type of Operator	No. of Poles	Features	General Purpose Enclosure Surface Mounting **NEMA Type 1**				General Purpose **Flush Mounting** (Without Pull Box)						Watertight and Dusttight Enclosure **NEMA Type 4** ◐		Class I Groups B, C, & D & Class II Groups E, F & G Enclosure **NEMA Types 7 & 9** ◐		**Open Type**	
			Standard		Oversized		Gray Flush Plate		Standard Stainless Steel Flush Plate		Jumbo Stainless Steel Flush Plate							
			Type	Price	Type△	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price
Toggle	2	Standard	KG-1	**$18.40**	KGJ-1	**$22.40**	KF-1	**$16.40**	KS-1	**$18.40**	.....	....	KW-1	**$88.00**	KR-1	**$96.00**	KO-1	**$14.40**
		With Pilot Light:																
		115 V. AC	KG-1A	**38.40**	KGJ-1A	**42.40**	KF-1A	**36.40**	KS-1A	**38.40**	KSJ-1A	**$44.40**	KW-1A	**120.00**	.....	....	KO-1A*	**34.40**
		230 V. AC	KG-1B	**38.40**	KGJ-1B	**42.40**	KF-1B	**36.40**	KS-1B	**38.40**	KSJ-1B	**44.40**	KW-1B	**120.00**	.....	....	KO-1B*	**34.40**
	3	Standard	KG-2	**42.00**	KGJ-2	**46.00**	KF-2	**40.00**	KS-2	**42.00**	.....	....	KW-2	**108.00**	KR-2	**118.00**	KO-2	**38.00**
		With Pilot Light:																
		208-240 V. AC	KG-2B	**62.00**	KGJ-2B	**66.00**	KF-2B	**60.00**	KS-2B	**62.00**	KSJ-2B	**68.00**	KW-2B	**140.00**	.....	....	KO-2B*	**58.00**
		440-600 V. AC	KG-2C	**62.00**	KGJ-2C	**66.00**	KF-2C	**60.00**	KS-2C	**62.00**	KSJ-2C	**68.00**	KW-2C	**140.00**	.....	....	KO-2C*	**58.00**
Key	2	Standard	KG-3	**26.40**	KGJ-3	**30.40**	KF-3	**24.40**	KS-3	**26.40**	.....	....	....	....	.....	....	KO-3	**22.40**
		With Pilot Light:																
		115 V. AC	KG-3A	**46.40**	KGJ-3A	**50.40**	KF-3A	**44.40**	KS-3A	**46.40**	KSJ-3A	**52.40**	....	....	.....	....	KO-3A	**42.40**
		230 V. AC	KG-3B	**46.40**	KGJ-3B	**50.40**	KF-3B	**44.40**	KS-3B	**46.40**	KSF-3B	**52.40**	....	....	.....	....	KO-3B	**42.40**
	3	Standard	KG-4	**50.00**	KGJ-4	**54.00**	KF-4	**48.00**	KS-4	**50.00**	.....	....	....	....	.....	....	KO-4	**46.00**
		With Pilot Light:																
		208-240 V. AC	KG-4B	**70.00**	KGJ-4B	**74.00**	KF-4B	**68.00**	KS-4B	**70.00**	KSJ-4B	**76.00**	....	....	.....	....	KO-4B	**66.00**
		440-600 V. AC	KG-4C	**70.00**	KGJ-4C	**74.00**	KF-4C	**68.00**	KS-4C	**70.00**	KSJ-4C	**76.00**	....	....	.....	....	KO-4C	**66.00**

◐ Furnished with one ¾" pipe tap in bottom (reversible for top feed). To obtain ¾" pipe tap top and bottom, add suffix letter "H" to type number and add **$8.00** to price.
* *Do not use as replacement interiors for NEMA Type 4 devices.*

REVERSING — CLASS 2511*

Type of Operator	No. of Poles	Motor Types for Which Suitable	Features (Including Mechanical Interlock)	General Purpose Enclosure Surface Mounting **NEMA Type 1**		With Flush Plate for **Cavity Mounting** (Without Pull Box)■	
				Type	Price	Type	Price
Toggle	2	Single Phase 3-Lead Repulsion-Induction	Standard	KG-11	**$ 80.**	KF-11	**$ 76.**
			With Pilot Light:				
			115 V. AC	KG-11A	**112.**	KF-11A	**108.**
			230 V. AC	KG-11B	**112.**	KF-11B	**108.**
	3	Three Phase; Also Single Phase Capacitor, Split Phase, or 4-Lead Repulsion-Induction	Standard	KG-22	**124.**	KF-22	**120.**
			With Pilot Light:				
			110-120 V. AC	KG-22A	**156.**	KF-22A	**152.**
			208-220 V. AC	KG-22B	**156.**	KF-22B	**152.**
			440-600 V. AC	KG-22C	**156.**	KF-22C	**152.**

TWO SPEED — CLASS 2512*

Type of Operator	No. of Poles	Motor Types for Which Suitable	Features (Including Mechanical Interlock)	General Purpose Enclosure Surface Mounting **NEMA Type 1**		With Flush Plate for **Cavity Mounting** (Without Pull Box)■	
				Type	Price	Type	Price
Toggle	2	Single Phase Two Winding (3-Lead)	Standard	KG-11	**$ 80.**	KF-11	**$ 76.**
			With 2 Pilot Lights:				
			115 V. AC	KG-11A	**144.**	KF-11A	**140.**
			230 V. AC	KG-11B	**144.**	KF-11B	**140.**
	3	Three Phase Separate Winding (Wye-Connected)	Standard	KG-22	**124.**	KF-22	**120.**
			With 2 Pilot Lights:				
			208-240 V. AC	KG-22B	**188.**	KF-22B	**184.**
			440-600 V. AC	KG-22C	**188.**	KF-22C	**184.**

* To order switch for Replacement in Class 2511 or 2512 device, add suffix letter "T" to type number of toggle operated switch and add **$4.00** to price. (Example: Class 2512 Type KG-11 contains two 2510 KO-1T switches, **$18.40** each.)
■ Devices manufactured after January, 1981 date code AL have been modified to fit a standard duplex box.
△ Separate oversized enclosure only also available; Class 9991 Type KE-1 **$8.00** D1B.

ELECTRICAL RATINGS

Voltage Rating — 600 volts maximum ac.

Horsepower Ratings —

Device	No. of Poles	Motor Type	Maximum HP		
			115 Volts	200-230 Volts	460-575 Volts
Class 2510	2	Single Phase	1	2	3
	3	Three Phase	2	5	10
Class 2511	2	Single Phase	1	2	3
	3	Three Phase	2	5	10
Class 2512	2	Single Phase	1	2	3
	3	3 Phase, Constant or Variable Torque	2	5	10
	3	3 Phase, Constant Horsepower	2	5	10

Continuous Current Rating — 30 amperes at 250 volts max., 20 amperes at 600 volts maximum.

DIMENSIONS — See Page 193 or Control Catalog Class 2510, 2511, 2512.

ORDERING INFORMATION REQUIRED
Class and type number.

FOR ACCESSORIES & APPLICATION DATA — *See Page 193.*

SQD SLV_000970

AC MANUAL MOTOR STARTING SWITCHES
WITHOUT OVERLOAD PROTECTION

CLASS 2510 2511 2512

APPLICATION DATA — TYPE K

PILOT LIGHT

Red or green neon pilot light units are available *factory installed* in NEMA Type 1 surface and flush mounting and NEMA Type 4 enclosures or as a *field modification* kit for NEMA Type 1 enclosures and gray flush plates. The pilot lights are permanently encased in a red or green plastic module that does not increase enclosure size. Bulbs are not replaceable. Class 9999 pilot light accessory kits (shown in table at right), include a clear lens for enclosure cover and appropriate nameplate for field addition to Class 2510 starters. For 2511 and 2512, a special nameplate is required. Refer to type numbers FN-20 through FN-25 in replacement nameplate table below.

REVERSING — CLASS 2511

Type K reversing manual switches provide a compact means of starting, stopping, and reversing ac motors, where overload protection is not required or is provided separately. They are suitable for use with three phase squirrel cage motors and for single phase motors which can be reversed by reconnecting motor leads. Two switches are used, one to connect the motor for forward rotation and one for reverse.

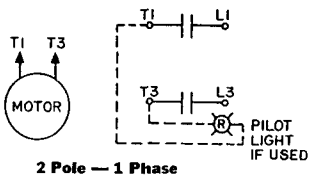
PILOT LIGHT KITS

Application	Voltage	Red Pilot Light Class & Type	Green Pilot Light Class & Type	Price
For field addition to any Class 2510 Type KF or KG Switch	110-120 VAC	9999PL-11	9999PL-11G	$20.
	208-240 VAC	9999PL-12	9999PL-12G	20.
	440-600 VAC	9999PL-13	9999PL-13G	20.

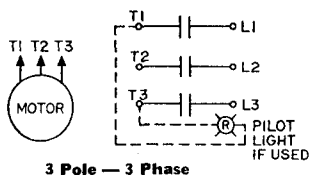
TWO SPEED — CLASS 2512

Type K two speed manual switches may be used with separate winding three phase or single phase ac motors, where overload protection is not required or is provided separately. Two switches are employed to give "on-off" control in each speed.

Typical Wiring Diagrams

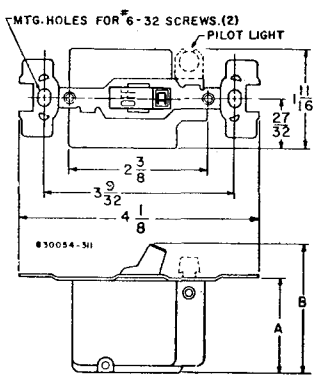


2 Pole — 1 Phase



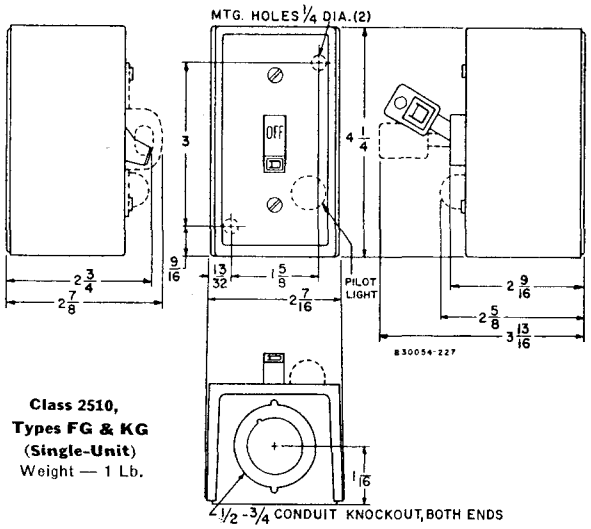
3 Pole — 3 Phase

APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS — TYPES F AND K



Dimension	Type FO	Type KO
"A"	1 19/32	1 45/64
"B"	2 7/32	2 11/32

Class 2510, Types FO & KO
Weight — ½ Lb.



Class 2510, Types FG & KG (Single-Unit)
Weight — 1 Lb.

REPLACEMENT NAMEPLATES CLASS 2510 TYPES F AND K

Description	Application	Nameplate Marking	Nameplate Type Number — Class 2510				Price
			For Type K Switch		For Type F Starter (Includes "Reset" indication)		
			Without Pilot Light	With Pilot Light	Without Pilot Light	With Pilot Light	
1¾" x 2 13/16" Nameplate with Embossed Mounting Holes for #6 Oval Head Screws	Standard commercial switch box cover or flush plate, including Square D stainless steel plates	(Blank)	FN-1	.....	FN-2	.....	$ 6.
		(Special marking — Specify marking desired.)	FN-5	.....	FN-6	.....	12.
1 29/32" x 3 27/32" Flat Nameplate with Mounting Holes for #6 Pan Head Screws	Square D NEMA 1 surface mounted enclosure or gray flush plate	(Blank)	FN-10	FN-20	FN-30	FN-40	6.
		High	FN-11	FN-21	FN-31	FN-41	6.
		Low	FN-12	FN-22	FN-32	FN-42	6.
		Forward	FN-13	.....	.....	.....	6.
		Reverse	FN-14	FN-24	.....	.....	6.
		(Special marking — Specify marking desired.)	FN-15	FN-25	FN-35	FN-45	12.

SQD SLV_000971

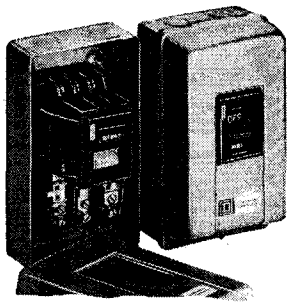
INTEGRAL HORSEPOWER MANUAL STARTERS

WITH OVERLOAD PROTECTION

CLASS 2510

Types M and T integral horsepower manual starters provide convenient "ON-OFF" operation of small single phase, polyphase, or DC motors. Typical applications include small machine tools, pumps, fans, and conveyors. The standard and LVP versions (see below) of Class 2510 Type M size M-O manual starters are now approved for group motor installations per NEC 430-53(c) in NEMA Types 4, 4X, 7 & 9 and 12 enclosures. For NEMA Type 1 enclosed Loom Switches and further information on group motor installations, refer to Page 198. See Pages 195-196 for ordering information, application data, and modifications.

- Push Button or Toggle Operators
- Optional Jog-Run Feature
- Reliable overload protection
- Pilot light and electrical interlock available.



Class 2510 Types M and T in General Purpose Enclosure

NON REVERSING — **CLASS 2510** — **MAX. VOLTAGE: 600 V. AC — 250 V. DC**

No. of Poles	NEMA Size	Ratings: Volts	Ratings: Max. HP Poly-Phase	Ratings: Max. HP Single Phase	General-Purpose Surface Mounting Enclosure NEMA Type 1◐ Type	Price*	Watertight and Dusttight Enclosure Stainless Steel NEMA Type 4 Type	Price*	Watertight, Dusttight and Corrosion-Resistant Glass-Polyester Enclosure NEMA Type 4X Type	Price*	For Hazardous Locations Class I — Groups C, D Class II — Groups E, F, G NEMA Types 7 & 9 Type	Price*	Dusttight and Driptight Industrial Use Enclosure NEMA Type 12▲ Type	Price*	Open Type With Square Buttons◐ Type	Price*	Number of Thermal Units
2 Pole	M-0	115 230	....	1 2	MBG-1†	$ 74.	MBW-11★	$202.	MBW-1★	$202.	MBR-1★	$282.	MBA-1★	$102.	MBO-1□	$ 66.	1
	M-1	115 230	....	2 3	MCG-1	94.	MCW-11	250.	MCW-1	250.	MCR-1	336.	MCA-1	122.	MCO-1	86.	1
	M-1P	115 230	....	3 5	MCG-2	138.	MCW-12	306.	MCW-2	306.	MCR-2	388.	MCA-2	166.	MCO-2	130.	1
3 Pole	M-0	115 200-230 380-575	.... 3 5	1 2	MBG-2†	88.	MBW-12★	216.	MBW-2★	216.	MBR-2★	298.	MBA-2★	116.	MBO-2□	80.	3
	M-1	115 200-230 380-575	.... 7½ 10	2 3	MCG-3	108.	MCW-13	264.	MCW-3	264.	MCR-3	352.	MCA-3	136.	MCO-3	100.	3
DC 2 Pole	M-0	115 230	1 HP—D.C. 1½ HP—D.C.		MBG-4	74.	MBW-14	202.	MBW-4	202.	....	....	MBA-4	102.	MBO-4	66.	1
	M-1	115 230	1½ HP—D.C. 2 HP—D.C.		MCG-5	94.	MCW-15	250.	MCW-5	250.	....	....	MCA-5	122.	MCO-5	86.	1

See below for footnotes

INTEGRAL HORSEPOWER MANUAL STARTERS WITH LOW VOLTAGE PROTECTION

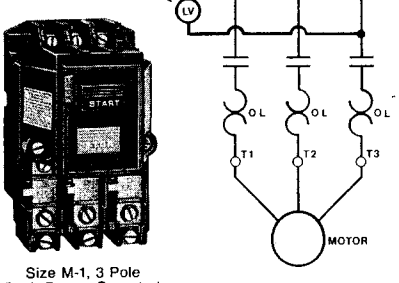
AND OVERLOAD PROTECTION

CLASS 2510

Types M and T manual starters with Low Voltage Protection (LVP) combine the features of the standard Types M and T with the additional advantage of protection from automatic start-up after a power loss. Low voltage protection is accomplished by a continuous duty solenoid which is energized whenever line side voltage is present. In the event of a loss of power, the solenoid de-energizes, opening the starter contacts. To close contacts after power returns, the starter must be manually reset.

Manual starters with LVP meet OSHA, ANSI, NFPA, and local safety standards requiring low voltage protection for certain applications. They are directly interchangeable with standard Types M and T and utilize the same enclosures and accessories. Typical applications include metal and woodworking machinery, grinders, mixers, conveyors, and power presses. See pages 195-196 for ordering information, application data, and modifications.

When ordering manual starters with low voltage protection, coil voltage (same as motor line voltage) must be specified.



Size M-1, 3 Pole Push Button Operated

NON-REVERSING — **CLASS 2510** — **MAX. VOLTAGE: 600 V. AC.**

No. of Poles	NEMA Size	Ratings: Motor Voltage	Ratings: Max. HP Poly-Phase	Ratings: Max. HP Single Phase	Ratings: Coil Voltage (60 Hz)	General-Purpose Surface Mounting Enclosure NEMA Type 1◐ Type	Price*	Watertight and Dusttight Enclosure Stainless Steel NEMA Type 4 Type	Price*	Watertight, Dusttight and Corrosion-Resistant Glass-Polyester Enclosure NEMA Type 4X Type	Price*	For Hazardous Locations Class I — Groups C, D Class II — Groups E, F, G NEMA Types 7 & 9 Type	Price*	Dusttight and Driptight Industrial Use Enclosure NEMA Type 12▲ Type	Price*	Open Type With Square Buttons◐ Type	Price*	Number of Thermal Units
2 Pole	M-0	115 230	....	1 2	120 240	MBG-21†	$118.	MBW-31★	$246.	MBW-21★	$246.	MBR-21★	$326.	MBA-21★	$146.	MBO-21□	$110.	1
	M-1	115 230	....	2 3	120 240	MCG-21	138.	MCW-31	294.	MCW-21	294.	MCR-21	388.	MCA-21	166.	MCO-21	130.	1
	M-1P	115 230	....	3 5	120 240	MCG-22	182.	MCW-32	350.	MCW-22	350.	MCR-22	432.	MCA-22	210.	MCO-22	174.	1
3 Pole	M-0	200 230 460 575	3 3 5 5	....	208 240 480 600	MBG-22†	132.	MBW-32★	260.	MBW-22★	260.	MBR-22★	342.	MBA-22★	160.	MBO-22□	124.	3
	M-1	200 230 460 575	7½ 7½ 10 10	....	208 240 480 600	MCG-23	152.	MCW-33	308.	MCW-23	308.	MCR-23	396.	MCA-23	180.	MCO-23	144.	3

*** PRICES DO NOT INCLUDE THERMAL UNITS. SEE ORDERING INFORMATION FOR SELECTION.**

◐**Devices listed have push button operators. To order toggle operated manual starters, replace prefix letter M by T in device type number;** e.g., Class 2510 Type TCG-3 — same list prices apply. NEMA Types 4, 4X, 7 & 9 and 12 enclosures use, as standard, external toggle operators (See page 197).

▲NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to Class 9991.

★Now approved for group motor installations per NEC 430-53(c).

†For a NEMA Type 1 enclosed starter approved for group motor installations refer to Loom Switch on page 198.

□Interiors can also be used for replacements in NEMA Types 4, 4X, 7 & 9 and 12 enclosures for group motor installations (Square button versions **only**).

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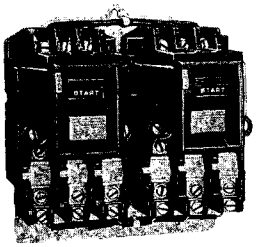


Class 2511 **Type MCO-1**

INTEGRAL HORSEPOWER MANUAL STARTERS

REVERSING AND TWO SPEED WITH OVERLOAD PROTECTION

CLASS 2511 2512

Class 2511 reversing and Class 2512 two-speed manual starters consist of two mechanically interlocked Class 2510 Types M or T manual starters. Reversing and two-speed starters are available with or without low voltage protection in NEMA Type 1 enclosures or open type. See page 196 for application data and modifications. Dimensions are on page 197.

When ordering manual starters with low voltage protection, coil voltage (same as motor line voltage) must be specified.

Class	Description	No. of Poles	NEMA Size	Ratings: Motor Voltage	Ratings: Maximum HP	Ratings: Coil Voltage (60 Hz)	General-Purpose Surface Mounting Enclosure NEMA Type 1◐ Type	General-Purpose Surface Mounting Enclosure NEMA Type 1◐ Price*	Open Type With Square Buttons◐ Type	Open Type With Square Buttons◐ Price*	Number of Thermal Units
REVERSING					**CLASS 2511**						**MAX. VOLTAGE: 600 V. AC**
2511	Standard	3 Pole	M-0	200-230 380-575	3 5	... ...	MBG-1	**$276.**	MBO-1	**$252.**	6
			M-1	200-230 380-575	7½ 10	... ...	MCG-1	**336.**	MCO-1	**312.**	6
	with Low Voltage Protection (LVP)	3 Pole	M-0	200 230 460 575	3 3 5 5	208 240 480 600	MBG-21	**364.**	MBO-21	**340.**	6
			M-1	200 230 460 575	7½ 7½ 10 10	208 240 480 600	MCG-21	**424.**	MCO-21	**400.**	6
TWO SPEED (WYE-CONNECTED SEPARATE WINDING MOTORS ONLY)					**CLASS 2512**						**MAX. VOLTAGE: 600 V. AC**
2512	Standard	3 Pole	M-0	200-230 380-575	2(3)★ 3(5)★	....	MBG-1	**276.**	MBO-1	**252.**	6
			M-1	200-230 380-575	5(7½)★ 7½(10)★	....	MCG-1	**336.**	MCO-1	**312.**	6
	with Low Voltage Protection (LVP)	3 Pole	M-0	200 230 460 575	2(3)★ 2(3)★ 3(5)★ 3(5)★	208 240 480 600	MBG-21	**364.**	MBO-21	**340.**	6
			M-1	200 230 460 575	5(7½)★ 5(7½)★ 7½(10)★ 7½(10)★	208 240 480 600	MCG-21	**424.**	MCO-21	**400.**	6

*** PRICES DO NOT INCLUDE THERMAL UNITS. SEE ORDERING INFORMATION FOR SELECTION.**

◐ Devices listed have push button operators. To order toggle operated manual starters, replace prefix letter M by T in device type number; e.g., Class 2512 Type TCG-21 same list prices apply.

★ Horsepower ratings shown without parenthesis are for Constant Horsepower. Ratings shown in parenthesis are for Constant Torque or Variable Torque.

CLASSES 2510, 2511 AND 2512 ORDERING INFORMATION REQUIRED

1. Class and type number of device.
2. Coil voltage and frequency (equal to line voltage).
3. Any special features required. Refer to page 196 for listing of factory and field modifications available.
4. Thermal units should be ordered separately. See information at right.

THERMAL UNITS

Starters will not operate without properly installed thermal unit. Thermal unit must be installed so that markings face the front of starter. Thermal units should be ordered separately. For selection of thermal units, refer to page 466 or refer to "Overload and Short Circuit Protector" in the Control Catalog. Standard trip thermal units are priced at **$6.00** each.

DIMENSIONS — Page 197
REPAIR PARTS KITS — See Class 9998

Class 9991 separate enclosures listed at right, allow installation of one Class 2510 Type MBO or MCO open style manual starters. Class 2510 Types TBO and TCO starters may also be installed in NEMA Type 1 flush mounting enclosures. All enclosures listed will accept starters with or without low voltage protection and are designed for greater flexibility of manual starter application. See Class 9991 for a complete listing of separate enclosures.

For Dimensions refer to Page 197.

SEPARATE ENCLOSURES FOR CLASS 2510

CLASS 9991

NEMA Type 1 General Purpose Flush Mounting: With Pullbox and Plaster Adjustment Type	Price△	Without Pullbox but with Mounting Strap Type	Price△	Watertight and Dusttight Enclosure stainless steel **NEMA Type 4▲** Type	Price△	Watertight, Dusttight and Corrosion-Resistant Glass-Polyester Enclosure **NEMA Type 4X▲** Type	Price△	Dusttight and Driptight Industrial Use Enclosure **NEMA Type 12▲** Type	Price△
MF-1	**$60.**	MF-2	**$36.**	MW-11	**$136.**	MW-1	**$136.**	MA-1	**$36.**

▲ NEMA Types 4, 4X and 12 enclosures will accept Class 2510 Type M push button operated starters only. NEMA Type 1 flush mounting enclosures will accept push button or toggle operated devices.

△ **D1B DISCOUNT**

SQD SLV_000973

INTEGRAL HORSEPOWER MANUAL STARTERS

WITH OR WITHOUT LOW VOLTAGE PROTECTION

CLASS
2510
2511
2512

APPLICATION DATA

Size—Available in NEMA Sizes M-0, M-1, and M-1P.

Poles—Two poles single phase; three poles polyphase; 2 poles dc (without Low Voltage Protection only).

Voltage—600 volts ac maximum; 250 volts dc maximum (without Low Voltage Protection only).

Overload Relays—Melting alloy thermal overload relays have provisions for one Type B thermal unit for single phase starters and three Type B thermal units for three phase starters. All thermal units must be installed and the device reset before the starter contacts will operate. After overload relays have tripped allow one or two minutes for the alloy to solidify before resetting.

Operator—Available with a pushbutton or toggle operator in open or NEMA Type 1 versions. The NEMA 4, 4X, 7 & 9 and 12 versions feature an external toggle of extremely rugged construction to actuate a push button device. Type M open type manual starters are also available with round extended buttons suitable for installation in enclosures of the user's own design.

Mechanism Lock Off—Both open devices and starters in NEMA Type 1 surface and flush mounting, NEMA types 4, 4X, 7 & 9 and 12 enclosures can be locked in the OFF or STOP position. In addition, the NEMA Type 1 surface mounting 4, 4X, 7 & 9 and 12 enclosures can be locked closed to prevent unauthorized entry.

TERMINALS

NEMA Size	Power Terminals		Auxiliary Interlock Terminals	
	Type of Lug	Wire Size (Solid or stranded copper wire) Min.—Max.	Type of Lug	Wire Size (Solid or stranded copper wire) Min.—Max.
M-0	Pressure Wire	#14—#8	Pressure Wire	#16—#12
M-1	Pressure Wire	#14—#8	Pressure Wire	#16—#12
M-1P	Box Lug	#14—#6	Pressure Wire	#16—#12

MAINTENANCE OF EQUIPMENT

For proper performance, all equipment should be periodically inspected and maintained. Replacement contacts and interlocks are available in kit form to facilitate servicing and stocking. In addition, the service bulletin referenced contains an exploded view of the device with components clearly marked for easy identification by description and part number.

NEMA Size	Series	No. of Poles	Service Bulletin		Replacement Contact Kit	
			Without Low Voltage Protector	With Low Voltage Protector	Class	Type
M-0	A	2 or 3	312AS	369AS	9998	ML-1
	B	2 or 3	312AS	411AS	9998	ML-1
M-1	A	2 or 3	312AS	369AS	9998	ML-2
	B	2 or 3	312AS	411AS	9998	ML-2
M-1P	A	2	312AS	369AS	9998	ML-2
	B	2	312AS	411AS	9998	ML-2

For replacement electrical interlocks refer to listing under modification.



Electrical Interlock

ACCESSORIES AND MODIFICATION KITS



Pilot Light Kit

One ELECTRICAL INTERLOCK, either N.O. or N.C. can easily be added internally to any open or enclosed manual starter. It occupies the space provided in either the upper right hand or left hand corners of the device. These interlocks are for ac loads only. Electrical ratings are shown in Class 9999 Type SX-11 and SX-12, page 455.

A JOG-RUN selector can be factory installed to provide both momentary and maintained operation. This modification is ideal for applications where **moderate** jogging is encountered, such as machine set-up or occasional positioning. The Jog-Run selector switch is available on NEMA Type 1 ac enclosed and open style starters. Since the Jog-Run selector switch is an integral part of the starter, it is not practical to add Form M2 in a NEMA Types 4, 4X, 7 and 9, or 12 enclosure. Access to the starter is not readily available to enable operator to easily change from Jog to Run.



Jog-Run Selector

A unique red PILOT LIGHT assembly that just clips into place is available **factory installed** on NEMA Types 1, 4, 4X, 12 and flush enclosures or as a **field modification kit** on the NEMA Type 1 surface or flush mounting General Purpose enclosures. Not available on NEMA Type 7 & 9 enclosures. The color cap assembly snaps into a knockout in the enclosure cover on the General Purpose enclosures. Pilot light kits are available for use on various voltages (110-600 volts). The replacement bulb for all the pilot lights is an ASA B2A.

A REMOTE EMERGENCY STOP function may be **factory added** to manual starters with Low Voltage Protection. The user then wires a N.C. pushbutton or other control device in series with the LVP coil. After operation of the emergency stop, the starter must be manually reset.

MODIFICATIONS

Description	FACTORY MODIFICATIONS AND FORMS		FIELD MODIFICATIONS	
	Form Number	Price Addition	Kit Class & Type	Price
JOG-RUN▲ Selector	M2	**$ 8.**	Factory Installed only	....
Pilot Light†	P11	**32.**	9999 MP-1 (110-120 V.) 9999 MP-2 (208-240 V.) 9999 MP-3 (440-600 V.)	**$20.◐**
Electrical Interlocks	X	**44.**	9999 SX-11 (N.O.) 9999 SX-12 (N.C.)	**24.◐**
Provisions for Remote Stop■	N10	N.C.	Factory Installed Only	....
Separate Control of LVP Coil■	N10S	N.C.	Factory Installed Only	....
LVP Coil Wired to Transformer Secondary★	FN10T	**108.**	Factory Installed Only	....

▲Available on ac starters, NEMA Type 1, flush and open devices only.
† Can be field added to NEMA Type 1 enclosures only.
■ Available on starters with low voltage protection only.
★ Available on starters with LVP in NEMA Types 1 or 12 enclosures only. (Not approved for group motor installations.)

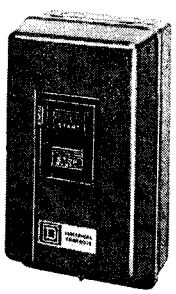
◐ D1B DISCOUNT

SQD SLV_000974

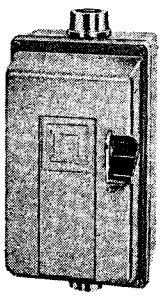
INTEGRAL HORSEPOWER MANUAL STARTERS
WITH OR WITHOUT LOW VOLTAGE PROTECTION

CLASS
2510
2511
2512

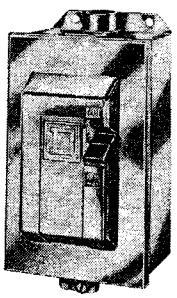
A VARIETY OF ENCLOSURES TO FIT EVERY APPLICATION



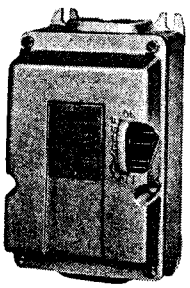
NEMA Type 1
General Purpose Surface Mounting
Flush Mounting also Available



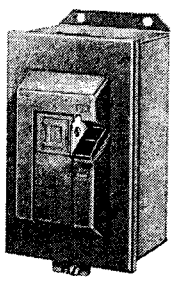
NEMA Type 4X
Watertight, Dusttight, and
Corrosion Resistant Glass
Polyester



NEMA Type 4
Watertight and Dusttight
Stainless Steel

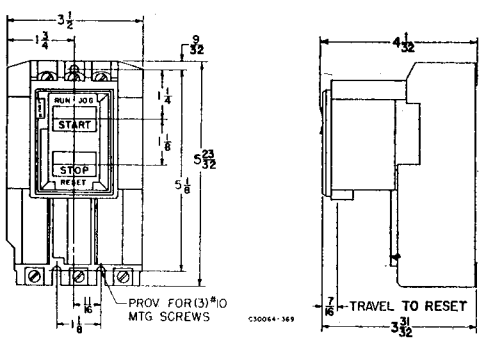


NEMA Type 7 & 9
Hazardous Locations

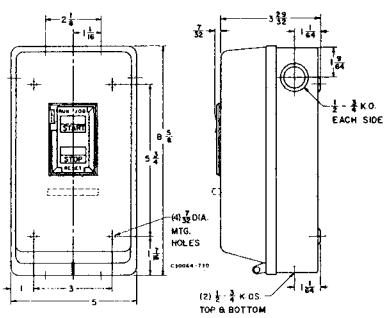


NEMA Type 12
Dusttight and Driptight
Industrial Use

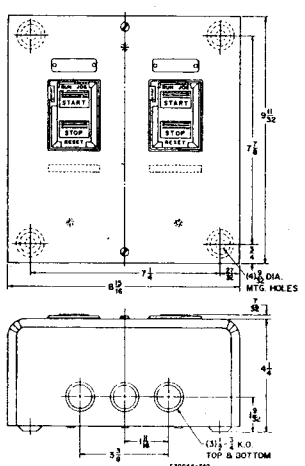
APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS



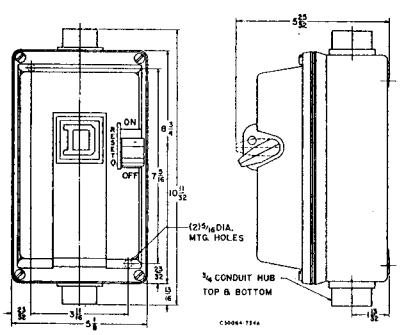
Class 2510 Type M Sizes M-0, M-1 and M-1P, Open Type
Approximate Shipping Weight — 3 Lbs.



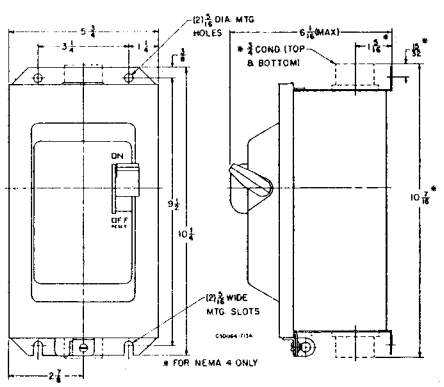
Class 2510 Types M & T Sizes M-0, M-1 and M-1P NEMA Type 1, General Purpose Enclosure and Class 2510 Type TBL Loom Switch
Approximate Shipping Weight — 5 Lbs.



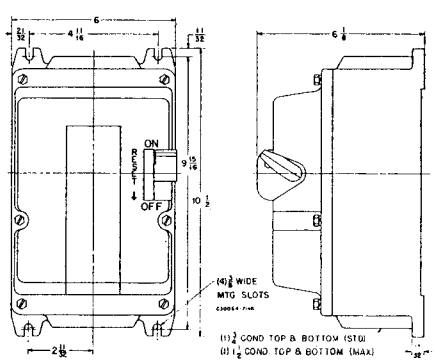
Classes 2511, 2512, Types M & T Sizes M-0 and M-1 NEMA Type 1, General Purpose Enclosure
Approximate Shipping Weight — 9 Lbs.



Class 2510 Type M Sizes M-0, M-1 and M-1P, NEMA Type 4X Watertight Corrosion-Resistant Glass Polyester Enclosure
Approximate Shipping Weight — 6 Lbs.



Class 2510 Type M Sizes M-0, M-1 and M-1P NEMA Type 4, Watertight Stainless Steel Enclosure NEMA Type 12, Dusttight Industrial Use Enclosure and Class 2510 Type MBL Loom Switch
Approximate Shipping Weight — 9 Lbs.



Class 2510 Type M Sizes M-0, M-1 and M-1P NEMA Type 7 & 9, Hazardous Location Cast Iron Enclosure
Approximate Shipping Weight — 18 Lbs.

SQD SLV_000975

AC MANUAL LOOM SWITCHES

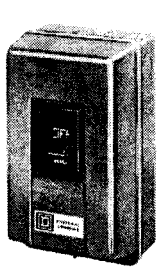
FOR TEXTILE LOOMS AND OTHER GROUP MOTOR INSTALLATIONS PER NEC 430-53(C)

CLASS 2510

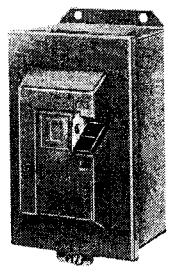
- Reliable Overload Protection
- Straight through wiring for quick and easy installation
- Available with low voltage protection
- Addition of one electrical interlock, either N.O. or N.C., for greater control flexibility
- Trip mechanism to prevent disassembly with contacts closed

For many applications, particularly in the Textile Industry, manual starters are required for group motor installations. Class 2510 Type TBL devices are NEMA Type 1 Enclosed Loom Switches which are used with textile looms and other group fused motors. The NEMA Type 1 enclosed Loom Switches utilize standard open type manual starters as the interior with a special enclosure designed specifically for group fusing and severe mill service where lint accumulations are common, and humidifiers create dampness. In applications where NEMA Types 4, 4X, 7 & 9 and 12 enclosed manual starters are required, the standard Class 2510 Type M Size M-O manual starters are approved for group motor installations per NEC 430-53 (c).

For additional application data covering the standard Type M manual starter line, see pages 194 through 197.



Type TBL-2
NEMA Type 1



Type MBA-2
NEMA Type 12

3-POLE — **600 VOLTS MAX., AC**

NEMA Size	Volts	Maximum Horsepower Suitable for Group Fusing		Enclosure	Standard Device		Device with Low Voltage Protection△		Interior Replacement Starter				
									Standard Device		Device with Low Voltage Protection		No. of Thermal Units Required
		Polyphase	Single Phase		Type	Price*	Type	Price*	Type	Price*	Type	Price*	
M-O	115	....	1	NEMA Type 1 General Purpose	TBL-2	$ 88.	TBL-22	$132.	TBO-2	$80.	TBO-22	$124.	3
	200	3	....										
	230	3	2	NEMA Type 12 Linttight	MBA-2 (Formerly MBL-2)	116.	MBA-22 (Formerly MBL-22)	160.	MBO-2	80.	MBO-22	124.	3
	380-575	5	....										

*** Prices do not include thermal units. SEE ORDERING INFORMATION FOR SELECTION.**
△Line voltage required.
FOR DIMENSIONS REFER TO PAGE 197.

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Quantity and type number of thermal units.
3. Coil voltage and frequency if LVP device.
4. Any special features required.

THERMAL UNITS should be ordered separately. See Selection Index on Page 466 or refer to "Overload and Short Circuit Protector" in the Control Catalog. Standard trip units are priced at **$6.00** each. Devices require 3 thermal units.

FACTORY MODIFICATIONS			FIELD MODIFICATIONS
Modifications	Form Number	Price Addition	Kit Class & Type
JOG-RUN◐ Selector	M2	$ 8.	Factory Installed only
Electrical Interlocks	X	44.	9999 SX-11 (N.O.) 9999 SX-12 (N.C.)

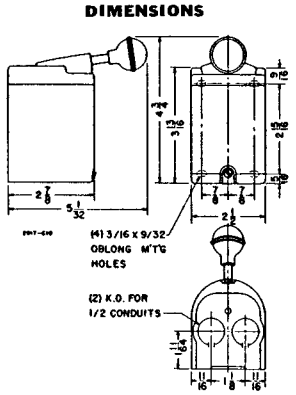
◐Available on Type TBL or TBO only.

REVERSING DRUM SWITCHES

CLASS 2601

Class 2601 reversing drum switches may be used for across-the-line starting and the reversing of ac polyphase, ac single phase, or dc motors. They are compact and inexpensive but ruggedly constructed. Drum Switches are field convertible from maintained to momentary operation. This conversion consists of unscrewing the handle, removing the hub, turning the shaft 180 degrees, and then replacing the hub and handle.

DIMENSIONS



Class 2601, Type AG
Weight — 1½ Lbs.

600 VOLTS MAX. AC — **250 VOLTS MAX. DC**

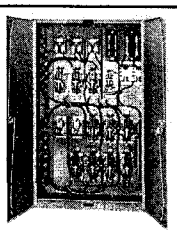
Internal Switching			3 Phase Wiring Diagram	Volts	Ratings: Maximum Horsepower AC Single Phase	Ratings: Maximum Horsepower AC Poly-Phase	Ratings: Maximum Horsepower DC	General Purpose Enclosure NEMA Type 1◐ Type	General Purpose Enclosure NEMA Type 1◐ Price
Rev.	Off	For.		115 230 200-575	1½ 2 ...	2 ... 2	¼ ¼ ...	AG-2	$ 44.
Rev.	Off	For.		115 200-230 230 460-575	1½ ... 3 5	3 5 ... 7½	2 ... 2 ...	BG-1	120.

◐It is recommended that these drum switches be mounted in the vertical position.

ORDERING INFORMATION REQUIRED

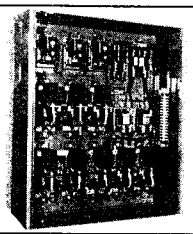
1. Class and type number of drum switch.
2. Horsepower, voltage and phase of motor.

SQD SLV_000976



Class 6121 Control Panels

- Reversing dynamic lowering control for hoist drives
- Reversing plugging control for bridge and trolley drives
- Recommended for CMAA service classifications A1, C, D, E, and F
- 5 speed points
- Large number of panel modifications available
- Available in NEMA contactor sizes 3 through 8, single and multiple motors
- Uses Class 7004 Type M contactor and Type K relays

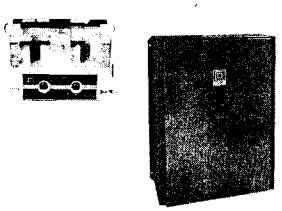


Class 6131 Control Panels

- Reversing dynamic lowering control for hoist drives
- Reversing plugging control for bridge and trolley drives
- Recommended for CMAA service classifications A2 and B
- 3 or 4 speed points
- Limited panel modifications available
- Available in NEMA contactor sizes 1 through 4, single motors only
- Uses Class 7004 Type M contactors and Class 7001 Type K relays

AC AND DC CRANE CONTROL

ACCESSORIES

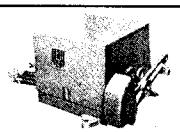


Class 6590 Radio Control

- Used for remote operation of multi-speed motor controllers on overhead traveling cranes and other electrically operated material handling vehicles
- Operating Frequency — 72 to 76 MHZ
- Normal Operating Range — 200 to 300 feet
- Available with up to 4 multi-speed motor switches and 4 single point or two or three position selector switch auxiliary functions.

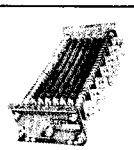


- **Class 6140 Manual Magnetic Disconnect Switch for DC Crane Control**
- **Class 6440 Manual Magnetic Disconnect Switch for AC Crane Control**
- **Class 6820 Manual & Magnetic Disconnect Switch for Magnet Control**
- **Class 6823 Manual Disconnect Switch for Magnet Control**



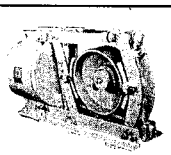
Class 6170 YOUNGSTOWN® Hoist Power Limit Switch

- Limits upper travel of hoist
- Interrupts motor power directly



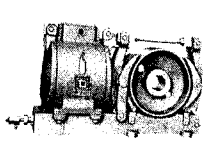
Class 6715 TAB-WELD® Resistors

- Used in motor circuits to control acceleration and speed regulation
- Available in continuous ampere rating of 13 amperes to 500 amperes
- Applicable where environmental conditions of vibration and dirt are severe



Class 5010 WB Brakes

- Used to hold drive stationary when motor is off
- Spring set electrically released, dc shoe type
- Available in 8″ through 30″ wheel diameters
- Torque ratings 100 foot-pounds through 9000 foot-pounds



Class 5060 Adjustable Torque Brakes

- Used on bridge and trolley drives
- Provides fixed holding torque for parking
- Provides electrically controlled adjustable torque for stopping
- Available in 10″, 13″ and 16″ wheel diameters with corresponding torque ratings of 200, 550 and 1000 foot-pounds

For additional information refer to Class 5010 and Class 6121 in your Control Products Catalog.

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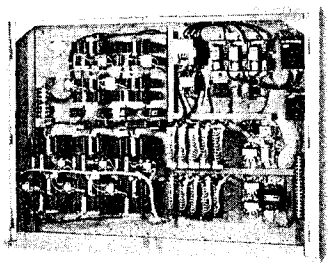
AC CRANE CONTROL

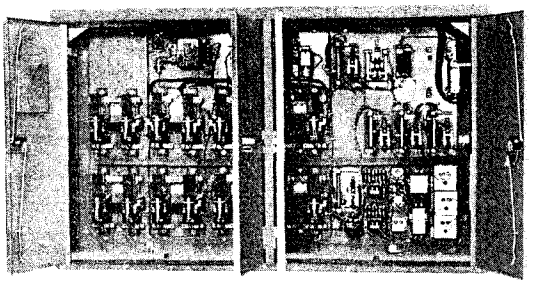
CLASS 6400



Class 6401 STATA® Control Panels

- Thyristor control for ac wound rotor motors
- Stepless, static-reversing, tachometer speed regulator hoist control
- Stepless, contactor-reversing bridge or trolley control
- Suitable for all CMAA service classifications
- Recommended for CMAA service classifications D, E, and F

AC MAGNETIC CONTROL PANELS



- For control of ac wound rotor motors
- Suitable for all CMAA service classifications
- Recommended for CMAA service classifications D, E, and F
- Uses Class 8503 Type M clapper type contactors
- Uses Class 8503 Type ZF frequency acceleration relays

Class 6420 EDDYMAG® Hoist Control

- Uses eddy current electric load brake
- Provides slow, hoisting and lowering speeds for all loads

Class 6421 AC Dynamic Lowering Hoist Control

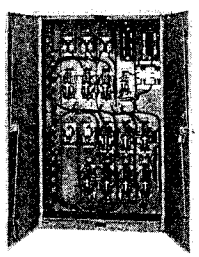
- Uses single phase motor connection for dynamic lowering
- Suitable for applications not requiring slow lowering speeds

Class 6422 CONTRA-TORQUE® Hoist Control

- Provides slow, hoisting and lowering speeds for overhauling loads only.
- Recommended for magnet and bucket cranes.

Class 6426 Reversing Plugging Bridge or Trolley Control

- Provides accurate plugging control with Type ZF frequency relay,



Class 6424 DC Control Panels

- Controls dc series wound motor with dc control panel and rectifier power supply
- Reversing dynamic lowering control for hoist drives
- Suitable for all CMAA service classifications
- Recommended for CMAA service classifications D, E, and F
- 5 speed points
- Large number of panel modifications available
- Available in NEMA contactor sizes 3 though 8, single and multiple motors
- Uses Class 7004 Type M contactor and Type K relays

For additional information refer to Class 6401 in your Control Products Catalog

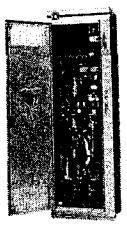
SQD SLV_000978

SOLID STATE PUMP CONTROL SYSTEMS

Solid state pump control systems are coordinated AC adjustable speed controllers for variable torque pump, fan and blower applications. These systems consist of: Class 6520 or Class 6521 adjustable speed controllers, Class 6522 LEVEL/PAK® controls, Class 6523 pressure transducers and Class 6524 programmers. These systems may be applied in sewage-lift stations, water booster stations, cooling towers, chemical processing plants, air conditioning installations, and similar applications which demand accurate pressure, level, flow or temperature control.

CLASS 6520 6521 6522 6523 6524

Class 6520 Primary Voltage Solid State Pump Controllers



- 50% Speed Range Adjustable Speed Controllers
- Simplex and Duplex Adjustable Speed Thyristor Control
- Stepless Speed Control
- Control for High Slip Squirrel Cage or Wound Rotor Motors
- Full Wave Control
- Suitable for Variable Torque Loads that Decrease with Speed
- MCC Construction

Class 6521 ECONOPAK Slip Recovery Solid State Pump Controllers



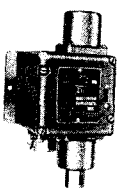
- 50% and 100% Speed Range Adjustable Speed Controllers
- Simplex and Duplex Adjustable Speed Control
- Stepless Speed Control
- Control for Wound Rotor Motors
- High Efficiency
- MCC Construction

Class 6522 LEVEL/PAK Solid State Pump Controllers



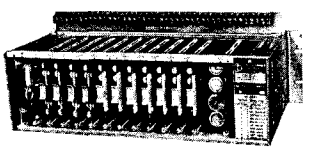
- Simplex and Duplex Solid State Level Control
- Programs Adjustable and Constant Speed Pump and Alarms
- Bubbler Type Level Control
- MCC Construction

Class 6523 Pressure Transducer



- Self-contained Electronic Circuits
- Linear Variable Differential Transformer (LVDT) Type
- Standard Class 9012 Pressure Switch Mechanism
- 0-10 or 4-20 dc ma Output signal
- NEMA 13 Enclosure

Class 6524 Programmer

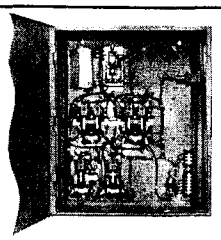


- Solid State Programmable Modules
- Programs Adjustable & Constant Speed Pumps & Alarms
- Accept 0-10, 0-20, & 0-50 dc ma Input Signals
- Proportional or Integral Control
- Self-Contained Mounting Rack

DC MOTOR STARTERS
REDUCED VOLTAGE TYPE

CLASS 7135 7136 7145 7146

DC reduced voltage starters are used to accelerate shunt, series and compound wound dc motors. Some typical applications where dc motors are used are: machine tools, conveyors, pumps, blowers, fans, process lines, etc.



STANDARD STARTERS AVAILABLE IN NEMA SIZES 1 THROUGH 5

- Time Limit Acceleration to accelerate the motor in a definite time independent of load.
- Solid State Acceleration Timers
- Acceleration Resistors mounted and wired as an integral part of the starter
- Undervoltage and Thermal Overload Protection
- Complete Front Mounting and Wiring
- Up to 75 HP at 230V Dc
- Up to 40 HP at 115V Dc
- Rugged Mill Duty Components

SYNCHRONOUS MOTOR STARTERS

Class 8820 full voltage starters provide a simple, reliable and automatic method of starting synchronous motors using an electromagnetic scheme.

Class 8822 reduced voltage autotransformer type synchronous starters are used whenever it is necessary to limit either the motor inrush or the motor torque on starting.

CLASS 8820 8822

STANDARD STARTERS AVAILABLE IN NEMA SIZES 1 THROUGH 5

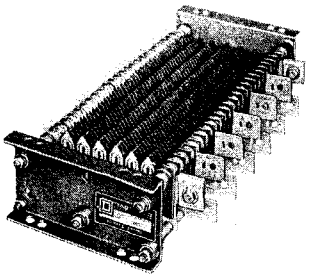
- Solid State Synchronizing and Protection Module for Synchronizing Function
- 1.0 and 0.8 Power Factor Correction
- 230V or 460V Ratings
- MCC Construction

SQD SLV_000979

TAB-WELD®
PLATE RESISTOR

CLASS 6715

Class 6715 TAB-WELD Resistors are heavy duty units designed for hard worked applications such as accelerating and speed regulating service on electric overhead cranes or other mill applications where environmental conditions of vibration and dirt are severe.



RATING

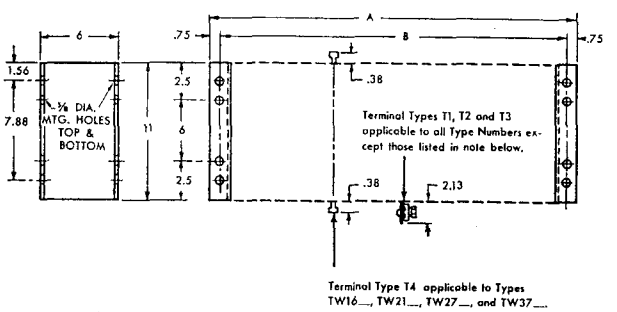
Ampere ratings shown in the table below are based on continuous duty. Intermittent ratings for all grid sizes are listed under Class 6715 in the Control Products Catalog.

0-600 VOLTS, AC & DC

Continuous Ampere Capacity (375° C. Rise)	26½" Sections				18" Sections				12½" Sections				Extra Unmounted Terminals	
	Resistance in Ohms at 25° C.				Resistance in Ohms at 25° C.				Resistance in Ohms at 25° C.					
	Total In Sections	Between Taps	Type	Price ★	Total In Sections	Between Taps	Type	Price ★	Total In Sections	Between Taps	Type	Price ★	Type	Price
500	.0214	.0039	TW500D	**$500.**	.....		.....	....	.....	.....	.....	....	T1	**$16.**
430	.0306	.0051	TW430D	**500.**	.....	.....	.....	....	.....	.....	.....	....		
360	.0432	.0072	TW360D	**500.**	.....	.....	.....	....	.....	.....	.....	....		
280	.0748	.0088	TW280D	**500.**	.....	.....	.....	....	.....	.....	.....	....	T2	**8.**
220	.126	.014	TW220D	**500.**	.....	.....	.....	....	.....	.....	.....	....		
180	.198	.022	TW180D	**500.**	.....	.....	.....	....	.....	.....	.....	....		
150	.231	.021	TW150D	**460.**	.126	.021	TW150E	**$280.**	.063	.021	TW150F	**$220.**		
120	.341	.031	TW120D	**460.**	.186	.031	TW120E	**280.**	.093	.031	TW120F	**220.**		
100	.504	.042	TW100D	**460.**	.252	.042	TW100E	**280.**	.126	.042	TW100F	**220.**		
85	.741	.057	TW85D	**460.**	.399	.057	TW85E	**280.**	.171	.057	TW85F	**220.**		
72	1.02	.073	TW72D	**460.**	.511	.073	TW72E	**280.**	.219	.073	TW72F	**220.**	T3	**6.**
62	1.44	.17	TW62D	**460.**	.680	.17	TW62E	**280.**	.340	.17	TW62F	**220.**		
50	2.55	.30	TW50D	**460.**	1.20	.30	TW50E	**280.**	.600	.30	TW50F	**220.**		
42	4.14	.362	TW42D	**460.**	2.16	.362	TW42E	**280.**	1.086	.36	TW42F	**220.**		
32	6.96	.584	TW32D	**460.**	3.77	.584	TW32E	**280.**	1.752	.58	TW32F	**220.**		
37	5.20	.118	TW37D	**560.**	2.83	.118	TW37E	**360.**	1.30	.118	TW37F	**240.**		
27	9.55	.217	TW27D	**560.**	5.20	.217	TW27E	**360.**	2.38	.217	TW27F	**240.**		
21	15.75	.350	TW21D	**560.**	8.75	.350	TW21E	**360.**	3.85	.350	TW21F	**240.**	T4	**4.**
16	25.20	.56	TW16D	**560.**	14.00	.56	TW16E	**360.**	6.15	.56	TW16F	**240.**		
13	40.00	.85	TW13D	**560.**	22.10	.85	TW13E	**360.**	10.20	.85	TW13F	**240.**		

★Price includes 2 Terminals.

APPROXIMATE DIMENSIONS — NOT TO BE USED FOR CONSTRUCTION UNLESS SPECIFICALLY ENDORSED.



Terminal Type T4 applicable to Types TW16__, TW21__, TW27__, and TW37__.

Applicable to Type Numbers with following suffix	A	B	Net Wt. per section
TW-D	26.5	25	35
TW-E	18	16.5	22
TW-F	12.5	11	18

ORDERING INFORMATION REQUIRED

1. Class and type number of resistor.
2. Quantity and type number of extra unmounted terminals (if required).

Resistors with Isolated Sections — Resistors with either 2 or 3 isolated sections are available in the 26½ inch 13 thru 50 ampere sizes. These resistors are intended for use as accelerating resistors in the secondary of an ac wound motor, where isolated sections are needed for each rotor phase. The two types of resistors are designated as TWD2 or TWD3. The D denotes section length, and the numeral indicates the number of separate isolated grid groups. Isolating points are located at the ⅓ ⅔ point on D2 resistors and at ⅓ intervals on D3 resistors.

Special Resistors—To conserve space and material, special resistors can be supplied which are made with more than one size grid in a given frame. These "tapered" resistors must be factory engineered. Full details regarding proposed applications of this type should be forwarded to your Square D Field Office for pricing.

UNI-STACK Racks — Resistor racks are available both wired and unwired. They are also available with enclosures.

For further details, pricing and ordering information, see the Class 6715 section of the Heavy Industry Control catalog.

DC MAGNETIC RELAYS

CLASS 7001

See Class 8501, Pages 220 and 221 and Class 7001 in the Control Products Catalog.

UNI-STACK is a Trademark of Square D Company

SQD SLV_000980

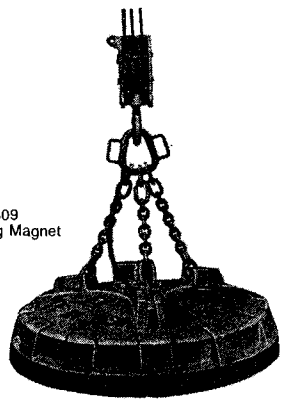
MAGNET AND MAGNET CONTROLLERS

SCRAP HANDLING MAGNETS

CLASS 6800

(Formerly 1300)

- Designed specifically for scrap handling operations.
- High lift to weight ratio means greater pay load on crane.
- Cooler operation for bigger lifts all day long.
- Available in Standard and Deep Field versions.
- Diameters 40 - 100 inches.
- 230V DC standard. Other coil voltages available.



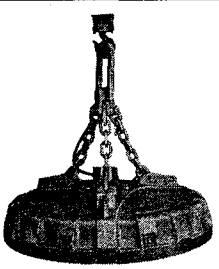
Class 6809
Scrap Handling Magnet

Class 6809 Type	Dia. (In.)	Field Depth	Approx. Weight (Lbs.)	Volts	Cold Current (Amperes)	Recommended Controller Class 6815	Suggested Generator (KW)‡	*Approximate Lifting Capacities (Lbs.) #1 Heavy Melting Scrap	Plate Punchings	Pipe Scrap
40SH	40	Standard	1700	230	33	A80	10	1010	1190	590
45SH	45	Standard	2300	230	37	A80	10	1430	1650	885
45DSH	45	Deep	2700	230	40	A80	10	1500	1720	950
54SH	54	Standard	3600	230	53	A80	15	2470	2920	1410
54DSH	54	Deep	4150	230	59	A80	15	2560	3000	1500
63SH	63	Standard	5500	230	73	A80	15	3800	4200	2150
63DSH	63	Deep	6180	230	79	A80	20	3970	4350	2280
69SH	69	Standard	6800	230	89	A130	20	4290	5560	2950
69DSH	69	Deep	8000	230	94	A130	20	4520	5770	3150
75DSH	75	Deep	10980	230	114	A130	30	5650	7380	4400
87DSH	87	Deep	15450	230/134	237/139†	R22	40	8360	10700	6400
100DSH	100	Deep	23000	230/135	265/170†	R22	50	10300	13000	8200

‡ Values are given only as a guide. Refer to generator specifications for maximum allowable amperes.

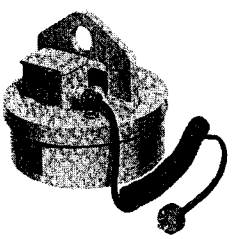
* Approximate average (All Day) lifting capacities. Lifting capacities are based on optimum conditions. Performance will vary due to specific operating conditions.

† This magnet is designed for use with a High Speed Charge and Discharge Type Magnet Controller on a 230 V dc system.



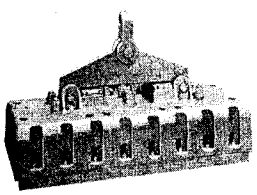
Class 6810
Steel Mill Circular Magnets

- **Designed specifically for use in steel mill applications.**
- **Maximum lifting capacity when handling slabs, plate, ingots, molds and crops.**
- **Extra rugged ribbed case with deep pole shoes for longer service.**
- **Standard and Deep Field versions.**
- **Diameters 39 - 84 inches.**
- **Available with copper or aluminum wound coils.**



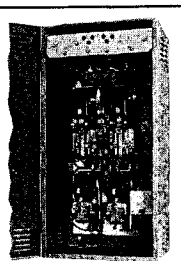
Class 6814
Utility Magnets

- **For light scrap and clean up.**
- **Ideal for shop and foundry handling of rough castings, billets and bars.**
- **May be used in clusters for handling plate.**
- **Available in sizes from 8" to 24".**
- **Available in AC and DC voltages.**



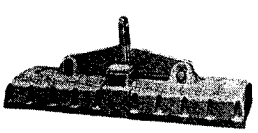
Class 6811
Billet Handling Magnets

- **For billet, rail, and bar handling.**
- **Suitable for handling material at elevated temperature.**
- **Encapsulated coils.**



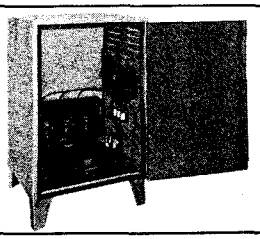
Class 6815
Lifting Magnet Controllers

- **For use with Square D and competitive magnets.**
- **Reliable, rugged, easy to maintain.**
- ***Designed for push button or master switch operation.***



Class 6813
Plate Handling Magnets

- **Specifically designed for general plate handling applications.**
- **For handling single plates or stacks of plates.**
- **Suitable for use in clusters for handling very large plates.**
- **Horizontal and vertical handling.**



Class 6825 Power
Conversion Unit

- **Converts 3 Phase AC to 230V DC.**
- **Ideal for magnets on AC cranes.**
- **Designed for lifting magnet service.**
- **Capacities for all magnet sizes.**
- **Convection-cooled.**

For additional information on lifting magnets, controllers and accessories, refer to Catalog 6800, available by writing Square D Company, P.O. Box 472, Milwaukee, Wisconsin 53201.

SQD SLV_000981

5 KV MEDIUM VOLTAGE CONTROLLERS

AIR BREAK — 5000 VOLTS MAXIMUM — NEMA CLASS E2

Medium Voltage controllers are recommended for motors above 200 horsepower to reduce the overall cost of an installation. These controllers utilize a single contactor size (NEMA Size H3, 5000 Volts, 360 amps enclosed rating). This feature provides greater flexibility for field changes such as contactor interchangeability or change in motor horsepower. It also reduces spare parts stocking to minimum.

THE CONTROLLERS ARE DESIGNED TO MEET UL STANDARD 347, NEMA STANDARD ICS-2-324 AND REQUIREMENTS FOR CERTIFICATION BY CANADIAN STANDARDS ASSOCIATION

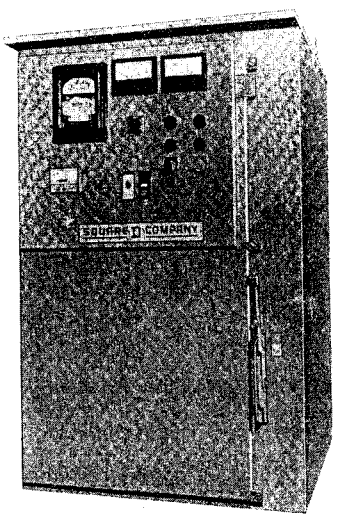
MINI-FLEX™ CONTROLLER

INDIVIDUALLY MOUNTED

CLASS 8196

NEMA 1 Enclosure 34″ W, 35″ D, 54″ H

Options:
NEMA 1 Gasketed
NEMA 12 or
NEMA 3 Enclosure



For Squirrel Cage motors and transformer loads.
- Full Voltage Non-Reversing
- Latched Contactors

Ideal for installations where height is limited.
Can be shipped as part of complete package by original equipment manufacturers. Typical examples are:
- Deep well pumping
- Chiller Equipment
- Compressor Equipment

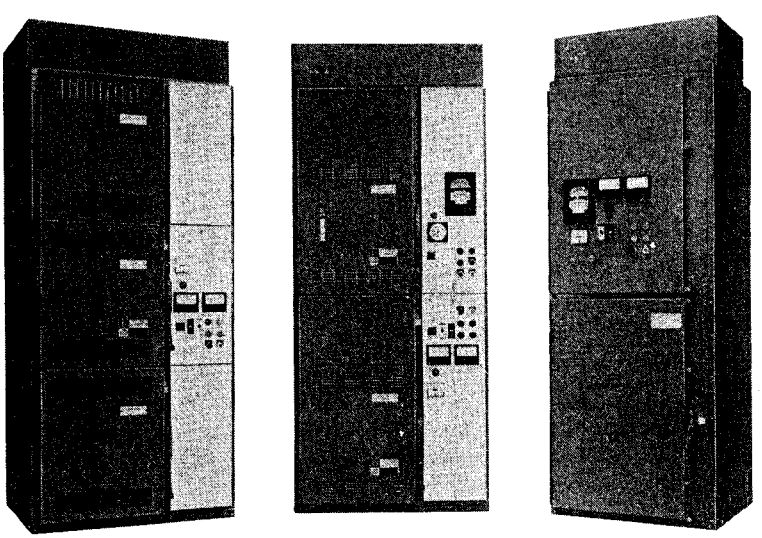
ISO-FLEX® CONTROLLER

MOTOR CONTROL CENTER CONSTRUCTION

CLASS 8198

NEMA 1 Enclosure: 42″ W, 35″ D, 90″ H (Two and Three High)
34″ W, 35″ D, 90″ H (One High Only)
(Add 10″ To Height For Horizontal Power Bus)

Options:
NEMA 1 Gasketed
NEMA 12 or
NEMA 3 Enclosures



For Squirrel Cage, synchronous or wound rotor motor and for transformer loads.
- Full Voltage Non-Reversing
- Full Voltage Reversing
- Reduced Voltage Primary Reactor or Autotransformer Type
- Latched Contactors
- Special Controllers for:
  - Two/Three Speed Motors
  - Transfer Schemes
  - Motor Test Stands

MINI-FLEX is a Trademark of Square D Company.
ISO-FLEX is a Registered Trademark of Square D Company.

For complete information refer to Class 8196 and 8198 in your Catalog.

SQD SLV_000982

CONTROL RELAY SELECTION GUIDE

CLASS 8501

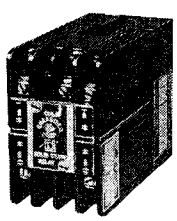
INDUSTRIAL CONTROL RELAYS



Pages 206-210

TYPE L
CONVERTIBLE CONTACTS

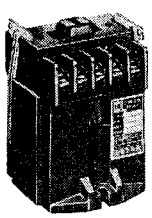
- 600 Volt 10 Amp Rating (NEMA A600)
- 2-8 Poles
- Mounting Track
- Plug-in Contacts
- Small Size
- Economically Priced
- Timing & Latch Attachments
- AC Operation



Page 211

TYPE LS
SOLID STATE

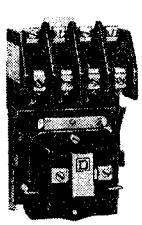
- 120 Volt 1.5 Amp Rating
- 2-4 Poles
- Convertible Contacts
- Extremely Long Life
- Unaffected by dirt & dust
- Transient Protected
- For High Duty Cycle
- AC Operation



Pages 212-215

TYPE G
CONVERTIBLE CONTACTS

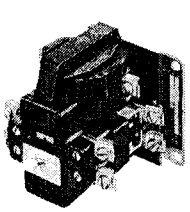
- 300 Volt 10 Amp Rating
- 2-12 Poles
- Mounting Track
- Small Size
- Timing & Latch Attachments
- Special Contacts
- Transient Suppressor
- AC or DC Operation



Pages 216-219

TYPE H
CONVERTIBLE CONTACTS

- 600 Volt 15 Amp Rating (NEMA A600)
- 2-12 Poles
- Mounting Track
- Timing & Latching Relays
- Optional Transient Suppressed Coil
- Visible Contacts
- Adder Poles
- AC or DC Operation

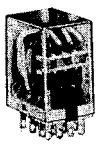


Pages 220-221

TYPE D
FIXED CONTACTS

- 600 Volt 10 Amp Rating
- 2-8 Poles
- Small Size
- Visible Contacts
- Timer Option
- AC or DC Operation

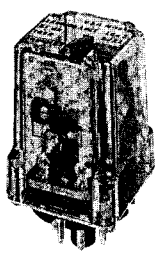
GENERAL PURPOSE CONTROL RELAYS



Pages 222-224

TYPE R
MINIATURE RELAY

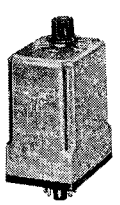
- 240 Volts, 3 or 5 Amp Rating
- Horsepower Rating
- 4 PDT
- AC or DC Operation
- Track or Panel Mounted Sockets
- Back Wired Sockets
- Manual Operator Option
- Pilot Light Option



Pages 225-227

TYPE K
ICE CUBE RELAY

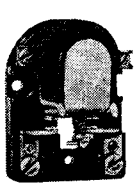
- 240 Volts, 10 Amp Rating
- Horsepower Rating
- 2 PDT or 3 PDT
- AC or DC Operation
- Track or Panel Mounted Sockets
- Back Wired Sockets
- Pilot Light Option
- Manual Operator Option



Page 228

TYPE JCK
ICE CUBE TIMING RELAY

- 240 Volt 5 Amp Rating
- Horsepower Rating
- 2 PDT
- Timing Ranges from 0.1 to 180 Seconds
- ± 2% Repeat Accuracy
- On and Off Delay Versions
- Transient Protected
- Dual AC/DC Operation



Pages 229-230

TYPE C
HORSEPOWER RATED

- 600 Volt 30 Amp Rating
- 2 Horsepower Rating
- 1-2 Poles
- Visible Contacts
- AC or DC Operation

ADDITIONAL RELAYS

Intrinsically safe and resistance sensitive relays are available. Consult local Square D field office for other types of AC or DC relays.

ADDITIONAL TIMING RELAYS

PNEUMATIC ..... See Class 9050

SOLID STATE ..... See Class 9050

SQD SLV_000983

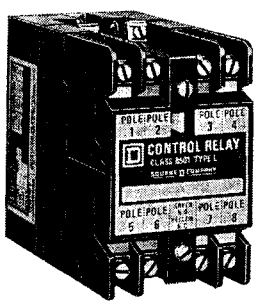
INDUSTRIAL CONTROL RELAYS — 600 VOLT

TYPE L

CLASS 8501

The Class 8501, Type L relay line has heavy duty contact ratings with electrical clearances for up to 600 volts. It is a high quality device which makes it ideal for use in machine tool type applications where long life, high reliability and ease of maintenance are important. Simple and positive contact conversion is made possible through the use of a plug-in cartridge concept. Modern manufacturing techniques and product flexibility make this line economical to use in both small and large control systems.

- 600 Volt
- Plug-in contacts
- Captive pressure wire terminals
- 50 or 60 Hertz
- Convertible Contacts
- 10 Amp
- Color coded contacts
- Continuous duty coils



Type LO-80

CONTROL RELAY

The Control Relay is electromagnetically operated and held. Energization of the magnet coil will cause the normally open contacts to close and the normally closed contacts to open. De-energization of the coil will cause the contacts to switch back to their original state.

Number of Normally Open Convertible Contacts	Open Type	
	Type Number	Price
2	LO-20	**$48.**
3	LO-30	**56.**
4	LO-40	**64.**
6	LO-60	**80.**
8	LO-80	**96.**

STANDARD COILS

Frequency	Voltage
60 Hz	24, 48, 120, 240, 277, 480, 600
50 Hz	24, 48, 110, 220, 440, 550

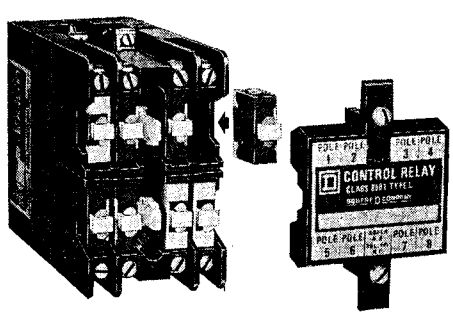
ORDERING INFORMATION REQUIRED

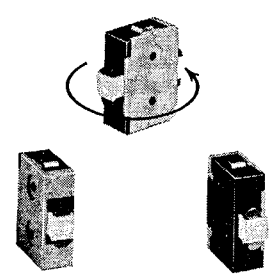
1. Class and type number.
2. Voltage and frequency of operating coil.

Contact conversion is so simple that it is generally more economical to purchase relays with all contacts normally open and convert contacts to normally closed as required. If it is preferred that relays be factory assembled, with a combination of normally open and normally closed contacts, order by type number from page 193. Also, add **$8.00** to the price shown in the table above for a relay having the same total number of contacts. For example, a relay with 1 N.O. and 2 N.C. poles would be identified as a Type LO-12 and priced at **$64.00**.

A 2 or 3 pole relay will accept additional cartridges to make up to a 4 pole relay. A 4 pole relay can be converted to a 5, 6, 7 or 8 pole relay by the addition of a LM-1 terminal block (which contains one contact cartridge) and the appropriate number of additional contact cartridges.

CONTACT CONVERSION





Normally Closed (Yellow Front)

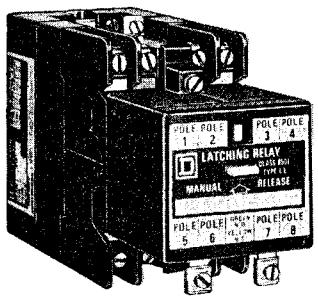
Normally Open (Green Front)

1. Loosen two captive screws and remove cover.
2. Use fingers to remove contact, invert to opposite color and return to terminal block socket.
3. Replace cover and tighten screws.

SQD SLV_000984

LATCHING RELAY

- Manually operable for circuit checkout
- Mechanical Latch
- Continuous Duty Coils

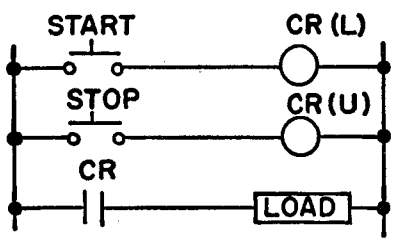


Class 8501, Type LO-80-LL

The latching relay is electromagnetically operated and is held by means of a mechanical latch. Energization of the latching coil will cause the normally open contacts to close and the normally closed contacts to open. The mechanical latch will hold all contacts switched, even after power is removed from the latching coil. Energization of a second coil, the unlatching coil, will result in all contacts switching back to their original state. Both coils are continuously rated and require no coil clearing contacts.

Number of Normally Open Convertible Contacts	Open Type	
	Class 8501 Type	Price
2	LO-20-LL	$104.
3	LO-30-LL	112.
4	LO-40-LL	120.
6	LO-60-LL	136.
8	LO-80-LL	152.

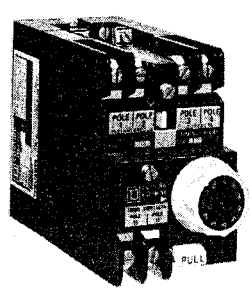
For relays having a combination of normally open and normally closed contacts, replace numerals in above type numbers with appropriate numerals from CONTACT ARRANGEMENTS table on page 209 and add **$8.00** to the prices shown above.



Conventional Two-Coil Circuit

TIMING RELAY

- On Delay and Off Delay, Convertible
- 0.1 to 60 Sec. Timing, Adjustable
- ±10% Repeat Accuracy
- 2 Timed and 4 Instantaneous Contacts Maximum, all Convertible



Class 8501, Type LO-40-LT

The timing relay consists of the basic control relay and a pneumatic timer attachment. The timer can be converted to either ON delay or OFF delay modes by simply positioning a lever. The timing relay is furnished in the ON delay mode with 1 N.O. and 1 N.C. convertible timed contacts and up to four instantaneous convertible contacts.

Number of Normally Open Instantaneous Convertible Contacts	Number of Timed Convertible Contacts		Open Type	
	Normally Open	Normally Closed	Class 8501 Type	Price
0	1	1	LO-00-LT	$144.
2	1	1	LO-20-LT	160.
4	1	1	LO-40-LT	176.

For timing relays having a combination of normally open and normally closed instantaneous contacts (maximum 4), replace numerals in above type numbers with appropriate numerals from CONTACT ARRANGEMENT table on page 209 and add **$8.00** to the list price shown above.

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Voltage and frequency.

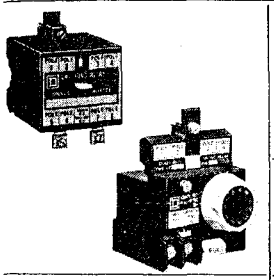
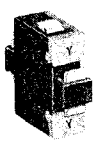
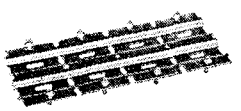
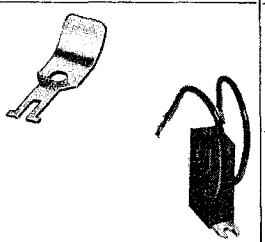
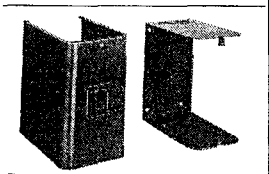
SQD SLV_000985

INDUSTRIAL CONTROL RELAYS — 600 VOLT

TYPE L

CLASS 8501

ACCESSORIES

	Description	Identification	Price
	**MECHANICAL LATCH ATTACHMENT**—Mounts on any 2 through 8 pole relay. When used on a basic relay, it will hold all contacts switched after power is removed from the latch coil. Ideally suited for use where a retentive memory function is required in a control system. Coil is rated for continuous duty. Specify voltage and frequency.	Type LL	$ 56.00
	PNEUMATIC TIMER ATTACHMENT — Mounts on any 0 through 4 pole relay and provides 1 N.O. and 1 N.C. convertible timed contacts. These contacts are the same LC-1 cartridges used on the basic relay. The timer attachment is provided in the OFF delay mode and is easily convertible to ON delay by simply repositioning a lever.	Type LT	112.00
	**BASE ASSEMBLY**—Consists of a power plant plus one terminal block without contacts but with provisions for installing up to four contact cartridges. Specify voltage and frequency of operating coil.	Type LB-1	32.00
	**TERMINAL BLOCK ASSEMBLY**—Consists of a terminal block with one factory installed contact cartridge and all the necessary hardware to install three more. It mounts on a two, three or four pole relay or on a base assembly to provide space for additional contacts.	Type LM-1	8.00
	**CONTACT CARTRIDGE**—Consists of movable and stationary contacts enclosed in a color coded case. The entire non-tamperable assembly plugs into a socket in the relay terminal block.	Type LC-1	8.00
	**OVERLAPPING CONTACT CARTRIDGE**—Is similar to the standard contact cartridge except that when it is used in the normally open mode it will close early and when used in the normally closed mode it will open late. If two or more are used together, the normally open contacts will close before the normally closed contacts open, as the relay picks up. Overlap also occurs during dropout.	Type LC-2	8.00
	**GOLD PLATED CONTACT CARTRIDGE**—Similar to the LC-1 contact cartridge but with a gold plate over the standard contact tips for improved shelf life. Provides improved contact reliability in low energy, low duty cycle applications.	Type LC-3	19.00
	**MOUNTING TRACK**—Made from heavy gauge sheet steel which is formed to provide a rigid mounting surface for individual relays. Transverse slots are provided to simplify cutting to special lengths. Longitudinal slots are provided to reduce the cost of mounting the track on the panel. The track is available in various lengths: 9″ long for 4 relays - Type L-4 — 4.00 18″ long for 8 relays - Type L-8 — 6.00 27″ long for 12 relays - Type L-12 — 9.00 36″ long for 16 relays - Type L-16 — 11.00		
	**MANUAL TEST TOOL**—Provides a means of manually switching the contacts of a basic relay and holding all contacts in their switched state until the tool is removed. This simplifies the checking of control circuits without power on the coil or contacts.	Type LA-1	1.60
	TRANSIENT SUPPRESSOR—Consists of an R-C circuit designed to suppress coil generated transients to approximately 200 per cent of peak voltage. It is particularly useful when using the Type L relay in conjunction with solid state equipment and is designed for use on coils rated 120V or less.	Type LA-2	12.00
	**NEMA 1 ENCLOSURE**—Formed from sheet steel to provide strength and rigidity. Two conduit knockouts are located in the top and bottom of the enclosure. The enclosure is furnished with self tapping screws for mounting the relay inside the enclosure. Accommodates any pole combination with or without latch or timer attachment.	Class 9991 Type UE-7 (formerly Class 8501)	28.00

ORDERING INFORMATION REQUIRED

1. Class and type number. 2. Voltage and frequency.

SQD SLV_000986

CLASS 8501

APPLICATION DATA

MAXIMUM ELECTRICAL CONTACT RATINGS

Volts	AC RATINGS — NEMA A600						DC RATINGS			
	Inductive 35% Power Factor					Resistive 75% Power Factor	Inductive		Resistive	
	Make		Break							
	Amps.	VA	Amps.	VA	Continuous Amperes	Make, Break and Continuous Amperes	Make and Break Amperes	Continuous Amperes	Make and Break Amperes	Continuous Amperes
120	60	7200	6	720	10	10	1.1	10	4	10
240	30	7200	3	720	10	10	0.4	10	0.8	10
480	15	7200	1.5	720	10	10	...	...	...	...
600	12	7200	1.2	720	10	10	...	...	...	...

†AC MAGNET COILS

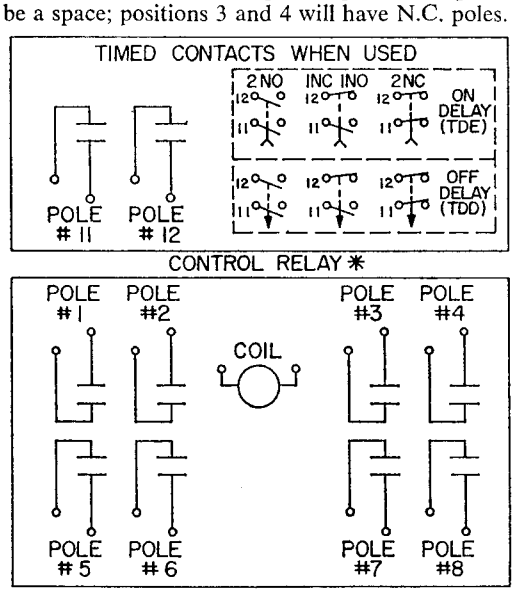
Heavy duty, molded coils are used. These coils are designed to operate on line voltage fluctuations as much as 15% below and 10% above nominal voltage.

Coil Prefix	Hertz	SUFFIX NUMBERS (Coil part numbers consist of coil prefix followed by suffix number)												Coil Volt-Amps	
		12 Volts	24 Volts	48 Volts	110 Volts	120 Volts	208 Volts	220 Volts	240 Volts	277 Volts	440 Volts	480 Volts	550 Volts	600 Volts	In-Rush	Sealed
*Class 9998 Type CRL	60	608	618	631	...	801	665	...	802	721	...	803	...	804	120	17.5
	50	508	518	531	801	556	565	802	569	...	803	581	804	586	115	17.5

* Effective January 1, 1980. Directly supersedes 31111-400- coils.
† Replacement coil for latch attachment not available.

CONTACT ARRANGEMENT

The following table lists all pole arrangements and the location of the N.O. and N.C. poles. Relays purchased from the factory will correspond to these tables. For example: an LO-12 will have one N.O. pole in position 1; position 2 will be a space; positions 3 and 4 will have N.C. poles.



* FOR LATCH RELAY USE SAME DIAGRAM AS ABOVE EXCEPT FOR THE ADDITION OF AN UNLATCH COIL

2, 3 and 4 Pole Relay
All Contacts Convertible

No. of Poles	Type	Pole Number‡ 1	2	3	4
2	LO-20	O	S	S	O
	LO-11	O	S	S	1
	LO-02	1	S	S	1
3	LO-30	O	S	O	O
	LO-21	O	S	O	1
	LO-12	O	S	1	1
	LO-03	1	S	1	1
4	LO-40	O	O	O	O
	LO-31	O	O	O	1
	LO-22	O	O	1	1
	LO-13	O	1	1	1
	LO-04	1	1	1	1

LT Timer Attachment
All Contacts Convertible

No. of Timed Contacts	Type	Pole Number‡ 11	12
2	LT	0	1

‡O — Normally Open Contact
1 — Normally Closed Contact
S — Space for Future Contact

6 and 8 Pole Relay
All Contacts Convertible

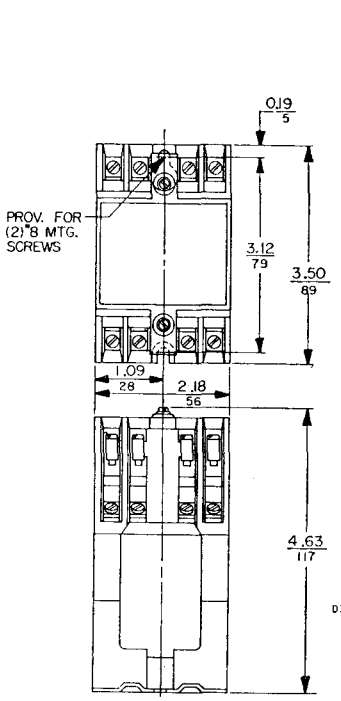
No. of Poles	Type	Pole Number‡ 1	2	3	4
		5	6	7	8
6	LO-60	O	O	O	O
		O	S	S	O
	LO-51	O	O	O	1
		O	S	S	O
	LO-42	O	O	1	1
		O	S	S	O
	LO-33	O	1	1	1
		O	S	S	O
	LO-24	1	1	1	1
		O	S	S	O
	LO-15	1	1	1	1
		O	S	S	1
	LO-06	1	1	1	1
		1	S	S	1
8	LO-80	O	O	O	O
		O	O	O	O
	LO-71	O	O	O	1
		O	O	O	O
	LO-62	O	O	1	1
		O	O	O	O
	LO-53	O	1	1	1
		O	O	O	O
	LO-44	1	1	1	1
		O	O	O	O
	LO-35	1	1	1	1
		O	O	O	1
	LO-26	1	1	1	1
		O	O	1	1
	LO-17	1	1	1	1
		O	1	1	1
	LO-08	1	1	1	1
		1	1	1	1

SQD SLV_000987

INDUSTRIAL CONTROL RELAYS — 600 VOLT
TYPE L

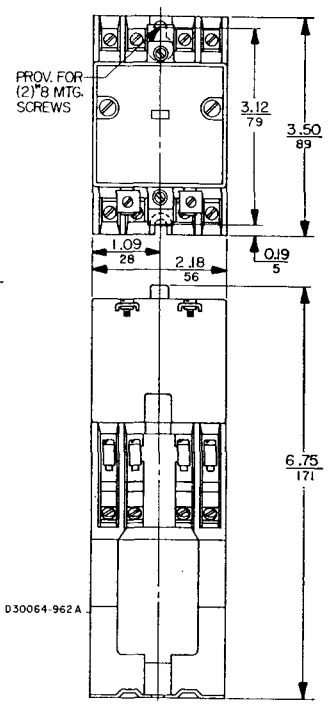
CLASS 8501

APPLICATION DATA
APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS



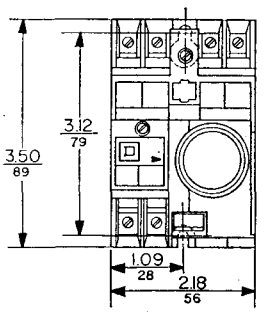
Control Relay Type LO 2-8P

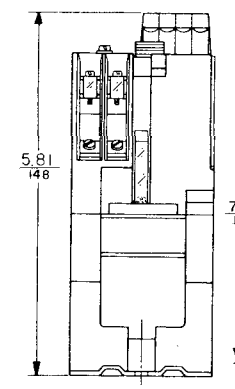
Weight — 3 lbs.



Latching Relay Type LO 2-8P

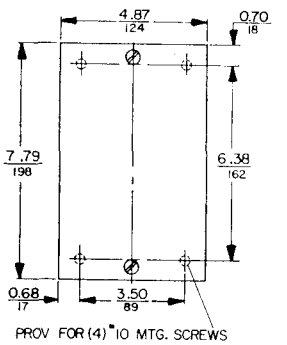
Weight — 3½ lbs.

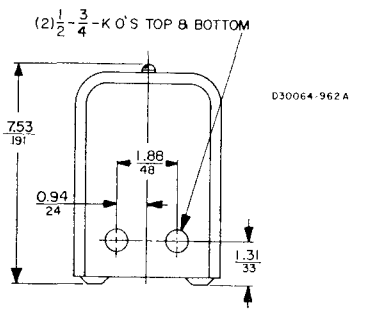




Pneumatic Timing Relay Type LO __ LT

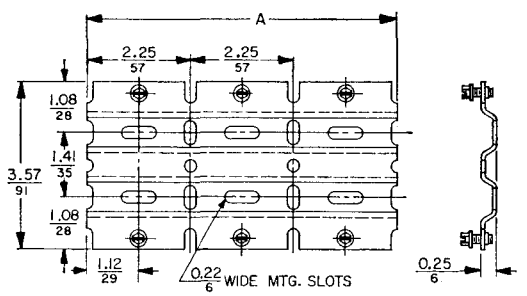
Weight—3½ lbs.





NEMA 1 Enclosure Class 9991 Type UE-7

Weight — 4 Lbs.



Type L Relay Mounting Track

NO. OF RELAYS	A	WEIGHT IN LBS.
4	9/229	0.75
8	18/457	1.5
12	27/686	2.25
16	36/914	3.0

AVERAGE OPERATING TIMES

Device	Milli-Seconds	
	Pick-Up	Drop-Out
Basic Relay	16	12
Latching Relay	16	12

Dual Dimensions: **INCHES** / Millimeters

SQD SLV_000988

CLASS 8501

The Type LS solid state relay can provide more than ten times the operating life normally expected of standard mechanical relays. These relays are ideal for high cyclic rate applications. If requirements include the use of solid state controls on machinery normally provided with mechanical relays, the Type LS can be the easiest and most economical solution. Standard relay terminology, symbols, and panel layout can be used so the Type LS can be directly substituted without redesigning the system or retraining personnel. Standard Type LS relays are supplied with the number of Type LSC convertible solid state contact cartridges shown in the table. Each can easily be changed from normally open to normally closed by movement of a conversion switch. A relay cover plate prevents unintentional conversion. For complete technical information request product data M-460.

- Extremely long life
- Convertible contacts
- Relay symbols and terms
- Arcless, bounceless switching
- Can control up through Size 4 contactor
- Input/Output Isolation
- Standard pilot light
- Transient protected

APPLICATION DATA

Operating Data

Temperature Range: −20°C to +65°C (0°F to 150°F)
Pickup Time: 8 milliseconds typical
Dropout Time: 16 milliseconds typical

Coil Data

Voltage: 120 volts (+10, −15%) 50/60 Hz.
Burden: 35 milliamps

Solid State Contact Data

Voltage Range: 24 volts to 132 volts 50/60 Hz.
Maximum Current: Continuous: 2.5 amps RMS at 20°C (68°F). See derating curves for higher temperatures. Allowable inrush 15 amps RMS for 30 msec.
Minimum Current: 35 milliamps
Open contact leakage current: 3 milliamps max.
Closed contact voltage drop: 1.5 volts typical.
Number of contacts that can be connected in series or parallel: 3.
Load fusing: Recommended for inductive loads susceptible to jamming which would cause the allowable inrush to be exceeded. Use a fast acting fuse such as a Bussmann ABC-3 or KAA-3. This fuse provides overload not short circuit protection.

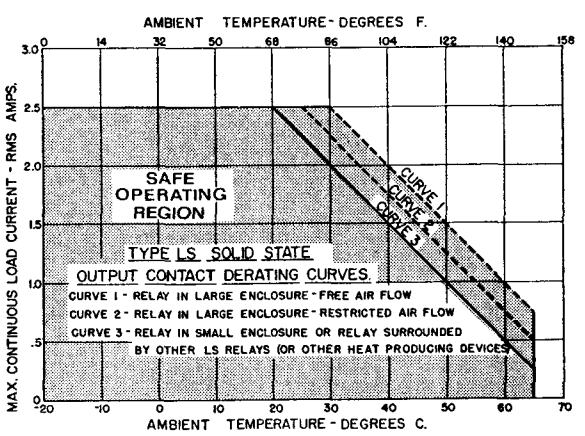
Reed Contact Data

Maximum switching voltage: 34 VDC or VAC Peak (24v RMS).
Maximum resistive load: 3 watts.
Maximum current (make, break, and carry): .100 ampere.

Transient Protection

Both the relay and the solid state contact cartridge are protected against damage due to transients up to two joules.

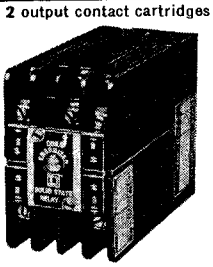
The solid state contact of Types LSA, LSB, and LSC cartridges is a TRIAC. It is protected by transient suppression circuitry. Input/output isolation and the gating signal are provided by a hermetically sealed magnetic reed switch. The operating coil of the reed switch is located in the relay base housing and the reed itself in the tubular protrusion at the base of the contact cartridge. On the Type LRC contact, the TRIAC is removed and the reed switch is used as the output.



Ambient temperature refers to the temperature immediately adjacent to the output contact.

Number of Normally Open Solid State Convertible Contacts	Open Type	
	Type	Price
1	LSO-10*	$154.
2	LSO-20*	210.
3	LSO-30	272.
4	LSO-40	328.

*Device has provision for 2 output contact cartridges **max.**



Type LSO-40 Relay

ACCESSORIES AND PARTS



Type LSC Contact Cartridge

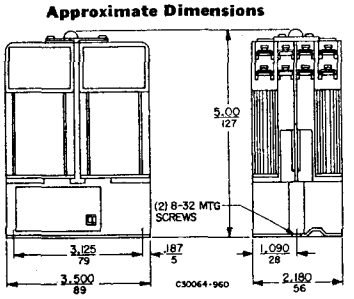
Description	Type	Price
Solid State Contact Cartridges		
N.O. (Fixed)	LSA	$ 42.
N.C. (Fixed)	LSB	42.
N.O. (Convertible)	LSC	56.
Reed Contact Cartridge — Convertible	LRC	42.
Relay Base — Less Contact Cartridges		
Spaces for 2 Contact Cartridges	LS-2*	98.
Spaces for 4 Contact Cartridges	LS-4	104.

*Device has provision for 2 output contact cartridges **max.**

ENCLOSURE

Separately packed NEMA 1 sheet steel enclosure for Type LS relays: Class 9991 Type UE-7 (formerly Class 8501). Price **$28.00**.

Approximate Dimensions



WARNING
The solid state contact may not switch OFF if operated outside the indicated safe operating region.

ORDERING INFORMATION — Class and type number

Dual Dimensions: **INCHES** / Millimeters

SQD SLV_000989

INDUSTRIAL CONTROL RELAYS — 300 VOLT
TYPE G

CLASS 8501

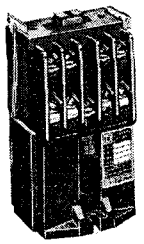
The Type G industrial control relay and its accessories are suitable for 300 volt industrial control applications where long life, high reliability, and versatility are important. Some of the important features are:

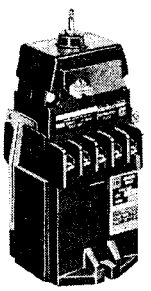
- 300 Volt 10 Amp. Rating
- AC and DC Operated
- Convertible Timer
- Uniform Mounting Dimensions
- Convertible Contacts
- Latching Attachment
- Timer Attachments
- Universal Pole Attachment

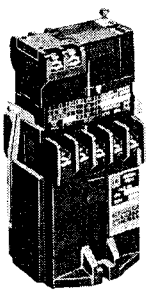
The tables below list relays with all convertible contacts normally open. Relays having a combination of normally open and normally closed convertible contacts can be ordered by description. Add **$8.00** per relay.


Type GO-40


Type GO-40-GU-44


Type GO-80


Type GO-40-GL


Type GO-40-GE

AC OPERATED — OPEN TYPE

50-60 HERTZ — **300 VOLTS MAX.**

Number of Instantaneous Contacts					Standard Relay		†Mechanically Held Relay		Relay Operated Pneumatic Timer		
	Convertible		Fixed						OFF Delay	ON Delay	Price
Total	Normally Open	Normally Closed	Normally Open	Normally Closed	Type	Price	Type	Price	Type	Type	
0	0	0	0	0	GO-00	$ 32.	.....	....	GO-00-GD	GO-00-GE	$144.
2	2	0	0	0	GO-20	48.	GO-20-GL	$104.	GO-20-GD	GO-20-GE	160.
3	3	0	0	0	GO-30	56.	GO-30-GL	112.	GO-30-GD	GO-30-GE	168.
4	4	0	0	0	GO-40	64.	GO-40-GL	120.	GO-40-GD	GO-40-GE	176.
6	6	0	0	0	GO-60	80.	GO-60-GL	136.	.....	.....	...
8	8	0	0	0	GO-80	96.	GO-80-GL	152.	.....	.....	...
8	0	0	4	4	GO-00-GU-44	88.	.....	....	.....	.....	...
10	2	0	4	4	GO-20-GU-44	104.	.....	....	.....	.....	...
12	4	0	4	4	GO-40-GU-44	120.	.....	....	.....	.....	...

DC OPERATED — OPEN TYPE

6-250 VOLT COILS — DC — **300 VOLTS MAX.**

No. of Convertible Contacts on Relay (Instantaneous Contacts)	No. of Contacts Normally Open	No. of Contacts Normally Closed	Standard Relay		*†Mechanically Held Relay		Relay Operated Pneumatic Timer		
							OFF Delay	ON Delay	Price
			Type	Price	Type	Price	Type	Type	
0	0	0	.....	...	.....	....	GDO-00-GD	GDO-00-GE	$172.
2	2	0	GDO-20	$ 76.	GDO-20-GDL	$140.	GDO-20-GD	GDO-20-GE	188.
3	3	0	GDO-30	84.	GDO-30-GDL	148.	.....	.....	....
4	4	0	GDO-40	100.	GDO-40-GDL	164.	.....	.....	....
6	6	0	GDO-60	124.	GDO-60-GDL	188.	.....	.....	....
8	8	0	GDO-80	148.	GDO-80-GDL	212.	.....	.....	....

* DC latch attachment has an intermittent rated coil and should be connected through a normally open contact of the relay. Order one more N.O. contact than application requires to accommodate DC latch attachment.
† For applications where it is desirable that the latch or unlatch coils do not operate continuously, coil clearing contacts are available. See Page 213 — Form Y-14.

REPLACEMENT PARTS

CONTACTS — See Class 9998.

COILS — See Page 214 or Class 9998.

Standard Coils	
Frequency	Voltage
60 Hz AC	12, 24, 48, 120, 240, 277
50 Hz AC	12, 24, 48, 110, 220
DC	12, 24, 48, 115, 230/250

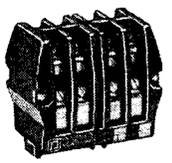
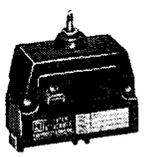
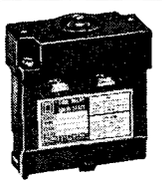
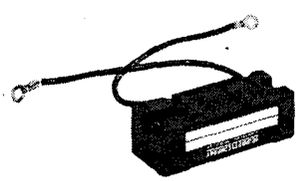
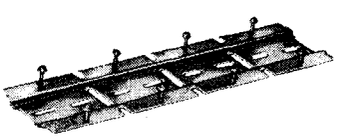
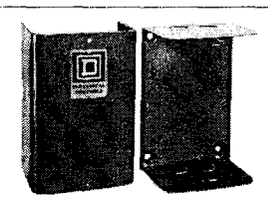
ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Voltage and frequency of operating coil.

SQD SLV_000990

ATTACHMENTS AND ACCESSORIES

CLASS 8501

	Description	Identification	Price
	**Universal Pole Attachment** — *converts any 0, 2, 3 or 4 pole ac relay* to an 8, 10, 11 or 12 pole relay. It contains four normally open and four normally closed fixed contacts. All contacts are electrically isolated and may be used in circuits of opposite polarity. Contacts have the same heavy duty rating as the standard convertible contacts	Type GU-44	$ 56.00
	**Mechanically Held Attachment** — mounts on any 2 through 8 pole relay having all convertible contacts; both ac and dc. The Type GL and GDL latch attachments are identical in size and mounting provisions. The Type GL, ac latch attachment, has a continuous duty rated coil. The Type GDL, dc latch attachment has an *intermittent rated coil and should* be connected through a normally open contact of the basic relay.		
	AC	Type GL	56.00
	DC	Type GDL	64.00
	**Pneumatic Timer Attachment** — may be mounted on a 0, 2, 3 or 4 pole ac relay or factory installed on a 0 or 2 pole dc relay. It has a single pole, double throw, double break timed contact. The timing range is adjustable between 0.2 seconds and one minute with a repeat accuracy of ± 15%. Timing mode is convertible.		
	OFF Delay	Type GD	112.00
	ON Delay	Type GE	112.00
	**Solid State Timer Attachment** — has a normally open single pole output contact which times closed after energization (TDE). The timing period is adjustable, by means of a potentiometer, from 0.1 seconds to 30 seconds with a repeat accuracy of ±2%. It is suitable for use on 120 volts, 50 or 60 hertz and has a burden of 4.5 volt amperes. This timer may be mounted on a Type G relay, door mounted in a knockout or panel mounted on its own baseplate, which is included	Type GTO-1	270.00
	**Transient Suppressor** — consists of an RC circuit and is intended for use with Type G Relays. *It is designed to suppress voltage transients* generated by the relay coil to approx. 300 volts and is for use on 120 volts or less.		
	Separate Suppressor for field mounting	Type G-6	12.00
	***Mounting Track:***		
	12″ long for 4 relays	Type G-4	4.00
	24″ long for 8 relays	Type G-8	6.00
	36″ long for 12 relays	Type G-12	9.00
	48″ long for 16 relays	Type G-16	11.00
	**NEMA 1 Enclosure** — Separate enclosure for use with:		
	2-4 pole relay	Class 9991 Type UE-6 (formerly Class 8501)	28.00
	6-8 pole or 2 to 4 pole relay with attachments	Class 9991 Type UE-7 (formerly Class 8501)	28.00
Coil Clearing Contacts — for mechanically held relays. Disconnects latch and unlatch coils from power after energization. Order and price relay with one more normally open (standard) and normally closed (late opening) contacts than application requires and specify		Form Y-14	Add 9.00
Overlapping Contacts — convertible contacts can be supplied with overlap. Description must **state** contacts are to be overlapping and specify how many normally open (early closing) and normally closed (late opening) contacts. Order as pairs		Form Y35 plus description	Add 18.00 Per Pair
Dual Contacts — provide two parallel paths per pole for maximum reliability in low energy circuits. Supplied as standard on DC operated relays and Type GU-44		Form Y-89	N/C
Manual Test Tool — for manually operating basic relay		31021-054-01	1.40

ORDERING INFORMATION REQUIRED:

1. Class and Type Number. 2. Voltage and Frequency of Operating Coil.

SQD SLV_000991

INDUSTRIAL CONTROL RELAYS — 300 VOLT

TYPE G

CLASS 8501

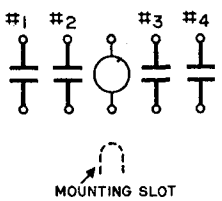
Contact Arrangement for Self-Checking Circuit Application

Self-checking is the term commonly used when N.O. and N.C. contacts of a relay are arranged in a circuit so that a particular function or functions will not occur if the relay contacts fail to open and close at predetermined times in the control sequence.

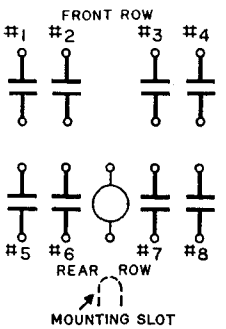
The following tables list pole arrangements and the location of N.O. and N.C. poles. Relays purchased from the factory will correspond to these tables. For example: a GO-22P will have N.O. poles in positions 1 and 4; positions 2 and 3 will have N.C. poles. These pole configurations are recommended where optimization of self-checking circuitry is desired, such as in certain types of press control systems.

Contact Configurations

1–Normally Closed Contact
O–Normally Open Contact



No. of Poles	Type	Price	Contact Number 1	2	3	4
4	GO-31P	$72.	0	0	1	0
	GO-22P	72.	0	1	1	0



No. of Poles	Type	Price	Contact Number 1	2	3	4
			5	6	7	8
6	GO-51P	$ 88.	0	0	1	0
			0			0
	GO-42P	88.	0	1	1	0
			0			0
8	GO-62P	104.	0	1	1	0
			0	0	0	0
	GO-44P	104.	0	1	1	0
			0	1	1	0

APPLICATION DATA

MAXIMUM CURRENT RATINGS FOR CONTROL CIRCUIT CONTACTS

CLASS 8501 Type	Device	Volts	AC RATINGS Inductive 35% Power Factor Make Amps.	Make VA	Break Amps.	Break VA	Continuous Amperes	Resistive 75% Power Factor Make, Break and Continuous Amperes	DC RATINGS Inductive Make and Break Amperes	Inductive Continuous Amperes	Resistive Make and Break Amperes	Resistive Continuous Amperes
GO GDO GU	Relays*	120 240	60 30	7200 7200	6 3	720 720	10 10	10 10	1.1 0.55	10 10	5.0 0.55	10 10
GD GE	Pneumatic Timer	120 240	30 15	3600 3600	3 1.5	360 360	6 6	6 6	0.5 0.25	6 6	1.1 0.55	6 6
GTO	Solid State Timer	120	1.5	180	0.4	50	1	1	0.05	1	0.1	1

*NEMA A300 contact rating

AC MAGNET COILS

Coil Prefix	Hertz	SUFFIX NUMBERS (Coil part numbers consist of coil prefix followed by suffix number) 12 Volts	24 Volts	48 Volts	110 Volts	120 Volts	220 Volts	240 Volts	277 Volts	COIL BURDEN VOLT—AMPERES Inrush	Sealed
31021-400-	60	30	39	47	59	60	..	69	70	100	13
	50	32	41	50	60	62	69	71	72	90	13

Type GL latch attachment coils have a 24 VA inrush and 12 VA sealed.
AC magnet coils are designed to operate on line voltages fluctuating as much as 15% below and 10% above nominal voltage.

DC MAGNET COILS

Coil Prefix	SUFFIX NUMBERS 12 Volts	24 Volts	48 Volts	115 Volts	230/250 Volts	Coil Burden (Watts)
31030-400-	28	37	46	58	67	8

Type GDL latch attachment coils have a burden of 36 watts.
DC magnet coils are designed to operate on line voltages fluctuating as much as 20% below and 10% above nominal voltage.

AVERAGE OPERATING TIMES

Device	Milli-Seconds Pick-up	Drop-out
AC Relay	11	6
DC Relay	28	12

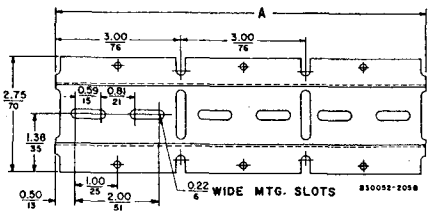
ORDERING INFORMATION REQUIRED:

1. Class and Type Number. 2. Voltage and Frequency of operating coil.

SQD SLV_000992

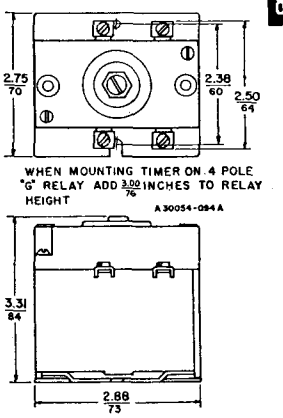
APPLICATION DATA

APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS
(DIMENSIONS APPLY TO AC AND DC DEVICES)

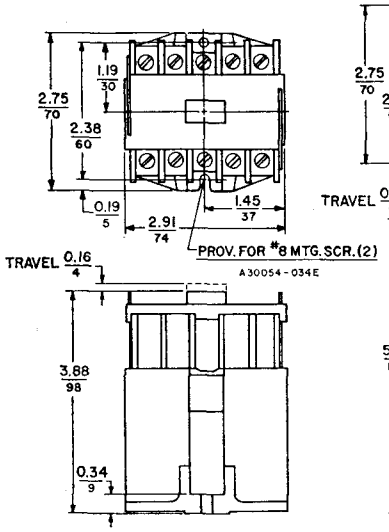


Type G Relay Mounting Track

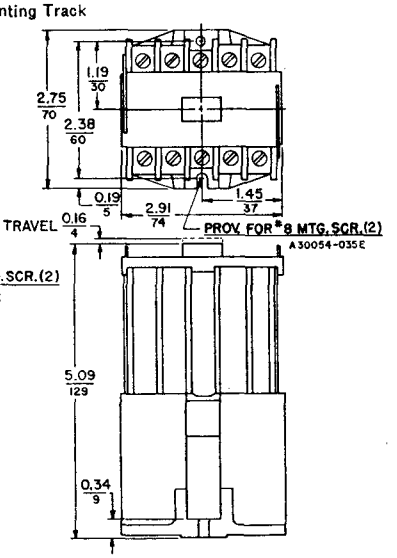
No. of Relays	A	
	Inches	Centimeters
4	12	30.5
8	24	61.0
12	36	91.5
16	48	122.0



Type GTO-1
Weight — 1 Lb.

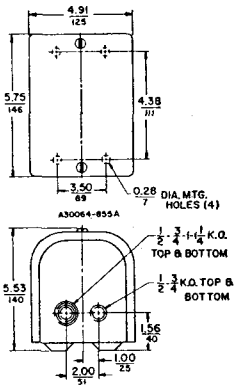


Class 8501 Type G
2, 3 or 4 Pole
Weight — 1½ Lbs.

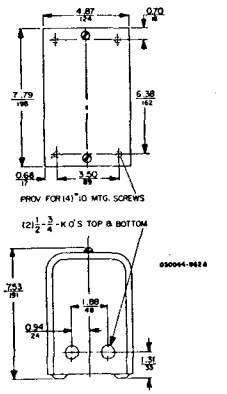


Class 8501 Type G
6 or 8 Pole
Weight — 2 Lbs.

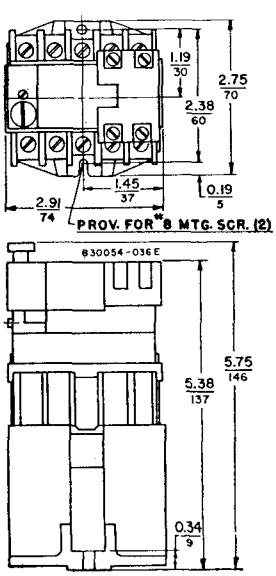
NEMA Type 1
General Purpose Enclosure



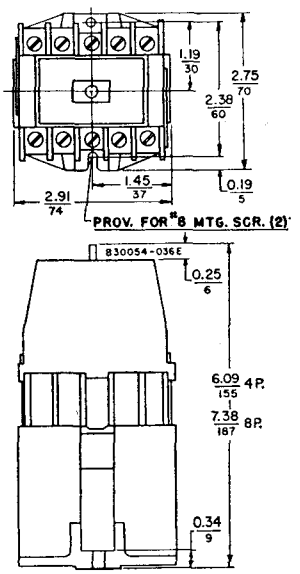
Class 9991 Type UE-6
Enclosure, 2, 3 and 4 pole relays without Attachments
Weight — 2 Lbs.



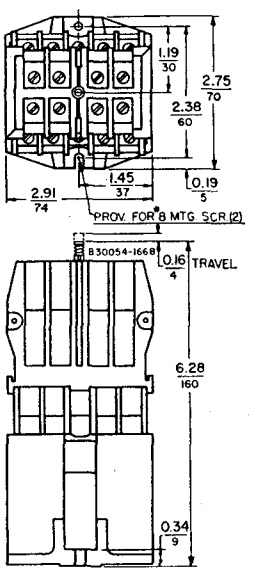
Class 9991 Type UE-7
Enclosure, 2, 3 and 4 pole relays with Attachments and 6 and 8 pole relays without Attachments
Weight — 4 Lbs.



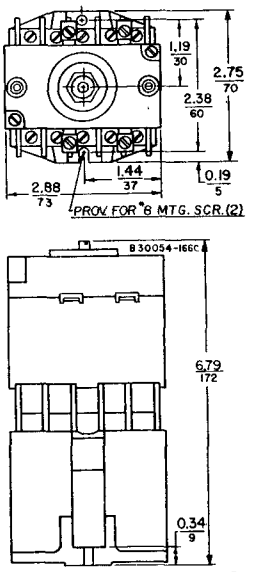
Class 8501 Type G
Pneumatic Timer on 0, 2, 3 or 4 Pole Relay
Weight — 2 Lbs.



Class 8501 Type G
Mechanically Held Relay
2, 3, 4, 6 or 8 Poles
Weight — 2 Lbs.



Class 8501 Type G
Universal Pole Attachment on 0, 2, 3 or 4 Pole Relay
Weight — 2 Lbs.



Class 8501 Type G
Solid State Timer on 2, 3 or 4 Pole Relay
Weight — 2 Lbs.

Dual Dimensions: **INCHES** / *Millimeters*

SQD SLV_000993

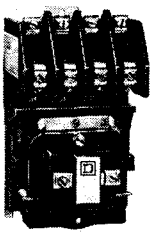
INDUSTRIAL CONTROL RELAYS — 600 VOLT

TYPE H

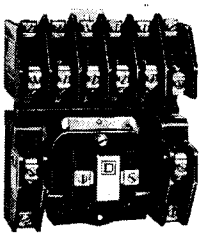
CLASS 8501

The Class 8501, Type H is a heavy duty relay with electrical clearance distances for up to 600 volts. As such, it is particularly well suited for machine tool type applications where long life, high reliability and easy maintenance inspection are important. The ease of contact conversion and coil change provides the flexibility needed to take care of last minute circuit changes. Some of the important features are:

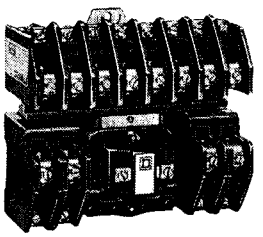
- 600 Volt 15 Amp Rating
- Convertible Contacts
- N.O. & N.C. Indicators
- Visible Contacts
- "Adder Poles" To Increase Stock Flexibility
- AC or DC
- Continuous Duty Coils



Type HO-40



Type HO-80



Type HXO-1200

15 AMPERE AC OPERATED RELAY									15 AMPERE DC OPERATED RELAY		
	CONTROL RELAY				LATCHING RELAY				CONTROL RELAY		
Number of Normally Open Convertible Contacts*	Hazardous Locations Class I Groups C & D Class II Groups E, F & G NEMA TYPE 7 & 9		Open Type		Harzardous Locations Class I Groups C & D Class II Groups E, F & G NEMA TYPE 7 & 9		Open Type		Number of Normally Open Convertible Contacts*	Open Type	
	Type	Price	Type	Price	Type	Price	Type	Price		Type	Price
2	HR-20	**$338.**	HO-20	**$ 65.**	HLR-20	**$405.**	HLO-20	**$126.**	2	HDO-20	**$113.**
3	HR-30	**351.**	HO-30	**78.**	HLR-30	**418.**	HLO-30	**139.**	3	HDO-30	**130.**
4	HR-40	**362.**	HO-40	**87.**	HLR-40	**429.**	HLO-40	**148.**	4	HDO-40	**139.**
6	HR-60	**409.**	HO-60	**130.**	HLR-60	**477.**	HLO-60	**191.**	6	HDO-60	**195.**
8	HR-80	**438.**	HO-80	**156.**	HLR-80	**505.**	HLO-80	**217.**	7	HDO-70	**221.**
8	.....	....	HXO-80▲	**191.**	.....	....	HXLO-80	**251.**			
10	.....	....	HXO-1000	**217.**	.....	....	HXLO-1000	**277.**			
12	.....	....	HXO-1200	**243.**	.....	....	HXLO-1200	**303.**			

▲The HXO-80 has an 8-pole contact block and has the capability to accept up to 4 more poles.

*The above tables list relays with all normally open convertible contacts. For relays having a combination of normally open and normally closed contacts order by description and add **$13.** to prices shown.

AC CONTROL RELAY

The control relay is electromagnetically operated and held. Energization of the magnet coil will cause the normally open contacts to close and the normally closed contacts to open. De-energization of the coil will cause the contacts to switch back to their original state.

DC CONTROL RELAY

The dc operated relays are similar to the ac operated relays except for the use of a different coil, an economizing resistor and an economizing contact. The economizing circuit is completely prewired at the factory so that field wiring of the coil is a simple two terminal connection.

AC LATCHING RELAY

The latching relay is electromagnetically operated and is held by means of a permanent magnet. Energization of the latching coil will cause the normally open contacts to close and the normally closed contacts to open. The permanent magnet latch will hold all contacts switched, even after power is removed from the latching coil. Energization of a second coil, the unlatching coil, will result in all contacts switching back to their original state. Both coils are continuously rated and require no coil clearing contacts.

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Voltage and frequency of operating coils.

MODIFICATIONS AND ACCESSORIES — See Page 217.

RATINGS — See Page 218.

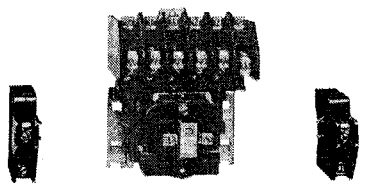
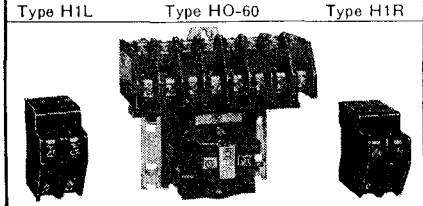
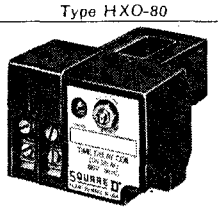
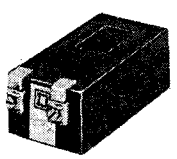
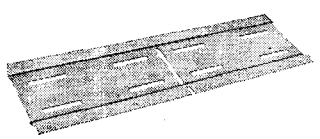
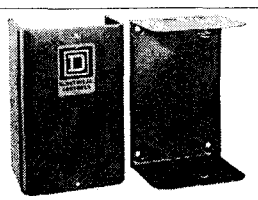
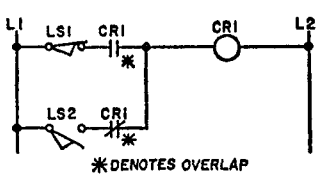
APPLICATION DATA — See Pages 218 and 219.

STANDARD COILS

Frequency	Voltage
60 Hz	24, 48, 120, 240, 277, 480, 600
50 Hz	24, 48, 110, 220, 440, 550
DC	24, 32, 115/125, 230/250

SQD SLV_000994

MODIFICATIONS AND ACCESSORIES

Description	Identification	Price
 Type H1L Type HO-60 Type H1R **ADDER POLES** Used to convert the 6 pole Type H relay into an 8 pole relay and the 8 pole Type HX relay into a 10 pole relay. The 6 pole Type H and 8 pole Type HX relays are provided with mounting brackets so that adder poles can be mounted from the front without additional parts. Convertible contacts are used on the adder poles and on the basic relay. 15 Amp. N.O. Pole for Left Hand Mounting 15 Amp. N.O. Pole for Right Hand Mounting	 Type H1L Type H1R	 **$13.00** **13.00**
 Type H3L Type HXO-80 Type H3R **DUAL ADDER POLES** Used to convert the 8 pole Type HX into a 12 pole relay. Each dual adder pole consists of two isolated convertible poles permanently fixed together so that a dual adder pole can be fastened to the relay by means of a single captive screw. 15 Amp. 2 N.O. Poles for Left Hand Mounting on Type HX only 15 Amp. 2 N.O. Poles for Right Hand Mounting on Type HX only	 Type H3L Type H3R	 **26.00** **26.00**
 **SOLID STATE TIMING COIL** Used in place of the standard coil to convert a standard 2-8 pole ac relay into a timing relay. The time delay occurs after energization of the coil. All contacts are timed contacts and a pilot light glows during the timing period. The timing period is adjustable from 0.6 seconds to 60 seconds with a repeat accuracy of ±1% with constant voltage and temperature. Reset time is 0.05 seconds. Nominal coil rating is 120 volts, 60 hertz Separate coil for 2-8 pole relay, 120 volt, 60 Hz. 2-8 pole relay with factory installed coil	 Type HTE-1 or Form Y-165	 **152.00** Add **152.00**
 **TRANSIENT SUPPRESSED COIL** Used where transient voltages, generated when opening the coil circuit, interfere with the proper operation of nearby solid state control circuits. The suppression feature is built into the coil and is designed to suppress coil generated transients to approximately 200 per cent of peak line voltage. Separate coil for 2-8 pole relay Available in 6, 12, 24, 48, 120, 208 and 240 volts at 60 hertz. 2-8 pole relay with factory installed coil	 *See Page 202 for coil voltage suffix numbers. 31071-406-* or Form Y-145	 ★ **35.00** Add **8.60**
 **MOUNTING TRACK** Used to reduce installation costs when mounting large numbers of Type H relays. Prepunched mounting holes simplify mounting of track to panel. Prepunched relay mounting holes plus self tapping screws provide flexibility in mounting relays with various pole combinations. 18″ long 36″ long 54″ long	 Type H-6 Type H-12 Type H-18	 **7.80** **10.40** **13.00**
 **NEMA 1 ENCLOSURES** For Types HO, HDO, HLO, HXO & HXLO use	 Class 9991 Type LG-1	 **40.00**
 **OVERLAPPING CONTACTS** Used for shifting a control signal from a momentary input (LS2) circuit to another circuit without interrupting the signal to the coil. Special movable contacts are supplied so that the normally open pole closes before the normally closed pole opens, when the relay is energized. Overlap also occurs when the relay is de-energized. Order with desired number of normally open and closed contacts and specify by Form number how many pairs must be provided with overlap. One Pair Two pair	 Form Y159-1 Form Y159-2	 Add **19.50** Add **19.50**
Coil Clearing Contacts — for latching relay. Consists of one late opening, normally closed contact and one standard, normally open contact. Disconnects latch and unlatch coils from power after energization. Type number should call for number of usable poles. Ten poles maximum.	Form Y-14	**26.00**
Adaptor Plate — for mounting Type H relay in place of obsolete Class 8501 Types A & BH relays.	HA-1	**6.50**

★ D14A Discount.

ORDERING INFORMATION REQUIRED

1. Class and type number. 2. Voltage and frequency of operating coils. 3. Special features as shown above.

SQD SLV_000995

INDUSTRIAL CONTROL RELAYS — 600 VOLT
TYPE H

CLASS 8501

APPLICATION DATA

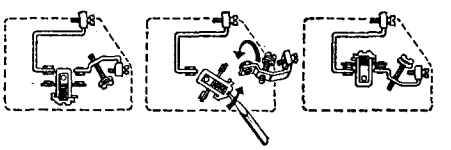
AC MAGNET COILS

These heavy duty, molded coils are designed to operate on line voltage fluctuations as much as 15% below and 10% above nominal voltage.

Type Coil	Used On	Coil Prefix	Hertz	SUFFIX NUMBERS (Coil part numbers consist of coil prefix followed by suffix number) 6✚ Volts	12✚ Volts	24 Volts	48 Volts	110 Volts	120 Volts	208 Volts	220 Volts	240 Volts	277 Volts	440 Volts	480 Volts	550 Volts	600 Volts	Coil Volt-Amps. Inrush	Sealed
Pick-up Coil	H, HL	31071-400-	60	05	14	23	32	43	44	50	—	53	55	—	62	—	65	150	30
			50	—	—	24	33	44	45	52	53	54	—	62	63	65	—	140	30
	HX, HXL ◐	31071-408-	60	05	14	23	32	—	44	50	—	53	55	—	62	—	65	180	35
			50	—	—	—	—	44	—	52	53	—	—	62	—	65	—	170	35
✱Unlatch Coil Assembly	HL	31071-963-	60	—	—	50	51	—	52	53	—	54	55	—	56	—	57	18	18
			50	—	—	—	—	52	—	—	54	—	—	56	—	57	—	17	17
	HXL	31071-964-	60	—	—	50	51	—	52	53	—	54	55	—	56	—	57	18	18
			50	—	—	—	—	52	—	—	54	—	—	56	—	57	—	17	17
Transient Suppressed Coil	H, HL	31071-406-	60	05	14	23	32	—	44	50	—	53	—	—	—	—	—	150	30

✱ Includes coil and portion of latching mechanism. Coil only is not replaceable.
✚ 6 and 12 volt coils for HL and HXL are not available.
◐ All Type H relays with P suffix (see page 214) use 31071-400- series coils.

CONTACT CONVERSION



1. Remove front stationary contact.
2. Rotate movable contact 180°.
3. Invert and replace front stationary contact.

DC APPLICATION DATA

Volts	DC Magnet Coil Number 31071-412-	DC Economizing Resistor Number 31071-209-	Current In Amperes Inrush	Sealed
24	23	55	8.0	0.75
32	26	56	6.8	0.61
48	32	57	6.0	0.36
115/125	44	58	1.9	0.15
230/250	53	59	1.0	0.08

DC magnet coils are designed to operate on line voltages fluctuating as much as 20% below and 10% above nominal voltage.

AVERAGE OPERATING TIMES

Relay Type	Milliseconds Pick-up	Drop-out
H	14	12
HL	14	18

MAXIMUM ELECTRICAL CONTACT RATINGS

Volts	AC RATINGS — NEMA A600 Inductive 35% Power Factor Make Amps.	Make VA	Break Amps.	Break VA	Continuous Amperes	Resistive 75% Power Factor Make, Break and Continuous Amperes	DC RATINGS Inductive Make Amperes	Break Amperes	Continuous Amperes	Resistive Make Amperes	Break Amperes	Continuous Amperes
120	60	7200	6	720	15	15	11	1.1	15	60	6	15
240	30	7200	3	720	15	15	5.5	0.55	15	10	1	15
480	15	7200	1.5	720	15	15	...	...	...	...	...	...
600	12	7200	1.2	720	15	15	2	0.2	15	5	0.5	15

SQD SLV_000996

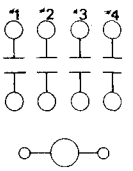
Contact Arrangement for Self-Checking Circuit Application

Self-checking is the term commonly used when N.O. and N.C. contacts of a relay are arranged in a circuit so that a particular function or functions will not occur if the relay contacts fail to open and close at predetermined times in the control sequence.

The following tables list pole arrangements and the location of N.O. and N.C. poles. Relays purchased from the factory will correspond to these tables. For example: a HO-22P will have N.O. poles in positions 1 and 4; positions 2 and 3 will have N.C. poles. These pole configurations are recommended where optimization of self-checking circuitry is desired, such as in certain types of press control systems.

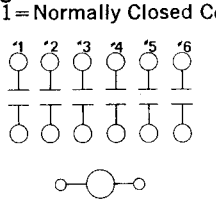
Contact Configurations

0 = Normally Open Contact 1 = Normally Closed Contact



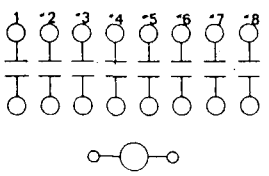
4 Pole Relay

No. of Poles	Type	Price	Contact Number 1	2	3	4
4	HO-31P	$100.	0	0	1	0
	HO-22P	100.	0	1	1	0



6 Pole Relay

No. of Poles	Type	Price	Contact Number 1	2	3	4	5	6
6▲	HO-51P	$143.	0	0	1	0	0	0
	HO-42P	143.	0	0	1	1	0	0



8 Pole Relay†

No. of Poles	Type	Price	Contact Number 1	2	3	4	5	6	7	8
8▲	HX0-62P	$204.	0	0	0	1	1	0	0	0
	HX0-44P	204.	0	1	1	0	0	1	1	0

▲NOTE: Adder poles may not be used in self-checking circuits.

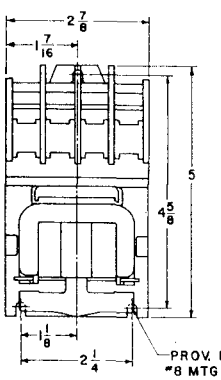
† APPLICATION NOTE

On 8 pole relays, do not use the following combinations in the same self-checking circuit:

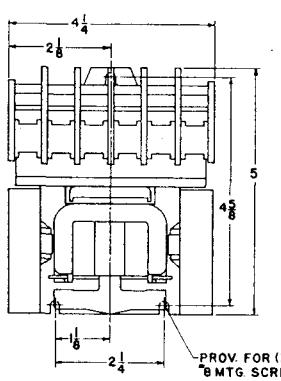
a) N.O. contact #1 with N.C. contact #5, 6 or 7.

b) N.O. contact #8 with N.C. contact #2, 3 or 4.

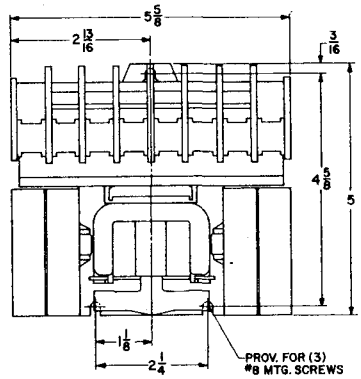
APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS



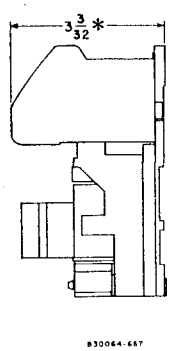
Open Type — 2 thru 4 Pole — AC — 2 and 3 Pole — DC
Weight — 3 Lbs.



Open Type — 6 and 8 Pole — AC — 4 thru 7 Pole — DC
Weight — 3½ Lbs.



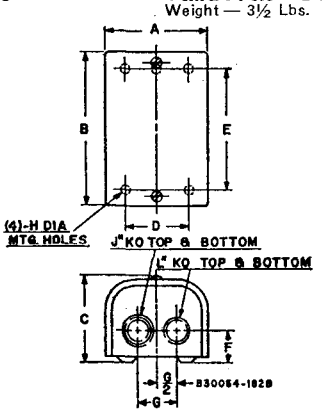
Open Type — 10 and 12 Pole — AC
Weight — 4 Lbs.



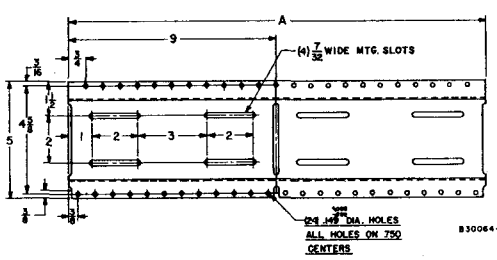
*LATCHING RELAY DIMENSIONS are same as above except the depth is 4 inches rather than 3-3/32 inches.

DC RELAY DIMENSIONS are same as above except the depth is 4-11/16 inches rather than 3-3/32.

	9991 LG-1
A	7 17/32
B	9 25/32
C	5 29/32
D	6 1/8
E	8 3/8
F	1 5/16
G	1 7/8
H	9/32
J & L	½, ¾, 1



Class 9991 LG-1
Weight — 10 Lbs.



Type H Relay Mounting Track

Type	"A"
H-6	18"
H-12	36"
H-18	54"

ORDERING INFORMATION REQUIRED 1. Class and type number. 2. Voltage and frequency of operating coils.

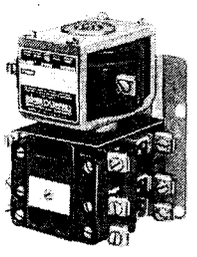
SQD SLV_000997

INDUSTRIAL CONTROL RELAYS — 600 VOLT
TYPE D

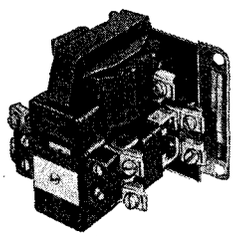
CLASS 8501 7001 8508

The Type D relay is a fixed contact, heavy duty relay well suited for machine tool type applications where long life and good contact reliability are important. Some of the important features are:

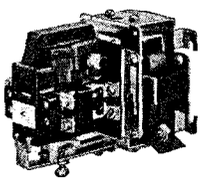
- 600 Volt, 10 Amp Rating
- Fixed Contacts
- Visible Contacts
- Continuous Duty Molded Coils
- Easy Disassembly
- Gravity Drop-out



Class 7001
Type DO-42



Class 8501
Type DO-22



Class 8508
Type DO-22

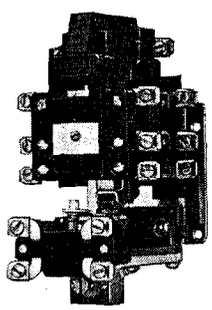
Description	*Number of Contacts		DC CLASS 7001 Open Type		AC CLASS 8501 Open Type		AC — LATCHING CLASS 8508 Open Type	
	Normally Open	Normally Closed	Type	Price	Type	Price	Type	Price
2 Pole, Single Throw	2	0	DO-20	**$114.**	DO-20	**$ 57.**	DO-20	**$130.**
2 Pole, Single Throw	0	2	DO-02	**114.**	DO-02	**70.**	DO-02	**143.**
2 Pole, Double Throw	2	2	DO-22	**141.**	DO-22	**79.**	DO-22	**152.**
4 Pole, Single Throw	4	0	DO-40	**141.**	DO-40	**75.**	DO-40	**148.**
4 Pole, 2 Double Throw, 2 N.O.	4	2	DO-42	**167.**	DO-42	**103.**	DO-42	**176.**
8 Pole, 4 N.O., 4 N.C.	4	4	DO-44	**194.**	DO-44	**103.**	DO-44	**176.**
6 Pole, 6 N.O.	6	0	DO-60	**167.**	DO-60	**110.**	DO-60	**183.**
8 Pole, 6 N.O., 2 N.C.	6	2	DO-62	**194.**	DO-62	**145.**	DO-62	**218.**
8 Pole, 2 Double Throw, 4 N.O., 2 N.C.	6	4	DO-64	**220.**	DO-64	**154.**	DO-64	**227.**
8 Pole, 8 N.O.	8	0	DO-80	**194.**	DO-80	**132.**	DO-80	**205.**
8 Pole, 6 N.O., 2 Double Throw	8	2	DO-82	**220.**	DO-82	**180.**	DO-82	**253.**

*Double throw contacts must be used on same polarity.

TYPE D RELAY OPERATED TIMER

Class 8501 Type D relay operated timer is well suited and economical for applications where a timing relay must operate simultaneously with a control relay. The advantages of using a Type D relay operated timer are that it requires power to only one coil and uses less panel space than two separate devices. Features of this device are:

- Timing Range — 0.1 sec to 1 min
- Repeat Accuracy — ± 10%
- Timed Contacts — 1 N.O. & 1 N.C.
- Instantaneous Contacts — Up to 4 N.O. & 2 N.C.
- Convertible Timing



Class 8501
Type DEO-42

Description		Number of Instantaneous Contacts*		Number of Timed Contacts*		AC CLASS 8501 Open Type	
		N.O.	N.C.	N.O.	N.C.	Type	Price
Time Delay after De-energization (Off Delay)	2 Pole, Double Throw	2	2	1	1	DDO-22	**$264.**
	4 Pole, 2 Double Throw, 2 N.O.	4	2	1	1	DDO-42	**308.**
Time Delay after Energization (On Delay)	2 Pole, Double Throw	2	2	1	1	DEO-22	**264.**
	4 Pole, 2 Double Throw, 2 N.O.	4	2	1	1	DEO-42	**308.**

*Double throw contacts must be used on same polarity.

STANDARD COILS	
Frequency	Voltage
60 Hz	6, 12, 24, 48, 120, 240, 277, 480, 600
50 Hz	6, 12, 24, 48, 110, 220, 440, 550
DC	12, 24, 48, 115, 230/250

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Voltage and frequency of operating coil.

DIMENSIONS — see Page 221.

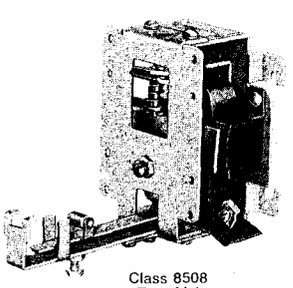
REPLACEMENT CONTACTS — See Class 9998.

LATCHING ATTACHMENT			
For Conversion of Class 8501, Type DO, Electrically Held Relay to Mechanically Held	Class	Type	Price
Attachment	8508	M-1	**$73.**

ADAPTOR PLATE — For mounting Type D relays in place of obsolete Class 7001 Types Q & R and Classes 8501 & 8508 Types A & BH relays. Order by Part No. 31071-216-01, list price **$6.60.**

NEMA 1 ENCLOSURE — Separate enclosure for use with Class 7001 and 8501, Type DO relays. Order as Class 9991 Type UE-6, for 2-4 pole relays, and Type UE-3 for 6-8 pole relays. Separate enclosure for use with Class 8501, Type DDO and DEO timers. Order as Class 9991 Type UE-3. Price **$28.00.**

NEMA 4 ENCLOSURE — Separate enclosure for 7001 & 8501 Type D relays, order as 9991 LW-1. List price **$144.00.** For additional enclosure information consult factory.



Class 8508
Type M-1

SQD SLV_000998

APPLICATION DATA

CONTACT RATINGS

Volts	AC Ratings — NEMA A-600						DC Ratings*			
	Inductive 35% Power Factor					Resistive 75% Power Factor	Inductive		Resistive	
	Make		Break		Continuous	Make, Break and Continuous	Make and Break	Continuous	Make and Break	Continuous
	Amperes	VA	Amperes	VA	Amperes	Amperes	Amperes	Amperes	Amperes	Amperes
120	60	7200	6	720	10	10	1.1	10	6	10
240	30	7200	3	720	10	10	0.55	10	1	10
480	15	7200	1.5	720	10	10	...	...	...	...
600	12	7200	1.2	720	10	10	0.2	10	0.5	10

*DC Ratings do not apply to Type DEO or DDO timed contacts.

AC MAGNET COILS

Type	Poles	Coil Prefix	Hertz	SUFFIX NUMBERS (Coil part numbers consist of coil prefix followed by suffix number)												Coil Volt-Amperes	
				60◐ Volts	120◐ Volts	240◐ Volts	480◐ Volts	110-115 Volts	120 Volts	208-220 Volts	240 Volts	277 Volts	440 Volts	480 Volts	550 Volts	600 Volts	In-rush	Sealed
DO-20 to DO-42	2-4	2959-S1	60	W20A	W23A	W26A	W29A	W32B	W33A	W35B	W36A	W36B	W38A	W39A	W39B	W40A	58	12
			50	W20B	W23B	W26B	W29B	W33A	W33B	...	W36B	...	W39A	W39B	W40A	W40B	52	11
DO-44 to DO-82	6 & 8	2959-S49	60	W18A	W21A	W24A	...	W30B	W31A	W33B	W34A	W34B	W36B	W37A	W37B	W38A	100	25
			50	W19A	W22A	W25A	...	W31A	W32A	...	W35A	...	W37A	W38A	W38A	W39A	75	22
DEO &DDO	Any	2959-S49	60	W18B	W21B	W24B	...	W31A	W31B	W34A	W34B	W35A	W37A	W37B	W38A	W38B	62	12
			50	W19B	W22B	W25B	...	W31B	W32B	...	W35B	...	W37B	W38B	W38B	...	52	11
Unlatch Coil for 8508	Any	2959-S13	60	...	W20B	W23B	W26B	W30A	W30B	W33A	W33B	W35B	W36A	W36B	W37A	W37B	39	12
			50	...	W21B	W24B	W27B	W30B	W31B	W33B	W34B	W36B	W36B	...	W37B	...	34	10

◐VA values for these coils are 120% of the values shown.

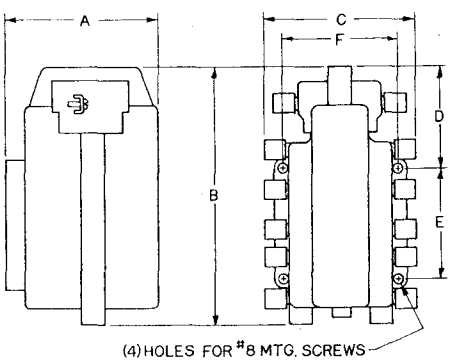
AC magnet coils are designed to operate on line voltages fluctuating as much as 15% below and 10% above nominal voltage.

DC MAGNET COILS

Type	Poles	Coil Prefix	SUFFIX NUMBERS (Coil part numbers consist of coil prefix followed by suffix number)				
			12 Volts	24 Volts	48 Volts	115 Volts	230/250 Volts
DO-20 to DO-82	Any	4491-S1	W24	W27	W30	W34	W37
Resistance (Ohms)			12	48	192	1220	4680

DC magnet coils are designed to operate on line voltages fluctuating as much as 20% below and 10% above nominal voltage.

APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS



(4) HOLES FOR #8 MT'G SCREWS

Figure 1

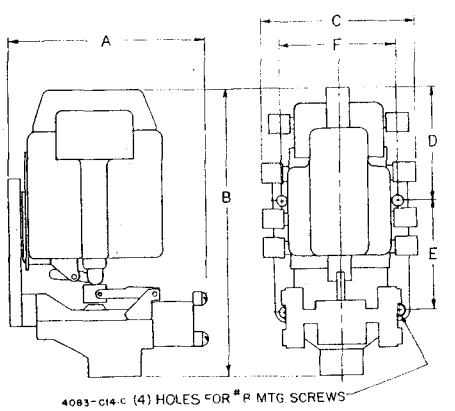


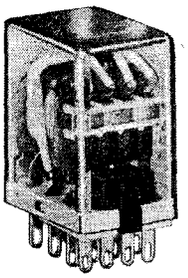
Figure 2

Class	Type	Figure Number	Dimensions — Inches						Weight (lbs.)
			A	B	C	D	E	F	
8501	DO-02, -20, -22	1	3 3/32	3 7/32	3	57/64	2 1/8	2 1/4	1 1/2
	DO-40, -42	1	3 3/32	3 33/64	3	1 13/64	2 1/8	2 1/4	1 1/2
	DO-44, -60, -62, -64, -80, -82	1	3 3/32	5 1/64	3	2 1/64	2 1/8	2 1/4	2
	DDO-22, -42	2	3 17/32	5 9/16	3 1/16	2 13/64	2 1/8	2 1/4	2
	DEO-22, -42	2	3 13/16	5 9/16	3 1/16	2 13/64	2 1/8	2 1/4	2

SQD SLV_000999

GENERAL PURPOSE CONTROL RELAYS

TYPE R



CLASS 8501

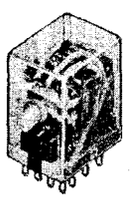
The Type R relay is suited for use both as a logic element and as a power switching output device. Because of the low mass and short stroke motion of the armature it has the extremely long mechanical life required for high speed control systems. Gold flashed fine silver, gold diffused contacts are available to provide high contact reliability. Gold flashed silver cadmium oxide contacts are available for weld resistance on inductive and motor loads.

- LONG LIFE
- HIGH CONTACT RELIABILITY
- HORSEPOWER RATED
- COMPLETE SOCKET LINE
- MANUAL OPERATOR OPTION
- AC OR DC OPERATION

Contacts 4PDT 120 or 240 Volts AC Max. 28 Volts DC Max.	Terminals: Solder or Plug-in* Type	Terminals: Printed Circuit Board Type	Operation	Coil Volts	Price Each — Order Quantity: 1-24	25-49	50-99	100-249	250-499	500-749	750-999	1000-1499	1500 & up
Fine Silver-Gold Diffused — Gold Flashed **3 Amp.** Resistive Best for low level switching.	RS4	RC4	AC 50/60 Hz.	6, 12, 24	**$25.38**	**$24.11**	**$22.84**	**$19.04**	**$17.77**	**$15.20**	**$13.95**	**$13.30**	**Consult your Square D Distributor**
				48, 120	**25.93**	**24.64**	**23.35**	**19.45**	**18.16**	**15.55**	**14.25**	**13.60**	
				240	**27.86**	**26.51**	**25.11**	**20.92**	**19.57**	**16.75**	**15.35**	**14.65**	
Application data below	RSD4	RCD4	DC	6, 12, 24	**22.65**	**21.51**	**20.39**	**16.98**	**15.86**	**13.60**	**12.45**	**11.90**	
				48	**23.19**	**22.04**	**20.88**	**17.40**	**16.24**	**13.90**	**12.75**	**12.15**	
				110	**25.27**	**24.00**	**22.76**	**18.95**	**17.70**	**15.15**	**13.90**	**13.25**	
Silver Cadmium Oxide — Gold Flashed **5 Amp.** Resistive Best for switching inductive loads	RS14	RC14	AC 50/60 Hz.	6, 12, 24	**22.75**	**21.64**	**20.47**	**17.04**	**15.91**	**13.65**	**12.50**	**11.95**	
				48, 120	**24.73**	**23.50**	**22.25**	**18.56**	**17.31**	**14.85**	**13.60**	**13.00**	
				240	**26.53**	**25.24**	**23.87**	**19.89**	**18.56**	**15.90**	**14.55**	**13.90**	
Application data below	RSD14	RCD14	DC	6, 12, 24,	**22.54**	**21.42**	**20.28**	**16.91**	**15.78**	**13.50**	**12.35**	**11.80**	
				48	**23.09**	**21.93**	**20.79**	**17.31**	**16.17**	**13.85**	**12.70**	**12.10**	
				110	**25.16**	**23.92**	**22.65**	**18.88**	**17.61**	**15.10**	**13.85**	**13.20**	

*For use with sockets listed on page 223.

SPECIAL FEATURES



Form M1

Form	Feature	Function	Voltage	Additions Price Each Device — Order Quantity: 1-24	25-49	50-99	100-249	250-499	500-749	750-999	1000-1499	1500 & up
M1	Manual Operator	Permits manual operating of contacts	Any	**$ 1.44**	**$ 1.42**	**$ 1.29**	**$ 1.14**	**$ 1.02**	**$ .90**	**$ .80**	**$ .95**	**Consult your Square D Distributor**
P14	Pilot Light	Indicates Power To Coil	Up to 48 V AC & DC	**13.12**	**12.48**	**12.03**	**9.89**	**9.17**	**7.90**	**7.25**	**6.90**	
			110 V DC 120, 240, V AC	**6.56**	**6.24**	**5.91**	**4.93**	**4.60**	**3.95**	**3.65**	**3.50**	

STOCK DEVICES

The following relays are stocked in the Square D Physical Distribution System. Orders for relays which are not stocked must call for a **Minimum** quantity of 100 identical devices and will have a lead time of 16 weeks.

RCD-4	6VDC	RS-4M1P14	120VAC	RS-14M1P14	240VAC	RSD-4P14	110VDC
RCD-4	12VDC	RS-4P14	120VAC	RS-14P14	120VAC	RSD-14	12VDC
RCD-4	24VDC	RS-14	12VAC	RSD-4	12VDC	RSD-14	24VDC
RCD-14	6VDC	RS-14	24VAC	RSD-4	20VDC	RSD-14	48VDC
RCD-14	12VDC	RS-14	120VAC	RSD-4	24VDC	RSD-14	110VDC
RS-4	24VAC	RS-14	240VAC	RSD-4	240VDC	RSD-14M1	24VDC
RS-4	120VAC	RS-14M1	120VAC	RSD-4M1	24VDC	RSD-14P14	24VDC
RS-4M1	120VAC	RS-14M1P14	120VAC	RSD-4M1P14	20VDC	RSD-14P14	110VDC

APPLICATION DATA — (See Page 207 For More Information)

OPERATING DATA

Pick Up Time: 13ms max.
Drop Out Time: 10ms max.
Ambient Temperature Range: −45°C to +70°C (−49°F to +158°F)

CONTACTS

Configuration: 4PDT (4 Form C)
Material: Fine Silver-Gold Diffused-Gold Flashed, or Silver Cadmium Oxide-Gold Flashed
Voltage Ratings: 120 or 240VAC max., 28VDC max.
Load Ratings: See table on Page 207.

COILS

Duty: Continuous rated coils
Standard Voltages: See tables above.
Voltage Range: AC coils: +10%, −15% of nominal
DC coils: +10%, −20% of nominal
Burden: AC coils: 3.5 VA inrush, 1.2 VA sealed
DC coils: 0.9 watts
Frequency: 50/60Hz (AC)

GENERAL

Terminals: Types RS, RSD-Solder/plug-in suitable for sockets listed on page 223.
Types RC, RCD-Printed Circuit.
Dust Covers: Type RS — Green Transparent Polycarbonate. Type RSD — Red Transparent Polycarbonate. Type RC — Green Translucent Nylon. Type RCD — Red Translucent Nylon.

UL/CSA

Type R relays are UL component recognized under File E42240 Guide NLDX2. Type RS relays, when used with the Type NR-44 socket, are UL listed under File E42240 Guide NLDX. Type R relays are CSA approved under File 22861M11 Guide 184-N-13-1U.

ORDERING INFORMATION REQUIRED — See Page 223.

SQD SLV_001000

APPLICATION DATA (Con't.)

MAXIMUM ELECTRICAL CONTACT RATINGS

Contact Material	AC Amperes						DC Amperes				
	AC Volts	Inductive 35% P.F. Make	Inductive 35% P.F. Break	Inductive 35% P.F. Continuous	Res. 75% P.F. Make Break & Continuous	HP	DC Volts	Inductive Make	Inductive Break	Res. Make Break & Continuous
Silver Cadmium Oxide Gold Flashed	120	15	1.5	5	5	1/10	28	1.5	1.5	5
	240	7.5	.75	5	2.5	1/10	...	...	...	....
Fine Silver — Gold Flashed	120	15	1.5	3	3	....	28	1.5	1.5	3

STANDARD COILS

Volts	Ohms AC 50/60 Hz	Ohms DC
6	10	40
12	40	160
24	155	650
48	670	2600
110	.....	11000
120	3900	.....
240	14900	.....

ORDERING INFORMATION REQUIRED

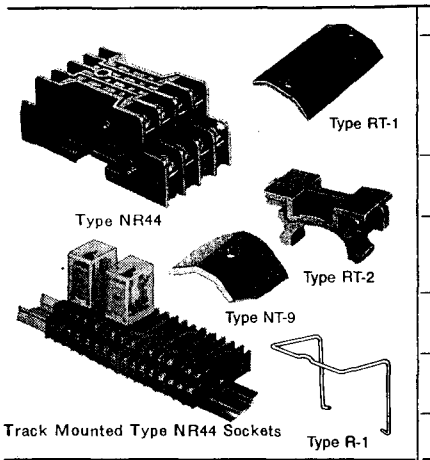
1. Class and type number.
2. Coil voltage and whether ac or dc.
3. If special features are desired, add form designations to Class and type number, e.g. Class 8501 RS14 Form M1 — 120 volts, 50/60 Hz.
4. Quantity prices apply only to quantities of identical relays (i.e. same Class, Type, Form and Voltage).

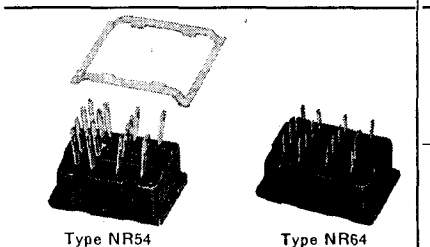
   Orders for 100 or less must be scheduled in one shipment in order for the full quantity discount to apply.

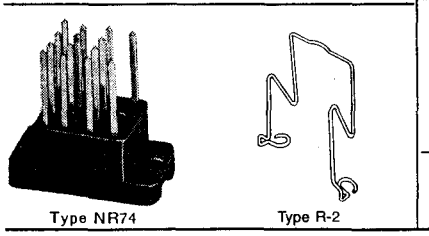
   Orders for 100 to 999 must be scheduled for shipments of 100 pieces minimum and the order must be completed within 90 days (180 days for 1000 or up) after the date scheduled for first shipment in order for the full quantity discount to apply.

Increase in quantity of an acknowledged order will be considered a new order, and priced in the discount bracket applicable to the quantity of the increase.

Decrease in quantity of an acknowledged order will subject the entire order to the applicable discount for the remaining quantity. It will also be necessary to issue supplemental billing of invoices already issued and may involve cancellation charges for parts accumulated and materials fabricated.







Description	Type	Quantity	Price
SCREW TERMINAL SOCKET — DIRECT MOUNTED Screw terminals are provided with pressure wire clamps to speed wiring. The socket accepts one or two #14-22 wires.	NR44	1-24 25-99 100-249 250-499 500-749 750-999 1000-1499	**$18.99** **18.05** **17.09** **14.25** **12.75** **11.70** **11.15**
CHANNEL CLAMP Allows Type NR44 sockets to be mounted on Type NT3 mounting track listed below. Use one Channel clamp per socket.	RT-1	Min. Qty. 10*	**.39** ea.
QUICK MOUNT CLAMP Allows adjacent Type NR-44 sockets to be interlocked and mounted on Type NT-3 mounting track without screws on every socket. The end sockets must be secured by the Type NT-9 clamp.	RT-2	Min. Qty. 10*	**.35** ea.
CHANNEL CLAMP For use on end Type NR-44 sockets when using Type RT-2 quick mount clamps on Type NT-3 track.	NT-9	Min. Qty. 10*	**.35** ea.
TRACK FOR NR44 SOCKETS A 36 inch section of extruded aluminum mounting track for Type NR44 sockets.	NT-3	Any	**6.85** ea.
RELAY RETAINER CLIP For optional use with Type NR44 sockets on high vibration applications.	R-1	Min. Qty. 50*	**.68** ea.
BACK WIRED SOCKET — SOLDER TERMINALS Mounts in rectangular cutout in chassis. Greenlee Tool's 1.018" x .861" #731-R punch makes a suitable hole. A socket mounting clip is included with each socket. Terminals are pierced to accept one or two wires.	NR54	Min. Qty. 10*	**2.10** ea.
BACK WIRED SOCKET — PRINTED CIRCUIT TERMINALS Mounts on printed circuit board.	NR64	Min. Qty. 10*	**2.04** ea.
BACK WIRED SOCKET — WIRE-WRAP TERMINALS Can be wired by hand or by tape controlled automatic wiring machinery. Socket terminals are .031 in. thick x .062 in. wide. Solid wire from #20 to #26 may be connected using WIRE-WRAP tools. WIRE-WRAP is a trade mark of Gardner-Denver	NR74	Min. Qty. 10*	**2.98** ea.
RELAY RETAINER CLIP For optional use with Type NR74 sockets on high vibration applications. Not to be used in conjunction with relays having the Form M1 (manual operator) feature.	R-2	Min. Qty. 50*	**.94** ea.

* Must be ordered in multiples of the min. qty. specified.

ORDERING INFORMATION REQUIRED:
Class and Type Number

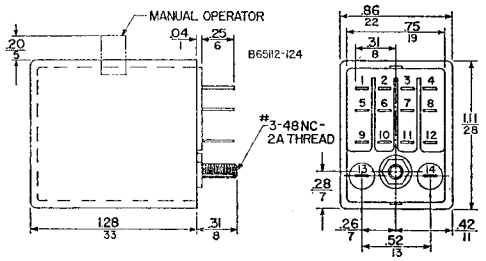
SQD SLV_001001

GENERAL PURPOSE CONTROL RELAYS

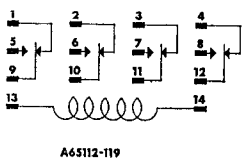
TYPE R

CLASS 8501

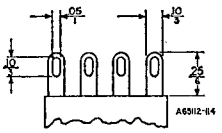
APPROXIMATE RELAY DIMENSIONS



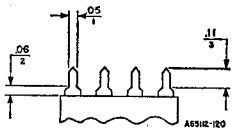
WIRING DIAGRAM



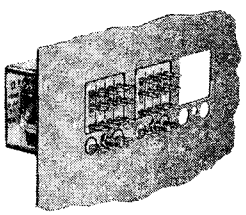
A65112-119

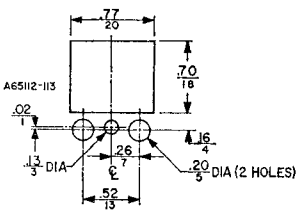


Type RS — Solder or Socket Terminals

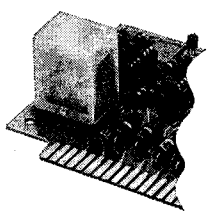


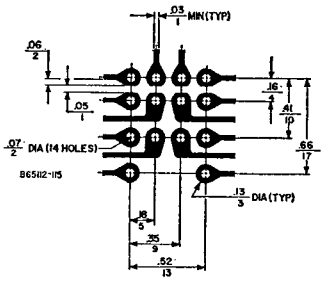
Type RC — Printed Circuit Terminals



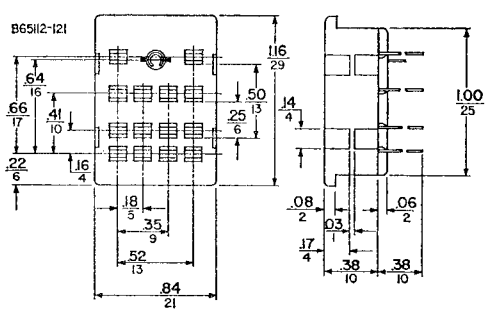


Chassis Cutout

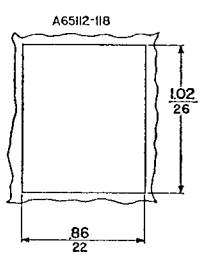




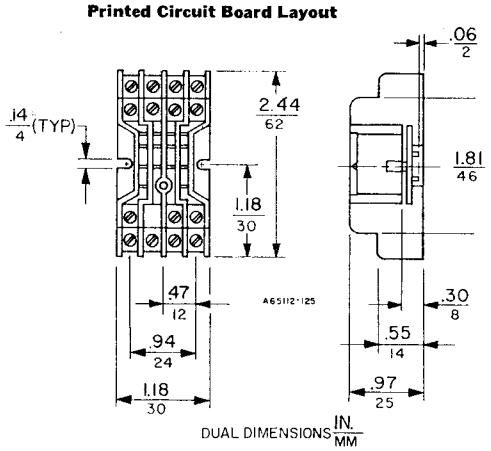
Printed Circuit Board Layout



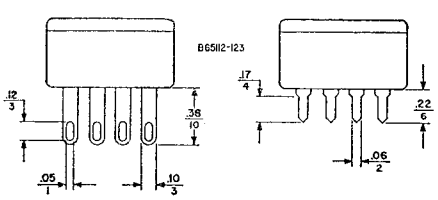
APPROXIMATE SOCKET DIMENSIONS



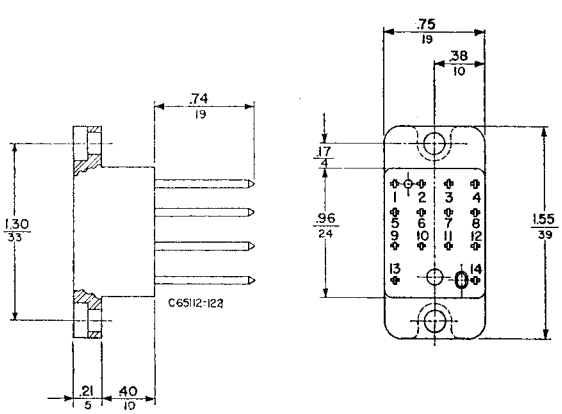
Chassis Cutout for NR54
Use GREENLEE TOOL CO.
No. 731R Relay Punch



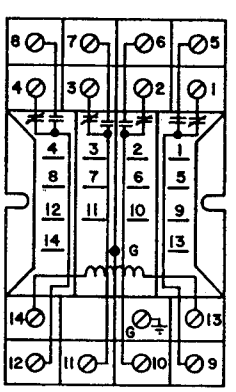
Type NR44



Types NR54 & NR64



Type NR74



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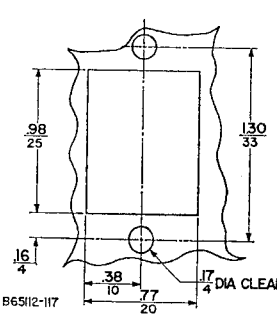
Type NR44 Wiring Diagram



Chassis Cutout for NR74

Dual Dimensions. **INCHES** / Millimeters

SQD SLV_001002

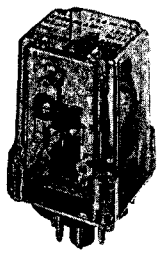
GENERAL PURPOSE CONTROL RELAYS

TYPE K

CLASS 8501

Class 8501 Type K general purpose control relays are designed for multipole switching applications at, or below 240 volts. Class 8501 Type K relays have an industry standard wiring and pin arrangement which allows their use as replacements for many similar relays without wiring or hardware modifications.

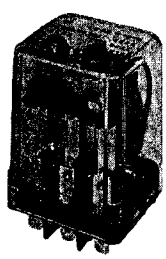
- 240 Volt 10 Amp.
- AC or DC Operation
- DPDT or 3PDT
- Manual Operator Option (Type KU Only)
- Pilot Light Option
- UL Component Recognized



Type KP
Tube Type

TYPE KP—TUBE TYPE TERMINATION

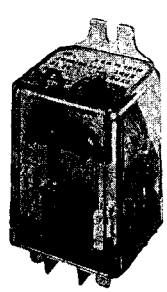
	Operation	Contacts	Type	Coil Voltage**	PRICE EACH ORDER QUANTITY 1-24	25-49	50-99	100-249	250-499	500-749	750-999	1000-1499	1500 & up
Type KP 10 Amp Res. 240 Volts Tube Type Socket Mounted Use Type NR Sockets Listed on Page 227	AC 50/60 Hz	DPDT	KP-12	**6,12,24,48,120**	**$29.54**	**$28.07**	**$26.59**	**$22.17**	**$20.68**	**$17.75**	**$16.30**	**$15.55**	Consult your Square D Distributor
				240	**31.40**	**29.82**	**28.27**	**23.54**	**21.99**	**18.85**	**17.30**	**16.50**	
		3PDT	KP-13	6,**12,24,48,120**	**36.65**	**34.81**	**33.00**	**27.48**	**25.67**	**22.00**	**20.20**	**19.30**	
				240	**38.73**	**36.81**	**34.86**	**29.06**	**27.11**	**23.25**	**21.35**	**20.35**	
	DC	DPDT	KPD-12	**6,12,20,24**	**29.43**	**27.96**	**26.50**	**22.08**	**20.61**	**17.65**	**16.20**	**15.45**	
				48	**31.07**	**29.52**	**27.96**	**23.30**	**21.75**	**18.65**	**17.10**	**16.30**	
				110,125,130	**32.28**	**30.66**	**29.06**	**24.20**	**22.60**	**19.35**	**17.75**	**16.95**	
		3PDT	KPD-13	6,**12,24**	**36.32**	**34.51**	**32.69**	**27.24**	**25.43**	**21.80**	**20.00**	**19.10**	
				48	**38.18**	**36.28**	**34.38**	**28.64**	**26.74**	**22.90**	**21.00**	**20.05**	
				110,125,130	**39.17**	**37.22**	**35.25**	**29.39**	**27.42**	**23.50**	**21.55**	**20.55**	



Type KU
Square Base

TYPE KU—SQUARE BASE TERMINATION

	Operation	Contacts	Type	Coil Voltage**	PRICE EACH ORDER QUANTITY 1-24	25-49	50-99	100-249	250-499	500 & up
Type KU 10 Amp Res. 240 Volts Square Base Socket Mounted Use Type NR Sockets Listed on Page 227	AC 50/60 Hz	DPDT	KU-12	6,12,**24**,48,**120**	**$17.55**	**$16.70**	**$15.85**	**$13.15**	**$12.30**	Consult your Square D Distributor
				240	**20.05**	**19.05**	**18.05**	**15.05**	**14.05**	
		3PDT	KU-13	6,12,**24**,48,**120**	**19.60**	**18.65**	**17.65**	**14.70**	**13.75**	
				240	**22.10**	**21.00**	**19.90**	**16.60**	**15.50**	
	DC	DPDT	KUD-12	**6**,12,24	**15.40**	**14.65**	**13.90**	**11.55**	**10.80**	
				48	**16.35**	**15.55**	**14.75**	**12.25**	**11.50**	
				110	**19.60**	**18.65**	**17.65**	**14.70**	**13.75**	
		3PDT	KUD-13	6,12,**24**	**18.15**	**17.25**	**16.35**	**13.60**	**12.70**	
				48	**19.25**	**18.30**	**17.35**	**14.45**	**13.50**	
				110	**22.35**	**21.20**	**20.10**	**16.75**	**15.65**	



Type KF
Flange Mounted

TYPE KF—FLANGE MOUNTED—SQUARE BASE TERMINATION

	Operation	Contacts	Type	Coil Voltage**	PRICE EACH ORDER QUANTITY 1-24	25-49	50-99	100-249	250-499	500 & up
Type KF 10 Amp Res. 240 Volts Flange Mounted Use .187 Slip-on Connectors or Solder Connections	AC 50/60 Hz	DPDT	KF-12	6,**12,24**,48,**120**	**$18.25**	**$17.35**	**$16.45**	**$13.70**	**$12.80**	Consult your Square D Distributor
				240	**20.50**	**19.50**	**18.45**	**15.40**	**14.35**	
		3PDT	KF-13	6,12,24,48,**120**	**20.30**	**19.25**	**18.30**	**15.20**	**14.20**	
				240	**22.80**	**21.65**	**20.50**	**17.10**	**15.95**	
	DC	DPDT	KFD-12	6,12,**24**	**16.10**	**15.30**	**14.50**	**12.10**	**11.25**	
				48	**17.10**	**16.25**	**15.40**	**12.85**	**11.95**	
				110	**20.30**	**19.25**	**18.30**	**15.20**	**14.20**	
		3PDT	KFD-13	6,**12,24**	**18.80**	**17.90**	**16.95**	**14.15**	**13.15**	
				48	**20.00**	**19.00**	**18.00**	**15.05**	**13.95**	
				110	**23.00**	**21.85**	**20.75**	**17.25**	**16.10**	

SPECIAL FEATURES FOR TYPES KP & KU RELAYS

Form	Feature	Function	ADDITIONS PRICE EACH DEVICE ORDER QUANTITY 1-24	25-49	50-99	100-249	250-499	500-749	750-999	1000-1499	1500 & up
P14	Pilot Light	Indicates Power to Coil	**$5.45**	**$5.05**	**$4.75**	**$3.95**	**$3.70**	**$3.15**	**$2.90**	**$2.80**	
M1◐	Manual Operator	Manual Closing of Contacts	**2.95**	**2.80**	**2.65**	**2.20**	**2.06**	**Consult your Square D Distributor**			

**THE COIL VOLTAGES IN BOLD PRINT ARE STOCK DEVICES.

◐NOT AVAILABLE ON TYPE KP DEVICES.

Orders for Type K relays which are not stocked must call for a minimum quantity of 100 identical devices, and will have a lead time of 16 weeks. In addition to the devices indicated as stock above, the following devices are also stocked:

KP-12P14	24V/60HZ	KP-13P14	120V/60HZ	KUD-12M1P14	24VDC
KP-12P14	120V/60HZ	KPD-13P14	24VDC	KU-13M1	120V/60HZ
KPD-12M1	20VDC	KU-12M1	120V/60HZ	KU-13M1P14	120V/60HZ
KPD-12P14	12VDC	KU-12M1P14	6V/60HZ	KUD-13M1	24VDC
KPD-12P14	24VDC	KU-12M1P14	120V/60HZ	KUD-13M1P14	24VDC
KPD-12P14	110VDC	KUD-12M1	24VDC	KUD-13M1P14	110VDC
KP-13P14	24V/60HZ	KUD-12M1	20VDC		

ORDERING INFORMATION REQUIRED — See Page 223.

SQD SLV_001003

GENERAL PURPOSE CONTROL RELAYS

ORDERING INFORMATION — APPLICATION DATA — TYPE K

CLASS 8501

APPLICATION DATA

THIS DATA IS APPLICABLE TO ALL TYPE K RELAYS LISTED ON PAGE 225.

OPERATING DATA

Pick Up Time: Approximately 15 ms.
Drop Out Time: Approximately 10 ms.
Ambient Temp. Range: AC: 2 pole: −45°C to +55°C
3 pole: −45°C to +45°C
DC: −45°C to +70°C

CONTACTS

Configuration: 2 or 3 PDT (2 or 3 Form C)
Material: Silver Cadmium Oxide
Ratings: See table below

UL/CSA:

Type K relays are UL component recognized under File E42240 Guide NLDX2. Types KF and KU relays are CSA approved under File 1573451M Guide 184-N-13.13 and Type KP relays under File 25490C Guide 184-N-13.1U.

TYPE K — MAXIMUM ELECTRICAL CONTACT RATINGS

Volts	AC Amperes Inductive 35% PF▲ Make	Break	Continuous	Resistive 75% PF Make, Break & Continuous	HP	DC Volts	DC Amperes Inductive▲ Make Break	Continuous
120	30	3	10	10	¼	24-110	60 VA	10 A
240	15	1.5	10*	10*	⅓			

▲ Based on inductive loads such as coils and solenoids.
* 3 pole devices have 6⅔ Amps max. continuous rating.

COILS

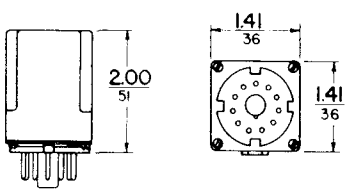
Duty: Continuous
Standard Voltages: See table below
Operate: AC: 85% of Nominal Voltage at 25°C.
DC: 75% of Nominal Voltage at 25°C.
Burden: Type KP: AC: 3 VA inrush, 2 VA sealed
DC: 1.2 watts standard
3 watts maximum
Types KU, KF: AC: 2 pole — 3 VA inrush, 2 VA sealed
3 pole — 5.4 VA inrush, 2.7 VA sealed
DC: 1.2 watts standard
3 watts maximum

COIL RESISTANCE — OHMS*

Volts	KP AC 50/60 Hz	KP DC	KU & KF AC 50/60 Hz 2 Pole	KU & KF AC 50/60 Hz 3 Pole	KU & KF DC
6	6.0	32	6.0	4.2	32.1
12	24	120	24	18	120
24	85	472	85	72	472
48	—	1800	—	—	1800
110	—	10,000	—	—	10,000
120	2250	—	2250	1700	—
240	9110	—	9110	7200	—

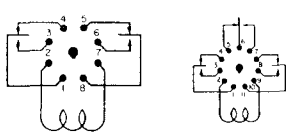
*Resistance values for AC coils above are ±15% @ 25°C, and resistance values for DC coils above are ±10% @ 25°C.

WIRING DIAGRAMS & APPROXIMATE DIMENSIONS

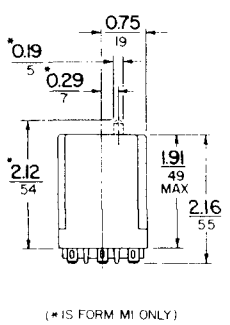


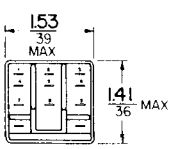
TYPE KP, KPD

TYPE KP — WIRING DIAGRAMS

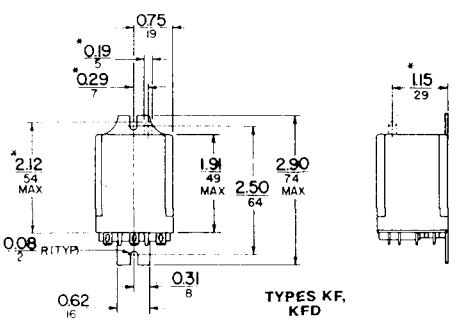


2 POLE 3 POLE



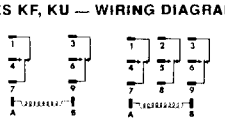


TYPES KU, KUD

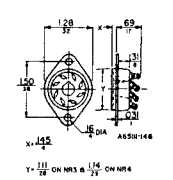


TYPES KF, KFD

TYPES KF, KU — WIRING DIAGRAMS

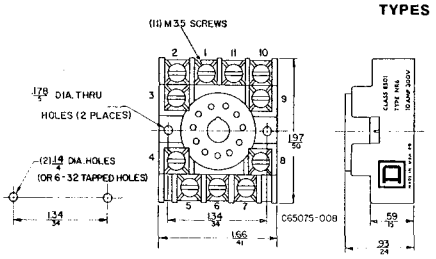


2 POLE 3 POLE

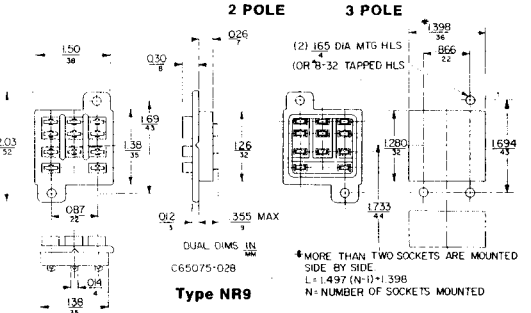


Mounts in 1.156/29 hole

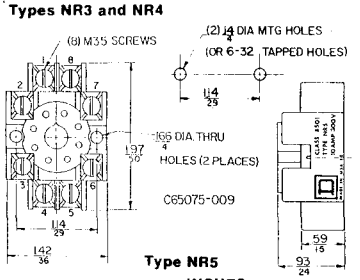
Types NR3 and NR4



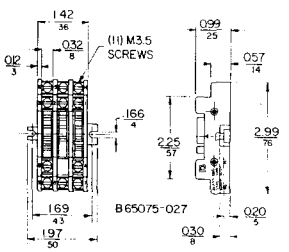
Type NR6



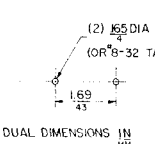
Type NR9

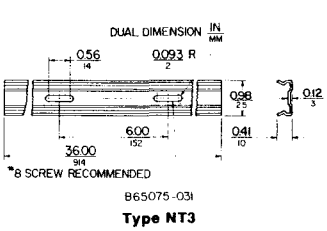


Type NR5



Type NR8





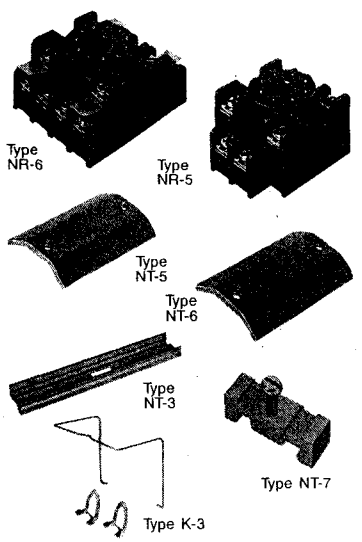
Type NT3

Dual Dimensions: INCHES / Millimeters

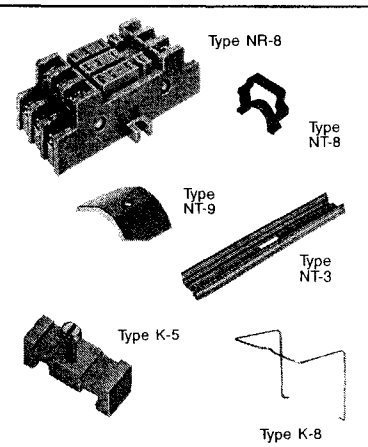
SQD SLV_001004

GENERAL PURPOSE CONTROL RELAYS
SOCKETS AND ACCESSORIES

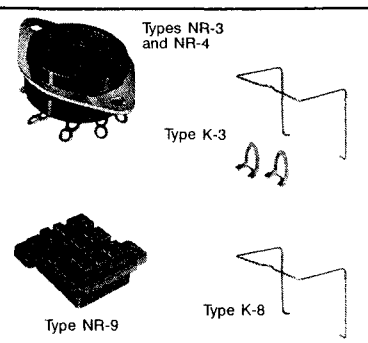
CLASS 8501



Relay	Description	Type	Quantity	Price
KP (DPDT)	**Screw Terminal Socket** For use with 8 pin tube base type relays. Screw terminals are provided with pressure wire clamps that accept 1 or 2 #14-22 wires.	NR-5	1-24 25-49 50-99 100-249 250-499 500 & Up	**$7.83** **7.44** **7.05** **6.55** **6.15** **5.80**
KP (3PDT)	**Screw Terminal Socket** For use with 11 pin tube base type relays. Screw terminals are provided with pressure wire clamps that accept 1 or 2 #14-22 wires.	NR-6	1-24 25-49 50-99 100-249 250-499 500 & Up	**11.73** **11.14** **10.55** **9.80** **9.15** **8.30**
KP (DPDT)	**Channel Clamp** Allows Type NR-5 sockets to be mounted on Type NT-3 mounting channel listed below. Use 1 channel clamp per socket.	NT-5	Min. Qty. 10*	**.42**
KP (3PDT)	**Channel Clamp** Allows Type NR-6 sockets to be mounted on Type NT-3 mounting channel listed below. Use 1 channel clamp per socket.	NT-6	Min. Qty. 10*	**.42**
—	**Mounting Channel** A 36 inch section of extruded aluminum mounting channel. Channel clamps must be used for mounting of relay sockets on channel.	NT-3	1	**6.85**
—	**Channel Clamp** Allows Types NR-5 or NR-6 sockets to be mounted on Class 9080 Type GH terminal block channel.	NT-7	Min. Qty. 10*	**1.32**
KP	**Relay Retainer Clip** For optional use with Types NR-5 or NR-6 sockets on high vibration applications.	K-3	Min. Qty. 10*	**.75**



Relay	Description	Type	Quantity	Price
KU	**Screw Terminal Socket** For use with 11 pin square base type relays. Screw terminals are provided with pressure wire clamps that accept 1 or 2 #14-22 wires.	NR-8	1-24 25-49 50-99 100-249 250-499 500 & Up	**12.43** **11.82** **11.18** **10.60** **10.10** †
KU	**Quick Mount Clamp** Allows adjacent Type NR-8 sockets to be interlocked and mounted on Type NT-3 mounting channel without screws on every socket. Each end socket must be secured by a Type NT-9 channel clamp.	NT-8	Min. Qty. 10*	**.44**
KU	**Channel Clamp** For use on end Type NR-8 sockets when using Type NT-8 quick mount clamps on Type NT-3 channel.	NT-9	Min. Qty. 10*	**.35**
—	**Mounting Channel** A 36 inch section of extruded aluminum mounting channel. Channel clamps must be used for mounting of relay sockets on channel.	NT-3	1	**6.85**
—	**Channel Clamp** Allows Type NR-8 sockets to be mounted on Class 9080 Type GH terminal block channel.	NT-7	Min. Qty. 10*	**1.32**
KU	**Relay Retainer Clip** For optional use with Type NR-8 sockets on high vibration applications.	K-8	Min. Qty. 10*	**.37**



Relay	Description	Type	Quantity	Price
KP (DPDT)	**Backwired Socket-Solder Terminals** For use with 8 pin tube base type relays. Mounts in round cutout in chassis. Terminals are pierced to accept 1 or 2 wires.	NR-3	1	**1.25**
KP (3PDT)	**Backwired Socket-Solder Terminals** For use with 11 pin tube base type relays. Mounts in round cutout in chassis. Terminals are pierced to accept 1 or 2 wires.	NR-4	1	**1.70**
KP	**Relay Retainer Clip** For optional use with Types NR-3 or NR-4 sockets on high vibration applications.	K-3	Min. Qty. 10*	**.75**
KU	**Backwired Socket-Solder Terminals** For use with 11 pin square base type relays. Mounts in rectangular cutout in chassis.	NR-9	1-24 25-49 50-99 100-249 250-499 500 & Up	**2.80** **2.65** **2.50** **2.10** **1.95** †
KU	**Relay Retainer Clip** For optional use with Type NR-9 sockets on high vibration applications.	K-8	Min. Qty. 10*	**.37**

* Must be ordered in multiples of the minimum quantity specified.
† Consult your Square D Distributor.

ORDERING INFORMATION REQUIRED — Class and type number.

SQD SLV_001005

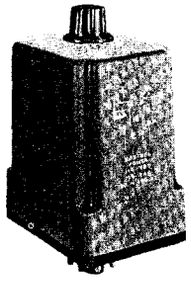
GENERAL PURPOSE TIMING RELAYS

SOLID STATE — TYPE JCK

CLASS 8501

Class 8501 Type JCK timing relays are designed to provide low cost timing in a plug-in housing. A CMOS integrated circuit provides an accurate time delay. The timer is directly interchangeable with many other 8 and 11 pin radio tube base timers. The JCK may be installed using the same mounting sockets as used by the Class 8501 Type KP relay.

- Excellent Repeat Accuracy
- On and Off Delay Versions Available
- Transient Protected
- Dual AC/DC Operation



TYPE JCK

Timing Mode	Compatible Socket	Timing Range	Type	Price Each — Order Quantity 1-9	10-24	25-49	50 & Up
On delay	Types NR3 & NR5	0.1-10 seconds	JCK-11	$ 81.65	$ 77.55	$ 73.45	$ 65.30
		0.3-30 seconds	JCK-12	83.00	78.85	74.70	66.40
		0.6-60 seconds	JCK-13	84.35	80.15	75.95	67.50
		1.2-120 seconds	JCK-14	94.10	89.40	84.70	75.25
		1.8-180 seconds	JCK-15	120.45	114.45	108.40	96.35
Off delay	Types NR4 & NR6	0.1-10 seconds	JCK-21	103.15	98.00	92.85	82.55
		0.3-30 seconds	JCK-22	104.90	99.65	94.45	83.95
		0.6-60 seconds	JCK-23	106.65	101.30	96.00	85.30
		1.2-120 seconds	JCK-24	118.90	112.95	107.05	95.15
		1.8-180 seconds	JCK-25	152.25	144.65	137.05	121.80

APPLICATION DATA

Timing: Knob adjustable with 5 timing ranges of 0.1-10 seconds, 0.3-30 seconds, 0.6-60 seconds, 1.2-120 seconds and 1.8-180 seconds.

Repeat Accuracy: ± 2% for constant voltage and temperature. ± 10% for any variation of voltage and temperature within specifications.

Recycle time: On delay, 100 milliseconds typical and 125 milliseconds maximum. Off delay, 40 milliseconds.

Modes of Operation: On delay, non-convertible
Off delay, non-convertible

Operating Voltages: 120VAC/110VDC, 48VAC/DC, and 24VAC/DC are available. The timers are dual rated AC/DC. This allows a timer to operate on either an AC or DC voltage. DC on delay versions have no polarity restrictions. For proper operation, the DC off delay version must be wired with the polarity shown in the wiring diagram. Reverse polarity, however, will not damage the timer.

Voltage range: AC operation, + 10%, − 15% of nominal at 50 thru 400 Hz
DC operation, + 10%, − 20% of nominal.

Burden: On delay — 1 VA during timing, 2 VA after timing
Off delay — 2 VA during timing, 1 VA after timing.

Ambient temperature range:
Operating: − 10° C to + 55° C (14° F to 131° F)
Storage: − 55° C to + 85° C (− 67° F to + 185° F)

Transient protection: 2,000 volts for 100 micro-seconds.

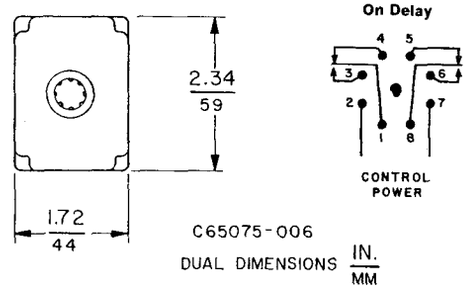
False operation: None.

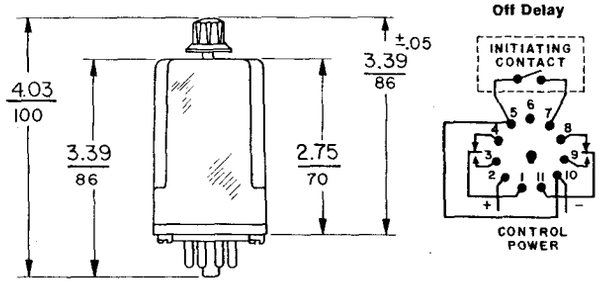
Dial: Reference scale is marked in seconds. At minimum setting the actual time delay may be less than specified and at maximum setting, the time delay may be up to 25% more than specified.

UL: Type JCK timing relays are UL component recognized under File E42259(M) Guide NKCR2.

MAXIMUM ELECTRICAL CONTACT RATINGS

AC Volts	AC Amperes Inductive 35% P.F. Make	Break	Con-tinuous	Res. 75% P.F. Make Break and Con-tinuous	HP	DC Volts	DC Amperes Inductive Make	Break	Res. Make Break and Con-tinuous
120	15	1.5	5	5	1/10	28	1.5	1.5	5
240	7.5	.75	5	2.5	1/10				





SOCKETS: See table above and page 227 for selection and pricing of sockets.

OTHER TIMING RELAYS: Page 415.

ORDERING INFORMATION REQUIRED:
1. Class and type number
2. Input voltage

QUANTITY PRICING: To qualify for quantity prices, orders must meet requirements on page 223, Item 4.

SQD SLV_001006

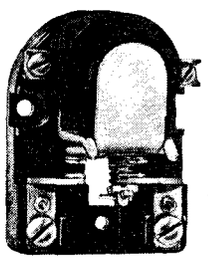
GENERAL PURPOSE CONTROL RELAYS

TYPE C

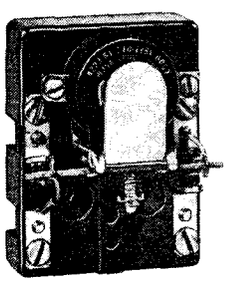
CLASS 8501

Class 8501 Type C relays are ideally suited for controlling small single phase motors and other light loads such as electric heaters, pilot lights, or audible signals. Features of this device are:

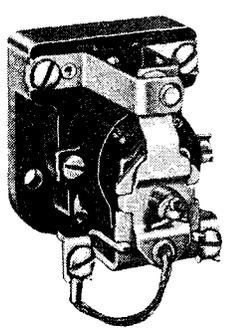
- Horsepower Rated
- Ampere Rated
- Quiet Operation
- Visible Contacts
- Low Cost
- UL Listed



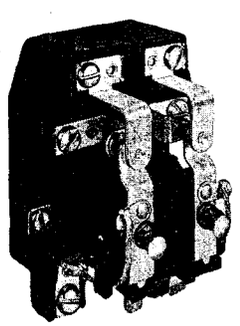
Type CO-1



Type CO-3



Type CO-12



Type CO-16

Number of Contacts		AC Max. Contact Volts	AC Res. Ampere Rating 75% Power Factor	Inductive AC — VA Rating★ 35% Power Factor	Maximum AC Single Phase Horsepower		AC Operated **Open Type**		DC Operated **Open Type**	
Normally Open	Normally Closed				115 Volts	230 Volts	Type	Price	Type	Price*
1	0	277	15	690	1	1½	CO-1	**$22.**	CDO-1	**$34.**
2	0	277	10	345	½	½	CO-2	**34.**	CDO-2	**46.**
		600	5							
1	1	277	10	345	½	½	CO-3	**40.**	CDO-3	**52.**
		600	5							
0	2	277	10	345	½	½	CO-4	**40.**	CDO-4	**52.**
		600	5							
0	1	277	15	690	¾	1	CO-5	**24.**	CDO-5	**36.**
1	0	277	10	690	½	¾	CO-11	**28.**	CDO-11	**40.**
1	1	277	10	690	½	¾	CO-12	**34.**	CDO-12	**46.**
1	0	277	10	690	½	¾	CO-13	**30.**	CDO-13	**42.**
		600	5							
1	1	277	10	690	½	¾	CO-14	**36.**	CDO-14	**48.**
		600	5							
1	1	277	30	720	1	2	CO-15	**42.**	CDO-15	**54.**
		600	10							
2	2	240	30	720	1	2	CO-16	**48.**	CDO-16	**60.**
		600	10							

★ Maximum current from 0 to 115VAC for 345VA rated devices is 30 amps make and 3 amps break. Maximum current from 0 to 115VAC for 690VA rated devices is 60 amps make and 6 amps break. Maximum current from 0 to 115VAC for 720VA rated devices is 85 amps make and 30 amps break.

* For quantities of 25 or more identical devices, the price each is the same as the equivalent AC operated device.

APPLICATION DATA

Standard Coil Voltages:

Frequency	Voltage
60 Hz	6, 12, 24, 48, 120, 208, 240, 277, 480
50 Hz	6, 12, 24, 48, 110, 120, 220, 240, 440, 480
DC	6, 12, 24, 110, 120

Coil Burden:

AC —

COIL VA

Hz	Types CO 1-14		Types CO 15-16	
	Inrush	Sealed	Inrush	Sealed
50	14	8.6	14.8	9.8
60	11	6.6	14.8	9.8

DC — Types CO1-14: 3.5 watts nominal
Types CO15-16: 2.0 watts nominal

Input Voltage:

AC — 6 through 480 volts, + 10% — 15% of nominal

DC — 6 through 120 volts, + 10% — 20% of nominal

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Voltage and frequency of operating coil.
3. Minimum order quantity for non-stock devices is 25.

UL/CSA:

Type C control relays are UL listed under File E42240 Guide NLDX and CSA approved under File 25490C Guide 184-N-13.3.

Enclosure —

Type C relay in NEMA 1 sheet steel enclosure — change "O" in the Type designation to "G" and add **$14.50** list each to the price of the open type relay.

Separately packed NEMA 1 sheet steel enclosure for Types CO & CDO relays— order Class 9991 Type UE-1 (formerly 8501 UE-1) **$14.50** list each.

AC Stock Devices:

X denotes stocked in Square D physical Distribution System.

	AC Operating Coil Voltage									
Type CO —	6	12	24	48	120	208	230	240	277	480
1	X	X	X	X	X	X		X	X	X
2	X	X	X		X	X		X	X	X
3		X	X		X	X		X		X
4		X	X		X	X		X		X
5		X	X		X	X	X	X	X	X
11			X		X		X	X		
12	X		X		X	X	X	X		X
13			X		X	X		X		X
14					X		X	X		X
15			X		X			X	X	X
16			X		X	X		X		X

DC Stock Devices:

CDO-1	12, 24VDC	CDO-12	24, 120VDC
CDO-2	24VDC	CDO-16	24VDC
CDO-5	24VDC		

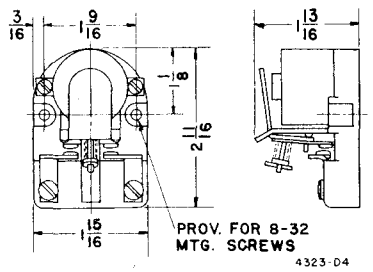
SQD SLV_001007

GENERAL PURPOSE CONTROL RELAYS

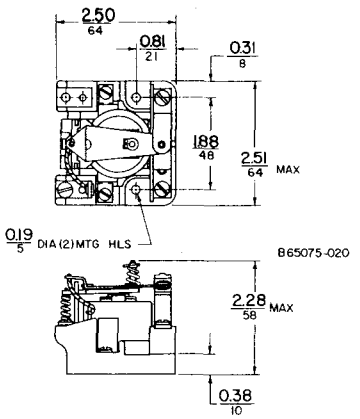
TYPE C

CLASS 8501

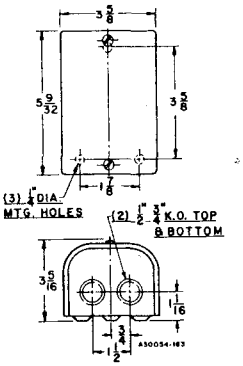
APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS



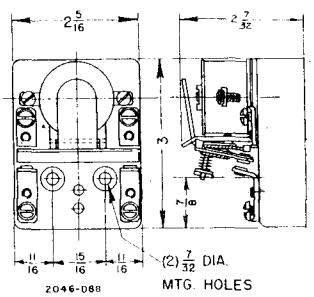
Class 8501 Types CO-1 and CO-5
CDO-1 and CDO-5



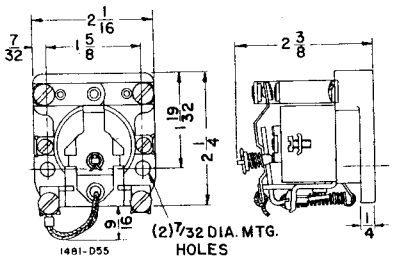
★Class 8501 Types CO-15, CDO-15



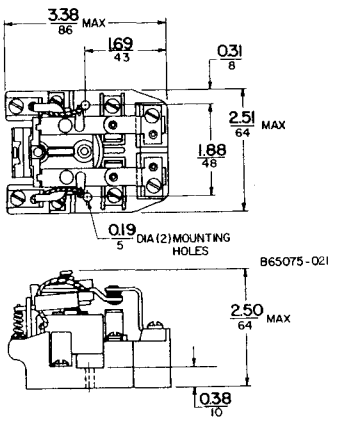
Class 9991 Type UE-1
General Purpose Enclosure
Weight — 2 Lbs.



Class 8501 Types CO-2, 3 and 4
CDO-2, 3, 4

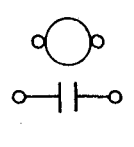


Class 8501 Types CO-11, 12, 13 and 14
CDO-11, 12, 13 and 14

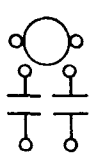


★Class 8501 Types CO-16, CDO-16

CONTACT ARRANGEMENTS



Type CO-1, CDO-1



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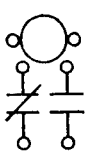
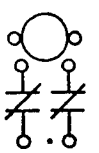


Type CO-3, CDO-3



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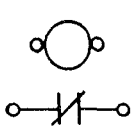

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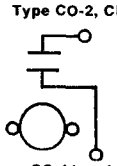
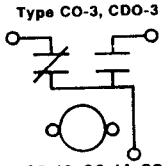
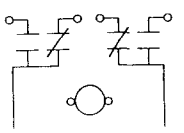


Types CO-11 and CO-13
CDO-11 and CDO-13



Types CO-12, CO-14, CO-15
CDO-12, CDO-14, CDO-15



Types CO-16, CDO-16

SQD SLV_001008

AC MAGNETIC CONTACTORS AND STARTERS

ELECTRICAL RATINGS

CLASS
8536
8502

NEMA Size	Load Volts	Maximum Horsepower Rating — Nonplugging and Nonjogging Duty		Maximum Horsepower Rating — Plugging and Jogging Duty †		Continuous Current Rating, Amperes — 600 Volt Max.	Service-Limit Current Rating, Amperes *	Tungsten and Infrared Lamp Load, Amperes — 250 Volts Max. ★	Resistance Heating Loads, KW — other than Infrared Lamp Loads ‡		KVA Rating for Switching Transformer Primaries At 50 or 60 Cycles				3 Phase Rating for Switching Capacitors •
											Transformers Having Inrush Currents (Worst Case Peak) of Not More Than 20 Times Peak of Continuous Current Rating		Transformers Having Inrush Currents (Worst Case Peak) of Over 20 Through 40 Times Peak of Continuous Current Rating		
		Single Phase	Poly-Phase	Single Phase	Poly-Phase				Single Phase	Poly-Phase	Single Phase	Poly-Phase	Single Phase	Poly-Phase	KVAR
00	115	⅓	...	...	...	9	11	5	...	...	...	...	...	...	...
	200	...	1½	...	...	9	11	5	...	...	...	...	...	...	...
	230	1	1½	...	...	9	11	5	...	...	...	...	...	...	...
	380	...	1½	...	...	9	11	...	...	...	...	...	...	...	...
	460	...	2	...	...	9	11	...	...	...	...	...	...	...	...
	575	...	2	...	...	9	11	...	...	...	...	...	...	...	...
0	115	1	...	½	...	18	21	10	...	...	0.6	...	0.3	...	...
	200	...	3	...	1½	18	21	10	...	...	...	1.8	...	0.9	...
	230	2	3	1	1½	18	21	10	...	...	1.2	2.1	0.6	1.0	...
	380	...	5	...	1½	18	21	...	...	...	...	...	...	...	...
	460	...	5	...	2	18	21	...	...	...	2.4	4.2	1.2	2.1	...
	575	...	5	...	2	18	21	...	...	...	3.0	5.2	1.5	2.6	...
1	115	2	...	1	...	27	32	15	3	5	1.2	...	0.6	...	...
	200	...	7½	...	3	27	32	15	...	9.1	...	3.6	...	1.8	...
	230	3	7½	2	3	27	32	15	6	10	2.4	4.3	1.2	2.1	...
	380	...	10	...	5	27	32	...	...	16.5	...	...	...	...	...
	460	...	10	...	5	27	32	...	12	20	4.9	8.5	2.5	4.3	...
	575	...	10	...	5	27	32	...	15	25	6.2	11.0	3.1	5.3	...
1P	115	3	...	1½	...	36	42	24	...	...	...	...	...	...	...
	230	5	...	3	...	36	42	24	...	...	...	...	...	...	...
2	115	3	...	2	...	45	52	30	5	8.5	2.1	...	1.0	...	...
	200	...	10	...	7½	45	52	30	...	15.4	...	6.3	...	3.1	...
	230	7½	15	5	10	45	52	30	10	17	4.1	7.2	2.1	3.6	8
	380	...	25	...	15	45	52	...	...	28	...	...	...	...	...
	460	...	25	...	15	45	52	...	20	34	8.3	14	4.2	7.2	16
	575	...	25	...	15	45	52	...	25	43	10.0	18	5.2	8.9	20
3	115	7½	...	...	...	90	104	60	10	17	4.1	...	2.0	...	...
	200	...	25	...	15	90	104	60	...	31	...	12	...	6.1	...
	230	15	30	...	20	90	104	60	20	34	8.1	14	4.1	7.0	27
	380	...	50	...	30	90	104	...	...	56	...	...	...	...	...
	460	...	50	...	30	90	104	...	40	68	16	28	8.1	14	53
	575	...	50	...	30	90	104	...	50	86	20	35	10	18	67
4	200	...	40	...	25	135	156	120	...	45	...	20	...	10	...
	230	...	50	...	30	135	156	120	30	52	14	23	6.8	12	40
	380	...	75	...	50	135	156	...	...	86.7	...	...	...	...	...
	460	...	100	...	60	135	156	...	60	105	27	47	14	23	80
	575	...	100	...	60	135	156	...	75	130	34	59	17	29	100
5	200	...	75	...	60	270	311	240	...	91	...	41	...	20	...
	230	...	100	...	75	270	311	240	60	105	27	47	14	24	80
	380	...	150	...	125	270	311	...	...	173	...	...	...	...	...
	460	...	200	...	150	270	311	...	120	210	54	94	27	47	160
	575	...	200	...	150	270	311	...	150	260	68	117	34	59	200
6	200	...	150	...	125	540	621	480	...	182	...	81	...	41	...
	230	...	200	...	150	540	621	480	120	210	54	94	27	47	160
	380	...	300	...	250	540	621	...	...	342	...	...	...	...	...
	460	...	400	...	300	540	621	...	240	415	108	188	54	94	320
	575	...	400	...	300	540	621	...	300	515	135	234	68	117 -	400
7	230	...	300	...	...	810	932	...	180	315	...	...	...	...	240
	460	...	600	...	...	810	932	...	360	625	...	...	...	...	480
	575	...	600	...	...	810	932	...	450	775	...	...	...	...	600
8	230	...	450	...	...	1215	1400	...	...	...	...	...	...	...	360
	460	...	900	...	...	1215	1400	...	...	...	...	...	...	...	720
	575	...	900	...	...	1215	1400	...	...	...	...	...	...	...	900

Tables and footnotes are taken from NEMA Standards.

† Ratings shown are for applications requiring repeated interruptions of stalled motor current or repeated closing of high transient currents encountered in rapid motor reversal, involving more than five openings or closings per minute and more than ten in a ten-minute period, such as plug-stop, plug-reverse or jogging duty. Ratings apply to single speed and multi-speed controllers.

* Per NEMA Standards paragraph IC 1-21A.20, the service-limit current represents the maximum rms current, in amperes, which the controller may be expected to carry for protracted periods in normal service. At service-limit current ratings, temperature rises may exceed those obtained by testing the controller at its continuous current rating. The ultimate trip current of over-current (overload) relays or other motor protective devices shall not exceed the service-limit current ratings of the controller.

★ FLUORESCENT LAMP LOADS — 300 VOLTS AND LESS — The characteristics of fluorescent lamps are such that it is not necessary to derate Class 8502 contactors below their normal continuous current rating. Class 8903 contactors may also be used with fluorescent lamp loads. For controlling tungsten and infrared lamp loads, and resistance heating loads, Class 8903 ac lighting contactors are recommended. These contactors are specifically designed for such loads and are applied at their full rating as listed in the Class 8903 Section.

‡ Ratings apply to contactors which are employed to switch the load at the utilization voltage of the heat producing element with a duty which requires continuous operation of not more than five openings per minute. Class 8903 Types L and S lighting contactors are rated for resistance heating loads.

• When discharged, a capacitor has essentially zero impedance. For repetitive switching by contactor, sufficient impedance should be connected in series to limit inrush current to not more than 6 times the contactor rated continuous current. In many installations, the impedance of connecting conductors may be sufficient for this purpose. When switching to connect additional banks, the banks already on the line may be charged and can supply additional available short-circuit current which should be considered when selecting impedance to limit the current.

The ratings for capacitor switching above assume the following maximum available fault currents:

NEMA Size 2-3: 5,000 A RMS Sym.
NEMA Size 4-5: 10,000 A RMS Sym.
NEMA Size 6-8: 22,000 A RMS Sym.

If available fault current is greater than these values, connect sufficient impedance in series as noted in the previous paragraph.

The motor ratings in the above table are NEMA standard ratings and apply only when the code letter of the motor is the same as or occurs earlier in the alphabet than is shown in the table below.

Motors having code letters occurring later in the alphabet may require a larger controller. Consult local Square D field office.

Motor HP Rating	Maximum Allowable Motor Code Letter
1½-2	L
3-5	K
7½ & above	H

SQD SLV_001009

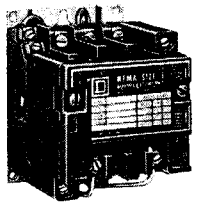
AC MAGNETIC CONTACTORS

WITHOUT OVERLOAD PROTECTION

CLASS 8502

Magnetic contactors are used to switch heating loads, capacitors, transformers and electric motors where overload protection is separately provided. A normally open holding circuit interlock for three wire control is provided on all contactors as standard.

- Easy Inspection and Maintenance
- Small Size
- Quick Installation
- Increased Flexibility
- Complete Enclosure Line
- Easy Field Modifications
- Long Electrical and Mechanical Life
- 50-60 Hertz — 600 Volts Max.
- 1 and 2 Pole Single Phase — 3, 4, and 5 Pole Polyphase



Type SCO-2
Size 1, 3 Pole Contactor

1 AND 2 POLE SINGLE PHASE — 3 POLE POLYPHASE

No. of Poles	NEMA Size	Continuous Current Rating Amperes †	Horsepower Rating Volts◐	Horsepower Rating Max. HP†	General Purpose Enclosure NEMA Type 1★ Type	General Purpose Enclosure NEMA Type 1★ Price	Watertight and Dusttight Enclosure NEMA Type 4 Type	Watertight and Dusttight Enclosure NEMA Type 4 Price	Watertight, Dusttight and Corrosion-Resistant Glass-Polyester Enclosure NEMA Type 4X Type	Watertight, Dusttight and Corrosion-Resistant Glass-Polyester Enclosure NEMA Type 4X Price	For Hazardous Locations Class I, Groups C & D Class II, Groups E, F & G NEMA Type 7 & 9 Type	For Hazardous Locations Class I, Groups C & D Class II, Groups E, F & G NEMA Type 7 & 9 Price	Dusttight and Driptight Industrial Use Enclosure NEMA Type 12‡ Type	Dusttight and Driptight Industrial Use Enclosure NEMA Type 12‡ Price	Open Type Type	Open Type Price
1 Pole Single Phase *	00	9	115 230	⅓ 1	AG-5	$ 76.	Use Size 0		....	....	Use Size 0		Use Size 1		AO-5	$ 68.
	0	18	115 230	1 2	SBG-5	100.	SBW-15▲	$ 240.	....	....	SBR-5	$ 554.	SBA-5▲	$ 148.	SBO-5	92.
	1	27	115 230	2 3	SCG-5	120.	SCW-15▲	264.	....	....	SCR-5	580.	SCA-5▲	168.	SCO-5	112.
2 Pole Single Phase *	00	9	115 230	⅓ 1	AG-1	88.	Use Size 0		Use Size 0		Use Size 0		Use Size 0		AO-1	80.
	0	18	115 230	1 2	SBG-1	112.	SBW-11▲	252.	SBW-21▲	$252.	SBR-1	566.	SBA-1▲	160.	SBO-1	104.
	1	27	115 230	2 3	SCG-1	132.	SCW-11▲	276.	SCW-21▲	276.	SCR-1	588.	SCA-1▲	180.	SCO-1	124.
	2	45	115 230	3 7½	SDG-1	272.	SDW-11▲	560.	SDW-21▲	560.	SDR-1	954.	SDA-1▲	360.	SDO-1	232.
	3	90	115 230	7½ 15	SEG-1	448.	SEW-11▲	856.	Consult Local Square D Field Office		SER-1	1424.	SEA-1▲	552.	SEO-1	368.
	4	135	....	....	SFG-1	1056.	SFW-11▲	1752.			SFR-1	2284.	SFA-1▲	1400.	SFO-1	888.
	5	270	....	....	SGG-1	2232.	SGW-11	3112.	....	....	SGR-1	5020.	SGA-1	3112.	SGO-1	1924.
	6	540	....	....	SHG-1	6252.	SHW-1	8252.	....	....	SHR-1	14088.	SHA-1	7332.	SHO-1	4896.
	7	810	....	....	SJG-1	8504.	SJW-1	10504.	....	....	....	....	SJA-1	9584.	SJO-1	7148.
	8	1215	....	....	KG-1	13696.	KW-1	15696.	....	....	....	....	KA-1	14776.	KO-1	11472.
3 Pole Polyphase	00	9	200-230 380 460-575	1½ 1½ 2	AG-2	100.	Use Size 0		Use Size 0		Use Size 0		Use Size 0		AO-2	92.
	0	18	200-230 380-575	3 5	SBG-2	124.	SBW-12▲	264.	SBW-22▲	264.	SBR-2	580.	SBA-2▲	172.	SBO-2	116.
	1	27	200-230 380-575	7½ 10	SCG-2	144.	SCW-12▲	288.	SCW-22▲	288.	SCR-2	606.	SCA-2▲	192.	SCO-2	136.
	2	45	200 230 380-575	10 15 25	SDG-2	288.	SDW-12▲	576.	SDW-22▲	576.	SDR-2	976.	SDA-2▲	376.	SDO-2	248.
	3	90	200 230 380-575	25 30 50	SEG-2	480.	SEW-12▲	888.	SEW-22	1110.	SER-2	1460.	SEA-2▲	584.	SEO-2	400.
	4	135	200 230 380 460-575	40 50 75 100	SFG-2	1128.	SFW-12▲	1824.	SFW-22	2280.	SFR-2	2362.	SFA-2▲	1472.	SFO-2	960.
	5	270	200 230 380 460-575	75 100 150 200	SGG-2	2400.	SGW-12	3280.	....	....	SGR-2	5206.	SGA-2	3280.	SGO-2	2092.
	6	540	200 230 380 460-575	150 200 300 400	SHG-2	7068.	SHW-2	9068.	....	....	SHR-2	14904.	SHA-2	8148.	SHO-2	5712.
	7	810	230 460-575	300 600	SJG-2	9512.	SJW-2	11512.	....	....	....	....	SJA-2	10592.	SJO-2	8152.
	8	1215	230 460-575	450 900	KG-2	14808.	KW-2	16808.	....	....	....	....	KA-2	15888.	KO-2	12584.

◐ Voltage ratings are those at which motors are rated and are not necessarily identical with contactor coil rating. See ◐ footnote on Page 234.

* The holding circuit interlock has the same rating as the main contacts for Sizes 00, 0, and 1 contactors. If this interlock is not required on 2 pole contactor, order 1 pole contactor.

★ **Flush mounting general purpose enclosures** are available. See enclosure components in Class 9991 section.

‡ NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to Class 9991 section.

▲ Separate enclosures are available for these sizes and types of enclosures; see Class 9991 section.

† For other electrical ratings, see Page 231.

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Line voltage, frequency and phase.
3. Control voltage and frequency, if different from line voltage.
4. Any special features required.

FACTORY MODIFICATIONS AND FORMS — Page 461
APPLICATION DATA — Pages 236-237
FIELD MODIFICATION KITS — Pages 238-239
DIMENSIONS — Pages 240-241
REPAIR PARTS KITS — Class 9998
ADDITIONAL FIELD MODIFICATION KITS — Class 9999

SQD SLV_001010

Listed below are Class 8502 4 and 5 pole contactors. Size 0-2 contactors utilize a 3 pole contactor with a factory installed single or double circuit normally open power pole adder. Sizes 3 and 4 use a special 4 or 5 pole contactor. Additional power pole adders may not be added to 4 or 5 pole devices. For required ordering information, see page 232.

CLASS 8502 4 AND 5 POLE POLYPHASE

No. of Poles	NEMA Size	Continuous Current Rating Amperes †	Horsepower Rating		General Purpose Enclosure NEMA Type 1★		Watertight and Dusttight Enclosure NEMA Type 4		Watertight, Dusttight and Corrosion-Resistant Glass-Polyester Enclosure NEMA Type 4X		For Hazardous Locations Class I, Groups C & D Class II, Groups E, F & G NEMA Type 7 & 9		Dusttight and Driptight Industrial Use Enclosure NEMA Type 12‡		Open Type	
			Volts◐	Max. HP	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price
4 Pole Polyphase	0	18	200-230 380-575	3 5	SBG-3	$ 156.	SBW-13▲	$ 300.	SBW-23▲	$ 300.	SBR-3	$ 616.	SBA-3▲	$ 204.	SBO-3	$ 148.
	1	27	200-230 380-575	7½ 10	SCG-3	176.	SCW-13▲	320.	SCW-23▲	320.	SCR-3	642.	SCA-3▲	224.	SCO-3	168.
	2	45	200 230 380-575	10 15 25	SDG-3	360.	SDW-13▲	760.	SDW-23▲	760.	SDR-3	1178.	SDA-3▲	448.	SDO-3	320.
	3	90	200 230 380-575	25 30 50	SEG-3	592.	SEW-13▲	1112.	Consult Local Square D Field Office		SER-3	1706.	SEA-3▲	696.	SEO-3	512.
	4	135	200 230 380 460-575	40 50 75 100	SFG-3	1504.	SFW-13▲	2488.			SFR-3	3208.	SFA-3▲	1968.	SFO-3	1336.
5 Pole Polyphase	0	18	220-230 380-575	3 5	SBG-4	200.	SBW-14▲	344.	Consult Local Square D Field Office		....	....	SBA-4▲	248.	SBO-4	192.
	1	27	200-230 380-575	7½ 10	SCG-4	220.	SCW-14▲	364.			....	....	SCA-4▲	268.	SCO-4	212.
	2	45	200 230 380-575	10 15 25	SDG-4	520.	SDW-14▲	920.			....	....	SDA-4▲	608.	SDO-4	480.
	3	90	200 230 380-575	25 30 50	SEG-4	848.	SEW-14▲	1368.			....	....	SEA-4▲	952.	SEO-4	768.
	4	135	200 230 380 460-575	40 50 75 100	SFG-4	2016.	SFW-14▲	3000.			....	....	SFA-4▲	2480.	SFO-4	1848.

◐Voltage ratings are those at which motors are rated and are not necessarily identical with contactor coil rating. See ◐ footnote on Page 234.
★**Flush mounting general purpose enclosures** are available. See enclosure components in Class 9991 section.
‡NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to Class 9991 section.
▲Separate enclosures are available for these sizes and types of enclosures; see Class 9991 section.
†For other electrical ratings, see Page 231.

APPLICATION DATA

Short Circuit Protection: According to the National Electrical Code branch circuit overcurrent protection must be provided for each contactor or starter. For starters refer to instructions furnished with the thermal unit selection table. For contactors (Class 8502 or 8702) provide branch circuit overcurrent protection in accordance with the National Electrical Code, except do not exceed the maximum protective device ratings in table at right.

Capacitor Switching: The kilovar ratings of enclosed, three phase contactors used as switches for capacitor loads, when only one load appears on the secondary of a distribution system are shown in the table on page 231.

Mixed Loads: For those applications having both resistive and inductive characteristics refer to the Class 8903 section. Square D lighting contactors have the ability to control mixed loads.

Mechanically Held Contactors: Information regarding mechanically held contactors can be found in the Class 8903 section. Mechanically held relays can be found in the Class 8501 section.

SHORT CIRCUIT PROTECTION RATINGS

NEMA Size	Maximum Voltage	Class K5 or R Fuse (Ampere)	Class K1 or J Fuse (Ampere)	Inverse-Time Circuit Breaker (Ampere)
00	600	10	15	....
	250	12	....	....
0	600	20	30	20
	250	25	....	35
1	600	30	60	35
	250	40	....	60
1P	250	50	80	80
2	600	60	100	90
3	600	100	200	125
	250	125	....	150
4	600	200	400	225
5	600	400	600	400
6	600	600	1200*	800

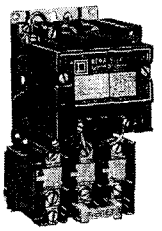
*Class L Fuse

For further application data refer to pages 236-241.

SQD SLV_001011

AC MAGNETIC STARTERS
WITH MELTING ALLOY OVERLOAD RELAYS

CLASS 8536



Type SCO-3
Size 1,
3 Pole Starter

Line voltage magnetic starters are used when full starting torque and the resulting current inrush is not objectionable. Motor overload protection is provided by melting alloy type thermal overload relays. All starters include a N.O. holding circuit interlock as standard.

- Reliable Overload Protection
  One piece factory tested thermal units
- Each Inspection and Maintenance
- Small Size
- Quick Installation
- Increased Flexibility
- Complete Enclosure Line
- Easy Field Modifications
- Long Electrical and Mechanical Life
- 600 Volts Max. — 50-60 Hertz

2 POLE SINGLE PHASE — 3 POLE POLYPHASE

No. of Poles	NEMA Size	Maximum Ratings Volts◐	Maximum Ratings Max. HP†	General Purpose Enclosure NEMA Type 1★ Type	General Purpose Enclosure NEMA Type 1★ Price*	Watertight and Dusttight Enclosure NEMA Type 4 Type	Watertight and Dusttight Enclosure NEMA Type 4 Price*	Watertight, Dusttight And Corrosion-Resistant Glass Polyester Enclosure NEMA Type 4X Type	Watertight, Dusttight And Corrosion-Resistant Glass Polyester Enclosure NEMA Type 4X Price*	For Hazardous Locations Class I, Groups C & D Class II, Groups E, F, & G NEMA Type 7 & 9 Type	For Hazardous Locations Class I, Groups C & D Class II, Groups E, F, & G NEMA Type 7 & 9 Price*	Dusttight and Driptight Industrial Use Enclosure NEMA Type 12‡ Type	Dusttight and Driptight Industrial Use Enclosure NEMA Type 12‡ Price*	Open Type Type	Open Type Price*	Number of Thermal Units Required *
2 Pole Single Phase	00	115 230	⅓ 1	AG-1	$ 116.	Use Size 0		Use Size 0		Use Size 0		Use Size 0		AO-1	$ 103.	1
	0	115 230	1 2	SBG-1	130.	SBW-11▲	$ 270.	▲ SBW-21	$270.	SBR-1	$ 586.	SBA-1▲	$ 178.	SBO-1	122.	1
	1	115 230	2 3	SCG-1	150.	SCW-11▲	294.	▲ SCW-21	294.	SCR-1	612.	SCA-1▲	198.	SCO-1	142.	1
	1P	115 230	3 5	SCG-2	194.	SCW-12▲	338.	▲ SCW-22	338.	SCR-2	662.	SCA-2▲	242.	SCO-2	186.	1
	2	115 230	3 7½	SDG-6	298.	SDW-16▲	586.	▲ SDW-26	588.	SDR-6	986.	SDA-6▲	386.	SDO-6	258.	1
	3	115 230	7½ 15	SEG-6	482.	SEW-16▲	890.	SEW-26	1113.	....	....	SEA-6▲	586.	SEO-6	402.	1
3 Pole Poly-phase	00	200-230 380 460-575	1½ 1½ 2	AG-2	116.	Use Size 0		Use Size 0		Use Size 0		Use Size 0		A0-2	108.	3
	0	200-230 380-575	3 5	SBG-2	144.	SBW-12▲	284.	▲ SBW-22	284.	SBR-2	602.	SBA-2▲	192.	SBO-2	136.	3
	1	200-230 380-575	7½ 10	SCG-3	164.	SCW-13▲	308.	▲ SCW-23	308.	SCR-3	628.	SCA-3▲	212.	SCO-3	156.	3
	2	200 230 380-575	10 15 25	SDG-1	324.	SDW-11▲	612.	▲ SDW-21	612.	SDR-1	1016.	SDA-1▲	412.	SDO-1	284.	3
	3	200 230 380-575	25 30 50	SEG-1	540.	SEW-11▲	948.	SEW-21	1185.	SER-3	1526.	SEA-1▲	644.	SEO-1	460.	3
	4	200 230 380 460-575	40 50 75 100	SFG-1	1220.	SFW-11▲	1916.	SFW-21	2395.	SFR-1	2464.	SFA-1▲	1564.	SFO-1	1052.	3
	5	200 230 380 460-575	75 100 150 200	SGG-1	2878.	SGW-11	3758.	....	....	SGR-1	5888.	SGA-1	3758.	SGO-1	2570.	3
	6	200 230 380 460-575	150 200 300 400	SHG-2	8110.	SHW-2	10110.	....	....	SHR-1	15302.	SHA-2	9190.	SHO-2	6110.	3
	7	230 460-575	300 600	SJG-2	10778.	SJW-2	12778.	....	....	....	....	SJA-2	11858.	SJO-2	8778.	0
	8	230 460-575	450 900	KG-1	14970.	KW-1	16970.	....	....	....	....	KA-1	16050.	KO-1	12970.	3

*** PRICES DO NOT INCLUDE THERMAL UNITS. FOR SELECTION, SEE PAGE 466.**

★Flush mounting general purpose enclosures are available. See enclosure components in Class 9991 section.

‡NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to Class 9991 section.

▲Separate enclosures are available for these sizes and types of enclosures; see Class 9991 section.

†For other electrical ratings, see page 231.

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Line voltage, frequency and phase.
3. Control voltage and frequency, if different from line voltage.
4. Any special features required.

◐Voltage ratings in the price table above are those at which motors are rated and are not necessarily identical with the starter (contactor) coil rating. The table below lists the common 60 hertz motor voltage ratings and the corresponding starter (contactor) coil voltage which will be furnished for those ratings. When ordering starters (contactors), always indicate coil voltage.

System	Motor Voltage	Coil Voltage Starters (Class 8536)	Coil Voltage Contactors (Class 8502)
Single Phase	115 230	120/240† 120/240†	120 240
Poly-phase	Separate Control 200-208 220-230 380 (50Hz.) 440-460 550-575	120 208 240 380 (50 Hz.) 480 600	120 208 240 380 (50 Hz.) 480 600

† Size 00 Single Phase starters are supplied with single voltage 120 or 240 volt coils.

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AC MAGNETIC STARTERS AND CONTACTORS
APPLICATION DATA

CLASS 8536

Listed below are Class 8536 4 pole starters. These starters should be used on two phase applications only. The overload relay provided with these devices has provisions for accepting two thermal units. If 4 or 5 pole starters are required for 3 phase applications, use a three phase starter with a factory installed power pole adder.

The Size 0-2 devices listed below utilize a Class 9999 normally open power pole mounted on a 3 pole starter with a 2 pole overload block. Size 3 and 4 devices listed below use 4 pole contactors and 2 pole overload blocks. Additional power poles may not be added to a 4 pole starter. For required ordering information, see page 234.

CLASS 8536 4 POLE — 2 PHASE

No. of Poles	NEMA Size	Maximum Ratings		General Purpose Enclosure **NEMA Type 1★**		Watertight and Dusttight Enclosure **NEMA Type 4**		Watertight, Dusttight And Corrosion-Resistant Glass-Polyester Enclosure **NEMA Type 4X**		For Hazardous Locations: Class I, Groups C & D Class II, Groups E, F, & G **NEMA Type 7 & 9**		Dusttight and Driptight Industrial Use Enclosure **NEMA Type 12‡**		**Open Type**		Number of Thermal Units Required *
		Volts◐	Max. HP†	Type	Price*	Type	Price*	Type	Price*	Type	Price*	Type	Price*	Type	Price*	
4 Pole Poly-phase	0	200-230 380-575	3 5	SBG-3	**$ 188.**	SBW-13▲	**$ 344.**	SBW-23▲	**$344.**	SBR-3	**$ 658.**	SBA-3▲	**$ 236.**	SBO-3	**$ 176.**	2
	1	200-230 380-575	7½ 10	SCG-4	**212.**	SCW-14▲	**364.**	SCW-24▲	**364.**	SCR-4	**682.**	SCA-4▲	**260.**	SCO-4	**200.**	2
	2	200 230 380-575	10 15 25	SDG-2	**400.**	SDW-12▲	**816.**	SDW-22▲	**816.**	SDR24	**1346.**	SDA-2▲	**488.**	SDO-2	**360.**	2
	3	200 230 380-575	25 30 50	SEG-2	**660.**	SEW-12▲	**1180.**	Consult local Square D field office		SER-2	**1948.**	SER-2▲	**764.**	SEO-2	**588.**	2
	4	200 230 320 460-575	40 50 75 100	SFG-2	**1604.**	SFW-12▲	**2588.**			....	....	SFA-2▲	**2068.**	SFO-2	**1444.**	2

*** Prices do not include thermal units.**
★ Flush mounting general purpose enclosures are available. See enclosure components Class 9991 section.
‡ NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to Class 9991 section.
▲ Separate enclosures are available for these sizes and types of enclosures; see Class 9991 section.
† For other electrical ratings, see page 231.
◐ Voltage ratings are those at which motors are rated and are not necessarily identical with contactor coil rating. See ◐ footnote on Page 234.

CLASS 8502 and 8536 APPLICATION DATA

General: Class 8502 contactors are the basic contactors used in Class 8536 starters.

Operation: Class 8502 contactors and Class 8536 starters **Sizes 00-5** are supplied with coils designed to operate satisfactorily on line voltages of 85% to 110% of rated voltage. See page 234 for standard coil voltages available.

Voltage: 600 volts ac maximum.

Power Contact Ratings: All contactors and starters are rated in accordance with NEMA standards. The ratings shown in the price tables on pages 233 and 234 are for normal service. For complete data on power contact ratings, refer to page 231.

Mounting: Type S Sizes 0-4 contactors and melting alloy starters can be horizontally mounted in the vertical plane.

Maintenance of Equipment: Class 9998 Repair Parts Kits are available for all Class 8502 contactors and Class 8536 starters. Service bulletins with a complete list of replaceable parts are supplied with all enclosed devices. Separate bulletins can be ordered and are listed along with the appropriate contact parts kit:

Device				Service Bulletin	Replacement Contacts **Class 9998** Type
NEMA Type	Type	Series	No. of Poles		
00	A	B&C	1-3	307AS	AA-81
0	SB	A&B	1-3 4 5	277AS 277AS & 250AS 277AS & 250AS	SL-2 SL-12 (1)SL-12 & (1)SL-22 or (1)SL-2 & (2)SL-22
1	SC	A&B	1-3 4 5	278AS 278AS & 250AS 278AS & 250AS	SL-3 SL-13 (1)SL-13 & (1)SL-22 or (1)SL-3 & (2)SL-22
1P	SC	A	2	278AS	SL-3
2	SD	A	2-3 4 5	279AS 279AS & 293AS 279AS & 293AS	SL-4 SL-14 (1)SL-14 & (1)SL-24 or (1)SL-4 & (2)SL-24
3	SE	A	2 3 4 5	305AS 305AS 326AS 326AS	SL-6 SL-7 (2)SL-6 (1)SL-6 & (1)SL-7
4	SF	A	2 3 4 5	306AS 306AS 326AS 326AS	SL-8 SL-9 (2)SL-8 (1)SL-8 & (1)SL-9
5	SG	A	2 3	328AS 328AS	SL-10 SL-11
6	SH	A	2 3	342AS 342AS	SL-25 SL-26
		B	2 3	370AS 370AS	SL-25 SL-26
7	SJ	A	2 3	397AS	SL-30 SL-31
8	K	A&B	2-3	352AS	KA-81

FACTORY MODIFICATIONS AND FORMS — Page 461
APPLICATION DATA — Pages 236-237
FIELD MODIFICATION KITS — Pages 238-239
DIMENSIONS — Pages 240-241
REPAIR PARTS KITS — Class 9998
ADDITIONAL FIELD MODIFICATION KITS — Class 9999

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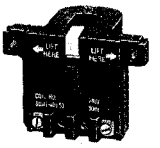
AC MAGNETIC STARTERS AND CONTACTORS
APPLICATION DATA

CLASS 8536 8502



Magnet Coil

CLASS 8502 AND 8536 APPLICATION DATA

TERMINALS

NEMA Size	Type	Power Terminals		Control Terminals	
		Type of Lug	Wire Sizes* Min.—Max.	Type of Lug	Wire Sizes* Min.—Max.
00	A	Pressure Wire	#16—#12	Pressure Wire	#16—#12
0 & 1	SB & SC	Pressure Wire	#14—#8	Pressure Wire	#16—#12
2	SD	Box Lug	#14—#4	Pressure Wire	#16—#12
3	SE	Box Lug	#14—1/0	Pressure Wire	#16—#12
4	SF	Box Lug	#8-250 MCM	Pressure Wire	#16—#12
5	SG	Box Lug	#4-500 MCM	Pressure Wire	#16—#12
6	SH	Parallel Groove	250 MCM — 500 MCM	Pressure Wire	#16—#12▲
7	SJ	Parallel Groove	One to four 250-500 MCM per phase	Pressure Wire	#16—#12▲
8	K	Clam Shell	350 MCM — 500 MCM	Pressure Wire	#16—#12

* Solid or stranded copper wire.
▲ Terminal block connections have a range of #16—#14.

Sizes 6 and 7: Type SH and SJ contactors and starters have a dc coil operated by a solid state rectifier circuit mounted on the device and powered from an ac source. The Type S Sizes 6 and 7 are equipped as standard with a fused control circuit transformer rated 240-480/120 volts 60 hertz, 220-440/110 volts 50 hertz.

Size 8: Type K contactors and starters have a pilot control relay which operates on the 120 volt secondary of the control transformer that also supplies power to the self-contained rectifier for the dc main operating coil.

The tables below give the replacement transformers for Type S Sizes 6 and 7 contactors and starters. To change voltages on these devices, coils are not changed, instead transformers with the desired voltage are changed.

REPLACEMENT CONTROL TRANSFORMERS FOR TYPE S SIZE 6

Voltage		Class 9070 Type	Price
60 Hertz	50 Hertz		
240/480-120	220/440-110	EO-3-S2A	$80.
208-120	.....	EO-3-S2B	
277-120	.....	EO-3-S2C	
.....	380-110	EO-3-S2D	
600-120	550-110	EO-3-S2E	
120-120	110-110	EO-3-S2F	
240-120	220-110	EO-3-S2G	

REPLACEMENT CONTROL TRANSFORMERS FOR TYPE S SIZE 7

Voltage		Class 9070 Type	Price
60 Hertz	50 Hertz		
240/480-120	220/440-110	EO-19-S2A	$80.
208-120	.....	EO-19-S2B	
277-120	.....	EO-19-S2C	
.....	380-110	EO-19-S2D	
600-120	550-110	EO-19-S2E	
120-120	110-110	EO-19-S2F	
240-120	220-110	EO-19-S2G	

COIL DATA

Magnet coils are designed to operate satisfactorily on line voltages of 85% to 110% of rated voltage. Coils are available for application on 50 or 60 hertz only.

All 2-pole single phase starters, except Size 00, are supplied with a dual voltage, 120/240 volt, 60 hertz coil as standard. Polyphase starters are supplied with a single voltage coil.

COIL BURDEN▲

NEMA Size	No. of Poles	Inrush VA		Sealed VA		Sealed Watts	
		50 Hertz	60 Hertz	50 Hertz	60 Hertz	50 Hertz	60 Hertz
00	1-3	....	112	....	11.8	....	3.6
0 & 1	1-5	232	245	26	27	7.7	7.8
2	2 & 3	296	311	36	37	12	14
	4 & 5	429	438	37	38	12	14
3	2-3	678	700	47	46	15	14
	4-5	1260	1185	89	85	23.4	22
4	2-5						
5	2-3	2970	2970	250	212	42	39
6	2-3	1495	1780	87	71	27	32
7	2-3	....	1960	....	59	....	36

▲Mean values.

CONTROL CIRCUIT TRANSFORMERS

Class 9070 Type E machine tool control transformers are normally used when it is necessary to provide a lower voltage to the control circuit. This transformer with fused protection may be ordered from the factory by specifying Form FT (see price adder on page 461). The addition of a transformer often requires the use of a larger enclosure. The table below shows the transformer selection for given sized starters and contactors with or without auxiliary units.

NEMA Size	Type	No. of Poles	Auxiliary Units	Transformer Class 9070 Type
00	A	1-3	None available.	EO-1
0 & 1	SB SC	1-3	With max. of 3 external interlocks	EO-1
			With timer and maximum of 2 external interlocks.	
			With 4 external interlocks.	EO-2
			With timer and 3 external interlocks.	
0 & 1	SB SC	4 & 5	With or without external interlocks or timer.	EO-2
0 & 1 Mechanically Interlocked Devices	SB SC	1-5	With and without any attachment.	EO-2
2	SD	2-5	With and without any attachment.	EO-2
3	SE	2-3	With and without any attachment.	EO-3†
3	SE	4 & 5	With and without any attachment.	EO-4
4	SF	2-5	With and without any attachment.	EO-4
5	SG	2-3	Any	*
6, 7	SH SJ	2-3	Any	‡
8	K	2-3	With maximum of two external interlocks	EO-51

***NOTE:** Standard engineering practice for Size 5 contactors is to use a Class 9070 Type EO-1 transformer and Class 8501 Type DO-20 control relay.

† Class 8502 & 8536 Type S, Size 3 standard NEMA 1, 4 and 12 enclosures have space for field mounting a fused control circuit transformer. A Class **9070 Type GFT-3** transformer and fuse block kit is available at **$150.00**, D8 discount, for Form FT requirements.

‡ A Class 9070 transformer is an integral part of the Size 6 and Size 7 control circuit providing 120 volt control circuit voltage as standard on devices wired for common control.

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CLASS 8536 8502

OVERLOAD RELAYS

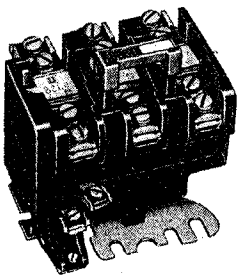
Thermal Units — Standard starters include hand reset, melting alloy type overload relays. Interchangeable thermal units are available in standard trip Sizes 00-8, quick trip Sizes 0-4, and slow trip Sizes 0-3 and 6. Refer to Class 9065 catalog section for additional information. Single phase starters use one thermal unit. Two phase starters use two thermal units. Three phase starters use three thermal units.

Standard Contact — One normally closed contact is provided in each overload relay block on the Sizes 00-4 and 6. On the Size 5, a normally closed contact is provided with each of the three overload relay blocks. The contacts are replaceable on the Sizes 0-6, and are identified as Class 9998 Type SO-1 on Sizes 0-4 and 6, and by Part Number 31102-514-50 on Size 5. See table below.

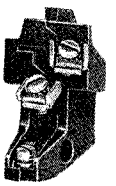
Alarm Contact — A normally open isolated alarm circuit contact can be supplied in addition to the standard normally closed contact. A pilot light or alarm bell can be wired in series with this contact to indicate tripped overload relays. The unit can be field added on Sizes 0-4, and 6. On Size 5 devices it must be factory installed. Current transformers and a 30 amp overload block are used.

If the overload relay alarm circuit contact is to be supplied as a factory modification, Form Y34-2 is specified. Refer to factory modifications. The alarm circuit contact is replaceable and is also interchangeable with the standard normally closed contact unit. The isolated alarm circuit contact unit is identified as Class 9999 Type SO-4.

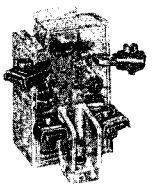
Automatic Reset Overloads — Bimetallic overload relays are available with an automatic reset feature allowing the relay contacts to automatically reclose, after tripping, when the relay has cooled. This is an advantage when the starter is mounted in an inaccessible location. Refer to factory modifications.



Class 9065 Type SEO-5



Class 9998 Type SO-1
Standard Contact Unit



Class 9999 Type SO-4
Alarm Contact Unit

Temperature Compensated Overloads — Bimetallic overload relays are available with a temperature-compensation feature and are intended for use where the motor is located in a constant ambient, and the controller is located in a varying ambient. Refer to factory modifications.

Size 7 — Class 8536 Type SJ Size 7 starters utilize a unique solid state Motor System Monitor. This Class 9065 Type SSRO-207 offers a combination of features that are very desirable when controlling large motors. These features include Class 20 ambient compensated overload protection, phase failure and underload protection, and manual or automatic reset. Overload protection is established by dialing in the motor full load current on two switches. Isolated alarm contacts and a test function are standard features.

OVERLOAD BLOCK CONTACT UNIT

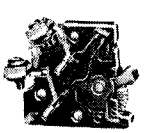
NEMA Size	Description	Overload Contact	Price
0-4 6, 8	Standard N.C. Contact	9998 SO-1	**$12.**
5		31102-514-50	**41.**
0, 8	N.O. Isolated Alarm Contact Plus Standard N.C. Contact	9999 SO-4	**28.▲**
5	SPDT Alarm Contact (non isolated)	31102-514-51	**60.**

▲D1B Discount

OVERLOAD CONTACT RATINGS*

Device	Volts AC	Pilot Duty — AC Only (35% Power Factor)	
		Make	Carry and Break
9998 SO-1 and 9999 SO-4	120 or Less	30 Amps.	3 Amps.
	120-600	3600 VA	360 VA
31102-514-50 and 31102-514-51	120 or Less	60 Amps.	6 Amps.
	120-600	7200 VA	720 VA

* For more details on contact ratings see Class 9065 section.



Internal Holding Circuit Interlock

HOLDING CIRCUIT INTERLOCK

A normally open holding circuit interlock is provided as standard on all contactors and starters. Sizes 0, 1 and 2 devices use a Class 9999 Type SX-11 as the holding circuit interlock. Larger devices use the Class 9999 Type SX-6 as standard. On Size 00 and Size 0 & 1 single phase contactors, a power pole is used as the holding circuit interlock. See table on page 231 for ratings of power poles, if it is desired to use this normally open pole for something other than a holding circuit interlock.

On Sizes 6 and 7 controllers, a normally closed electrical interlock is provided as standard in addition to the normally open holding circuit interlock. This N.C. electrical interlock must be used with the coil control unit. Do not use this N.C. interlock for any other purpose.

See the table at right for ratings of holding circuit interlocks.

RATINGS — HOLDING CIRCUIT INTERLOCK

Device			Volts AC	Pilot Duty — AC only (35% Power Factor)	
NEMA Size	No. of Poles	Type		Make	Carry and Break
00	All	A	Uses Power Pole as holding circuit interlock		
0, 1	1 & 2	SB & SC	Class 8502 uses a power contact as the holding circuit interlock.		
0, 1	2, 3, 4 & 5	SB & SC	120 or less	30 Amps.	3 Amps.
			120-600	3600 VA	360 VA
2	All	SD	120 or less	30 Amps.	3 Amps.
			120-600	3600 VA	360 VA
3, 4, 5, 6 & 7	All	SE, SF, SG, SH & SJ	120 or less	60 Amps.	6 Amps.
			120-600	7200 VA	720 VA

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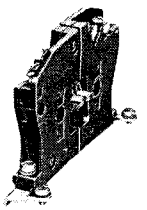
AC MAGNETIC STARTERS AND CONTACTORS

APPLICATION DATA

CLASS 8536 8502



Double Circuit External Electrical Interlock

ELECTRICAL INTERLOCKS

Additional electrical interlocks may be factory or field added to any Type S contactor or starter. The table below lists the selection for field addable electrical interlocks. Types SX-6 through SX-8 are external interlocks that can be installed on Sizes 0 through 7. These types are field convertible from normally open to normally closed and vice versa. Types SX-11 and SX-12 are non-convertible internal interlocks that can be installed on Sizes 0, 1, and 2 devices only. On these devices, one Class 9999 Type SX-11 is used as the holding circuit interlock, and one additional internal interlock can be factory or field added (maximum of two internal interlocks total).

NEMA Size	Type	Electrical Interlock Kit Description	Class 9999 Type	Class 9999 Price
00	A	None Available	....	....
0-7	SB-SJ	**External** (Field Convertible)		
		1 N.O. Contact	SX-6	**$24.**
		1 N.C. Contact	SX-7	**24.**
		1 N.O. and 1 N.C. Isolated Contacts	SX-8	**32.**
0-2	SB-SD	**Internal**		
		1 N.O. Contact	SX-11	**24.**
		1 N.C. Contact	SX-12	**24.**
8	K	1 N.O. or N.C. (Convertible)	WX-6	**162.**

For factory installed electrical interlocks, either specify the number of normally open and normally closed interlocks per contactor, or select Form designation from table below. Price adder for each factory installed electrical interlock is **$44.**, D1A discount.

FORM NUMBER OF ADDITIONAL ELECTRICAL INTERLOCKS

When ordering factory installed additional interlocks, the Form designations listed should be used.

Number of N.O. Interlocks	Number of N.C. Interlocks	Form Number
0	1	X2
0	2	X5
0	3	X9
0	4	X14
1	0	X1
1	1	X4
1	2	X8
1	3	X13
2	0	X3
2	1	X7
2	2	X12
3	0	X6
3	1	X11
4	0	X10

USER MODIFICATION KITS

The following is a listing of kits that can be field added to any size Type S starter or contactor. For further information refer to Class 9999 section.

Description			Class 9999 Type	Class 9999 Price
Control Circuit Fuse Holder	Single Fuse Unit*		SF-3	**$ 16.**
	Double Fuse Unit*		SF-4	**24.**
Power Poles	One Normally Open Unit	Size 0, 1	SB-6	**44.**
		Size 2	SB-11	**80.**
	One Normally Closed Unit	Size 0, 1	SB-7	**44.**
		Size 2	SB-12	**80.**
	One Normally Open & One Normally Closed	Size 0, 1	SB-8	**88.**
		Size 2	SB-13	**160.**
	Two Normally Open	Size 0, 1	SB-9	**88.**
		Size 2	SB-14	**160.**
	Two Normally Closed	Size 0,1	SB-10	**88.**
		Size 2	SB-15	**160.**
	Adapter Bracket to Use Power Poles on Sizes 3, 4, 5, 6 and 7		SBT-1	**6.**
Pneumatic Timer	Time Delay After Energization (On Delay)		SK-4	**112.**
	Time Delay After De-energization (Off Delay)		SK-3	**112.**
Transient Suppression Module	Sizes 00-2		ST-1	**16.**
	Sizes 3-7		ST-2	**16.**
	Bracket for Mounting ST-1 to Size 00		SFT-1	**3.**
Tie Point Terminal Kit, Sizes 0-4			T-7	**8.**
Isolated Overload Alarm Contact▲			SO-4	**28.**

* Fuse not included.
▲Size 5 also requires current transformers and size 1 overload block.

AUXILIARY UNITS

Electrical interlocks, power poles, and timer attachments can be added by the factory or in the field on all Type S starters and contactors. The table below shows the maximum number of auxiliary units (in addition to the holding circuit interlock) that can be added to a given size starter or contactor. In addition, it is possible to add a second internal interlock on NEMA Size 0, 1, and 2 contactors and starters.

NEMA Size	Type	No. of Poles of Basic Contactor	Maximum Number of Auxiliary Units (In addition to holding circuit interlock)
00	A	1-3	No auxiliary units available — Use Size 0.
0, 1, and 2	SB SC SD	1, 2 or 3	4 single circuit external interlocks (N.O. or N.C.)
			3 single circuit external interlocks (N.O. or N.C.) plus 1 attached timer (ON or OFF delay).
			2 single circuit external interlocks (N.O. or N.C.) plus 1 power pole adder (1 or 2 poles, N.O. or N.C.).
			1 attached timer (ON or OFF delay) plus 1 power pole adder (1 or 2 poles, N.O. or N.C.) plus 1 interlock.
		4 or 5	2 single circuit external interlocks (N.O. or N.C.)
			1 timer attachment plus 1 interlock.
3, 4 & 5	SE SF SG	2-5 (Size 3 & 4)	4 single circuit external interlocks (N.O. or N.C.)
			2 single circuit (Sizes 3 & 4) or 3 single circuit (Size 5) external interlocks plus 1 attached timer (ON or OFF delay).
		2-3 (Size 5)	2 single circuit external interlocks (N.O. or N.C.) plus 1 NEMA Size 0-1 or Size 2 power pole adder (1 or 2 poles, N.O. or N.C.)
6 and 7	SH SJ	2-3	4 single circuit external interlocks (N.O. or N.C.)
			3 single circuit external interlocks (N.O. or N.C.) plus 1 attached timer (ON or OFF delay).
			2 single circuit external interlocks (N.O. or N.C.) plus 1 NEMA Size 0-1 or Size 2 power pole adder (1 or 2 poles, N.O. or N.C.)
8	K	2 or 3	2 single circuit interlocks, convertible N.O. or N.C.

SQD SLV_001016

MODIFICATIONS — COVER MOUNTED CONTROL STATIONS

Class 9999 push button, selector switch and pilot light kits can be factory or field added to the cover of Class 8502 and 8536 contactors and starters in a NEMA Type 1 enclosure. The kits include the control unit complete with leads and clearly illustrated installation instructions. A knockout is provided in NEMA Type 1 general purpose enclosures for the field addition of either a push button or selector switch. A second knockout allows the field addition of a pilot light unit. All kits are identical to the units which are installed at the factory.

The pilot light kit provides positive indication of starter energization. The pilot light for the Size 0-4 is energized by a small coil mounted on the contactor magnet adjacent to the operating coil. This coil serves as a transformer secondary and provides the necessary voltage for the pilot light. Since the pilot light coil operates on magnetic flux, the same pilot light kit (which includes the pilot light bulb, socket assembly, color cap and pilot light coil) is used on all operating voltages through 600 volts ac, 50 or 60 Hz.

On the Size 00, a neon pilot light is used. Sizes 5-8 use Class 9001 Type K heavy duty oiltight control units.

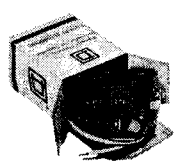
NOTE: Cover mounted control stations for NEMA 4 and NEMA 12 enclosures can be selected from the Class 9001 section. Cover mounted control stations for NEMA 7 & 9 enclosures are only available as a factory modification.



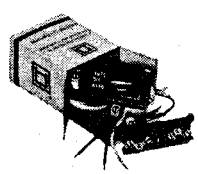
Selector Switch and Pilot Light in Size 1 Starter NEMA Type 1 Enclosure



Pilot Light Kit



Push Button Kit



Selector Switch Kit

CLASS 9999

For Use With					Kit Description											
					Red Pilot Light				Push Button				Selector Switch			
					NEMA Type 1 Enclosure Description				Start-Stop		On-Off		Hand-Off-Auto		On-Off	
					Form FT		Standard									
Class	Type	NEMA Size	No. of Poles	Voltage	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price
8502 & 8536	A	00	All	110-120V	....	....	PL-1	**$60.**	A	**$32.**	None Available		SC-1	**$32.**	SC-21	**$32.**
				208-240V			PL-2									
				440-600V			PL-3									
	SB & SC	0, 1 & 1P	All	6-600 Volts 50-60 Hertz	SP-2R	**$60.**	SP-2R	**60.**	SA-2	**32.**	SA-10	**$32.**	SC-2	**32.**	SC-22	**32.**
	SD	2	All		SP-13R	**60.**	SP-3R	**60.**								
	SE	3	2-3		SP-4R	**60.**	SP-4R	**60.**								
			4-5		SP-15R	**60.**	SP-5R	**60.**								
	SF	4	All		SP-15R	**60.**	SP-5R	**60.**								
	SG-SH, SJ K	5-8	All		Use Class 9001 Type K Oiltight Control Units											

REPLACEMENT LAMPS FOR PILOT LIGHT KITS

Pilot Light Types	Lamp Type	Square D Part Number
PL-1, PL-2, PL-3	GE No. B2A	25501-01013
SP-2R thru SP-15R	GE No. 44	25501-01005
Class 9001 Type KP-1R6 or KP-7R6	GE No. 44	25501-01005

SQD SLV_001017

AC MAGNETIC STARTERS AND CONTACTORS

APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS

CLASS
8536
8502

CLASS 8502 OPEN TYPE — WITHOUT ENCLOSURE

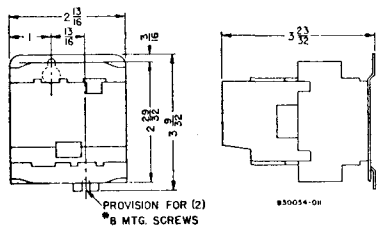


Figure 1

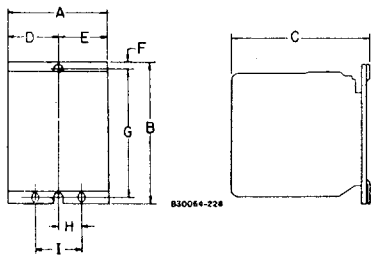


Figure 2

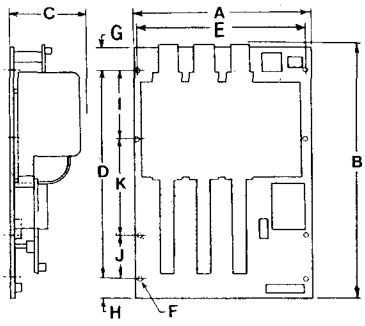


Figure 3

CLASS 8536 OPEN TYPE — WITHOUT ENCLOSURE

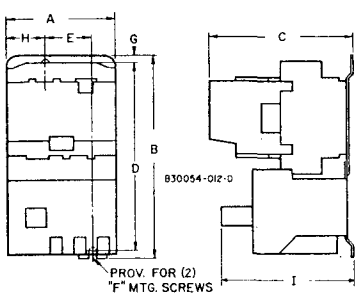


Figure 4

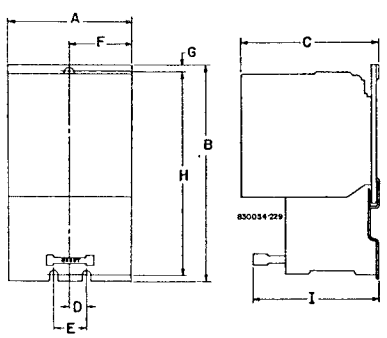


Figure 5

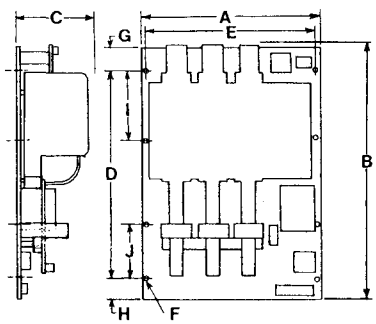


Figure 6

Class	NEMA Size	Type	No. of Poles	Figure Number	Mounting Screws	Dimensions — Inches (Refer to Appropriate Figure) A	B	C	D	E	F	G	H	I	Weight (Lbs.)
8502	00	AO	1-3	1	(2) #8	See Figure 1.									2
	0	SBO	1-3	2	(2) #10	3 7/32	4 11/32	4 7/32	1 5/8	1 5/8	7/32	3 15/16	....	....	4
	1	SCO	4-5	2	(2) #10	4 1/4	4 11/32	4 7/32	1 5/8	2 5/8	7/32	3 15/16	....	....	4 1/2
	2	SDO	2-3	2	(3) #10	4 5/16	5 1/8	4 15/16	2 5/32	2 5/32	7/32	4 19/32	1 7/32	1 1/16	6 3/4
			4-5	2	(3) #10	5 5/8	5 1/8	4 15/16	2 5/32	3 15/32	7/32	4 19/32	1 7/32	1 1/16	8 1/4
	3	SEO	2-3	2	(3) 1/4"	5 15/32	7 3/32	6 1/2	1 7/8	3 19/32	5/16	6 1/32	3 1/4	4 3/4	14
			4-5	2	(3) 5/16"	9 3/4	7 7/8	6 1/2	3 15/16	5 13/16	5/16	7	4 17/32	9 1/16	22
	4	SFO	2-3	2	(3) 5/16"	6	8 3/16	6 1/2	2 1/32	3 9/32	5/16	7	3 19/32	5 5/16	18
			4-5	2	(3) 5/16"	9 3/4	8 3/16	6 1/2	3 15/16	5 13/16	5/16	7	4 17/32	9 1/16	22
	5	SGO	2-3	2	(3) 1/2"	8 21/32	12 5/16	8 3/4	3 1/4	5 13/32	5/8	11 1/8	4 3/4	7 1/4	45
	6	SHO	2-3	2	(3) 1/2"	9 5/16	28 1/16	9	3 17/32	5 25/32	5 1/16	18 9/16	4 3/4	7 1/4	80
	7	SJO	2-3	2	(3) 1/2"	9 5/16	37 1/4	10 7/8	3 17/32	5 25/32	7 7/32	22 3/8	4 3/4	7 1/4	135
	8	KO	2-3	3	(4) 3/8"	26	38	14	30	25 1/4	3/8	3 7/8	....	....	330
8536	00	AO	2	4	(2) #8	2 13/16	5 5/32	3 45/64	2 29/32	1 3/16	#8	3/16	1	3 13/32	2 1/2
			3	4	(2) #8	2 13/16	5 5/32	3 45/64	4 25/32	1 3/16	#8	3/16	1	3 13/32	2 1/2
	0, 1, 1P	SBO-SCO	2-3	5	(3) #10	3 1/2	6 49/64	4 7/32	1/2	1	1 39/64	1 3/64	6 1/4	3 31/32	5
	0, 1	SBO-SCO	4	5	(3) #10	4 17/32	6 49/64	4 7/32	1/2	1	2 21/32	1 3/64	6 1/4	3 31/32	5 1/2
	2	SDO	2-3	5	(3) #10	4 5/16	7 13/16	4 15/16	1/2	1	2 5/32	1 3/64	7 11/32	4 1/16	7 3/4
			4	5	(3) #10	5 5/8	7 13/16	4 15/16	1/2	1	3 15/32	1 3/64	7 11/32	4 1/16	9 1/4
	3	SEO	2-3	5	(3) 1/4"	5 15/32	11 3/32	6 1/2	7/8	1 3/4	3 19/32	5/16	10 3/16	5 3/4	17
			4	5	(3) 5/16"	9 3/4	12 1/8	6 1/2	1 13/16	1 3/4	5 13/16	5/16	11 3/16	5 3/4	25
	4	SFO	3	5	(3) 5/16"	6	12 7/8	6 1/2	1 13/16	1 3/4	3 15/16	5/16	11 3/16	5 3/4	22
			4	5	(3) 5/16"	9 3/4	12 7/8	6 1/2	1 13/16	1 3/4	5 29/32	5/16	11 3/16	5 3/4	25
	5	SGO	3	5	(3) 1/2"	8 9/16	17 9/16	8 3/4	4 3/4	7 1/4	5 3/8	5/8	16 3/8	6	62
	6	SHO	3	5	(3) 1/2"	9 5/16	28 1/16	9	4 3/4	7 1/4	5 25/32	5 1/16	18 9/16	8 11/16	85
	7	SJO	3	5	(3) 1/2"	9 5/16	37 1/4	10 7/8	4 3/4	7 1/4	5 25/32	7 7/32	22 3/8	9	140
	8	KO	3	6	(4) 5/8"	26	38	14	30	25 1/4	3/8	3 7/8	2 7/8	....	450

SQD SLV_001018

CLASS 8536 8502

NEMA TYPE 1 — GENERAL PURPOSE ENCLOSURE

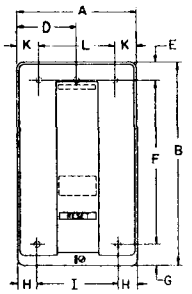
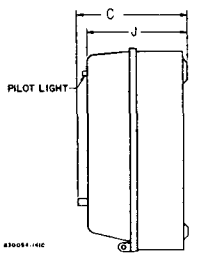


Figure 7



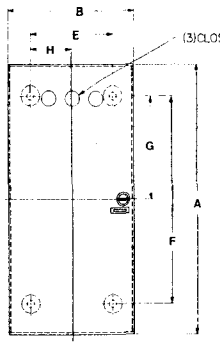
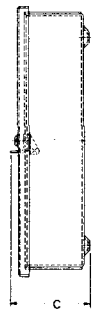


Figure 8



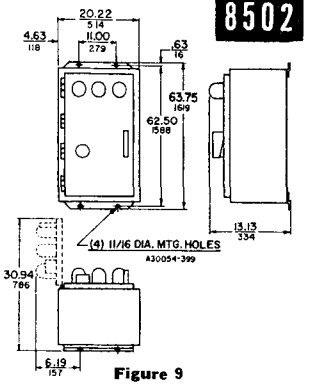


Figure 9

NEMA Size	Class	Type	No. of Poles	Fig. No.	Mounting Screws	Dimensions (Inches) (Refer to appropriate figure) A	B	C 8502	C 8536	D	E	F	G	H	I	J	K	L	Weight (Lbs.,) Class 8502	Class 8536
00	8502 & 8536	AG	All	7	(3) #10	$4\frac{13}{16}$	$7\frac{1}{4}$	$4\frac{1}{4}$	$4\frac{3}{4}$	$2\frac{7}{8}$	$1\frac{7}{32}$	$5\frac{13}{16}$	$2\frac{9}{32}$	$2\frac{9}{32}$	3	$4\frac{1}{4}$	....	....	4	$4\frac{1}{2}$
0	8502 & 8536	SBG	All	7	(3) #10	6	10	$5\frac{9}{32}$	$5\frac{9}{16}$	3	$\frac{7}{8}$	$8\frac{1}{8}$	1	$\frac{15}{16}$	$4\frac{1}{8}$	5	....	....	$7\frac{1}{2}$	8
1	8502 & 8536	SCG	All	7	(3) #10															
2	8502 & 8536	SDG	All	7	(4) ¼ "	$7\frac{13}{16}$	$12\frac{11}{16}$	$6\frac{1}{32}$	$6\frac{5}{16}$	....	$1\frac{3}{32}$	$10\frac{1}{2}$	$1\frac{3}{32}$	$1\frac{3}{32}$	$5\frac{5}{8}$	$5\frac{3}{4}$	$1\frac{3}{32}$	$5\frac{5}{8}$	$14\frac{1}{2}$	$15\frac{1}{2}$
3	8502 & 8536	SEG	All	7	(4) ⅜ "	$11\frac{1}{16}$	$21\frac{13}{16}$	$7\frac{3}{4}$	$8\frac{1}{8}$	....	$1\frac{17}{32}$	$18\frac{3}{4}$	$1\frac{17}{32}$	$1\frac{17}{32}$	$8\frac{3}{8}$	$7\frac{1}{2}$	$1\frac{17}{32}$	$8\frac{3}{8}$	34	37
4	8502 & 8536	SFG	All	7	(4) ⅜ "														38	44
5	8502 & 8536	SGG	All	8	(4) $\frac{9}{16}$ "	$35\frac{11}{16}$	$17\frac{5}{8}$	$12\frac{13}{32}$	$12\frac{13}{32}$	....	13	31	$15\frac{1}{2}$	$6\frac{1}{2}$	....	....	....	....	100	114
6	8502 & 8536	SHG	All	9	(4) $\frac{11}{16}$ "	See Figure 9													185	222
7	8502 & 8536	SJG	All	8	....	93	$34\frac{1}{2}$	$23\frac{1}{2}$	$23\frac{1}{2}$	Floor Mounting									....	....
8	8502 & 8536	KG	All	8	....	90	28	20	20										750	800

NEMA TYPE 4 — WATERTIGHT ENCLOSURES

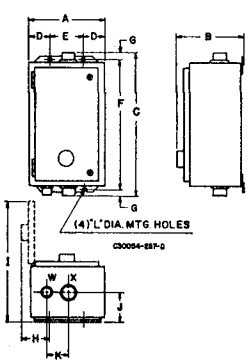


Figure 10
NEMA Type 4
Watertight Enclosure

NEMA Size	Class	Type	No. of Poles	Dimensions — Inches (Figure 10) A	B	C	D	E	F	G	H	I	J	K	L	W Bot. Only	X Top & Bot.	Weight (Lbs.) Class 8502	Class 8536
0 and 1	8502	SBW	All	$6\frac{3}{8}$	$7\frac{1}{8}$	$13\frac{3}{16}$	$1\frac{1}{16}$	$4\frac{1}{4}$	12	$\frac{19}{32}$	$1\frac{11}{16}$	$11\frac{25}{32}$	$1\frac{5}{8}$	$2\frac{5}{16}$	$\frac{5}{16}$	¾ " Dia. Hub	1 " Dia. Hub	17	....
		SCW																....	18
	8536	SBW	All	$6\frac{3}{8}$	$7\frac{13}{16}$	$13\frac{3}{16}$	$1\frac{1}{16}$	$4\frac{1}{4}$	12	$\frac{19}{32}$	$2\frac{3}{8}$	$11\frac{25}{32}$	$1\frac{5}{8}$	$2\frac{5}{16}$	$\frac{5}{16}$				
		SCW																	
2	8502	SDW	All	$8\frac{1}{8}$	$7\frac{7}{8}$	$13\frac{11}{16}$	$1\frac{5}{16}$	$4\frac{1}{4}$	$12\frac{1}{2}$	$\frac{19}{32}$	$2\frac{5}{16}$	$14\frac{3}{4}$	2	$2\frac{5}{8}$	$\frac{5}{16}$	¾ " Dia. Hub	1½ " Dia. Hub	22	....
	8536	SDW	All	$8\frac{1}{8}$	$8\frac{9}{16}$	$13\frac{11}{16}$	$1\frac{15}{16}$	$4\frac{1}{4}$	$12\frac{1}{2}$	$\frac{19}{32}$	$3\frac{1}{4}$	$14\frac{3}{4}$	2	$2\frac{5}{8}$	$\frac{5}{16}$			....	23
3 and 4	8502	SEW	All	$11\frac{3}{8}$	$8\frac{1}{8}$	$27\frac{1}{4}$	$3\frac{9}{16}$	$4\frac{1}{4}$	25	$1\frac{1}{8}$	$4\frac{7}{32}$	$18\frac{5}{32}$	$2\frac{9}{16}$	$3\frac{3}{16}$	$\frac{5}{16}$	¾ " Dia. Hub	2½ " Dia. Hub	47	....
		SFW																57	....
	8536	SEW	All	$11\frac{3}{8}$	$8\frac{29}{32}$	$27\frac{1}{4}$	$3\frac{9}{16}$	$4\frac{1}{4}$	25	$1\frac{1}{8}$	5	$18\frac{5}{32}$	$2\frac{9}{16}$	$3\frac{3}{16}$	$\frac{5}{16}$			....	50
		SFW																....	70
5	8502 & 8536	SGW	All	$17\frac{7}{32}$	$12\frac{3}{32}$	$38\frac{11}{32}$	$4\frac{3}{32}$	9	$36\frac{1}{2}$	$\frac{15}{16}$	$5\frac{3}{8}$	$28\frac{7}{16}$	3	$5\frac{1}{4}$	$\frac{1}{16}$	¾ " Dia. Hub	3½ " Dia. Hub	120	138
6	8502 & 8536	SHW	All	$20\frac{1}{4}$	$13\frac{1}{8}$	$63\frac{3}{4}$	$4\frac{5}{8}$	11	$62\frac{1}{2}$	$\frac{5}{8}$	$6\frac{3}{16}$	$30\frac{15}{16}$	$2\frac{11}{16}$	$4\frac{1}{2}$	$1\frac{1}{16}$	¾ " Dia. Hub	(2) 3 " Dia. Hub	230	250
7	8502 & 8536	SJW	All	$34\frac{1}{2}$	$23\frac{1}{2}$	101	Floor Mounting											....	....
8	8502 & 8536	KW	All	28	20	90												800	800

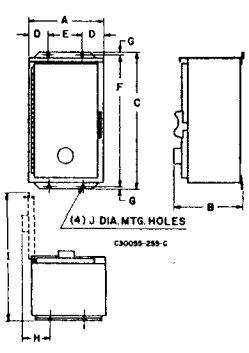


Figure 11
NEMA Type 12
Industrial Use Enclosure

NEMA TYPE 12 — DUSTTIGHT ENCLOSURE

NEMA Size	Class	Type	No. of Poles	Dimensions — Inches (Figure 11) A	B	C	D	E	F	G	H	I	J	Weight (Lbs.) Class 8502	Class 8536
0	8502 & 8536	SBA	All	$6\frac{3}{8}$	$8\frac{13}{32}$	$12\frac{1}{4}$	$1\frac{1}{16}$	$4\frac{1}{4}$	12	$\frac{3}{8}$	$3\frac{1}{16}$	$12\frac{1}{4}$	$\frac{5}{16}$	15	16
1	8502 & 8536	SCA	All												
2	8502 & 8536	SDA	All	$8\frac{1}{8}$	$9\frac{3}{32}$	$13\frac{1}{4}$	$1\frac{15}{16}$	$4\frac{1}{4}$	$12\frac{1}{2}$	$\frac{3}{8}$	$3\frac{13}{16}$	$15\frac{3}{8}$	$\frac{5}{16}$	20	21
3	8502 & 8536	SEA	All	$11\frac{3}{8}$	$9\frac{3}{32}$	$25\frac{3}{4}$	$3\frac{9}{16}$	$4\frac{1}{4}$	25	$\frac{3}{8}$	$5\frac{9}{16}$	$18\frac{11}{16}$	$\frac{5}{16}$	42	45
4	8502 & 8536	SFA	All											52	65
5	8502 & 8536	SGA	All	$17\frac{7}{32}$	$13\frac{3}{8}$	$37\frac{1}{2}$	$4\frac{3}{32}$	9	$36\frac{1}{2}$	$\frac{1}{2}$	$5\frac{1}{16}$	28	$\frac{7}{16}$	116	128
6	8502 & 8536	SHA	All	$20\frac{1}{4}$	$13\frac{1}{8}$	$63\frac{3}{4}$	$4\frac{5}{8}$	11	$62\frac{1}{2}$	$\frac{5}{8}$	$6\frac{13}{16}$	$30\frac{15}{16}$	$\frac{11}{16}$	222	230
7	8502 & 8536	SJA	All	$34\frac{1}{2}$	$23\frac{1}{2}$	93	Floor Mounting							....	....
8	8502 & 8536	KA	All	28	20	90								800	800

SQD SLV_001019

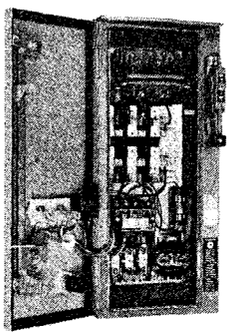
AC COMBINATION STARTERS

FUSIBLE DISCONNECT SWITCH TYPE

CLASS 8538

UL LISTED ♦

The disconnect switch type combination starter design utilizes a flange operated visible blade switch. Interchangeable fuse clips, straight through wiring, three overloads as standard, space for a fused control transformer with additional capacity and provisions for adding a disconnect switch electrical interlock are key features of this starter.



Fusible Combination Starter in NEMA 12 Enclosure

LINE VOLTAGE TYPE, NON-REVERSING WITH THREE MELTING ALLOY OVERLOAD RELAYS

3 POLE — 600 VOLTS MAX. — 50-60 HERTZ

Ratings				General Purpose Enclosure **NEMA Type 1**		Watertight and Dusttight Enclosure Stainless Steel (Sizes 0-5) **NEMA Type 4**		Watertight, Dusttight and Corrosion Resistant Enclosure **NEMA Type 4X▲**		Dusttight and Driptight Industrial Use Enclosure **NEMA Type 12◐**		
Motor Voltage (Starter Voltage)	Max. HP Poly-phase	NEMA Size	Fuse Clip Size Amps	Type	Price*	Type	Price*	Type	Price*	With External Reset Type	Without External Reset Type	Price*
200 (208)	3	0	30	SBG-12	$ 376.	SBW-12	$ 760.	SBW-22	$ 876.	SBA-22	SBA-12	$ 472.
	5	1	30	SCG-12	396.	SCW-12	780.	SCW-22	896.	SCA-22	SCA-12	492.
	7½		60	SCG-13	404.	SCW-13	788.	SCW-23	908.	SCA-23	SCA-13	500.
	10	2	60	SDG-12	624.	SDW-12	1216.	SDW-22	1340.	SDA-22	SDA-12	760.
	20	3	100	SEG-15	1052.	SEW-15	2084.	SEW-25	2292.	SEA-25	SEA-15	1228.
	25		200	SEG-12	1140.	SEW-12	2172.	.....	.....	SEA-22	SEA-12	1316.
	40	4	200	SFG-15	2020.	SFW-15	3340.	.....	.....	SFA-25	SFA-15	2508.
	75	5	400	SGG-15	4526.	SGW-15	7894.	.....	.....	SGA-25	SGA-15	5710.
	150	6	600	SHG-13	11986.	SHW-13	15186.	.....	.....	SHA-23	SHA-13	13366.
230 (240)	3	0	30	SBG-12	376.	SBW-12	760.	SBW-22	876.	SBA-22	SBA-12	472.
	5	1	30	SCG-12	396.	SCW-12	780.	SCW-22	896.	SCA-22	SCA-12	492.
	7½		60	SCG-13	404.	SCW-13	788.	SCW-23	908.	SCA-23	SCA-13	500.
	15	2	60	SDG-12	624.	SDW-12	1216.	SDW-22	1340.	SDA-22	SDA-12	760.
	25	3	100	SEG-15	1052.	SEW-15	2084.	SEW-25	2292.	SEA-25	SEA-15	1228.
	30		200	SEG-12	1140.	SEW-12	2172.	.....	.....	SEA-22	SEA-12	1316.
	50	4	200	SFG-15	2020.	SFW-15	3340.	.....	.....	SFA-25	SFA-15	2508.
	100	5	400	SGG-15	4526.	SGW-15	7894.	.....	.....	SGA-25	SGA-15	5710.
	200	6	600	SHG-13	11986.	SHW-13	15186.	.....	.....	SHA-23	SHA-13	13366.
460-575 (480-600)	5	0	30	SBG-13	384.	SBW-13	768.	SBW-23	884.	SBA-23	SBA-13	480.
	10	1	30	SCG-14	404.	SCW-14	788.	SCW-24	908.	SCA-24	SCA-14	500.
	15	2	30	SDG-16	628.	SDW-16	1220.	SDW-26	1344.	SDA-26	SDA-16	764.
	25		60	SDG-14	636.	SDW-14	1228.	SDW-24	1352.	SDA-24	SDA-14	772.
	50	3	100	SEG-13	1072.	SEW-13	2104.	SEW-23	2314.	SEA-23	SEA-13	1248.
	100	4	200	SFG-13	2036.	SFW-13	3356.	.....	.....	SFA-23	SFA-13	2524.
	200	5	400	SGG-13	4526.	SGW-13	7894.	.....	.....	SGA-23	SGA-13	5710.
	400	6	600	SHG-12	11986.	SHW-12	15186.	.....	.....	SHA-22	SHA-12	13366.

*** Prices do not include thermal units. For selection, see page 466.**
◐ *NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to page 448.*
▲ NEMA Type 4X hubs are included with each starter at no additional cost.

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Horsepower, voltage, phase, frequency and full load current of motor.
3. Control voltage and frequency if different from line voltage.
4. Any factory modifications and forms required, see pages 461-463.

THERMAL UNITS

Thermal units should be ordered separately. See Selection Index on Page 466. Standard trip thermal units are priced at **$6.00** each.

♦UL LISTED SHORT CIRCUIT WITHSTAND RATINGS‡

NEMA Size	Available Amperes RMS Symmetrical
0-3	5,000
4-5	10,000
6	18,000

‡NEMA Type 4X devices are not UL Listed.

FIELD MODIFICATION KITS

Refer to Pages 244 & 246 and Class 9999 Section.

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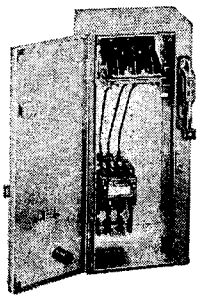


Non-Fusible Combination Starter in NEMA 1 Enclosure

AC COMBINATION STARTERS

NON-FUSIBLE DISCONNECT SWITCH TYPE■

CLASS 8538

The disconnect switch type combination starter design utilizes a flange operated visible blade switch. Size 0-2, non-fusible combination starters can be converted to a fusible type. All NEMA Type 1, 4 and 12 enclosures have the same size enclosure for fusible and non-fusible combination starters. Therefore, space is available for the conversion to a fusible type.

LINE VOLTAGE TYPE, NON-REVERSING WITH THREE MELTING ALLOY OVERLOAD RELAYS

3 POLE — 600 VOLTS MAX. — 50-60 HERTZ

RATINGS			General Purpose Enclosure **NEMA Type 1**		Watertight and Dusttight Enclosure Stainless Steel (Sizes 0-5) **NEMA Type 4**		Watertight, Dusttight and Corrosion Resistant Enclosure **NEMA Type 4X▲**		Dusttight and Driptight, Industrial Enclosure **NEMA Type 12◐**		
Motor Voltage (Starter Voltage)	Max. HP Poly-phase	NEMA Size	Type	Price*	Type	Price*	Type	Price*	With External Reset Type	Without External Reset Type	Price*
200 (208)	3	0	SBG-11	$ 364.	SBW-11	$ 748.	SBW-21	$ 860.	SBA-21	SBA-11	$ 460.
	7½	1	SCG-11	384.	SCW-11	768.	SCW-21	884.	SCA-21	SCA-11	480.
	10	2	SDG-11	608.	SDW-11	1200.	SDW-21	1320.	SDA-21	SDA-11	744.
	25	3	SEG-11	1012.	SEW-11	2044.	SEW-21	2248.	SEA-21	SEA-11	1188.
	40	4	SFG-11	1952.	SFW-11	3272.	.....	.....	SFA-21	SFA-11	2440.
	75	5	SGG-11	4382.	SGW-11	7750.	.....	.....	SGA-21	SGA-11	5566.
	150	6	SHG-11	11562.	SHW-11	14762.	.....	.....	SHA-21	SHA-11	12942.
230 (240)	3	0	SBG-11	364.	SBW-11	748.	SBW-21	860.	SBA-21	SBA-11	460.
	7½	1	SCG-11	384.	SCW-11	768.	SCW-21	884.	SCA-21	SCA-11	480.
	15	2	SDG-11	608.	SDW-11	1200.	SDW-21	1320.	SDA-21	SDA-11	744.
	30	3	SEG-11	1012.	SEW-11	2044.	SEW-21	2248.	SEA-21	SEA-11	1188.
	50	4	SFG-11	1952.	SFW-11	3272.	.....	.....	SFA-21	SFA-11	2440.
	100	5	SGG-11	4382.	SGW-11	7750.	.....	.....	SGA-21	SGA-11	5566.
	200	6	SHG-11	11562.	SHW-11	14762.	.....	.....	SHA-21	SHA-11	12942.
460-575 (480-600)	5	0	SBG-11	364.	SBW-11	748.	SBW-21	860.	SBA-21	SBA-11	460.
	10	1	SCG-11	384.	SCW-11	768.	SCW-21	884.	SCA-21	SCA-11	480.
	25	2	SDG-11	608.	SDW-11	1200.	SDW-21	1320.	SDA-21	SDA-11	744.
	50	3	SEG-11	1012.	SEW-11	2044.	SEW-21	2248.	SEA-21	SEA-11	1188.
	100	4	SFG-11	1952.	SFW-11	3272.	.....	.....	SFA-21	SFA-11	2440.
	200	5	SGG-11	4382.	SGW-11	7750.	.....	.....	SGA-21	SGA-11	5566.
	400	6	SHG-11	11562.	SHW-11	14762.	.....	.....	SHA-21	SHA-11	12942.

*** Prices do not include thermal units. For selection, see page 466.**
◐ NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to page 448.
▲ NEMA Type 4X hubs are included with each starter at no additional cost.
■ **UL LISTED**

UL LISTED FOR 100,000A ‡

AC COMBINATION STARTERS

FUSIBLE DISCONNECT SWITCH TYPE WITH CLASS R FUSE CLIPS

LINE VOLTAGE TYPE, NON-REVERSING WITH THREE MELTING ALLOY OVERLOAD RELAYS

3 POLE — 600 VOLTS MAX. — 50-60 HERTZ

RATINGS				General Purpose Enclosure **NEMA Type 1**		Watertight and Dusttight Enclosure Stainless Steel (Sizes 0-5) **NEMA Type 4**		Watertight, Dusttight and Corrosion Resistant Enclosure **NEMA Type 4X▲**		Dusttight and Driptight, Industrial Enclosure **NEMA Type 12◐**		
Motor Voltage (Starter Voltage)	Max. HP Poly-phase	NEMA Size	Fuse Clip Size Amps.	Type	Price*	Type	Price*	Type	Price*	With External Reset Type	Without External Reset Type	Price*
200 (208)	3	0	30	SBG-32	$ 382.	SBW-32	$ 766.	SBW-42	$ 880.	SBA-42	SBA-32	$ 478.
	5	1	30	SCG-32	402.	SCW-32	786.	SCW-42	904.	SCA-42	SCA-32	498.
	7½	1	60	SCG-33	410.	SCW-33	794.	SCW-43	912.	SCA-43	SCA-33	506.
	10	2	60	SDG-32	630.	SDW-32	1222.	SDW-42	1344.	SDA-42	SDA-32	766.
	20	3	100	SEG-35	1064.	SEW-35	2096.	SEW-45	2306.	SEA-45	SEA-35	1240.
	25	3	200	SEG-32	1152.	SEW-32	2184.	.....	.....	SEA-42	SEA-32	1328.
	40	4	200	SFG-35	2032.	SFW-35	3352.	.....	.....	SFA-45	SFA-35	2520.
	75	5	400	SGG-35	4554.	SGW-35	7922.	.....	.....	SGA-45	SGA-35	5738.
	150	6	600	SHG-33	12014.	SHW-33	15214.	.....	.....	SHA-43	SHA-33	13394.
230 (240)	3	0	30	SBG-32	382.	SBW-32	766.	SBW-42	880.	SBA-42	SBA-32	478.
	5	1	30	SCG-32	402.	SCW-32	786.	SCW-42	904.	SCA-42	SCA-32	498.
	7½	1	60	SCG-33	410.	SCW-33	794.	SCW-43	912.	SCA-43	SCA-33	506.
	15	2	60	SDG-32	630.	SDW-32	1222.	SDW-42	1344.	SDA-42	SDA-32	766.
	25	3	100	SEG-35	1064.	SEW-35	2096.	SEW-45	2306.	SEA-45	SEA-35	1240.
	30	3	200	SEG-32	1152.	SEW-32	2184.	.....	.....	SEA-42	SEA-32	1328.
	50	4	200	SFG-35	2032.	SFW-35	3352.	.....	.....	SFA-45	SFA-35	2520.
	100	5	400	SGG-35	4554.	SGW-35	7922.	.....	.....	SGA-45	SGA-35	5738.
	200	6	600	SHG-33	12014.	SHW-33	15214.	.....	.....	SHA-43	SHA-33	13394.
460-575 (480-600)	5	0	30	SBG-33	390.	SBW-33	774.	SBW-43	890.	SBA-43	SBA-33	486.
	10	1	30	SCG-34	410.	SCW-34	794.	SCW-44	912.	SCA-44	SCA-34	506.
	15	2	30	SDG-36	634.	SDW-36	1226.	SDW-46	1348.	SDA-46	SDA-36	770.
	25	2	60	SDG-34	642.	SDW-34	1234.	SDW-44	1358.	SDA-44	SDA-34	778.
	50	3	100	SEG-33	1084.	SEW-33	2116.	SEW-43	2328.	SEA-43	SEA-33	1260.
	100	4	200	SFG-33	2048.	SFW-33	3368.	.....	.....	SFA-43	SFA-33	2536.
	200	5	400	SGG-33	4554.	SGW-33	7922.	.....	.....	SGA-43	SGA-33	5738.
	400	6	600	SHG-32	12014.	SHW-32	15214.	.....	.....	SHA-42	SHA-32	13394.

*** Prices do not include thermal units. For selection, see page 466.**
◐ NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to page 448.
▲ NEMA Type 4X hubs are included with each starter at no additional cost.
‡ Available amperes RMS symmetrical. NEMA Type 4X devices are not UL Listed.

Ordering Information — Refer to Page 242.
Field modification kits — Refer to Pages 244 & 246 and Class 9999 section.

SQD SLV_001021

AC COMBINATION STARTERS

DISCONNECT SWITCH TYPE — APPLICATION DATA

MODIFICATIONS — FUSE BLOCK

CLASS 8538

Conversion Kit to Fusible — Size 0-2, non-fusible combination starters can be converted to a fusible type. All NEMA Type 1, 4 and 12 enclosures have the same size enclosure for fusible and non-fusible combination starters. Therefore, space is available for the conversion to a fusible type. To make the conversion, a Class 9999 Type SF fuse block kit and Class 9999 Type S or SR fuse clip kit (page 458) are required.

FUSE BLOCK KIT

NEMA Size	Starter Type	Class 9999	
		Type	Price
0 & 1	SB & SC	SF-1	$14.
2	SD	SF-2	17.

D1B DISCOUNT

Fuse Selection—Fuse clips furnished in standard Square D combination controllers are sized to accept Class K5 or RK5 time delay fuses, since they are the most frequently used fuses for motor circuits. A time delay fuse rating of 125% to 175% of motor full-load current is normally recommended. However, fuse ratings for motor circuits must not exceed the limitations given in NEC 430-52 and additional restrictions which may be listed in instructions supplied with the controller.

For Size 0 through 3 controllers, Class H non-time delay fuses whose rating does not exceed 300% of motor full-load current may also be used if available short-circuit current does not exceed 5,000 RMS symmetrical amperes. (Larger fuse clips may be required.) For size 4 through 6 controllers Class K5 or RK5 fuses are required, since Class H fuses do not provide adequate short-circuit protection.

If use of Class J or L fuses is desired, consult local field office. For additional information regarding recommended and maximum fuse ratings see "Overload and Short Circuit Protection Selector" in Control Catalog.

Interchangeable Fuse Clips — On all sizes, the spacing of the fuse clips can be changed from 250 to 600 volts or vice versa. On NEMA Sizes 0-2, the ampere size of the fuse clips can also be changed.

Fuse clips can be changed on NEMA Sizes 0-2 by the use of a Class 9999 Type S or SR fuse clip kit.

Class H Fuse Clips — Supplied as standard in combination starters and will accept Class H, K1, K5, RK1 and RK5 fuses.

Class R Fuse Clips — Class R fuse clips are rejection type clips and will accept only Class R fuses. Field installation of Class R fuse clips requires the use of a Class 9999 Type SR fuse clip kit. Class 9999 Types SR-1, SR-2 and SR-3 kits include three Class H clips and three Class R rejection clips. Types SR-4 and SR-5 kits include only the non-removable pins and are installable only on the latest production of combination starters which have a hole in the lower fuse clips. Once Class R clips are installed, the device cannot be converted back to Class H clips without great difficulty and expense.

FOR FUSE CLIP KITS SEE PAGE 458

COMBINATION STARTERS IN OVERSIZED ENCLOSURES

LINE VOLTAGE TYPE, NON-REVERSING WITH THREE MELTING ALLOY OVERLOAD RELAYS

UL LISTED ♦

CLASS 8538 8539

3 POLE — 600 VOLTS MAX. — 50-60 HERTZ

CLASS 8538 NON-FUSIBLE DISCONNECT SWITCH TYPE■

Ratings				General Purpose Enclosure NEMA Type 1		Watertight and Dusttight Enclosure Stainless Steel NEMA Type 4		Dusttight and Driptight Industrial Use Enclosure NEMA Type 12◐		
Motor Voltage (Starter Voltage)	Max. HP Poly-phase	NEMA Size	Fuse Clip Size Amps	Type	Price*	Type	Price*	With External Reset Type	Without External Reset Type	Price*
200 (208)	3	0	NONE	SBG-11-S8	$464.	SBW-11-S8	$1048.	SBA-21-S8	SBA-11-S8	$640.
	7½	1	NONE	SCG-11-S8	484.	SCW-11-S8	1068.	SCA-21-S8	SCA-11-S8	660.
	10	2	NONE	SDG-11-S8	708.	SDW-11-S8	1500.	SDA-21-S8	SDA-11-S8	924.
230 (240)	3	0	NONE	SBG-11-S8	464.	SBW-11-S8	1048.	SBA-21-S8	SBA-11-S8	640.
	7½	1	NONE	SCG-11-S8	484.	SCW-11-S8	1068.	SCA-21-S8	SCA-11-S8	660.
	15	2	NONE	SDG-11-S8	708.	SDW-11-S8	1500.	SDA-21-S8	SDA-11-S8	924.
460-575 (480-600)	5	0	NONE	SBG-11-S8	464.	SBW-11-S8	1048.	SBA-21-S8	SBA-11-S8	640.
	10	1	NONE	SCG-11-S8	484.	SCW-11-S8	1068.	SCA-21-S8	SCA-11-S8	660.
	25	2	NONE	SDG-11-S8	708.	SDW-11-S8	1500.	SDA-21-S8	SDA-11-S8	924.

■ UL LISTED

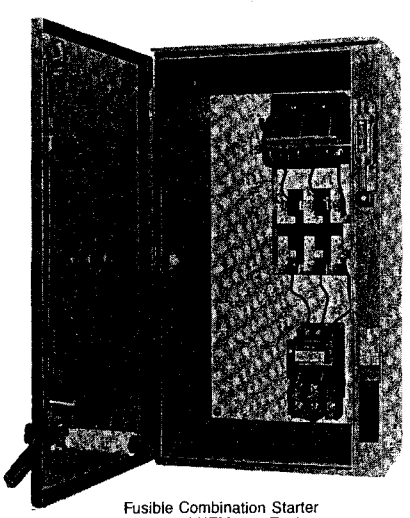
CLASS 8538 FUSIBLE DISCONNECT SWITCH TYPE

200 (208)	3	0	30	SBG-12-S8	$476.	SBW-12-S8	$1060.	SBA-22-S8	SBA-12-S8	$652.
	5	1	30	SCG-12-S8	496.	SCW-12-S8	1080.	SCA-22-S8	SCA-12-S8	672.
	7½	1	60	SCG-13-S8	504.	SCW-13-S8	1088.	SCA-23-S8	SCA-13-S8	680.
	10	2	60	SDG-12-S8	724.	SDW-12-S8	1516.	SDA-22-S8	SDA-12-S8	940.
230 (240)	3	0	30	SBG-12-S8	476.	SBW-12-S8	1060.	SBA-22-S8	SBA-12-S8	652.
	5	1	30	SCG-12-S8	496.	SCW-12-S8	1080.	SCA-22-S8	SCA-12-S8	672.
	7½	1	60	SCG-13-S8	504.	SCW-13-S8	1088.	SCA-23-S8	SCA-13-S8	680.
	15	2	60	SDG-12-S8	724.	SDW-12-S8	1516.	SDA-22-S8	SDA-12-S8	940.
460-575 (480-600)	5	0	30	SBG-13-S8	484.	SBW-13-S8	1068.	SBA-23-S8	SBA-13-S8	660.
	10	1	30	SCG-14-S8	504.	SCW-14-S8	1088.	SCA-24-S8	SCA-14-S8	680.
	15	2	30	SDG-16-S8	728.	SDW-16-S8	1520.	SDA-26-S8	SDA-16-S8	944.
	25	2	60	SDG-14-S8	736.	SDW-14-S8	1528.	SDA-24-S8	SDA-14-S8	952.

♦ UL LISTED SHORT CIRCUIT WITHSTAND RATING

Fuse Clip Type	Available Amperes RMS Symmetrical
Standard	5,000
Non-Fusible	Not Applicable

UP TO 190 SQ. IN. PANEL SPACE FOR CUSTOMER USE



Fusible Combination Starter In Oversized NEMA 12 Enclosure

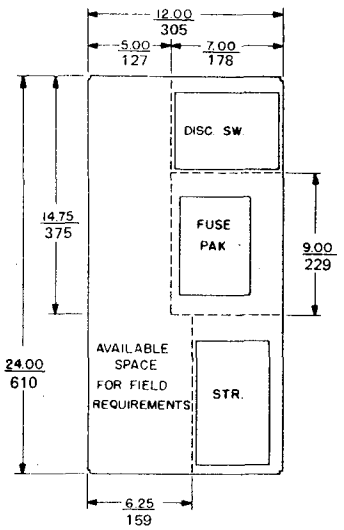
SQD SLV_001022

COMBINATION STARTERS IN OVERSIZED ENCLOSURES

LINE VOLTAGE TYPE, NON-REVERSING WITH THREE MELTING ALLOY OVERLOAD RELAYS

UL LISTED

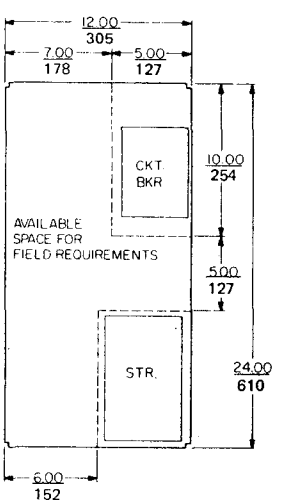
CLASS 8538 8539



These are PANEL dimensions. For ENCLOSURE dimensions, see page 250.

UL LISTED
SHORT CIRCUIT WITHSTAND RATINGS

Fuse Clip Type	Available Amperes RMS Symmetrical
Standard	5,000
Class R	100,000



These are PANEL dimensions. For ENCLOSURE dimensions, see page 250.

UL LISTED
SHORT CIRCUIT WITHSTAND RATINGS

NEMA Size	Voltage	Available Amperes RMS Symmetrical
0 & 1	0-480	22,000
0 & 1	481-600	10,000
2	600	22,000

3 POLE — 600 VOLTS MAX. — 50-60 HERTZ

CLASS 8538 FUSIBLE DISCONNECT SWITCH TYPE WITH CLASS R FUSE CLIPS

Ratings				General Purpose Enclosure NEMA Type 1		Watertight and Dusttight Enclosure Stainless Steel NEMA Type 4		Dusttight and Driptight Industrial Use Enclosure NEMA Type 12◐		
Motor Voltage (Starter Voltage)	Max. HP Poly-phase	NEMA Size	Fuse Clip Size Amps	Type	Price*	Type	Price*	With External Reset	Without External Reset	
								Type	Type	Price*
200 (208)	3	0	30	SBG-32-S8	**$482.**	SBW-32-S8	**$1064.**	SBA-42-S8	SBA-32-S8	**$658.**
	5	1	30	SCG-32-S8	**502.**	SCW-32-S8	**1086.**	SCA-42-S8	SCA-32-S8	**678.**
	7½	1	60	SCG-33-S8	**510.**	SCW-33-S8	**1094.**	SCA-43-S8	SCA-33-S8	**686.**
	10	2	60	SDG-32-S8	**730.**	SDW-32-S8	**1522.**	SDA-42-S8	SDA-32-S8	**946.**
230 (240)	3	0	30	SBG-32-S8	**482.**	SBW-32-S8	**1066.**	SBA-42-S8	SBA-32-S8	**658.**
	5	1	30	SCG-32-S8	**502.**	SCW-32-S8	**1086.**	SCA-42-S8	SCA-32-S8	**678.**
	7½	1	60	SCG-33-S8	**510.**	SCW-33-S8	**1094.**	SCA-43-S8	SCA-33-S8	**686.**
	15	2	60	SDG-32-S8	**730.**	SDW-32-S8	**1522.**	SDA-42-S8	SDA-32-S8	**946.**
460-575 (480-600)	5	0	30	SBG-33-S8	**490.**	SBW-33-S8	**1074.**	SBA-43-S8	SBA-33-S8	**666.**
	10	1	30	SCG-34-S8	**510.**	SCW-34-S8	**1094.**	SCA-44-S8	SCA-34-S8	**686.**
	15	2	30	SDG-36-S8	**734.**	SDW-36-S8	**1526.**	SDA-46-S8	SDA-36-S8	**950.**
	25	2	60	SDG-34-S8	**742.**	SDW-34-S8	**1534.**	SDA-44-S8	SDA-34-S8	**958.**

3 POLE — 600 VOLTS MAX. — 50-60 HERTZ

CLASS 8539 MAG-GARD® MOTOR CIRCUIT PROTECTOR TYPE

Ratings				General Purpose Enclosure NEMA Type 1		Watertight and Dusttight Enclosure Stainless Steel (Sizes 0-5) NEMA Type 4		Dusttight and Driptight Industrial Use Enclosure NEMA Type 12◐		
Motor Voltage (Starter Voltage)	H.P. Range Poly-phase	NEMA Size	Catalog Number (See page 232 for Breaker Adjustment Range)	Type	Price*	Type	Price*	With External Reset	Without External Reset	
								Type	Type	Price*
200 (208)	¼-⅓	0	FAL36003-11M	SBG-41-S8	**$608.**	SBW-41-S8	**$1192.**	SBA-51-S8	SBA-41-S8	**$ 784.**
	½-1		FAL36007-12M	SBG-42-S8		SBW-42-S8		SBA-52-S8	SBA-42-S8	
	1½-3		FAL36015-13M	SBG-43-S8		SBW-43-S8		SBA-53-S8	SBA-43-S8	
	¼-⅓	1	FAL36003-11M	SCG-41-S8	**628.**	SCW-41-S8	**1212.**	SCA-51-S8	SCA-41-S8	**804.**
	½-1		FAL36007-12M	SCG-42-S8		SCW-42-S8		SCA-52-S8	SCA-42-S8	
	1½-3		FAL36015-13M	SCG-43-S8		SCW-43-S8		SCA-53-S8	SCA-43-S8	
	5		FAL36030-15M	SCG-44-S8		SCW-44-S8		SCA-54-S8	SCA-44-S8	
	7½		FAL36050-16M	SCG-45-S8		SCW-45-S8		SCA-55-S8	SCA-45-S8	
	1½-3	2	FAL36015-13M	SDG-41-S8	**848.**	SDW-41-S8	**1640.**	SDA-51-S8	SDA-41-S8	**1064.**
	5		FAL36030-15M	SDG-42-S8		SDW-42-S8		SDA-52-S8	SDA-42-S8	
	7½-10		FAL36050-16M	SDG-43-S8		SDW-43-S8		SDA-53-S8	SDA-43-S8	
230 (240)	¼-⅓	0	FAL36003-11M	SBG-41-S8	**608.**	SBW-41-S8	**1192.**	SBA-51-S8	SBA-41-S8	**784.**
	½-1		FAL36007-12M	SBG-42-S8		SBW-42-S8		SBA-52-S8	SBA-42-S8	
	1½-3		FAL36015-13M	SBG-43-S8		SBW-43-S8		SBA-53-S8	SBA-43-S8	
	¼-⅓	1	FAL36003-11M	SCG-41-S8	**628.**	SCW-41-S8	**1212.**	SCA-51-S8	SCA-41-S8	**804.**
	½-1		FAL36007-12M	SCG-42-S8		SCW-42-S8		SCA-52-S8	SCA-42-S8	
	1½-3		FAL36015-13M	SCG-43-S8		SCW-43-S8		SCA-53-S8	SCA-43-S8	
	5-7½		FAL36030-15M	SCG-44-S8		SCW-44-S8		SCA-54-S8	SCA-44-S8	
	1½-3	2	FAL36015-13M	SDG-41-S8	**848.**	SDW-41-S8	**1640.**	SDA-51-S8	SDA-41-S8	**1064.**
	5-7½		FAL36030-15M	SDG-42-S8		SDW-42-S8		SDA-52-S8	SDA-42-S8	
	10		FAL36050-16M	SDG-43-S8		SDW-43-S8		SDA-53-S8	SDA-43-S8	
	15		FAL36100-18M	SDG-44-S8		SDW-44-S8		SDA-54-S8	SDA-44-S8	
460 (480)	¼-1	0	FAL36003-11M	SBG-41-S8	**608.**	SBW-41-S8	**1192.**	SBA-51-S8	SBA-41-S8	**784.**
	1½-3		FAL36007-12M	SBG-42-S8		SBW-42-S8		SBA-52-S8	SBA-42-S8	
	5		FAL36015-13M	SBG-43-S8		SBW-43-S8		SBA-53-S8	SBA-43-S8	
	¼-1	1	FAL36003-11M	SCG-41-S8	**628.**	SCW-41-S8	**1212.**	SCA-51-S8	SCA-41-S8	**804.**
	1½-3		FAL36007-12M	SCG-42-S8		SCW-42-S8		SCA-52-S8	SCA-42-S8	
	5-7½		FAL36015-13M	SCG-43-S8		SCW-43-S8		SCA-53-S8	SCA-43-S8	
	10		FAL36030-15M	SCG-44-S8		SCW-44-S8		SCA-54-S8	SCA-44-S8	
	5-7½	2	FAL36015-13M	SDG-41-S8	**848.**	SDW-41-S8	**1640.**	SDA-51-S8	SDA-41-S8	**1064.**
	10-15		FAL36030-15M	SDG-42-S8		SDW-42-S8		SDA-52-S8	SDA-42-S8	
	20-25		FAL36050-16M	SDG-43-S8		SDW-43-S8		SDA-53-S8	SDA-43-S8	
575 (600)	¼-1	0	FAL36003-11M	SBG-41-S8	**608.**	SBW-41-S8	**1192.**	SBA-51-S8	SBA-41-S8	**784.**
	1½-3		FAL36007-12M	SBG-42-S8		SBW-42-S8		SBA-52-S8	SBA-42-S8	
	5		FAL36015-13M	SBG-43-S8		SBW-43-S8		SBA-53-S8	SBA-43-S8	
	¼-1	1	FAL36003-11M	SCG-41-S8	**628.**	SCW-41-S8	**1212.**	SCA-51-S8	SCA-41-S8	**804.**
	1½-3		FAL36007-12M	SCG-42-S8		SCW-42-S8		SCA-52-S8	SCA-42-S8	
	5-10		FAL36015-13M	SCG-43-S8		SCW-43-S8		SCA-53-S8	SCA-43-S8	
	5-10	2	FAL36015-13M	SDG-41-S8	**848.**	SDW-41-S8	**1640.**	SDA-51-S8	SDA-41-S8	**1064.**
	15-20		FAL36030-15M	SDG-42-S8		SDW-42-S8		SDA-52-S8	SDA-42-S8	
	25		FAL36050-16M	SDG-43-S8		SDW-43-S8		SDA-53-S8	SDA-43-S8	

*** Prices do not include thermal units. For selection, see page 466.**
◐ NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to page 448.

SQD SLV_001023

AC COMBINATION STARTERS

DISCONNECT SWITCH & CIRCUIT BREAKER TYPES APPLICATION DATA FOR TYPES SB-SH, J AND K

CLASS 8538 8539

MODIFICATIONS — DISCONNECT SWITCH AND BREAKER INTERLOCKS

A one or two pole electrical interlock can be added to the disconnect switch or circuit breaker. Thus if a separate control circuit is used, the magnetic starter can be de-energized when the disconnect is thrown to the OFF position. See table below for proper interlock selection.

DISCONNECT SWITCH AND BREAKER INTERLOCKS

Class	Starter Size	Series	Interlock Description			
			Single Pole		Two Pole	
			Class 9999 Type	Price	**Class 9999 Type**	Price
8538 8738	0, 1	A	R-6	**$ 30.**	R-7	**$ 58.**
	2	A and B	R-6	**30.**	R-7	**58.**
	2	C	R-43	**30.**	R-44	**58.**
	3, 4	A	R-8	**34.**	R-9	**64.**
	3	B	R-41	**36.**	R-42	**48.**
	4	B	R-39	**34.**	R-40	**64.**
	5	A	R-35	**106.**	R-36	**136.**
	6	A	R-26	**34.**	R-27	**64.**
8539 8739	0-6	A	R-26	**34.**	R-27	**64.**



An electrical interlock may also be factory installed in either a disconnect switch or circuit breaker combination starter. Specify Form Y74 for single pole, or Form Y75 for two pole interlocks. For prices see Page 463.

MODIFICATIONS — CONTROL CIRCUIT TRANSFORMER

Transformer Selection — Space and drilling are provided in all disconnect switch and circuit breaker combination starters in NEMA Type 1, 4 and 12 enclosures for the field addition (or factory installation) of a Class 9070 control circuit transformer and Class 9080 type PF-1 fuse block. The transformers used with the standard three-pole starters are given in the table below. Consult field office for transformer additions to NEMA 4X and NEMA 7 & 9 enclosures.

NEMA Size	Starter Type	Transformer Selection		
		Standard Capacity (Form FT)	100 VA Additional Capacity (Form FT-11)	200 VA Additional Capacity (Form FT-12)
		Class 9070 Type	Class 9070 Type	Class 9070 Type
0 & 1	SB & SC	EO-1	GO-3	GO-4◆
2	SD	GO-2	GO-4	GO-4
3	SE	EO-3	EO-4	EO-51
4	SF	EO-4	EO-51	EO-51
5	SG	EO-1 and 8501 Relay	EO-3 and 8501 Relay	EO-4 and 8501 Relay
6	SH	EO-3-S2 is Standard	EO-3-S2 and EO-2	EO-3-S2 and EO-4
7	J	EO-51	EO-61	EO-61
8	K	EO-51	EO-61	EO-61

◆Class 8539 uses larger enclosure. For dimensions see page 250 ". . . oversized enclosures."

Fuse Block Mounting Brackets — The standard capacity transformer, Class 9070 Type EO-1, for the Size 0 and 1 starters mounts directly to the right of the magnetic starter. If it is desired to mount other control components in this space, the standard transformer can be installed by the factory or in the field beneath the main fuse block. The fuse block is raised off the panel on mounting brackets to provide space beneath for the Class 9070 Type EO-1 transformer.

Factory installed, this transformer mounting is identified as Form FT-9. The mounting brackets only, for field installation, are listed in the following table. The price adder for FT-9 is **$108.00** list (D1A Discount).

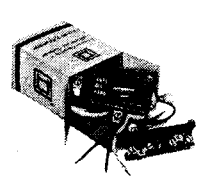
MOUNTING BRACKETS

NEMA Size	Class 9999	
	Type	Price
0 & 1	SF-11	**$8.**

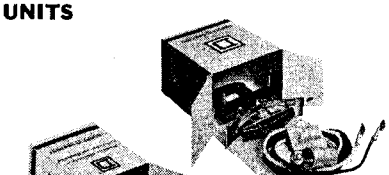
MODIFICATIONS — COVER MOUNTED CONTROL UNITS

NEMA Type 1 Enclosures — Knockouts are provided in the cover to accept factory or field installed Class 9999 control units. The table below lists the kits for field installation.

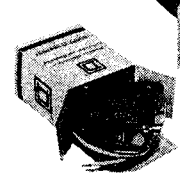
NEMA Types 4 and 12 Enclosures — Three punched holes are provided in the cover to accept factory or field installation of Class 9001 Type K control units. These holes are covered with Class 9001 closing plates. When installing Class 9001 Type K control units in NEMA Type 4 enclosures, Class 9001 Type KU water-tight caps must be used. For further details and pricing of these units, see the Class 9001 Section.



Selector Switch Kit



Pilot Light Kit



Push Button Kit

Type of Control Unit For NEMA 1 Enclosures	NEMA Size	Starter Type	Class 9999	
			Type	Price
Start-Stop push buttons	0-4	SB-SF	SA-2	**$32.**
Hand-Off-Auto selector switch	0-4	SB-SF	SC-2	**32.**
On-Off selector switch	0-4	SB-SF	SC-22	**32.**
Closing plate for above knockouts	0-4	SB-SF	SG-1	**4.**
Red pilot light	0, 1	SB-SC	SP-12R	**60.**
	2	SD	SP-13R	**60.**
	3	SE	SP-14R	**60.**
	4	SF	SP-15R	**60.**
Closing plate for above pilot light	0-4	SB-SF	SG-2	**4.**
Size 5 and 6 devices are provided with three punched holes with closing plates for use with Class 9001 Type K oil-tight units	5-6	SG-SH	....	...

MODIFICATIONS — STARTER RESET KITS

Class 9066 Type RA and RB reset kits make it possible to replace or add external reset mechanisms to NEMA 1, NEMA 4 and NEMA 12 enclosed combination starters.

Type of Enclosure	Size 0, 1		Size 2		Sizes 3 & 4		Size 5		Size 6	
	Class 9066 Type	Price	Class 9066 Type	Price	Class 9066 Type	Price	Class 9066 Type	Price	Class 9066 Type	Price
NEMA 1 & 12	RB-1	**$12.**	RB-2	**$12.**	RA-1	**$16.**	RA-3	**$24.**	RA-1	**$16.**
NEMA 4	Use correct Type RA or RB kit listed above and Class 9066 Type W-1 kit at **$8.** list each.									

SQD SLV_001024

UL LISTED
FOR 22,000A◆
OR 100,000A

AC COMBINATION STARTERS

MAG-GARD® MOTOR CIRCUIT PROTECTOR TYPE

NOTE: The type number selections are listed for motors with typical locked rotor inrush characteristics. For selection restrictions refer to the "motor code letter" table below★

CLASS 8539

LINE VOLTAGE TYPE, NON-REVERSING WITH THREE MELTING ALLOY OVERLOAD RELAYS

3 POLE, 600 VOLTS AC MAXIMUM — 50-60 HERTZ

Ratings				General Purpose Enclosure **NEMA Type 1**		Watertight and Dusttight Enclosure Stainless Steel (Sizes 0-5) **NEMA Type 4**		Watertight Dusttight and Corrosion Resistant Enclosure **NEMA Type 4X▲**		For Hazardous Locations— SPIN TOP® Enclosure Class I Groups C & D Class II Groups E, F & G **NEMA Types 7 and 9†**		Dusttight and Driptight Industrial Use Enclosure **NEMA Type 12◐**		
Motor Voltage (Starter Voltage)	H.P. Range Poly-phase	NEMA Size	Catalog Number (See page 248 for Breaker Adjustment Range)	Type	* Price	Type	* Price	Type	* Price	Type	* Price	With External Reset Type	Without External Reset Type	* Price
200 (208)	¼-⅓ ½-1 1½-3	0	FAL36003-11M FAL36007-12M FAL36015-13M	SBG-41 SBG-42 SBG-43	$ 508.	SBW-41 SBW-42 SBW-43	$ 892.	SBW-51 SBW-52 SBW-53	$1024.	SBR-41 SBR-42 SBR-43	$1078.	SBA-51 SBA-52 SBA-53	SBA-41 SBA-42 SBA-43	$ 604.
	¼-⅓ ½-1 1½-3 5 7½	1	FAL36003-11M FAL36007-12M FAL36015-13M FAL36030-15M FAL36050-16M	SCG-41 SCG-42 SCG-43 SCG-44 SCG-45	528.	SCW-41 SCW-42 SCW-43 SCW-44 SCW-45	912.	SCW-51 SCW-52 SCW-53 SCW-54 SCW-55	1048.	SCR-41 SCR-42 SCR-43 SCR-44 SCR-45	1104.	SCA-51 SCA-52 SCA-53 SCA-54 SCA-55	SCA-41 SCA-42 SCA-43 SCA-44 SCA-45	624.
	1½-3 5 7½-10	2	FAL36015-13M FAL36030-15M FAL36050-16M	SDG-41 SDG-42 SDG-43	748.	SDW-41 SDW-42 SDW-43	1340.	SDW-51 SDW-52 SDW-53	1474.	SDR-41 SDR-42 SDR-43	1474.	SDA-51 SDA-52 SDA-53	SDA-41 SDA-42 SDA-43	884.
	15-25	3	FAL36100-18M	SEG-42	1088.	SEW-42	2120.	SEW-52	2332.	SER-42	2436.	SEA-52	SEA-42	1264.
	30 40	4	KAL36225-25M KAL36225-26M	SFG-42 SFG-43	2388.	SFW-42 SFW-43	3708.	SFW-52 SFW-53	4080.	SFR-42 SFR-43	3796.	SFA-52 SFA-53	SFA-42 SFA-43	2876.
	50 60 75	5	KAL36225-30M LAL36400-32M LAL36400-33M	SGG-42 SGG-44 SGG-45	5538.	SGW-42 SGW-44 SGW-45	8906.	.....	....	SGR-42 SGR-44 SGR-45	8250.	SGA-52 SGA-54 SGA-55	SGA-42 SGA-44 SGA-45	6418.
	100 125 150	6	LAL36400-36M MAL36600-40M MAL36600-42M	SHG-43 SHG-44 SHG-45	12026.	SHW-43 SHW-44 SHW-45	14026.	.....	....	SHR-43 SHR-44 SHR-45	19124.	SHA-53 SHA-54 SHA-55	SHA-43 SHA-44 SHA-45	13106.
230 (240)	¼-⅓ ½-1 1½-3	0	FAL36003-11M FAL36007-12M FAL36015-13M	SBG-41 SBG-42 SBG-43	508.	SBW-41 SBW-42 SBW-43	892.	SBW-51 SBW-52 SBW-53	1024.	SBR-41 SBR-42 SBR-43	1078.	SBA-51 SBA-52 SBA-53	SBA-41 SBA-42 SBA-43	604.
	¼-⅓ ½-1 1½-3 5-7½	1	FAL36003-11M FAL36007-12M FAL36015-13M FAL36030-15M	SCG-41 SCG-42 SCG-43 SCG-44	528.	SCW-41 SCW-42 SCW-43 SCW-44	912.	SCW-51 SCW-52 SCW-53 SCW-54	1048.	SCR-41 SCR-42 SCR-43 SCR-44	1104.	SCA-51 SCA-52 SCA-53 SCA-54	SCA-41 SCA-42 SCA-43 SCA-44	624.
	1½-3 5-7½ 10 15	2	FAL36015-13M FAL36030-15M FAL36050-16M FAL36100-18M	SDG-41 SDG-42 SDG-43 SDG-44	748.	SDW-41 SDW-42 SDW-43 SDW-44	1340.	SDW-51 SDW-52 SDW-53 SDW-54	1474.	SDR-41 SDR-42 SDR-43 SDR-44	1474.	SDA-51 SDA-52 SDA-53 SDA-54	SDA-41 SDA-42 SDA-43 SDA-44	884.
	15-30	3	FAL36100-18M	SEG-42	1088.	SEW-42	2120.	SEW-52	2332.	SER-42	2436.	SEA-52	SEA-42	1264.
	40 50	4	KAL36225-26M KAL36225-29M	SFG-43 SFG-44	2388.	SFW-43 SFW-44	3708.	SFW-53 SFW-54	4080.	SFR-43 SFR-44	3796.	SFA-53 SFA-54	SFA-43 SFA-44	2876.
	60 75 100	5	KAL36225-31M LAL36400-32M LAL36400-35M	SGG-43 SGG-44 SGG-46	5538.	SGW-43 SGW-44 SGW-46	8906.	.....	....	SGR-43 SGR-44 SGR-46	8250.	SGA-53 SGA-54 SGA-56	SGA-43 SGA-44 SGA-46	6418.
	125-150 200	6	MAL36600-40M MAL36600-44M	SHG-44 SHG-46	12026.	SHW-44 SHW-46	14026.	.....	....	SHR-44 SHR-46	19124.	SHA-54 SHA-56	SHA-44 SHA-46	13106.
	300	7	MAL■	JG-1	16242.	JW-1	18242.	.....	....	.....	....	JA-1	.....	17322.

For 460 volt and 575 volt listings, see Page 248.

*** Prices do not include thermal units. For selection, see page 466.**
◐ NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to page 448.
■ Circuit breaker rating for Size 7 device is dependent on H.P. and voltage supplied at time of order entry.
† Size 6 device uses Killark Electric bolted enclosure.
▲ NEMA Type 4X hubs are included with each starter at no additional cost.

★MOTOR CODE LETTER TABLE

Horsepower	Motor Code Letters
½ or less	A-L
¾ — 1½	A-K
2 — 3	A-J
5 — 25	A-H
30 — 125	A-G
150 or more	A-F

For other motors a special thermal trip circuit breaker with magnetic trip settings for the specific motor is required. When ordering combination starters for these special applications, specify the complete motor horsepower, voltage, frequency, full load current and **code letter** (or locked rotor current) to assure proper selection. This special circuit breaker will be listed as Form Y53-8.

◆UL LISTED SHORT CIRCUIT WITHSTAND RATINGS‡

NEMA Size	Voltage	Available Amperes RMS Symmetrical
0 & 1	0-480	22,000
0 & 1	481-600	10,000
2-6	600	22,000
0-3 With CLM See Page 248	600	100,000
0-3 NEMA 7 & 9	600	5,000
4-5 NEMA 7 & 9	600	10,000

‡NEMA Type 4X is not UL Listed.

ORDERING INFORMATION REQUIRED — See Page 242

THERMAL UNITS

Thermal units should be ordered separately. See Selection Index on Page 466. Standard trip thermal units are priced at **$6.00** each.

FIELD MODIFICATION KITS

Refer to Pages 244 & 246 and Class 9999 Section.

MAG-GARD is a Registered Trademark of Square D Company.
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SQD SLV_001025

AC COMBINATION STARTERS

MAG-GARD® MOTOR CIRCUIT PROTECTOR TYPE

CLASS 8539

NOTE: The type number selections are listed for motors with typical locked rotor inrush characteristics. For selection restrictions refer to the "motor code letter" table on Page 247.

UL LISTED FOR 22,000A◆ OR 100,000A

LINE VOLTAGE TYPE, NON-REVERSING — WITH THREE MELTING ALLOY OVERLOAD RELAYS

3 POLE, 600 VOLTS AC MAXIMUM — 50-60 HERTZ

Ratings				General Purpose Enclosure NEMA Type 1		Watertight and Dusttight Enclosure Stainless Steel (Sizes 0-5) NEMA Type 4		Watertight, Dusttight and Corrosion Resistant Enclosure NEMA Type 4X▲		For Hazardous Locations SPIN TOP® Enclosure Class I Groups C & D Class II Groups E, F & G NEMA Types 7 and 9†		Dusttight and Driptight Industrial Use Enclosure NEMA Type 12◐		
Motor Voltage (Starter Voltage)	H.P. Range Poly-phase	NEMA Size	Catalog Number (See below for Breaker Adjustment Range)	Type	Price*	Type	Price*	Type	Price*	Type	Price*	With External Reset	Without External Reset	Price*
460 (480)	¼-1 1½-3 5	0	FAL36003-11M FAL36007-12M FAL36015-13M	SBG-41 SBG-42 SBG-43	$ 508.	SBW-41 SBW-42 SBW-43	$ 892.	SBW-51 SBW-52 SBW-53	$1024.	SBR-41 SBR-42 SBR-43	$1078.	SBA-51 SBA-52 SBA-53	SBA-41 SBA-42 SBA-43	$ 604.
	¼-1 1½-3 5-7½ 10	1	FAL36003-11M FAL36007-12M FAL36015-13M FAL36030-15M	SCG-41 SCG-42 SCG-43 SCG-44	528.	SCW-41 SCW-42 SCW-43 SCW-44	912.	SCW-51 SCW-52 SCW-53 SCW-54	1048.	SCR-41 SCR-42 SCR-43 SCR-44	1104.	SCA-51 SCA-52 SCA-53 SCA-54	SCA-41 SCA-42 SCA-43 SCA-44	624.
	5-7½ 10-15 20-25	2	FAL36015-13M FAL36030-15M FAL36050-16M	SDG-41 SDG-42 SDG-43	748.	SDW-41 SDW-42 SDW-43	1340.	SDW-51 SDW-52 SDW-53	1474.	SDR-41 SDR-42 SDR-43	1474.	SDA-51 SDA-52 SDA-53	SDA-41 SDA-42 SDA-43	884.
	20-25 30-50	3	FAL36050-16M FAL36100-18M	SEG-41 SEG-42	1088.	SEW-41 SEW-42	2120.	SEW-51 SEW-52	2332.	SER-41 SER-42	2436.	SEA-51 SEA-52	SEA-41 SEA-42	1264.
	60-75 100	4	KAL36225-25M KAL36225-29M	SFG-42 SFG-44	2388.	SFW-42 SFW-44	3708.	SFW-52 SFW-54	4080.	SFR-42 SFR-44	3796.	SFA-52 SFA-54	SFA-42 SFA-44	2876.
	125 150 200	5	KAL36225-31M LAL36400-32M LAL36400-35M	SGG-43 SGG-44 SGG-46	5538.	SGW-43 SGW-44 SGW-46	8906.	....	....	SGR-43 SGR-44 SGR-46	8250.	SGA-53 SGA-54 SGA-56	SGA-43 SGA-44 SGA-46	6418.
	250 300 350 400	6	LAL36400-36M MAL36600-40M MAL36600-42M MAL36600-44M	SHG-43 SHG-44 SHG-45 SHG-46	12026.	SHW-43 SHW-44 SHW-45 SHW-46	14026.	....	....	SHR-43 SHR-44 SHR-45 SHR-46	19124.	SHA-53 SHA-54 SHA-55 SHA-56	SHA-43 SHA-44 SHA-45 SHA-46	13106.
	500-600	7	MAL■	JG-1	16242.	JW-1	18242.	.....	....	.....	....	JA-1	.....	17322.
	700-900	8	PAF■	KG-1	24170.	KW-1	26170.	.....	....	.....	....	KA-1	.....	25250.
575 (600)	¼-1 1½-3 5	0	FAL36003-11M FAL36007-12M FAL36015-13M	SBG-41 SBG-42 SBG-43	508.	SBW-41 SBW-42 SBW-43	892.	SBW-51 SBW-52 SBW-53	1024.	SBR-41 SBR-42 SBR-43	1078.	SBA-51 SBA-52 SBA-53	SBA-41 SBA-42 SBA-43	604.
	¼-1 1½-3 5-10	1	FAL36003-11M FAL36007-12M FAL36015-13M	SCG-41 SCG-42 SCG-43	528.	SCW-41 SCW-42 SCW-43	912.	SCW-51 SCW-52 SCW-53	1048.	SCR-41 SCR-42 SCR-43	1104.	SCA-51 SCA-52 SCA-53	SCA-41 SCA-42 SCA-43	624.
	5-10 15-20 25	2	FAL36015-13M FAL36030-15M FAL36050-16M	SDG-41 SDG-42 SDG-43	748.	SDW-41 SDW-42 SDW-43	1340.	SDW-51 SDW-52 SDW-53	1474.	SDR-41 SDR-42 SDR-43	1474.	SDA-51 SDA-52 SDA-53	SDA-41 SDA-42 SDA-43	884.
	25-30 40-50	3	FAL36050-16M FAL36100-18M	SEG-41 SEG-42	1088.	SEW-41 SEW-42	2120.	SEW-51 SEW-52	2332.	SER-41 SER-42	2436.	SEA-51 SEA-52	SEA-41 SEA-42	1264.
	60-100	4	KAL36225-25M	SFG-42	2388.	SFW-42	3708.	SFW-52	4080.	SFR-42	3796.	SFA-52	SFA-42	2876.
	125 150 200	5	KAL36225-29M KAL36225-30M LAL36400-32M	SGG-41 SGG-42 SGG-44	5538.	SGW-41 SGW-42 SGW-44	8906.	....	....	SGR-41 SGR-42 SGR-44	8250.	SGA-51 SGA-52 SGA-54	SGA-41 SGA-42 SGA-44	6418.
	250 300 350-400	6	LAL36400-35M LAL36400-36M MAL36600-40M	SHG-42 SHG-43 SHG-44	12026.	SHW-42 SHW-43 SHW-44	14026.	....	....	SHR-42 SHR-43 SHR-44	19124.	SHA-52 SHA-53 SHA-54	SHA-42 SHA-43 SHA-44	13106.
	500-600	7	MAL■	JG-1	16242.	JW-1	18242.	.....	....	.....	....	JA-1	.....	17322.
	700-900	8	PAF■	KG-1	24170.	KW-1	26170.	.....	....	.....	....	KA-1	.....	25250.

*** Prices do not include thermal units. For selection, see Page 466.**
◐ NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to page 448.
■ Circuit breaker ratings for Size 7 and 8 devices are dependent on H.P. and voltage supplied at time of order entry.
† Size 6 device uses Killark Electric bolted enclosure.
▲ NEMA Type 4X hubs are included with each starter at no additional cost.

ORDERING INFORMATION REQUIRED — See Page 242

FIELD MODIFICATION KITS

Refer to Pages 244 & 246 and Class 9999 Section.

MAG-GARD TRIP RANGE

Suffix Number	Range Amps.	Suffix Number	Range Amps.	Suffix Number	Range Amps.
11M	8-22	25M	625-1250	33M	1500-3000
12M	18-58	26M	750-1500	35M	1750-3500
13M	50-150	29M	875-1750	36M	2000-4000
15M	100-300	30M	1000-2000	40M	2500-5000
16M	150-480	31M	1125-2250	42M	3000-6000
18M	330-1200	32M	1250-2500	44M	3500-7000

SPIN TOP is a Registered Trademark of Square D Company.
MAG-GARD is a Registered Trademark of Square D Company.

CURRENT LIMITING MODULE

Classes 8539 and 8739 combination starters NEMA Sizes 0-3, NEMA Types 1, 4 and 12 with a factory added Current Limiting Module (CLM) are UL listed for use on systems having an available fault current of 100,000 amperes RMS symmetrical.

A combination starter with the CLM is obtained by:

1. Selecting a NEMA Size 0-3, NEMA Type 1, 4, or 12 Mag-Gard® combination starter based on voltage and motor horsepower from the 8539 or 8739 tables.
2. Requesting Form Y126-1. Adder is **$120.** D1A.

◆UL LISTED SHORT CIRCUIT WITHSTAND RATINGS‡

NEMA Size	Voltage	Available Amperes RMS Symmetrical
0 & 1	0-480	22,000
0 & 1	481-600	10,000
2-6	600	22,000
0-3 With CLM	600	100,000
0-3 NEMA 7 & 9	600	5,000
4-5 NEMA 7 & 9	600	10,000

‡NEMA Type 4X is not UL Listed.

SQD SLV_001026

APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS

NEMA 1 ENCLOSURE — FIGURE 1

NEMA Size	Class	Type	DIMENSIONS IN INCHES* A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Top & Bottom W	X	Sides Y	Wt. (Lbs.)
0-1	8538 & 8539	SBG SCG	9⅝	21⅜	8 11/32	6⅜	19½	14 21/32	1 13/16	1 11/16	3⅜	2 5/16	1 1/16	3⅜	2 1/16	1¼	⅞	½-¾	½-¾	½	38
2	8538 & 8539	SDG	10⅝	25⅛ ◆	9 19/32	7⅜	23 ◆	16 29/32	2⅛	2	4	2 5/16	1 1/16	3⅜	2 1/16	1¼	⅞	1-1¼	½-¾	½	54
3	8538 & 8539	SEG●	15 13/32	33 21/32	10 21/32	11⅞	31	22 23/32	2 29/32	2 11/16	5⅜	3¼	1 11/32	4 29/32	2 1/32	1 9/32	29/32	1-1¼ 2-2½	½-¾	½	102
4	8538	SFG	16 5/32	43 3/32	10 19/32	12⅝	40½	23 21/32	2 29/32	2 11/16	5⅜	2⅝	1 11/32	4⅞	2 1/32	1 9/32	29/32	2½	½-¾	½	158
	8539	SFG	15 13/32	33 21/32	10 21/32	11⅞	31	22 23/32	2 29/32	2 11/16	5⅜	3¼	1 11/32	3 5/16	2 1/32	1 9/32	29/32	1-1¼ 2-2½	½-¾	½	120
5	8538	SGG	20¼	67	15½	15	66	29 13/32	3 9/16	3 3/16	....	6 9/32	½	9 7/32	2⅝	....	....	¾ †	3	....	....
	8539	SGG	20¼	55	11 29/32	15	54	27 13/32	3 9/16	3 3/16	....	6 9/32	½	9 7/32	2⅝	....	....	¾ †	3	....	420
6▲	8538 & 8539	SHG	36	80	21 1/32	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

† Left side only.
● 8538 SEG-12, 32 use SFG enclosure.

NEMA 4 ENCLOSURE — FIGURE 2

NEMA Size	Class	Type	DIMENSIONS IN INCHES* A	B	C	D	E	F	G	H	I	J	K	L	Bottom W	Top & Bot X	Wt. (Lbs.)
0-1	8538 & 8539	SBW SCW	9⅛	8 11/32	23 11/16	3⅞	2 11/16	4¼	22½	19/32	4	1⅜	2 5/16	14 9/32	¾ Hub	1 Hub	40
2	8538 & 8539	SDW	10⅝	9 19/32	27 3/16 ◆	3⅞	3 3/16	4¼	26 ◆	19/32	4½	2	2⅝	16 17/32	¾ Hub	1½ Hub	55
3	8538 & 8539	SEW■	15⅜	10 9/16	36 3/16	4 29/32	3 3/16	9	35	19/32	5 3/16	2 9/16	3 3/16	22 3/16	¾ Hub	2½ Hub	111
4	8538	SFW	16⅛	10 17/32	45 11/16	4⅞	3 9/16	9	44½	19/32	4 27/32	2 9/16	3 3/16	22 31/32	¾ Hub	2½ Hub	158
	8539	SFW	15⅜	10 9/16	36 3/16	3 5/16	3 3/16	9	35	19/32	5 3/16	2 9/16	3 3/16	22 3/16	¾ Hub	2½ Hub	120
5	8538	SGW	20¼	15½	67 3/32	9 7/32	2⅝	15	66	9/16	6 9/32	3	3½	29 13/32	¾ Hub	3½ Hub	....
	8539	SGW	20¼	11 29/32	55 3/32	4 29/32	2⅝	15	54	9/16	6 9/32	3	3½	27 13/32	¾ Hub	3½ Hub	440
6▲	8538 & 8539	SHW	36	21 1/32	88	....	....	....	....	....	....	....	....	....	....	....	....

■ 8538 SEW-12, 32 use SFW enclosure.

NEMA 12 ENCLOSURE — FIGURE 3

NEMA Size	Class	Type	DIMENSIONS IN INCHES* A	B	C	D	E	F	G	H	I	J	Wt. (Lbs.)
0-1	8538 & 8539	SBA SCA	9⅝	8 1/32	23¼	3⅞	2 11/16	4¼	22½	⅜	4 7/16	14 5/16	40
2	8538 & 8539	SDA	10⅝	9 1/16	26 3/4 ◆	3⅞	3 1/16	4¼	26 ◆	⅜	4 15/16	16 9/16	55
3	8538 & 8539	SEA◐	15 1/32	10 1/32	36	4 29/32	3 7/32	9	35	½	5 3/16	22 5/16	111
4	8538	SFA	16 5/32	10 17/32	45½	4⅞	3 19/32	9	44½	½	5 5/16	22 31/32	158
	8539	SFA	15 1/32	10 1/32	36	4 29/32	3 7/32	9	35	½	5 3/16	22 5/16	120
5	8538	SGA	20¼	15½	67	9 7/32	2⅝	15	66	½	6 9/32	29 13/32	....
	8539	SGA	20¼	11 29/32	55	4 29/32	2⅝	15	54	½	6 9/32	27 13/32	440
6▲	8538 & 8539	SHA	36	21 1/32	80	....	....	....	....	....	....	....	....

◐8538 SEA-12, 22, 32, 42 use SFA enclosure.
▲Size 6 enclosures are floor mounting.
✱Above dimensions include space for control circuit transformers.
◆Dimension in table for 8538 Series A and 8539 Series A thru C only. For 8538 Series B & C and 8539 Series D devices (manufactured only after Jan. 1, 1981) add 1" to NEMA 1 B and E dimensions and NEMA 4 and 12 C and G dimensions.

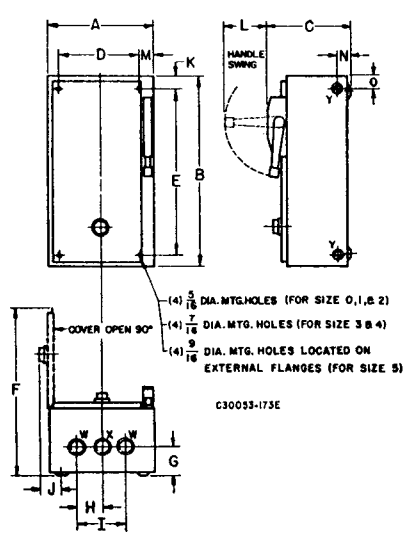


Figure 1
NEMA 1 Enclosure

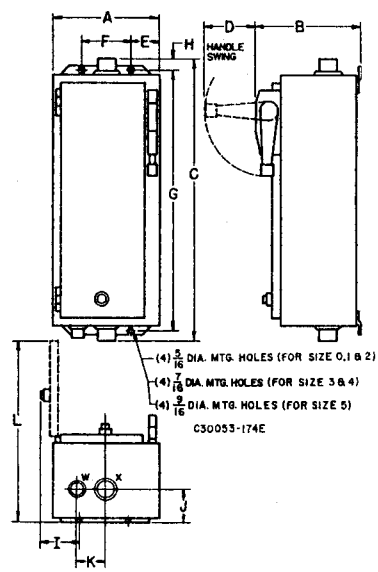


Figure 2
NEMA 4 Enclosure

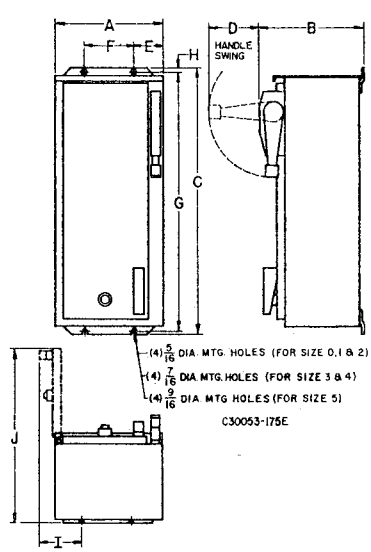


Figure 3
NEMA 12 Enclosure

SQD SLV_001027

AC COMBINATION STARTERS
DISCONNECT SWITCH & CIRCUIT BREAKER TYPES

CLASS
8538
8539

APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS

NEMA 4X ENCLOSURE — FIGURE 1

NEMA Size	Class	Type	Dimensions In Inches*										Wt. (lbs)
			A	B	C	D	E	F	G	H	I	J	
0-1	8538 & 8539	SBW SCW	11.41	10.60	26.13	4.75	1.77	7.88	25.38	.38	2.33	15.62	45
2	8538	SDW	15.41	11.60	28.00	4.75	1.77	11.88	27.25	.38	2.33	20.62	60
	8539	SDW	11.41	10.60	26.13	4.75	1.77	7.88	25.38	.38	2.33	15.62	50
3	8538 & 8539	SEW	25.41	11.60	28.00	4.75	1.83	21.75	27.25	.38	2.39	30.62	90
4	8539	SFW	25.41	11.60	28.00	4.75	1.83	21.75	27.25	.38	2.39	30.62	95

*Dimensions also for Form FT (standard control transformer), Form FT11 (100 VA extra capacity) and Form FT12 (200 VA extra capacity).

Hubs are supplied with each NEMA 4X combination starter as follows: (Not installed)

NEMA Size	Quantity	Hub Size
0 & 1	1 2	¾" 1"
2	1 2	¾" 1½"
3 & 4	1 2	¾" 2½"

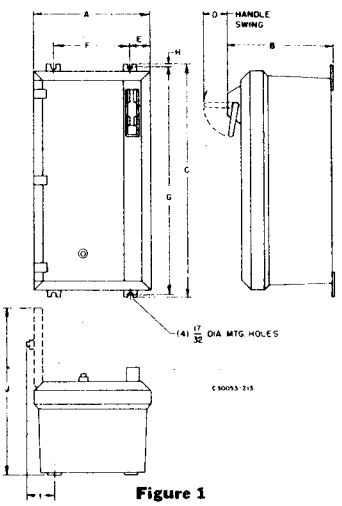


Figure 1

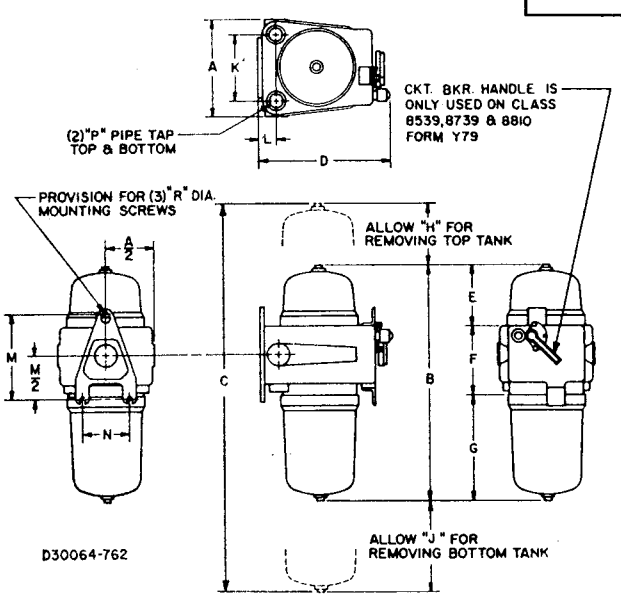
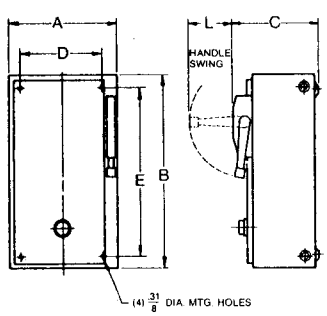


Figure 2

COMBINATION STARTERS IN OVERSIZED ENCLOSURES



NEMA Size	NEMA Type Encl.	Dimensions In Inches					
		Wide A	High B	Deep C	Handle L	Mounting D	Mounting E
0-2	1	15⅛	27⅞ ■	9⅝	3⅞	11⅜	25¼ ■
	4	15⅛	30 ■	9⅝	3⅞	4¼	28¾ ■
	12	15⅛	29½ ■	11	3⅞	4¼	28¾ ■

■ For 8538 Series A, 8539 Series A thru C only. For 8538 Series B & C and 8539 Series D devices (manufactured only after Jan. 1, 1981) add 1" to B and E dimensions.

CLASS 8539 — NEMA 7 & 9 ENCLOSURE — FIGURE 2

NEMA Size	Type	Dimensions in Inches																		Wt. (Lbs.)
		A	B*	B†	C*	C†	D	E*	E†	F	G	H*	H†	J	K	L	M	N	P	R	
0-1	SBR SCR	10⅝	26 1/16	31 1/16	35 1/16	47 1/16	14 1/16	6¾	11¾	7 1/16	11⅝	2	9	7⅝	7⅜	2 1/16	9⅜	5¼	1¼	⅜	70
2	SDR	12	30 5/16	35 5/16	43 1/16	55 1/16	16¾	7¼	12¼	7 1/16	15⅜	3	9	11½	8½	2 1/16	9⅜	5¼	1½	⅜	100
3-4	SER SFR	16⅛	38½	41½	61	67½	20¼	9⅛	12⅛	8⅝	20¾	4½	8	18	12	2⅝	11	5½	2½	½	165 195
5	SGR	20¾	63⅛	63⅛	104⅝	104⅝	25¾	24⅝	24⅝	13⅞	24⅝	20	20	21½	14⅜	4¾	17	8	4	⅝	375

*Without control transformer.
†With control transformer (Form T).

SQD SLV_001028

REDUCED VOLTAGE STARTING OF SQUIRREL CAGE MOTORS

Squirrel cage motors draw high starting currents, and produce high starting torques, when started at full voltage. While these values will vary for motors of different design, for a typical NEMA design B motor, the starting current will be approximately 600% of full load, and the starting torque will be approximately 150% of full load values. This current, and torque, may cause problems in the electrical system, and in the driven machine — or in the material being processed.

When motors are started at reduced voltage, the current at the motor terminals is reduced in direct proportion to the voltage reduction, while the torque is reduced as the square of the voltage reduction. If the "typical" motor above were started at 70% of line voltage, the starting current would be 420% and the torque would be 74% of full load values. Thus, reduced voltage starting provides an effective means of reducing both current and torque.

PRIMARY RESISTOR STARTING

In primary resistor starting, a resistor is connected in each motor line (in one line only in single phase starters) to produce a voltage drop due to the motor starting current. A timing relay causes shorting out of the resistors after motor acceleration. Thus the motor is started at reduced voltage, but operates at line voltage.

Primary resistor starters provide extremely smooth starting due to the increasing voltage across the motor terminals, as the motor accelerates. Since motor current decreases with increasing speed, the voltage drop across the resistor decreases as the motor accelerates — and motor terminal voltage increases. Thus, if a resistor is shorted out as the motor reaches maximum speed, there is little increase in current or torque.

Standard primary resistor starters provide two point acceleration (one step of resistance) with approximately 70% of line voltage at motor terminals at instant of motor start. Other starting values are available on special order. In addition, additional accelerating points are available if required by power companies, or for other considerations.

AUTOTRANSFORMER STARTING

Autotransformer starters provide reduced voltage starting at the motor terminals through the use of a tapped, 3 phase, autotransformer. Upon initiation of the controller pilot device, a 2 pole and a 3 pole contactor close to connect the motor to the pre-selected autotransformer taps. A timing relay causes the transfer of the motor from the reduced voltage start to line voltage operation without disconnecting the motor from the power source. This is known as closed transition starting.

Taps on the autotransformer provide selection of 50%, 65% or 80% of line voltage as a starting voltage. Starting torque will be 25%, 42% or 64% respectively of line voltage values. However, because of transformer action, the controller line current will be less than motor current, being 25%, 42%, or 64% of full voltage values. Thus, autotransformer starting may be used to provide maximum torque available with minimum line current, together with taps to permit both of these factors to be varied.

WYE-DELTA STARTING

Wye-Delta motors have 6 leads to enable the windings to be connected either in Wye, or in Delta. When connected in Wye the motor has a voltage rating 173% of its voltage rating when connected in Delta. By connecting the windings in Wye, and by operating the motor from a supply which corresponds to the Delta connected voltage rating, reduced starting current and reduced starting torque is obtained. Thus, while Wye-Delta starting is not truly a reduced voltage means, it provides the effect of reduced voltage starting (reduced current and torque), and is classified as such.

Wye-Delta starters are inherently open transition type. When the pilot device closes, two contactors close, one of which connects the windings in Wye, and the other of which energizes those windings. After a time delay, the Wye contactor opens (momentarily de-energizing the motor) and an additional contactor closes to reconnect the motor to the lines with the windings connected in Delta. With the motor starting in Wye, both starting current and starting torque are 33⅓% of Delta starting values.

Closed transition versions are available which keep the motor windings energized for the few cycles required to transfer the motor windings from a Wye connection to a Delta connection. Such starters are provided with one additional contactor, plus a resistor bank.

Wye-Delta starters can be used only with a Wye-Delta motor; the conventional motor does not have windings to permit this starting method.

PART WINDING STARTING

Part winding motors have two sets of identical windings — intended to be operated in parallel — which can be energized in sequence to provide reduced starting current and reduced starting torque. Most (but not all) dual voltage 230/460 volt motors are suitable for part winding starting at 230 volts.

When one winding of a part winding motor is energized, the torque produced is about 50% of "both winding" torque, and line current is 60-70% (depending upon motor design) of comparable line voltage values. Thus, while part winding starting is not truly a reduced voltage means, it is usually so classified because of the reduced current and torque resulting.

When a dual voltage *Delta connected* motor is operated at 230 volts from a part winding starter having a 3 pole starting and a 3 pole running contactor, an unequal current division occurs during normal operation, resulting in overloading of the starting contactor. To overcome this defect, Class 8640 part winding starters in Sizes 1PW through 4PW are furnished with a 4 pole starting contactor and a 2 pole running contactor. Not only does such an arrangement eliminate the unequal current division obtained with a Delta wound motor, but it enables Wye connected part winding motors to be given either a ½ or a ⅔ part winding start.

Class 8640 part winding starters have a starting contactor, a timing relay, a running contactor and necessary overload relays. Closing of the pilot device contact causes the starting contactor to close to connect the start winding, and to initiate the time cycle. After expiration of the preset timing, the run contactor closes to connect the balance of the motor windings. A time setting of one second is recommended; most motor manufactures do not permit energization of the start winding alone for longer than 3 seconds. Part winding starters provide closed transition starting.

SQD SLV_001029

REDUCED VOLTAGE STARTERS

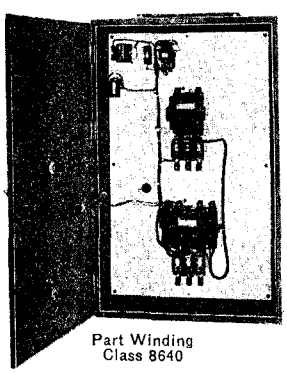
GENERAL APPLICATION DATA

REDUCED VOLTAGE STARTING OF SQUIRREL CAGE MOTORS

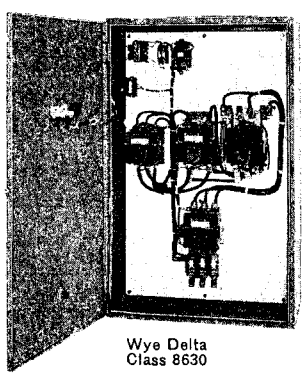
COMPARISON TABLE

TO AID IN THE SELECTION OF THE TYPE OF STARTING BEST SUITED FOR THE LIMITATION INVOLVED

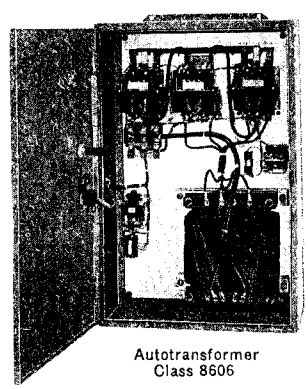
TYPE OF STARTER	STARTING CHARACTERISTICS IN PERCENT OF FULL VOLTAGE VALUES			ADVANTAGES	DISADVANTAGES
	Voltage at Motor	Line Current	Starting Torque		
Autotransformer (Class 8606)	Taps 80 65 50	 64 42 25	 64 42 25	1. Provides highest torque per ampere of line current. 2. Taps on autotransformer permit adjustment of starting voltage. 3. Suitable for long starting periods. 4. Closed transition starting. 5. While starting, motor current is greater than line current.	1. In lower HP ratings, is most expensive design. 2. Low power factor.
Primary Resistor (Class 8547 or 8549)	70	70	49	1. Smooth acceleration — motor voltage increases with speed. 2. High power factor during start. 3. Closed transition starting. 4. Less expensive than autotransformer starter in lower HP ratings. 5. Available with as many as 7 accelerating points.	1. Low torque efficiency. 2. Resistor gives off heat. 3. Starting time in excess of 5 seconds requires expensive resistor. 4. Starting voltage difficult to adjust to meet varying conditions.
Part Winding (Class 8640)	100	65	48	1. Least expensive reduced voltage starter. 2. Closed transition starting. 3. Most dual voltage motors can be started part winding on lower of two voltages. 4. Small size.	1. Unsuited for high inertia, long starting loads. 2. Requires special motor design for voltages higher than 230 V.
Wye-Delta (Class 8630)	100	33⅓	33⅓	1. Moderate cost — less than primary resistor or autotransformer. 2. Suitable for high inertia, long acceleration, loads. 3. High torque efficiency.	1. Requires special motor design. 2. Starting torque is low. 3. Inherently open transition — closed transition available at added cost.



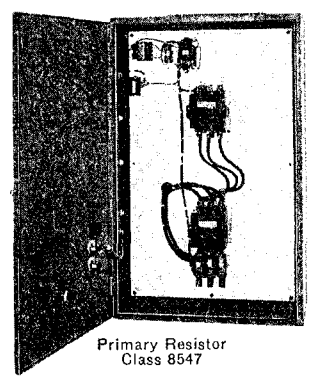
Part Winding
Class 8640



Wye Delta
Class 8630



Autotransformer
Class 8606



Primary Resistor
Class 8547

SELECTION TABLE

TO AID IN THE SELECTION OF A STARTER BEST SUITED FOR A PARTICULAR CHARACTERISTIC

CHARACTERISTIC WANTED	TYPE OF STARTER TO USE (Listed in order of desirability)		COMMENTS
Minimum Line Current	1. Autotransformer 2. Wye-Delta 3. Part Winding 4. Primary Resistor	(Class 8606) (Class 8630) (Class 8640) (Class 8547)	Little choice between 1 and 2 or between 3 and 4.
Smooth Acceleration	1. Primary Resistor 2. Wye-Delta 3. Autotransformer 4. Part Winding	(Class 8547) (Class 8630) (Class 8606) (Class 8640)	.....
High Starting Torque	1. Autotransformer 2. Primary Resistor 3. Part Winding	(Class 8606) (Class 8547) (Class 8640)	The part winding motor may not be able to fully accelerate the load until the second winding is connected.
Suitability for Long Acceleration	1. Autotransformer 2. Wye-Delta 3. Primary Resistor	(Class 8606) (Class 8630) (Class 8547)	For this classification the primary resistor starter must be provided with a resistor suitable for long accelerating duty.
Suitability for Frequent Starting	1. Primary Resistor 2. Autotransformer 3. Wye-Delta	(Class 8547) (Class 8606) (Class 8630)	In general, the part winding motor is unsuited for frequent starting.

SQD SLV_001030

REDUCED VOLTAGE STARTERS

PRIMARY RESISTOR TYPE

Class 8547 (non-reversing) or Class 8549 (reversing) primary resistor starters should be used when squirrel cage motors must be started with limited current inrush to avoid power line disturbances, or with limited torque to prevent damage to driven machinery. Standard starters are furnished with NEMA Class 116 resistors (one 5 second start each 80 seconds) and melting alloy type overload relays.

CLASS 8547 8549

50-60 HERTZ — **MELTING ALLOY THERMAL UNITS** — **600 VOLTS MAX.**

No. of Poles	Maximum Horse-power	Volts	NEMA Size	Number of Thermal Units Required *	Class 8547, Non-Reversing: General Purpose Enclosure NEMA Type 1 Type	Price*	Class 8547, Non-Reversing: Dusttight and Driptight Industrial Use Enclosure NEMA Type 12 Type	Price*	Class 8549, Reversing: General Purpose Enclosure NEMA Type 1 Type	Price*	Class 8549, Reversing: Dusttight and Driptight Industrial Use Enclosure NEMA Type 12 Type	Price*
2 Pole Single Phase	2	115-230	1	1	SCG-1	$ 802.	SCA-1	$ 1682.	....	....	....	....
	3	115 230	1P 1	1 1	SCG-2 SCG-1	954. 802.	SCA-2 SCA-1	1834. 1682.	....	....	....	....
	5	230	1P	1	SCG-2	954.	SCA-2	1834.	....	....	....	....
	7½	230	2	1	SDG-1	1710.	SDA-1	2950.	....	....	....	....
	10	230	3	1	SEG-1	1902.	SEA-1	3142.	....	....	....	....
	15	230	3	1	SEG-1	1962.	SEA-1	3202.	....	....	....	....
3 Pole Three Phase	5	200-230 380-575	1	3	SCG-3	1132.	SCA-3	1732.	SCG-1	$ 1708.	SCA-1	$ 2308.
	7½	200-230 380-575	1	3	SCG-3	1172.	SCA-3	1772.	SCG-1	1748.	SCA-1	2348.
	10	200-230 380-575	2 1	3	SDG-2 SCG-3	1668. 1252.	SDA-2 SCA-3	2388. 1852.	SDG-1 SCG-1	3244. 1828.	SDA-1 SCA-1	3964. 2428.
	15	200 230 380-575	3 2 2	3	SEG-2 SDG-2 SDG-2	2388. 1788. 1788.	SEA-2 SDA-2 SDA-2	3148. 2508. 2508.	SEG-1 SDG-1 SDG-1	4052. 3364. 3364.	SEA-1 SDA-1 SDA-1	4812. 4084. 4084.
	20	200-230 380-575	3 2	3	SEG-2 SDG-2	2388. 1924.	SEA-2 SDA-2	3148. 2644.	SEG-1 SDG-1	4052. 3500.	SEA-1 SDA-1	4812. 4220.
	25	200-230 380-575	3 2	3	SEG-2 SDG-2	2428. 2004.	SEA-2 SDA-2	3188. 2724.	SEG-1 SDG-1	4092. 3580.	SEA-1 SDA-1	4852. 4300.
	30	200 230 380-575	4 3 3	3	SFG-1 SEG-2 SEG-2	5172. 2540. 2540.	SFA-1 SEA-2 SEA-2	6132. 3300. 3300.	SFG-1 SEG-1 SEG-1	8780. 4204. 4204.	SFA-1 SEA-1 SEA-1	9740. 4964. 4964.
	40	200-230 380-575	4 3	3	SFG-1 SEG-2	5172. 2636.	SFA-1 SEA-2	6132. 3396.	SFG-1 SEG-1	8780. 4300.	SFA-1 SEA-1	9740. 5060.
	50	200 230 380-575	5 4 3	3 3 3	SGG-1 SFG-1 SEG-2	8230. 5172. 2724.	SGA-1 SFA-1 SEA-2	9310. 6132. 3484.	SGG-1 SFG-1 SEG-1	12542. 8780. 4300.	SGA-1 SFA-1 SEA-1	13622. 9740. 5148.
	75	200-230 380-575	5 4	3 3	SGG-1 SFG-1	8230. 5268.	SGA-1 SFA-1	9310. 6228.	SGG-1 SFG-1	12542. 8876.	SGA-1 SFA-1	13622. 9836.
	100	200 230 380 460-575	6 5 5 4	3 3 3 3	SHG-1 SGG-1 SGG-1 SFG-1	15222. 8854. 8518. 5268.	SHA-1 SGA-1 SGA-1 SFA-1	16722. 9934. 9598. 6228.	.... SGG-1 SGG-1 SFG-1	.... 13166. 12830. 8876.	.... SGA-1 SGA-1 SFA-1	.... 14246. 13910. 9836.
	125	200-230 380-575	6 5	3 3	SHG-1 SGG-1	15222. 8518.	SHA-1 SGA-1	16722. 9598.	SGG-1	12830.	SGA-1	13910.
	150	200-230 380-575	6 5	3 3	SHG-1 SGG-1	15870. 8518.	SHA-1 SGA-1	17370. 9598.	SGG-1	12830.	SGA-1	13910.
	200	230 380 460-575	6 6 5	3 3 3	SHG-1 SHG-1 SGG-1	16438. 15998. 9630.	SHA-1 SHA-1 SGA-1	17938. 17498. 10710.	.... SGG-1	.... 13942.	.... SGA-1	.... 15022.
	250	230 380-575	7 6	3	SJG-1 SHG-1	25110. 15998.	SJA-1 SHA-1	27110. 17498.	....	....	....	....
	300	230 380-575	7 6	3	SJG-1 SHG-1	25962. 16926.	SJA-1 SHA-1	27962. 18426.	....	....	....	....
	400	230 460-575	8 6	3	KG-1 SHG-1	34346. 17414.	KA-1 SHA-1	36586. 18914.	....	....	....	....
	450	230 460-575	8 7	3	KG-1 SJG-1	36586. 27182.	KA-1 SJA-1	38086. 28682.	....	....	....	....
	500	460-575	7	3	SJG-1	27182.	SJA-1	28682.	....	....	....	....
	600	460-575	7	3	SJG-1	27830.	SJA-1	29330.	....	....	....	....
	700	460-575	8	3	KG-1	37690.	KA-1	39190.	....	....	....	....
	800	460-575	8	3	KG-1	39026.	KA-1	40526.	....	....	....	....
	900	460-575	8	3	KG-1	40430.	KA-1	41930.	....	....	....	....

***Prices do not include thermal units. See note below for selection.**

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Horsepower, voltage, phase and hertz.
3. Control voltage and hertz — if different than line supply.
4. Special features or modifications.

FACTORY MODIFICATIONS AND FORMS — See Pages 462-464.

APPLICATION DATA — See Pages 251-252.

OUTLINE DIMENSIONS — See Pages 257-258.

COMBINATION STARTERS

These starters are available with circuit breaker or main disconnect. See Page 464 for form letter and price adder.

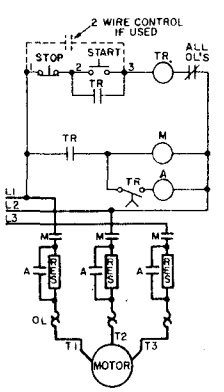
THERMAL UNITS

Thermal units should be ordered separately. See Selection Procedure on Page 466. Standard trip thermal units are priced at **$6.00** each.

MULTI-POINT VERSIONS

Multi-Point Primary Resistor Starters and Primary Resistor Starters with NEMA 156 Resistors for high inertia loads are available — consult local Square D Field Office.

Typical Non-Reversing Primary Resistor Starter



SQD SLV_001031

REDUCED VOLTAGE STARTERS — AUTOTRANSFORMER TYPE

CLASS 8606

Class 8606 Autotransformer type starters apply a reduced voltage to the motor through the use of an autotransformer with taps to permit starting at 50, 65 or 80% of line voltage. Closed transition starting is provided. Autotransformer starters provide a maximum torque with a minimum of line current. Starters are furnished with three hand reset melting alloy overload relays.

50-60 HERTZ — **THREE MELTING ALLOY THERMAL RELAYS** — **600 VOLTS MAX.**

Max. HP Ratings	Volts	NEMA Size	General Purpose Enclosure NEMA Type 1		Watertight and Dusttight Enclosure NEMA Type 4▲		For Hazardous Locations Class II Group E, F & G NEMA Type 9		Dusttight and Driptight Industrial Use Enclosure NEMA Type 12‡		Open Type	
			Type	Price*	Type	Price*	Type	Price*	Type	Price*	Type	Price*
10	200-230 380-575	2	SDG-1	**$ 2268.**	SDW-1	**$ 3508.**	SDE-1	**$ 3858.**	SDA-1	**$ 2988.**	SDO-1	**$ 2172.**
15	200 230 380-575	3 2 2	SEG-1 SDG-1 SDG-1	**2668.** **2268.** **2268.**	SEW-1 SDW-1 SDW-1	**3908.** **3508.** **3508.**	SEE-1 SDE-1 SDE-1	**4298.** **3858.** **3858.**	SEA-1 SDA-1 SDA-1	**3428.** **2988.** **2988.**	SEO-1 SDO-1 SDO-1	**2364.** **2172.** **2172.**
25	200-230 380-575	3 2	SEG-1 SDG-1	**2668.** **2268.**	SEW-1 SDW-1	**3908.** **3508.**	SEE-1 SDE-1	**4298.** **3858.**	SEA-1 SDA-1	**3428.** **2988.**	SEO-1 SDO-1	**2364.** **2172.**
30	200 230 380-575	4 3 3	SFG-1 SEG-1 SEG-1	**5172.** **2780.** **2780.**	SFW-1 SEW-1 SEW-1	**7452.** **4020.** **4020.**	SFE-1 SEE-1 SEE-1	**8196.** **4422.** **4422.**	SFA-1 SEA-1 SEA-1	**6132.** **3540.** **3540.**	SFO-1 SEO-1 SEO-1	**4732.** **2476.** **2476.**
40	200-230 380-575	4 3	SFG-1 SEG-1	**5172.** **2876.**	SFW-1 SEW-1	**7452** **4116.**	SFE-1 SEE-1	**8196.** **4526.**	SFA-1 SEA-1	**6132.** **3636.**	SFO-1 SEO-1	**4732.** **2572.**
50	200 230 380-575	5 4 3	SGG-1 SFG-1 SEG-1	**8230.** **5172.** **2876.**	SGW-1 SFW-1 SEW-1	**10510.** **7452.** **4116.**	.... SFE-1 SEE-1	.... **8196.** **4526.**	SGA-1 SFA-1 SEA-1	**9310.** **6132.** **3636.**	SGO-1 SFO-1 SEO-1	**7342.** **4732.** **2572.**
75	200-230 380-575	5 4	SGG-1 SFG-1	**8230.** **5268.**	SGW-1 SFW-1	**10510.** **7548.**	.... SFE-1	.... **8302.**	SGA-1 SFA-1	**9310.** **6228.**	SGO-1 SFO-1	**7342.** **4828.**
100	200 230 380 460-575	6 5 5 4	SHG-1 SGG-1 SGG-1 SFG-1	**15222.** **8854.** **8518.** **5268.**	SHW-1 SGW-1 SGW-1 SFW-1	**18222.** **11134.** **10798.** **7548.**	.... SFE-1	.... **8302.**	SHA-1 SGA-1 SGA-1 SFA-1	**16722.** **9934.** **9598.** **6228.**	SHO-1 SGO-1 SGO-1 SFO-1	**13798.** **7966.** **7630.** **4828.**
125	200 230 380-575	6 6 5	SHG-1 SHG-1 SGG-1	**15222.** **15222.** **8518.**	SHW-1 SHW-1 SGW-1	**18222.** **18222.** **10798.**	....	....	SHA-1 SHA-1 SGA-1	**16722.** **16722.** **9598.**	SHO-1 SHO-1 SGO-1	**13798.** **13798.** **7630.**
150	200 230 380-575	6 6 5	SHG-1 SHG-1 SGG-1	**15870.** **15870.** **8518.**	SHW-1 SHW-1 SGW-1	**18870.** **18870.** **10798.**	....	....	SHA-1 SHA-1 SGA-1	**17370.** **17370.** **9598.**	SHO-1 SHO-1 SGO-1	**14446.** **14446.** **7630.**
200	230 380 460-575	6 6 5	SHG-1 SHG-1 SGG-1	**16438.** **15870.** **9630.**	SHW-1 SHW-1 SGW-1	**19438.** **18870.** **11910.**	....	....	SHA-1 SHA-1 SGA-1	**17938.** **17370.** **10710.**	SHO-1 SHO-1 SGO-1	**15014.** **14446.** **8742.**
250	230 380-575	7 6	SJG-1 SHG-1	**25110.** **15998.**	SJW-1 SHW-1	**28110.** **18998.**	....	....	SJA-1 SHA-1	**26610.** **17490.**	.... SHO-1	.... **14574.**
300	230 380-575	7 6	SJG-1 SHG-1	**25962.** **16926.**	SJW-1 SHW-1	**28962.** **19926.**	....	....	SJA-1 SHA-1	**27462.** **18426.**	.... SHO-1	.... **15502.**
400	230 460-575	8 6	KG-1 SHG-1	**34346.** **17414.**	KW-1 SHW-1	**37346.** **20414.**	....	....	KA-1 SHA-1	**36586.** **18914.**	.... SHO-1	.... **15990.**
450	230 460-575	8 7	KG-1 SJG-1	**36586.** **27182.**	KW-1 SJW-1	**39586.** **30182.**	....	....	KA-1 SJA-1	**38086.** **28682.**	....	....
500	460-575	7	SJG-1	**27182.**	SJW-1	**30182.**	....	....	SJA-1	**28682.**	....	....
600	460-575	7	SJG-1	**27830.**	SJW-1	**30830.**	....	....	SJA-1	**29330.**	....	....
700	460-575	8	KG-1	**37690.**	KW-1	**40694.**	....	....	KA-1	**39190.**	....	....
800	460-575	8	KG-1	**39026.**	KW-1	**42026.**	....	....	KA-1	**40526.**	....	....
900	460-575	8	KG-1	**40430.**	KW-1	**43430.**	....	....	KA-1	**41930.**	....	....

*** Prices do not include thermal units. For selection, see below.**
‡ NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to Class 9991, page 448.
▲ NEMA Type 4 enclosures are painted sheet steel. Where required, stainless steel enclosures are available at extra cost. Specify as Form Y56.

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Horsepower, voltage, phase and hertz.
3. Control voltage and hertz — if different than line supply.
4. Special features or modifications.

FACTORY MODIFICATIONS AND FORMS — See Pages 462-464.

APPLICATION DATA — See Pages 251-252.

OUTLINE DIMENSIONS — See Pages 257-258.

COMBINATION STARTERS

These starters are available with circuit breaker or main disconnect. See Page 464 for form letter and price adder.

THERMAL UNITS

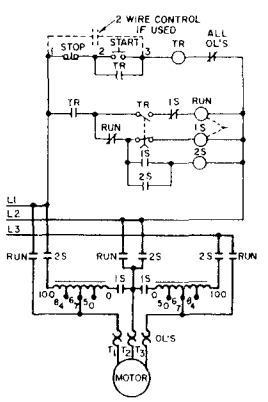
Thermal units should be ordered separately. See Selection Procedure on Page 466. Standard trip thermal units are priced at **$6.00** each.

REVERSING VERSIONS

Reversing versions are available at extra cost. Specify as Form Y64.

Controllers with special requirements needed for large, centrifugal, hermetic air conditioning compressors are available. Consult local Square D Field Office.

Typical Autotransformer Starter



SQD SLV_001032

REDUCED VOLTAGE STARTERS
WYE-DELTA TYPE

Class 8630 Wye-Delta starters may only be used with Wye-Delta (6 lead) motors. These starters connect the motor windings in wye (for starting) and then in delta (for running). Starting torque and inrush current in wye are ⅓ of their value for a line voltage, delta connected start. All sizes utilize three melting alloy overload relays.

CLASS 8630

600 VOLTS MAX. — **THREE MELTING ALLOY OVERLOAD RELAYS** — **50-60 HERTZ**

Max. HP	Voltage	NEMA Size	OPEN TRANSITION STARTING								CLOSED TRANSITION STARTING							
			General Purpose Enclosure NEMA Type 1		Watertight and Dusttight Enclosure (Stainless Steel, Sizes 1YD-4YD) NEMA Type 4		Dusttight and Driptight Industrial Use Enclosure NEMA Type 12‡		Open Type		General Purpose Enclosure NEMA Type 1		Watertight and Dusttight Enclosure (Stainless Steel, Sizes 1YD-4YD) NEMA Type 4		Dusttight and Driptight Industrial Use Enclosure NEMA Type 12		Open Type	
			Type	Price*	Type	Price*	Type	Price*	Type	Price*	Type	Price*	Type	Price*	Type	Price*	Type	Price*
10	200–230	1YD	SCG-1	$ 1374.	SCW-11	$ 1854.	SCA-1	$ 1774.	SCO-1	$ 1350.	SCG-2	$ 2098.	SCW-12	$ 2578.	SCA-2	$ 2498.	SCO-2	$ 2074.
	380–575	1YD	SCG-1	1374.	SCW-11	1854.	SCA-1	1774.	SCO-1	1350.	SCG-2	2098.	SCW-12	2578.	SCA-2	2498.	SCO-2	2074.
15	200–230	2YD	SDG-1	1626.	SDW-11	2166.	SDA-1	2126.	SDO-1	1562.	SDG-2	2350.	SDW-12	2890.	SDA-2	2850.	SDO-2	2286.
	380–575	1YD	SCG-1	1374.	SCW-11	1854.	SCA-1	1774.	SCO-1	1350.	SCG-2	2098.	SCW-12	2578.	SCA-2	2498.	SCO-2	2074.
20	200–230	2YD	SDG-1	1626.	SDW-11	2166.	SDA-1	2126.	SDO-1	1562.	SDG-2	2374.	SDW-12	2914.	SDA-2	2874.	SDO-2	2310.
	380–575	2YD	SDG-1	1626.	SDW-11	2166.	SDA-1	2126.	SDO-1	1562.	SDG-2	2374.	SDW-12	2914.	SDA-2	2874.	SDO-2	2310.
25	200	3YD	SEG-1	2366.	SEW-11	3146.	SEA-1	2966.	SEO-1	2118.	SEG-2	3190.	SEW-12	3970.	SEA-2	3790.	SEO-2	2942.
	230	2YD	SDG-1	1626.	SDW-11	2166.	SDA-1	2126.	SDO-1	1562.	SDG-2	2374.	SDW-12	2914.	SDA-2	2874.	SDO-2	2310.
	380–575	2YD	SDG-1	1626.	SDW-11	2166.	SDA-1	2126.	SDO-1	1562.	SDG-2	2374.	SDW-12	2914.	SDA-2	2874.	SDO-2	2310.
30	200–230	3YD	SEG-1	2366.	SEW-11	3146.	SEA-1	2966.	SEO-1	2118.	SEG-2	3190.	SEW-12	3970.	SEA-2	3790.	SEO-2	2942.
	380–575	2YD	SDG-1	1626.	SDW-11	2166.	SDA-1	2126.	SDO-1	1562.	SDG-2	2374.	SDW-12	2914.	SDA-2	2874.	SDO-2	2310.
40	200–230	3YD	SEG-1	2366.	SEW-11	3146.	SEA-1	2966.	SEO-1	2118.	SEG-2	3278.	SEW-12	4058.	SEA-2	3878.	SEO-2	3030.
	380–575	2YD	SDG-1	1626.	SDW-11	2166.	SDA-1	2126.	SDO-1	1562.	SDG-2	2462.	SDW-12	3002.	SDA-2	2962.	SDO-2	2398.
50	200	4YD	SFG-1	4934.	SFW-11	6162.	SFA-1	5734.	SFO-1	4490.	SFG-2	6190.	SFW-12	7418.	SFA-2	6990.	SFO-2	5746.
	230	3YD	SEG-1	2366.	SEW-11	3146.	SEA-1	2966.	SEO-1	2118.	SEG-2	3278.	SEW-12	4058.	SEA-2	3878.	SEO-2	3030.
	380–575	3YD	SEG-1	2366.	SEW-11	3146.	SEA-1	2966.	SEO-1	2118.	SEG-2	3278.	SEW-12	4058.	SEA-2	3878.	SEO-2	3030.
60	200–230	4YD	SFG-1	4934.	SFW-11	6162.	SFA-1	5734.	SFO-1	4490.	SFG-2	6266.	SFW-12	7494.	SFA-2	7066.	SFO-2	5822.
	380–575	3YD	SEG-1	2366.	SEW-11	3146.	SEA-1	2966.	SEO-1	2118.	SEG-2	3374.	SEW-12	4154.	SEA-2	3974.	SEO-2	3126.
75	200	5YD	SGG-1	8870.	SGW-1	11150.	SGA-1	9950.	SGO-1	7982.	SGG-2	10774.	SGW-2	13054.	SGA-2	11854.	SGO-2	9886.
	230	4YD	SFG-1	4934.	SFW-11	6162.	SFA-1	5734.	SFO-1	4490.	SFG-2	6458.	SFW-12	7686.	SFA-2	7258.	SFO-2	6014.
	380–575	3YD	SEG-1	2366.	SEW-11	3146.	SEA-1	2966.	SEO-1	2118.	SEG-2	3706.	SEW-12	4486.	SEA-2	4306.	SEO-2	3458.
100	200–230	5YD	SGG-1	8870.	SGW-1	11150.	SGA-1	9950.	SGO-1	7982.	SGG-2	10774.	SGW-2	13054.	SGA-2	11854.	SGO-2	9886.
	380–575	4YD	SFG-1	4934.	SFW-11	6162.	SFA-1	5734.	SFO-1	4490.	SFG-2	6714.	SFW-12	7942.	SFA-2	7514.	SFO-2	6270.
150	200–230	5YD	SGG-1	8870.	SGW-1	11150.	SGA-1	9950.	SGO-1	7982.	SGG-2	10870.	SGW-2	13150.	SGA-2	11950.	SGO-2	9982.
	380–575	4YD	SFG-1	4934.	SFW-11	6162.	SFA-1	5734.	SFO-1	4490.	SFG-2	6810.	SFW-12	8038.	SFA-2	7610.	SFO-2	6366.
250	200–230	6YD	SHG-1	18982.	SHW-1	21982.	SHA-1	20482.	SHO-1	17558.	SHG-2	23878.	SHW-2	26878.	SHA-2	25378.	SHO-2	22454.
	380–575	5YD	SGG-1	8870.	SGW-1	11150.	SGA-1	9950.	SGO-1	7982.	SGG-2	11134.	SGW-2	13414.	SGA-2	12214.	SGO-2	10246.
300	200–230	6YD	SHG-1	18982.	SHW-1	21982.	SHA-1	20482.	SHO-1	17558.	SHG-2	23878.	SHW-2	26878.	SHA-2	25378.	SHO-2	22454.
	380	6YD	SHG-1	18982.	SHW-1	21982.	SHA-1	20482.	SHO-1	17558.	SHG-2	23878.	SHW-2	26878.	SHA-2	25378.	SHO-2	22454.
	460–575	5YD	SGG-1	8870.	SGW-1	11150.	SGA-1	9950.	SGO-1	7982.	SGG-2	11738.	SGW-2	14018.	SGA-2	12818.	SGO-2	10850.
350	200	7YD	SJG-1	25602.	SJW-1	28602.	SJA-1	27102.	SJO-1	24178.	SJG-2	33198.	SJW-2	36198.	SJA-2	34698.	SJO-2	31774.
	230	6YD	SHG-1	18982.	SHW-1	21982.	SHA-1	20482.	SHO-1	17558.	SHG-2	23878.	SHW-2	26878.	SHA-2	25378.	SHO-2	22454.
	380–575	6YD	SHG-1	18982.	SHW-1	21982.	SHA-1	20482.	SHO-1	17558.	SHG-2	23878.	SHW-2	26878.	SHA-2	25378.	SHO-2	22454.
500	200–230	7YD	SJG-1	25602.	SJW-1	28602.	SJA-1	27102.	SJO-1	24178.	SJG-2	33198.	SJW-2	36198.	SJA-2	34698.	SJO-2	31774.
	380–575	6YD	SHG-1	18982.	SHW-1	21982.	SHA-1	20482.	SHO-1	17558.	SHG-2	23878.	SHW-2	26878.	SHA-2	25378.	SHO-2	22454.
600	200–230	8YD	KG-1	35430.	KW-1	38430.	KA-1	36930.	KO-1	34006.	KG-2	43702.	KW-2	46702.	KA-2	45202.	KO-2	42278.
	380	7YD	SJG-1	25602.	SJW-1	28602.	SJA-1	27102.	SJO-1	24178.	SJG-2	33198.	SJW-2	36198.	SJA-2	34698.	SJO-2	31774.
	460–575	6YD	SHG-1	18982.	SHW-1	21982.	SHA-1	20482.	SHO-1	17558.	SHG-2	23878.	SHW-2	26878.	SHA-2	25378.	SHO-2	22454.
700	200–230	8YD	KG-1	35430.	KW-1	38430.	KA-1	36930.	KO-1	34006.	KG-2	44854.	KW-2	47854.	KA-2	46354.	KO-2	43430.
	380	7YD	SJG-1	25602.	SJW-1	28602.	SJA-1	27102.	SJO-1	24178.	SJG-2	33198.	SJW-2	36198.	SJA-2	34698.	SJO-2	31774.
	460–575	6YD	SHG-1	18982.	SHW-1	21982.	SHA-1	20482.	SHO-1	17558.	SHG-2	23878.	SHW-2	26878.	SHA-2	25378.	SHO-2	22454.
750	200–230	8YD	KG-1	35430.	KW-1	38430.	KA-1	36930.	KO-1	34006.	KG-2	44854.	KW-2	47854.	KA-2	46354.	KO-2	43430.
	380–575	7YD	SJG-1	25602.	SJW-1	28602.	SJA-1	27102.	SJO-1	24178.	SJG-2	33198.	SJW-2	36198.	SJA-2	34698.	SJO-2	31774.
800	230	8YD	KG-1	35430.	KW-1	38430.	KA-1	36930.	KO-1	34006.	KG-2	44854.	KW-2	47854.	KA-2	46354.	KO-2	43430.
	380–575	7YD	SJG-1	25602.	SJW-1	28602.	SJA-1	27102.	SJO-1	24178.	SJG-2	33198.	SJW-2	36198.	SJA-2	34698.	SJO-2	31774.
1000	380	8YD	KG-1	35430.	KW-1	38430.	KA-1	36930.	KO-1	34006.	KG-2	45458.	KW-2	48458.	KA-2	46958.	KO-2	44034.
	460–575	7YD	SJG-1	25602.	SJW-1	28602.	SJA-1	27102.	SJO-1	24178.	SJG-2	33198.	SJW-2	36198.	SJA-2	34698.	SJO-2	31774.
1500	460–575	8YD	KG-1	35430.	KW-1	38430.	KA-1	36930.	KO-1	34006.	KG-2	45458.	KW-2	48458.	KA-2	46958.	KO-2	44034.

*** Prices do not include thermal units. For selection, see below.**
‡NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to Class 9991, page 448.

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Horsepower, voltage, phase and hertz.
3. Control voltage and hertz — if different than line supply.
4. Special features or modifications.

FACTORY MODIFICATIONS AND FORMS — See Pages 462-465.

APPLICATION DATA — See Pages 251-252.

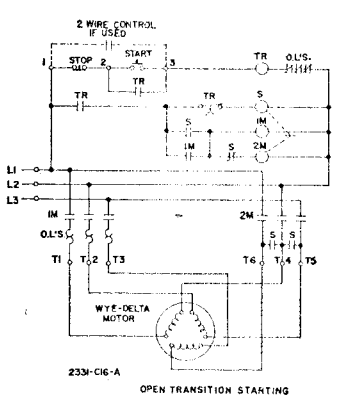
OUTLINE DIMENSIONS — See Page 257.

COMBINATION STARTERS

These starters are available with circuit breaker or main disconnect. See Page 464 for form letter and price adder.

THERMAL UNITS

Thermal units should be ordered separately. See Selection Procedure on Page 466. Standard trip thermal units are priced at $6.00 each.



Typical Open Transition Wye-Delta Starter

Controllers with special requirements needed for large, centrifugal, hermetic air conditioning compressors are available. Consult local Square D Office.

SQD SLV_001033

REDUCED VOLTAGE STARTERS—PART WINDING

CLASS 8640

Part winding starters are used with motors having two sets of windings, and which are suitable for starting with only one set of windings energized. After starting, the controller connects the second winding in parallel with the first winding. Two sets of hand reset melting alloy thermal units (one set for each winding) are used.

SIX MELTING ALLOY OVERLOAD RELAYS — **600 VOLTS MAX.**

Motor Voltage	Max. HP Poly-phase	NEMA Size	General Purpose Enclosure **NEMA Type 1** Type	Price*	Watertight and Dusttight Enclosure (Stainless steel, sizes 1PW-4PW) **NEMA Type 4** Type	Price*	Hazardous Locations Class II, Groups E, F & G Enclosure **NEMA Type 9** Type	Price*	Dusttight and Driptight Industrial Use Enclosure **NEMA Type 12‡** Type	Price*	**Open Type** Type	Price*
200	10	1PW	SCG-1	$ 876.	SCW-11	$ 1356.	SCE-1	$1544.	SCA-1	$ 1276.	SCO-1	$ 852.
	20	2PW	SDG-1	1248.	SDW-11	1788.	SDE-1	2244.	SDA-1	1748.	SDO-1	1184.
	40	3PW	SEG-1	1760.	SEW-11	2540.	SEE-1	3096.	SEA-1	2360.	SEO-1	1648.
	75	4PW	SFG-1	3764.	SFW-11	4992.	SFE-1	5856.	SFA-1	4564.	SFO-1	3556.
	150	5PW	SGG-1	7884.	SGW-1	10164.	....	....	SGA-1	8964.	SGO-1	7444.
230	10	1PW	SCG-1	876.	SCW-11	1356.	SCE-1	1544.	SCA-1	1276.	SCO-1	852.
	25	2PW	SDG-1	1248.	SDW-11	1788.	SDE-1	2244.	SDA-1	1748.	SDO-1	1184.
	50	3PW	SEG-1	1760.	SEW-11	2540.	SEE-1	3096.	SEA-1	2360.	SEO-1	1648.
	75	4PW	SFG-1	3764.	SFW-11	4992.	SFE-1	5856.	SFA-1	4564.	SFO-1	3556.
	150	5PW	SGG-1	7884.	SGW-1	10164.	....	....	SGA-1	8964.	SGO-1	7444.
	300	6PW	SHG-1	16484.	SHW-1	18912.	....	....	SHA-1	18484.	SHO-1	15060.
	450	7PW	SJG-1	25184.	SJW-1	27796.	....	....	SJA-1	27584.	SJO-1	22664.
460-575	15	1PW	SCG-1	876.	SCW-11	1356.	SCE-1	1544.	SCA-1	1276.	SCO-1	852.
	40	2PW	SDG-1	1248.	SDW-11	1788.	SDE-1	2244.	SDA-1	1748.	SDO-1	1184.
	75	3PW	SEG-1	1760.	SEW-11	2540.	SEE-1	3096.	SEA-1	2360.	SEO-1	1648.
	150	4PW	SFG-1	3764.	SFW-11	4992.	SFE-1	5856.	SFA-1	4564.	SFO-1	3556.
	350	5PW	SGG-1	7884.	SGW-1	10164.	....	....	SGA-1	8964.	SGO-1	7444.
	600	6PW	SHG-1	16484.	SHW-1	18912.	....	....	SHA-1	18484.	SHO-1	15060.
	900	7PW	SJG-1	25184.	SJW-1	27796.	....	....	SJA-1	27584.	SJO-1	22664.

***Prices do not include thermal units. For selection, see below.**

‡NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to Class 9991, page 448.

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Horsepower, voltage, phase and hertz.
3. Control voltage and hertz — if different than line voltage.
4. Special features or modifications.

FACTORY MODIFICATIONS AND FORMS — See Pages 462-465.

APPLICATION DATA — See Pages 251-252.

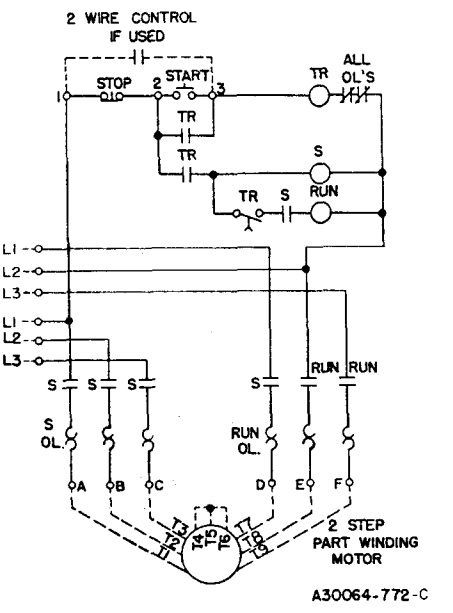
OUTLINE DIMENSIONS — See Pages 257-258.

COMBINATION STARTERS

These starters are available with circuit breaker or main disconnect. See page 465 for Form letter and price adder.

THERMAL UNITS

Thermal units should be ordered separately. To select such thermal units, first divide total motor full load current by 2, and then select as indicated by Selection Procedure on Page 466. Standard trip thermal units are priced at **$6.00** each.



Typical Part Winding Starter (Size 1PW-4PW)

REDUCED VOLTAGE STARTERS—SECONDARY RESISTOR

CLASS 8650 8651

Secondary resistor starters for wound rotor motors are available in non-reversing (Class 8650) and reversing (Class 8651) versions. Both types are equipped with resistors which are connected in the ring circuit to allow the motor to develop high starting torque with low starting current.

Starters are available in Size 1 through Size 8 for motors 1HP through 900HP, at 600 volts maximum. Two to eight accelerating points are provided, depending upon the horsepower rating.

Consult local Square D Field Office.

SQD SLV_001034

APPROXIMATE DIMENSIONS

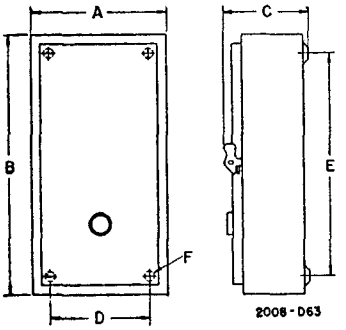


Figure 1

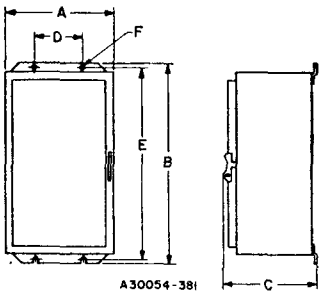


Figure 2

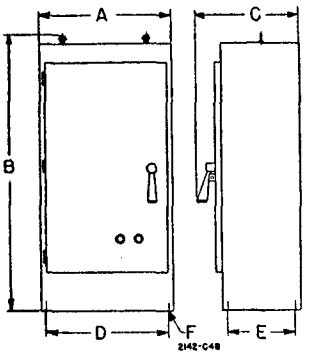


Figure 3

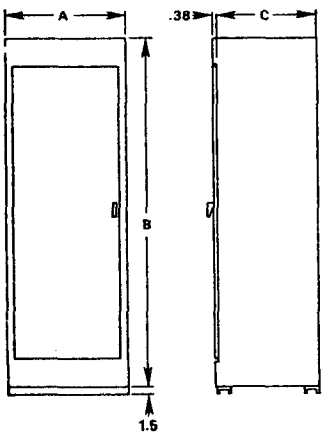


Figure 4

CLASS 8547 AND CLASS 8549 PRIMARY RESISTOR STARTERS

Dimension Symbol	Class 8547 Type								Class 8549 Type		
	SCG-1 SCG-2 SCG-3 SDG-1 SDG-2	SCA-1 SCA-2 SCA-3 SDA-1 SDA-2	SEG-1 SEG-2 SEA-1 SEA-2 SFG-1 SFA-1	SGG-1	SGA-1	SHG-1 SHA-1	SJG-1 SJA-1	KG-1 KA-1	SCG-1 SDG-1	SCA-1 SDA-1	SEG-1 SEA-1 SFG-1 SFA-1
	Fig. 1	Fig. 2	Fig. 2	Fig. 3		Fig. 3		Fig. 4	Fig. 1	Fig. 2	Fig. 2
A	23½	23½	28½	30½	Consult local Square D field office	69	Consult local Square D field office	56	23½	23½	28½
B	23½	25¾	48	58½		83		90	23½	25¾	48
C	17	17	16¼	30½		23		20	17	17	16¼
D	20¾	9	15	28		..		..	20¾	9	15
E	18¾	24¾	47	24½		..		..	18¾	24¾	47
F	7/16	7/16	9/16	11/16		..		..	7/16	7/16	9/16
Number of Doors	1	1	1	1		2		2	1	1	1

CLASS 8606 AUTOTRANSFORMER STARTERS

Dimension Symbol	Type								
	SDG-1	SDA-1	SEG-1 SEA-1	SFA-1 SFG-1	SGA-1 SGG-1	SGW-1	SHG-1 SHA-1	SJG-1 SJA-1	KG-1 KA-1 KW-1
	Fig. 1	Fig. 2	Fig. 2	Fig. 2	Fig. 3	Fig. 3	Fig. 3	Fig. 4	Fig. 4
A	20¼	18¼	26	26	28½	28½		64½	60
B	36¼	38¾	42	42	58½	63½	93	93	90
C	10¼	10¼	12½	12½	18½	18½	23½	27½	20
D	17½	15	15	15	25¾	26	..	61¾	..
E	33½	37¾	41	41	12⅞	9	..	17¼	..
F	7/16	9/16	9/16	9/16	11/16	11/16	..	13/16	..
Number of Doors	1	1	1	1	1	1	1	2	2

CLASS 8630 WYE-DELTA STARTERS

Dimension Symbol	Type										
	SCG-1 SDG-1	SCG-2 SDG-2	SCA-1 SDA-1	SCA-2 SDA-2	SEG-1 SEA-1 SFG-1 SFA-1	SEG-2 SEA-2 SFG-2 SFA-2	SGG-1 SGG-2	SGA-1 SGA-2	SHG-1 SHA-1 SHG-2 SHA-2	SJG-1 SJA-1 SJG-2 SJA-2 SJW-1 SJW-2	KG-1 KA-1 KG-2 KA-2 KW-1 KW-2
	Fig. 1	Fig. 1	Fig. 2	Fig. 2	Fig. 2	Fig. 2	Fig. 3		Fig. 3		Fig. 4
A	23¼	23½	23¼	23½	28½	28½	37½	Consult local Square D field office	38¼	Consult local Square D field office	60
B	24¾	23½	25½	25¾	48	48	92½		93		90
C	9¼	17	9¼	17	8½	16¼	26½		23½		20
D	20½	20¾	9	9	15	15	34¾		35¾		..
E	22	18¾	24½	24¾	47	47	20½		16½		..
F	7/16	7/16	7/16	7/16	9/16	9/16	11/16		7/8		..
Number of Doors	1	1	1	1	1	1	1		1		2

CLASS 8640 PART WINDING STARTERS

Dimension Symbol	Type						
	SCG-1 SDG-1	SCA-1 SDA-1	SEG-1 SEA-1 SFG-1 SFA-1	SGA-1	SGG-1	SHG-1 SHA-1	SJG-1 SJA-1 SJW-1
	Fig. 1	Fig. 2	Fig. 2	Fig. 2	Fig. 1	Fig. 3	
A	23¼	23¼	28½	26¼	24¼	28¼	Consult local Square D field office
B	24¾	25¼	48	42	42¼	59	
C	9¼	9¼	8½	16	13	19½	
D	20½	9	15	22	20	25¾	
E	22	24½	47	41	38	12⅞	
F	7/16	7/16	9/16	11/16	9/16	11/16	

All dimensions are in inches.

SQD SLV_001035

REDUCED VOLTAGE STARTERS
APPLICATION DATA

OPEN PANEL AND DISCONNECT TYPE — APPROXIMATE DIMENSIONS
Use Figures on Page 259

CLASS 8547 PRIMARY RESISTOR STARTERS

Dimension Symbol	Type: SCG-1 SDG-1 W/Form Y79-1,2,3,4,5	SEG-1 SFG-1 W/Form Y79-1,2,5,6	SGG-1 W/Form Y79-1,2,7	SHG-1 W/Form Y79-1,7,8,9,10
	Fig. 3	Fig. 4	Fig. 6	Fig. 7
A	**23.50** 597	**29.00** 737	**32.25** 819	**69.00** 1753
B	**23.50** 597	**45.75** 1162	**70.25** 1784	**80.25** 2038
C	**16.25** 413	**18.38** 467	**30.25** 768	**20.25** 514
D	**20.75** 527	**15.00** 381	**29.75** 756	**66.50** 1689
E	**18.75** 476	**47.00** 1194	**26.50** 673	**16.50** 419
F	**1.38** 35	**7.00** 178	**1.25** 32	**1.25** 32
G	**2.38** 60	**.50** 13	**1.25** 32	**1.25** 32
H	**.25** 6	**1.13** 29	**2.50** 64	**2.50** 64
I	**1.75** 44	**1.25** 32	**3.00** 76	**3.00** 76
J	**.25** 6	**.25** 6	**.69** 17	**.69** 17
K	**.44** 11	**.56** 14	**1.63** 41	....

CLASS 8606 AUTOTRANSFORMER STARTERS

Dimension Symbol	Type: SDO-1	SDG-1 W/Form Y79-1,2,3,4	SEO-1	SFO-1	SGO-1	SEG-1 SFG-1 SGG-1 W/Form Y79-1,2,3,4,5,6	SGG-1 W/Form Y79-7	SHG-1 W/Form Y79-1,10	SHG-1 W/Form Y79-7,8,9
	Fig. 1	Fig. 3	Fig. 1	Fig. 1	Fig. 1	Fig. 6	Fig. 6	Fig. 6	Fig. 7
A	**16.25** 413	**20.25** 514	**23.00** 584	**23.00** 584	**24.50** 622	**28.25** 718	**36.25** 921	**34.25** 870	**64.25** 1632
B	**34.00** 864	**36.25** 921	**36.50** 927	**36.50** 927	**49.00** 1245	**70.25** 1784	**70.25** 1784	**90.25** 2292	**90.25** 2292
C	**7.88** 200	**9.63** 244	**9.00** 229	**10.38** 264	**12.38** 314	**16.25** 413	**16.25** 413	**20.25** 514	**24.25** 616
D	**15.00** 381	**17.50** 445	**21.75** 552	**21.75** 552	**23.25** 591	**25.75** 654	**33.75** 857	**31.75** 806	**61.75** 1568
E	**33.00** 838	**33.50** 851	**35.50** 902	**35.50** 902	**48.00** 1219	**12.50** 318	**12.50** 318	**16.50** 419	**17.25** 438
F	**.63** 16	**1.38** 35	**.63** 16	**.63** 16	**.63** 16	**1.25** 32	**1.25** 32	**1.25** 32	**1.25** 32
G	**.50** 13	**1.38** 35	**.50** 13	**.50** 13	**.50** 13	**1.25** 32	**1.25** 32	**1.25** 32	**4.50** 114
H	**1.00** 25	**.25** 6	**1.00** 25	**1.00** 25	**2.13** 54	**2.50** 64	**2.50** 64	**3.00** 76	**3.00** 76
I	**.63** 16	**1.75** 44	**.56** 14	**.56** 14	**.56** 14	**3.00** 76	**3.00** 76	**3.00** 76	**3.00** 76
J	....	**.25** 6	....	....	....	**.69** 17	**.69** 17	**.69** 17	**.81** 21
K	....	**.44** 11	....	....	....	....	....	....	....

CLASS 8630 WYE-DELTA STARTERS

Dimension Symbol	Type: SCO-1	SDO-1	SCG-1 SDG-1 W/Form Y79-1,2,3,4,5	SCG-2 SDG-2 W/Form Y79-1,2,3,4,5	SEO-1 SFO-1	SEG-1 W/Form Y79-1,2,4,5,6	SEG-2 W/Form Y79-1,2,4,5,6	SFG-1 W/Form Y79-1,2,6	SFG-2 W/Form Y79-1	SFG-2 W/Form Y79-2,6,7	SGO-1	SGG-1,2 W/Form Y79-1,7,10	SHO-1	SHG-1,2 W/Form Y79-1,8,10
	Fig. 2	Fig. 2	Fig. 3	Fig. 3	Fig. 2	Fig. 5	Fig. 4	Fig. 5	Fig. 4	Fig. 6	Fig. 2	Fig. 6	Fig. 1	Fig. 7
A	**21.25** 540	**21.25** 540	**23.25** 591	**23.50** 597	**25.50** 648	**22.25** 565	**29.00** 737	**19.25** 489	**29.00** 737	**28.25** 718	**22.25** 565	**37.25** 946	**34.25** 870	**64.25** 1632
B	**21.25** 540	**21.25** 540	**24.75** 629	**23.50** 597	**41.75** 1060	**42.75** 1086	**45.75** 1162	**55.25** 1403	**45.75** 1162	**70.25** 1784	**58.25** 1480	**90.25** 2292	**87.00** 2210	**90.25** 2292
C	**5.81** 148	**6.53** 166	**8.50** 216	**16.25** 413	**7.00** 178	**10.63** 270	**15.75** 400	**9.25** 235	**18.38** 467	**16.25** 413	**9.75** 248	**24.25** 616	**11.13** 283	**24.25** 616
D	**20.00** 508	**20.00** 508	**20.50** 521	**20.75** 527	**24.25** 616	**17.88** 454	**15.00** 381	**15.63** 397	**15.00** 381	**25.75** 654	**20.00** 508	**34.75** 883	**32.00** 813	**61.75** 1568
E	**20.00** 508	**20.00** 508	**22.00** 559	**18.75** 476	**40.50** 1029	**38.50** 978	**47.00** 1194	**52.50** 1334	**47.00** 1194	**12.50** 318	**56.00** 1422	**20.50** 521	**85.50** 2172	**17.25** 438
F	**.63** 16	**.63** 16	**1.38** 35	**1.38** 35	**.63** 16	**2.13** 54	**7.00** 178	**1.38** 35	**7.00** 178	**1.25** 32	**1.13** 29	**1.25** 32	**1.13** 29	**1.25** 32
G	**.63** 16	**.63** 16	**1.38** 35	**2.38** 60	**.63** 16	**2.13** 54	**.50** 13	**1.38** 35	**.50** 13	**1.25** 32	**1.13** 29	**1.25** 32	**.75** 19	**4.50** 114
H	**.50** 13	**.50** 13	**.25** 6	**.25** 6	**.50** 13	**1.25** 32	**1.13** 29	**1.25** 32	**1.13** 29	**2.50** 64	**1.00** 25	**2.50** 64	**2.13** 54	**3.00** 76
I	**.31** 8	**.31** 8	**1.75** 44	**1.75** 44	**.38** 10	**.25** 6	**1.25** 32	**.25** 6	**1.25** 32	**3.00** 76	**.63** 16	**3.00** 76	**.63** 16	**3.00** 76
J	....	....	**.25** 6	**.25** 6	....	**.56** 14	**.25** 6	**.44** 11	**.25** 6	**.69** 17	....	**.69** 17	....	**.81** 21
K	....	....	**.44** 11	**.44** 11	....	....	**.56** 14	....	**.56** 14	....	....	....	....	....

CLASS 8640 PART-WINDING STARTERS

Dimension Symbol	Type: SCO-1	SDO-1	SCG-1 SDG-1 W/Form Y79-11	SCG-1 SDG-1 W/Form Y79-2,31,41	SEO-1 SFO-1	SEG-1 SFG-1 W/Form Y79-11	SEG-1 W/Form Y79-2,41,51,61	SFG-1 W/Form Y79-2,61,71	SGO-1	SGG-1 W/Form Y79-2,11,20,71	SHO-1	SGG-1, SHG-1 W/Form Y79-21,22
	Fig. 2	Fig. 2	Fig. 5	Fig. 3	Fig. 2	Fig. 5	Fig. 5	Fig. 6	Fig. 2	Fig. 6	Fig. 1	Fig. 7
A	**21.25** 540	**21.25** 540	**19.25** 489	**23.25** 591	**25.50** 648	**30.25** 768	**25.25** 641	**32.25** 819	**24.25** 616	**36.35** 921	**24.50** 622	**64.25** 1632
B	**21.25** 540	**21.25** 540	**30.25** 768	**24.75** 629	**41.75** 1060	**38.25** 972	**50.25** 1276	**70.25** 1784	**29.25** 743	**70.25** 1784	**49.00** 1245	**90.25** 2292
C	**4.75** 121	**5.44** 138	**10.75** 273	**8.50** 216	**7.00** 178	**12.63** 321	**10.63** 270	**16.25** 413	**9.75** 248	**16.25** 413	**11.63** 295	**24.25** 616
D	**20.00** 508	**20.00** 508	**15.63** 397	**20.50** 521	**24.25** 616	**26.63** 676	**20.88** 530	**29.75** 756	**22.00** 559	**33.75** 857	**23.25** 591	**61.75** 1568
E	**20.00** 508	**20.00** 508	**27.50** 699	**22.00** 559	**40.50** 1029	**35.50** 902	**46.00** 1168	**12.50** 318	**27.00** 686	**12.50** 318	**48.00** 1219	**17.25** 438
F	**.63** 16	**.63** 16	**1.38** 35	**1.38** 35	**.63** 16	**1.38** 35	**2.13** 54	**1.25** 32	**1.13** 29	**1.25** 32	**.63** 16	**1.25** 32
G	**.63** 16	**.63** 16	**1.38** 35	**1.38** 35	**.63** 16	**1.38** 35	**2.13** 54	**1.25** 32	**1.13** 29	**1.25** 32	**.50** 13	**4.50** 114
H	**.50** 13	**.50** 13	**1.25** 32	**.25** 6	**.50** 13	**1.25** 32	**1.25** 32	**2.50** 64	**1.00** 25	**2.50** 64	**2.00** 51	**3.00** 76
I	**.31** 8	**.31** 8	**.25** 6	**1.75** 44	**.38** 10	**.25** 6	**.25** 6	**3.00** 76	**.63** 16	**3.00** 76	**.56** 14	**3.00** 76
J	....	....	**.44** 11	**.25** 6	....	**.44** 11	**.56** 14	**.69** 17	....	**.69** 17	....	**.81** 21
K	....	....	....	**.44** 11	....	....	....	....	....	....	....	....

Dual Dimensions: **INCHES** / Millimeters

SQD SLV_001036

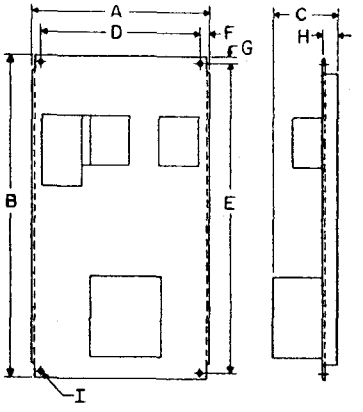


FIGURE 1

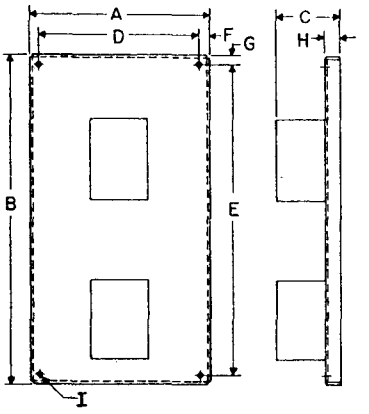


FIGURE 2

C30080-008

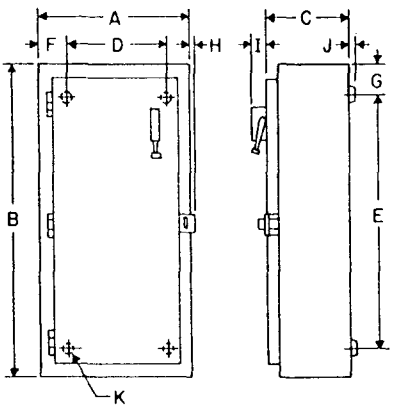


FIGURE 3

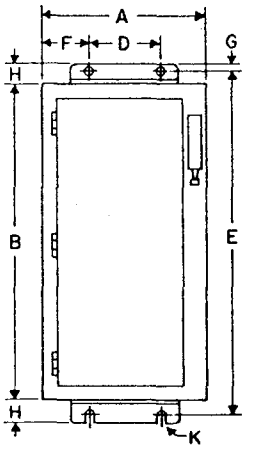


FIGURE 4

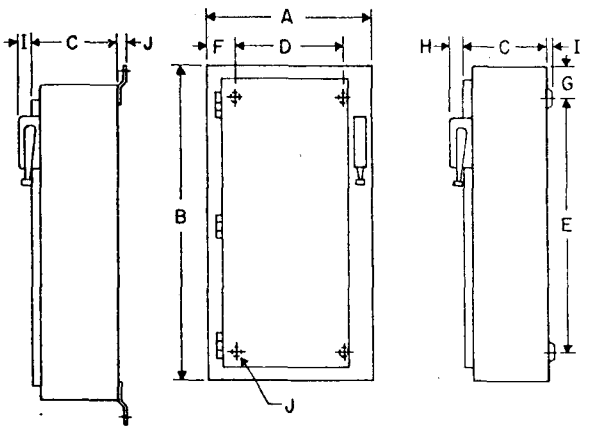


FIGURE 5

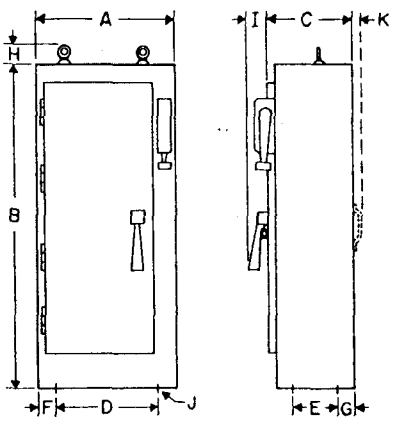


FIGURE 6

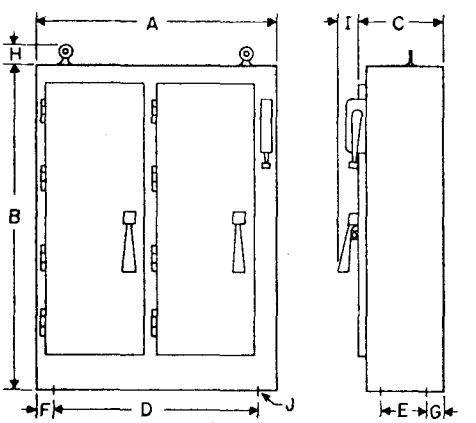


FIGURE 7

SQD SLV_001037

AC REVERSING MAGNETIC CONTACTORS
LINE VOLTAGE TYPE WITHOUT OVERLOAD PROTECTION

CLASS 8702

Reversing magnetic contactors provide convenient means for starting, stopping and reversing ac motors, where other provision is made for overload protection or where overload protection is not required. These reversing contactors are designed for the control of polyphase squirrel cage motors, and single phase motors that may be reversed by a reconnection of windings. Two contactors are employed on each device to perform the reversing operation. One contactor connects motor windings for forward rotation, and the other connects for reverse rotation.

600 VOLTS MAX. — **50-60 HERTZ**

Number of Poles	NEMA Size	Ratings† Volts	Ratings† Max. HP	Type of Motor	General Purpose Enclosure NEMA Type 1 Type	General Purpose Enclosure NEMA Type 1 Price	Watertight and Dusttight Enclosure NEMA Type 4 Type	Watertight and Dusttight Enclosure NEMA Type 4 Price	SPIN TOP® For Hazardous Locations Class I Groups C & D Class II, Groups E, F & G NEMA Types 7 & 9 Type	SPIN TOP® For Hazardous Locations Class I Groups C & D Class II, Groups E, F & G NEMA Types 7 & 9 Price	Dusttight and Driptight Industrial Use Enclosure NEMA Type 12‡ Type	Dusttight and Driptight Industrial Use Enclosure NEMA Type 12‡ Price	Open Type Vertical Type	Open Type Horizontal Type Use For NEMA 1, 4, & 12 Interiors	Price*
2 Pole Single Phase	00	115 230	⅓ 1	Single Phase 3-Wire	SAG-1	$ 248.	Use NEMA Size 0		Use NEMA Size 0		Use NEMA Size 0		.....	SAO-1	$ 232.
	0	115 230	1 2		SBG-1	296.	SBW-11▲	$ 480.	SBR-6	$1034.	SBA-1▲	$ 368.	SBO-9	SBO-1	280.
	1	115 230	2 3		SCG-2	344.	SCW-11▲	600.	SCR-6	1086.	SCA-1▲	416.	SCO-1	SCO-2	320.
3 Pole Single Phase	00	115 230	⅓ 1	4-Wire Rep.-Ind.	SAG-2	256.	Use NEMA Size 0		Use NEMA Size 0		Use NEMA Size 0		.....	SAO-2	240.
		115 230	⅓ 1	4-Wire Split Ph.	SAG-3	256.	Use NEMA Size 0		Use NEMA Size 0		Use NEMA Size 0		.....	SAO-3	240.
	0	115 230	1 2	4-Wire Rep.-Ind.	SBG-2	304.	SBW-12▲	488.	SBR-7	1042.	SBA-2▲	376.	SBO-10	SBO-2	288.
		115 230	1 2	4-Wire Split Ph.	SBG-3	304.	SBW-13▲	488.	SBR-8	1042.	SBA-3▲	376.	SBO-11	SBO-3	288.
	1	115 230	2 3	4-Wire Rep.-Ind.	SCG-4	352.	SCW-12▲	608.	SCR-7	1094.	SCA-2▲	424.	SCO-3	SCO-4	328.
		115 230	2 3	4-Wire Split Ph.	SCG-6	352.	SCW-13▲	608.	SCR-8	1094.	SCA-3▲	424.	SCO-5	SCO-6	328.
3 Pole Polyphase	00	200–230 380 460–575	1½ 1½ 2	3 Phase	SAG-4	256.	Use NEMA Size 0		Use NEMA Size 0		Use NEMA Size 0		.....	SAO-4	240.
	0	200–230 380–575	3 5		SBG-4	304.	SBW-14▲	488.	SBR-9	1042.	SBA-4▲	376.	SBO-12	SBO-4	288.
	1	200–230 380–575	7½ 10		SCG-8	352.	SCW-14▲	608.	SCR-9	1094.	SCA-4▲	424.	SCO-7	SCO-8	328.
	2	200 230 380–575	10 15 25		SDG-2	688.	SDW-11▲	1104.	SDR-3	1826.	SDA-1▲	808.	SDO-1	SDO-2	624.
	3	200 230 380–575	25 30 50		SEG-2	1148.	SEW-11	1764.	SER-3	2930.	SEA-1	1412.	SEO-1	SEO-2	1036.
	4	200 230 380 460–575	40 50 75 100		SFG-3	2792.	SFW-11	3880.	SFR-1	5046.	SFA-1	3200.	SFO-1	SFO-3	2584.
	5	200 230 380 460–575	75 100 150 200		SGG-3	5864.	SGW-11	6744.	.....	.....	SGA-1	6744.	SGO-1	SGO-3	4660.
	6	200 230 380 460–575	150 200 300 400		SHG-1	13652.	SHW-1	15652.	.....	.....	SHA-1	14732.	.....	SHO-1	11652.
	7	230 460–575	300 600		SJG-1	18674.	SJW-1	20674.	.....	.....	SJA-1	19754.	.....	SJO-1	16674.
	8	230 460–575	450 900		KG-1	26920.	KW-1	26920.	.....	.....	KA-1	28000.	KO-1	.....	24920.
4 Pole Polyphase	0	200–230 380–575	3 5	2 Phase 4-Wire	SBG-5	384.	SBW-15	568.	SBR-10	1130.	SBA-5	456.	SBO-13	SBO-5	368.
	1	200–230 380–575	7½ 10		SCG-10	436.	SCW-15	692.	SCR-10	1188.	SCA-5	508.	SCO-9	SCO-10	420.
	2	200 230 380–575	10 15 25		SDG-4	856.	SDW-12	1296.	SDR-4	2036.	SDA-2	976.	.....	SDO-4	792.
	3	200 230 380–575	25 30 50		SEG-4	1432.	SEW-12	2040.	.....	.....	SEA-2	1688.	.....	SEO-4	1312.
	4	200 230 380 460–575	40 50 75 100		SFG-4	3552.	SFW-12	4648.	.....	.....	SFA-2	3968.	.....	SFO-4	3336.

▲ Separate NEMA Type 4 and 12 enclosures are available; see Class 9991 page 447.
‡ NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to Class 9991 page 447.
† Voltage ratings in the price table above are those at which motors are rated and are not necessarily identical with the starter (contactor) coil rating. The table below lists the common 60 hz. motor voltage ratings and the corresponding starter (contactor) coil voltage which will be furnished for those ratings. When ordering starters (contactors), always indicate coil voltage.

System	Motor Voltage	Coil Voltage Starters & Contactors (Class 8702 & Class 8736)
Single Phase	115 230	120 240
Poly-phase	Separate Control 200–208 220–230 380 (50 Hz.) 440–460 550–575	120 208 240 380 (50 Hz.) 480 600

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Line voltage, frequency and phase.
3. Control voltage and frequency, if different from line voltage.
4. Any special features required.

SPECIAL FEATURES — See page 461
APPLICATION DATA — Pages 262-265
DIMENSIONS — Pages 266, 267
SEPARATE ENCLOSURES — Class 9991
REPAIR PARTS KITS — Class 9998
MODIFICATION KITS — Class 9999

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SQD SLV_001038

AC REVERSING MAGNETIC STARTERS

LINE VOLTAGE TYPE WITH MELTING ALLOY OVERLOAD RELAYS

CLASS 8736

Class 8736 ac reversing magnetic starters are electro-mechanical devices which provide a convenient and economical means for starting, stopping and reversing ac motors where full starting torque may be applied to the driven machinery and where current inrush resulting from across-the-line starting or reversing is not objectionable. These reversing starters are designed for the control of polyphase squirrel cage motors, and single phase motors that may be reversed by a reconnection of windings. Two contactors are employed on each device to perform the reversing operation. One contactor connects motor windings for forward rotation, and the other connects for reverse rotation.

50-60 HERTZ — **600 VOLTS MAX.**

No. of Poles	NEMA Size	Ratings† Volts	Ratings† Max. HP	Type of Motor	General Purpose Enclosure NEMA Type 1 Type	General Purpose Enclosure NEMA Type 1 Price*	Watertight and Dusttight Enclosure NEMA Type 4 Type	Watertight and Dusttight Enclosure NEMA Type 4 Price*	SPIN TOP® For Hazardous Locations Class I Groups C & D Class II Groups E, F & G NEMA Types 7 & 9 Type	SPIN TOP® For Hazardous Locations Class I Groups C & D Class II Groups E, F & G NEMA Types 7 & 9 Price*	Dusttight and Driptight Industrial Use Enclosure NEMA Type 12‡ Type	Dusttight and Driptight Industrial Use Enclosure NEMA Type 12‡ Price*	Open Type Vertical Type	Open Type Horizontal Type Use For NEMA 1,4, & 12 Interiors	Open Type Price*	Number of Thermal Units Required*
2 Pole Single Phase	00	115 230	⅓ 1	Single Phase 3-Wire	SAG-13	$ 258.	Use NEMA Size 0		Use NEMA Size 0		Use NEMA Size 0		.....	SAO-13	$ 242.	1
	0	115 230	1 2		SBG-1	306.	SBW-11▲	$ 490.	SBR-6	$1044.	SBA-1▲	$ 378.	SBO-7	SBO-1	290.	1
	1	115 230	2 3		SCG-2	354.	SCW-11▲	610.	SCR-6	1096.	SCA-1▲	426.	SCO-1	SCO-2	330.	1
3 Pole Single Phase	00	115 230	⅓ 1	4-Wire Rep.-Ind.	SAG-14	266.	Use NEMA Size 0		Use NEMA Size 0		Use NEMA Size 0		.....	SAO-14	250.	1
		115 230	⅓ 1	4-Wire Split Ph.	SAG-15	266.	Use NEMA Size 0		Use NEMA Size 0		Use NEMA Size 0		.....	SAO-15	250.	1
	0	115 230	1 2	4-Wire Rep.-Ind.	SBG-2	314.	SBW-12▲	498.	SBR-7	1052.	SBA-2▲	386.	SBO-8	SBO-2	298.	1
		115 230	1 2	4-Wire Split Ph.	SBG-3	314.	SBW-13▲	498.	SBR-8	1052.	SBA-3▲	386.	SBO-9	SBO-3	298.	1
	1	115 230	2 3	4-Wire Rep-Ind.	SCG-4	362.	SCW-12▲	618.	SCR-7	1106.	SCA-2▲	434.	SCO-3	SCO-4	338.	1
		115 230	2 3	4-Wire Split Ph.	SCG-6	362.	SCW-13▲	618.	SCR-8	1106.	SCA-3▲	434.	SCO-5	SCO-6	338.	1
3 Pole Poly-phase	00	200-230 380 460-575	1½ 1½ 2	3 Phase	SAG-16	276.	Use NEMA Size 0		Use NEMA Size 0		Use NEMA Size 0		.....	SAO-16	260.	3
	0	200-230 380-575	3 5		SBG-4	324.	SBW-14▲	508.	SBR-9	1064.	SBA-4▲	396.	SBO-10	SBO-4	308.	3
	1	200-230 380-575	7½ 10		SCG-8	372.	SCW-14▲	628.	SCR-9	1116.	SCA-4▲	444.	SCO-7	SCO-8	348.	3
	2	200 230 380-575	10 15 25		SDG-2	724.	SDW-11▲	1140.	SDR-3	1864.	SDA-1▲	844.	SDO-1	SDO-2	660.	3
	3	200 230 380-575	25 30 50		SEG-2	1208.	SEW-11	1824.	SER-3	2996.	SEA-1	1472.	SEO-1	SEO-2	1096.	3
	4	200 230 380 460-575	40 50 75 100		SFG-3	2884.	SFW-11	3972.	SFR-1	5148.	SFA-1	3292.	SFO-1	SFO-3	2676.	3
	5	200 230 380 460-575	75 100 150 200		SGG-3	6346.	SGW-11	7226.	SGR-1	11738.	SGA-1	7226.	SGO-1	SGO-3	5142.	3
	6	200 230 380 460-575	150 200 300 400		SHG-1	14134.	SHW-1	16134.	.....	....	SHA-1	15214.	.....	SHO-1	12134.	3
	7	230 460-575	300 600		SJG-1	19202.	SJW-1	21202.	.....	....	SJA-1	20282.	.....	SJO-1	17202.	3
	8	230 460-575	450 900		KG-1	27306.	KW-1	29306.	.....	....	KA-1	28386.	KO-1	.....	25306.	3
4 Pole Polyphase	0	200-230 380-575	3 5	2 Phase 4-Wire	SBG-5	404.	SBW-15▲	588.	SBR-10	1152.	SBA-5▲	476.	SBO-11	SBO-5	388.	2
	1	200-230 380-575	7½ 10		SCG-10	456.	SCW-15▲	712.	SCR-10	1210.	SCA-5▲	528.	SCO-9	SCO-10	440.	2
	2	200 230 380-575	10 15 25		SDG-4	892.	SDW-12▲	1332.	SDR-4	2076.	SDA-2▲	1012.	.....	SDO-4	828.	2
	3	200 230 380-575	25 30 50		SEG-4	1492.	SEW-12	2100.	.....	....	SEA-2	1748.	.....	SEO-4	1372.	2
	4	200 230 380 460-575	40 50 75 100		SFG-4	3644.	SFW-12	4740.	.....	....	SFA-2	4060.	.....	SFO-4	3428.	2

***Prices do not include thermal units. See page 466 for thermal unit selection.**

▲Separate NEMA Type 4 and 12 enclosures are available; see Class 9991 page 447.

‡NEMA Type 12 enclosures may be field modified for use in outdoor applications. For details refer to Class 9991 page 447.

†*Voltage ratings in the price table above are those at which motors are rated and are not necessarily identical with the starter (contactor) coil rating.* The table below lists the common 60 hz. motor voltage ratings and the corresponding starter (contactor) coil voltage which will be furnished for those ratings. When ordering starters (contactors), always indicate coil voltage.

System	Motor Voltage	Coil Voltage — Contactors and Starters (Classes 8702 & 8736)
Single Phase	115	120
	230	240
Poly-phase	Separate Control	120
	200-208	208
	220-230	240
	380 (50 Hz.)	380 (50 Hz.)
	440-460	480
	550-575	600

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Line voltage, frequency and phase.
3. Control voltage and frequency, if different from line voltage.
4. Any special features required.

SPECIAL FEATURES — See page 461
APPLICATION DATA — Pages 262-265
DIMENSIONS — Pages 266, 267
SEPARATE ENCLOSURES — Class 9991
REPAIR PARTS KITS — Class 9998
MODIFICATION KITS — Class 9999

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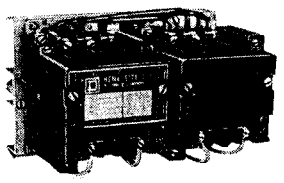
SQD SLV_001039

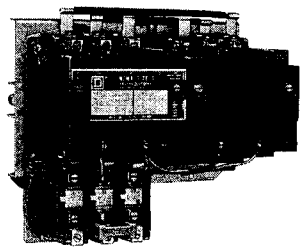
AC REVERSING MAGNETIC CONTACTORS & STARTERS

APPLICATION DATA

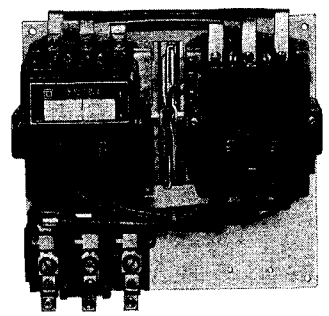
CLASS
8736
8702



Size 00, 0 or 1
3 Pole Reversing Contactor



Size 2
3 Pole Reversing Starter



Size 3
3 Pole Reversing Starter

General: Class 8702 reversing contactors consist of two Class 8502 contactors mechanically and electrically interlocked. Class 8736 reversing starters consist of a Class 8502 contactor and Class 8536 starter mechanically and electrically interlocked. Open type devices, Sizes 0-5 are available in either horizontal or vertical arrangements; Sizes 00, 6, and 7 are available as horizontal only while Size 8 is vertical only. Enclosed devices Sizes 00-7 use horizontally arranged components, while Size 8 uses vertically arranged components.

Operation: Sizes 00-5 are supplied with single voltage coils, designed to operate satisfactorily on line voltages of 85% to 110% of rated voltage. Coils are available for application on 50 or 60 hertz only.

Sizes 6 and 7: Type SH and SJ contactors and starters have a dc coil operated by a solid state rectifier circuit mounted on the device and powered from an ac source. The Type S Sizes 6 and 7 are equipped as standard with a fused control circuit transformer rated 240/480-120 volts 60 hertz, 220/440-110 volts 50 hertz.

The tables below give the replacement transformers for Type S Sizes 6 and 7 contactors and starters. To change voltages on these devices, coils are not changed, instead transformers with the desired voltage are changed.

Size 8 contactors have a pilot relay which operates on the 120 volt secondary of the control transformer that also supplies power to the self-contained rectifier for the dc main operating coil.

TABLE 1 — REPLACEMENT CONTROL TRANSFORMERS FOR TYPE S SIZE 6

Voltage		Class 9070 Type	Price
60 Hertz	50 Hertz		
240/480-120	220/440-110	EO-3-S2A	
208-120	.....	EO-3-S2B	
227-120	.....	EO-3-S2C	
.....	380-110	EO-3-S2D	**$80.**
600-120	550-110	EO-3-S2E	
120-120	110-110	EO-3-S2F	
240-120	220-110	EO-3-S2G	

TABLE 2 — REPLACEMENT CONTROL TRANSFORMERS FOR TYPE S SIZE 7

Voltage		Class 9070 Type	Price
60 Hertz	50 Hertz		
240/480-120	220/440-110	EO-19-S2A	
208-120	.....	EO-19-S2B	
277-120	.....	EO-19-S2C	
.....	380-110	EO-19-S2D	**$80.**
600-120	550-110	EO-19-S2E	
120-120	110-110	EO-19-S2F	
240-120	220-110	EO-19-S2G	

Power Contact Ratings: All contactors are rated in accordance with NEMA standards. The ratings shown in the price tables on pages 2 and 3 are for normal service. For complete data on power contact ratings, refer to Class 8536 Section.

Voltage: 600 volts ac maximum.

Frequency: Coils are available for application on 50 or 60 hertz only.

Maintenance of Equipment: Class 9998 repair parts kits are available for all Class 8702 contactors and Class 8736 starters. Service bulletins with a complete list of replaceable parts are supplied with all devices. Separate bulletins can be ordered and are listed below along with the appropriate replacement contact parts list:

NEMA Size	Type	Series	No. of Poles	Service Bulletin		Replacement Contacts Class 9998 Type◐
				Contactor	Mechanical Interlock	
00	SA	A	2-3	....	286AS	SL-2
0	SB	A & B	2-3 4	277AS 277AS & 250AS	286AS 286AS	SL-2 SL-12
1	SC	A & B	2-3 4	278AS 278AS & 250AS	286AS 286AS	SL-3 SL-13
2	SD	A	3 4	279AS 279AS & 293AS	294AS 294AS	SL-4 SL-14
3	SE	A	3 4	305AS 326AS	....	SL-7 (2)SL-6
4	SF	A	3 4	306AS 326AS	....	SL-9 (2)SL-8
5	SG	A	3	328AS	....	SL-11
6	SH	A	3	342AS	....	SL-26
7	J	A & B	3	351AS	....	JA-81
8	K	A & B	3	352AS	....	KA-81

◐Each kit will supply replacement contacts for one contactor — two (2) kits are required for both contactors.

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AC REVERSING MAGNETIC CONTACTORS & STARTERS

APPLICATION DATA

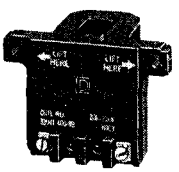
CLASS 8736 8702

TERMINALS

NEMA Size	Type	Power Terminals		Control Terminals	
		Type of Lug	Wire Size* Min.—Max.	Type of Lug	Wire Size* Min.—Max.
00, 0 & 1	SA SB & SC	Pressure Wire	#14—#8	Pressure Wire	#16—#12
2	SD	Box Lug	#14—#4	Pressure Wire	#16—#12
3	SE	Box Lug	#14—#0	Pressure Wire	#16—#12
4	SF	Box Lug	#8-250 MCM	Pressure Wire	#16—#12
5	SG	Box Lug	#4-500 MCM	Pressure Wire	#16—#12
6	SH	Parallel Groove	250 MCM — 500 MCM	Pressure Wire	#16—#12▲
7	SJ	Parallel Groove	250 MCM — 500 MCM	Pressure Wire	#16—#12▲
8	K	Clam Shell	350 MCM — 500 MCM	Pressure Wire	#16—#12

* Solid or stranded copper wire.
▲ Terminal block connections have a range of #16—#14.

Magnet coils are designed to operate satisfactorily on line voltages of 85% to 110% of rated voltage. Coils are available for application on 50 or 60 hertz. All devices are supplied with single voltage coils.

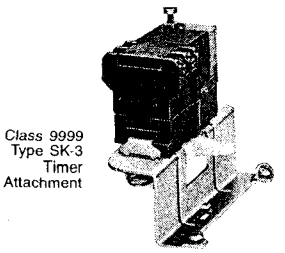


AC Magnet Coil

COIL BURDEN△

NEMA Size	No. of Poles	Inrush VA		Sealed VA		Sealed Watts	
		50 Hertz	60 Hertz	50 Hertz	60 Hertz	50 Hertz	60 Hertz
00, 0 & 1	2-5	232	245	26	27	7.7	7.8
2	2-3	296	311	36	37	12	14
	4	429	438	37	38	12	14
3	3	678	700	47	46	15	14
	4	1260	1185	89	85	23.4	22
4	3-4						
5	3	2970	2970	250	212	42	39
6	3	1495	1780	87	71	27	32

△Mean values.



Class 9999 Type SK-3 Timer Attachment

USER MODIFICATION KITS

The following is a listing of kits that can be field added to any size Type S starter or contactor. For further information refer to Class 9999 section.

Description			Class 9999 Type	Class 9999 Price
Control Circuit Fuse Holder	Single Fuse Unit*		SF-3	$ 16.
	Double Fuse Unit*		SF-4	24.
Power Poles‡	One Normally Open Unit	Size 0, 1	SB-6	44.
		Size 2	SB-11	80.
	One Normally Closed Unit	Size 0, 1	SB-7	44.
		Size 2	SB-12	80.
	One Normally Open & One Normally Closed	Size 0, 1	SB-8	88.
		Size 2	SB-13	160.
	Two Normally Open	Size 0, 1	SB-9	88.
		Size 2	SB-14	160.
	Two Normally Closed	Size 0,1	SB-10	88.
		Size 2	SB-15	160.
	Adapter Bracket to Use Power Poles on Sizes 3, 4, 5, 6 and 7		SBT-1	6.
Pneumatic Timer	Time Delay After Energization (On Delay)		SK-4	112.
	Time Delay After De-energization (Off Delay)		SK-3	112.
Transient Suppression Module	Sizes 00-2		ST-1	16.
	Sizes 3-7		ST-2	16.
	Bracket for Mounting ST-1 to Size 00		SFT-1	3.
Tie Point Terminal Kit, Sizes 0-4			T-7	8.
Isolated Overload Alarm Contact▲			SO-4	28.

* Fuse not included.
▲ Size 5 also requires current transformers and size 1 overload block.
‡ When adding a power pole, a different mechanical interlock is often required. See page 265.

AC MAGNET COILS FOR AC CONTACTORS AND STARTERS

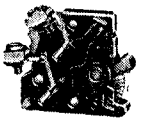
Devices Using Coil			Coil Specification Number	SUFFIX NUMBERS (Complete coil part number consists of a specification number followed by suffix number as 31041-400-51.)						
NEMA Size	Type	Poles		24 V./60 Hz.	120 V./60 Hz. 110 V./50 Hz.	208 V./60 Hz.	240 V./60 Hz 220 V./50 Hz.	277 V./60 Hz.	480 V./60 Hz. 440 V./50 Hz.	600 V./60 Hz. 550 V./50 Hz.
00	SA	All	31041-400-	20	42	48	51	52	60	62
0	SB	All	31041-400-	20	42	48	51	52	60	62
1	SC	All	31041-400-	20	42	48	51	52	60	62
2	SD	3	31063-409-	16	38	44	47	49	57	60
		4	31063-400-	16	38	44	47	49	57	60
3	SE	3	31074-400-	16	38	44	47	49	57	60
		4	31091-400-	16	38	44	47	49	57	60
4	SF	3-4	31091-400-	16	38	44	47	49	57	60
5	SG	3	31096-400-	....	09	15	18	19	24	29
6	SH	3	31104-400-50 (all voltages)							
7	SJ	3	31104-400-50 (all voltages)							
8	H	3	A51030-034-01 (2 Required Per Contactor)†							

† All contactors are supplied with self-contained dc supply consisting of suitable transformer and rectifier to supply 100 volts dc for coil. An ac control relay is also supplied for pilot circuit.

SQD SLV_001041

AC REVERSING MAGNETIC CONTACTORS & STARTERS

CLASS 8736 8702



Internal Electrical Interlock

APPLICATION DATA

MODIFICATIONS

STANDARD ELECTRICAL INTERLOCKS

Two normally open holding circuit interlocks are provided as standard on all reversing contactors and starters. Sizes 00, 0, 1, and 2 devices use a Class 9999 Type SX-11 as the holding circuit interlock. Larger devices use the Class 9999 Type SX-6 as standard. Additionally, two normally closed electrical interlocks are provided as standard and wired to prevent simultaneous energization of both coils. Sizes 00, 0, 1, and 2 use a Class 9999 Type SX-12 while larger Sizes use a Class 9999 Type SX-7 for this purpose.

On Sizes 6 & 7 controllers, an additional normally closed electrical interlock is provided as standard. This N.C. electrical interlock must be used with the coil control unit. Do not use this N.C. interlock for any other purpose.

See the table below for ratings of interlocks.

ELECTRICAL CONTACT RATINGS

Class 9999	Contact Ratings			
	Volts AC	Pilot Duty — AC Only (35% Power Factor)		AC Amps. (75-80% Power Factor)
		Make	Carry and Break	
SX-6 SX-7 SX-8	120 or Less	60 Amps.	6 Amps.	6
	120-600	7200 VA	720 VA	6
SX-11 SX-12	120 or Less	30 Amps.	3 Amps.	3
	120-600	3600 VA	360 VA	3

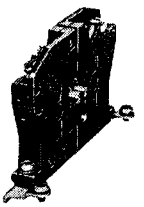
CONTROL TRANSFORMER SELECTION

The following table gives the proper size control transformer to be used with a given reversing device, with or without additional electrical interlocks or timer. For factory addition of control transformers see page 461.

NEMA Size	Type	No. of Poles	Transformers* **Class 9070** Type
0, 1 & 2	SB, SC & SD	Any	EO-2 or GO-2
3	SE	3	EO-3 or GO-3
		4 & 5	EO-4
4	SF	Any	EO-4
5	SG	Any	■
6 & 7	SH & SJ	Any	‡

* If a different manufacturer's transformer is to be used, check its suitability for use with coil loads. See page 263 for inrush and sealed VA ratings of the contactor coil.
‡ A special transformer is an integral part of the Sizes 6 and 7 control circuit providing 120 volt control circuit voltage as standard on devices wired for common control.
■ Standard engineering practice for Size 5 devices is to use a Class 9070 Type EO-1 transformer and Class 8501 Type DO-20 control relay.

Double Circuit External Electrical Interlock



ADDITIONAL ELECTRICAL INTERLOCKS

Additional electrical interlocks may be factory or field added to any Type S contactor or starter. The table directly below lists the selection for field addable electrical interlocks. Types SX-6 through SX-8 are external interlocks that can be installed on Sizes 00 through 7. These types are field convertible from normally open to normally closed and vice versa. Types SX-11 and SX-12 are non-convertible internal interlocks that are installed on Sizes 00-2 devices only. On these devices, one Class 9999 Type SX-11 is used as the holding circuit interlock, and one Class 9999 Type SX-12 is used for electrically interlocking the contactor coils. No additional internal interlocks may be field added.

For factory installed electrical interlocks, either specify the number of normally open and normally closed interlocks per contactor or select Form designation from table at bottom of page.

NEMA Size	Type	Electrical Interlock Kit Description	Class 9999 Type	Class 9999 Price
00-7	SA-SJ	**External** (Field Convertible) 1 N.O. Contact 1 N.C. Contact 1 N.O. and 1 N.C. Isolated Contacts	SX-6 SX-7 SX-8	**$24.** **24.** **32.**
00-2	SA-SD	**Internal** 1 N.O. Contact 1 N.C. Contact	SX-11 SX-12	**24.** **24.**
8	K	1 N.O. or N.C. (convertible)	WX-6	**162.**

MAX. NUMBER OF AUXILIARY UNITS

NEMA Size (Type)	No. of Poles of Basic Contactor	Maximum number of auxiliary units on each contactor, forward or reverse, (in addition to internal holding circuit and electrical interlocks).
00, 0, 1 and 2 (SA, SB, SC and SD)	2 or 3	4 single circuit external interlocks (N.O. or N.C.)
		1 single circuit external interlock (N.O. or N.C.) plus 1 attached timer (ON or OFF delay).
	4	2 single circuit external interlocks (N.O. or N.C.)
3, 4, 5, 6, and 7 (SE, SF, SG, SH, and SJ)	Any	2 single circuit external interlocks (N.O. or N.C.)
		1 single circuit external interlock plus 1 attached timer (ON or OFF delay).

FORM DESIGNATIONS FOR FACTORY INSTALLATION OF ELECTRICAL INTERLOCKS

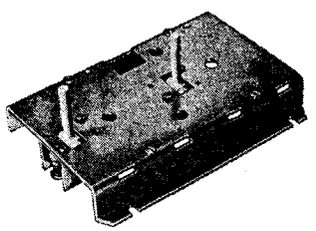
Additional Electrical Interlocks on L.H. Contactor (Forward Contactor)	Additional Electrical Interlocks on R.H. Contactor (Reverse Contactor)						
	Standard (No Additional Interlocks)	Change N.O. Holding Circuit Interlock to N.C.	1 N.O.	1 N.C.	2 N.O.	1 N.O.-1 N.C.	2 N.C.
Standard (No Additional Interlocks)		X01	X02	X03	X05	X06	X07
Change N.O. Holding Circuit Interlock to N.C.	X10	X11	X12	X13	X15	X16	X17
1 N.O.	X20	X21	X22	X23	X25	X26	X27
1 N.C.	X30	X31	X32	X33	X35	X36	X37
2 N.O.	X50	X51	X52	X53	X55	X56	X57
1 N.O.-1 N.C.	X60	X61	X62	X63	X65	X66	X67
2 N.C.	X70	X71	X72	X73	X75	X76	X77

SQD SLV_001042

MECHANICAL INTERLOCK

General: Type S contactors or starters are mechanically interlocked so that only one device will be energized at a time. The mechanical interlock is an interference (non-jamming) type, locking at the beginning of the stroke of any starter or contactor.

Overload Relay Mounting Bracket: Mechanical interlock Types SM-1 through SM-10 for Sizes 00-2 devices use overload relay mounting brackets to support the overload relay portion of the starter.



Class 9999 Type SM-1 Mechanical Interlock For Two Contactors Horizontally Mounted



Class 9999 Type SM-12 For Sizes 3 and 4 Horizontally Mounted



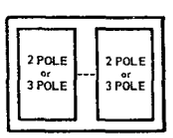
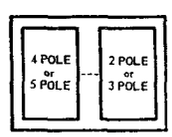
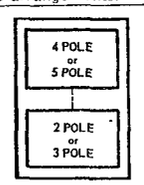
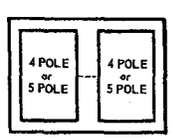
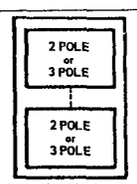
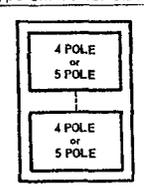
Class 9999 Type SM-11 For Size 3 Vertically Mounted

Type S Sizes 00, 0, 1 and 2 — The mechanical interlock is mounted on the underside of the reversing baseplate. Two pins extend from the mechanical interlock through openings in the baseplate and engage the contact carrier of each contactor. Two styles of mechanical interlocks are used: one version for three pole contactors, a different version for four or five pole contactors. **When adding a power pole to an existing three pole reversing contactor, a new mechanical interlock must also be installed.**

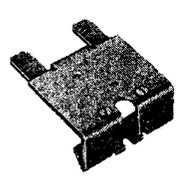
Type S Sizes 3, 4, 5, 6 and 7 — The mechanical interlock is separate from the mounting pan on Sizes 3-7. Cams on the mechanical interlocks are operated by the contact carrier of each contactor. The mechanical interlock is attached to the underside of the two contactors on Sizes 3 and 4; directly to the mounting pan on Sizes 5, 6, and 7.

Size 8 — The mechanical interlock is of the vertical type and consists of an interlock bar mounted on each contactor armature, with an adjustable operating rod between the contactor.

MECHANICAL INTERLOCK FOR TWO CONTACTORS

Kit Description The following kits consist of the mechanical interlock and base assembly for interlocking 2-5 pole contactors. Mechanical interlocks for horizontal and vertical mounting are listed for various pole arrangements.			Contactor NEMA Size	**Class 9999** Type	Price
 Horizontal Type SM-1 for size 00†, 0, or 1 Type SM-6 for size 2 Type SM-12 for Sizes 3 & 4	 Horizontal* Type SM-2 for size 0 or 1 Type SM-7 for size 2 Type SM-12 for Sizes 3 & 4	 Vertical* Type SM-2 for size 0 or 1 Type SM-10 for size 2 Type SM-11 for Size 3 Type SM-13 for Size 4	00†, 0, 1	SM-1	$32.
			0, 1	SM-2*	32.
			0, 1	SM-3	32.
			0, 1	SM-4	32.
			0, 1	SM-5	32.
			2	SM-6	72.
			2	SM-7	72.
 Horizontal Type SM-3 for size 0 or 1 Type SM-8 for size 2 Type SM-12 for Sizes 3 & 4	 Vertical Type SM-4 for size 0 or 1 Type SM-9 for size 2 Type SM-11 for size 3 Type SM-13 for Size 4	 Vertical Type SM-5 for size 0 or 1 Type SM-11 for Size 3 Type SM-13 for Size 4	2	SM-8	72.
			2	SM-9	72.
			2	SM-10	72.
			3	SM-11▲	72.
			3, 4	SM-12▲	72.
			4	SM-13▲	72.

* The Type SM-2 interlock is factory assembled for horizontal mounting but can easily be converted to vertical mounting. Conversion instructions are included.
† For replacement only on the NEMA Size 00, reversing starters and contactors.
▲Interlocks do not include mounting panel.



Type SO-11 Overload Relay Mounting Bracket

OVERLOAD RELAY MOUNTING BRACKET

Kit Description	**Class 9999** Type	Price
Bracket for one overload relay used with horizontal mechanical interlocks, Types SM-1, SM-2, SM-3, SM-6, SM-7 and SM-8	SO-11	$ 4.
Bracket for two overload relays used with vertical mechanical interlocks, Types SM-2, SM-4, SM-5, SM-9 and SM-10	SO-12	12.

SQD SLV_001043

AC REVERSING CONTACTORS & STARTERS

APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS

CLASS
8736
8702

OPEN TYPE — 2 OR 3 POLE ONLY

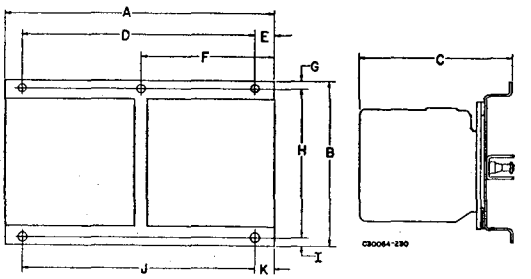


Figure 1

Size 00-5 Contactors
Open Type, Horizontally Mounted

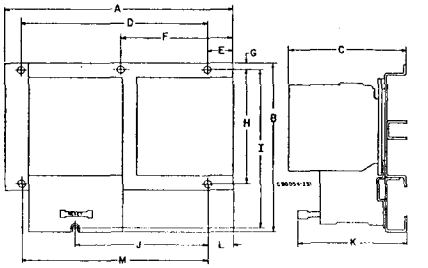


Figure 2

Size 00-5 Starters
Open Type, Horizontally Mounted

Class	NEMA Size	Type	Mounting	Figure Number	Dimensions — Inches A	B	C	D	E	F	G	H	I	J	K	L	M	Weight (Lbs.)
8702	00	SAO	Horizontal	1	7⅛	5	5 5/16	....	....	3 13/32	1 5/32	4 1 1/32	3/16	5½	2 9/32	....	....	12
	0 1	SBO SCO	Horizontal	1	7⅛	5	5 5/16	....	....	3 13/32	1 5/32	4 1 1/32	3/16	5½	2 9/32	....	....	12
			Vertical	1*	5 15/32	9 7/32	5 5/16	5 1/32	7/32	....	3 9/64	8	3 9/64	5 1/32	7/32	....	....	12
	2	SDO	Horizontal	1	9	6⅞	6 1/32	....	....	4½	⅜	5 5/8	¼	6	1½	....	....	16
			Vertical	1*	6¾	11 3/8	6 1/32	6¼	¼	....	½	10 3/8	½	6¼	¼	....	....	16
	3	SEO	Horizontal	1	12 23/32	7 31/32	7	11¾	3 1/64	....	3 1/64	7	3 1/64	11¾	3 1/64	....	....	35
			Vertical	1*	7 13/64	19	7	6¼	3 1/64	....	1 1/64	17	6 3/64	6¼	3 1/64	....	....	35
	4	SFO	Horizontal	1	14¼	11 1 1/16	7	13¼	½	....	½	8	1 27/32	13¼	½	....	....	45
			Vertical	1*	7 31/32	23 29/32	7	7	3 1/64	....	1 13/16	20¼	1 3/16	7	3 1/64	....	....	45
	5	SGO	Horizontal	1	19 5/16	16 3/16	9⅜	18	2 1/32	....	1½	14	1 5/32	18	2 1/32	....	....	98
			Vertical	1*	10¾	34 1 3/32	9⅜	9½	⅝	....	1¼	32	1 5/32	9½	⅝	....	....	98
	6	SHO	Horizontal	1	19 17/32	28 3/64	9 33/64	18	4 9/64	....	3 53/64	21 3/16	3 1/32	18	4 9/64	....	....	195
	7	SJO	Horizontal	1	22 25/32	37¼	13 1 3/16	19¾	1 33/64	....	....	30	....	....	....	....	....	....
	8	KO	Vertical	1*	28	86	14	83	25¼	....	....	....	....	....	....	....	....	750
8736	00	SAO	Horizontal	2	7⅛	6 29/32	5 5/16	....	....	3 13/32	1 5/32	4 1 1/32	6 7/32	4 17/32	5 1/16	2 1/32	....	13
	0 1	SBO SCO	Horizontal	2	7⅛	6 29/32	5 5/16	....	....	3 13/32	1 5/32	4 1 1/32	6 7/32	4 17/32	5 1/16	2 1/32	....	13
			Vertical	2*	5 13/32	11 33/64	5 5/16	5 1/32	7/32	....	3 9/64	8	10 45/64	2 33/64	5 1/16	7/32	5 1/32	13
	2	SDO	Horizontal	2	9	8½	6 1/32	....	....	4½	⅜	5 5/8	7½	5	5 5/32	1½	....	18
			Vertical	2*	6¾	13 31/64	6 1/32	6¼	¼	....	2 5/32	10 3/8	12 31/32	3⅛	5 5/32	¼	6	18
	3	SEO	Horizontal	2	12 23/32	11 23/32	7	11¾	3 1/64	....	3 1/64	10¾	10¾	11¾	6¼	3 1/64	11¾	38
			Vertical	2*	7 5/16	22¼	7	6¼	3 1/64	....	1 1/64	20¾	....	6¼	6¼	3 1/64	6¼	38
	4	SFO	Horizontal	2	14¼	14 19/32	7	13¼	½	....	1 27/32	12¼	12¼	13¼	6¼	½	13¼	48
			Vertical	2*	7 31/32	26 1 3/16	7	7	3 1/64	....	1 27/32	24½	....	4 3/64	6¼	3 1/64	7	48
	5	SGO	Horizontal	2	19 5/16	20 29/32	9⅜	18	2 1/32	....	1 3/32	19	19	18	6 5/8	⅝	18	115
			Vertical	2*	10¾	39 5/32	9⅜	9½	2 1/32	....	1 3/32	37¼	37¼	9½	6 5/8	⅝	9½	115
	6	SHO	Horizontal	2	19 17/32	28 3/64	9 33/64	18	4 9/64	....	3 53/64	21 3/16	3 1/32	18	4 9/64	....	....	200
	7	SJO	Horizontal	1	22 25/32	37¼	13 1 3/16	19¾	1 33/64	....	....	30	....	....	....	....	....	....
	8	KO	Vertical	2*	28	86	14	83	25¼	....	....	....	....	....	....	....	....	840

* Vertical type design differs from that shown on the corresponding NEMA size horizontal type figure, but dimensions listed apply to that figure.

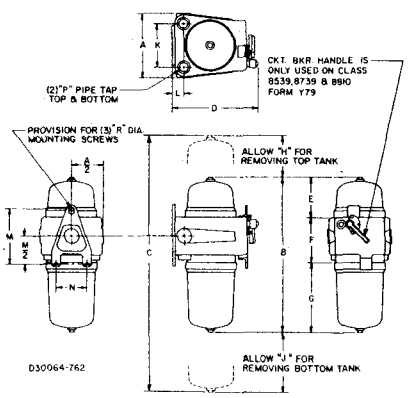


Figure 3
Class 8702 & 8736, NEMA Types 7 & 9
Cast Aluminum

NEMA TYPE 7 & 9

CLASS 8702 & 8736 — NEMA TYPES 7 & 9

NEMA Size	Type	Form	Dimensions — Inches (Figure 3) A	B	C	D	E	F	G	H	J	K	L	M	N	P	R
0 & 1	SBR and SCR	Stan.	12	41 1/16	68 1/16	16¾	7¼	7 1/16	26⅛	3	24	8½	2 1/16	9⅜	5¼	1½	⅜
		Form T	12	46⅛	79⅛	16¾	12¼	7 1/16	26⅛	9	24	8½	2 1/16	9⅜	5¼	1½	⅜
2	SDR	Stan.	16⅛	48½	81½	20¼	12⅛	8⅝	27¾	8	25	12	2⅝	11	5½	2½	⅜
		Form T	16⅛	50½	85	20¼	9⅛	8⅝	32¾	4½	30	12	2⅝	11	5½	2½	⅜

For Sizes 3, 4 & 5 consult local Square D Field Office.

SQD SLV_001044

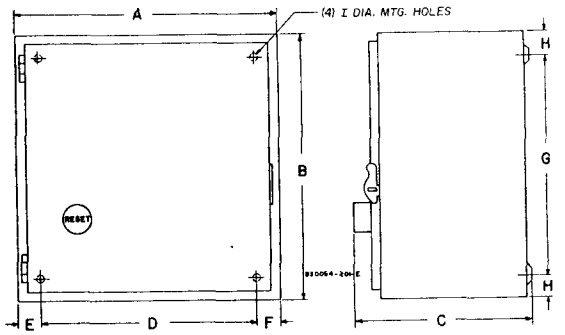


Figure 1

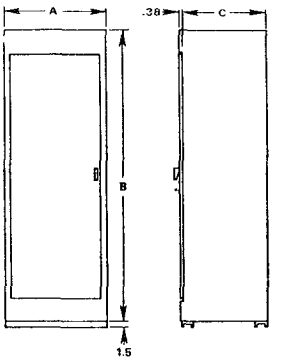


Figure 2

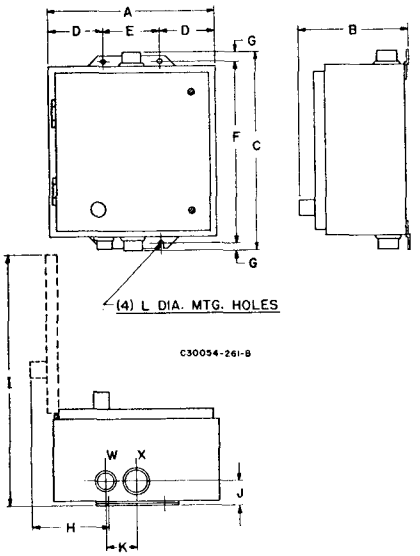


Figure 3

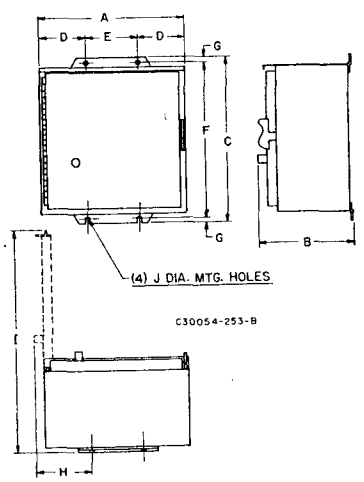


Figure 4

All dimensions are in inches.

NEMA TYPE 1

NEMA Size	Class Number	Fig. No.	Dimensions — Inches A	B	C 8702	C 8736	D	E	F	G	H	I	Weight (Lbs.) 8702	8736
00▲	8702 & 8736	1	11	10	7¼		9¾	⅝	⅝	8⅛	9/16	7/32	16	16
0† 1†	8702 & 8736	1	11⅞	11⅞	7 13/32	7 17/32	9¾	1 1/16	1 1/16	9¾	1 1/16	5/16	16	17
2†	8702 & 8736	1	14⅞	14⅛	7 9/16	7 21/32	12¾	1 1/16	1 1/16	12	1 1/16	5/16	24	25
3* 4*	8702 & 8736	1	16⅛	24⅛	8½	8 17/32	13½	1 5/16	1 5/16	21½	1 5/16	7/16	57	60
5	8702	1	21 5/32	30 5/32	11½	....	18½	1 21/64	1 21/64	27½	1 21/64	7/16	180	....
	8736	1	24 5/32	35 5/32	....	11 17/32	21½	1 21/64	1 21/64	32½	1 21/64	7/16	....	200
6	8702 & 8736	2	28¼	57¾	18⅜		Floor Mounting.						325	330
7	8702 & 8736	2	34½	93	23½								....	....
8	8702 & 8736	2	28	90	20								1000	1125

▲Drawing outline only valid for dimension measurements. Actual construction is a wrap-around type with slip-on cover.
†Standard enclosure has space for a fused control transformer, Form FT, on Sizes 0-2.
*3 Pole only.

NEMA TYPE 4

NEMA Size	Class Number	Fig. No.	Dimensions — Inches A	B	C	D	E	F	G	H	I	J	K	L	Hub Dia. W Bot. Only	Hub Dia. X Top & Bot.	Weight (Lbs.) 8702	8736
0† 1†	8702 & 8736	3	12⅝	7 13/16	14 11/16	4 3/16	4¼	13½	1 9/32	5½	18 13/32	1 21/32	2 5/16	5/16	¾	1	25	26
2†	8702 & 8736	3	14⅞	8¼	15¾	5 5/16	4¼	15	⅜	6⅝	20⅞	1 23/32	2⅝	5/16	¾	1½	33	35
3* 4*	8702	3	16⅛	7 13/16	24 3/16	3 9/16	9	23	1 9/32	3 31/32	23 1/16	2 7/16	3 3/16	7/16	¾	2½	65	....
	8736	3	16⅛	8 19/32	26½	3 9/16	9	25½	½	4⅞	23 1/16	2 9/16	3 3/16	7/16	¾	2½	....	68
5	8702	3	21 5/32	10 27/32	32¾	3 5/64	15	25½	½	...	31	2 51/64	3½	7/16	¾	3½	200	....
	8736	3	24 5/32	11 15/32	37¾	4 37/64	15	36¾	41/64	...	34	2 51/64	3½	7/16	¾	3½	....	225
6	8702 & 8736	2	28¼	68⅝	18⅜		Floor Mounting.										425	430
7	8702 & 8736	2	34½	101	23½												....	....
8	8702 & 8736	2	28	90	20												1000	1175

†Standard enclosure has space for a fused control transformer, Form FT, on Sizes 0-2.
*3 Pole only.

NEMA TYPE 12

NEMA Size	Class Number	Fig. No.	Dimensions — Inches A	B	C	D	E	F	G	H	I	J	Weight (Lbs.) 8702	8736
0† 1†	8702 & 8736	4	11⅞	7¾	13½	3 13/16	4¼	12¾	⅜	4 29/32	18⅛	5/16	23	24
2†	8702 & 8736	4	14⅞	7⅞	15¾	5 5/16	4¼	15	⅜	6 13/32	21¼	5/16	31	32
3* 4*	8702	4	16⅛	8 11/32	26½	3 9/16	9	25½	½	3¾	23 13/32	7/16	56	....
	8736	4	16⅛	8 9/16	26½	3 9/16	9	25½	½	4 7/32	23 13/32	7/16	....	60
5	8702	4	21 5/32	11 15/32	32½	3 5/64	15	31½	½	3 23/32	31⅛	7/16	190	....
	8736	4	24 5/32	11 15/32	37½	4 37/64	15	36½	½	5 7/32	34⅛	7/16	....	215
6	8702 & 8736	2	28¼	68⅝	18⅜	Floor Mounting.							415	420
7	8702 & 8736	2	34½	93	23½								....	....
8	8702 & 8736	2	28	90	20								1050	1165

†Standard enclosure has space for a fused control transformer, Form FT, on Sizes 0-2.
*3 Pole only.

SQD SLV_001045

AC REVERSING COMBINATION STARTERS
FUSIBLE DISCONNECT SWITCH TYPE

CLASS 8738

UL LISTED ♦

LINE VOLTAGE TYPE, REVERSING WITH THREE MELTING ALLOY OVERLOAD RELAYS
3 POLE — 600 VOLTS MAX. — 50-60 HERTZ

Ratings				General Purpose Enclosure **NEMA Type 1**		Watertight and Dusttight Enclosure Stainless Steel **NEMA Type 4**		Watertight, Dusttight and Corrosion Resistant Enclosure **NEMA Type 4X▲**		Dusttight and Driptight Industrial Use Enclosure **NEMA Type 12◐**		
Motor Voltage (Starter Voltage)	Max. HP Poly-phase	NEMA Size	Fuse Clip Size Amps.	Type	Price*	Type	Price*	Type	Price*	With External Reset Type	Without External Reset Type	Price*
200 (208)	3	0	30	SBG-12	$ 608.	SBW-12	$1096.	SBW-22	$1260.	SBA-22	SBA-12	$ 744.
	5	1	30	SCG-12	648.	SCW-12	1136.	SCW-22	1306.	SCA-22	SCA-12	784.
	7½		60	SCG-13	656.	SCW-13	1144.	SCW-23	1316.	SCA-23	SCA-13	792.
	10	2	60	SDG-12	1080.	SDW-12	1824.	SDW-22	2006.	SDA-22	SDA-12	1256.
	20	3	100	SEG-15	1784.	SEW-15	3088.	.....	.....	SEA-25	SEA-15	2016.
	40	4	200	SFG-15	3764.	SFW-15	5412.	.....	.....	SFA-25	SFA-15	4400.
	75	5	400	SGG-15	7358.	SGW-15	11566.	.....	.....	SGA-25	SGA-15	8870.
230 (240)	3	0	30	SBG-12	608.	SBW-12	1096.	SBW-22	1260.	SBA-22	SBA-12	744.
	5	1	30	SCG-12	648.	SCW-12	1136.	SCW-22	1306.	SCA-22	SCA-12	784.
	7½		60	SCG-13	656.	SCW-13	1144.	SCW-23	1316.	SCA-23	SCA-13	792.
	15	2	60	SDG-12	1080.	SDW-12	1824.	SDW-22	2006.	SDA-22	SDA-12	1256.
	25	3	100	SEG-15	1784.	SEW-15	3088.	.....	.....	SEA-25	SEA-15	2016.
	50	4	200	SFG-15	3764.	SFW-15	5412.	.....	.....	SFA-25	SFA-15	4400.
	100	5	400	SGG-15	7358.	SGW-15	11566.	.....	.....	SGA-25	SGA-15	8870.
460-575 (480-600)	5	0	30	SBG-13	616.	SBW-13	1104.	SBW-23	1270.	SBA-23	SBA-13	752.
	10	1	30	SCG-14	656.	SCW-14	1144.	SCW-24	1316.	SCA-24	SCA-14	792.
	15	2	30	SDG-16	1084.	SDW-16	1828.	SDW-26	2010.	SDA-26	SDA-16	1260.
	25		60	SDG-14	1092.	SDW-14	1836.	SDW-24	2020.	SDA-24	SDA-14	1268.
	50	3	100	SEG-13	1808.	SEW-13	3112.	.....	.....	SEA-23	SEA-13	2040.
	100	4	200	SFG-13	3780.	SFW-13	5428.	.....	.....	SFA-23	SFA-13	4416.
	200	5	400	SGG-13	7358.	SGW-13	11566.	.....	.....	SGA-23	SGA-13	8870.

AC REVERSING COMBINATION STARTERS
NON-FUSIBLE DISCONNECT SWITCH TYPE

LINE VOLTAGE TYPE, REVERSING WITH THREE MELTING ALLOY OVERLOAD RELAYS
3 POLE — 600 VOLTS MAX. — 50-60 HERTZ

200 (208)	3	0	None	SBG-11	$ 596.	SBW-11	$1084.	SBW-21	$1246.	SBA-21	SBA-11	$ 732.
	7½	1	None	SCG-11	636.	SCW-11	1124.	SCW-21	1292.	SCA-21	SCA-11	772.
	10	2	None	SDG-11	1064.	SDW-11	1808.	SDW-21	1988.	SDA-21	SDA-11	1240.
	25	3	None	SEG-11	1764.	SEW-11	3068.	.....	.....	SEA-21	SEA-11	1996.
	40	4	None	SFG-11	3696.	SFW-11	5344.	.....	.....	SFA-21	SFA-11	4332.
	75	5	None	SGG-11	7214.	SGW-11	11422.	.....	.....	SGA-21	SGA-11	8726.
230 (240)	3	0	None	SBG-11	596.	SBW-11	1084.	SBW-21	1246.	SBA-21	SBA-11	732.
	7½	1	None	SCG-11	636.	SCW-11	1124.	SCW-21	1292.	SCA-21	SCA-11	772.
	15	2	None	SDG-11	1064.	SDW-11	1808.	SDW-21	1988.	SDA-21	SDA-11	1240.
	30	3	None	SEG-11	1764.	SEW-11	3068.	.....	.....	SEA-21	SEA-11	1996.
	50	4	None	SFG-11	3696.	SFW-11	5344.	.....	.....	SFA-21	SFA-11	4332.
	100	5	None	SGG-11	7214.	SGW-11	11422.	.....	.....	SGA-21	SGA-11	8726.
460-575 (480-600)	5	0	None	SBG-11	596.	SBW-11	1084.	SBW-21	1246.	SBA-21	SBA-11	732.
	10	1	None	SCG-11	636.	SCW-11	1124.	SCW-21	1292.	SCA-21	SCA-11	772.
	25	2	None	SDG-11	1064.	SDW-11	1808.	SDW-21	1988.	SDA-21	SDA-11	1240.
	50	3	None	SEG-11	1764.	SEW-11	3068.	.....	.....	SEA-21	SEA-11	1996.
	100	4	None	SFG-11	3696.	SFW-11	5344.	.....	.....	SFA-21	SFA-11	4332.
	200	5	None	SGG-11	7214.	SGW-11	11422.	.....	.....	SGA-21	SGA-11	8726.

*** Prices do not include thermal units. For selection, see page 466.**

◐ NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to page 448.

▲ NEMA Type 4X hubs are included with each starter at no additional cost.

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Horsepower, voltage, phase, frequency and full load current of motor.
3. Control voltage and frequency if different from line voltage.
4. Any factory modifications and forms required, see pages 461-463.

THERMAL UNITS

Thermal units should be ordered separately. See Selection Index on Page 466. Standard trip thermal units are priced at **$6.00** each.

FIELD MODIFICATION KITS

Refer to Page 269 and Class 9999 Section.

♦UL LISTED
SHORT CIRCUIT WITHSTAND RATINGS‡

Standard Fuse Clips NEMA Size	Available Amperes RMS Symmetrical
0-2	5,000

Non-Fusible Disconnect Switch devices are UL Listed in NEMA Sizes 0-2.

‡ NEMA Type 4X devices are not UL Listed.

SQD SLV_001046

UL LISTED
FOR 100,000A ‡

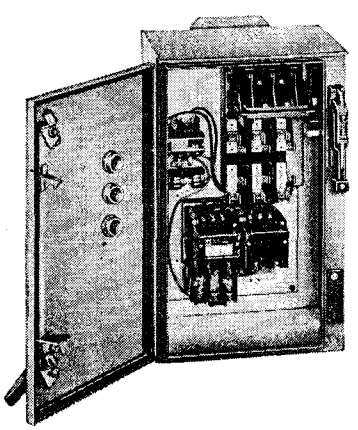
AC REVERSING COMBINATION STARTERS
FUSIBLE DISCONNECT SWITCH TYPE WITH CLASS R FUSE CLIPS

CLASS 8738

LINE VOLTAGE TYPE, REVERSING WITH THREE MELTING ALLOY OVERLOAD RELAYS
3 POLE — 600 VOLTS MAX. — 50-60 HERTZ

Ratings				General Purpose Enclosure NEMA Type 1		Watertight and Dusttight Enclosure Stainless Steel NEMA Type 4		Watertight, Dusttight and Corrosion Resistant Enclosure NEMA Type 4X▲		Dusttight and Driptight Industrial Use Enclosure NEMA Type 12◐		
Motor Voltage (Starter Voltage)	Max. HP Poly-phase	NEMA Size	Fuse Clip Size Amps.	Type	Price*	Type	Price*	Type	Price*	With External Reset Type	Without External Reset Type	Price*
200 (208)	3	0	30	SBG-32	$ 614.	SBW-32	$1102.	SBW-42	$1268.	SBA-42	SBA-32	$ 750.
	5	1	30	SCG-32	654.	SCW-32	1142.	SCW-42	1314.	SCA-42	SCA-32	790.
	7½		60	SCG-33	662.	SCW-33	1148.	SCW-43	1320.	SCA-43	SCA-33	798.
	10	2	60	SDG-32	1086.	SDW-32	1830.	SDW-42	2014.	SDA-42	SDA-32	1262.
	20	3	100	SEG-35	1796.	SEW-35	3100.	.....	.....	SEA-45	SEA-35	2028.
	40	4	200	SFG-35	3776.	SFW-35	5424.	.....	.....	SFA-45	SFA-35	4412.
	75	5	400	SGG-35	7386.	SGW-35	11566.	.....	.....	SGA-45	SGA-35	8898.
230 (240)	3	0	30	SBG-32	614.	SBW-32	1102.	SBW-42	1268.	SBA-42	SBA-32	750.
	5	1	30	SCG-32	654.	SCW-32	1142.	SCW-42	1314.	SCA-42	SCA-32	790.
	7½		60	SCG-33	662.	SCW-33	1148.	SCW-43	1320.	SCA-43	SCA-33	798.
	15	2	60	SDG-32	1086.	SDW-32	1830.	SDW-42	2014.	SDA-42	SDA-32	1262.
	25	3	100	SEG-35	1796.	SEW-35	3100.	.....	.....	SEA-45	SEA-35	2028.
	50	4	200	SFG-35	3776.	SFW-35	5424.	.....	.....	SFA-45	SFA-35	4412.
	100	5	400	SGG-35	7386.	SGW-35	11566.	.....	.....	SGA-45	SGA-35	8898.
460-575 (480-600)	5	0	30	SBG-33	622.	SBW-33	1110.	SBW-43	1276.	SBA-43	SBA-33	758.
	10	1	30	SCG-34	662.	SCW-34	1150.	SCW-44	1322.	SCA-44	SCA-34	798.
	15	2	30	SDG-36	1090.	SDW-36	1834.	SDW-46	2018.	SDA-46	SDA-36	1266.
	25		60	SDG-34	1098.	SDW-34	1842.	SDW-44	2086.	SDA-44	SDA-34	1274.
	50	3	100	SEG-33	1820.	SEW-33	3124.	.....	.....	SEA-43	SEA-33	2052.
	100	4	200	SFG-33	3792.	SFW-33	5460.	.....	.....	SFA-43	SFA-33	4428.
	200	5	400	SGG-33	7386.	SGW-33	11566.	.....	.....	SGA-43	SGA-33	8898.

*** Prices do not include thermal units. For selection, see page 466.**
◐ NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to page 448.
▲ NEMA Type 4X hubs are included with each starter at no additional cost.
‡ Available amperes RMS symmetrical. NEMA sizes 0-2 only. NEMA Type 4X devices are not UL Listed.



ORDERING INFORMATION — See page 268.

Reversing Combination Starter, Showing Interchangeable Fuse Clips and Transformer

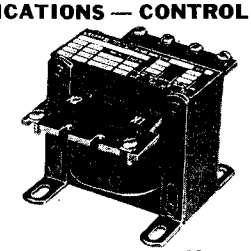
AC REVERSING COMBINATION STARTERS
DISCONNECT SWITCH AND CIRCUIT BREAKER TYPE

CLASS 8738 8739

MODIFICATIONS — FUSE BLOCK
Refer to Class 8538-8539 section, page 244.

MODIFICATIONS — CONTROL CIRCUIT TRANSFORMER

Space and drilling are provided in all combination starters, in NEMA Types 1, 4 and 12 enclosures, for the field addition (or factory installation) of a Class 9070 transformer. Space and drilling are also provided for the Class 9080 Type PF-1 control circuit fuse block. Consult local Square D field office for transformer additions to NEMA Type 4X enclosures.



Class 9070 Type EO Control Circuit Transformer

TRANSFORMER SELECTION

NEMA Size	Starter Type	Standard Capacity (Form FT) Class 9070 Type	100 VA Additional Capacity (Form FT-11) Class 9070 Type	200 VA Additional Capacity (Form FT-12) Class 9070 Type
0-2	SB-SD	EO-2	EO-4	EO-4
3	SE	EO-3	EO-4	EO-51
4	SF	EO-4	EO-51	EO-51
5	SG	EO-1 and 8501 Relay	EO-3 and 8501 Relay	EO-4 and 8501 Relay

MODIFICATIONS — COVER MOUNTED CONTROL UNITS

NEMA Types 1, 4 and 12 Enclosures — Three punched holes are provided in the cover to accept factory or field installation of Class 9001 Type K control units. These holes are covered with Class 9001 closing plates. When installing Class 9001 Type K control units in NEMA Type 4 enclosures, Class 9001 Type KU water-tight caps must be used. For further details and pricing of these units, see the Class 9001 Section.

SQD SLV_001047

AC REVERSING COMBINATION STARTERS

MAG-GARD® MOTOR CIRCUIT PROTECTOR TYPE

CLASS 8739

NOTE: The type number selections are listed for motors with typical locked rotor inrush characteristics. For selection restrictions refer to the "motor code letter" table on Page 271.

UL LISTED FOR 22,000A♦ OR 100,000A

LINE VOLTAGE TYPE, REVERSING WITH THREE MELTING ALLOY OVERLOAD RELAYS

3 POLE, 600 VOLTS AC MAXIMUM — 50-60 HERTZ

Ratings				General Purpose Enclosure NEMA Type 1		Watertight and Dusttight Enclosure Stainless Steel (Sizes 0-5) NEMA Type 4		Watertight Dusttight and Corrosion Resistant Enclosure NEMA Type 4X▲		For Hazardous Locations — SPIN TOP® Enclosure Class I Group C & D Class II Groups E, F & G NEMA Type 7 & 9		Dusttight and Driptight, Industrial Use Enclosure NEMA Type 12◐		
Motor Voltage (Starter Voltage)	H.P. Range Poly-phase	NEMA Size	Catalog Number (See Below for Breaker Adjust-ment Range)	Type	Price*	Type	Price*	Type	Price*	Type	Price*	With External Reset Type	Without External Reset Type	Price*
200 (208)	¼-⅓ ½-1 1½-3	0	FAL36003-11M FAL36007-12M FAL36015-13M	SBG-41 SBG-42 SBG-43	$ 716.	SBW-41 SBW-42 SBW-43	$ 1204.	SBW-51 SBW-52 SBW-53	1384.	SBR-41 SBR-42 SBR-43	$ 1486.	SBA-51 SBA-52 SBA-53	SBA-41 SBA-42 SBA-43	$ 852.
	¼-⅓ ½-1 1½-3 5 7½	1	FAL36003-11M FAL36007-12M FAL36015-13M FAL36030-15M FAL36050-16M	SCG-41 SCG-42 SCG-43 SCG-44 SCG-45	764.	SCW-41 SCW-42 SCW-43 SCW-44 SCW-45	1252.	SCW-51 SCW-52 SCW-53 SCW-54 SCW-55	1440.	SCR-41 SCR-42 SCR-43 SCR-44 SCR-45	1540.	SCA-51 SCA-52 SCA-53 SCA-54 SCA-55	SCA-41 SCA-42 SCA-43 SCA-44 SCA-45	900.
	1½-3 5 7½-10	2	FAL36015-13M FAL36030-15M FAL36050-16M	SDG-41 SDG-42 SDG-43	1220.	SDW-41 SDW-42 SDW-43	1964.	SDW-51 SDW-52 SDW-53	2160.	SDR-41 SDR-42 SDR-43	2288.	SDA-51 SDA-52 SDA-53	SDA-41 SDA-42 SDA-43	1396.
	15-25	3	FAL36100-18M	SEG-42	1824.	SEW-42	3128.	SEW-52	3440.	SER-42	3818.	SEA-52	SEA-42	2056.
	30 40	4	KAL36225-25M KAL36225-26M	SFG-42 SFG-43	4132.	SFW-42 SFW-43	5780.	SFW-52 SFW-53	6358.	....	....	SFA-52 SFA-53	SFA-42 SFA-43	4768.
	50 60 75	5	KAL36225-30M LAL36400-32M LAL36400-33M	SGG-42 SGG-44 SGG-45	8370.	SGW-42 SGW-44 SGW-45	12578.	....	....	....	....	SGA-52 SGA-54 SGA-55	SGA-42 SGA-44 SGA-45	9882.
	100 125 150	6	LAL36400-36M MAL36600-40M MAL36600-42M	SHG-43 SHG-44 SHG-45	18050.	SHW-43 SHW-44 SHW-45	20050.	....	....	....	....	SHA-53 SHA-54 SHA-55	SHA-43 SHA-44 SHA-45	19130.
230 (240)	¼-⅓ ½-1 1½-3	0	FAL36003-11M FAL36007-12M FAL36015-13M	SBG-41 SBG-42 SBG-43	716.	SBW-41 SBW-42 SBW-43	1204.	SBW-51 SBW-52 SBW-53	1384.	SBR-41 SBR-42 SBR-43	1486.	SBA-51 SBA-52 SBA-53	SBA-41 SBA-42 SBA-43	852.
	¼-⅓ ½-1 1½-3 5-7½	1	FAL36003-11M FAL36007-12M FAL36015-13M FAL36030-15M	SCG-41 SCG-42 SCG-43 SCG-44	764.	SCW-41 SCW-42 SCW-43 SCW-44	1252.	SCW-51 SCW-52 SCW-53 SCW-54	1440.	SCR-41 SCR-42 SCR-43 SCR-44	1540.	SCA-51 SCA-52 SCA-53 SCA-54	SCA-41 SCA-42 SCA-43 SCA-44	900.
	1½-3 5-7½ 10 15	2	FAL36015-13M FAL36030-15M FAL36050-16M FAL36100-18M	SDG-41 SDG-42 SDG-43 SDG-44	1220.	SDW-41 SDW-42 SDW-43 SDW-44	1964.	SDW-51 SDW-52 SDW-53 SDW-54	2160.	SDR-41 SDR-42 SDR-43 SDR-44	2288.	SDA-51 SDA-52 SDA-53 SDA-54	SDA-41 SDA-42 SDA-43 SDA-44	1396.
	15-30	3	FAL36100-18M	SEG-42	1824.	SEW-42	3128.	SEW-52	3440.	SER-42	3818.	SEA-52	SEA-42	2056.
	40 50	4	KAL36225-26M KAL36225-29M	SFG-43 SFG-44	4132.	SFW-43 SFW-44	5780.	SFW-53 SFW-54	6358.	....	....	SFA-53 SFA-54	SFA-43 SFA-44	4768.
	60 75 100	5	KAL36225-31M LAL36400-32M LAL36400-35M	SGG-43 SGG-44 SGG-46	8370.	SGW-43 SGW-44 SGW-46	12578.	....	....	....	....	SGA-53 SGA-54 SGA-56	SGA-43 SGA-44 SGA-46	9882.
	125-150 200	6	MAL36600-40M MAL36600-44M	SHG-44 SHG-46	18050.	SHW-44 SHW-46	20050.	....	....	....	....	SHA-54 SHA-56	SHA-44 SHA-46	19130.

For 460 and 575 volt listings, see Page 271.

*** Prices do not include thermal units. For selection, see page 466.**

◐ NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to page 448.

▲ NEMA Type 4X hubs are included with each starter at no additional cost.

MAG-GARD TRIP RANGE

Suffix Number	Range Amps.	Suffix Number	Range Amps.	Suffix Number	Range Amps.
11M	8-22	25M	625-1250	33M	1500-3000
12M	18-58	26M	750-1500	35M	1750-3500
13M	50-150	29M	875-1750	36M	2000-4000
15M	100-300	30M	1000-2000	40M	2500-5000
16M	150-480	31M	1125-2250	42M	3000-6000
18M	330-1200	32M	1250-2500	44M	3500-7000

ORDERING INFORMATION REQUIRED — See Page 268.

FIELD MODIFICATION KITS

Refer to Page 269 and Class 9999 Section.

CURRENT LIMITING MODULE

Classes 8539 and 8739 combination starters NEMA Sizes 0-3, NEMA Types 1, 4 and 12 with a factory added Current Limiting Module (CLM) are UL listed for use on systems having an available fault current of 100,000 amperes RMS symmetrical.

A combination starter with the CLM is obtained by:

1. Selecting a NEMA Size 0-3, NEMA Type 1, 4 or 12 Mag-Gard® combination starter based on voltage and motor horsepower from the 8539 or 8739 tables.
2. Requesting Form Y126-1. Adder is **$120.** D1A.

♦UL LISTED
SHORT CIRCUIT WITHSTAND RATINGS‡

NEMA Size	Voltage	Available Amperes RMS Symmetrical
0 & 1	0-480	22,000
0 & 1	481-600	10,000
2-6	600	22,000
0-3 With CLM	600	100,000

‡ NEMA Type 4X and NEMA Types 7 and 9 are not UL Listed.

SQD SLV_001048

UL LISTED
FOR 22,000A♦
OR 100,000A

AC REVERSING COMBINATION STARTERS
MAG-GARD® MOTOR CIRCUIT PROTECTOR TYPE

NOTE: The type number selections are listed for motors with typical locked rotor inrush characteristics. For selection restrictions refer to the "motor code letter" table below★

CLASS 8739

LINE VOLTAGE TYPE, REVERSING WITH THREE MELTING ALLOY OVERLOAD RELAYS

3 POLE, 600 VOLTS MAX., 50-60 HERTZ

Ratings				General Purpose Enclosure NEMA Type 1		Watertight and Dusttight Enclosure Stainless Steel (Sizes 0-5) NEMA Type 4		Watertight, Dusttight and Corrosion Resistant Enclosure NEMA Type 4X▲		For Hazardous Locations — SPIN TOP® Enclosure Class I Group C & D Class II Groups E, F & G NEMA Type 7 & 9		Dusttight and Driptight, Industrial Use Enclosure NEMA Type 12◐		
Motor Voltage (Starter Voltage)	H.P. Range Poly-phase	NEMA Size	Catalog Number (Refer to Page 270 for Breaker Adjust-ment Range)	Type	Price*	Type	Price*	Type	Price*	Type	Price*	With External Reset Type	Without External Reset Type	Price*
460 (480)	¼-1 1½-3 5	0	FAL36003-11M FAL36007-12M FAL36015-13M	SBG-41 SBG-42 SBG-43	$ 716.	SBW-41 SBW-42 SBW-43	$ 1204.	SBW-51 SBW-52 SBW-53	$1384.	SBR-41 SBR-42 SBR-43	$1486.	SBA-51 SBA-52 SBA-53	SBA-41 SBA-42 SBA-43	$ 852.
	¼-1 1½-3 5-7½ 10	1	FAL36003-11M FAL36007-12M FAL36015-13M FAL36030-15M	SCG-41 SCG-42 SCG-43 SCG-44	764.	SCW-41 SCW-42 SCW-43 SCW-44	1252.	SCW-51 SCW-52 SCW-53 SCW-54	1440.	SCR-41 SCR-42 SCR-43 SCR-44	1540.	SCA-51 SCA-52 SCA-53 SCA-54	SCA-41 SCA-42 SCA-43 SCA-44	900.
	5-7½ 10-15 20-25	2	FAL36015-13M FAL36030-15M FAL36050-16M	SDG-41 SDG-42 SDG-43	1220.	SDW-41 SDW-42 SDW-43	1964.	SDW-51 SDW-52 SDW-53	2160.	SDR-41 SDR-42 SDR-43	2288.	SDA-51 SDA-52 SDA-53	SDA-41 SDA-42 SDA-43	1396.
	20-25 30-50	3	FAL36050-16M FAL36100-18M	SEG-41 SEG-42	1824.	SEW-41 SEW-42	3128.	SEW-51 SEW-52	3440.	SER-41 SER-42	3818.	SEA-51 SEA-52	SEA-41 SEA-42	2056.
	60-75 100	4	KAL36225-25M KAL36225-29M	SFG-42 SFG-44	4132.	SFW-42 SFW-44	5780.	SFW-52 SFW-54	6358.	....	....	SFA-52 SFA-54	SFA-42 SFA-44	4768.
	125 150 200	5	KAL36225-31M LAL36400-32M LAL36400-35M	SGG-43 SGG-44 SGG-46	8370.	SGW-43 SGW-44 SGW-46	12578.	....	....	....	....	SGA-53 SGA-54 SGA-56	SGA-43 SGA-44 SGA-46	9882.
	250 300 350 400	6	LAL36400-36M MAL36600-40M MAL36600-42M MAL36600-44M	SHG-43 SHG-44 SHG-45 SHG-46	18050.	SHW-43 SHW-44 SHW-45 SHW-46	20050.	....	....	....	....	SHA-53 SHA-54 SHA-55 SHA-56	SHA-43 SHA-44 SHA-45 SHA-46	19130.
575 (600)	¼-1 1½-3 5	0	FAL36003-11M FAL36007-12M FAL36015-13M	SBG-41 SBG-42 SBG-43	716.	SBW-41 SBW-42 SBW-43	1204.	SBW-51 SBW-52 SBW-53	1384.	SBR-41 SBR-42 SBR-43	1486.	SBA-51 SBA-52 SBA-53	SBA-41 SBA-42 SBA-43	852.
	¼-1 1½-3 5-10	1	FAL36003-11M FAL36007-12M FAL36015-13M	SCG-41 SCG-42 SCG-43	764.	SCW-41 SCW-42 SCW-43	1252.	SCW-51 SCW-52 SCW-53	1440.	SCR-41 SCR-42 SCR-43	1540.	SCA-51 SCA-52 SCA-53	SCA-41 SCA-42 SCA-43	900.
	5-10 15-20 25	2	FAL36015-13M FAL36030-15M FAL36050-16M	SDG-41 SDG-42 SDG-43	1220.	SDW-41 SDW-42 SDW-43	1964.	SDW-51 SDW-52 SDW-53	2160.	SDR-41 SDR-42 SDR-43	2288.	SDA-51 SDA-52 SDA-53	SDA-41 SDA-42 SDA-43	1396.
	25-30 40-50	3	FAL36050-16M FAL36100-18M	SEG-41 SEG-42	1824.	SEW-41 SEW-42	3128.	SEW-51 SEW-52	3440.	SER-41 SER-42	3818.	SEA-51 SEA-52	SEA-41 SEA-42	2056.
	60-100	4	KAL36225-25M	SFG-42	4132.	SFW-42	5780.	SFW-52	6358.	....	....	SFA-52	SFA-42	4768.
	125 150 200	5	KAL36225-29M KAL36225-30M LAL36400-32M	SGG-41 SGG-42 SGG-44	8370.	SGW-41 SGW-42 SGW-44	12578.	....	....	....	....	SGA-51 SGA-52 SGA-54	SGA-41 SGA-42 SGA-44	9882.
	250 300 350-400	6	LAL36400-35M LAL36400-36M MAL36600-40M	SHG-42 SHG-43 SHG-44	18050.	SHW-42 SHW-43 SHW-44	20050.	....	....	....	....	SHA-52 SHA-53 SHA-54	SHA-42 SHA-43 SHA-44	19130.

*** Prices do not include thermal units. For selection, see page 466.**
◐ NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to page 448.
▲ NEMA Type 4X hubs are included with each starter at no additional cost.

♦UL LISTED
SHORT CIRCUIT WITHSTAND RATINGS‡

NEMA Size	Voltage	Available Amperes RMS Symmetrical
0 & 1	0-480	22,000
0 & 1	481-600	10,000
2-6	600	22,000
0-3 With CLM See P. 270	600	100,000

‡ NEMA Type 4X and NEMA Types 7 and 9 are not UL Listed.

★MOTOR CODE LETTER TABLE

HORSEPOWER	MOTOR CODE LETTERS
½ or less	A-L
¾ - 1½	A-K
2 - 3	A-J
5 - 25	A-H
30 - 125	A-G
150 or more	A-F

For other motors a special thermal strip circuit breaker with magnetic trip settings for the specific motor is required. When ordering combination starters for these special applications, specify the complete motor horsepower, voltage, frequency, full load current and **code letter** (or locked rotor current) to assure proper selection. This special circuit breaker will be listed as Form Y53-8.

ORDERING INFORMATION REQUIRED — See Page 268.

THERMAL UNITS

Thermal units should be ordered separately. See Selection Index on Page 466. Standard trip thermal units are priced at **$6.00** each.

FIELD MODIFICATION KITS — Refer to Page 269 and Class 9999 Section.

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SPIN TOP is a Registered Trademark of Square D Company.

SQD SLV_001049

AC REVERSING COMBINATION STARTERS
DISCONNECT SWITCH or CIRCUIT BREAKER TYPE

CLASS 8738 8739

APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS

NEMA 1 ENCLOSURE — FIGURE 1

NEMA Size	Class	Type	DIMENSIONS IN INCHES* A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Top & Bottom W	Top & Bottom X	Sides Y	Wt. (Lbs.)
0-1	8738 & 8739	SBG SCG	13 7/8	22 1/8	8 11/32	10 5/8	20	18 29/32	1 7/8	1 7/8	3 3/4	2 5/16	1 1/16	3 7/8	2 3/16	1 1/4	7/8	1/2-3/4-1	1/2-3/4-1	1/2	49
2	8738 & 8739	SDG	15 5/32	27 29/32◆	9 19/32	11 5/8	25 1/4◆	21 15/32	2 3/16	2	4	2 9/16	1 5/16	3 7/8	2 3/16	1 1/2	2 9/32	1-1 1/4	1/2-3/4	1/2	80
3	8738 & 8739	SEG	18 21/32	36 21/32	10 21/32	15 1/8	34	25 31/32	2 29/32	2 11/16	5 3/8	2 9/16	1 11/32	4 29/32	2 7/32	1 9/32	2 9/32	1-1 1/4 2-2 1/2	1/2-3/4	1/2	245
4	8738	SFG	21 29/32	42 29/32	12 5/32	18 3/8	40 1/4	30 23/32	2 29/32	2 11/16	5 3/8	2 9/16	1 11/32	4 29/32	2 7/32	1 9/32	2 9/32	1-1 1/4 2-2 1/2	1/2-3/4	1/2	...
	8739	SFG	18 21/32	36 21/32	10 21/32	15 1/8	34	25 31/32	2 29/32	2 11/16	5 3/8	2 9/16	1 11/32	3 5/16	2 7/32	1 9/32	2 9/32	1-1 1/4 2-2 1/2	1/2-3/4	1/2	...
5	8738	SGG	30 1/4	67	15 1/2	15	66	39 13/32	3 9/16	3 3/16	..	6 9/32	1/2	9 7/32	7 5/8	..	..	3/4†	3	....	....
	8739	SGG	30 1/4	55	11 29/32	15	54	27 13/32	3 9/16	3 3/16	..	6 9/32	1/2	9 7/32	7 5/8	..	..	3/4†	3	....	....
6▲	8739	SHG	36	80	21 1/32	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

†Left side only.

NEMA 4 ENCLOSURE — FIGURE 2

NEMA Size	Class	Type	DIMENSIONS IN INCHES* A	B	C	D	E	F	G	H	I	J	K	L	Bottom W	Top & Bot X	Wt. (Lbs.)
0-1	8738 & 8739	SBW SCW	13 7/8	8 11/32	24 1/8	3 7/8	4 13/16	4 1/4	23	1 9/32	6 3/32	1 5/8	2 5/16	18 17/32	3/4 Hub	1 Hub	52
2	8738 & 8739	SDW	15 1/8	9 19/32	29 15/16◆	3 7/8	5 7/16	4 1/4	28 3/4◆	5/8	6 23/32	2	2 5/8	21 1/32	3/4 Hub	1 1/2 Hub	95
3	8738 & 8739	SEW	18 5/8	10 9/16	39 3/16	4 29/32	4 13/16	9	38	1 9/32	6 3/32	2 9/16	3 3/16	25 1/2	3/4 Hub	2 1/2 Hub	255
4	8738	SFW	21 7/8	12 9/16	45 7/16	4 29/32	6 7/16	9	44 1/4	1 9/32	7 23/32	2 9/16	3 3/16	30 1/4	3/4 Hub	2 1/2 Hub	...
	8739	SFW	18 5/8	10 9/16	39 3/16	3 5/16	4 13/16	9	38	1 9/32	6 3/32	2 9/16	3 3/16	25 1/2	3/4 Hub	2 1/2 Hub	...
5	8738	SGW	30 1/4	15 1/2	67 3/32	9 7/32	7 5/8	15	66	9/16	11 9/32	3	3 1/2	39 13/32	3/4 Hub	3 1/2 Hub	...
	8739	SGW	30 1/4	12 13/32	55 3/32	4 29/32	7 5/8	15	54	9/16	11 9/32	3	3 1/2	37 29/32	3/4 Hub	3 1/2 Hub	...
6▲	8739	SHW	36	21 1/32	88	....	....	....	....	....	....	....	....	....	....	....	....

NEMA 4X ENCLOSURE — FIGURE 1 PAGE 250

NEMA Size	Class	Type	Dimensions In Inches* A	B	C	D	E	F	G	H	I	J	Wt. (Lbs.)
0-2	8738-8739	SBW SCW SDW	15.41	11.60	28.00	4.75	1.77	11.88	27.25	.38	2.33	20.62	65 65 70
3-4	8739	SEW SFW	25.41	11.60	28.00	4.75	1.83	21.75	27.25	.38	2.39	30.62	110 120

NEMA 12 ENCLOSURE — FIGURE 3

NEMA Size	Class	Type	DIMENSIONS IN INCHES* A	B	C	D	E	F	G	H	I	J	Wt. (Lbs.)
0-1	8738 & 8739	SBA SCA	13 7/8	10 3/32	23 3/4	3 7/8	4 13/16	4 1/4	23	3/8	6 19/32	20 5/16	52
2	8738 & 8739	SDA	15 5/32	10 31/32	29 1/2◆	3 7/8	5 7/16	4 1/4	28 3/4◆	3/8	7 3/16	23 7/16	95
3	8738 & 8739	SEA	18 21/32	10 19/32	39	4 29/32	4 27/32	9	38	1/2	6 9/16	25 19/32	255
4	8738	SFA	21 29/32	12 3/32	45 1/4	4 29/32	6 15/32	9	44 1/4	1/2	8 3/16	30 11/32	....
	8739	SFA	18 21/32	10 19/32	39	3 5/16	4 27/32	9	38	1/2	6 9/16	25 19/32	....
5	8738	SGA	30 1/4	15 1/2	67	9 7/32	7 5/8	15	66	1/2	11 9/32	39 13/32	....
	8739	SGA	30 1/4	12 13/32	55	4 29/32	7 5/8	15	54	1/2	11 9/32	37 29/32	....
6▲	8739	SHA	36	21 1/32	80	....	....	....	....	....	....	....	....

▲Size 6 enclosures are floor mounting.
*Above dimensions also for Form FT (standard control transformer). Form FT11 (100 VA extra capacity) and Form FT12 (200 VA extra capacity).
◆Dimension in table for 8738 Series A and 8739 Series A thru C only. For 8738 Series B & C and 8739 Series D devices (manufactured only after January 1, 1981) add 1" to NEMA 1 B and E dimensions and NEMA 4 and 12 C and G dimensions.

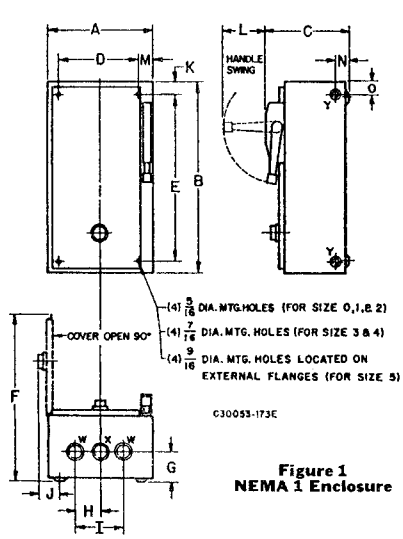


Figure 1
NEMA 1 Enclosure

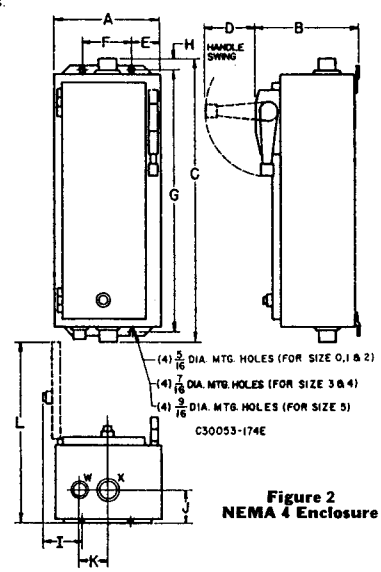


Figure 2
NEMA 4 Enclosure

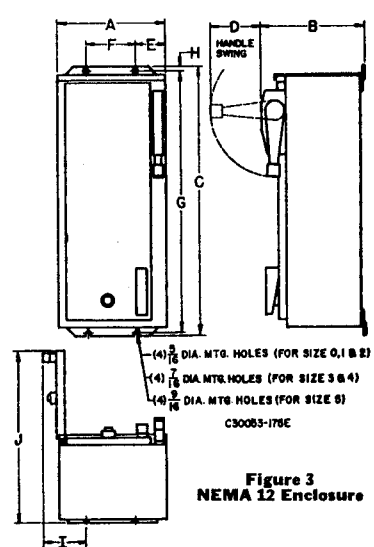


Figure 3
NEMA 12 Enclosure

SQD SLV_001050

AC MULTISPEED MAGNETIC STARTERS

APPLICATION DATA

CLASS 8810 8811 8812

Multispeed motors are available in two basic versions: 1). Consequent pole and 2). separate winding. A separate winding motor has a winding for each speed while a consequent pole motor has a winding for every two speeds (three speed motors have two windings). The motor connections (and thus the types of controllers) for two speed starters are exemplified by the schematic diagrams shown below. Note that consequent pole two speed controllers involve a 5-pole and a 3-pole starter while separate winding controllers have two 3-pole starters.

Separate winding motors are usually chosen when flexibility is important, since the speeds of a consequent pole motor are usually limited to a 2/1 ratio; a broad range of speeds can be obtained on a separate winding motor.

Both consequent pole and separate winding motors are available in three types: 1). Constant horsepower, 2). Constant torque, and 3). Variable torque. Typical applications for these different types of motors are shown below. NOTE: For detailed information involving the technical aspects of flexibility of the starters used in the multispeed controllers, see Classes 8702, 8736 and 8810 application data.

TYPICAL APPLICATIONS

CONSTANT H.P.	CONSTANT TORQUE	VARIABLE TORQUE
A. Spindles	A. Conveyors	A. Fans
B. Cutting Tools	B. Mills	B. Centrifugal Pumps
1. Lathes	C. Dough Mixers	
2. Saws	D. Reciprocating Pumps	

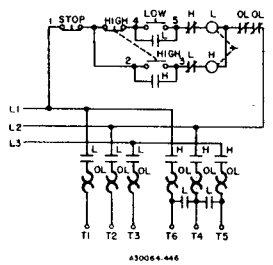
SPEED SELECTION

The speed of a squirrel cage motor is directly proportional to the power supply frequency and inversely proportional to the number of poles in the stator winding. With the frequency constant, motor speed is determined by the number of poles.

$$(\text{RPM) SPEED} = \frac{(120)\ (\text{Frequency})}{\text{No. of Poles}} \qquad \text{Horsepower} = \frac{T \times S}{5250}$$

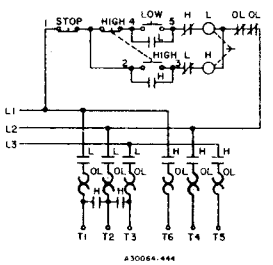
WHERE:
T = Torque in Lb. Ft.
S = Speed in RPM

TYPICAL SCHEMATIC DIAGRAMS



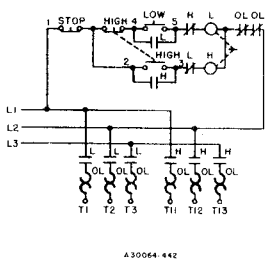
A30064-446

2-Speed
Consequent Pole
Constant Horsepower
NEMA SIZE 0-4
Sizes 5, 6 & 7 Use Special Circuitry



A30064-444

2-Speed
Consequent Pole
Constant or Variable Torque
NEMA SIZE 0-4
Sizes 5, 6 & 7 Use Special Circuitry



A30064-442

2-Speed
Separate Winding
Constant HP, Constant Torque
and Variable Torque
NEMA SIZE 0-4
Sizes 5, 6 & 7 Use Special Circuitry

ADDITIONAL FEATURES

SPECIAL RELAYS FOR NON-REVERSING AND REVERSING MULTISPEED STARTERS

General. Standard starters are not equipped with any special relays to require starting at lowest speed, progressive acceleration or deceleration through each speed, etc. However, when the type of motor or characteristics of the load involved make certain starting or control sequences necessary, four types of relays/timers are available to accomplish the required function.

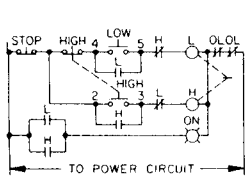
Form R1 Compelling Relay. This relay makes it necessary for the motor to be started at low speed before any higher speed can be selected. Pressing any push button except the low speed will not start the motor. This arrangement insures that the motor will always start the load at low speed. The stop button must be pressed before it is possible to change from a higher to a lower speed.

Form R2 Accelerating Relay/Timer. When the starter is equipped with Form R2 accelerating relays, the ultimate speed is determined by the button which is pressed, but the starter will start the motor at low speed and then automatically accelerate it through successive steps until the selected speed is reached. Definite time intervals must elapse between each speed change. Individual timing relays are provided for each interval, and all are adjustable. The stop button must be pressed before it is possible to change from a higher to a lower speed.

Form R3 Decelerating Relay/Timer. This is similar in action to Form R2 accelerating relays, except that they function to prevent immediate transfer from a higher to a lower speed. A definite time interval, preset on the timer, must elapse between each speed change.

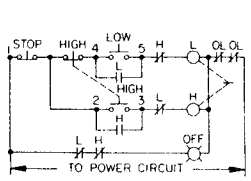
Form R10 Antiplugging Relays/Timers. If it is necessary to have an imposed time delay when transferring from the forward to the reverse direction or reverse to forward, then Form R10 should be included in the form designation of the **reversing** multispeed starters. This provides up to a 60 second delay in the transfer of the direction of the motor, and can help prevent damage which could result from plugging.

SPECIAL PILOT LIGHTING



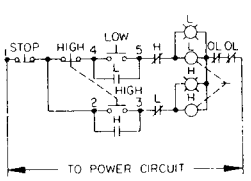
A30080-017

One pilot light "ON"



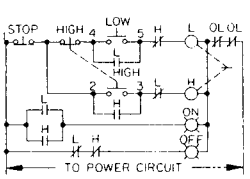
A30080-018

One pilot light "OFF"



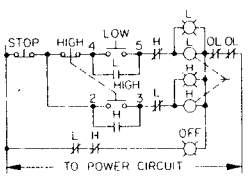
A30080-015

Two pilot lights "L" and "H"



A30080-016

Two pilot lights "ON" and "OFF"



A30080-019

Three pilot lights "L", "H" and "OFF"

SQD SLV_001051

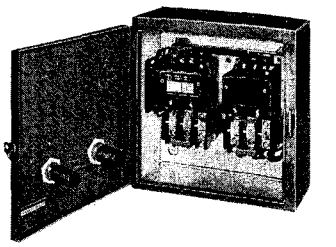
AC TWO SPEED MAGNETIC STARTERS

LINE VOLTAGE — WITH MELTING ALLOY OVERLOAD RELAYS

CLASS 8810 8811 8812

Line voltage type, ac two speed starters are designed to control reconnectable squirrel cage motors to operate at two different constant speeds, depending upon their construction. The use of an automatic starter and proper control station permits greater operating efficiency and offers protection to both motor and machine against improper sequencing or too rapid speed change. Protection against motor overload in each speed is provided by an overload relay block which accepts three (3) thermal units.

Two speed reversing (Class 8810), three speed (Class 8811) and four speed (Class 8812) starters are also available. For prices and type numbers, consult local Square D Field Office.



Class 8810, Type S in NEMA 1 Enclosure

CLASS 8810 — NON-REVERSING — TWO SPEED

50-60 HERTZ — **600 VOLTS MAX.**

Type of Motor	NEMA Size	Maximum Polyphase Horsepower Ratings: Constant Horsepower Motors 200 V.	230 V.	460-575 V.	Constant Torque or Variable Torque Motors 200 V.	230 V.	460-575 V.	General Purpose Enclosure NEMA Type 1 Type	Price*	Watertight and Dusttight Enclosure (Stainless Steel) (Sizes 0-5 only) Size 6 Sheet Steel ■ NEMA Type 4 Type	Price*	For Hazardous Locations Class I Groups C & D Class II Groups E, F & G NEMA Types 7 and 9 Type	Price*	Dusttight and Driptight Industrial Use Enclosure NEMA Type 12† Type	Price*	Open Type Type	Price*
								SINGLE WINDING (CONSEQUENT POLE) 5 Pole — 3 Pole									
Constant Horsepower	0	2	2	3	...	...	...	SBG-1	**$ 616.**	SBW-1▲	**$1000.**	...	...	SBA-1▲	**$ 740.**	SB0-1	**$ 600.**
	1	5	5	7½	...	...	...	SCG-1	**664.**	SCW-1▲	**1040.**	SCR-1	**$1654.**	SCA-1▲	**788.**	SC0-1	**640.**
	2	7½	10	20	...	...	...	SDG-1	**1208.**	SDW-1	**1672.**	SDR-1	**3136.**	SDA-1	**1384.**	SD0-1	**1136.**
	3	20	25	40	...	...	...	SEG-1	**1824.**	SEW-1	**2512.**	SER-1	**4928.**	SEA-1	**2224.**	SE0-1	**1712.**
	4	30	40	75	...	...	...	SFG-1	**4872.**	SFW-1	**6280.**	SFR-1	**10598.**	SFA-1	**5664.**	SF0-1	**4432.**
	5	60	75	150	...	...	...	SGG-1	**9628.**	SGW-1	**12920.**	...	...	SGA-1	**12920.**	SG0-1	**8760.**
	6	100	150	300	...	...	...	SHG-1	**21704.**	SHW-1	**23884.**	...	...	SHA-1	**23520.**	SH0-1	**19884.**
Constant Torque or Variable Torque	0	...	...	...	3	3	5	SBG-2	**616.**	SBW-2▲	**1000.**	...	...	SBA-2▲	**740.**	SB0-2	**600.**
	1	...	...	...	7½	7½	10	SCG-2	**664.**	SCW-2▲	**1040.**	SCR-2	**1654.**	SCA-2▲	**788.**	SC0-2	**640.**
	2	...	...	...	10	15	25	SDG-2	**1208.**	SDW-2	**1672.**	SDR-2	**3136.**	SDA-2	**1384.**	SD0-2	**1136.**
	3	...	...	...	25	30	50	SEG-2	**1824.**	SEW-2	**2512.**	SER-2	**4928.**	SEA-2	**2224.**	SE0-2	**1712.**
	4	...	...	...	40	50	100	SFG-2	**4872.**	SFW-2	**6280.**	SFR-2	**10598.**	SFA-2	**5664.**	SF0-2	**4432.**
	5	...	...	...	75	100	200	SGG-2	**9628.**	SGW-2	**12920.**	...	...	SGA-2	**12920.**	SG0-2	**8760.**
	6	...	...	...	150	200	400	SHG-2	**21704.**	SHW-2	**23884.**	...	...	SHA-2	**23520.**	SH0-2	**19884.**
								TWO WINDING (SEPARATE WINDING) 3 Pole — 3 Pole◐									
Constant Horsepower ◐	0	2	2	3	...	...	...	SBG-3	**440.**	SBW-3▲	**824.**	...	...	SBA-3▲	**564.**	SB0-3	**424.**
	1	5	5	7½	...	...	...	SCG-3	**496.**	SCW-3▲	**872.**	SCR-3	**1394.**	SCA-3▲	**620.**	SC0-3	**472.**
	2	7½	10	20	...	...	...	SDG-3	**888.**	SDW-3	**1360.**	SDR-3	**2216.**	SDA-3	**1064.**	SD0-3	**824.**
	3	20	25	40	...	...	...	SEG-3	**1392.**	SEW-3	**2080.**	SER-3	**3374.**	SEA-3	**1792.**	SE0-3	**1280.**
	4	30	40	75	...	...	...	SFG-3	**3416.**	SFW-3	**4824.**	SFR-3	**6164.**	SFA-3	**4208.**	SF0-3	**3208.**
	5	60	75	150	...	...	...	SGG-3	**8064.**	SGW-3	**11356.**	SGR-3	**14778.**	SGA-3	**11356.**	SG0-3	**7580.**
	6	100	150	300	...	...	...	SHG-3	**16480.**	SHW-3	**18560.**	...	...	SHA-3	**18308.**	SH0-3	**14560.**
	7	...	225	450	...	...	...	SJG-3	**21352.**	...	...	...	...	SJA-3	**23260.**	SJ0-3	**19432.**
Constant Torque or Variable Torque ◐	0	...	...	...	3	3	5	SBG-4	**440.**	SBW-4▲	**824.**	...	...	SBA-4▲	**564.**	SB0-4	**424.**
	1	...	...	...	7½	7½	10	SCG-4	**496.**	SCW-4▲	**872.**	SCR-4	**1394.**	SCA-4▲	**620.**	SC0-4	**472.**
	2	...	...	...	10	15	25	SDG-4	**888.**	SDW-4	**1360.**	SDR-4	**2216.**	SDA-4	**1064.**	SD0-4	**824.**
	3	...	...	...	25	30	50	SEG-4	**1392.**	SEW-4	**2080.**	SER-4	**3374.**	SEA-4	**1792.**	SE0-4	**1280.**
	4	...	...	...	40	50	100	SFG-4	**3416.**	SFW-4	**4824.**	SFR-4	**6164.**	SFA-4	**4208.**	SF0-4	**3208.**
	5	...	...	...	75	100	200	SGG-4	**8064.**	SGW-4	**11356.**	SGR-4	**14778.**	SGA-4	**11356.**	SG0-4	**7580.**
	6	...	...	...	150	200	400	SHG-4	**16480.**	SHW-4	**18560.**	...	...	SHA-4	**18308.**	SH0-4	**14560.**
	7	...	...	...	...	300	600	SJG-4	**21352.**	...	...	...	...	SJA-4	**23260.**	SJ0-4	**19432.**

***Prices do not include thermal units. For selection, see below.**

◐Prices and type numbers shown for three phase separate winding motor starters apply only when motor windings are wye connected. When motor windings are connected open delta use the prices shown for three phase consequent pole motor starters.

▲Separate NEMA Type 4 and 12 enclosures available; see Class 9991.

†NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to Class 9991.

■NEMA Type 4X enclosures available; consult Local Square D Field Office.

380 VOLTS, 50 HERTZ — above prices and type numbers will apply to starters for 380 volt, 50 hertz but the selection by NEMA size must be based on the horsepower ratings in the following table:

NEMA Size	0	1	2	3	4	5	6
Constant Horsepower	3	7½	20	40	60	100	200
Constant or Variable Torque Horsepower	5	10	25	50	75	150	300

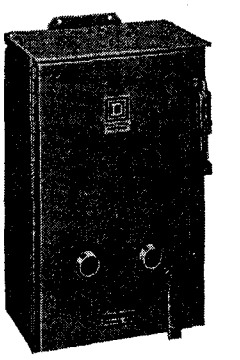
THERMAL UNITS

Thermal units should be ordered separately. See Selection Index on Pages 466-467. *Do not use horsepower rating(s) for thermal unit selection. All three phase two speed magnetic starters require six (6) thermal units, three per speed.* Standard trip thermal units are priced at **$6.00** each.

SPECIAL FEATURES — See Factory Modifications and Forms, pages 461-465.

FIELD MODIFICATION KITS — See Class 9999 Section.

Class 8810, 8811 and 8812 multi-speed starters, both non-reversing and reversing versions, are available with either circuit breaker or disconnect switch. Refer to Factory Modifications, Pages 461-465, for Form numbers and price additions.



Class 8810 in NEMA 12 Enclosure with a Disconnect Switch

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Motor hp, voltage, phase, hertz and full load current at each speed.
3. Control voltage and frequency if different from line voltage.
4. Any special features required.

SQD SLV_001052

APPROXIMATE DIMENSIONS
ALL DIMENSIONS IN INCHES

OPEN TYPE — FIGURE 1*

Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N
SBO-1,2 SCO-1,2	9 5/8	7 11/32	5 5/16	8	5/8	...	7/32	6 29/32	...	7/32	4 3/4	2 1/4	5 1/16	1 9/32
SBO-3 & 4 SCO-3 & 4	7 1/8	6 29/32	5 5/16	...	...	3 13/32	1 5/32	6 7/32	...	7/32	3 9/16	1 5/8	5 1/16	1 9/32
SDO-1, 2	12 1/32	8 17/32	6 1/32	10 3/8	1/2	...	1/4	8 1/8	6 1/4	5/32	5 3/4	2 13/16	5 5/32	2 5/32
SDO-3 & 4	9	8 1/16	6 1/32	...	...	4 1/2	3/8	7 1/2	...	3/16	4 11/32	2 5/32	5 5/32	2 5/32
SEO-1, 2	18	14 7/16	7	17	1/2	...	1 1/2	12 1/4	12 1/4	1 1/16	7 3/8	3 11/16	6 1/4	2 5/32
SEO-3 & 4	12 3/4	12 9/32	7	11 3/4	1/2	...	1 1/32	10 3/4	10 3/4	1/2	6 3/4	3	6 1/4	1 5/32
SFO-1, 2	18 5/8	15 19/32	7	17	1/2	...	1 7/8	12 1/4	12 1/4	1 1/2	7 21/32	3 7/16	6 1/4	1 21/32
SFO-3 & 4	14 1/4	14 19/32	7	13 1/4	1/2	...	1 7/8	12 1/4	12 1/4	1/2	7 3/8	3 7/16	6 1/4	1 21/32
**SGO-1, 2	29 9/32	20 29/32	9 3/8	28	5/8	...	1 9/32	19	19	5/8	10	6 1/16	6 5/8	5 13/32
**SGO-3 & 4	19 9/32	20 29/32	9 3/8	18	5/8	...	1 9/32	19	19	5/8	9 7/8	6 1/16	6 5/8	5 13/32
◐**SHO-1, 2	29 17/32	28 1/32	9 17/32	28	3/4	...	5/8	....	21 3/16	5/8	9 7/8	12 5/8	9 17/32	6 31/32
◐**SHO-3, 4	19 17/32	28 1/32	9 17/32	18	3/4	...	5/8	....	21 3/16	5/8	9 7/8	2 7/16	9 17/32	6 31/32
◐**SJO-3, 4	Consult Local Square D Field Office													

*Size 3, 4, 5 & 6, Types SEO, SFO, SGO & SHO are not shown, but dimensions apply.

**Consequent pole type starters consist of two 3-pole starters as pictured in Figure 1 and an additional two-pole shorting contactor (not shown), all on a common base-plate, horizontally mounted.

◐Current transformers used with Size 1 overload relay blocks.

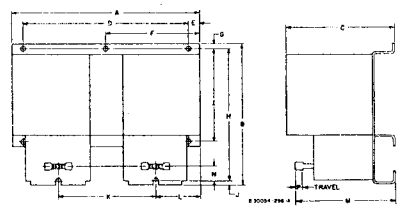


Figure 1*

NEMA 1 ENCLOSURE — FIGURE 2

Type	A	B	C	D	E	F	G	"H"
SBG and SCG	11 7/8	11 7/8	7 17/32	9 3/4	1 1/16	1 1/16	9 3/4	5/16
SDG	14 7/8	14 1/8	7 21/32	12 3/4	1 1/16	1 1/16	12	5/16
SEG-1 & -2 and SFG-1 & -2	20 5/32	24 5/32	8 17/32	17 1/2	1 21/64	1 21/64	21 1/2	7/16
SEG-3 & -4 and SFG-3 & -4	16 5/32	24 5/32	8 17/32	13 1/2	1 21/64	1 21/64	21 1/2	7/16
SGG-1 & -2	32 5/32	35 5/32	11 17/32	29 1/2	1 21/64	1 21/64	32 1/2	7/16
SGG-3 & 4	24 5/32	35 5/32	11 17/32	21 1/2	1 21/64	1 21/64	32 1/2	7/16
SHG-1, 2	39	59	19 1/2	Floor Mount				
SHG-3 & 4	29	59	19 1/2					

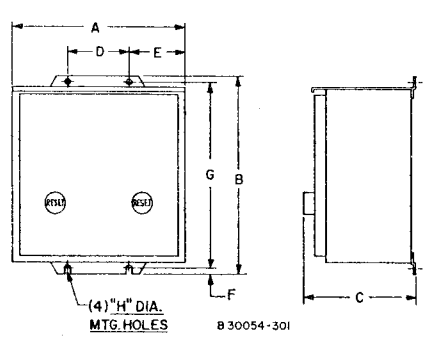


Figure 2

NEMA 12 ENCLOSURE — FIGURE 3

Type	A	B	C	D	E	F	G	"H"
SBA and SCA	11 7/8	13 1/2	7 3/4	4 1/4	3 13/16	3/8	12 3/4	5/16
SDA	14 7/8	15 3/4	7 7/8	4 1/4	5 5/16	3/8	15	5/16
SEA-1 & -2 and SFA-1 & -2	20 5/32	26 1/2	8 15/32	9	5 37/64	1/2	25 1/2	7/16
SEA-3 & -4 and SFA-3 & -4	16 5/32	26 1/2	8 15/32	9	3 37/64	1/2	25 1/2	7/16
SGA-1 & 2	32 5/32	37 1/2	11 15/32	15	8 37/64	1/2	36 1/2	9/16
SGA-3 & 4	24 5/32	37 1/2	11 15/32	15	4 37/64	1/2	36 1/2	9/16
SHA-1, 2	39	59	19 1/2	Floor Mount				
SHA-3 & 4	29	59	19 1/2					

Figure 3

NEMA 4 ENCLOSURE — FIGURE 4

Type	A	B	C	D	E	F	G	"H"	I	J
SBW and SCW	12 5/8	14 11/16	7 13/16	4 1/4	4 3/16	1 9/32	13 1/2	5/16	1 21/32	2 5/16
SDW	14 7/8	15 3/4	8 1/4	4 1/4	5 5/16	3/8	15	5/16	2 1/32	2 5/8
SEW-1 & 2 and SFW-1 & 2	20 5/32	26 23/32	8 9/16	9	5 9/16	1 9/32	25 1/2	7/16	2 5/16	2 7/8
SEW-3 & 4 and SFW-3 & 4	16 1/8	24 3/16	8 9/16	9	3 9/16	1 9/32	23	7/16	2 9/16	3 3/16
SGW-1 & 2	32 5/32	38 1/32	11 19/32	15	8 37/64	41/64	36 3/4	9/16	2 61/64	3 1/2
SGW-3 & 4	24 5/32	38 1/32	11 19/32	15	4 37/64	41/64	36 3/4	9/16	2 61/64	3 1/2
SHW-1, 2	39	68	19 1/2	Floor Mount						
SHW-3 & 4	29	68	19 1/2							

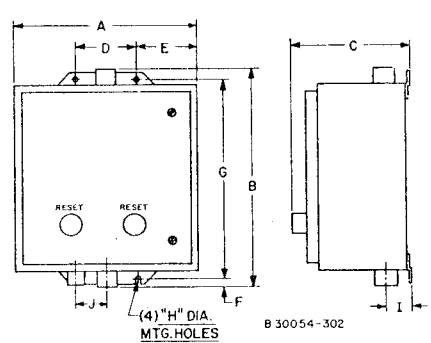


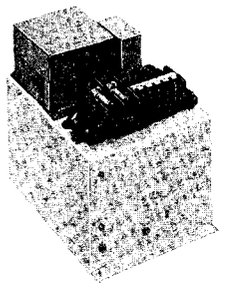
Figure 4

COMBINATION DEVICE DIMENSIONS — Consult local Square D field office.

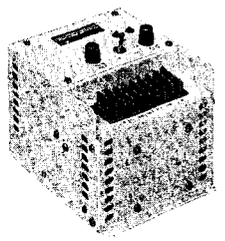
SQD SLV_001053

SOLID STATE LOGIC CONTROL *NORPAK*®

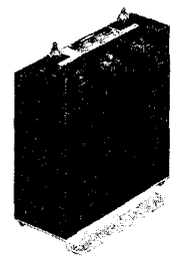
CLASS
8851
8852
8853
8854
8855



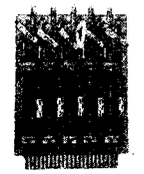
Class 8851 Type P Logic Power Supplies

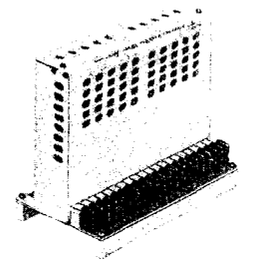






Class 8851 Type N
Signal Converters





Class 8854 Type SC
Signal Converter Card and Housing

POWER SUPPLIES

LOGIC
Main Logic Power Supplies (120V AC)
Class 8851
Outputs

Input Hz.	−20V DC Rating	+20V DC	Off Ret.	−130V DC	Type	Price
60	125 units	1000	20	20	P-1	**$ 500.**
50/60	50 units	50	10	0	P-12	**280.**
60	1000 units	1000	20	10	P-13	**800.**
60	2000 units	2000	50	40	P-14	**1000.**
50	2000 units	2000	50	40	P-17	**1200.**
50/60	500 units	1000	50	0	P-18	**600.**

ACCESSORIES
Accessory Power Supplies
(120V AC, 50/60 Hz. Input(1)
Class 8851

Accessory Load Served	Output Ratings	Type	Price
Readout Tubes	250V DC for 6-8851 R-1 max.	P-9	**$180.**
TO-3 and TO-4 Amplifiers	−24V DC full wave unfiltered 50 watts max. 300 watts max.	 A-51 A-301	 **228.** **340.**
Pulse Generator	−6V DC, 160 ma. max.(1)	P-15	**120.**

(1) Type P-15 input burden is 100 units of −20V DC power load.

INPUT DEVICES

ENCAPSULATED NORPAK® DEVICES

AC Class 8851	Type	Price
AC Signal Converter — Provides two inputs for 120V AC signals. Indicating lights are included	N-2	**$170.**

AC — DC Class 8851	Type	Price
Universal Signal Converter — Provides one input for 120V AC or DC signals. This device can be track or panel mounted and includes indicating light	N-8	**$75.**

DC Class 8851	Type	Price
DC Signal Converter — Provides four inputs for 130vdc signals. The 130vdc (−V) is obtained from the Class 8851 Type P-13, P-14 and P-17 Power Supplies. Indicating lights are included	N-5	**$150.**
DC Signal Converter — Provides one input for 24vdc. Requires filtered dc supply voltage. Not for use with A50 or A301 power supply	N-9	**120.**

Filter Class 8851	Type	Price
Filter Pak — Provides twelve R-C filter circuits — 20V DC input signals	F-1	**$220.**

Selector Switches Class 8851	Type	Price
Selector Switch — Rotary, 10 position 0-9, with knob and 4 diodes (For decoding 8852 L-12 and L-15 BCD counters)	T-10	**$64.**

PROXIMITY SWITCHES

Proximity Devices	Class	Type	Price
Proximity Limit Switch, Provides complementary solid state output signals suitable as a direct input to NORPAK® Devices. Sensitivity approx. 3" with steel; .15" with aluminum	9007	PS-1	**$200.**
Proximity Limit Switch, Has solid state output with self-contained power supply. Can be used as a direct input to NORPAK® Devices. Sensitivity approx. ¾"	9007	VQ-1-S1	**276.**

PLUG-IN NORPAK® DEVICES

AC — DC Class 8854	Type	Price
Universal Signal Converter Card (five functions on plug-in card for the SC-10 housing. Converts 120V AC or −130V DC to logic level voltage. Includes pilot light)	SC-1	**$200.**
Signal Converter Housing (accepts 2 SC-1 cards. Includes 10 pairs of isolated AC input terminals with space for identification. Connects to logic frame through one ribbon connector of an SL-37)	SC-10	**240.**

Filter Class 8854	Type	Price
20 Pack with Leads, twenty filters equipped with six foot leads of 20 gauge wire for input logic signals direct into front of pack, or through back edge connector	SL-28	**$320.**

Logic Systems Isolators Class 8854	Type	Price
Logic input isolator 10 Pack (ten inputs to NORPAK® Devices from other logic systems interfaced with photo isolation. For ± 4 to 24V DC. Input impedance 1K ohm)	SL-33	**$660.**

Thumbwheels Class 8854	Type	Price
Thumbwheel selector switches 0-9 for 1-2-4-8 code BCD counter packs. Complete with diodes. With 14 point socket connector to accept plugs from ribbon cables to SL-37 interconnection pack		
Decode, 2 decade	SR-37-2	**$190.**
Decode, 3 decade	SR-37-3	**250.**
Decode, 4 decade	SR-37-4	**330.**
Preset, 2 decade	SR-38-2	**170.**
Preset, 3 decade	SR-38-3	**240.**

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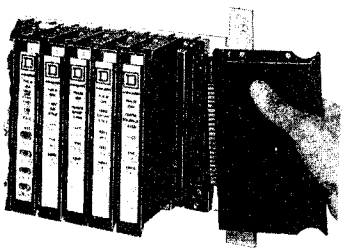
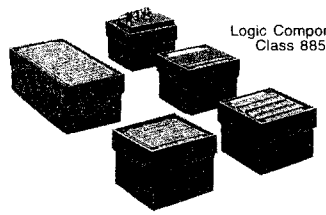
NORPAK® SOLID STATE LOGIC CONTROL



Logic Components
Class 8854



Logic Components
Class 8852

CLASS
8851
8852
8853
8854
8855

NORS

An entire system could be built using the basic 3 input NOR. To simplify the system design, NORs with variations in number of inputs and fanout capacity and optional base connection are available.

CLASS 8854 PLUG-IN NORPAK® DEVICES	Type	Price
10 Standard NORs, 3 inputs, fanout 5 units	SL-1	**$120.**
NOR 8 PACK — 4 three Input NORs with direct base connections and 4 four Input NORs	SL-2	**100.**
8 Standard NORs, 4 inputs, fanout 5 units	SL-41	**100.**
*8 Standard NORs, 3 inputs plus direct base input, fanout 5 units	SL-42	**100.**
10 Power NORs, 3 inputs, fanout 10 units	SL-35	**140.**
8 Power Amplifiers, 3 inputs, can be used as a 250 ma, 20 volt dc amplifier or as a power NOR with fanout to 150 units	SL-5	**260.**

CLASS 8852 ENCAPSULATED NORPAK® DEVICES	Type	Price
6 Standard NORs — 3 inputs plus direct base input, fanout 4 units	L-1	**$140.**
20 Standard NORs — 3 inputs plus direct base input, fanout 4 units	L-2	**370.**
20 Four Input NORs — fanout 5 units	L-19	**375.**
6 Power NORs — 3 inputs plus direct base input, fanout 10 units	L-6	**140.**
5 Universal NORs — 3 inputs plus direct base input, ma. fanout 50 units, can also be used as 75 ma. 20V DC amplifier	L-9	**180.**

COUNTERS AND SHIFT REGISTERS

Binary coded decimal counters are available in various configurations to handle virtually any counting need. A complete counting circuit would include thumbwheel or PROM memory input and numeric readout. Shift registers for data manipulation are capable of both synchronous and asynchronous operation.

CLASS 8854 PLUG-IN NORPAK® DEVICES	Type	Price
0-15 Binary or 0-9 BCD Counter Pack, Unidirectional, 4 bit 1-2-4-8 code	SL-6	**$180.**
0-9 BCD Bidirectional Counter Pack, 4 bit, 1-2-4-8 code includes decoding/driving circuitry for SR-4 readout tube	SL-11	**320.**
Shift Register, 1 bit, 5 zone	SL-9	**180.**

CLASS 8852 ENCAPSULATED NORPAK® DEVICES	Type	Price
0-9 BCD Unidirectional Counter with 1, 2, 4, 2' output code	L-12	**$280.**
0-9 BCD Bidirectional Counter with 1, 2, 4, 2' output code	L-15	**460.**
0-9 BCD Bidirectional Counter with 1-2-4-8 output code. Includes socket provisions for Class 8854 readout tube and decode switch ribbon cables.	L-20	**470.**
Shift Register — 5 transfer memories prewired as a 1 bit, 5 zone shift register	L-17	**340.**

OTHER FUNCTIONS

CLASS 8854 PLUG-IN NORPAK® DEVICES	Type	Price
Time Delay 2 Pack (two timers adjustable in ranges .1 to 300 sec.)	SL-7	**$320.**
Single Shot 4 Pack, four circuits with adjustable output pulses	SL-8	**280.**
*Pulse Element 10 Pack, ten trail edge gated pulse circuits for use with direct base inputs of SL-42	SL-21	**120.**
Transfer Memory Pack, five dual pulse elements and flip-flop NOR memories	SL-10	**180.**
Annunciator 2 Pack, two circuits for monitoring N.O. or N.C. contacts	SL-20	**340.**
Retentive Memory Adder 5 Pack, five magnetically held reed relay circuits for use with flip-flop memories, counters or shift registers	SL-4	**380.**
OR Diode 20 Pack, twenty single input isolated diodes	SL-3	**80.**
Sealed AND 4 Pack, four 4 input AND functions each with sealed memory provision on 3 inputs. Complementary outputs have 10 units fanout	SL-19	**180.**
AND 8 Pack, eight 4 input AND functions each having 10 units fanout	SL-39	**170.**
Flip-Flop MEMORY 6 Pack, six memory functions with common off-return. Each memory has 2 set and 2 reset inputs and complementary outputs with 10 units fanout	SL-40	**160.**

CLASS 8852 ENCAPSULATED NORPAK® DEVICES	Type	Price
Time Delay Pack — one function adjustable in two ranges .1 to 300 sec.	L-18	**$240.**
Single Shot Pack — two circuits with adjustable output pulses	L-16	**140.**
Transfer Pack — four transfer elements	L-8	**148.**
Transfer Memory Pack — two transfer elements and flip-flop NOR memories	L-11	**150.**
Retentive Memory — 3 memory circuits which resume last output state when power is restored	L-22	**400.**
OR-Diode Pack — seven 2 input ORs plus seven isolated diodes	L-3	**120.**

CLASS 8854 PLUG-IN NORPAK DEVICES	Type	Price
Extender Pack — Provides access to logic module socket connections from front side of module mounting rack for test purposes	SL-16	**$120.**
Miscellaneous Component Pack — Provides 20 pairs of terminals on circuit board for mounting resistors, capacitor, etc.	SL-31	**100.**
Interconnection Pack — Provides 40 six foot leads of 20 gauge wire for "off-frame" wiring	SL-32	**150.**
Flat Cable Interconnection Pack without ribbon cables. Use with maximum of 4 Type SR-19-X ribbon cables for connections between logic frames, to I/O housing or to other "off-frame" accessories	SL-37	**100.**

* Obsolescent — Use for replacement parts only.

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NORPAK® SOLID STATE LOGIC CONTROL

CLASS
8851
8852
8853
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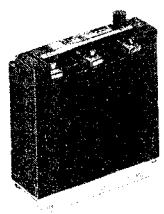
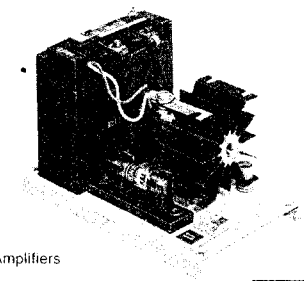
8855

OUTPUT DEVICES

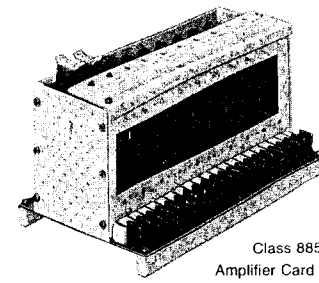






Class 8853 Type TO Amplifiers





Class 8854 Type SA
Amplifier Card and Housing

ENCAPSULATED NORPAK® DEVICES

AC Class 8853	Type	Price
1 Amp. RMS max. — (inrush 7 Amp. RMS max.) Totally solid state switching (1) (3)	TO-10	**$170.**
1 Amp. RMS max. — (inrush 10 Amp. RMS max.) Reed relay isolation (1) (2) (3)	TO-11	**90.**
5 Amp. RMS max. — (inrush 35 Amp. RMS max.) Totally solid state switching. Includes fuse (1)	TO-9	**300.**

DC Class 8853	Type	Price
5 w. max. 24V DC — (See power supplies A-51, A-301)(1)	TO-3	**$120.**
30 w. max. 24V DC — (See power supplies A-51, A-301)(1)	TO-4	**130.**
250 ma. max. 20V DC — Two amplifiers per pack to drive loads at logic level voltage	TO-7	**130.**
75 ma. max. 20V DC — Drives load at logic level voltage	See 8852 L-9	

(1) Includes indicator pilot light.
(2) Track or panel mounted.
(3) Should be used with Limitron Type KAA-2 Fuse.
Square D Part No. 25418-10002 ..... **$10.00 D14A DISCOUNT.**

Light Class 8851	Type	Price
Neon — Transistor driven operates from −20V DC logic level signal (requires −130V DC output from logic power supply)	T-12	**$ 24.**

Numeric Readout Class 8853	Type	Price
Readout Tube Driver — For use with 8851 R-1 readout tube and 1, 2, 4, 2' code BCD counter. (Also requires 8851 P-9 power supply)	TO-8	**$180.**

Class 8851	Type	Price
Tube — NIXIE* .6" high neon numerals 0-9. For P-9 power supply and T-11 bezel	R-1	**$ 80.**
Bezel and Sockets		
(For 2 R-1 tubes)	T-11-2	**116.**
(For 3 R-1 tubes)	T-11-3	**136.**

* NIXIE is a registered trademark of Burroughs Corp.

PLUG-IN NORPAK® DEVICES

AC Class 8854	Type	Price
Output Amplifier Card (one function on plug-in card for the SA-10 housing. 120V-AC output is rated 2.5 amp. continuous, 20 amp. inrush. Includes fuse and pilot light). Supersedes SA-1 in NORPAK® Device applications	SA-4	**$ 80.**
Output Amplifier Housing (accepts 10 SA-4 cards. Includes 10 pairs of isolated AC input terminals with space for identification. Connects to logic frame through one ribbon connector of an SL-37)	SA-10	**320.**

Reed Relay Class 8854	Type	Price
Reed Relay 6 pack (six single pole normally open reed relays driven from logic level signals)	SL-22	**$320.**

Logic Systems Isolator Class 8854	Type	Price
Logic Output Isolator 10 Pack (ten outputs from NORPAK to other logic systems interfaced with photo isolation. For either ± 4 to 24V DC. Maximum sink current 5 ma.)	SL-34	**$600.**

Light Class 8854	Type	Price
Indicator Light 10 Pack (ten light emitting diodes for logic monitoring driven from logic level signals)	SL-14	**$180.**

Numeric Readout Class 8854	Type	Price
Readouts		
Seven Segment Readout Tube (0-9)	SR-4	**$ 40.**
Tube Socket Assembly. Accommodates single SR-4 readout tube. Mounts in bezel and bracket. Fed by ribbon cable from SL-36 or SL-37	SR-18	**34.**
Bezel and bracket. Accommodates 2 SR-4 readout tubes and SR-18 tube socket assemblies	SR-33	**60.**
Bezel and bracket. Accommodates 3 SR-4 readout tubes and SR-18 tube socket assemblies	SR-16	**70.**
Bezel and bracket. Accommodates 4 SR-4 readout tubes and SR-18 tube socket assemblies	SR-34	**80.**
Bezel and bracket. Accommodates 5 SR-4 readout tubes and SR-18 tube socket assemblies	SR-17	**90.**
Readout Tube Power Supply (Maximum 7 SR-4)	SR-6	**40.**

REPLACEMENT PARTS — BULBS AND FUSES — ORDER BY SQUARE D PART NUMBER

Fuse Type No.	Sq. D Part No.	Price	Disc.	Device Type Number: TO-9	TO-10	TO-11	SA-4	P-12	P-1 −20	P-1 +20	P-13 −V	P-13 −20	P-13 +20	P-14 & P-17 −V	P-14 & P-17 −20	P-14 & P-17 +20	P-18 −20	P-18 AC Line
ABC-3	25499-00401	**$2.00**	D14A				X											
AGC-¼	25420-10020	**2.00**	D14A								X							
AGC-¾	25420-10075	**2.00**	D14A					X										
AGC-1	25420-10100	**2.00**	D14A						X	X				X		X		
AGC-2	25420-10200	**2.00**	D14A															X
AGC-3	25420-10300	**2.00**	D14A														X	
KAA-2	25418-10002	**10.00**	D14A		X	X												
KAA-8	25418-10008	**10.00**	D14A	X														
KTK-1	25419-10061	**14.00**	D14A										X					
KTK-5	25419-10111	**14.00**	D14A									X						
BAF-10	25419-41000	**2.00**	D14A												X			

Bulb Type No.	Sq. D Part No.	Price	Disc.	Device Type Number: N-2	N-5	N-8	TO-3	TO-4	TO-9	TO-10	TO-11
NE-84	25501-05014	**$4.50**	D14A	X	X				X	X	
SPECIAL	25501-05018	**12.50**	D14A			X					X
24ESB	25501-05002	**8.00**	D14A				X	X			

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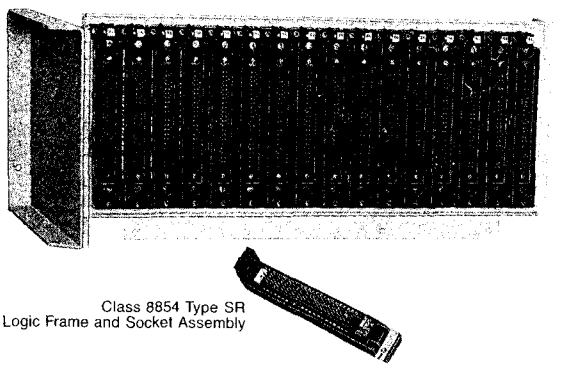
TOOLS, TESTERS AND WIRING SUPPLIES

SOCKETS AND FRAMES

Racks Class 8854	Type	Price
Logic Module Frame — Hinged, 19" Width, Holds 16 Sockets .....for Rack Mounting	SR-9	**$60.**
Logic Module Frame — Hinged, 19" Width, Holds 16 Sockets .....for Panel Mounting	SR-10	**70.**
Socket Assembly for WIRE-WRAP* Connections ..... With optional interlock contact which opens upon removal of plug-in pack for end socket positions (2 req'd. for each frame)	SR-1	**24.**
	SR-26	**30.**
for between sockets (max. 14 req'd. for each frame)	SR-25	**30.**
Keying Pins for SR-1, SR-26 or SR-26 Sockets .....(pack of 50)	SR-8	**20.**

*WIRE-WRAP is a registered trademark of Gardner-Denver Company



Class 8854 Type SR
Logic Frame and Socket Assembly

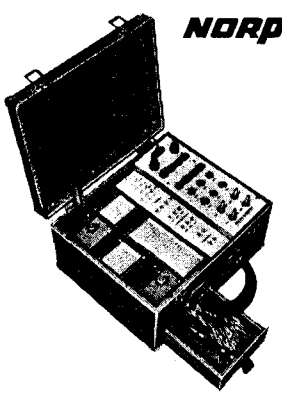
Tools Class 8854	Type	Price
WIRE-WRAP* Manual Twist Tool with bit (wraps both right and left hand)	SR-29	**$174.**
WIRE-WRAP* Manual Unwrap Tool (removes right hand wraps)	SR-30	**20.**
Wiring Supplies Class 8854	**Type**	**Price**
Bus Bar Kit for Sockets (2 bars for COM and −20. Use wire Jumpers for +20. Slip-on connections for max. of 16 sockets (SR-1, SR-26 or SR-26 sockets only) ea. kit	SR-3	**$ 44.**
Jumper bar for every other terminal on SA-10 or SC-10 housings	SR-20	**16.**
Wire #26 AWG solid, 1000 spool suitable for WIRE-WRAP* wiring	SR-24	**120.**
Ribbon cable with plug at each end. For use with Type SL-37, SA10, SC10, SR37, SR18 (2 foot length)	SR-19-2	**16.**
(3 foot length)	SR-19-3	**16.**
(4 foot length)	SR-19-4	**16.**
(6 foot length)	SR-19-6	**18.**
(8 foot length)	SR-19-8	**20.**
Ribbon cable extension. Male-female (2 foot length)	SR-35-2	**30.**
(4 foot length)	SR-35-4	**30.**
(6 foot length)	SR-35-6	**32.**
(8 foot length)	SR-35-8	**32.**

*WIRE-WRAP is a registered Trademark of Gardner-Denver Company.

Tools Class 8851	Type	Price
Insertion Tool — (for both insertion and extraction of taper pins)	T-1	**$190.**
Crimping Tool — (for taper pins)	T-7	**340.**
Wiring Kits Class 8851	**Type**	**Price**
Stand-Off Insulator — (for wiring of COMMON bus) ....each	T-5	**$ 9.**
Taper Pins and Sleeves — (100 of each)	T-8	**20.**
Patch Wires — (#20 AWG stranded wires for logic signal wiring. Taper pin & sleeve at each end)		

Each kit contains ..... Qty.	Length		
50	3"	W-3	**60.**
50	6"	W-6	**60.**
50	9"	W-9	**60.**
25	12"	W-12	**40.**
25	16"	W-16	**40.**
10	18"	W-18	**25.**
10	24"	W-24	**25.**
10	30"	W-30	**25.**
10	36"	W-36	**25.**
10	48"	W-48	**25.**

Class 8851	Type	Price
Probe Tester — Visual and audible indication. Base has magnets for portable use, and holes for permanent mounting. A standard probe and a clip on probe are included	T-18	**$200.**

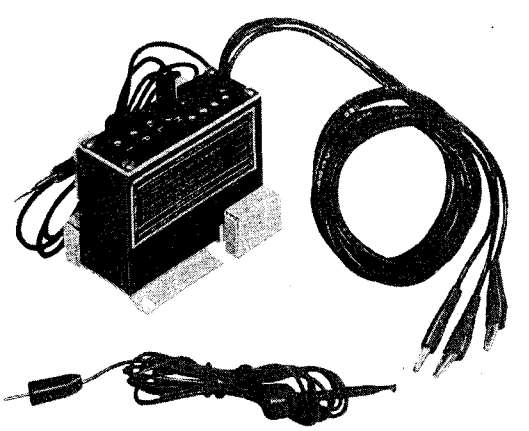


NORPAK® LOGIC SIMULATOR— EDUCATIONAL KIT

- Six pushbuttons and four toggle switches to simulate inputs.
- Eight pilot lights to indicate output signals.
- Patch wires and insertion tool included.
- Requires standard logic components.
- Internal power supply operates from a 120 V, 60 Hz. line.

NORPAK® Logic Simulator Class 8851,
Type S-1 with a combination of
Logic Components

Class 8851, Type S-1 Logic Simulator, Less Logic Components..... **$1500.**



Class 8851 Type T18
Logic Probe Tester for
All NORPAK Systems

SQD SLV_001057

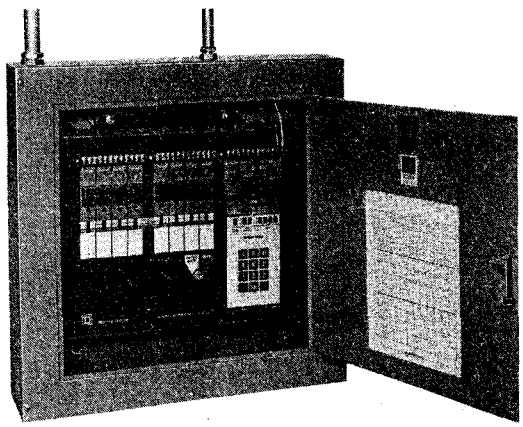
Watchdog™ ENERGY MANAGEMENT

CLASS 8865

FEATURES

- Microprocessor based controllers provide flexibility and low cost.
- Simple to operate, with easy to follow data entry steps.
- Data is entered directly in KW; there are no obscure readouts or percentages to interpret.
- Diagnostic error messages for incorrect data entry.
- Continuous rotating display of:
  - Demand Limit
  - Predicted Demand (Demand Status)
  - 24 Hour Clock
- Uses a continuous demand control technique to reduce demand.
- Automatic demand limit adjust eliminates the need for periodic user adjustments.
- Both set and equal priorities are provided.
- Reduces KWH consumption through load cycling and by utilization of time of day schedules.
- Easy to install current transformers provide necessary input.
- Each load is controlled by an output relay Class 8501 RSD-14.
- A status light and manual override switch are provided for each load.
- Alarm output relays for:
  - Exceeding demand alarm level
  - Power loss or control malfunction
- Battery backup for the 24 hour clock and memory storage.

UL LISTED devices available



Class 8865 Type EM-8
In Type BX-1 Enclosure

The Type EM-8 is a low cost, eight load UL listed control. (See Figure 2.) Settings include: the demand limit (which automatically adjusts up or down to seek an optimum level), shed and restore times, along with flexible priorities. Included as a standard feature is a 24 hour time of day schedule for normal working situations, along with a second independent schedule for weekends or holidays. Current transformers (see below) provide the necessary input information, thereby eliminating the need to obtain demand meter pulses from the utility company. Typical system interconnections are shown in Figure 3.

CURRENT TRANSFORMERS

Current Transformers (CT's) serve as the primary input to the Class 8865 energy management system. Three CT's are required for a three phase service unless phase imbalance is less than 10% in which case only one CT is required.

Any CT capable of providing a 0-5 amp signal at 5VA may be used. Normally utilities will not allow connections to their metering CT's.

Typical types of CT's available are the doughnut type which is usually used in new installations or the easy to install split-core type which is commonly used for existing installations.

Size the CT to the maximum expected current at the service. Various sizes are available through Electromagnetic Industries (Clearwater, Florida). High voltage CT's up to 35KV also available.

For CT ordering and pricing information, refer to pages 186-188.

CONVERTER UNIT

The Class 8865 Type CV Converter Unit accepts the 0-5 amp AC signal from one to three current transformer(s) and converts it to a 0-10 VDC signal that is used by the WATCHDOG Controller. The Converter unit should be mounted within 30 feet of the CT's. Up to three Converter Units may have their outputs wired in series to totalize current from three sources.

TYPICAL APPLICATIONS INCLUDE RETAIL STORES, HOTELS/MOTELS, OFFICE BUILDINGS, INDUSTRIAL PLANTS, SUPERMARKETS, WAREHOUSES OR WHEREVER MONTHLY ELECTRIC BILLS EXCEED $1000.

TYPICAL INTERCONNECTION

WIRE PER ALL APPLICABLE CODES.

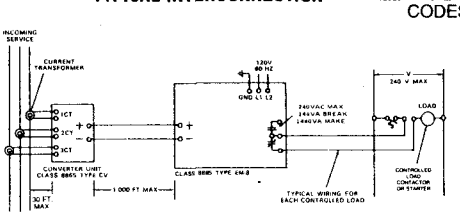


Figure 3

120 VAC	Class 8865	50/60 Hertz
Type	Description	•Price
EM-8	8 Load Energy Management System Quantity 5 — Up	$4700. 3650.
BA-1	Replacement battery assembly	42.
BX-1	U.L. listed steel enclosure with mounting studs for Type EM-8 controller. Has screw cover front with hinged door and flush lock. Finished in grey baked enamel. (Dim. 24" H x 24" W x 6" D)	195.
BX-2	NEMA 1 enclosure with mounting studs for EM8 controller. Viewing window located in hinged door. Flush lock. (Dim. 24" H x 24" W x 6" D)	215.
BX-12	NEMA 12 Enclosure with mounting panel for EM-8 controller. (Dim. 29" H x 24" W x 7½" D)	470.
CV-11	Converter for single service. Unit accepts only 1 CT	205.
CV-13	Converter for single service. Unit accepts 1 or 3 CT's	350.
CV-23	Converter for two services having same primary CT ratio. Unit accepts 1 or 3 CT's. (2 converters required)	480.
CV-33	Converter for three services having same primary CT ratio. Unit accepts 1 or 3 CT's. (3 converters required)	480.
CV-W2	Converter for single service. Unit drives 2 Type EM8 controllers. Unit accepts 1 or 3 CT's	480.
CV-SP	*Converter factory tuned to customer's specified values. Unit accepts 1 or 3 CT's	480.

• Revised since previous issue.

D18 DISCOUNT

WATCHDOG is a Trademark of Square D Company

SQD SLV_001058

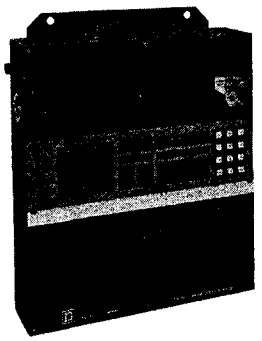
Watchdog™ ENERGY MANAGEMENT SYSTEM

CLASS 8865

The Square D Class 8865 Type EM-24 and Type EM-64 are expandable Energy Management Systems designed for medium to large industrial and commercial establishments. They contain all the features of the Type EM-8 plus many additional features usually found only in large, expensive, computer type systems. Some of these are: Load Rotation, Min/Max control, External Inputs, Seven day scheduling and a Communication Port for interfacing with a telephone, an inexpensive printer, or computer equipment.

The EM-24/64 WATCHDOG Energy Management System can monitor facility demand using either current transformers on the incoming service lines or pulses from the facility's KWH Meter.

The hardware consists of a Type EM-24 or 64 main unit, which is the heart of the system, and one or more Type R8 output units which contain the output relays that do the load switching.



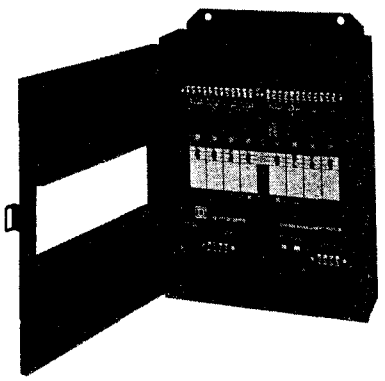
Type EM-24 or EM-64
Main Unit

The Type EM-24 main unit is designed for facilities with 8 to 24 loads. It can communicate with one to three Type R8 output units.

Type EM-24 ..... **$3,950.**

The Type EM-64 main unit is designed for facilities with 8 to 64 loads. It can communicate with one to eight Type R8 output units.

Type EM-64 ..... **$8,300.**



Type R8 Output Unit

Each Type R8 output unit controls eight loads or groups of loads. They are usually mounted near the loads being controlled, and they receive their commands from the main unit via a single pair of low voltage, communication type wire.

Type R8 ..... **$1,850.**

Type	Description	Price
TP-64	**Terminal Panel** The easiest way to connect the EM-24/64 to the various input and output accessory contacts is through a Class 8865 Type TP-64 terminal panel. This panel consists of a 120V/24VAC (Class II approved) transformer, two Class 8501 Type R relays for Demand Alarm and Power Loss Alarm, terminal strips wired and labeled, and the connecting cables and plugs for hooking up to the main unit. This assembly fits very nicely into the Type BX-64 enclosure listed below. One terminal panel is required per system.	**$590.**
BX-64	**EM-24/64 Enclosure** NEMA 1 enclosure with mounting studs for EM-24 or EM-64 main unit. Viewing window located in hinged door. Flush lock 24" H x 24" W x 6" D.	**190.**
C-15	**Extension Cable** A 15' extension cable enables operating the main control unit remote from the TP-64 terminal panel.	**350.**
RC-8	**Replacement Card** Replacement card for Type R8 output unit.	**1390.**

SQD SLV_001059

CLASS 8865

REMOTE LOAD SWITCHING

Remote switching devices allow a centrally located controller to switch remotely located loads without the expense or facility disruption commonly associated with direct wire techniques.

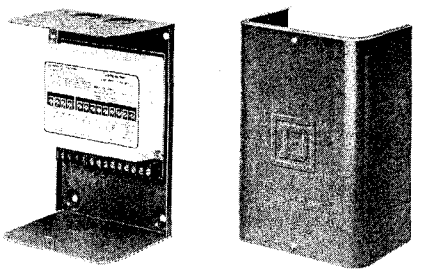
The Class 8865 Type RST transmitters and the Class 8865 Type RSR receivers are carrier current devices that send high frequency signals over existing facility power wiring. They are designed to lower the installation cost of facility controls, such as energy management systems, and are especially effective in existing buildings because they eliminate the need to run wires through existing walls or floors. The hardware to accomplish this consists of a transmitter, which is wired to the central controller, and a number of receivers that are located at each controlled load.

TRANSMITTER

Each transmitter controls eight separate channels of communication. A channel is activated by a contact input which could be anything from a simple toggle switch to an output contact from a sophisticated control system. When this activating contact closes, the transmitter places an appropriate electrical signal onto the existing facility power wiring. The corresponding receiver senses the presence of this signal and switches its output relay. When the activating contact to the transmitter opens, the transmitter removes this signal from the line.

Six independent transmitters are available, each capable of controlling 8 separate loads. This enables a maximum of 48 loads to be individually controlled.

Type RST-1, 2, 3, 4, 5, & 6 ..... each **$450.00**



Class 8865 Type RST

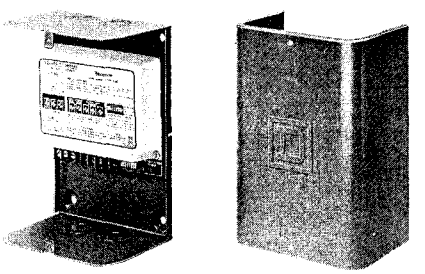
RECEIVER

The receivers are located near the loads being controlled. Connections are made from the receiver to both the load and the power line. When the receiver senses the appropriate electrical signal on the power line, it switches its relay, thus switching the load. As long as the transmitter maintains this signal on the line, the receiver keeps its relay switched.

Receivers must be matched to a specific transmitter. Like the transmitters, there are six different receivers available. Each receiver has eight switches for channel selection.

The receiver can be located up to one mile from the transmitter.

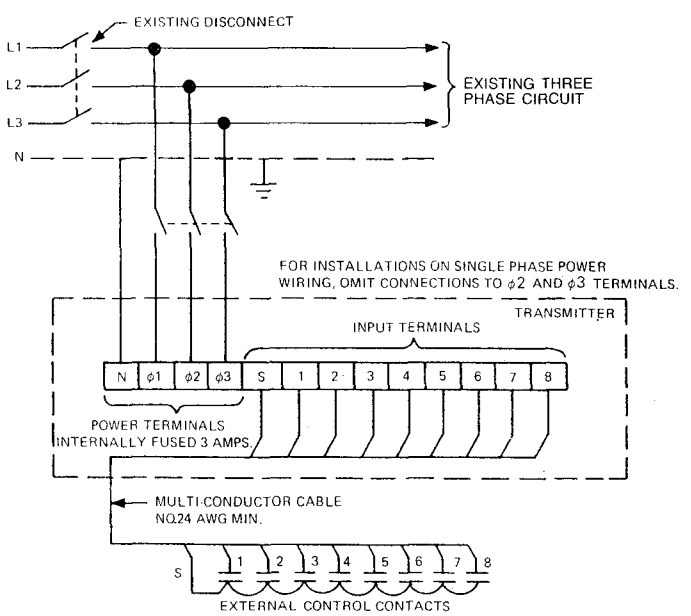
Type RSR-1, 2, 3, 4, 5, & 6 ..... each **$325.00**



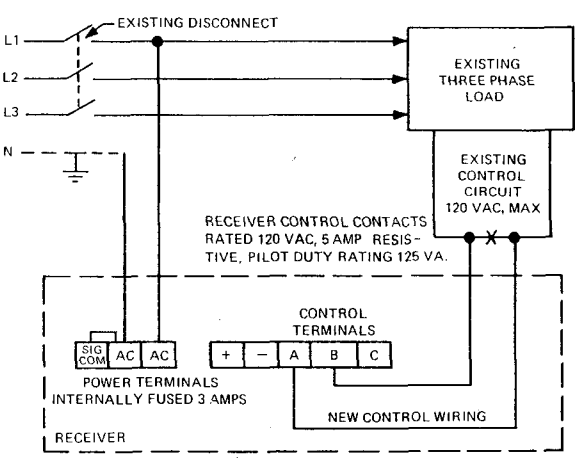
Class 8865 Type RSR

PLEASE NOTE: Suffix Number must match transmitter's suffix number i.e. A Type RSR-1 receiver will only work with a Type RST-1 transmitter and vice versa.

TRANSMITTER WIRING DIAGRAM



RECEIVER WIRING DIAGRAM



SQD SLV_001060

SY/MAX-20™ PROGRAMMABLE CONTROLLER

CLASS 8884

- EAROM memory — no battery backup required for the user program
- Four function arithmetic plus square root extraction
- Two indicating lights for each input and output
- Universal input module — 6V to 120V AC or DC
- Every output is equipped with a fuse and integral fuse puller
- Diagnostic indicators for all replaceable components
- Memory utilization: 1 word = 1 contact or coil (see below)
- Provides 1K or 2K words of memory (read/write, nonvolatile — no battery required)
- Has an external input/output capacity of 511 (any combination in increments of two)
- Provides 511 internal outputs (relay and latch relay equivalents)
- Provides 80 three digit counters and timers (any combination)
- Provides up to 960 reversible shift register zone bits

GENERAL

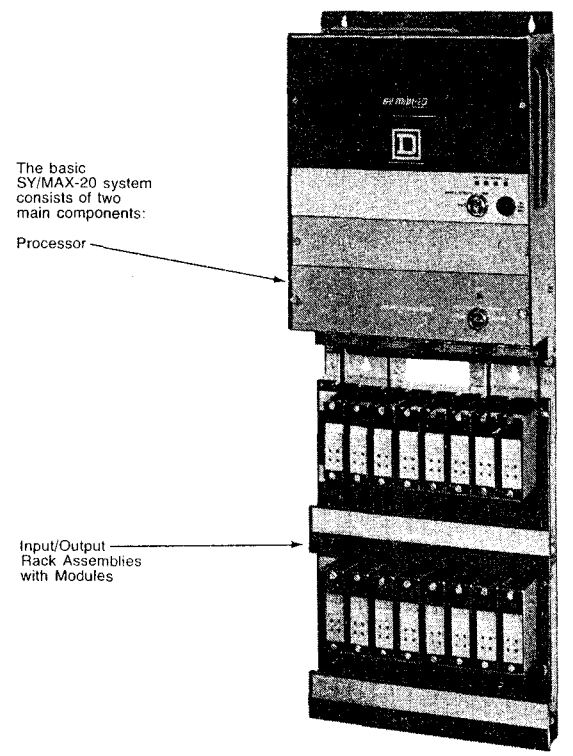
SY/MAX-20 is a microprocessor based programmable controller which can handle small to medium size applications ranging from simple relay control replacement to complex control functions requiring multiplication, division, and square root extraction. It is economical to use SY/MAX-20 to replace relay control systems of as few as 15 relays. Typical applications include automated packaging and assembly machines, material handling, machine tools, wood products and paper processing, welding machines, injection molding machines, film, chemical, food and petroleum processing.

SYSTEM HARDWARE VS. PROGRAMMING EQUIPMENT

The SY/MAX-20 Programmable Controller consists of two groups of equipment: 1) controller equipment and 2) programming equipment. Controller equipment is used to control the actual operation of the machine. Programming equipment is used to enter the user's control program into the controller equipment.

The controller equipment consists of a processor and one or more Input/Output racks. The processor interrogates I/O status at the I/O racks and has logic capability to operate according to the user's control program, which is stored in a plug-in memory module attached to the processor. The I/O racks and attached I/O modules communicate with external I/O control devices such as limit switches, solenoids and etc.

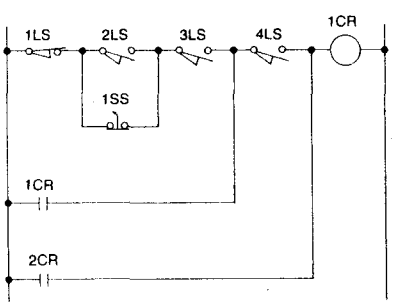
The SY/MAX-20 programming equipment consists of either a full featured CRT unit, or an inexpensive hand held keyboard/readout unit. Either version of programming equipment is available with the SY/MAX-20 Controller; and connects through a cable to a program interface module, located as an attachment to the processor. Once the control program is entered, the programming equipment can be used for monitoring, program alteration or can be removed and used on SY/MAX-20 controllers elsewhere.

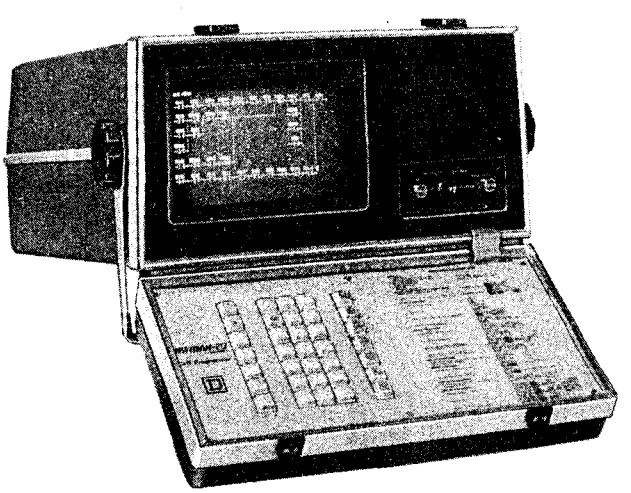


MEMORY WORD UTILIZATION

All contacts and all outputs (internal relay equivalent or external) of the relay ladder diagram each require one word of memory. In general memory word utilization can be determined by counting the total number of contacts and coils. Occasionally certain circuit configurations will require an extra word or two due to complex branching.

The ladder diagram rung below requires 8 words.





SUPPORT LITERATURE

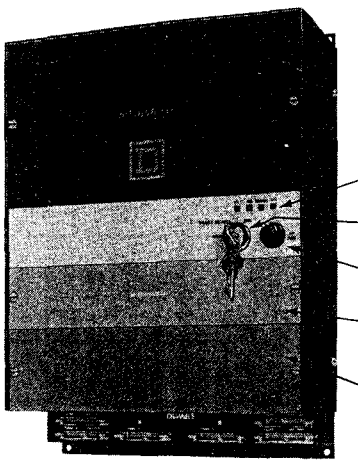
Descriptive Brochure — SM538
Technical Manual — SM544
Suggested Specification — M582
Basic Systems Troubleshooting — M557

SQD SLV_001061

SY/MAX-20™ PROGRAMMABLE CONTROLLER

CLASS 8884

PROCESSOR



The processor is housed within a single, compact enclosure, and contains the system power supply, processor logic boards and memory module. (A program interface module also plugs into the processor during programming or monitoring.) The power supply, within the processor, provides all logic power for any size system up to and including the largest number of input/output devices (511). There are no separate power supplies to mount or wire.

All processors have 511 internal outputs and 80 storage locations. Select processors with capability for either 256 maximum or 511 maximum (form VPS) external input/output devices from the table. If arithmetic capability is also required, form VA should be specified.

PROCESSOR WITHOUT MEMORY MODULE*

120V AC▲			50-60 Hz.
Description	Type	Form	Price
Basic Processor ⊕ — accommodates up to 256 external I/O	SCP-20	—	**$861.**
Processor ⊕ — accommodates up to 256 external I/O, with arithmetic ■	SCP-20	VA	**1,186.**
Processor ⊕ — accommodates up to 511 external I/O	SCP-20	VPS	**1,811.**
Processor ⊕ — accommodates up to 511 external I/O, with arithmetic ■	SCP-20	VA, VPS	**2,136.**

* A Type SMM-1000 or SMM-2000 Memory Module MUST also be ordered to obtain an operational processor.

⊕ Provides 511 internal outputs and 80 12 bit storage registers.

■ Form VA provides the following added capabilities: addition, subtraction, multiplication, division, square root extraction, cascade, transition detection, and shift register commands, (data in, shift right, shift left).

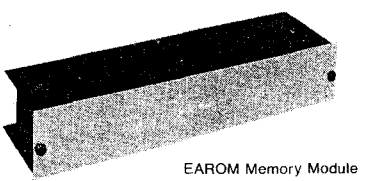
▲ For 240V AC operation, specify Form VH for any of the four processors.

MEMORY MODULE

The memory module contains 1K (1024) or 2K (2048) words of Electrically Alterable Read Only Memory (EAROM). Substituting a 2K memory module for a 1K memory module is all that is required to increase the memory size of the controller. The module is totally enclosed in a protective sheet metal housing and simply plugs into the processor.

EAROM MEMORY MODULE

Description	Type	Price
1K (1024) Words	SMM-1000	**$350.**
2K (2048) Words	SMM-2000	**900.**



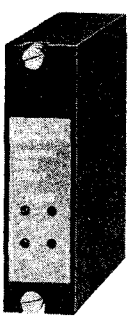
EAROM Memory Module

INPUT/OUTPUT MODULES

The input and output modules plug into their respective rack assemblies. Each I/O module provides two inputs or outputs. Each input and output function has the benefit of two LED status indicators, one red and one yellow. The red input or load LED indicates conducting status in the field power wiring circuit while the yellow logic LED indicates logic voltage signal status. Thus it is possible to witness not only signal arrival but also proper functioning of the I/O. This dual indication quickly shows if the module is operating properly and also provides blown fuse indication for output modules.

INPUT MODULES

Description	Type	Price
Universal Input Module — Contains two 6V to 120V AC/DC inputs	SIM-101	**$24.**
240V AC/DC Input Module — Contains two 240V AC/DC inputs	SIM-121	**26.**
TTL Input Module — Contains two TTL compatible inputs	SIM-131	**22.**
Input Simulator Module — Contains two toggle switches for simulating two inputs	SIM-191	**11.**



Universal Input Module Type SIM-101

ORDERING INFORMATION REQUIRED: Class, type and form number

SQD SLV_001062

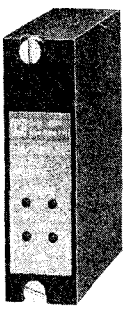
SY/MAX-20™ PROGRAMMABLE CONTROLLER

CLASS 8884

OUTPUT MODULES

Description	Type	Price
120/240V AC Output Module — Contains two triac outputs. Each output is rated at 1 amp. continuous*	SOM-221	**$28.**
120/240V AC 2 amp Output Module — Each output is rated at 2 amps continuous Δ	SOM-222	**33.**
9 to 150 VDC Output Module — Contains two DC solid state outputs each rated at 1 amp.	SOM-231	**28.**
TTL Output Module — Contains two TTL compatible outputs	SOM-251	**26.**
Output Simulator Module — Contains two LED indicators for simulating two outputs	SOM-291	**9.**

* Each output has a 25 amp inrush capability for 1 cycle, for a maximum of 10 times per minute.
Δ Maximum continuous current per module 2.5 Amps.



120/240V AC Output Module Type SOM-221

SIMULATOR MODULES SIM-191, SOM-291

Inexpensive input and output simulator modules are available which are inserted into the I/O rack assemblies. Each input simulator module has two toggle switches and each output simulator module has two LED indicators. With these devices, it is possible to check the operation of a program without wiring any input devices (push buttons, limit switches, etc.) or output devices to the rack assemblies.

INPUT/OUTPUT RACK ASSEMBLIES

Input and output racks provide terminals for wiring to the various external devices and accommodate up to eight plug-in input or output modules. Each module provides two external functions. Rack assemblies are furnished with separate mounting brackets and with a Type SDC-200 I/O data cable to connect the rack to one of the processor channels, either directly or through a preceding I/O rack.

INPUT/OUTPUT RACK ASSEMBLIES*

Description	Type	Price
Universal Input Rack Assembly (for TTL and 6 to 240V AC/DC input voltages) — Accepts 8 Input Modules: (all types)	SRK-100	**$170.**
120/240V AC/DC Input Rack Assembly (for 120/240V AC/DC input voltages only) — Accepts 8 Input Modules: (SIM-101, 121, 191)	SRK-120	**160.**
Low Voltage Input Rack Assembly (for TTL and 6 to 60V AC/DC input voltages) — Accepts 8 Input Modules: (SIM-101, 131, 191)	SRK-130	**160.**
Universal Output Rack Assembly (for TTL and 9 to 150V DC and 120/240V AC output voltages) — Accepts 8 Output Modules: (all types)	SRK-200	**160.**
Combination Rack Assembly — Accepts 4 Input Modules: (120/240V AC/DC only) and 4 Output Modules: (all types)	SRK-300	**160.**

* All Rack Assemblies include 18 inch I/O Data Cable (SDC-200), Horizontal Duct Cover (SCV-100) and two optional use Mounting Brackets (SMB-100)

I/O ACCESSORY EQUIPMENT

Description	Type	Price
36 Inch I/O Data Cable	SDC-210	**$36.**
Horizontal Duct Cover Extension	SCV-110	**3.**
Vertical Duct Assembly	SCV-120	**15.**
Blown Fuse Indicator Fuse Puller for SOM-221 (operating range 120-240V AC)	SBF-221 □	**5. ea.**
Blown Fuse Indicator Fuse Puller for SOM-231 (operating range 24-55V DC)	SBF-231 □	**5. ea.**
Blown Fuse Indicator Fuse Puller for SOM-231 (operating range 50-125V DC)	SBF-241 □	**5. ea.**

□ Replaces the standard fuse pullers on the Type SRK-200 Output Rack Assembly.

REPLACEMENT PARTS

Description	Type	Price
18 Inch I/O Data Cable	SDC-200	**$26.**
Horizontal Duct Cover	SCV-100	**3.**
Mounting Bracket for I/O Racks and Processor	SMB-100	**5.**
Switch Cover for I/O Rack Coding Switches or Input Module Voltage Range Switches	SSC-100	**1.**
Standard Fuse Puller	SFP-200	**1.**
Battery Pack for Processor	SBP-20	**15.**

PROGRAMMING EQUIPMENT

Two versions of programming equipment are available with the SY/MAX-20 controller. The hand-held version consists of a Type SPR-20 hand-held keyboard, cable connected to a Type SIB-20 program interface module. The CRT version consists of a Type SPR-25 portable CRT connected (via serial cable) to a Type SIB-25 interface module. Any combination of the available processors and memory modules can be programmed from either programming package. The trial memory feature increases programming and machine monitoring capabilities.

ORDERING INFORMATION REQUIRED: Class, type and form number.

SQD SLV_001063

SY/MAX-20™ PROGRAMMABLE CONTROLLER

CLASS 8884



Type SPR-20 Hand-Held Programmer

PROGRAMMER (HAND-HELD)

The programmer is used to program, edit, monitor or troubleshoot the system. It is a portable, hand-held keyboard device, which is plugged into the interface module via the attached cable.

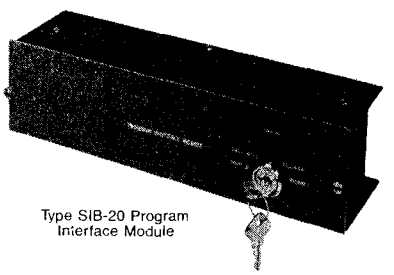
PROGRAM INTERFACE MODULE (TYPE SIB-20)

The program interface module plugs into a processor socket which is exposed by removing the lower gray cover plate on the processor.

TRIAL MEMORY (FORM VM-1 OR VM-2)

This program interface module optional feature enables storage of a second program while retaining the original processor program. A machine or process can be operated from either program by a simple command on the programmer keyboard. Using this extra capability, the program in trial memory can be changed while the machine or process continues to operate on the original program in the processor. If changes prove satisfactory the program in trial memory can be automatically copied into the processor. These capabilities are especially useful during start-up debugging.

Duplication of programs to additional EAROM memory modules is also possible using the trial memory. This may eliminate the need for a cassette device.



Type SIB-20 Program Interface Module

(HAND HELD PROGRAMMING EQUIPMENT)

Description	Type	Form	Price
Programmer (hand-held)*	SPR-20	—	**$240.**
Program Interface Module	SIB-20	—	**300.**
Program Interface Module With 1K Trial Memory	SIB-20	VM-1	**600.**
Program Interface Module With 2K Trial Memory	SIB-20	VM-2	**900.**
Optional Carrying Case for Programmer and Program Interface Module	SPR-21	—	**25.**

* MUST be used with one of the three Type SIB-20 Interface Modules to obtain an operational set of programming equipment.

CRT PROGRAMMER

The Type SPR-25 is a full featured portable CRT programmer. The CRT offers complete programming, monitoring, editing, and troubleshooting capabilities; with a large 9″ screen and special function keyboard for ease of operation. A magnetic tape cassette loader/recorder and printer can be connected to the programmer for program storage and loading, and hard copy documentation. A compartment to the rear of the CRT provides secure storage for the program interface module and interconnecting cable.

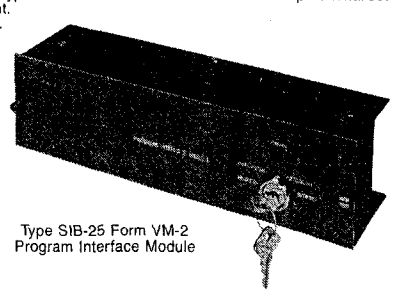
PROGRAM INTERFACE MODULE (TYPE SIB-25)

Adding the Type SIB-25 form VM-2 interface module to the CRT programmer, completes the SY/MAX-20 CRT programming package. The CRT program interface module contains 2K of trial memory, thereby offering numerous off-line programming and editing features.

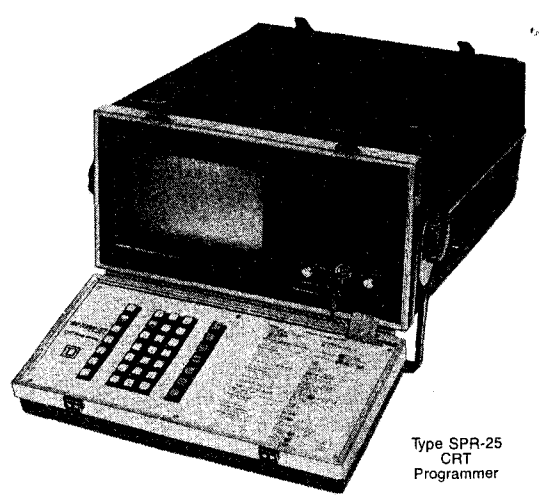
CRT PROGRAMMING EQUIPMENT

Description	Type	Form	Price
CRT Programmer*▲	SPR-25	—	**$2,000.**
Program Interface Module with 2K Trial Memory	SIB-25	VM-2	**1,000.**
10 foot CRT to Interface Module Interconnecting Cable	SCC-25	—	**75.**
100 foot CRT to Interface Module Interconnecting Cable	SCC-26	—	**125.**
200 foot CRT to Interface Module Interconnecting Cable	SCC-27	—	**170.**

* MUST be used with the Type SIB-25 Interface Module to obtain an operational set of programming equipment.
▲ Includes SCC-25 cable.



Type SIB-25 Form VM-2 Program Interface Module



Type SPR-25 CRT Programmer

ORDERING INFORMATION REQUIRED: Class, type and form number

SQD SLV_001064

In addition to the standard modules which provide interfacing of programming equipment, there are two special SY/MAX-20 interface modules.

The Type SIB-30 is a cassette interface which allows a direct connection to a cassette loader/recorder without the need of a CRT programming package.

The Type SIB-40 is a computer interface which provides a serial port with RS-232C or current loop capability. The baud rate is adjustable to 300, 1200, 9600, and 19,200. This interface allows a computer to interrogate I/O and register status, alter register status, force I/O, interrogate control programs, and down-load programs. This interface can also be used with the CRT programmer (SPR-25) in lieu of the SIB-25 Form VM-2.

SPECIAL INTERFACES

Description	Type	Form	Price
Cassette interface module	SIB-30	—	**$600.**
Computer interface module	SIB-40	—	*

* Consult factory.

The CRT Programmer has a built-in self test capability to diagnose its operation. In order to utilize this capability, two Class 8881 Type T-3 and one Class 8884 Type STP-25 Test Plugs are required.

TEST PLUGS

Description	Class	Type	Form	Price
CRT Programmer Test Plug for Processor Port	8884	STP-25	—	**$35.**
CRT Programmer Test Plug for Peripheral Ports	8881	T-3	—	**35.**

PERIPHERAL EQUIPMENT

Description	Class	Type	Price
Printer Terminal — 80 character lines, 300 BAUD, 30 cps	8881	PE-10	**$2,000.**
High Speed Line Printer — 132 character lines, up to 9600 BAUD, 300 lpm	8881	LP-2	**4,300.**
30 Ft. Printer Terminal or High Speed Line Printer Cable — 300 BAUD	8881	CC-21	**100.**
30 Ft. High Speed Line Printer Cable — up to 9600 BAUD	8881	CC-22	**100.**
CASSETTE LOADER/RECORDER (Includes 10' Cable and 1 PE-2 Cassette Cartridge)	8881	PE-1	**1,980.**
Cassette Cartridge	8881	PE-2	**14.**

RENTAL EQUIPMENT

Certain Class 8884 Programmable Controller Products are available on a monthly rental basis. Rental, rather than purchase, may be desirable for such temporary uses as programming, equipment start-up, or while equipment is being repaired.

EQUIPMENT

Description	Type	Form	Net Rental Price Per Month
CRT Programmer	SPR-25	—	**$120.**
Program Interface Module for CRT Programmer with 2K Trial Memory	SIB-25	VM-2	**80.**
Processor (256 I/O Capability with arithmatic function)	SCP-20	VA	**120.**
Memory Module (2048 Words)	SMM-2000	—	**80.**

TERMS

Minimum rental period is one month. Rental charges are billed in advance. Invoicing will be for one month intervals only and will be in advance for the next month's rental. Rental termination date is the date the returned equipment is received at Square D Company, Milwaukee Plant.

PURCHASE OPTION

Credit toward the purchase of the rented or like equipment will be given upon receipt of a purchase order **prior** to termination of rental, with the following credits given for rental payments:

100% of 1st month
80% of 2nd month
60% of 3rd month
40% of 4th month
20% of 5th month
0% of 6th month and thereafter

RENTAL EQUIPMENT REPAIR

Service of rental equipment in customer's plant is not included in rental charge. Rented equipment must be returned to the Square D Milwaukee Plant for repair, with shipping prepaid and absorbed by the customer. Replacement equipment will be shipped by Square D upon verbal notification of equipment needing repair, with shipping charges prepaid and absorbed by Square D. Replacement equipment will be invoiced at new equipment purchase price with full credit issued upon receipt of equipment requiring repair. If required repairs are the result of improper use or treatment, or should equipment returned upon termination of rental require repair, as determined by the Square D Company, the customer will be invoiced in full for all necessary repairs on the basis of repair cost.

ORDERING INFORMATION REQUIRED: Class, type and form number.

SQD SLV_001065

SY/MAX-20™ PROGRAMMABLE CONTROLLER

REPAIR/EXCHANGE PARTS

CLASS 8884

GENERAL

Inoperable Class 8884 Programmable Controller equipment, that is out of warranty, can be returned to Square D Company for either 1) repair or 2) exchange for equivalent rebuilt equipment (see list of available exchange items below). Inoperable equipment still under warranty is not covered by the Repair-Exchange Policy, but is covered under the terms of the original warranty.

The Repair-Exchange Policy provides the benefits of quick replacement (shipment within 48 hours after receipt of a purchase order) and replacement at a fixed price that is substantially discounted from new equipment prices.

NOTE: 48 HOUR SHIPMENT CANNOT BE GUARANTEED FOR MORE THAN 5 IDENTICAL MODULES.

TERMS

Equipment covered under the Repair-Exchange Policy will be furnished in exchange for repairable equipment of equivalent part number. The replacement equipment furnished will be shipped from our bank of rebuilt, retested equipment and will be covered by our repair warranty.

NON-REPAIRABLE EQUIPMENT

If the exchanged equipment returned to Square D is deemed "not repairable," due to physical damage, an invoice will be issued in the amount of the catalog price for new equipment, less 10%, and a credit will be issued in the amount of the exchange invoice. The non-repairable equipment will be returned to the customer, or discarded, at the customer's direction. If equipment for exchange is not received by Square D within 3 weeks after shipment of replacement equipment, it will be considered "not repairable" and invoiced accordingly.

WARRANTY

Square D warrants that equipment covered by our Repair-Exchange Policy to be free from defects in materials and workmanship for a period of 90 days from date of shipment by Square D. If within such period any such equipment shall be proved to Square D's satisfaction to be defective, such equipment shall be repaired or replaced at Square D's option. This warranty does not apply (a) to equipment not manufactured by Square D, (b) to equipment which shall have been repaired or altered by others than Square D so as, in its judgement, to affect the same adversely or (c) to equipment which shall have been subjected to negligence, accident, or damage by circumstances beyond Square D's control, or to improper operation, maintenance or storage, or to other than normal use or service.

All other terms are subject to Square D standard conditions of sale.

NOTE: 1. Repair reports will not be issued for equipment returned on a repair/exchange basis.
2. Equipment returned for repair rather than exchange will be invoiced at a minimum of $100.00 Net.

ORDERING INFORMATION REQUIRED: Specify repair/exchange order including class, type, and form number.

PROCESSORS

Description	Type	Form	Repair Price
Basic Processor — accommodates up to 256 external I/O	SCP-20	—	**$344.**
Processor — accommodates up to 256 external I/O with arithmatic	SCP-20	VA	**474.**
Processor — accommodates up to 511 external I/O	SCP-20	VPS	**724.**
Processor — accommodates up to 511 external I/O with arithmatic	SCP-20	VA VPS	**854.**

MEMORIES

Description	Type	Form	Repair Price
1K (1024 word memory module)	SMM-1000	—	**$140.**
2K (2048 word memory module)	SMM-200	—	**360.**

I/O RACKS

Description	Type	Form	Repair Price
Universal Input Rack Assembly (for TTL and 6 to 240V AC/DC input voltages) — Accepts 8 Input Modules: (all types)	SRK-100	—	**$68.**
120/240V AC/DC Input Rack Assembly (for 120/240V AC/DC input voltages only) — Accepts 8 Input Modules. (SIM-101, 121, 191)	SRK-120	—	**84.**
Low Voltage Input Rack Assembly (for TTL and 6 to 60V AC/DC input voltages) — Accepts 8 Input Modules. (SIM-101, 131, 191)	SRK-130	—	**64.**
Universal Output Rack Assembly (for TTL and 9 to 150V DC and 120/240V AC output voltages) — Accepts 8 Output Modules: (all types)	SRK-200	—	**64.**
Combination Rack Assembly — Accepts 4 Input Modules: (120/240V AC/DC only) and 4 Output Modules: (all types)	SRK-300	—	**64.**

PROGRAMMING EQUIPMENT

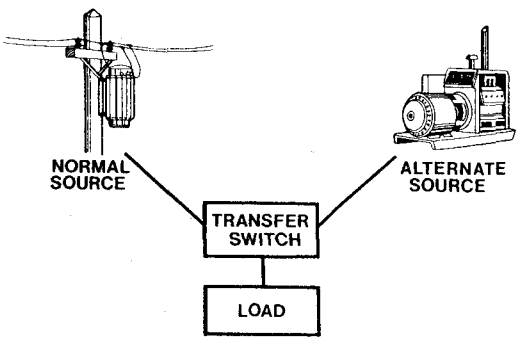
Description	Type	Form	Repair Price
Hand Held Programmer (Used with Type SIB-20 interface module)	SPR-20	—	**$ 96.**
CRT Programmer (Used with Type SIB-25 interface module)	SPR-25	—	**880.**
Program Interface Module	SIB-20	—	**120.**
Program Interface Module with 1K Trial Memory	SIB-20	VM1	**240.**
Program Interface Module with 2K Trial Memory	SIB-20	VM2	**360.**
CRT Program Interface with 2K Trial Memory	SIB-25	VM2	**440.**

SQD SLV_001066

UL LISTED
CSA APPROVED

AUTOMATIC TRANSFER SWITCHES
FOR EMERGENCY AND STANDBY POWER SERVICE

CLASS 8901



AUTOMATIC TRANSFER SWITCHES
Basic Application Data

For additional application information, special application data, descriptions of accessories, service data, and suggested specifications, refer to Control Products Catalog or your local Square D Field Office.

Standard Features:

- Fixed Voltage Sensing on all phases of Normal Source.
- Fixed Voltage Sensing on one phase of Alternate Source.
- 90% Pickup, 70% Dropout characteristics of fixed Voltage Sensing relays.
- Terminals provided for connection of test switch and Engine starting circuit.
- Normally closed engine starting contact.
- NEMA Type 1 enclosure with 3 point closing and provision for padlocking enclosure door.
- All wiring numbered and keyed to connection diagram.
- One Auxiliary contact closed when alternate source contactor is energized.
- Mechanically and electrically interlocked.
- All basic devices carry the UL Label and are listed in accordance with UL1008.
- Cu/Al Compatible lugs for power cable connections.

GENERAL

The automatic transfer switch, as part of the emergency power generating system, provides the important function of switching an essential electrical load from the normal source of electrical supply to an alternate source of supply.

The Model TSA device is designed to accommodate the differences in requirements which occur from installation to installation. The basic model TSA device, with the inclusion of one of the test switch options, provides engine starting, transfer and retransfer functions without time delays.

This basic device, and most listed factory modifications, are listed by Underwriter's Laboratories in accordance with the requirements of UL1008. Requirements for special equipment should be referred to the local Square D Company Field Office.

The factory modifications shown on the following page are to be selected to meet the requirements of the installation. Time delays, special voltage and frequency sensing requirements, and other control devices are added to the basic switch to arrive at a device which is custom tailored to the specification.

The automatic transfer switch is utilized in installations where emergency power must be provided to essential electrical loads as defined by the National Electrical Code (NFPA 70), The Life Safety Code (NFPA 101), Essential Electrical Systems for Health Care Facilities (NFPA 76A) and other codes and standards.

Installations requiring this emergency (alternate) source of supply include, but are not limited to: hospitals, nursing homes, theaters, auditoriums, banks, high rise buildings, airports, commercial ocean vessels, and petro-chemical plants. The transfer switch connects the alternate source of power to loads such as: operating rooms, intensive care units, medical gas distribution systems, exit and task illumination, critical chemical processes, radar and sonar equipment and ventilation equipment.

HEALTH CARE FACILITY REQUIREMENTS

Necessary transfer equipment for Hospitals and Health Care Facilities is outlined in the National Electrical Code and further detailed in NFPA 76A, "Essential Electrical Systems for Health Care Facilities."

In order to meet the requirements of these standards, automatic transfer switches for Hospitals and Health Care facilities must contain the following accessories as a minimum:

Form C9 — "Test-Auto" selector switch.
Form K17 — 0-30 minute time delay on retransfer.
Form P1 — "Alternate" indicating light.
Form P2 — "Normal" indicating light.
Form Y15-3 — Adjustable voltage sensing of Normal Source.
Form Y135-1 — Frequency sensing of Alternate Source.

In addition, other time delays and options can be applied to meet additional requirements of the installation. Certain portions of the Equipment System may be non-automatic (Form S).

NON-AUTOMATIC TRANSFER SWITCHES

Manually controlled, electrically operated transfer switches can be supplied by specifying "Form S" and the type of control to be used. Control input can be supplied through local or remote pushbuttons or selector switches, building energy management equipment or from an output signal on another automatic transfer switch. Additional information may be obtained from the local Square D Company field office.

SPECIAL POWER TRANSFER EQUIPMENT

Certain installations require special power transfer equipment. The automatic transfer switch provides the basis upon which this special equipment is designed.

Among these special installations are: three source transfer systems and emergency elevator control systems. Additional information on this equipment may be obtained through the local Square D Company field office.

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Form numbers, as applicable, from page 290.
3. Voltage, line to line, for both normal and alternate source.
4. Voltage, line to neutral, for both normal and alternate source, if applicable.
5. Frequency.
6. Number of phases.

EXAMPLE: Class 8901 SVG-9 Form KK9K10Y29
277/480V, 60Hz, 3ϕ, 4 Wire,
Normal and alternate.

SQD SLV_001067

AUTOMATIC TRANSFER SWITCHES

GENERAL — 30-800 AMPERES

CLASS 8901

480 Volts Maximum — Lighting Loads
480 Volts Maximum — Horsepower Rated Loads
480 Volts Maximum — General Use Loads

50-60 HERTZ	MODEL TSA										NEMA 1 GENERAL PURPOSE ENCLOSURE	
	AC SERVICE — NORMAL AND ALTERNATE											
	1 ϕ, 2 W.		1 ϕ, 3 W. (S/N)		1 ϕ, 3 W. (SWN)		3 ϕ, 3 W.		3 ϕ, 4 W. (S/N)		3 ϕ, 4 W. (SWN)	
Ampere Rating	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price
MECHANICALLY HELD												
30	SMG6	**$ 1216.**	SMG7	**$ 1232.**	SMG23	**$ 1224.**	SMG8	**$ 1544.**	SMG9	**$ 1560.**	SMG10	**$1628.**
60	SPG6	**1544.**	SPG7	**1576.**	SPG23	**1592.**	SPG8	**1912.**	SPG9	**1944.**	SPG10	**2080.**
100	SQG6	**2028.**	SQG7	**2076.**	SQG23	**2092.**	SQG8	**2412.**	SQG9	**2460.**	SQG10	**2696.**
150	SVG6	**3752.**	SVG7	**3848.**	SVG23	**3936.**	SVG8	**4256.**	SVG9	**4352.**	SVG10	**5016.**
225	SWG6	**5650.**	SWG7	**5825.**	SWG23	**5950.**	SWG8	**6250.**	SWG9	**6425.**		
260	SXG6	**6528.**	SXG7	**6728.**	SXG23	**6864.**	SXG8	**7184.**	SXG9	**7384.**		
400	SYG6	**7400.**	SYG7	**7650.**	SYG23	**8840.**	SYG8	**9000.**	SYG9	**9250.**		
600	SZG6	**13,600.**	SZG7	**13,900.**	SZG23	**15,840.**	SZG8	**16,000.**	SZG9	**16,300.**		
800	SJG6	**15,000.**	SJG7	**15,500.**	SJG23	**17,840.**	SJG8	**18,000.**	SJG9	**18,500.**		
ELECTRICALLY HELD												
30	SMG1	**$ 944.**	SMG2	**$ 960.**	SMG22	**$ 952.**	SMG3	**$1272.**	SMG4	**$1288.**	SMG5	**$1356.**
60	SPG1	**1240.**	SPG2	**1272.**	SPG22	**1288.**	SPG3	**1608.**	SPG4	**1640.**	SPG5	**1776.**
100	SQG1	**1684.**	SQG2	**1732.**	SQG22	**1748.**	SQG3	**2068.**	SQG4	**2116.**	SQG5	**2352.**
150	SVG1	**3208.**	SVG2	**3304.**	SVG22	**3392.**	SVG3	**3712.**	SVG4	**3808.**	SVG5	**4472.**

FACTORY MODIFICATIONS AND FORMS

Form Number	Description	Price
A6	Manual Return to Normal Pushbutton	**$108.**
A7	Time Delay Bypass Pushbutton	**108.**
A15-1	"Normal" and "Alternate" pushbuttons for use with Form S devices	**88.**
A15-2	Illuminated "Normal" and "Alternate" push buttons for use with Form S devices	**180.**
A15-3	Flashing illuminated push buttons, "Normal" and/or "Alternate" for use with Form S devices	**180.**
C9●	"Test-Auto" Selector Switch	**88.**
C12	Four Position Selector Switch "HAND CRANK — OFF-AUTO-TEST"	**276.**
C21	"Normal-Auto-Alternate" Selector Switch: For Manual Selection Of Source Or Automatic Operation	**100.**
C28	Two position selector switch "Normal-Alternate" for use with Form S devices	**88.**
K	Time Delay Return to Normal (.1-180 Seconds)	**336.**
K17	Time Delay Return to Normal (1-30 Minutes)	**560.**
K17-1	Time Delay Return to Normal (1-60 Minutes)	**560.**
K8	Time Delay Transfer to Alternate (.1-180 Seconds)	**336.**
K9	Time Delay Engine Start (.1-180 Seconds)	**336.**
K10	Time Delay Engine Overrun (.1-5 Minutes)	**336.**
K18	Time Delay Engine Overrun (1-30 Minutes)	**560.**
K11	One Cycle Cranking Limiter	**336.**
K12	Plant Exerciser (without Load)	**576.**
*K12-1	Plant Exerciser With Reserve Power (without Load)	**800.**
K13	Plant Exerciser (with Load)	**576.**
*K13-1	Plant Exerciser With Reserve Power (with Load)	**800.**
K20-3	Imposed Neutral Position For Transferring Motor Loads	**672.**
K21	Plant Exerciser and Selector Switch for "With Load — Without Load" Operations	**$676.**
P1	Pilot Light Marked "Alternate"	**108.**
P2	Pilot Light Marked "Normal"	**108.**
P3	Amber Pilot Light Marked "Alternate Source Available"	**108.**
P36	Blue Pilot Light Marked "Normal Source Available"	**108.**
S	Separate Control for Non-Automatic Operation (Deduct for 3 Phase Device)	**240.**
	Separate Control for Non-Automatic Operation (Deduct for 1 Phase Device)	**80.**
X10	Auxiliary Interlock — Closed on Normal	**44.**
X20	Auxiliary Interlock — Open on Normal	**44.**
X30■	2 Auxiliary Interlocks, Closed on Normal	**88.**
X40■	2 Auxiliary Interlocks, Open on Normal	**88.**
X50■	2 Auxiliary Interlocks, One Open and One Closed on Normal	**88.**
X01	Auxiliary Interlock Closed on Alternate	**44.**
X02	Auxiliary Interlock Open on Alternate	**44.**
X03■	2 Auxiliary Interlocks, Closed on Alternate	**88.**
X04■	2 Auxiliary Interlocks, Open on Alternate	**88.**
X05■	2 Auxiliary Interlocks, One Open, One Closed on Alternate	**88.**
Y15-1	Single Phase Variable Protection	**330.**
Y15-3	Three Phase Variable Protection	**620.**
Y29	Test Pushbutton	**64.**
Y135-1	Voltage and Frequency Lockout (includes Time Delay Bypass if Generator fails)	**440.**
*Y136	Battery Charger (Consult Factory)	...
T27	120 Volt Control Circuits (Consult Factory)	...

Enclosure Options:‡	Form Number	Model TSA 30 and 60 Amp.	100 and 150 Amp.	225 and 260 Amp.	400 and 600 Amp.
Omit Enclosure (Deduct)	✤	**$ 24.**	**$ 120.**	**$ 600.**	**$ 600.**
NEMA 12 (Add)	◐	**120.**	**408.**	**1200.**	**1200.**
NEMA 4 (Add)	▲	**416.**	**1088.**	Consult Factory	Consult Factory
Flush Mounting Enclosure (Includes Flush Lock)	★	**300.**	N/A	N/A	N/A
Substitute Stainless Trim On Flush Enclosure (Includes Flush Lock)	Y56	**116.**	N/A	N/A	N/A
Add Flush Lock to NEMA 1 Enclosure (Add)	Y137*	**96.**	**96.**	Not Available	N/A
Add Cover Gasket to NEMA 1 Enclosure (Add)	Y47*	**104.**	**240.**	**400.**	**400.**

‡ For other enclosure options, consult your local field office.
* Denotes option not listed by UL.
✤ Change third letter of Type Number to "O."
◐ Change third letter of Type Number to "A."
▲ Change third letter of Type Number to "W."
★ Change third letter of Type Number to "F."
■ Auxiliary interlocks may be restricted to one interlock per contactor due to control circuit requirements. Auxiliary Relays will be provided for interlock requirements when necessary.
● For key operated selector switch specify "Key Operated" and add $130.

SQD SLV_001068

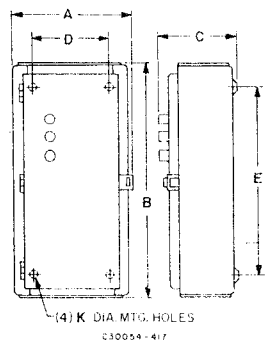


Figure 1
30-150 Amp NEMA 1 Enclosure

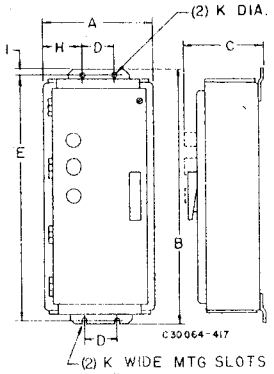


Figure 2
225-260 Amp NEMA 1 Enclosure

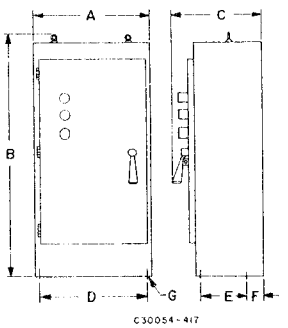


Figure 3
400-600 Amp NEMA 1 Enclosure

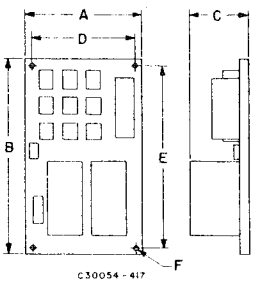


Figure 4
Open Style Devices 30-600 Amps

Type	Ampere Rating	Figure		NEMA Type 1 General Purpose Enclosure										Approx. Shipping Weight	Open Type — Figure 4					
				A	B	C	D	E	F	G	H	I	K		A	B	C	D	E	F
SM	30	1	Inches	24.31	32.16	9.47	21.50	29.50	...	...	...	...	.44	110	21.22	28.22	6.84	20.25	27.25	.38
			MM	617	817	241	546	749	...	...	...	...	11		539	717	174	514	692	10
SP	60	1	Inches	24.31	32.16	9.47	21.50	29.50	...	...	...	...	.44	115	21.22	28.22	6.84	20.25	27.25	.38
			MM	617	817	241	546	749	...	...	...	...	11		539	717	174	514	692	10
SQ	100	1	Inches	27.22	46.22	10.53	23.00	42.00	...	...	...	...	.56	200	24.22	40.22	7.72	23.00	39.00	.44
			MM	691	1174	267	584	1067	...	...	...	...	14		615	1022	196	584	991	11
SV	150	1	Inches	27.22	46.22	10.53	23.00	42.00	...	...	...	...	.56	200	24.22	40.22	7.72	23.00	39.00	.44
			MM	691	1174	267	584	1067	...	...	...	...	14		615	1022	196	584	991	11
SW	225	2	Inches	30.21	63.25	19.77	11.00	62.00	...	...	9.61	.63	.69	390	24.22	44.22	12.13	22	42	.625
			MM	767	1606	502	279	1574	...	...	244	16	18		615	1123	308	559	1067	16
SX	260	2	Inches	30.21	63.25	19.77	11.00	62.00	...	...	9.61	.63	.69	490	24.22	44.22	12.13	22	42	.625
			MM	767	1606	502	279	1574	...	...	244	16	18		615	1123	308	559	1067	16
SY	400	3	Inches	36.22	63.22	22.09	33.75	12.75	5.00	.69	...	...	...	530	29.72	55.00	13.25	27.50	53.50	.63
			MM	920	1606	561	857	324	127	18	...	...	...		755	1397	337	699	1359	16
SZ	600	3	Inches	36.22	63.22	22.09	33.75	12.75	5.00	.69	...	...	...	530	29.72	55.00	13.25	27.50	53.50	.63
			MM	920	1606	561	857	324	127	18	...	...	...		755	1397	337	699	1359	16
SJ	800	3	Inches	40.25	75.25	23.75	37.75	11.50	6.25	.69	...	...	...	650	33.50	67.00	17.25	31.50	65.50	.63
			MM	1022	1911	603	959	292	159	18	...	...	...		851	170	438	800	1944	16

TERMINAL SIZE

Ampere Rating	Line and* Load Terminals		Control Terminals for● Remote Test Switch		Solid neutral (If Furnished)	
	Type of Lug	Wire Size Min.-Max.	Type of Lug	Wire Size Min.-Max.	Type of Lug	Wire Size Min.-Max.
30	Box Lug	#14-#6	Pressure Wire	#22-#12	Box Lug	(1) #14-#2/0 per lug (4 Lugs total)
60	Box Lug	#14-#2	Pressure Wire	#22-#12	Box Lug	(1) #14-#2/0 per lug (4 Lugs total)
100	Box Lug	#14-#2/0	Pressure Wire	#22-#12	Box Lug	(1) #14-#2/0 per lug (4 Lugs total)
150	Box Lug	#2-250 MCM	Pressure Wire	#22-#12	Box Lug	(1) #4-600 MCM per lug or (2) #1/0-250 MCM per lug (3 Lugs total)
225	Box Lug	(1) #4-(1) 600 MCM OR (2) #1/0-(2) 250 MCM	Pressure Wire	#22-#12	Box Lug	(1) #4-600 MCM per lug or (2) #1/0-250 MCM per lug (3 Lugs total)
260	Box Lug	(1) #4-(1) 600 MCM OR (2) #1/0-(2) 250 MCM	Pressure Wire	#22-#12	Box Lug	(1) #4-600 MCM per lug or (2) #1/0-250 MCM per lug (3 Lugs total)
400	Box Lug (Two Barrel)	(1) #6-(2) 350 MCM	Pressure Wire	#22-#12	Box Lug (Two Barrel)	(2) #2-600 MCM per lug (3 Lugs total)
600	Box Lug (Two Barrel)	(1) #2-(2) 600 MCM	Pressure Wire	#22-#12	Box Lug (Two Barrel)	(2) #2-600 MCM per lug (3 Lugs total)
800	Box Lug (Three Barrel)	(1) #3/0-(3) 750 MCM	Pressure Wire	#22-#12	Box Lug (Three Barrel)	(3) #3/0-750 MCM Per Lug, 3 Lugs Total

* Cu or Al Cable
● Cu only.

SQD SLV_001069

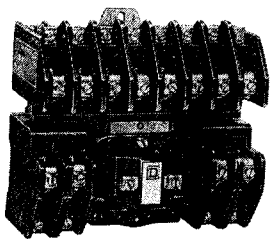
ELECTRICALLY HELD LIGHTING CONTACTORS

FOR TUNGSTEN & BALLAST LIGHTING AND RESISTANCE HEATING LOADS

CLASS 8903

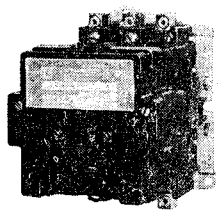
Electrically held lighting contactors are used in areas where the ac hum of a continuously energized coil would not be annoying (factories, outdoors, etc.) or wherever a high rate of operation is encountered. They are normally operated from a 2 wire, maintained contact input device.

TYPE L



- 2-12 Poles
- Convertible Contacts with N.O. and N.C. Indicators
- Silver Alloy Double Break Contacts
- Industrial Duty
- Adder Pole Kits Available
- DC Coils are Available

TYPE S



- Proven Type S Design
- No Arcing Contacts Required
- Enclosed Silver Alloy Double Break Contacts
- Lugs Suitable for Use with Copper or Aluminum Wire (60-800 Amperes Only)
- Combination Lighting Contactors Available (pages 294-295)

50-60 HERTZ — **ORDERING INFORMATION — Page 294** — **MAXIMUM VOLTAGE RATINGS — Page 296**

Ampere Ratings	No. of Poles	General Purpose Enclosure NEMA Type 1 Type	Price*	Flush Mounting General Purpose Enclosure with Plaster Adjustment Type	Price*	Watertight, Dusttight and Corrosion-Resistant Glass-Polyester Enclosure NEMA Type 4X Type	Price*	Watertight and Dusttight Enclosure Stainless Steel NEMA Type 4 Type	Price*	Dusttight and Driptight Industrial Use Enclosure NEMA Type 12‡ Type	Price*	Open Type Type	Price*
20◐	2	LG-20	$ 124.	LF-20●	$ 192.	Use 30 Ampere Type S		LW-20●	$ 256.	LA-20●	$ 240.	LO-20	$ 112.
	3	LG-30	136.	LF-30●	204.			LW-30●	268.	LA-30●	252.	LO-30	124.
	4	LG-40	172.	LF-40●	240.			LW-40●	304.	LA-40●	288.	LO-40	160.
	6	LG-60	248.	LF-60●	288.	Consult local Square D Field Office		LW-60●	352.	LA-60●	336.	LO-60	208.
	8	LG-80	324.	LF-80●	364.			LW-80●	428.	LA-80●	412.	LO-80	284.
	10	LG-1000	372.	LF-1000●	412.			LW-1000●	476.	LA-1000●	460.	LO-1000	332.
	12	LG-1200	428.	LF-1200●	468.			LW-1200●	532.	LA-1200●	516.	LO-1200	388.
30	2	SMG-1	132.	SMF-1●	184.	SMW-21●	$ 276.	SMW-1●	276.	SMA-1●	180.	SMO-1	124.
	3	SMG-2	144.	SMF-2●	196.	SMW-22●	288.	SMW-2●	288.	SMA-2●	192.	SMO-2	136.
	4	SMG-3	176.	SMF-3●	228.	SMW-23●	320.	SMW-3●	320.	SMA-3●	224.	SMO-3	168.
	5	SMG-4	232.	SMF-4●	284.	SMW-24●	376.	SMW-4●	376.	SMA-4●	280.	SMO-4	224.
60	2	SPG-1	272.	SPF-1●	340.	SPW-21●	560.	SPW-1●	560.	SPA-1●	360.	SPO-1	232.
	3	SPG-2	288.	SPF-2●	356.	SPW-22●	576.	SPW-2●	576.	SPA-2●	376.	SPO-2	248.
	4	SPG-3	360.	SPF-3●	428.	SPW-23●	760.	SPW-3●	760.	SPA-3●	448.	SPO-3	320.
	5	SPG-4	520.	SPF-4●	588.	SPW-24●	920.	SPW-4●	920.	SPA-4●	608.	SPO-4	480.
100	2	SQG-1	448.	SQF-1●	564.	SQW-21	1070.	SQW-1●	856.	SQA-1●	552.	SQO-1	368.
	3	SQG-2	480.	SQF-2●	596.	SQW-22	1110.	SQW-2●	888.	SQA-2●	584.	SQO-2	400.
	4	SQG-3	592.	....	....	....	....	SQW-3	1112.	SQA-3	696.	SQO-3	512.
	5	SQG-4	848.	....	....	....	....	SQW-4	1368.	SQA-4	952.	SQO-4	768.
200	2	SVG-1	1056.	SVF-1●	1136.	SVW-21	2190.	SVW-1	1752.	SVA-1	1400.	SVO-1	888.
	3	SVG-2	1128.	SVF-2●	1208.	SVW-22	2280.	SVW-2	1824.	SVA-2	1472.	SVO-2	960.
	4	SVG-3	1504.	....	....	....	....	SVW-3	2488.	SVA-3	1968.	SVO-3	1336.
300	2	SXG-1	2232.	....	....	....	....	SXW-1	3112.	SXA-1	3112.	SXO-1	1924.
	3	SXG-2	2400.	....	....	....	....	SXW-2	3280.	SXA-2	3280.	SXO-2	2092.
400▲	2	SYG-1	5844.	....	....	....	....	SYW-1	7844.	SYA-1	6924.	SYO-1	4576.
	3	SYG-2	6608.	....	....	....	....	SYW-2	8608.	SYA-2	7688.	SYO-2	5340.
600▲	2	SZG-1	7174.	....	....	....	....	SZW-1	9174.	SZA-1	8254.	SZO-1	5862.
	3	SZG-2	8060.	....	....	....	....	SZW-2	10060.	SZA-2	9140.	SZO-2	6746.
800▲	2	SJG-1	8504.	....	....	....	....	SJW-1	10540.	SJA-1	9504.	SJO-1	7148.
	3	SJG-2	9512.	....	....	....	....	SJW-2	11512.	SJA-2	10592.	SJO-2	8152.

* Price does not include holding circuit interlock.
◐ Factory conversion of N.O. contacts to any combination of N.C., **add $12 to list price.**
‡ NEMA Type 12 enclosures may be field modified for outdoor applications. For details, refer to page 448.
● Separate enclosures are available for these devices. Order open type contactor and separate class 9991 enclosure from page 297.
▲ Form FT is provided as standard; include line voltage when ordering. Control voltage is 120V/60HZ. For separate control, add Form S to Type Number.

FACTORY MODIFICATIONS FOR ELECTRICALLY HELD LIGHTING CONTACTORS

(For additional modifications refer to page 461.)

Description	Enclosure Type	Form Letter	20 Amp.	30 Amp.	60 Amp.	100 Amp.	200 Amp.	300 Amp.	400, 600 & 800 Amp.
"On-Off" push button — includes holding circuit interlock	1	A12	$132.■	$ 76.	$ 76.	$ 76.	$ 76.	$ 76.	$132.
	4, 12	A12	132.■	132.	132.	132.	132.	132.	132.
"On-Off" selector switch	1	C6	88.	32.	32.	32.	32.	32.	88.
	4, 12	C6	88.	88.	88.	88.	88.	88.	88.
"Hand-Off-Auto" selector switch	1	C	88.	32.	32.	32.	32.	32.	88.
	4, 12	C	88.	88.	88.	88.	88.	88.	88.
Pilot Lights: one light only	Any	P▲	60.	60.	60.	60.	60.	60.	60.
two or more lights — Each	Any	P▲	108.	108.	108.	108.	108.	108.	108.
push-to-test — Each	Any	P▲	120.	120.	120.	120.	120.	120.	120.
Operating interlock for pilot lights: Add to price of each pilot light — Each	Any	★	48.	48.	48.	48.	48.	48.	48.
Fused control circuit (1 fuse)	Any	F	88.	88.	88.	88.	88.	88.	Std.
Control circuit transformer with fused secondary (50 or 60 Hz)	Any	FT	108.	108.	152.	224.	272.	308.	Std.
Electrical interlocks (specify number of N.O. and N.C.) — Each	Any	X	†	44.	44.	44.	44.	44.	44.
Addition of 24 hour time clock (120-277 V. only)	1, 4, 12	K14	336.	336.	336.	336.	336.	336.	336.
Addition of 24 hour time clock with day omission (120-277 V only)	1, 4, 12	K14-1	336.	336.	336.	336.	336.	336.	336.
Addition of 7 day time clock (120-277 V. only)	1, 4, 12	K14-2	384.	384.	384.	384.	384.	384.	384.
Addition of terminal block for solid neutral	Any	N	32.	32.	32.	48.	96.	200.	240.
Addition of DC coil to Type L — max. of 6 poles (specify voltage — see pg. 296)	Any	Y48	68.	N/A	N/A	N/A	N/A	N/A	N/A
Auxiliary interlock installed on **combination lighting contactor** disconnect switch or circuit breaker operating mechanism (1 N.O.-1 N.C. Contact)	Any	Y74	N/A	44.	44.	44.	44.	116.	116.
Addition of photoelectric receptacle	4, 12	G10	52.	52.	52.	52.	52.	52.	52.
With photoelectric cell installed (120-277 V. only)	4, 12	G10-1	112.	112.	112.	112.	112.	112.	112.

▲ Indicate pilot light color as Form P (Red) or Form P (Green), etc., and how pilot light is to be wired into the circuit. Insert "Push-To-Test" before color if applicable.
★ DO NOT use Form X for any interlock which is wired in series with pilot light, but DO specify how pilot light and interlock are to be wired into the circuit.
† Order device with additional poles — interlocks not available.
■ Not available on 12 pole device; use "On-Off" selector switch (Form C6).

SQD SLV_001070

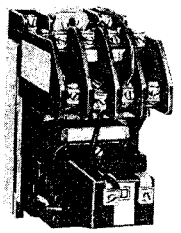
MECHANICALLY HELD LIGHTING CONTACTORS

FOR TUNGSTEN & BALLAST LIGHTING AND RESISTANCE HEATING LOADS

Mechanically held lighting contactors are used wherever quiet operation is required (offices, hospitals, theatres, etc.) or where excessive control distances are encountered. As standard, Square D mechanically held lighting contactors are provided with coil clearing contacts, assuring that the coils will be de-energized even if the control device is held closed.

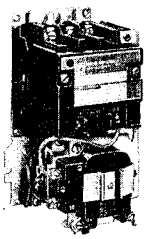
CLASS 8903

TYPE LL



- 2-10 Poles
- Convertible Contacts with N.O. and N.C. Indicators
- Silver Alloy Double Break Contacts
- Resistance Heating Rating
- Industrial Duty
- Adder Pole Kits Available
- Coil Clearing Contacts Standard

TYPE S



- Proven Type S Design
- No Arcing Contacts Required
- Enclosed Silver Alloy Double Break Contacts.
- Lugs Suitable for Use with Copper or Aluminum Wire (60-800 Amperes Only)
- Combination Lighting Contactors Available (Pages 294-295)
- Coil Clearing Contacts Standard

50-60 HERTZ — **ORDERING INFORMATION — Page 294** — **MAXIMUM VOLTAGE RATINGS — Page 296**

Ampere Ratings	No. of Poles	General Purpose Enclosure NEMA Type 1 Type	Price	**Flush Mounting** General Purpose Enclosure with Plaster Adjustment Type	Price	Watertight, Dusttight and Corrosion-Resistant Glass-Polyester Enclosure NEMA Type 4X Type	Price	Watertight and Dusttight Enclosure Stainless Steel NEMA Type 4 Type	Price	Dusttight and Driptight Industrial Use Enclosure NEMA Type 12‡ Type	Price	Open Type Type	Price
20◐	2	LLG-20	$ 172.	LLF-20●	$ 240.	Use 30 Ampere Type S		LLW-20●	$ 304.	LLA-20●	$ 288.	LLO-20	$ 160.
	3	LLG-30	184.	LLF-30●	252.			LLW-30●	316.	LLA-30●	300.	LLO-30	172.
	4	LLG-40	192.	LLF-40●	260.			LLW-40●	324.	LLA-40●	308.	LLO-40	180.
	6	LLG-60	332.	LLF-60●	372.	Consult local Square D Field Office		LLW-60●	436.	LLA-60●	420.	LLO-60	292.
	8	LLG-80	368.	LLF-80●	408.			LLW-80●	472.	LLA-80●	456.	LLO-80	328.
	10	LLG-1000	408.	LLF-1000●	448.			LLW-1000●	512.	LLA-1000●	496.	LLO-1000	368.
30	2	SMG-10	176.	SMF-10●	228.	SMW-31●	$ 320.	SMW-10●	320.	SMA-10●	224.	SMO-10	168.
	3	SMG-11	188.	SMF-11●	240.	SMW-32●	332.	SMW-11●	332.	SMA-11●	236.	SMO-11	180.
	4	SMG-12	200.	SMF-12●	252.	SMW-33●	344.	SMW-12●	344.	SMA-12●	248.	SMO-12	192.
	5	SMG-13	256.	SMF-13●	308.	SMW-34●	400.	SMW-13●	400.	SMA-13●	304.	SMO-13	248.
60	2	SPG-10	416.	SPF-10●	492.	SPW-31●	704.	SPW-10●	704.	SPA-10●	504.	SPO-10	384.
	3	SPG-11	432.	SPF-11●	508.	SPW-32●	720.	SPW-11●	720.	SPA-11●	520.	SPO-11	400.
	4	SPG-12	512.	SPF-12●	588.	SPW-33●	912.	SPW-12●	912.	SPA-12●	600.	SPO-12	480.
	5	SPG-13	672.	SPF-13●	748.	SPW-34●	1072.	SPW-13●	1072.	SPA-13●	760.	SPO-13	640.
100	2	SQG-10	584.	SQF-10●	628.	SQW-31	1240.	SQW-10●	992.	SQA-10●	688.	SQO-10	512.
	3	SQG-11	616.	SQF-11●	660.	SQW-32	1280.	SQW-11●	1024.	SQA-11●	720.	SQO-11	544.
	4	SQG-12	736.	....	....	....	....	SQW-12	1256.	SQA-12	840.	SQO-12	664.
	5	SQG-13	992.	....	....	....	....	SQW-13	1512.	SQA-13	1096.	SQO-13	920.
200	2	SVG-10	1496.	SVF-10●	1512.	SVW-31	2740.	SVW-10	2192.	SVA-10	1840.	SVO-10	1264.
	3	SVG-11	1688.	SVF-11●	1704.	SVW-32	2980.	SVW-11	2384.	SVA-11	2032.	SVO-11	1368.
	4	SVG-12	2064.	....	....	....	....	SVW-12	3048.	SVA-12	2528.	SVO-12	1744.
300	2	SXG-13	2616.	....	....	....	....	SXW-13	3496.	SXA-13	3496.	SXO-13	2120.
	3	SXG-14	2872.	....	....	....	....	SXW-14	3752.	SXA-14	3752.	SXO-14	2192.
400	2	SYG-16	6344.	....	....	....	....	SYW-16	8344.	SYA-16	7424.	SYO-16	5076.
	3	SYG-17	7108.	....	....	....	....	SYW-17	9108.	SYA-17	8188.	SYO-17	5840.
600	2	SZG-18	7674.	....	....	....	....	SZW-18	9674.	SZA-18	8754.	SZO-18	6362.
	3	SZG-19	8560.	....	....	....	....	SZW-19	10560.	SZA-19	9640.	SZO-19	7246.
800	2	SJG-10	9004.	....	....	....	....	SJW-10	11040.	SJA-10	10084.	SJO-10	7648.
	3	SJG-11	10012.	....	....	....	....	SJW-11	12012.	SJA-11	11092.	SJO-11	8652.

◐ Factory conversion of N.O. contacts to any combination of N.C., **add $12 to list price.**
‡ NEMA Type 12 enclosures may be field modified for outdoor applications. For details, refer to page 448.
● Separate enclosures are available for these devices. Order open type contactor and separate class 9991 enclosure from page 297.

FACTORY MODIFICATIONS FOR MECHANICALLY HELD LIGHTING CONTACTORS

(For additional modifications refer to page 461.)

Description	Enclosure Type	Form Letter	20 Amp.	30 Amp.	60 Amp.	100 Amp.	200 Amp.	300 Amp.	400, 600 & 800 Amp.
"On-Off" (momentary contact) push button	Any	A3	$ 88.	$ 88.	$ 88.	$ 88.	$ 88.	$ 88.	$ 88.
"On-Off" selector switch	Any	C6	88.	88.	88.	88.	88.	88.	88.
"Hand-Off-Auto" selector switch	Any	C	88.	88.	88.	88.	88.	88.	88.
Pilot Lights: one light only with operating interlock	Any	P▲★	108.	108.	108.	108.	108.	108.	108.
two or more lights with operating interlock ....Each	Any	P▲★	156.	156.	156.	156.	156.	156.	156.
push-to-test with operating interlock ....Each	Any	P▲★	168.	168.	168.	168.	168.	168.	168.
Fused control circuit (1 fuse)	Any	F	88.	88.	88.	88.	88.	88.	88.
Control circuit transformer with fused secondary (50 or 60 Hz)	Any	FT	108.	108.	152.	224.	272.	308.	308.
Electrical interlocks (specify number of N.O. and N.C.) ....Each	Any	X	†	44.	44.	44.	44.	44.	44.
Addition of 24 hour time clock (120-277 V. only)	1, 4, 12	K14	336.	336.	336.	336.	336.	336.	336.
Addition of 24 hour time clock with day omission (120-277 V. only)	1, 4, 12	K14-1	336.	336.	336.	336.	336.	336.	336.
Addition of 7 day time clock (120-277 V. only)	1, 4, 12	K14-2	384.	384.	384.	384.	384.	384.	384.
Sound proof enclosure and shock mounted panel	Any	G4	390.	390.	448.	470.	648.	820.	1060.
Addition of terminal block for solid neutral	Any	N	32.	32.	32.	48.	96.	200.	240.
Auxiliary interlock installed on **combination lighting contactor** disconnect switch or circuit breaker operating mechanism (1 N.O.-1 N.C. Contact)	Any	Y74	N/A	44.	44.	44.	44.	116.	116.
Addition of 2 pole relay for use with 1 pole pilot device	1, 4, 12	R6	204.	204.	204.	204.	320.	360.■	360.
Addition of photoelectric receptacle (includes Form R6)	4, 12	G10R6	256.	256.	256.	256.	372.	412.	412.
With photoelectric cell installed (120-277 V. only)	4, 12	G10-1R6	316.	316.	316.	316.	432.	472.	472.

▲ Indicate pilot light color as Form P (Red) or Form P (Green), etc., and how pilot light is to be wired into the circuit. Insert "Push-To-Test" before color if applicable.
★ DO NOT use Form X for any interlock which is wired in series with pilot light, but DO specify how pilot light and interlock are to be wired into the circuit.
† Order device with additional poles — interlocks not available.
■ Not required on Type SX 300 ampere mechanically held devices if Form FT is also specified.

SQD SLV_001071

COMBINATION LIGHTING CONTACTORS
FOR TUNGSTEN & BALLAST LIGHTING AND RESISTANCE HEATING LOADS

CLASS 8903

FUSIBLE OR NON-FUSIBLE DISCONNECT SWITCH

MAX. VOLT RATINGS — Page 296 | 3 POLE | 50-60 HERTZ

Contactor Ampere Rating	Fuse Clip Size (Amps.)	Fuse Clip Spacing (Volts)	General Purpose Enclosure NEMA Type 1 Type	Price*	Watertight and Dusttight Enclosure Stainless Steel NEMA Type 4† Type	Price*	Dusttight, Oiltight Driptight, Industrial Use Enclosure NEMA Type 12 Type	Price*
ELECTRICALLY HELD								
30	None	....	SMG-60	$ 364.	SMW-60	$ 748.	SMA-60	$ 460.
	30	600	SMG-61	384.	SMW-61	768.	SMA-61	480.
	30	250	SMG-62	376.	SMW-62	760.	SMA-62	472.
60	None	....	SPG-60	572.	SPW-60	1164.	SPA-60	708.
	60	600	SPG-61	600.	SPW-61	1192.	SPA-61	736.
	60	250	SPG-62	588.	SPW-62	1180.	SPA-62	724.
100	None	....	SQG-60	952.	SQW-60	1984.	SQA-60	1128.
	100	600	SQG-61	1012.	SQW-61	2044.	SQA-61	1188.
	100	250	SQG-62	992.	SQW-62	2024.	SQA-62	1168.
200	None	....	SVG-60	1860.	SVW-60	3180.	SVA-60	2348.
	200	600	SVG-61	1944.	SVW-61	3264.	SVA-61	2432.
	200	250	SVG-62	1928.	SVW-62	3248.	SVA-62	2416.
300	None	....	SXG-60	3904.	SXW-60	7272.	SXA-60	5088.
	400	600	SXG-61	4048.	SXW-61	7416.	SXA-61	5232.
	400	250	SXG-62	4048.	SXW-62	7416.	SXA-62	5232.
MECHANICALLY HELD								
30	None	....	SMG-70	408.	SMW-70	792.	SMA-70	504.
	30	600	SMG-71	428.	SMW-71	812.	SMA-71	524.
	30	250	SMG-72	420.	SMW-72	804.	SMA-72	516.
60	None	....	SPG-70	724.	SPW-70	1316.	SPA-70	860.
	60	600	SPG-71	752.	SPW-71	1344.	SPA-71	888.
	60	250	SPG-72	740.	SPW-72	1332.	SPA-72	876.
100	None	....	SQG-70	1096.	SQW-70	2128.	SQA-70	1272.
	100	600	SQG-71	1156.	SQW-71	2188.	SQA-71	1332.
	100	250	SQG-72	1136.	SQW-72	2168.	SQA-72	1312.
200	None	....	SVG-70	2268.	SVW-70	3588.	SVA-70	2756.
	200	600	SVG-71	2352.	SVW-71	3672.	SVA-71	2840.
	200	250	SVG-72	2336.	SVW-72	3656.	SVA-72	2824.
300	None	....	SXG-70	4004.	SXW-70	7372.	SXA-70	5188.
	400	600	SXG-71	4148.	SXW-71	7516.	SXA-71	5332.
	400	250	SXG-72	4148.	SXW-72	7516.	SXA-72	5332.

CIRCUIT BREAKER

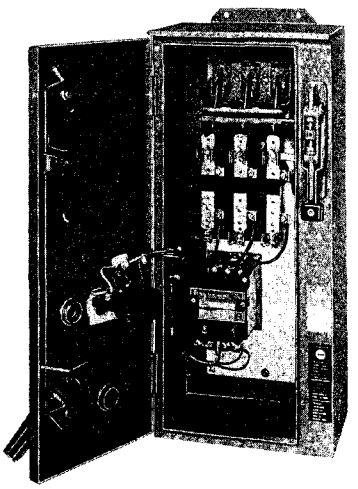
MAX. VOLT RATINGS — Page 296 | 3 POLE | 50-60 HERTZ

Contactor Ampere Rating	Circuit Breaker Trip Setting Amperes	Circuit Breaker Maximum Volts	General Purpose Enclosure NEMA Type 1 Type	Price*	Watertight and Dusttight Enclosure Stainless Steel (30-300 Amp.) NEMA Type 4† Type	Price*	Dusttight, Oiltight, Driptight, Industrial Use Enclosure NEMA Type 12 Type	Price*
ELECTRICALLY HELD								
30	30	600	SMG-81	$ 508.	SMW-81	$ 892.	SMA-81	$ 604.
	30	240	SMG-82	392.	SMW-82	776.	SMA-82	488.
60	60	600	SPG-81	712.	SPW-81	1304.	SPA-81	848.
	60	240	SPG-82	596.	SPW-82	1188.	SPA-82	732.
100	100	600	SQG-81	1028.	SQW-81	2060.	SQA-81	1204.
200	200	600	SVG-81	2296.	SVW-81	3616.	SVA-81	2784.
300	300	600	SXG-81	5060.	SXW-81	8428.	SXA-81	5940.
400◆	400	600	SYG-81	11256.	SYW-81	13256.	SYA-81	12336.
600◆	600	600	SZG-81	12662.	SZW-81	14662.	SZA-81	13742.
MECHANICALLY HELD								
30	30	600	SMG-91	552.	SMW-91	936.	SMA-91	648.
	30	240	SMG-92	436.	SMW-92	820.	SMA-92	532.
60	60	600	SPG-91	864.	SPW-91	1458.	SPA-91	1000.
	60	240	SPG-92	748.	SPW-92	1340.	SPA-92	884.
100	100	600	SQG-91	1172.	SQW-91	2204.	SQA-91	1348.
200	200	600	SVG-91	2704.	SVW-91	4024.	SVA-91	3192.
300	300	600	SXG-91	5160.	SXW-91	8528.	SXA-91	6040.
400	400	600	SYG-91	11756.	SYW-91	13756.	SYA-91	12836.
600	600	600	SZG-91	13122.	SZW-91	15162.	SZA-91	14242.

*Price does not include holding circuit interlock.

◆Form FT is standard; include line voltage when ordering. Control voltage is 120V/60 Hz. For separate control order "Form S."

†For **NEMA Type 4X** Watertight, Dusttight, and Corrosion-Resistant Glass-Polyester enclosure, consult field office.



Type SMA-62

It is often desirable to install the branch-circuit protective device and lighting contactor, combining switching and over-current protection, in one enclosure. Combination lighting contactors are particularly well suited for industrial, highway and area lighting applications, or where a lighting circuit may have to be disconnected for periodic maintenance. They may also be used for resistance heating loads.

Combination lighting contactors provide many advantages over a separate branch-circuit device and contactor. The single unit occupies less space, makes a neater installation, is quicker to install, and provides added protection for operating personnel.

- Disconnect Switch and Circuit Breaker Types
- Rugged Flange Operator
- Industrial Duty
- Room to Spare for Modifications

FACTORY MODIFICATIONS — Pages 292 and 293
APPLICATION DATA — Pages 296-297
REPAIR PARTS KITS — Class 9998
MODIFICATION KITS — Class 9999

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Line voltage, frequency and phase.
3. Control voltage and frequency, if different from line voltage.
4. Any special features required.

SQD SLV_001072

NIGHT-MASTER™

OUTDOOR LIGHTING CONTROLLER

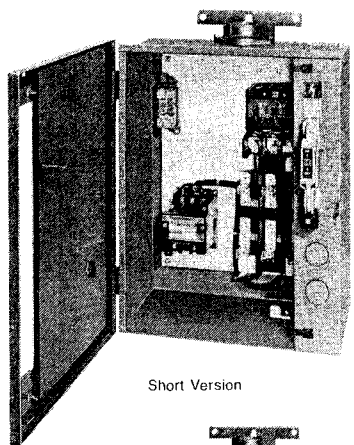
CLASS 8903

NIGHT-MASTER™ Outdoor Lighting Controllers offer disconnecting means, overcurrent protection and a lighting contactor in one NEMA Type 3R Rainproof enclosure. These combination units satisfy requirements of the National Electrical Code and UL 508 for service entrance equipment.

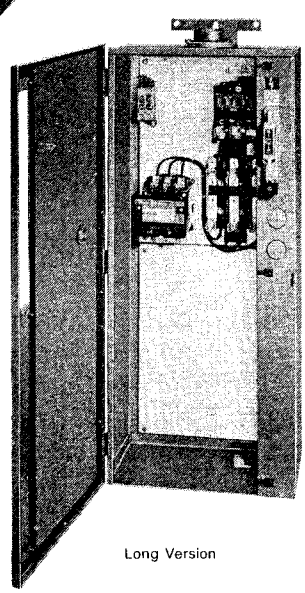
NIGHT-MASTER Outdoor Lighting Controllers offer an advantage over enclosed safety switches or circuit breakers. The electrically held lighting contactor provides the opportunity for automatic or remote control of all types of lighting. When used with photoelectric cells, time clocks or other control devices, they offer an economical means of controlling outdoor lighting. Typical installations include lighting of streets, parking lots and billboards, and recreational lighting such as tennis courts, stadiums, country clubs and parks.

NIGHT-MASTER Outdoor Lighting Controllers have been tested and approved for 100% rating (when used with conductors sized for 125% of controller rating) to meet NEC requirements per Article 220-2a Exception No. 2. It is not necessary to de-rate the fuses or circuit breakers to 80% of their rating. The combination units, consisting of the contactor and overcurrent protective devices, are rated to handle 100% of their nameplate rating.

UL APPROVED FOR SERVICE ENTRANCE



Short Version



Long Version

DISCONNECT SWITCH TYPE

Contactor Ampere Rating	Fuse Clip Size (Amperes)	Fuse Clip Spacing (Volts)	Short Version		Long Version	
			Class 8903 Type	List Price	Class 8903 Type	List Price
30	30 30	600 250	SMC-61 SMC-62	**$ 510.** **502.**	SMC-63 SMC-64	**$ 586.** **578.**
60	60 60	600 250	SPC-61 SPC-62	**694.** **686.**	SPC-63 SPC-64	**770.** **762.**
100	100 100	600 250	SQC-61 SQC-62	**1130.** **1106.**	SQC-63 SQC-64	**1206.** **1182.**
200	200 200	600 250	SVC-61 SVC-62	**2094.** **2078.**	SVC-63 SVC-64	**2394.** **2378.**

CIRCUIT BREAKER TYPE

Contactor Ampere Rating	Circuit Breaker		Short Version		Long Version	
	Ampere Rating	Maximum Volts	Class 8903 Type	List Price	Class 8903 Type	List Price
30	30	600	SMC-81	**$ 646.**	SMC-83	**$ 722.**
60	60	600	SPC-81	**806.**	SPC-83	**882.**
100	100	600	SQC-81	**1146.**	SQC-83	**1222.**
200	200	600	SVC-81	**2446.**	SVC-83	**2746.**

FACTORY MODIFICATIONS ▲

(ALL FACTORY INSTALLED MODIFICATIONS SHOWN BELOW ARE UL LISTED)

Description	Form Letter	Price
"Hand-Off-Auto" Selector Switch Flange Mounted Internally Mounted	C CG53	**$ 88.** **88.**
"On-Off" Selector Switch Flange Mounted Internally Mounted	C6 C6G53	**88.** **88.**
Pilot Light (Specify Color)	P	**60.**
Fused Control Circuit	F	**88.**
Control Circuit Transformer With Fused Secondary 30 Ampere (Type SMC) 60 Ampere (Type SPC) 100 Ampere (Type SQC) 200 Ampere (Type SVC)	FT	 **108.** **152.** **224.** **272.**
Program Time Clock* (120-277V. only) 24 Hour 24 Hour With Day Omission 7 Day	 K14* K14-1* K14-2*	 **220.** **220.** **268.**
Auxiliary Interlocks — Specify number of N.O. and N.C. (Each)	X	**44.**
Lightning Arrester	Y153-2	**160.**
Auxiliary Interlocks Installed On Disconnect Switch Or Circuit Breaker Operating Mechanism (1 N.O. — 1 N.C.)	Y74	**44.**

▲Some combinations of factory modifications may require long version. Consult local Square D Field Office.
*Available in long version only.

REPAIR PARTS KITS — Class 9998

MODIFICATION KITS — Class 9999

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Line voltage, frequency and phase.
3. Control voltage and frequency, if different from line voltage.
4. Any special features required.

NIGHT-MASTER is a Trademark of Square D Company

SQD SLV_001073

LIGHTING CONTACTORS

APPLICATION DATA

APPLICATIONS FOR LIGHTING CONTACTORS

CLASS 8903

Lighting contactors have evolved from the need for more than just simple on-off manual control of lights. Today's requirements call for the development of new and varied types of control. Often, the application will call for remote control of lighting from some distant location. This control may or may not be in addition to a master control station at a central location. Or certain applications include the use of automatic control by time clocks or photoelectric cells. Whatever the need may be, applications are increasing, and lighting contactors are designed to meet the ever-changing requirements.

Square D lighting contactors offer a time proven design for better electrical and mechanical performance. They are used wherever reliable, convenient and economical control of indoor and outdoor lighting is required. Typical installations include: parking lots, industrial plants, office buildings, theaters and auditoriums, hospitals and institutions, shopping centers, stadiums and airports.

MAXIMUM VOLTAGE RATINGS

Type of Load	Types L & LL 20 Amperes		Type SM 30 Amperes		Types SP, SQ, SV & SX 60-300 Amperes		Types SY, SZ & SJ 400-800 Amperes	
	When Connected 1 Pole to Load	When Connected 2 Poles to Load on 1ϕ and 3 Poles to Load on 3ϕ	When Connected 1 Pole to Load	When Connected 2 Poles to Load on 1ϕ and 3 Poles to Load on 3ϕ	When Connected 1 Pole to Load	When Connected 2 Poles to Load on 1ϕ and 3 Poles to Load on 3ϕ	When Connected 1 Pole to Load	When Connected 2 Poles to Load on 1ϕ and 3 Poles to Load on 3ϕ
Tungsten	277AC	480AC	277AC	480AC	277AC	480AC	....	....
Ballast	277AC▲	480AC▲	347AC	600AC	347AC	600AC	347AC	600AC
Resistance	600AC	600AC	600AC	600AC	600AC	600AC	600AC	600AC
DC with 2 Poles in Series*	125DC	125DC	....	....	250DC	250DC	....	....
DC with 3 Poles in Series*	250DC	250DC	250DC	250DC	250DC	250DC	....	....
Control Circuit (Coil) Voltage	12-600AC Type L, 24-277AC Type LL 24, 32, 115/125, and 230/250DC Type L (6 poles max.)		6-600AC		6-600AC Type SP 24-600AC Types SQ & SV 120-600AC Type SX		120-600AC	

▲ Types L and LL contactors also have a ballast lamp rating of 15 amperes 347VAC when connected 1 Pole to Load and 600VAC when connected 2 Poles to Load on 1ϕ and 3 Poles to Load on 3ϕ.
* For tungsten or resistance loads only.

RESISTANCE LOADS

Square D lighting contactors are fully rated for resistance loads up to 600 volts, Table 1. They can be used on resistance-type boilers, electric furnaces, electric water heaters and snow melting cables and panels.

MOTOR LOADS

This load consists of motors having an inrush current, or locked-rotor current, of from 4 to 10 times the full-load current. Square D Type S lighting contactors are fully rated for motor loads and have a horsepower rating equal to the equivalent NEMA-size motor contactor, Table 2.

MIXED LOADS

All Type S lighting contactors are rated to handle mixed loads, consisting of a combination of lighting, resistance and motor loads. Table 3 was developed to make selection of lighting contactors for mixed loads easier. Simply follow these steps:

1. Determine the total load by summing the lighting, resistance and motor (full load currents of each motor) loads.
2. Calculate the lighting and resistance (total non-motor) load as a percentage of the total load.
3. From that percent column in Table 3, determine the size lighting contactor required at the specified motor voltage.

TABLE 1 — KILOWATT RATINGS*

Voltage	Lighting Contactor Size							
	30 Amp.	60 Amp.	100 Amp.	200 Amp.	300 Amp.	400 Amp.	600 Amp.	800 Amp.
200 V.	10.3	20.7	34.6	69.2	103.9	138.5	207.8	277.1
230 V.	11.9	23.9	39.8	79.6	119.5	159.3	239.0	318.7
380 V.	19.7	39.4	65.8	131.6	197.4	263.2	394.9	526.5
460 V.	23.9	47.8	79.6	159.3	239.0	318.6	478.0	637.4
575 V.	30.0	60.0	99.0	199.0	299.0	398.4	597.6	796.7

*Resistance heating only (three phase system)

TABLE 2 — MOTOR LOAD RATINGS

Lighting Contactor Size	Has Same HP Ratings As Equivalent NEMA Size Contactor
30 Ampere	NEMA Size 1
60 Ampere	NEMA Size 2
100 Ampere	NEMA Size 3
200 Ampere	NEMA Size 4
300 Ampere	NEMA Size 5
400 Ampere	—
600 Ampere	NEMA Size 6
800 Ampere	NEMA Size 7

TABLE 3 — MIXED LOAD RATINGS

Motor Voltage and Phase ▲	Contactor Ampere Rating	Percent Lighting (and/or Resistive) Load							
		0%		25%		50%		75%	
		Max. Non-Motor Amp.	Max. Motor HP	Max. Non-Motor Amp.	Max. Motor HP	Max. Non-Motor Amp.	Max. Motor HP	Max. Non-Motor Amp.	Max. Motor HP
200 V. 3 Phase	30	0	7½	7.5	5	15.	3	22.5	1½
	60	0	10	15.	10	30.	7½	45.	3
	100	0	25	25.	20	50.	15	75.	5
	200	0	40	50.	40	100.	30	150.	15
	300	0	75	75.	75	150.	50	225.	20
	400	0	125	100.	100	200.	60	300.	30
	600	0	150	150.	150	300.	100	450.	50
	800	0	250	200.	200	400.	125	600.	60
230 V. 3 Phase	30	0	7½	7.5	7½	15.	3	22.5	2
	60	0	15	15.	10	30.	10	45.	3
	100	0	30	25.	25	50.	15	75.	7½
	200	0	50	50.	50	100.	30	150.	15
	300	0	100	75.	75	150.	50	225.	25
	400	0	150	100.	100	200.	75	300.	30
	600	0	200	150.	150	300.	100	450.	50
	800	0	300	200.	200	400.	150	600.	75
380 V. 3 Phase	30	0	10	7.5	7½	15.	7½	22.5	3
	60	0	25	15.	20	30.	15	45.	7½
	100	0	50	25.	40	50.	30	75.	10
	200	0	75	50.	75	100.	60	150.	30
	300	0	150	75.	150	150.	100	225.	40
	400	0	250	100.	200	200.	125	300.	60
	600	0	300	150.	250	300.	150	450.	75
	800	0	450	200.	350	400.	250	600.	125
460-575 V. 3 Phase	30	0	10	7.5	7½	15.	7½	22.5	3
	60	0	25	15.	20	30.	20	45.	10
	100	0	50	25.	40	50.	30	75.	15
	200	0	100	50.	100	100.	75	150.	30
	300	0	200	75.	150	150.	100	225.	50
	400	0	300	100.	200	200.	150	300.	75
	600	0	400	150.	350	300.	200	450.	100
	800	0	600	200.	500	400.	300	600.	150
115 V. Single Phase	30	0	2	7.5	1½	15.	¾	22.5	½
	60	0	3	15.	3	30.	2	45.	¾
	100	0	7½	25.	5	50.	3	75.	2
230 V. Single Phase	30	0	3	7.5	2	15.	2	22.5	¾
	60	0	7½	15.	5	30.	5	45.	2
	100	0	15	25.	15	50.	10	75.	3

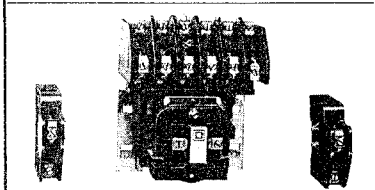
▲Select lighting contactor on basis of rated motor voltage, whether non-motor load is connected line-to-line or line-to-neutral.

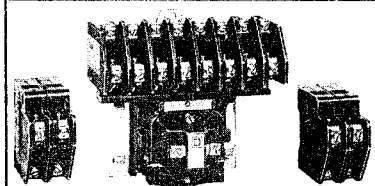
SQD SLV_001074

POWER POLE ADDER KITS

FOR TYPE L

The kits below are used to add 20 ampere power poles to existing Type L contactors when additional circuits are required. Type L lighting contactors are supplied with mounting brackets, so that adder poles may be mounted from the front by a single captive screw. Adder poles are supplied as standard with N.O. contacts which are convertible to N.C.





	May be Added to Contactor Type	Power Pole Adder Kit Class 8903 Type	Price
Single Pole			
	LO-60 LO-80 LLO-30 LLO-40 LLO-60	L1L L1R	$24. 24.
Double Pole			
	LO-80 LO-1000★ LLO-60 LLO-80★	L3L L3R	48. 48.

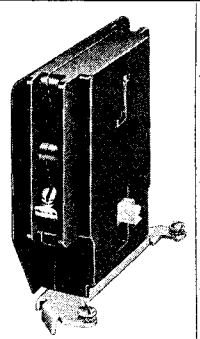
★Single pole power pole must be removed before double pole power pole can be installed.
■ D1A Discount

FOR TYPE S

A single-pole or double-pole kit can be added to any 2 or 3 pole 30 or 60 ampere Type S lighting contactor to make a 4 or 5 pole device. Factory assembled 4 and 5 pole contactors utilize the basic 3 pole device with a single or double-pole kit installed. Only one power pole can be added per contactor. Sufficient room is provided in all enclosure styles for the addition of a power pole kit.

To add the power pole to a 60 ampere contactor, it is necessary to replace the coil. Select a 4-5 pole coil from the coil table on page 449.

The 30 or 60 ampere power pole can be added to 100-800 ampere contactors by using the special adapter bracket.


Class 9999 Type SB-6
One N.O.
Power Pole Adder

Ampere Rating	Description	Class 9999 Type	Price
30	One N.O.	SB-6	$ 44.
	One N.C.	SB-7	44.
	One N.O. and One N.C.	SB-8	88.
	Two N.O.	SB-9	88.
	Two N.C.	SB-10	88.
60	One N.O.	SB-21∗	80.
	One N.C.	SB-22∗	80.
	One N.O. and One N.C.	SB-23∗	160.
	Two N.O.	SB-24∗	160.
	Two N.C.	SB-25∗	160.
....	Adapter Bracket for mounting 30 or 60 ampere kit above on 100, 200, 300, 400, 600 or 800 ampere contactor.	SBT-1	6.

∗When power pole is added to 60 ampere contactor, a 4 pole coil is also required. Order from Coil Table Page 449. 60 ampere power poles are suitable for use with copper or aluminum wire.

CLASS 9991 SEPARATE ENCLOSURES FOR NON-COMBINATION LIGHTING CONTACTORS

For Use With Class 8903		Enclosure Classification: Watertight and Dusttight Stainless Steel NEMA Type 4				Watertight Dusttight and Corrosion-Resistant Glass-Polyester NEMA Type 4X		Dusttight and Driptight Industrial Use NEMA Type 12‡				Flush Mounting General Purpose (Components)							
		Standard		With Two Cover Mtd. Closing Plates				Standard		With Two Cover Mtd. Closing Plates		Flush Plates				Mounting Strap		Pull Box	
												Standard		Stainless Steel					
Types (All Pole Arrangements)	Size	Class 9991 Type	Price	Class 9991 Type	Price	Class 9991 Type	Price	Class 9991 Type	Price	Class 9991 Type	Price	Class 9991 Type	Price	Class 9991 Type	Price	Class 9991 Type	Price	Class 9991 Type	Price
L & LL◐	20 Amp.	LW-1	$144.	....	...	....	...	LA-1	$128.	....	...	LF-1	$80.	Enclosure Complete (Std. Flush & Pull Box)					
SM★	30 Amp.	SCW-1	152.	SCW-11	$160.	SCW-20	$152.	SCA-1	56.	SCA-11	$ 64.	Electrically Held SCF-11 Mechanically Held SCF-13	16.	SCF-12♦	$ 56.	SCF-2	$20.	SCF-1	$24.
SP★	60 Amp.	SDW-1	328.	SDW-11	336.	SDW-20	328.	SDA-1	128.	SDA-11	136.	Electrically Held SDF-11 Mechanically Held SDF-13	48.	SDF-12♦	108.	SDF-2	28.	SDF-1	32.
SQ★	100 Amp.	SEW-1	488.	SEW-11	496.	....	...	SEA-1	184.	SEA-11	192.	SEF-11	248.	(Enclosure Complete)					
SV	200 Amp.	....	...	....	...	....	...	....	...	....	...	SEF-11	248.	(Enclosure Complete)					

★ Replace reset assembly with proper closing plate. For NEMA 4 use Class 9001 Type K52, for NEMA 12 use Class 9001 Type K51 and for Flush Mounting (except Types LF-1 and SEF-11) use Class 9999 Type SG-2.
‡ NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to page 448.
♦ For Type S electrically held lighting contactors only. Consult field office for Type S mechanically held.
◐ Separate NEMA Type 1 surface mounted enclosure available. Specify Class 9991 Type LG-1, **$40.**

OVERSIZE ENCLOSURES

The enclosures listed below are for use with electrically and mechanically held open type Class 8903 Type L 20 ampere and Type S 30 and 60 ampere lighting contactors. These enclosures include a panel with space and drilling for an open type contactor and fused control circuit transformer (Form FT) and/or an auxiliary relay for use with single pole pilot devices (Form R6). In addition, three closing plates are provided as standard for easy installation of Class 9001 Type K oiltight control units.

Select transformer from selection table. When auxiliary relay is required, use a Class 8501 Type DO-22 relay.

For Use With			Enclosure: General Purpose Enclosure NEMA Type 1		Watertight and Dusttight Enclosure Stainless Steel NEMA Type 4		Dusttight and Driptight Industrial Use Enclosure NEMA Type 12∗	
Class	Type	Ampere Rating	Class 9991 Type	Price	Class 9991 Type	Price	Class 9991 Type	Price
8903	LO, LLO SMO SPO	20 Amp. 30 Amp. 60 Amp.	∗∗ SDG-3	$112.	SDW-3	$328.	SDA-3	$192.

∗Suitable for NEMA 3 raintight and sleet resistant and 3R rainproof and sleet resistant applications. For details refer to page 448.
∗∗Class 9991 Type SCG-1 separate enclosure can also be used for Class 8903 Type SMO 30 ampere electrically held lighting contactor if Form FT (control transformer) with or without cover control units is required. (See page 448).

TRANSFORMER AND RELAY SELECTION

For Use With				Standard Transformer		Fuse Block	Auxiliary Relay
Class	Type	Ampere Rating	No. of Poles	Class 9070 Type∗	V.A.	Class 9080 Type	Class 8501 Type
8903	LO LLO	20	All	EO-1	50	PF-1	DO-22
	SMO	30	2-3	EO-1	50		
			4-5	EO-2	100		
	SPO	60	2-5	EO-2	100		

∗Class 9080 Type PF-1 fuse block is utilized to provide fusing of the transformer secondary.

SQD SLV_001075

LIGHTING CONTACTORS
APPROXIMATE DIMENSIONS

CLASS 8903

OPEN TYPE — ELECTRICALLY HELD

Ampere Rating	Type	Figure No.	Number of Poles	Dimensions A	B	C	D	E
20	LO	1	2-4	**2.88** 73	...	...	...	...
			6	**4.25** 108				
			8-10	**5.63** 143				
30	SMO	2	2-3	**4.34** 110	**3.22** 82	**4.22** 107	...	...
			4-5	**4.34** 110	**4.25** 108	**4.22** 107		
60	SPO	2	2-3	**5.11** 130	**4.31** 110	**4.94** 125	...	...
			4-5	**5.11** 130	**5.61** 143	**4.94** 125		
100	SQO	2	2-3	**7.09** 180	**5.45** 139	**6.50** 165	...	...
			4-5	**7.82** 199	**9.75** 248	**6.50** 165		
200	SVO	2	2-3	...	...	**6.50** 165	**8.00** 203	**13.12** 333
			4			**6.50** 165	**11.81** 300	**13.62** 346
300	SXO	2	2-3	**12.31** 313	**8.66** 220	**8.74** 222	...	...
400	SYO	2	2-3	...	**9.30** 236	**9.00** 229	...	**27.78** 706
600	SZO							
800	SJO	2	2-3	...	**9.30** 236	**11.94** 303	...	**42.70** 1085

OPEN TYPE — MECHANICALLY HELD

Ampere Rating	Type	Figure No.	Number of Poles	Dimensions A	B	C	D	E	F
20	LLO	1	2	**2.88** 73	...	...	...	...	...
			3-4	**4.25** 108					
			6-10	**5.63** 143					
30	SMO	2	2-3	**7.15** 182	**3.79** 96	**4.68** 119	...	...	...
			4-5	**7.15** 182	**4.54** 116	**4.68** 119			
60	SPO	2	2-3	**8.00** 203	**4.61** 117	**5.23** 133	...	...	...
			4-5	**8.00** 203	**5.90** 150	**5.23** 133			
100	SQO	2	2-3	**10.13** 257	**5.94** 151	**6.72** 171	...	...	...
			4-5	**10.56** 268	**9.75** 248	**6.72** 171			
200	SVO	2	2-3	...	...	**6.72** 171	**8.00** 203	**13.12** 333	...
			4			**6.72** 171	**8.00** 203	**13.62** 346	
300	SXO	2	2-3	**12.31** 313	**8.66** 220	...	...	...	**10.50** 267
400	SYO	2	2-3	...	**8.66** 220	...	...	**21.00** 533	**10.50** 267
600	SZO								
800	SJO	2	2-3	...	**8.66** 220	...	...	**35.35** 898	**11.94** 303

NEMA TYPE 1 ENCLOSURE (NON-COMBINATION)
ELECTRICALLY AND MECHANICALLY HELD

Ampere Rating	Type	Number of Poles	Form(s)		Figure Number	Dimensions Width	Height	Depth
20	LG, LLG	Any	Std.		3	**7.53** 191	**9.78** 248	**5.91** 150
			A3, A12, C, C6, FT, N, P, R6, X		3	**11.88** 302	**11.88** 302	**7.44** 189
30	SMG	2-5	Electrically Held	Std., A12, C, C6, P, X	3	**6.00** 152	**10.00** 254	**5.28** 134
			Mechanically Held	Std., X				
			Electrically Held	FT	3	**6.34** 161	**15.88** 403	**5.19** 132
				N	3	**14.88** 378	**14.12** 359	**7.56** 192
			Mechanically Held	A3, C, C6, FT, P, R6				
60	SPG	2-5	Electrically Held	Std., A12, C, C6, P, X	3	**7.81** 198	**12.69** 322	**6.03** 153
			Mechanically Held	Std., X				
			Electrically Held	FT, N	3	**14.88** 378	**14.12** 359	**7.56** 192
			Mechanically Held	A3, C, C6, FT, N, P, R6				
100	SQG	2-3	Electrically Held	Std., A12, C, C6, FT, P, X	3	**11.44** 291	**21.81** 554	**7.75** 197
			Mechanically Held	Std., X				
			Electrically Held	N	3	**16.13** 410	**24.13** 613	**8.50** 216
			Mechanically Held	A3, C, C6, FT, N, R6				
		4-5	With or without any forms		3	**22.38** 568	**32.50** 826	**10.00** 254
200	SVG	2-3	With or without any forms		3	**16.13** 410	**24.13** 613	**8.50** 216
		4	With or without any forms		3	**22.38** 568	**32.50** 826	**10.00** 254
300	SXG	2-3	With or without any forms		3	**17.63** 448	**35.69** 906	**10.91** 277
400	SYG	2-3	With or without any forms		3	**20.22** 514	**63.75** 1619	**13.13** 333
600	SZG	2-3						
800	SJG	2-3	With or without any forms		3	**34.50** 876	**93.00** 2362	**23.50** 597

Dual Dimensions: **INCHES** / Millimeters

For dimensions of all other enclosure types and combination lighting contactors, consult local Square D Field Office.

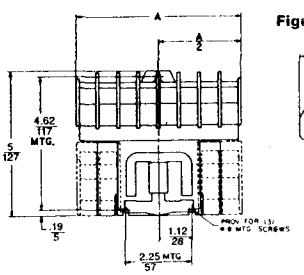
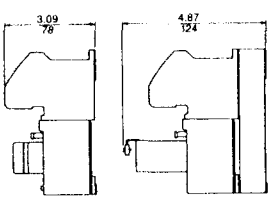


Figure 1 — Type L Open Style



Electrically Held **Mechanically Held**

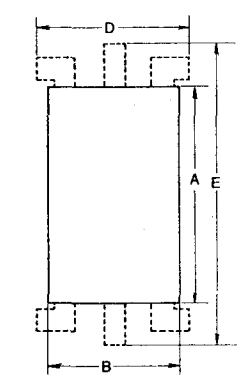
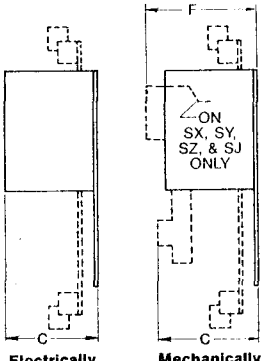


Figure 2 — Type S Open Style



Electrically Held **Mechanically Held**

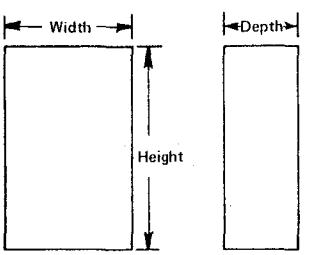


Figure 3 — NEMA Type 1 Enclosure

SQD SLV_001076

DEFINITE PURPOSE CONTACTORS
FOR ELECTRIC RESISTANCE HEATING APPLICATIONS

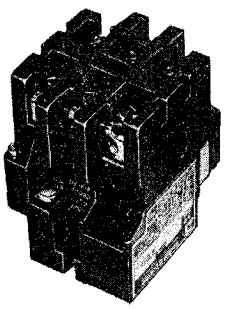
CLASS 8910

Class 8910 contactors are designed and tested for applications on resistance type electric heaters. They are also suitable as replacement contactors or air conditioning compressor units.

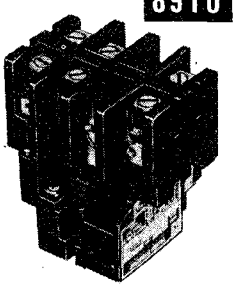
These contactors are Underwriters' Laboratories recognized and Canadian Standards Association listed for the above applications.

CAUTION! These devices are not suitable for general application.

For information on definite purpose starters, refer to local Square D Field Office.



Type KO-3
30 Amp., 3 Pole N.O.



Type LO-4
Form Y39-1, 40 Amp.,
4 Pole with 1 N.C. Pole

APPLICATION DATA

Electrical Interlocks — A maximum of two S.P.S.T. auxiliary interlocks, either of which may be N.O. or N.C., can be obtained on all sizes without increasing the panel area. The same interlocks are used on all sizes.

Pilot duty rating: 0-120 volts ac — 3 amps., 120-600 volts ac — 360 VA.

Contacts — Silver-cadmium-oxide overlay on copper fingers and supports. Contact springs are music wire.

Contact Block — Glass-reinforced alkyd for high interrupting capacity and di-electric strength.

Compact Design — These devices are available with 2, 3 or 4 poles. They are extremely compact, requiring the smallest amount of panel area.

Normally Closed Poles — This feature is available on 3 or 4 pole contactors for energizing accessory units when the contactor is de-energized. Normally closed power poles have an inductive rating of 15 amperes full load, 90 amperes locked rotor at 230 volts maximum. The resistive rating is 15 amperes full load at 600 volts maximum.

600 VOLTS AC MAXIMUM — CLASS 8910 — 50-60 HZ.

MAXIMUM RATINGS★				Resistance Load Amps.	No. of N.O. Poles	Open Type		General Purpose Enclosure NEMA Type 1**	
Full Load Amps.	Locked Rotor Amps.					Type	Price	Type	Price
	230 V.	460 V.	575 V.						
20	120	100	80	25	2	HO-2	$37.60	....	....
					3	HO-3	46.80	....	....
					4	HO-4	53.80	....	....
25	150	125	100	31	2	JO-2	38.00	....	....
					3	JO-3	47.20	....	....
					4	JO-4	54.20	....	....
30	180	150	120	37.5	2	KO-2	48.00	....	....
					3	KO-3	53.60	....	....
					4	KO-4	59.60	....	....
40	240	200	160	50	2	LO-2	62.20	....	....
					3	LO-3	67.80	....	....
					4	LO-4	85.00	....	....
50	300	250	200	62.5	2	MO-2	80.00	....	....
					3	MO-3	88.00	....	....
					4	MO-4	108.00	....	....

★ Above 220 volts, break all lines.
** For NEMA Type 1 enclosure order Class 9991, Type UE6 on Page 448.

MODIFICATIONS

Feature	Form	Additions Price
Substitute 1 N.C. Power Pole for 1 N.O. †	Y39-1	$20.00
1 N.O. Interlock	X1	11.00
1 N.C. Interlock	X2	11.00
2 N.O. Interlocks	X3	22.00
1 N.O.—1 N.C. Interlock	X4	22.00
2 N.C. Interlocks	X5	22.00
Addition of Adapter Plate to provide interchangeable mounting	Y127	3.00
Provide tab to accept .250 x .032 slip-on connectors on power, coil or interlock terminals.	Consult Local Square D Field Office	

†3 or 4 pole only

ORDERING INFORMATION REQUIRED

1 — Class and type number.

2 — Voltage and frequency of coil.

3 — Add form number to class and type numbers, for any special features required.

D1A DISCOUNT

ELECTRICAL INTERLOCKS TYPE H, J, K, L or M CONTACTORS

Interlock Kit			
Contact Arrangement	Class	Type	Price Each
1 N.O.	9999	R-20	$11.00
1 N.C.	9999	R-21	11.00

ORDERING INFORMATION REQUIRED
Class and type number.

D1B DISCOUNT

MAGNET COILS — TYPE H, J, K, L or M CONTACTORS

Coil Prefix*	Hertz	24 Volts	110-115 Volts	120 Volts	208-220 Volts	230 Volts	230-240 Volts	277 Volts	440 Volts	480 Volts	550 Volts	600 Volts	Price
65108-400-	60	19	39	40	48	...	49	51	57	58	60	61	$28.00
65108-400-	50	21	42	43	50	51	...	...	60	...	62	63	

*Complete part number of coil consists of prefix number followed by suffix number.
Example: Order 120 volt, 60 hertz coil as 65108-400-40.

ORDERING INFORMATION REQUIRED — Part number of coil required.

D14A DISCOUNT

SQD SLV_001077

WELL-GUARD® CONTROL

CLASS 8940

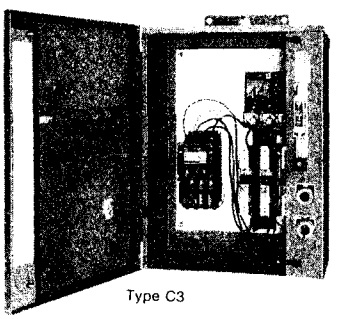
AC PUMPING PLANT PANELS — LINE VOLTAGE TYPE

Pumping Plant Panels in NEMA Type 3R enclosures are specifically designed for irrigation and oil field applications. Both short and long versions are available with either visible blade disconnect switches or circuit breakers. The long version provides 200 sq. inches of unused panel space for field installation of auxiliary equipment.

FUSIBLE DISCONNECT SWITCH TYPE ■

600 VOLTS MAX. — 3-POLE — 50-60 HERTZ

Motor (Starter) Volts	Max. HP Polyphase	NEMA Size	Fuse Clip Amps. ▲	Type Short Version	Price* with 3 Thermal Units	Type Long Version	Price* with 3 Thermal Units	Add For 3 Fuses ▲
230 (240)	7½	1◐	30	C1	**$520.**	WC1	**$596.**	**$16.**
	15	2◐	60	D1	**704.**	WD1	**806.**	**16.**
	30	3	100	E1	**1124.**	WE1	**1234.**	**48.**
	50	4	200	F1	**2096.**	WF1	**2304.**	**96.**
	100	5◐	400	....	....	WG1	**4496.**	**160.**
460 (480)	10	1◐	30	C3	**528.**	WC3	**604.**	**32.**
	25	2◐	60	D3	**712.**	WD3	**816.**	**48.**
	50	3	100	E3	**1148.**	WE3	**1262.**	**80.**
	100	4	200	F3	**2112.**	WF3	**2322.**	**176.**
	200	5◐	400	....	....	WG3	**4592.**	**320.**

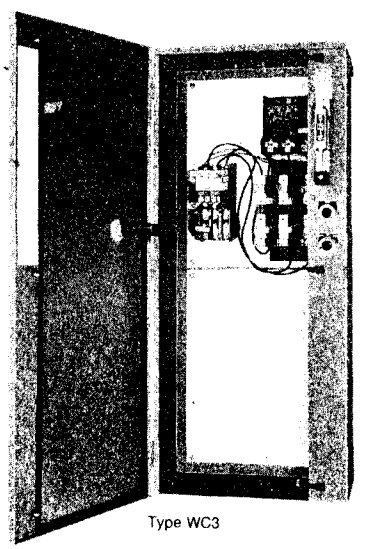


Type C3

CIRCUIT BREAKER TYPE ■

600 VOLTS MAX. — 3-POLE — 50-60 HERTZ

Motor (Starter) Volts	Max. HP Polyphase	NEMA Size	Circuit Breaker Frame Size	Circuit Breaker Trip Setting (Amps.)	Type Short Version	Price* with 3 Thermal Units	Type Long Version	Price* with 3 Thermal Units
230 (240)	5	1◐	FA	30	BC8	**$664.**	XC8	**$760.**
	7½		FA	45	BC4		XC4	
	10	2◐	FA	60	BD3	**824.**	XD3	**944.**
	15		FA	80	BD4		XD4	
	25	3	FA	100	....	....	XE1	**1278.**
	30		KA	110	....	....	XE2	
	40	4	KA	150	....	....	XF1	**2708.**
	50		KA	200	....	....	XF2	
	75	5◐	LA	250	....	....	XG1	**5604.**
	100		LA	350	....	....	XG2	
	150	6◐	MA	500	....	....	XH2	**12132.**
	200		MA	700	....	....	XH4	
	250	7◐	MA	800	....	....	XJ1	**16348.**
	300		MA	1000	....	....	XJ2	
460 (480)	7½	1◐	FA	20	BC5	**664.**	XC5	**760.**
	10		FA	25	BC3		XC3	
	15	2◐	FA	40	BD5	**824.**	XD5	**944.**
	20		FA	60	BD3		XD3	
	25		FA	70	BD6		XD6	
	30	3	FA	80	....	....	XE3	**1278.**
	40		FA	90	....	....	XE4	
	50		FA	100	....	....	XE1	
	75	4	KA	125	....	....	XF3	**2708.**
	100		KA	200	....	....	XF4	
	150	5◐	LA	250	....	....	XG1	**5604.**
	200		LA	350	....	....	XG2	
	300	6◐	MA	500	....	....	XH2	**12132.**
	350		MA	600	....	....	XH3	
	400		MA	700	....	....	XH4	
	500	7◐	MA	800	....	....	XJ1	**16348.**
	600		MA	1000	....	....	XJ2	



Type WC3

◐ Overload relays are ambient temperature compensated.

* **Price includes "START" push button, "HAND-OFF-AUTO" selector switch, three unit overload relay, and three overload relay thermal units. Deduct $18. if thermal units are omitted.**

▲ Fuse clips are sized for use with dual-element time-delay fuses. When fuses are priced from above table, dual-element time-delay fuses will be provided.

■ NOTE: All devices are UL listed and marked — "SUITABLE *ONLY* FOR USE AS SERVICE EQUIPMENT."

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Quantity and type number of thermal units.
3. Horsepower, voltage, phase, hertz and full load current of motor.
4. Control voltage and hertz, if different from line voltage.
5. Any factory modifications required.

THERMAL UNITS

For selection of thermal units, refer to Page 466.

FACTORY MODIFICATIONS AND FORMS — Refer to Page 302.

SQD SLV_001078

WELL-GUARD® CONTROL AC PUMPING PLANT PANELS — REDUCED VOLTAGE TYPE

CLASS 8940

CLOSED TRANSITION AUTOTRANSFORMER TYPE

600 VOLTS MAX. **50-60 HERTZ**

Motor (Starter) Volts	Max. HP Polyphase	NEMA Size	Combination Fusible Disconnect Type				Combination Circuit Breaker Type		
			Fuse Clip Amps. ▲	Type	Price* with 3 Thermal Units	Add For 3 Fuses▲	Circuit Breaker Frame Size	Type	Price* with 3 Thermal Units
230 (240)	15	2◐	60	RD-4	**$3368.**	**$16.**	FA	VD-1	**$3368.**
	25	3	100	RE-4	**4808.**	**48.**	FA	VE-1	**4808.**
	30		200	RE-1	**4888.**	**96.**	KA	VE-2	**5256.**
	50	4	200	RF-4	**7504.**	**96.**	KA	VF-1	**7912.**
	75	5◐	400	RG-1	**12360.**	**160.**	LA	VG-2	**13244.**
	100		400	RG-1	**12960.**	**160.**	LA	VG-2	**13328.**
460 (480)	25	2◐	60	RD-2	**3544.**	**48.**	FA	VD-1	**3602.**
	30	3	100	RE-2	**4816.**	**80.**	FA	VE-1	**4832.**
	50		100	RE-2	**5128.**	**80.**	FA	VE-1	**5128.**
	75	4	200	RF-2	**7504.**	**176.**	KA	VF-1	**7856.**
	100		200	RF-2	**7960.**	**176.**	KA	VF-1	**8100.**
	150	5◐	400	RG-3	**12020.**	**320.**	LA	VG-4	**13032.**
	200		400	RG-3	**13740.**	**320.**	LA	VG-4	**14408.**
	300	6◐	....	....	....	....	MA	VH-1	**22300.**
	400		....	....	....	....	MA	VH-2	**22300.**
	600	7◐	....	....	....	....	MA	VJ-1	**34600.**

*** Price includes "Start" push button, "Hand-Off-Auto" selector switch, and three overload relays with thermal units. Deduct $18 if thermal units are omitted.**
▲ Fuse clips are sized for use with dual-element time-delay fuses. When fuses are priced from the above table, dual-element time-delay fuses will be provided.
◐ Overload relays are ambient temperature compensated.

PART WINDING TYPE

600 VOLTS MAX. **50-60 HERTZ**

Motor (Starter) Volts	Max. HP Polyphase	NEMA Size	Combination Fusible Disconnect Type				Combination Circuit Breaker Type		
			Fuse Clip (2 Sets) Amps. ▲	Type	Price* With 6 Thermal Units	Add For 6 Fuses ▲	Circuit Breaker (2 Bkrs.) Frame Size	Type	Price* With 6 Thermal Units
230 (240)	25	2PW◐	60	MD-4	**$2152.**	**$32.**	FA	PD-1	**$2084.**
	30	3PW	60	ME-5	**3296.**	**32.**	FA	PE-3	**3216.**
	50		100	ME-6	**3296.**	**96.**	FA	PE-3	**3216.**
	75	4PW	200	MF-1	**6164.**	**192.**	KA	PF-3	**6608.**
	100	5PW◐	200	MG-3	**12204.**	**192.**	KA	PG-2	**12204.**
	125		400	MG-1	**12204.**	**320.**	LA	PG-3	**12204.**
	150		400	MG-1	**12204.**	**320.**	LA	PG-3	**12204.**
460 (480)	30	2PW◐	30	MD-5	**2152.**	**64.**	FA	PD-1	**2084.**
	40		60	MD-2	**2152.**	**96.**	FA	PD-1	**2084.**
	60	3PW	60	ME-7	**3296.**	**96.**	FA	PE-3	**3216.**
	75		100	ME-3	**3296.**	**160.**	FA	PE-3	**3216.**
	100	4PW	200	MF-3	**6164.**	**352.**	FA	PF-2	**6608.**
	150		200	MF-3	**6164.**	**352.**	KA	PF-3	**6608.**
	200	5PW◐	200	MG-4	**12204.**	**352.**	KA	PG-2	**12204.**
	250		200	MG-4	**12204.**	**352.**	LA	PG-3	**12204.**
	350		400	MG-2	**12204.**	**640.**	LA	PG-3	**12204.**

*** Price includes "Start" push button, "Hand-Off-Auto" selector switch, and six overload relays with thermal units. Deduct $36 if thermal units are omitted.**
▲ Fuse clips are sized for use with dual-element time-delay fuses. When fuses are priced from the above table, dual-element time-delay fuses will be provided.
◐ Overload relays are ambient temperature compensated.

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Quantity and type number of thermal units.
3. Horsepower, voltage, phase, hertz and full load current of motor.
4. Control voltage and hertz, if different from line voltage.
5. Any factory modifications required.

THERMAL UNITS

For selection of thermal units, refer to Page 466.

FACTORY MODIFICATIONS — Refer to Page 302.

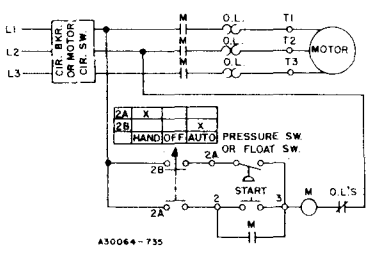
SQD SLV_001079

FACTORY MODIFICATIONS

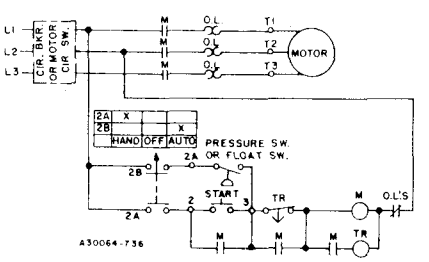
Description	Device Factory Installed	
	Form Letter	Price
Lightning Arrestor	Y153-2	**$160.**
Surge Capacitor	Y153-1	**192.**
Time Delay upon De-energization	K	**312.**
Time Delay upon Energization	K15	**312.**
Program Timer	K14	**302.**
Program Timer with Day Omission Feature	K14-1	**328.**
Undervoltage Relay (Connected between L2 and L3)	Y27	**204.**
Elapsed Time Meter	....	**232.**
Running Open Phase and Phase Sequence Reversal Protection NEMA Size: **1 and 2** **3 and 4** **5**		 **880.** **940.** **1250.**
Lockout Relay	....	**120.**
Extra Electrical Interlocks (Specify N.O. or N.C.) NEMA Size: **1, 2, 3, 4, 5** **6 and 7**	X	**44.** **132.**
Pilot Light (specify lens color) — Does not include interlock	P	**60.**
Control Circuit Transformer with Fused Secondary: NEMA Size: **1** 50 VA (9070 EO-1) **2** 100 VA (9070 EO-2) **3** 150 VA (9070 EO-3) **4** 300 VA (9070 EO-4) **5** * **6 and 7** —	FT	**108.** **152.** **224.** **272.** **308.**
	Standard (No Charge)	
Substitute Standard Trip Melting Alloy Overload Relays	Y61	N.C.
Substitute Quick-Trip Melting Alloy Overload Relays	Y61-1	N.C.
Substitute Quick-Trip Ambient Temperature Compensated Overload Relays, per starter NEMA Size: **1 and 2** **3 and 4** **5**	Y59	**24.** **28.** **300.**
Optional Enclosure Legs for types WF and WG (8940 QF-1)▲	E	**200.**

* The use of a Class 9070 EO-1 transformer (50 VA) and a control relay is standard Square D engineering practice for NEMA Size 5 devices.
▲ Class 8940 Type QF-1 Kit is **$90.** and contains the two legs required for each enclosure.

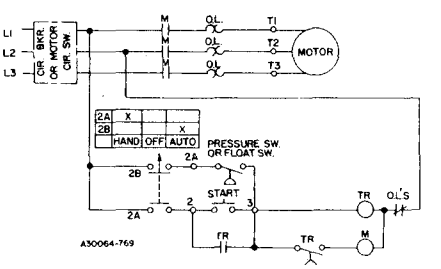
SCHEMATIC DIAGRAMS



STANDARD



FORM K



FORM K15

SQD SLV_001080

APPROXIMATE DIMENSIONS

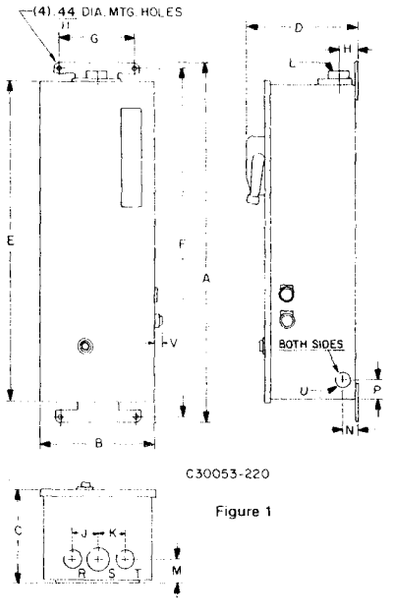


Figure 1

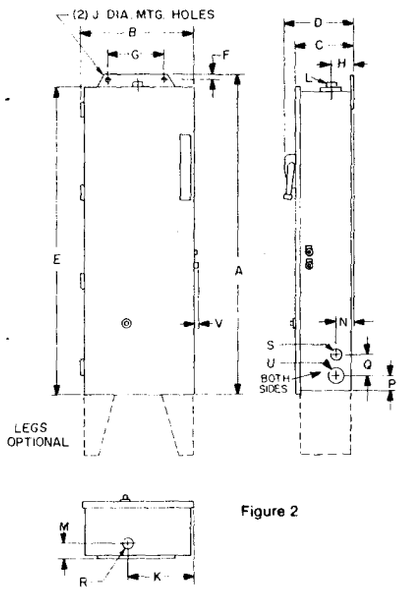


Figure 2

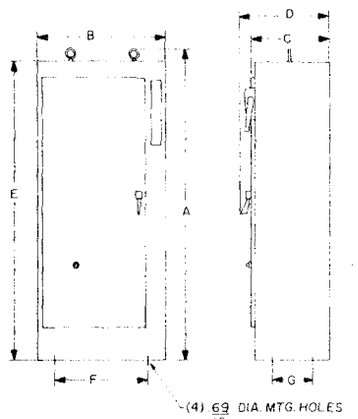


Figure 3

Type	Fig.	*	A	B	C	D	E	F	G	H	J	K	Cond. L	M	N	P	Q	Knockouts R	Knockouts S	Knockouts T	Knockouts U	V
C, D BC, BD	1	IN	23.50	15.88	8.42	10.42	20.30	22.38	7.00	2.18	2.13	2.13	1½	2.12	....	....	....	½-¾	1-1¼-1½	½-¾	....	....
		MM	597	403	214	265	516	568	178	55	54	54		54	....	....	....					
WC, WD XC, XD	1	IN	38.88	15.88	8.42	10.42	35.68	37.75	7.00	2.18	2.13	2.13	1½	2.12	....	....	....	½-¾	1-1¼-1½	½-¾	....	....
		MM	988	403	214	265	906	959	178	55	54	54		54	....	....	....					
E	1	IN	34.53	20.88	8.42	10.42	31.33	33.41	7.00	2.18	2.69	3.44	2	2.68	....	....	....	½-¾	1-1¼-2-2½	1-1¼-1½-2	....	....
		MM	877	530	214	265	796	849	178	55	68	87		68	....	....	....					
WE, XE XF	1	IN	42.53	20.88	8.42	10.42	39.33	41.41	7.00	2.18	2.69	3.44	WE,XE-2	2.68	....	....	....	½-¾	1-1¼-2-2½	1-1¼-1½-2	....	....
		MM	1080	530	214	265	999	1052	178	55	68	87	XF-2½	68	....	....	....					
F	SIM. 1	IN	44.37	19.15	9.06	10.38	40.15	43.25	7.00	2.11	2.69	3.44	2½	2.61	1.65	1.65	....	½-¾	1-1¼-2-2½	1-1¼-1½-2	1-1¼-1½	1.41
		MM	1127	486	230	264	1020	1099	178	54	68	87		66	42	42	....					36
WF	SIM. 1	IN	54.37	19.21	9.06	10.38	50.21	53.25	7.00	2.11	2.69	3.44	2½	2.61	1.65	1.65	....	½-¾	1-1¼-2-2½	1-1¼-1½-2	1-1¼-1½	1.41
		MM	1381	488	230	264	1275	1353	178	54	68	87		66	42	42	....					36
XG	2	IN	58.38	21.73	10.65	12.64	57.77	5.00	15.00	....	.56	13.00	....	2.75	3.09	2.85	3.88	2	2	....	3	1.07
		MM	1483	552	271	321	1467	127	381	....	14	330		70	78	72	99					27
WG	SIM. 2	IN	67.61	22.21	14.16	17.16	66.21	5.00	15.00	....	.56	....	....	....	....	....	....	....	....	....	....	1.41
		MM	1717	564	360	436	1682	127	381	....	14	....		....	....	....	....					36
XH	3	IN	82.71	36.21	20.21	23.21	80.21	33.75	16.50	....	....	....	....	....	....	....	....	....	....	....	....	....
		MM	2101	920	513	590	2037	857	419	....	....	....		....	....	....	....					
XJ	3	IN	92.71	34.21	20.21	23.21	90.21	31.75	16.50	....	....	....	....	....	....	....	....	....	....	....	....	....
		MM	2355	869	513	590	2292	806	419	....	....	....		....	....	....	....					

*Dual Dimensions:
INCHES
Millimeters

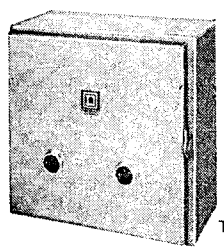
SQD SLV_001081

AC DUPLEX MOTOR CONTROLLERS

CLASS 8941

Duplex Motor Controllers are used to control two motors, and consist of two starters in a common enclosure. Two separate disconnect switches or circuit breakers with operators are included with all combination devices. Unless Form Y68 is specified, an alternation circuit is included, which alternately operates first one motor and then the other on each successive closing of a pilot device. Both motors will be energized should a second pilot device close.

Typical applications include pump motors where a second pump is required for peak demand periods yet alternation is desirable to equalize pump wear.



Type SCG-1

- Automatic alternation
- Melting alloy overload relays for more reliable protection
- One piece thermal units for greater accuracy
- Type S starters
- Visible blade switch or push-to-test circuit breaker with all combination types
- Rugged Flange Mounted Operator with 2 door interlocks
- Terminal block connections for remote float, pressure, temperature, or other pilot devices for easy installation.

NON-COMBINATION TYPE — WITHOUT DISCONNECT — WITH ELECTRIC ALTERNATOR

600 VOLTS MAX. **3 POLE** **50-60 HERTZ**

NEMA Size	Maximum Rating Each Motor		General Purpose Enclosure **NEMA Type 1**		Watertight and Dusttight AISI #304 Stainless Steel Enclosure **NEMA Type 4**		Dusttight and Driptight Industrial Use Enclosure **NEMA Type 12 (NEMA Type 3 and 3R)◐**		**Open Type**	
	Volts	HP Polyphase	Type	*Price	Type	*Price	Type	*Price	Type	*Price
0	200-230 460-575	3 5	SBG-1	**$ 652.**	SBW-1	**$ 872.**	SBA-1	**$ 720.**	SBO-1	**$ 600.**
1	200-230 460-575	7½ 10	SCG-1	**696.**	SCW-1	**924.**	SCA-1	**764.**	SCO-1	**644.**
2	200 230 460-575	10 15 25	SDG-1	**1048.**	SDW-1	**1524.**	SDA-1	**1224.**	SDO-1	**924.**
3	200 230 460-575	25 30 50	SEG-1	**1436.**	SEW-1	**2332.**	SEA-1	**1664.**	SEO-1	**1260.**
4	200 230 460-575	40 50 100	SFG-1	**2932.**	SFW-1	**4460.**	SFA-1	**3688.**	SFO-1	**2560.**

COMBINATION CIRCUIT BREAKER TYPE — WITH ELECTRIC ALTERNATOR

600 VOLTS MAX. **3 POLE** **50-60 HERTZ**

Motor Voltage (Starter Voltage)	Max. HP Poly-phase	NEMA Size	Circuit Breaker		General Purpose Enclosure **NEMA Type 1**		Watertight and Dusttight AISI #304 Stainless Steel Enclosure **NEMA Type 4**		Dusttight and Driptight Industrial Use Enclosure **NEMA Type 12 (NEMA Type 3 and 3R)◐**	
			Frame Size	Trip Setting	Type	*Price	Type	*Price	Type	*Price
200 (208)	2 3	0	FA	15 20	BBG-4 BBG-6	**$1108.**	BBW-4 BBW-6	**$1952.**	BBA-4 BBA-6	**$1320.**
	7½	1	FA	50	BCG-10	**1152.**	BCW-10	**1996.**	BCA-10	**1364.**
	10	2	FA	60	BDG-13	**1636.**	BDW-13	**2940.**	BDA-13	**1936.**
	15 20 25	3	FA FA KA	90 100 125	BEG-4 BEG-1 BEG-3	**2640.**	BEW-4 BEW-1 BEW-3	**4912.**	BEA-4 BEA-1 BEA-3	**3028.**
	30 40	4	KA	150 175	BFG-1 BFG-6	**5500.**	BFW-1 BFW-6	**8404.**	BFA-1 BFA-6	**6572.**
230 (240)	2 3	0	FA	15 20	BBG-4 BBG-6	**1108.**	BBW-4 BBW-6	**1952.**	BBA-4 BBA-6	**1320.**
	5 7½	1	FA	30 50	BCG-7 BCG-10	**1152.**	BCW-7 BCW-10	**1996.**	BCA-7 BCA-10	**1364.**
	10 15	2	FA	60 90	BDG-13 BDG-16	**1636.**	BDW-13 BDW-16	**2940.**	BDA-13 BDA-16	**1936.**
	25 30	3	FA KA	100 125	BEG-1 BEG-3	**2640.**	BEW-1 BEW-3	**4912.**	BEA-1 BEA-3	**3028.**
	40 50	4	KA	150 200	BFG-1 BFG-2	**5500.**	BFW-1 BFW-2	**8404.**	BFA-1 BFA-2	**6572.**
460-575 (480-600)	5	0	FA	15	BBG-5	**1364.**	BBW-5	**2208.**	BBA-5	**1576.**
	7½ 10	1	FA	20 30	BCG-8 BCG-11	**1408.**	BCW-8 BCW-11	**2252.**	BCA-8 BCA-11	**1620.**
	15 20 20 25	2	FA	40 50† 60 70	BDG-17 BDG-20 BDG-19 BDG-18	**1892.**	BDW-17 BDW-20 BDW-19 BDW-18	**3196.**	BDA-17 BDA-20 BDA-19 BDA-18	**2192.**
	30 50	3	FA	90 100	BEG-4 BEG-1	**2640.**	BEW-4 BEW-1	**4912.**	BEA-4 BEA-1	**3028.**
	75 100 100	4	KA	125 150† 175	BFG-3 BFG-7 BFG-6	**5500.**	BFW-3 BFW-7 BFW-6	**8404.**	BFA-3 BFA-7 BFA-6	**6572.**

*** Prices do not include thermal units. For selection, see page 305.**
◐NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to Class 9991 page 448.
†575 (600) volt only.

ORDERING INFORMATION REQUIRED — See Page 305.

SQD SLV_001082

CLASS 8941

COMBINATION FUSIBLE DISCONNECT TYPE WITH ELECTRIC ALTERNATOR

600 VOLTS MAX. — **3 POLE** — **50-60 HERTZ**

Motor Voltage (Starter Voltage)	Max. H.P. Poly-phase	NEMA Size	Fuse Clip Size Amps	General Purpose Enclosure NEMA Type 1 Type	General Purpose Enclosure NEMA Type 1 Price*	Watertight and Dusttight Enclosure (AISI #304 Stainless Steel) NEMA Type 4 Type	Watertight and Dusttight Enclosure (AISI #304 Stainless Steel) NEMA Type 4 Price*	Dusttight and Driptight Industrial Use Enclosure NEMA Type 12 (NEMA Type 3 and 3R)◐ Type	Dusttight and Driptight Industrial Use Enclosure NEMA Type 12 (NEMA Type 3 and 3R)◐ Price*
200 (208)	3	0	None	FBG-4	$1048.	FBW-4	$1892.	FBA-4	$1260.
			‡30	FBG-5	1072.	FBW-5	1916.	FBA-5	1284.
	7½	1	None	FCG-5	1092.	FCW-5	1936.	FCA-5	1304.
			‡30	FCG-6	1116.	FCW-6	1960.	FCA-6	1328.
	10	2	None	FDG-6	1584.	FDW-6	2888.	FDA-6	1884.
			‡60	FDG-7	1616.	FDW-7	2920.	FDA-7	1916.
	25	3	None	FEG-1	2472.	FEW-1	4744.	FEA-1	2860.
			‡100	FEG-5	2548.	FEW-5	4820.	FEA-5	2936.
	40	4	None	FFG-1	4540.	FFW-1	7444.	FFA-1	5616.
			‡200	FFG-2	4708.	FFW-2	7612.	FFA-2	5784.
230 (240)	3	0	None	FBG-4	1048.	FBW-4	1892.	FBA-4	1260.
			‡30	FBG-5	1072.	FBW-5	1916.	FBA-5	1284.
	7½	1	None	FCG-5	1092.	FCW-5	1936.	FCA-5	1304.
			‡30	FCG-6	1116.	FCW-6	1960.	FCA-6	1328.
	15	2	None	FDG-6	1584.	FDW-6	2888.	FDA-6	1884.
			‡60	FDG-7	1616.	FDW-7	2920.	FDA-7	1916.
	30	3	None	FEG-1	2472.	FEW-1	4744.	FEA-1	2860.
			‡100	FEG-5	2548.	FEW-5	4820.	FEA-5	2936.
	50	4	None	FFG-1	4540.	FFW-1	7444.	FFA-1	5616.
			‡200	FFG-2	4708.	FFW-2	7612.	FFA-2	5784.
460-575 (480 600)	5	0	None	FBG-4	1048.	FBW-4	1892.	FBA-4	1260.
			‡30	FBG-6	1076.	FBW-6	1920.	FBA-6	1288.
	10	1	None	FCG-5	1092.	FCW-5	1936.	FCA-5	1304.
			‡30	FCG-8	1120.	FCW-8	1964.	FCA-8	1332.
	25	2	None	FDG-6	1584.	FDW-6	2888.	FDA-6	1884.
			‡60	FDG-9	1628.	FDW-9	2932.	FDA-9	1928.
	50	3	None	FEG-1	2472.	FEW-1	4744.	FEA-1	2860.
			‡100	FEG-3	2592.	FEW-3	4864.	FEA-3	2980.
	100	4	None	FFG-1	4540.	FFW-1	7444.	FFA-1	5616.
			‡200	FFG-4	4708.	FFW-4	7612.	FFA-4	5784.

*** Prices do not include thermal units. For selection, see below.**
◐NEMA Type 12 enclosures may be field modified for outdoor applications. For details refer to Class 9991, page 448.
◐HP rating applies only when dual element time delay fuses are used.

FIELD OR FACTORY MODIFICATIONS AND FORMS

Description	Enclosure Type	Device For Field Mounting Class	Device For Field Mounting Type	Form Letter	Device Factory Installed Price/NEMA Size 0-1	2	3	4
PILOT DEVICES IN COVER								
"HAND-OFF-AUTO" selector switch — one supplied for each motor	1	(Two) 9999	SC-2	C	$ 64.	$ 64.	$ 64.	$ 64.
	4, 12	(Two) 9001★	KS-43B-H1	C	176.	176.	176.	176.
Start-Stop push buttons — one supplied for each motor (Form Y68 required)	1	(Two) 9999	SA-2	A	64.	64.	64.	64.
	4, 12	(Two) 9001★	KR-6RB-H2	A	176.	176.	176.	176.
"TEST" push button for each motor	Any	(Two) 9001★	KR-1B-H1	Y29	176.	176.	176.	176.
Pilot light — one supplied for each motor	1	(Two) 9999	SP-12R	P	120.	120.	120.	120.
	4, 12	(Two) 9001★	KP	P	216.	216.	216.	216.
CONTROL CIRCUIT								
Fused Control Circuit transformer with 600, 480, or 240 volt primary and 120 volt secondary — one supplied for each starter (60 Hz.) No deduction for omission of fuse block and fuses	Any	9070	NEMA Size 0 & 1-EO-2 2-EO-2 3-EO-3 4-EO-4	FT	216.	304.	448.	520.
Deduct for omission of electric alternator	Any	....	....	Y68	244.	244.	244.	244.
Transfer switch for manual alternation (For use on controllers without electric alternator)	Any	(One) 9001★	KS-11B-H4	C13	144.	144.	144.	144.
Additional electrical interlocks (Standard devices have 1 N.O. unwired interlock on each starter)	Any	(Each) 9999	SX	X	44.	44.	44.	44.
Addition for 2 relays to modify controller for operation w/single pole pilot devices	Any	(Two) 8501	DO-20	R7	408.	408.	408.	408.
Addition for 3 relays to modify controller for operation with single pole mercury float switches	Any	(Two) 8501 (One) 8501	DO-20 DO-22	R8	612.	612.	612.	612.
Modified wiring for use with two pole mercury float switches	Any			Y192	88.	88.	88.	88.
ENCLOSURES								
Add for cover gasket in NEMA 1 enclosure	1	....	....	Y47	88.	120.	208.	288.
Pressure switch for each starter	Any	(Two) 9013	per requirement	D	212.	212.	212.	212.
Extra length enclosure for non-combination devices without Forms D, FT, or other requirements	Any	....	....	G6	160.	160.	160.	160.

★Also requires Class 9001 Type KN nameplate.

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Quantity and type number of thermal units.
3. Horsepower, voltage, phase, hertz and full load current of motor.
4. Control voltage and hertz if different from line voltage.
5. Any special features required.

THERMAL UNITS

Thermal units should be ordered separately. For selection of thermal units, refer to the Selection Index on Page 466 or "Overload and Short Circuit Protection Selector" in Control Catalog. Standard trip thermal units are priced at **$6.00** each.

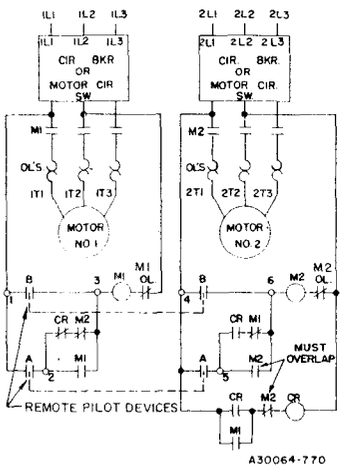
SQD SLV_001083

AC DUPLEX MOTOR CONTROLLERS

CLASS 8941

APPLICATION DATA

SCHEMATIC DIAGRAM



OPERATION

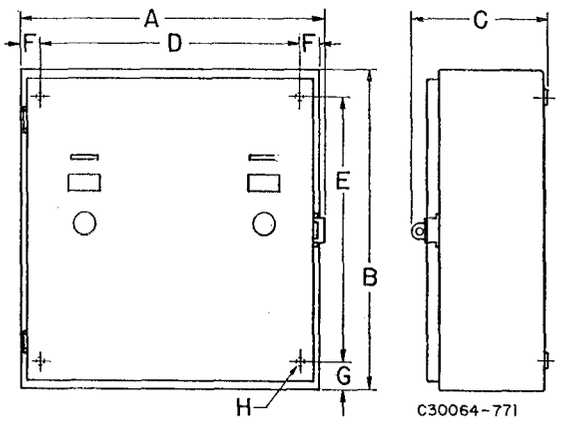
1. The controller alternately operates first one motor and then the other on each successive closing of pilot device A.
2. When pilot device B closes, both motors are energized. Typical applications include pump motors, where a second pump is required for peak demand periods. For this application, both pilot devices may be float or pressure switches and B is set to operate after A and only if both pumps are required.
3. Both pilot devices must be two pole, but B can be omitted if only alternation is required and both motors are never required to run simultaneously.
4. If one motor is running and its disconnect switch is opened, an overload relay trips, or the starter is de-energized for any reason, the other motor will automatically be started. If demand is satisfied and the motor is shut off, it will restart when pilot device B closes.

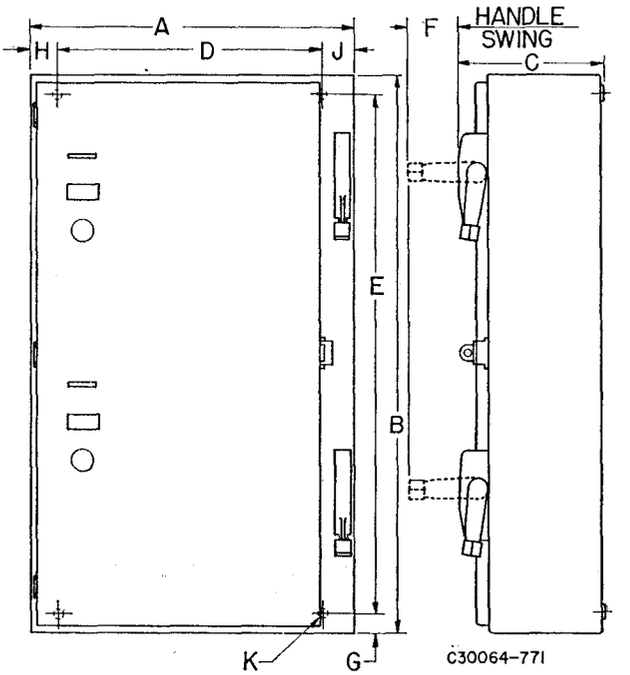
NOTE: Standard alternator circuit requires two two-pole pilot devices (A and B above). If single pole pilot devices are used, Form R7 is required.

APPROXIMATE DIMENSIONS — NEMA 1 ENCLOSURES

Standard combination enclosures will accommodate Form D, FT, or two additional relays (Form R7) or timers. The extra length non-combination enclosure is utilized for these additions, whereas the standard non-combination enclosure is used when these additions are not required.

All enclosures have either knockouts (NEMA 1) or closing plates (NEMA 4 and 12) to easily accept Form A or C and P without punching or drilling holes. Combination and extra length non-combination enclosures contain predrilled panel holes to accept Form FT, D, or R7.





NON-COMBINATION (STANDARD)

Starter Size	A	B	C	D	E	F	G	H
0, 1 or 2	18 5/16	13 1/8	8 5/8	16	11	1 1/16	1 1/16	5/16 Dia.
3 or 4	22 5/16	21 3/16	9 7/8	19 1/2	18 1/2	1 11/32	1 11/32	7/16 Dia.

NON-COMBINATION — EXTRA LENGTH ENCLOSURE (SUPPLIED WITH FORMS D AND FT)

Starter Size	A	B	C	D	E	F	G	H
0, 1 or 2	19 5/16	20 3/16	8 3/4	16 1/2	17 1/2	1 11/32	1 11/32	7/16 Dia.
3 or 4	22 5/16	32 3/16	9 7/8	19 1/2	29 1/2	1 11/32	1 11/32	7/16 Dia.

COMBINATION

Starter Size	A	B	C	D	E	F	G	H	J	K
0, 1 or 2 (For FAL Ckt. Bkr. & 30 A. & 60 A. Disc. Sw.)	20 9/16	35 3/16	9 11/16	17	32 1/2	3 5/16	1 11/32	1 11/32	2 7/32	7/16 Dia.
3 or 4 (For FAL & KAL Ckt. Bkr. & 100 A. Disc. Sw.)	32 1/4	44 1/4	10 13/16	28	40	*	2 1/8	2 1/8	2 1/8	9/16 Dia.
4 (For 200 A. Disc. Sw.)	34 1/4	54 1/4	12 13/16	30	50	4 7/8	2 1/8	2 1/8	2 1/8	9/16 Dia.

*For FAL & KAL Ckt. Bkr. Dimension F = 3 5/16.
For 100 A. Disc. Sw. Dimension F = 4 7/8.

SQD SLV_001084

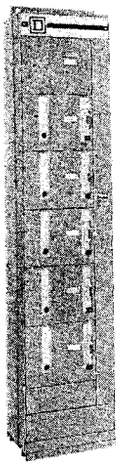
UL LISTED

SPEED-D® MOTOR CONTROL CENTERS

CLASS 8998

The SPEED-D Motor Control Center program is a selection of the most popular Class 8998 Model 4 Motor Control Center units, structures, and accessories.

SPEED-D equipment is completely interchangeable with Model 4, but care should be taken to match horizontal bus size and material as well as structure depth when bussing SPEED-D structures to existing motor control centers. SPEED-D units and structures are shipped in 5 working days (unassembled) and 10 working days (factory assembled) while Model 4 units only and structures can be shipped in a minimal amount of time from all Motor Control Center Assembly Plants in order to "mix and match" SPEED-D with Model 4 for the optimum in quick delivery.



6½ space factors
14" deep front-of-board
with non-removable back plates.

APPLICATION DATA

Voltage Rating:	Power — 600 Volts Max. — 50-60 Hz Control — 120 Volts 60 Hz, 110 Volts 50 Hz
System:	3 phase, 3 wire with horizontal ground bus
Enclosures:	NEMA 1 or 12, 6½ space factor with bottom wireway, 14" deep with non-removable back plate, or 20" deep front-of-board with removable back plates.
Horizontal Bus Bars:	600 amp tin plated aluminum or copper 1000 amp tin plated aluminum 1200 amp tin plated copper
Vertical Bus Bars:	300 amp tin plated aluminum or copper 600 amp copper with bottom located main lug compartment
Bus Bar Bracing:	42,000 RMS Symmetrical Amperes
Incoming Main Feeders:	Top or bottom located main lug sections Top located 400 or 600 amp main breaker and main fusible switch sections suitable for use as service equipment
Starters:	Square D Type S with external hand reset melting alloy overload relays (thermal units not included)
Wiring:	NEMA Class 1, Type A or B
Control Circuit Power:	Control circuit transformer (Form FT 240/480-120) or Separate 120 volt control with control circuit disconnect on the operating mechanism (Forms S, Y74)
Starter Disconnects:	MAG-GARD (Instantaneous Trip Magnetic Only) Circuit Breaker or Fusible Switch (Fuses not included)
Electrical Interlocks:	Each starter (each contactor on reversing and two-speed and autotransformer starters) provided with 1 N.O. and 1 N.C. auxiliary interlocks (Form X4) in addition to holding circuit interlock.
U.L. Listing:	All possible combinations of SPEED-D Motor Control Centers are U.L. Listed.

UNASSEMBLED PROGRAM

Unassembled SPEED-D Motor Control Centers consist of separately packaged vertical sections and units for customer assembly. Factory shipment on unassembled components is 5 days. Some options, however, (1B wiring, pilot accessories, NEMA 12 enclosures, bus barriers, and main breaker and main switch sections) require 10 days. Unassembled units consist of the starter unit, a unit mounting pan, a hinged door, and hardware to fasten the door and unit to the structure. For the names of local stocking distributors, contact your Square D Field Office.

FACTORY ASSEMBLED PROGRAM

SPEED-D Motor Control Centers may be obtained factory assembled and are available for shipment in 10 working days from the SPEED-D A-Plant. The factory assembled program consists of fully assembled control centers ready for installation, wiring, and service. All units are securely placed within structures and the structures are then palletized for shipment.

All units, sections, and accessories listed on the unassembled program are available factory assembled. In addition to these, a 20 circuit NQO panelboard with a 100 amp main breaker and autotransformer starters are available in a vertical section.

DESCRIPTIVE INFORMATION

Space Factor — Vertical heights are measured in space factors; ½ space factor = 6 inches and 1 space factor = 12 inches. The space factor of each unit is given in the appropriate selection table. Structures accept 6½ space factors of units for front mounting.

Spaces for future use are obtained with blank cover plates which are located under "Section Accessories". Each blank cover plate includes a unit mounting pan.

Empty units for mounting of customer equipment are designated by "MT". These units consist of an undrilled back plate, a unit mounting pan, and a hinged door.

Extra space for customer equipment is available in Size 1 and 2 units. Select the ones that are 1½ space factor.

Bus barriers are available and are listed under "Section Accessories".

Units available are combination starters (FVNR, FVR, 2-speed, and autotransformer), branch feeders, lighting panelboards, and distribution transformers.

ORDERING INFORMATION REQUIRED

A. Starter Units
1. Class and Type Number
2. Wiring Type (1A or 1B)
3. Control source: Choose either
   a. FT (state primary voltage 480 or 240 only)
   b. S, Y74 (state system voltage)
4. Modifications (from "STARTER UNIT OPTIONS" table)
5. Enclosure Type (NEMA 1 or 12)

B. Other Units
1. Class and Type Number
2. Enclosure Type (NEMA 1 or 12)

C. Structures
1. Class and Type Number
2. Modifications (Form U2, U3 if required)
3. Enclosure Type (NEMA 1 or 12)

D. Factory Assembly
1. Required information from A, B, and C.
2. Unit arrangement layout on form number PE-1149A

THERMAL UNITS

Thermal units should be ordered separately, from page 436.

FIELD MODIFICATION KITS

Most kits on pages 425-429 apply to motor control centers, subject to space limitations.

MAG-GARD is a Registered Trademark.

SQD SLV_001085

SPEED-D® MOTOR CONTROL CENTERS

CLASS 8998

UL LISTED FOR 22,000A ♦

MAG-GARD® CIRCUIT BREAKER TYPE COMBINATION STARTERS‡

FULL VOLTAGE NON-REVERSING

Horsepower Range At				NEMA Starter Size	C/B Amp	Unit Type Number	Space Factor	Price with FT	Price with S, Y74	Number of Thermal Units Required▲
*208V	**240V	480V	*600V							
¼-⅓ ½-1 1½-3 5	¼-⅓ ½-1 1½-3 5-7½	¼-1 1½-3 5-7½ 10	¼-1 1½-3 5-10	1	3 7 15 30	EC-403 EC-404 EC-405 EC-406	1	**$459.**	**$405.**	3
1½-3 5	1½-3 5-7½	5-7½ 10	5-10	1	15 30	EC-409 EC-410	1½+	**589.**	**535.**	3
5 7½-10	5-7½ 10 15	10-15 20-25	15-20 25	2	30 50 100	ED-402 ED-403 ED-404	1	**578.**	**486.**	3
5 7½-10	5-7½ 10 15	10-15 20-25	15-20 25	2	30 50 100	ED-405 ED-406 ED-407	1½+	**702.**	**610.**	3
10 15-25	10 15-30	20-25 30-50	25-30 40-50	3	50 100	EE-404 EE-405	1½	**794.**	**694.**	3
40 30	40 50	.... 75 100	.... 100	4	225 225 225	EF-406 EF-407 EF-408	2	**1485.**	**1375.**	3

FULL VOLTAGE REVERSING

Horsepower Range At				NEMA Starter Size	C/B Amp	Unit Type Number	Space Factor	Price with FT	Price with S, Y74	Number of Thermal Units Required▲
*208V	**240V	480V	*600V							
¼-⅓ ½-1 1½-3 5	¼-⅓ ½-1 1½-3 5-7½	¼-1 1½-3 5-7½ 10	¼-1 1½-3 5-10	1	3 7 15 30	FC-403 FC-404 FC-405 FC-406	2	**$627.**	**$573.**	3
5 7½-10	5-7½ 10 15	10-15 20-25	15-20 25	2	30 50 100	FD-402 FD-403 FD-404	2	**859.**	**767.**	3

TWO-SPEED,# CONSTANT H.P., FULL VOLTAGE NON-REVERSING

Horsepower Range At				NEMA Starter Size	C/B Amp	One Winding (Consequent Pole)				Two Winding (Separate Winding)				Number of Thermal Units Required▲
						Unit Type Number	Space Factor	Price with FT	Price with S, Y74	Unit Type Number	Space Factor	Price with FT	Price with S, Y74	
*208V	**240V	480V	*600V											
.... ¼-¾ 1-2 3-5	.... ⅛-¾ 1-2 3-5	¼-½ ¾-2 3-5 7½	¼-¾ 1-2 3-5 7½	1	3 7 15 30	HC-415 HC-416 HC-417 HC-418	2	**$848.**	**$794.**	HC-419 HC-420 HC-421 HC-422	2	**$762.**	**$708.**	6
.... 7½	.... 7½-10	10 15-20	10-15 20	2	30 50	HD-411 HD-412	2	**1188.**	**1096.**	HD-413 HD-414	2	**1037.**	**945.**	6

TWO-SPEED,# CONSTANT OR VARIABLE TORQUE FULL VOLTAGE NON-REVERSING

Horsepower Range At				NEMA Starter Size	C/B Amp	One Winding (Consequent Pole)				Two Winding (Separate Winding)				Number of Thermal Units Required▲
						Unit Type Number	Space Factor	Price with FT	Price with S, Y74	Unit Type Number	Space Factor	Price with FT	Price with S, Y74	
*208V	**240V	480V	*600V											
¼-⅓ ½-1 1½-3 5	¼-⅓ ½-¾ 1½-3 5-7½	¼-1 1½-3 5-7½ 10	¼-1 1½-3 5-10	1	3 7 15 30	HC-407 HC-408 HC-409 HC-410	2	**$848.**	**$794.**	HC-411 HC-412 HC-413 HC-414	2	**$762.**	**$708.**	6
5 7½-10	5-7½ 10 15	10-15 20-25	15-20 25	2	30 50 100	HD-405 HD-406 HD-407	2	**1188.**	**1096.**	HD-408 HD-409 HD-410	2	**1037.**	**945.**	6

‡ The type number selections listed in the tables on this page are for motors with typical locked rotor inrush characteristics. For selection restrictions refer to the "MOTOR CODE LETTER" table on page 67. For motors with higher code letters, Model 4 units should be selected. Consult your local Square D Field Office.

* Form FT (240/480-120) can be used on 240V and 480V systems only. For other voltages, Form S, Y74 must be used.

** On unassembled program, units are wired for 480 volts unless 240 volts is stated on order. The 480 V. control circuit transformer is reconnectable for 240 volts.

+ Includes extra ½ space factor additional space only.

▲ Melting alloy overload relay included; thermal units must be priced and ordered separately, see selection index on page 466. Ambient compensated bimetallic overloads available in Western Region only (voids UL label of unit). Consult local Square D Field Office.

Refer to page 273 for Application Data and typical schematic diagrams.

♦ UL LISTED
SHORT CIRCUIT WITHSTAND RATINGS

NEMA Size	Voltage	Available Amperes RMS Symmetrical
1	0-480	22,000
1	481-600	10,000
2-6	600	22,000

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FUSIBLE SWITCH COMBINATION STARTER UNITS‡

FULL VOLTAGE NON-REVERSING

Maximum Horsepower At				NEMA Starter Size	Switch Amp Rating	Unit Type Number	Space Factor	Price with FT	Price with S, Y74	Number of Thermal Units Required▲
*208V	**240V	480V	*600V							
5 .... 7½	5 .... 7½	.... 10	.... 10	1	30 30 60	NC-405 NC-406 NC-407	1	**$405.**	**$351.**	3
7½	7½	 10	 10	1	60 30	NC-408 NC-409	1½+	**535.**	**481.**	3
10	15	 25	 25	2	60 60	ND-405 ND-406	1	**540.**	**448.**	3
10	15	 25	 25	2	60 60	ND-407 ND-408	1½+	**670.**	**578.**	3
20 25	25 30	 50	 50	3	100 200 100	NE-410 NE-411 NE-412	1½ 3 1½	**859.**	**759.**	3
40	50	 100	 100	4	200 200	NF-409 NF-410	3½	**1372.**	**1262.**	3

FULL VOLTAGE REVERSING

Maximum Horsepower At				NEMA Starter Size	Switch Amp Rating	Unit Type Number	Space Factor	Price with FT	Price with S, Y74	Number of Thermal Units Required▲
*208V	**240V	480V	*600V							
5 7½	5 7½	 10	 10	1	30 60 30	OC-405 OC-406 OC-407	2	**$573.**	**$519.**	3
10	15	 25	 25	2	60 60	OD-405 OD-406	2	**821.**	**729.**	3

TWO-SPEED,# CONSTANT H.P., FULL VOLTAGE NON-REVERSING

Maximum Horsepower At				NEMA Starter Size	Switch Amp Rating	One Winding (Consequent Pole)				Two Winding (Separate Winding)				Number of Thermal Units Required▲
						Unit Type Number	Space Factor	Price with FT	Price with S, Y74	Unit Type Number	Space Factor	Price with FT	Price with S, Y74	
*208V	**240V	480V	*600V											
5 5	5 5	.... 7½	.... 7½	1	30 60 30	QC-423 QC-424 QC-425	2	**$789.**	**$735.**	QC-426 QC-427 QC-428	2	**$702.**	**$648.**	6
7½	10	 20	 20	2	60 60	QD-421 QD-422	2	**1140.**	**1048.**	QD-423 QD-424	2	**983.**	**891.**	6

TWO-SPEED,# CONSTANT OR VARIABLE TORQUE, FULL VOLTAGE NON-REVERSING

Maximum Horsepower At				NEMA Starter Size	Switch Amp Rating	One Winding (Consequent Pole)				Two Winding (Separate Winding)				Number of Thermal Units Required▲
						Unit Type Number	Space Factor	Price with FT	Price with S, Y74	Unit Type Number	Space Factor	Price with FT	Price with S, Y74	
*208V	**240V	480V	*600V											
7½ 7½	7½ 7½	 10	 10	1	30 60 30	QC-417 QC-418 QC-419	2	**$789.**	**$735.**	QC-420 QC-421 QC-422	2	**$702.**	**$648.**	6
10	15	 25	 25	2	60 60	QD-417 QD-418	2	**1140.**	**1048.**	QD-419 QD-420	2	**983.**	**891.**	6

‡ Fuses not included.

* Form FT (240/480-120) can be used on 240V and 480V systems only. For other voltages, Form S, Y74 must be used.

**On unassembled program, units are wired for 480 volts unless 240 volts is stated on order. The 480 V. control circuit transformer is reconnectable for 240 volts.

+ Includes extra ½ space factor additional space only.

▲ Melting alloy overload relay included; thermal units must be priced and ordered separately, see selection Index on page 466. Ambient compensated bimetallic overloads available in Western Region only (voids UL label of unit). Consult local Square D Field Office.

Refer to page 273 for Application Data and typical schematic diagrams.

SPEED-D® MOTOR CONTROL CENTERS

CLASS 8998

STARTER UNIT OPTIONS

Description♦	Form Number	Price
✱Start-Stop Push Buttons	A	**$ 65.**
✱Start-Stop with 1 Pilot light — Red (On)	AP	**146.**
✱Start-Stop with 2 Pilot lights (Interlock included)	APP	**249.**
+Forward-Reverse-Stop Push Buttons	A1	**130.**
+Forward-Reverse-Stop with 2 Pilot lights	A1PP	**292.**
#High-Low-Stop Push Buttons	A2	**130.**
#High-Low-Stop with 2 Pilot lights	A2PP	**292.**
✱Hand-Off-Auto Selector Switch	C	**65.**
✱Hand-Off-Auto with 1 Pilot light — Red (On)	CP	**146.**
✱Hand-Off-Auto with 2 Pilot lights (Interlock included)	CPP	**249.**
✱1 Pilot light only — Red (On)	P	**81.**
2 Pilot lights (Interlock included)	PP	**184.**

♦ To order unit with any of the options listed, add the form number as a suffix to the unit type number. Only listed combinations of options are available. Choose only one Form Number option per starter unit.
✱ Full Voltage Non-Reversing units or autotransformer starters only.
+ Reversing units only.
# Two Speed units only.

MISCELLANEOUS UNITS

MT Units (Undrilled Panel and Hinged Door)

Unit Type No.	Space Factors	Panel Dimensions✱	Price
MT-414	1	11¾" H x 13⅝" W	**$ 92.**
MT-415	2	22½" H x 13⅝" W	**165.**
MT-416	2½	28½" H x 13⅝" W	**175.**
MT-417	3	34½" H x 13⅝" W	**185.**
MT-418	3½	40¼" H x 13⅝" W	**200.**
MT-419	4	46¼" H x 13⅝" W	**225.**
MT-420	4½	52" H x 13⅝" W	**250.**
MT-421	5	58" H x 13⅝" W	**275.**
MT-422	5½	63¾" H x 13⅝" W	**310.**
MT-424	6½	75½" H x 13⅝" W	**355.**

NQO Panelboards

D-480	20 Ckt.1ϕ3W 120/240V A.C. NQO Panelboard with 100 amp main breaker. Available Factory Assembled ONLY.✱✱	**$520.**

✱ Dimensions are in inches — Depth from door to panel is 7½".
✱✱ Requires 2½ space factors at the top of a vertical section. When used with a distribution transformer, the panelboard will be mounted immediately above transformer unit. Branch QO breakers not included.

CIRCUIT BREAKER UNITS†

No. of Poles	Trip Rating	Breaker Frame Type	Unit Type Number	Price	Space Factor
2	15 20 30	FA	BW-419 BW-420 BW-421	**$303.**	1
	60	FA	BW-422	**308.**	
3	15 20 30 50	FA	BW-423 BW-424 BW-425 BW-428	**324.**	1
	60 100	FA	BW-426 BW-427	**351.**	
	125 150 200 225	KA	BY-405 BY-406 BY-407 BY-408	**692.**	1½

Dual Mounted Units

No. of Poles	Trip Rating	Breaker Frame Type	Unit Type Number	Price	Space Factor
3	15/15 20/20 30/30 50/50	FA/FA	BW-430 BW-431 BW-432 BW-433	**$570.**	1
	60/60 100/100	FA/FA	BW-434 BW-435	**624.**	

Note: FA = 14,000 RMS Symmetrical amperes @ 600V.
KA = 22,000 RMS Symmetrical amperes @ 600V.
† All branch circuit breakers are thermal magnetic.

5 KVA 1ϕ DISTRIBUTION TRANSFORMER UNITS✱+

Primary Switch Rating	Voltage	Unit Type Number	Space Factor	Price ■
30	240-120/240	CA-472	2½	**$ 755.**
30	480-120/240	CA-473	2½	**755.**
Primary Breaker Rating	**Voltage**	**Unit Type Number**	**Space Factor**	**Price**
30	240-120/240	CA-422	2½	**$ 790.**
16	480-120/240	CA-423	2½	**790.**

10 KVA 1ϕ DISTRIBUTION TRANSFORMER UNITS✱+

Primary Switch Rating	Voltage	Unit Type Number	Space Factor	Price ■
60	240-120/240	CA-470	2½	**$1030.**
30	480-120/240	CA-471	2½	**1030.**
Primary Breaker Rating	**Voltage**	**Unit Type Number**	**Space Factor**	**Price**
50	240-120/240	CA-420	2½	**$1085.**
30	480-120/240	CA-421	2½	**1085.**

✱ Transformers are positioned in the lower portion of a vertical section on factory assembled MCC's. Bottom location is also recommended for unassembled MCC's in order to lower center of gravity.
+ Smaller transformers and different primary voltages are available on Model 4. Consult local Field Office.
■ Price includes primary circuit breaker or fusible switch.

OTHER MISCELLANEOUS ITEMS

Description	Type Number	Price
Push Button Operator Plates: 1 hole	F-441	**$6.**
2 holes	F-442	**6.**
3 holes	F-443	**6.**
4 holes	F-444	**6.**
5 holes	F-445	**6.**
Type B terminal block mounting bracket	S-407	**2.**
Touch-up paint ANSI-49	PK-49SP	✱
Push buttons, selector switches, pilot lights, and closing plates . . . see Type K Selection Index on page 312.		
Thermal units for starter units . . . see Selection Index on page 466.		
Fuse clip kits other than Class H . . . see page 458.		

✱ See "Parts Kits" page 44.

FUSIBLE SWITCH UNITS‡ — 3 POLE

Single Units

Voltage	Max. Fuse Size	Unit Type No.	Price	Space Factor
250	30	KW-404	**$157.**	1
	60	KX-405	**179.**	1
	100	KY-405	**233.**	1
	200	KZ-409	**416.**	2½
600	30	KW-405	**195.**	1
	60	KX-406	**216.**	1
	100	KY-406	**276.**	1
	200	KZ-410	**456.**	2½

Dual Mounted Units

Voltage	Max. Fuse Size	Unit Type No.	Price	Space Factor
250	30/30	KK-441	**$314.**	1½
	60/60	KK-442	**358.**	1½
600	30/30	KK-443	**390.**	1½
	60/60	KK-444	**432.**	1½

‡ Fuses not included.

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VERTICAL SECTIONS

FRONT-OF-BOARD ALL BUS TIN PLATED

Ground bus (25% min.) provided in all sections. Each vertical section comes standard with a ½ space factor blank cover plate. Main switches and main breakers are top located and are suitable for use as service equipment. 1200A main lug compartments use two — 600A main lug compartments in two adjacent sections, so incoming feeders must be divided equally between these two sections. For transition section for bussing to a SPEED-D Switchboard, see Page 109. **Space factors (SF) are spaces usable for plug-in units,** and are divided evenly between multiple sections. Relay sections include door, mounting pan, and horizontal bus and cannot accept plug-in units.

Bus Type	Depth	1 Section			2 Sections			3 Sections			20" W Relay Section			28" W Relay Section			32" W Relay Section		
		Type	Price	SF	Type	Price	SF	Type	Price	SF	Type	Price	SF	Type	Price	SF	Type	Price	SF
600A Aluminum	14"	AVF-1-00	**$ 867.**	6½	AVF-2-00	**$1728.**	13	AVF-3-00	**$2592.**	19½	ATF-1-00	**$ 890.**	0	AYF-1-00	**$1015.**	0	—	—	—
	20"	AXF-1-00	**960.**	6½	AXF-2-00	**1920.**	13	AXF-3-00	**2880.**	19½	AWF-1-00	**985.**	0	APF-1-00	**1128.**	0	AZF-1-00	**$1425.**	0
600A Copper	14"	CVF-1-00	**965.**	6½	CVF-2-00	**1932.**	13	CVF-3-00	**2898.**	19½	CTF-1-00	**992.**	0	CYF-1-00	**1135.**	0	—	—	—
	20"	CXF-1-00	**1065.**	6½	CXF-2-00	**2130.**	13	CXF-3-00	**2880.**	19½	CWF-1-00	**1095.**	0	CPF-1-00	**1220.**	0	CZF-1-00	**1560.**	0
1000A■AL	20"	AXJ-1-00	**1082.**	6½	AXJ-2-00	**2164.**	13	AXJ-3-00	**3246.**	19½	AWJ-1-00	**1090.**	0	APJ-1-00	**1228.**	0	AZJ-1-00	**1568.**	0
1200A■CU	20"	CXJ-1-00	**1305.**	6½	CXJ-2-00	**2610.**	13	CXJ-3-00	**3915.**	19½	CWJ-1-00	**1335.**	0	CPJ-1-00	**1495.**	0	CZJ-1-00	**1860.**	0

Bus Type	Depth	1 Section w/600A M/L (Top)			1 Section w/600A M/L (Bottom)			1 Section w/400A M/B			1 Section w/600A M/B			1 Section w/400A M/S●			1 Section w/600A M/S●		
		Type	Price	SF	Type	Price	SF	Type	Price	SF	Type	Price	SF	Type	Price	SF	Type	Price	SF
600A Aluminum	14"	AVF-1-L6	**$ 978.**	5½	AVF-1-M6	**$1208.**	5	AVF-1-B4	**$2830.**	4½	AVF-1-B6	**$3087.**	4	AVF-1-S4	**$2000.**	2½	AVF-1-S6	**$2280.**	1½
	20"	AXF-1-L6	**1077.**	5½	AXF-1-M6	**1307.**	5	AXF-1-B4	**2940.**	4½	AXF-1-B6	**3181.**	4	AXF-1-S4	**2145.**	2½	AXF-1-S6	**2374.**	1½
600A Copper	14"	CVF-1-L6	**1086.**	5½	CVF-1-M6	**1316.**	5	CVF-1-B4	**2944.**	4½	CVF-1-B8	**3188.**	4	CVF-1-S4	**2165.**	2½	CVF-1-S6	**2382.**	1½
	20"	CXF-1-L6	**1185.**	5½	CXF-1-M6	**1415.**	5	CXF-1-B4	**3054.**	4½	CXF-1-B6	**3282.**	4	CXF-1-S4	**2250.**	2½	CXF-1-S6	**2476.**	1½
		2 Sections w/1200A M/L (Top)			2 Sections w/1200A M/L (Bottom)														
1000A■AL	20"	AXJ-2-L6	**$2264.**	11	AXJ-2-M6	**$2724.**	10												
1200A■CU	20"	CXJ-2-L6	**2586.**	11	CXJ-2-M6	**3046.**	10												

● *MUST* specify 250 or 600 volts on order.
■(2) ¼" x 2" bus bars per phase.

SUPPLY CONDUCTOR RANGE

Each Main Lug Compartment	2–3/0 to 750 MCM
600 Amp Main Switch or Breaker	3–3/0 to 500 MCM
400 Amp Main Switch	2–#1 to 250 MCM or 1 #1 to 600 MCM
400 Amp Main Breaker	2–#1 to 250 MCM or 1 #1 to 500 MCM

REDUCED VOLTAGE AUTOTRANSFORMER STARTERS (VERTICAL SECTION INCLUDED)

Autotransformer starter units are supplied with thermal magnetic circuit breaker disconnects, and are UL listed for 22,000 AIC. 1200A copper bus can be spliced to 600A copper or aluminum, 1200A aluminum or 1200A copper with the S-412 Splice Bar Kit. Autotransformer starters are factory assembled only. Bottom conductor entry is not recommended for autotransformer starter sections. **Space Factors (SF) are spaces usable for plug-in units.**

Maximum HP at 480V **Only**	NEMA Starter Size	Structure Type	*Number of* Thermal Units Required	CIRCUIT BREAKER					FUSIBLE SWITCH				
				Frame Size	Unit Type No.	SF	Dimensions	Price with FT (Class 1 Type B)	Switch Rating	Unit Type No.	SF	Dimensions	Price with FT (Class 1 Type B)
100	4	1200 A ■ Copper	3	KA	CXJ-1-C4	1	20" W x 20" D	**$ 5,135.**	200	CXJ-1-F4	—	20" W x 20" D	**$ 4,990.**
200	5	1200 A ■ Copper	3	LA	CXJ-1-C5	—	28" W x 20" D	**8,654.**	400	CXJ-1-F5	—	28" W x 20" D	**8,342.**
400	6	1200 A ■ Copper	3	MA	CXJ-1-C6	—	32" W x 20" D	**13,920.**	600	CXJ-2-F6	—	52" W x 20" D	**13,810.**

■(2) ¼" x 2" bus bars per phase.

PRICING INSTRUCTIONS

1. Select starter units from page 308 or 309 (Prices are Class I Type A wiring).
2. For Type B wiring, multiply prices from item 1 by 1.15.
3. Select branch units, transformer units and miscellaneous units from page 310.
4. Select a structure with main lugs, main breaker or main fusible switch from "Vertical Sections" table, above.
5. Sketch a unit arrangement layout (Form PE1149B can also be used).
6. Select any additional structures needed from tables above (including Autotransformer Sections).
7. Select splice kits from "Section Accessories" table, at right, to join adjacent structures.
8. Select the optional bus barriers (standard structures only) from "Section Accessories".
9. Select blank cover plates if needed, from "Section Accessories" table.
   Note: a ½ space factor blank cover plate is included as standard with each vertical section.
10. Add either item 1 or 2 to items 3, 4, 6, 7, 8 and 9.
11. For NEMA 12 enclosure, multiply item 10 by 1.06.
12. For Factory Assembled (units plugged into structures), multiply item 10 or 11 by 1.15.
13. Add Starter Unit Options, from page 310, to items 10, 11, or 12 for total list price.

SECTION ACCESSORIES

Description	Type No.	Price
600 Amp Al. Horizontal Splice Bar Kit*	S-406	**$ 76.**
600 Amp Cu. Horizontal Splice Bar Kit*	S-408	**89.**
1000 Amp Al. Horizontal Splice Bar Kit*	S-410	**152.**
1200 Amp Cu. Horizontal Splice Bar Kit*	S-412	**178.**
Blank Cover Plates		
½ Space Factor**	K-401	**22.**
1 Space Factor	K-402	**22.**
2 Space Factors	K-404	**34.**
Bus Barriers and closing plugs added to section. (Not applicable to Autotransformer or Relay sections)	U2 & U3	**65.**/section

* 3ϕ3W plus ground bus.
** One ½ S.F. blank plate included with each vertical section.

PRICING SUMMARY TABLE

TYPE A STARTER UNIT SUBTOTAL	
TYPE A STARTER UNIT SUBTOTAL x 1.15 = TYPE B STARTER UNIT SUBTOTAL	
+ BRANCH UNITS SUBTOTAL	
+ MISCELLANEOUS SUBTOTAL	
+ STRUCTURES SUBTOTAL	
= UNASSEMBLED NEMA 1 TOTAL	
UNASSEMBLED NEMA 1 TOTAL × 1.06 = UNASSEMBLED NEMA 12 TOTAL	
UNASSEMBLED NEMA 1 OR NEMA 12 × 1.15 = FACTORY ASSEMBLED TOTAL	
+ OPTIONS SUBTOTAL	
= TOTAL LIST	

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CLASS 9001

CONTROL STATION AND CONTROL UNIT

SELECTION GUIDE — TYPE NUMBER INDEX

SELECTION GUIDE

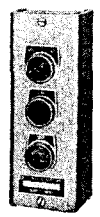
TYPE B — STANDARD DUTY



Standard Duty Control stations are used with magnetic starters and contactors through Size 4 to govern the more common control functions such as "Start-Stop" and "Forward-Reverse-Stop".

Class 9001	Page
Control Stations	313
Accessories	314

TYPE G — HEAVY DUTY



Heavy duty ratings permit use with contactors and starters through Size 8.

Class 9001	Page
Control Stations	316-317
Control Units	317

TYPE K — HEAVY DUTY OILTIGHT





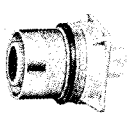
Type K heavy duty oiltight control units and stations are intended primarily for use on machine tool applications or in environments necessitating the use of a dusttight control station such as in foundries and steel mills.

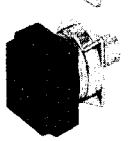
Virtually unlimited combinations of control units can be assembled into enclosures to meet specific circuit design requirements for an innumerable number of applications; including watertight applications in breweries and meat packing plants.

Class 9001	Page
Push Buttons (KR)	319-321
Selector Switches (KS)	322-325
Key Operated Switches	320,323-325
Selector-Pushbuttons (KQ)	326
Pilot Lights (KP, KT)	327
Contact Blocks (KA)	331
Legend Plates (KN)	330
Accessories	328-329
Enclosures (KY, KZ)	334
Control Stations (KY, KZ)	333
NEMA 4X (SKN, SKY)	336
Compact Pilot Lights (JP, JT, JTR)	337

TYPE L — MINIATURE OILTIGHT

(Supersedes Type M)





Miniature control units offer the same flexibility and reliability as the heavy duty oiltight Type K line, but at a 40% saving in space, round front or square front.

Miniature control units have standard duty contact ratings at maximum of 600 V AC and can be used with starters and contactors through Size 4.

Class 9001	Page
Push buttons LRR, LSR	339-340
Multi-Function Operators	341
Selector Switches (LRS, LSS)	342-346
Pilot Lights (LRP, LRT, LSP, LST)	347
Basic Operators	348
Accessories	350
Legend Plates (LRN, LSN)	350
Contact Blocks (LA, LB)	351
Enclosures (LYA)	352

TYPE T — HEAVY DUTY OILTIGHT



Type T heavy duty oiltight control units are intended primarily for machine tool and industrial applications.

Type K control units should be substituted where possible because of the additional flexibility built into the Type K line.

Class 9001	Page
Push Buttons (TR)	354
Selector Switches (TS)	354
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SPECIALTY CONTROL STATIONS



Designed specifically for control of magnetic contactors used on hoists, monorails, overhead doors, etc.

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GF-101 thru GF-231	316	L-6	327	R-8	325
GF-301 thru GF-330	317	L-7	321	R-9	327
GFP-10 thru GFP-80	317	L-8	325	R-16	325
GFP-101 thru GFP-231	316	L-9	327	R-19	320
GFP-301 thru GFP-330	317	L-16	325	R-20, R-21	321
GG-10 thru GG-80	317	L-20, L-21	321	R-22	320
GG-101 thru GG-231	316	L-22	320	R-24	325
GG-301 thru GG-330	317	L-24	325	R-26, R-29	337
GO-1 thru GO-21	317	L-25F thru L-28F	352	S-11, S-18	325
GR-10 thru GR-40	317	L-26, L-29	337	S-23	320
GR-101 thru GR-246	316	LA	351	S-25	325
GR-305 thru GR-353	317	LB	351	SK	336
GW-10 thru GW-40	317	LCS-1 thru LCS-7	345	T-1	355
GW-101 thru GW-246	316	LD, LE, LF	348	T-3	356
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K2L	328	LR-1LA thru LR-1LB	340	TP-35 thru TP-63	354
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K-12	329	LR-20 thru LR-23	349	TS-1 thru TS-27	354
K-13B thru K-13L	325	LR-27	339	TS-80 thru TS-82	356
K-15	329	LR-40, LR-41, LR-42	339	TS-400 thru TS-551	354
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K-42J thru K-79J	324	LR-59A thru LR-59Y	347	W-6	327
K-43	325	LR-61B	343	W-7	321
K-44	321	LR-65A thru LR-65Y	343	W-8	325
K-45, K-46	325	LR-67B	343	W-9	327
K-47	320	LR-70A thru LR-70Y	339	W-16	325
K-48, K-49	319	LR-A2J thru LR-C2J	343	W-20, W-21	321
K-50, K-51, K-52	329	LR-D1J thru LR-G7J	345	W-22	320
K-54, K-55	320	LRN-100 thru LRN-299R	350	W-24	325
		LRN-900, LRN-905	349	W-26, W-29	337
		LRN-910, LRN-910R	352	Y-6	327
		LRP	348	Y-7	321
		LRP-A thru LRP-B	347	Y-8	325
		LRR	348	Y-9	327
		LRR-1 thru LRR-5	339	Y-16	325
		LRR-11U	349	Y-20, Y-21	321
		LRSA thru LRSC	343	Y-22	320
				Y-24	325
				Y-26, Y-29	337

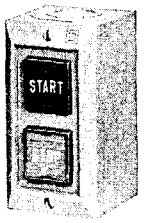
SQD SLV_001090

STANDARD DUTY CONTROL STATIONS

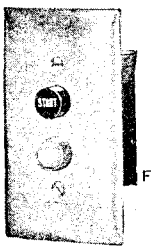
TYPE B

CLASS 9001

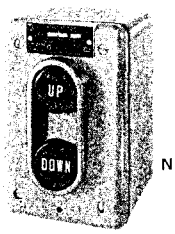
Standard duty control stations are designed for use with magnetic motor starters to govern the starting, stopping, or reversing of all types of electric motors. Push buttons are momentary contact unless otherwise indicated. Selector switches are maintained contact.



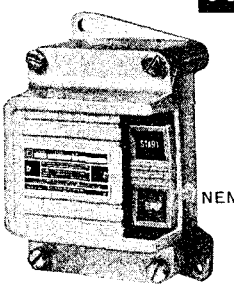
NEMA 1
Surface Mounting



NEMA 1
Flush Mounting
(w/o pullbox)



NEMA 4



NEMA 7-9

CONTROL STATIONS

Bold face Type numbers indicate stations normally stocked in the Square D Physical Distribution System or can be furnished as a quick ship out of Central Warehouse using a "Universal" station plus accessories.

No. of Units	Nameplate Markings and Features	Contact Symbol See Page 290	Surface Mounting NEMA Type 1		Stainless Steel Flush Plate (Pullbox* not included)		Watertight and Dusttight NEMA Type 4		For Hazardous Locations Class I, Groups B, C & D or Class II, Groups E, F, & G NEMA Types 7 and 9	
			Type	Price	Type	Price	Type	Price	Type	Price
1	Start	1	**BG101**	**$24.**	**BF101**	**$32.**	**BW146**	**$76.**	**BR101**	**$102.**
	Stop	3	**BG102**	**24.**	**BF102**	**32.**	**BW147**	**76.**	.....	.....
	Stop (Mushroom Button)	3	BG103	**28.**	.....	.....	BW151	**80.**	BR103	**106.**
	Stop (Lockout)	3	**BG104**	**36.**	.....	.....	**BW148**	**76.**	**BR104**	**102.**
	Universal (w/o Legend Insert) ▲	16	**BG107**	**23.**	**BF107**	**31.**	**BW159**	**75.**	**BR107**	**101.**
	Off-on (Selector Switch)	19	**BG111**	**24.**	BF111	**32.**	.....	.....	.....	.....
	Hand-Off-Auto (Selector Switch)	17	**BG112**	**24.**	**BF112**	**32.**	.....	.....	.....	.....
	Universal Selector Switch (w/o Legend Insert) ▲	19 or 17	**BG114**	**23.**	BF114	**31.**	.....	.....	.....	.....
	Red Pilot Light: 120/240V. AC or DC	121	**BG121**	**56.**	BF121	**64.**	.....	.....	.....	.....
	Green Pilot Light: 120/240V. AC or DC	121	BG122	**56.**	BF122	**64.**	.....	.....	.....	.....
	Pilot Light (w/o Lens): 120/240 V. AC or DC▲	121	**BG123**	**53.**	BF123	**61.**	.....	.....	.....	.....
2	Start-Stop	145	**BG201**	**24.**	**BF201**	**32.**	**BW240**	**76.**	**BR204**	**102.**
	Start-Stop	146	BG202	**30.**	BF202	**38.**	BW252	**76.**	BR202	**102.**
	Start-Stop (Mushroom on Stop)	145	**BG203**	**28.**	.....	.....	**BW250**	**80.**	BR203	**106.**
	Start-Stop (Lockout on Stop)	145	**BG204**	**36.**	.....	.....	**BW241**	**76.**	**BR204**	**102.**
	Start-Stop (Mushroom on Start and Stop)	145	BG205	**32.**	.....	.....	BW246	**84.**	BR205	**110.**
	Forward-Reverse	146	**BG206**	**30.**	BF206	**38.**	**BW242**	**76.**	BR206	**102.**
	Open-Close	146	**BG207**	**30.**	BF207	**38.**	**BW244**	**76.**	BR207	**102.**
	Up-Down	146	**BG208**	**30.**	**BF208**	**38.**	**BW243**	**76.**	BR208	**102.**
	Raise-Lower	146	BG209	**30.**	BF209	**38.**	BW253	**76.**	BR209	**102.**
	On-Off	145	**BG210**	**24.**	**BF210**	**32.**	**BW245**	**76.**	BR210	**102.**
	On-Off	146	**BG211**	**30.**	**BF211**	**38.**	BW254	**76.**	BR211	**102.**
	Universal (w/o Legend Inserts) ▲	25	**BG214**	**22.**	**BF214**	**30.**	**BW260**	**74.**	**BR214**	**100.**
	Start-Stop (Maintained Contact)	10	**BG215**	**36.**	**BF215**	**44.**	**BW255**	**88.**	**BR215**	**114.**
	On-Off (Maintained Contact)	10	**BG216**	**36.**	**BF216**	**44.**	**BW256**	**88.**	BR216	**114.**
	Hand-Auto (Maintained Contact)	10	**BG217**	**36.**	BF217	**44.**	BW257	**88.**	BR217	**114.**
	Universal (Maintained Contact w/o Legend Inserts) ▲	147	**BG218**	**34.**	**BF218**	**42.**	**BW258**	**86.**	**BR218**	**112.**
	Off-On (Selector Switch), Red P.L.: 120/240 V AC or DC	19 & 121	BG221	**88.**	BF221	**96.**				
	Hand-Off-Auto (Selector Switch), Red P.L.: 120/240V AC or DC	17 & 121	BG223	**88.**	BF223	**96.**				
	Universal Selector Switch & Pilot Light 120/240V AC or DC (w/o Legend Insert & w/o Lens) ▲	17 or 19 & 121	BG224	**84.**	BF224	**92.**				
	Hand-Off-Auto (Selector Switch) & Start (Push Button)	17 & 1	BG225	**36.**	BF225	**44.**				
	Universal Selector Switch & Push Button (w/o Legend Inserts) ▲	17 or 19 & 16	BG226	**34.**	BF226	**42.**				
3	Fast-Slow-Stop	109	BG301	**48.**	BF301	**58.**				
	Fwd.-Rev.-Stop	109	**BG302**	**48.**	**BF302**	**58.**				
	Open-Close-Stop	109	**BG303**	**48.**	**BF303**	**58.**				
	Raise-Lower-Stop	109	BG304	**48.**	BF304	**58.**				
	Up-Down-Stop	109	**BG305**	**48.**	**BF305**	**58.**				
	High-Low-Stop	109	**BG306**	**48.**	**BF306**	**58.**				
	Start-Jog-Stop	109	**BG316**	**48.**	.....	.....				
	Fwd.-Rev.-Stop (Lockout on Stop)	109	**BG322**	**60.**	.....	.....				
	Up-Down-Stop (Lockout on Stop)	109	**BG325**	**60.**	.....	.....				
	High-Low-Stop (Lockout on Stop	109	**BG326**	**60.**	.....	.....				
	Universal (w/o Legend Inserts) ▲	8	**BG307**	**45.**	**BF307**	**55.**				
	Start-Stop, Red Pilot Light: 120/240V AC or DC	145 & 121	**BG308**	**88.**	**BF308**	**96.**				
	Universal Push Buttons (2) & Pilot Light: 120/240V AC or DC (w/o Legend Inserts & w/o Lens) ▲	25 & 121	**BG309**	**83.**	BF309	**91.**				
	Start-Stop (Maintained Contacts) & Red Pilot Light: 120/240V AC or DC	10 & 121	**BG310**	**96.**	BF310	**104.**				
	On-Off (Maintained Contact) & Red Pilot Light: 120/240V AC or DC	10 & 121	**BG311**	**96.**	BF311	**104.**				
	Hand-Auto (Maintained Contact), & Red Pilot Light: 120/240V AC or DC	10 & 121	BG312	**96.**	BF312	**104.**				
	Universal Push Buttons (Maintained Contact) & Pilot Light: 120/240V AC or DC (w/o Legend Inserts & w/o Lens) ▲	147 & 121	**BG313**	**91.**	BF313	**99.**				
	Hand-Off-Auto (Selector Switch), & Start-Stop (Push Buttons)	17 & 145	BG314	**48.**	BF314	**56.**				
	Universal Selector Switch & 2 Push Buttons (w/o Legend Inserts) ▲	17 or 19 & 25	BG315	**45.**	BF315	**53.**				

▲"Universal" designates control stations with*out legend inserts, lenses or accessory kits.* Universal stations plus separate legend inserts and other accessories listed on page 314 allow the user to conveniently build up standard or custom stations. Universal stations in NEMA 4 line are not furnished with a lockout.

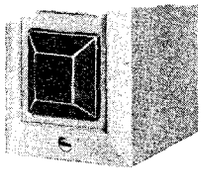
*Use standard $2^{11}/_{16}$ inch deep wall boxes, single gang for Types BF1 — and BF2— and two gang for Type BF3—.

SQD SLV_001091

STANDARD DUTY CONTROL STATIONS

ACCESSORIES — RATINGS — PILOT LIGHTS — TYPE B

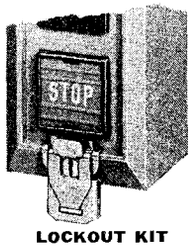
CLASS 9001



PILOT LIGHT LENSES

Color	For **NEMA Type 1** Surface Mounting Type	For **NEMA Type 1** Flush Mounting Type	Price
Red	B331	B341	**$3.**
Green	B332	B342	

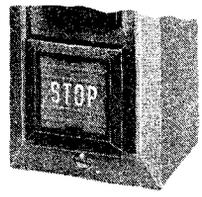
ACCESSORY KITS



LOCKOUT KIT

For **NEMA Type 1** surface mounting stations, bottom unit only. Can be used on either push button or on 2 or 3 position selector switch.

Type	Price
B321	**$12.**



MUSHROOM CAPS

For **NEMA Type 1** surface mounting stations. Kit does not include legend insert; order separate legend insert from the tables below.

EX: For red mushroom button marked STOP, order one 9001 Type B301 plus one 9001 Type B102.

Color	Type	Price
Red	B301	**$4.**
Black	B302	

For **NEMA 4** and **4X Type BW70's**

Color	Type	Price
Red	B303	**$4.**

INTERCHANGEABLE PUSH BUTTON LEGEND INSERTS

Marking	For **NEMA 1** Surface Mounting Push Button & Mushroom Caps Type	For **NEMA 1** Flush Mounting Type	For **NEMA 7-9** Type	For **NEMA 4, 4X Type BW70's** and **B40's** Type	Mushroom Button Inserts For **NEMA 4** and **4X Type BW70's** Type	Price Each
Start	B101	B131	B161	B259	B282	**$1.**
Stop	B102	B132	B162	B260	B283	
Fast	B103	B133	B163	....	....	
Slow	B104	B134	B164	....	....	
Forward	B105	B135	B165	B255	B278	
Reverse	B106	B136	B166	B256	B279	
Open	B107	B137	B167	B263	B286	
Close	B108	B138	B168	B264	B287	
Raise	B109	B139	B169	B261	B284	
Lower	B110	B140	B170	B262	B285	
Up	B111	B141	B171	B253	B276	
Down	B112	B142	B172	B254	B277	
High	B113	B143	B173	....	....	
Low	B114	B144	B174	....	....	
On	B115	B145	B175	B257	B280	
Off	B116	B146	B176	B258	B281	
Hand	B117	B147	B177	B265	B288	
Auto	B118	B148	B178	B266	B289	
Jog	B119	B149	B179	....	....	
Blank-Black	B129	B159	B189	B251	B251	
Blank-Red	B129R	B159R	B189R	B252	B252	

Order must specify quantity of 10 or multiples of 10.

LEGEND INSERT KITS

(Kit includes one each of standard legend inserts as indicated below Type No. of kit.)

Where Used:		Type	Price
For **NEMA 1** Surface Mounting	Push Buttons	B100 (Incl's 1 each of B101 thru B119)	**$19.**
	Selector Switches	B200 (Incl's 1 each of B201 thru B212)	**12.**
For **NEMA 1** Flush Mounting	Push Buttons	B130 (Incl's 1 each of B131 thru B149)	**19.**
	Selector Switches	B230 (Incl's 1 each of B231 thru B242)	**12.**
For **NEMA 7-9**	Push Button	B160 (Incl's 1 each of B161 thru B179)	**19.**
For **NEMA 4** and **4X Type BW70's**	Push Button	B250 (Incl's 1 each of B253 thru B266)	**14.**
For **NEMA 4** and **4X Type BW70's**	Mushroom Button	B300 (Incl's 1 each of B276 thru B289)	**14.**

INTERCHANGEABLE SELECTOR SWITCH LEGEND PLATES

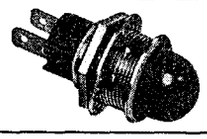
Marking	For **NEMA 1** Surface Mounting Type	For **NEMA 1** Flush Mounting Type	Price Each
Off-On	B201	B231	**$1.**
Hand-Off-Auto	B202	B232	
Manual-Auto	B203	B233	
Fwd.-Rev.	B204	B234	
Open-Close	B205	B235	
Open-Off-Close	B206	B236	
Hand-Auto	B207	B237	
Fwd.-Off-Rev.	B208	B238	
Summer-Winter	B209	B239	
Summer-Off-Winter	B210	B240	
Low-Off-High	B211	B241	
Up-Off-Down	B212	B242	

Order must specify quantity of 10 or multiples of 10.

ELECTRICAL CONTACT RATINGS

AC — NEMA B600							DC—NEMA P600		
Volts	**Inductive** 35% Power Factor					**Resistive** 75% Power Factor	Volts	**Inductive** and **Resistive**	
	Make		Break		Continuous Carrying Amperes	Make, Break and Continuous Carrying Amperes		Make and Break Amperes	Continuous Carrying Amperes
	Amps.	VA	Amps.	VA					
120	30	3600	3	360	5	5	120	1.1	5
240	15.	3600	1.5	360	5	5	240	.55	5
480	7.5	3600	.75	360	5	5	600	.2	5
600	6	3600	.6	360	5	5			

INSTRUMENT TYPE INCANDESCENT PILOT LIGHTS



Voltage	Avg. Current (Amps.)	Red Lens Type	Green Lens Type	Amber Lens Type	Clear Lens Type	Yellow Lens Type	White Lens Type	Price
12V	.170	OR-12	OG-12	OA-12	OC-12	OY-12	OW-12	**$8.**
24V	.073	OR-24	OG-24	OA-24	OC-24	OY-24	OW-24	
120V	.025	OR-120	OG-120	OA-120	OC-120	OY-120	OW-120	

For Compact Oiltight Pilot Light (Class 9001 Type J) — See Page 337

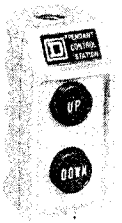
SQD SLV_001092

STANDARD DUTY CONTROL STATIONS

APPLICATION DATA

CLASS 9001

THERMOPLASTIC PENDANT CONTROL STATION (RATED NEMA 1, 3, 3R, 4, AND 4X)



Type BW70 Series (Replaces Type B60 Series)

No. of Units	Nameplate Markings	Mechanical Interlock	Enclosure Color			Price	Contact Symbol See Below
			Yellow	Black	Red		
2	Up-Down	Yes	BW72Y	BW72B	BW72R	$33.	146
	Forward-Reverse	Yes	BW73Y	BW73B	BW73R	33.	146
	On-Off*	Yes	BW74Y	BW74B	BW74R	45.	10
	Start-Stop	No	BW75Y	BW75B	BW75R	33.	145
	Start-Stop*	Yes	BW76Y	BW76B	BW76R	45.	10
	On-Off	No	BW77Y	BW77B	BW77R	33.	146
	On-Off	No	BW79Y	BW79B	BW79R	33.	145
	W/O Legend Inserts	Yes	BW70YU	BW70BU	BW70RU	31.	25
	W/O Legend Inserts	No	BW71YU	BW71BU	BW71RU	31.	25
	W/O Legend Inserts*	Yes	BW74YU	BW74BU	BW74RU	43.	147

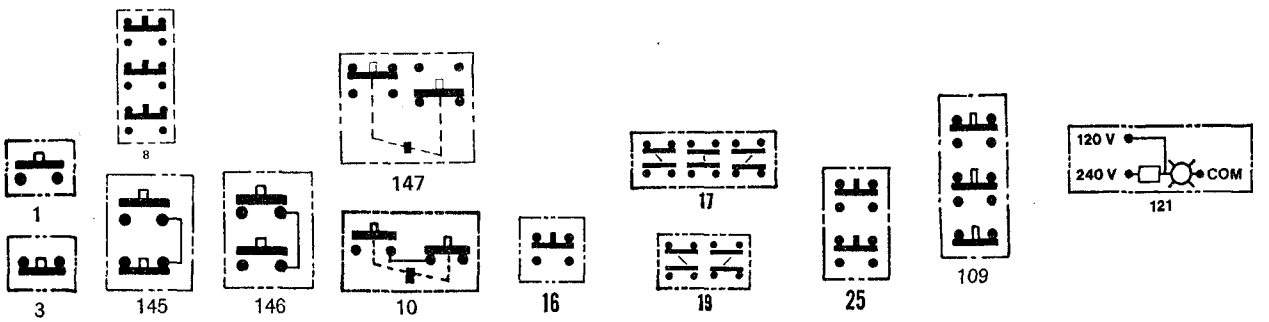
*Maintained Contact.

▲Refer to Digest Page 314 for legend inserts and kits.

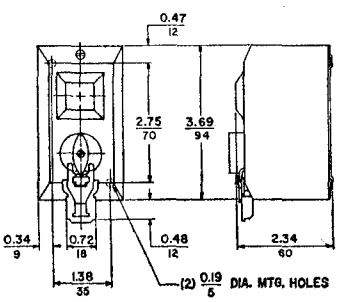
HANGER BRACKET AND SEAL KIT

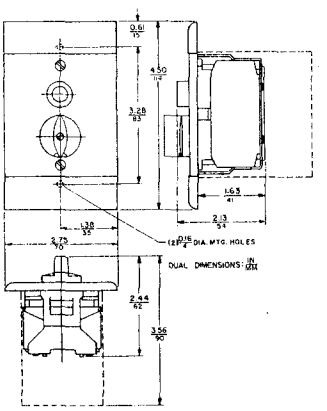
Type	Price
B350	$2.

CONTACT SYMBOLS

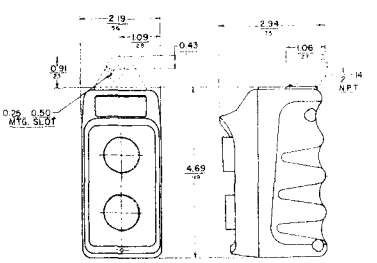


APPROXIMATE DIMENSIONS

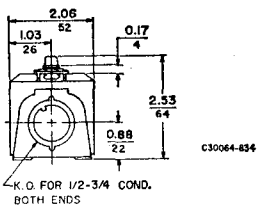




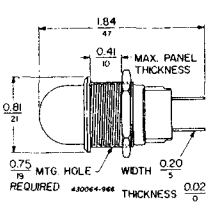
Type BF
Stainless Steel Cover



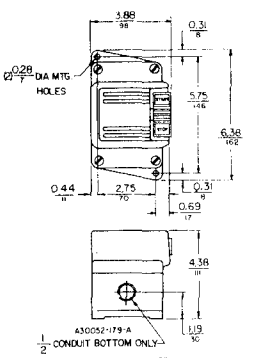
Type BW70B thru Type BW79Y



Type BG★
Glass Filled Polyester Cover



Type O★



Type BR
Cast Aluminum Enclosure

★Dual Dimensions: INCHES / Millimeters

SQD SLV_001093

TYPE G HEAVY DUTY CONTROL STATIONS

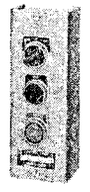
CLASS 9007

Heavy duty control stations are intended for use in the control circuits of magnetic starters or control panels where the contact rating required is higher than that of the standard duty line. For push button, selector switch and pilot light control units only — refer to local Square D field office. For dimensions on the devices listed below, refer to Page 318. Contact ratings are same as for Type KA-1 shown on Page 331.

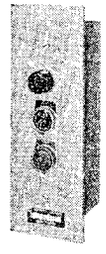
NEMA Type 4, 7 and 9 stations as standard have provision for padlocking the "Stop" button in the depressed position.

No. of Units	Legend Plate Marking and Features	General Purpose Surface Mounting **NEMA Type 1** Type	Price	General Purpose **Flush Mounting** Without Pullbox◐ Type	Price	General Purpose **Flush Mounting** With Pullbox◐ Type	Price	Watertight and Dusttight **NEMA Type 4**∗ Type	Price	For Hazardous Locations Class I, Groups B, C and D Class II, Groups E, F and G **NEMA Types 7 & 9** Type	Price	Contact Symbol—See Page 318
1	Start	GG-101	$44.	GF-101	$44.	GFP-101	$68.	GW-101	$92.	GR-101	$118.	
	Stop	GG-102	44.	GF-102	44.	GFP-102	68.	use GW-103	....	use GR-103	....	
	Stop (Lockout)	GG-103	56.	GF-103	56.	GFP-103	80.	GW-103	92.	GR-103	118.	
	Reset	GG-104	44.	GF-104	44.	GFP-104	68.	GW-104	92.	GR-104	118.	
	Jog	GG-105	44.	GF-105	44.	GFP-105	68.	GW-105	92.	GR-105	118.	16
	Stop (Mushroom Button)	GG-107	56.	GF-107	56.	GFP-107	80.	use GW-115	....	use GR-115	....	
	Start (Mushroom Button)	GG-108	56.	GF-108	56.	GFP-108	80.	GW-108	104.	GR-108	130.	
	Stop (Mushroom, Lockout)	GG-115	68.	GF-115	68.	GFP-115	92.	GW-115	104.	GR-115	130.	
	Safe-Run (Selector Switch)	GG-116	48.	GF-116	48.	GFP-116	72.	GW-116	96.	GR-116	122.	18
	High-Low (Selector Switch)	GG-117	48.	GF-117	48.	GFP-117	72.	GW-117	96.	GR-117	122.	19
	Open-Close (Selector Switch)	GG-118	48.	GF-118	48.	GFP-118	72.	GW-118	96.	GR-118	122.	19
	Off-On (Selector Switch)	GG-119	48.	GF-119	48.	GFP-119	72.	GW-119	96.	GR-119	122.	18
	Up-Down (Selector Switch)	GG-120		GF-120		GFP-120		GW-120		GR-120		
	For.-Rev. (Selector Switch)	GG-121	48.	GF-121	48.	GFP-121	72.	GW-121	96.	GR-121	122.	19
	Jog-Run (Selector Switch) Maintained	GG-122		GF-122		GFP-122		GW-122		GR-122		
	Hand-Off-Auto. (Selector Switch)	GG-123	48.	GF-123	48.	GFP-123	72.	GW-123	96.	GR-123	122.	17
	Fast-Slow (Selector Switch)	GG-124	48.	GF-124	48.	GFP-124	72.	GW-124	96.	GR-124	122.	19
	Man.-Auto. (Selector Switch)	GG-126	48.	GF-126	48.	GFP-126	72.	GW-126	96.	GR-126	122.	19
	Red Pilot Light:											
	120 V., 60 Hz., 110 V., 50 Hz.	GG-127A		GF-127A		GFP-127A		GW-127A		....		
	240 V., 60 Hz., 220 V., 50 Hz.	GG-127B	72.	GF-127B	72.	GFP-127B	96.	GW-127B	120.	GR-127B	146.	22
	480 V., 60 Hz., 440 V., 50 Hz.	GG-127C		GF-127C		GFP-127C		GW-127C		GR-127C		
	600 V., 60 Hz., 550 V., 50 Hz.	GG-127D		GF-127D		GFP-127D		GW-127D		GR-127D		
	Red Pilot Light:											
	120 V., AC or DC	GG-128	64.	GF-128	64.	GFP-128	88.	GW-128	112.	GR-128	138.	23
	240 V., AC or DC	GG-129		GF-129		GFP-129		GW-129		GR-129		
2	Start-Stop	GG-201	68.	GF-201	68.	GFP-201	92.	use GW-206	....	use GR-206		
	For.-Rev.	GG-202	68.	GF-202	68.	GFP-202	92.	GW-202	104.	GR-202		
	Up-Down	GG-203	68.	GF-203	68.	GFP-203	92.	GW-203	104.	GR-203		
	Open-Close	GG-204	68.	GF-204	68.	GFP-204	92.	GW-204	104.	GR-204	132.	25
	High-Low	GG-205	68.	GF-205	68.	GFP-205	92.	GW-205	104.	GR-205		
	Start-Stop (Lockout on Stop)	GG-206	80.	GF-206	80.	GFP-206	104.	GW-206	104.	GR-206		
	On-Off	GG-210	68.	GF-210	68.	GFP-210	92.	GW-210	104.	GR-210		
	Start-Stop (Maintained Contact)	GG-213	68.	GF-213	68.	GFP-213	92.	GW-241	104.	GR-241	132.	107
	On-Off (Maintained Contact)	GG-214	68.	GF-214	68.	GFP-214	92.	GW-214	104.	GR-214	132.	107
	Start-Stop (Mushroom Button on Stop)	GG-215	80.	GF-215	80.	GFP-215	104.	GW-242	116.	GR-242	144.	25
	Open-Close (Maintained Contact)	GG-220	68.	GF-220	68.	GFP-220	92.	GW-220	104.	GR-220	132.	107
	Jog-Stop (Lockout on Stop)	GG-221	80.	GF-221	80.	GFP-221	104.	GW-221	104.	GR-221	132.	25
	Safe-Run, Start (1 Sel. Sw., 1 Button)	GG-222	72.	GF-222	72.	GFP-222	96.	GW-222	108.	GR-222	136.	18 16
	Start — Red Pilot Light, 1 Button:											
	120 V., 60 Hz., 110 V., 50 Hz.	GG-226A		GF-226A		GFP-226A		GW-226A		....		
	240 V., 60 Hz., 220 V., 50 Hz.	GG-226B	96.	GF-226B	96.	GFP-226B	120.	GW-226B	132.	GR-226B	160.	22
	480 V., 60 Hz., 440 V., 50 Hz.	GG-226C		GF-226C		GFP-226C		GW-226C		GR-226C		16
	600 V., 60 Hz., 550 V., 50 Hz.	GG-226D		GF-226D		GFP-226D		GW-226D		GR-226D		
	Start — Red Pilot Light, 1 Button:											
	120 V., AC or DC	GG-227	88.	GF-227	88.	GFP-227	112.	GW-227	124.	GR-227	152.	23
	240 V., AC or DC	GG-228		GF-228		GFP-228		GW-228		GR-228		16
	Stop — Red Pilot Light, 1 Button:											
	120 V., 60 Hz., 110 V., 50 Hz.	GG-229A		GF-229A		GFP-229A		GW-244A		....		
	240 V., 60 Hz., 220 V., 50 Hz.	GG-229B	96.	GF-229B	96.	GFP-229B	120.	GW-244B	132.	GR-244B	160.	22
	480 V., 60 Hz., 440 V., 50 Hz.	GG-229C		GF-229C		GFP-229C		GW-244C		GR-244C		16
	600 V., 60 Hz., 550 V., 50 Hz.	GG-229D		GF-229D		GFP-229D		GW-244D		GR-244D		
	Stop — Red Pilot Light, 1 Button:											
	120 V., AC or DC	GG-230	88.	GF-230	88.	GFP-230	112.	GW-245	124.	GR-245	152.	23
	240 V., AC or DC	GG-231		GF-231		GFP-231		GW-246		GR-246		16

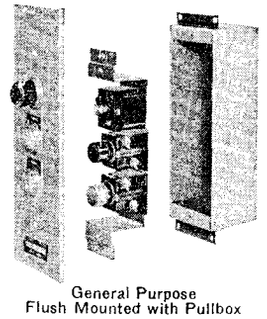
◐ Pullboxes can be ordered separately on page 317. Type GFP consists of Type GF plus Type FP pullbox.
∗ For NEMA 4X corrosion resistant and watertight control stations, see page 336.



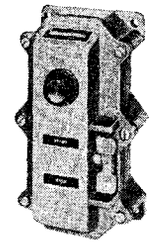
General Purpose
Surface Mounted



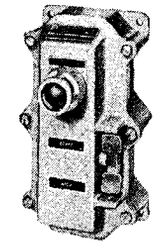
General Purpose
Flush Mounted



General Purpose
Flush Mounted with Pullbox



NEMA
Type 4



NEMA
Type 7 & 9

ORDERING INFORMATION REQUIRED: Class and type number.

SQD SLV_001094

HEAVY DUTY CONTROL STATIONS & CONTROL UNITS — TYPE G

CLASS 9001

HEAVY DUTY CONTROL STATIONS

NEMA Type 4, 7 and 9 stations as standard have provision for padlocking the "Stop" button in the depressed position.

No. of Units	Legend Plate Marking and Features	General Purpose Surface Mounting NEMA Type 1		General Purpose Flush Mounting Without Pullbox		General Purpose Flush Mounting With Pullbox		Watertight and Dusttight NEMA Type 4		For Hazardous Locations Class I, Groups B, C and D Class II, Groups E, F and G NEMA Types 7 and 9		Contact Symbol — See Page 318
		Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	
3	For.-Rev.-Stop	GG-301	$ 88.	GF-301	$ 88.	GFP-301	$124.	use GW-310	....	use GR-310	....	
	Up-Down-Stop	GG-302	88.	GF-302	88.	GFP-302	124.	use GW-311	....	use GR-311	....	
	Open-Close-Stop	GG-303	88.	GF-303	88.	GFP-303	124.	use GW-307	....	use GR-307	....	
	High-Low-Stop	GG-304	88.	GF-304	88.	GFP-304	124.	use GW-308	....	use GR-308	....	
	Start-Jog-Stop (Lockout on Stop)	GG-305	100.	GF-305	100.	GFP-305	136.	GW-305	$176.	GR-305	$254.	
	Up-Down-Run	GG-306	88.	GF-306	88.	GFP-306	124.	GW-306	176.	GR-306	254.	
	Open-Close-Stop (Lockout on Stop)	GG-307	100.	GF-307	100.	GFP-307	136.	GW-307	176.	GR-307	254.	
	High-Low-Stop (Lockout on Stop)	GG-308	100.	GF-308	100.	GFP-308	136.	GW-308	176.	GR-308	254.	
	Start-Jog-Stop	GG-309	88.	GF-309	88.	GFP-309	124.	....	....	....	....	8
	For.-Rev.-Stop (Lockout on Stop)	GG-310	100.	GF-310	100.	GFP-310	136.	GW-310	176.	GR-310	254.	
	Up-Down-Stop (Lockout on Stop)	GG-311	100.	GF-311	100.	GFP-311	136.	GW-311	176.	GR-311	254.	
	Start-Jog-Stop (Jog Attachment)	GG-316	100.	GF-316	100.	GFP-316	136.	....	....	....	....	33
	For.-Rev., Start-Stop (Sel. Sw., 2 Push Buttons)	GG-317		GF-317		GFP-317		GW-350		GR-350		
	High-Low, Start-Stop (Sel. Sw., 2 Push Buttons)	GG-318		GF-318		GFP-318		GW-351		GR-351		19
	Up-Down, Start-Stop (Sel. Sw., 2 Push Buttons)	GG-319	92.	GF-319	92.	GFP-319	128.	GW-352	180.	GR-352	258.	25
	Jog-Run, Start-Stop (Sel. Sw., 2 Push Buttons)	GG-320		GF-320		GFP-320		GW-353		GR-353		
	Start-Stop — Red Pilot Light, 2 Push Buttons: 120 V., 60 Hz., 110 V., 50 Hz.	GG-328A		GF-328A		GFP-328A		GW-334A				
	Start-Stop — 240 V., 60 Hz., 220 V., 50 Hz.	GG-328B	116.	GF-328B	116.	GFP-328B	152.	GW-334B	204.	GR-334B	282.	22
	Start-Stop — 480 V., 60 Hz., 440 V., 50 Hz.	GG-328C		GF-328C		GFP-328C		GW-334C		GR-334C		25
	Start-Stop — 600 V., 60 Hz., 550 V., 50 Hz.	GG-328D		GF-328D		GFP-328D		GW-334D		GR-334D		
	Start-Stop — Red Pilot Light, 2 Push Buttons: 120 V., AC or DC	GG-329	108.	GF-329	108.	GFP-329	144.	GW-335	196.	GR-335	274.	23
	Start-Stop — 240 V., AC or DC	GG-330		GF-330		GFP-330		GW-336		GR-336		25

PULL BOXES FOR TYPE GF DEVICES (Converts Type GF to Type GFP)

Number of Units	Type	Price	Number of Units	Type	Price
1	FP-1	$24.	5	FP-5	$48.
2	FP-2	24.	6	FP-6	48.
3	FP-3	36.	7	FP-7	72.
4	FP-4	36.	8	FP-8	72.

CUSTOM FACTORY ASSEMBLED CONTROL STATIONS

ORDERING INFORMATION: Base prices shown *include the enclosure with either* **9001 GO-1, GO-2 or GO-3** push buttons and legend plates. The complete price for an assembled station is the sum of this base price plus prices of any special control units or special features from table below to be installed. (There is no extra charge for factory assembly.) **Order must be accompanied with a sketch** showing all control units in their desired locations.

Number of Units	Legend Plate Marking Included In Base Price	General Purpose Surface Mounting NEMA Type 1		General Purpose Flush Mounting Without Pullbox◐		General Purpose Flush Mounting With Pullbox◐		Watertight and Dusttight NEMA Type 4		For Hazardous Locations Class I, Groups B, C and D Class II, Groups E, F and G NEMA Types 7 & 9	
		Type	Base Price	Type	Base Price	Type	Base Price	Type	Base Price	Type	Base Price
1	Standard Markings	GG-10	$ 44.	GF-10	$ 44.	GFP-10	$ 68.	GW-10	$ 92.	GR-10	$118.
2	Standard Markings	GG-20	68.	GF-20	68.	GFP-20	92.	GW-20	104.	GR-20	132.
3	Standard Markings	GG-30	88.	GF-30	88.	GFP-30	124.	GW-30	176.	GR-30	254.
4	Standard Markings	GG-40	108.	GF-40	108.	GFP-40	144.	GW-40	212.	GR-40	396.
5	Standard Markings	GG-50	128.	GF-50	128.	GFP-50	176.	.....	....	.....	....
6	Standard Markings	GG-60	148.	GF-60	148.	GFP-60	196.	.....	....	.....	....
7	Standard Markings	GG-70	172.	GF-70	172.	GFP-70	244.	.....	....	.....	....
8	Standard Markings	GG-80	192.	GF-80	192.	GFP-80	264.	.....	....	.....	....

◐Pullboxes can be ordered separately from table above. Type GFP consists of Type GF plus Type FP pullbox.

PRICES FOR ADDITIONS AND SPECIAL FEATURES

Substitutions (In Place of Standard Push Button Units)	Enclosure Type	Price Addition Each
Selector sw. (Maintained only available)	All	$ 4.
Two single pole, single throw, maintained P. B.	All	N.C.
Transformer type P.L. with standard voltages	All	28.
Resistor type P.L. with standard voltages (Full voltage bulb furnished in NEMA 7 & 9)	All	20.
Three Point Contact (Contact Symbol 40)	All	12.
Double Unit P.B. (2 N.O. only **or** 2 N.C.only Contacts)	All	12.
Jog attachment for P. B. (Not available in NEMA 4, 7-9)	GG, GF, GFP	12.
Mushroom cap P. B. (Red or black) 1¾" dia.	All	12.
Lockout latch to P.B.	GG, GF, GFP	12.
Special legend plate, per plate	All	4.
Special station N. P. marking	All	6.
Standard legend plates: 9001 TN-2 (See pg. 355)	GG, GF, GFP	N.C.
9001 KN-8 (See pg. 330)	GW, GR	N.C.

PUSH BUTTON AND SELECTOR SWITCH OPERATORS

Function	Description	Push Button Type	Push Button Price	GG, GF, GFP Mushroom P.B. Type	GG, GF, GFP Mushroom P.B. Price	Contact Symbol — See Page 318
Push Button Units	Black Button—double circuit	GO-1	$14.80	GO-16	$26.80	16
	Red Button—single circuit N.C.	GO-2	14.80	GO-17	26.80	3
	Red Button—double circuit	GO-3	14.80	GO-18	26.80	16
	Black Button—3 point contacts	GO-4	26.80	GO-19	42.80	40
	Black Button—2 poles N.O.	GO-7	26.80	GO-20	42.80	41
	Red Button—2 poles N.C.	GO-8	26.80	GO-21	42.80	42

Function	Description	GG, GF, GFP only: Vertical Mounting Type	GG, GF, GFP only: Horizontal Mounting Type	Price	Contact Symbol — See Page 318
Selector Switch Units	Single Pole, double throw	HO-1	HO-7	$18.80	17
	Double Pole, single throw	HO-2	HO-8	18.80	18
	Single Pole, double throw	HO-3	HO-9	18.80	19
	Single Pole, double throw	HO-4	HO-10	18.80	20
	Double Pole, single throw	HO-5	HO-11	18.80	21

For other component replacements refer to service bulletin 268 AS.

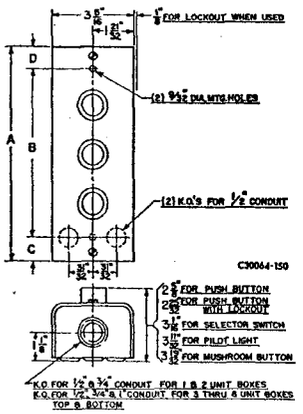
SQD SLV_001095

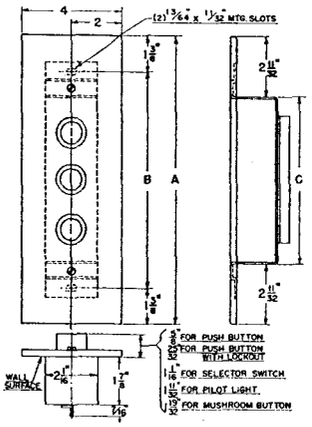
TYPE G HEAVY DUTY CONTROL STATIONS

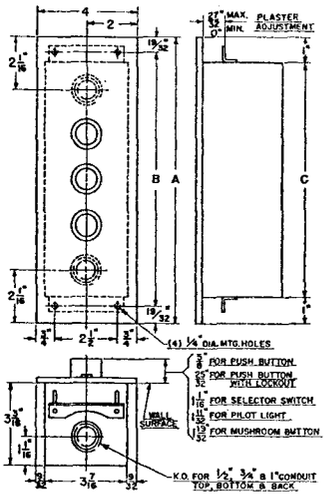
DIMENSIONS and CONTACT SYMBOLS

CLASS 9001

APPROXIMATE DIMENSIONS







GENERAL PURPOSE SURFACE MOUNTING

No. of Units	Dimensions			
	A	B	C	D
1	4 3/8	2 5/8	29/32	27/32
2	6 1/4	4 1/2	29/32	27/32
3	8 3/8	6 3/8	1 1/32	31/32
4	10 1/4	8 1/4	1 1/32	31/32
5	12 1/8	10 1/8	1 1/32	31/32
6	14	12	1 1/32	31/32
7	15 7/8	13 7/8	1 1/32	31/32
8	17 3/4	15 3/4	1 1/32	31/32

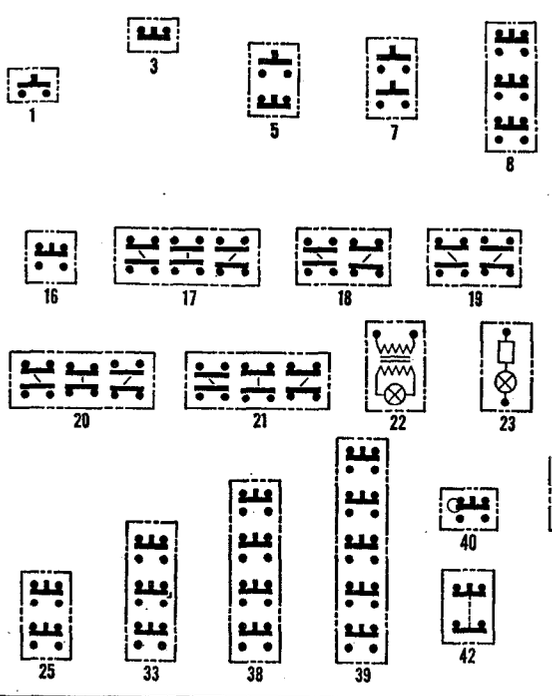
GENERAL PURPOSE FLUSH MOUNTING WITHOUT PULLBOX

No. of Units	Dimensions		
	A	B	C
1	7 9/16	4 13/16	2 7/8
2	9 7/16	6 11/16	4 3/4
3	11 5/16	8 9/16	6 5/8
4	13 3/16	10 7/16	8 1/2
5	15 1/16	12 5/16	10 3/8
6	16 15/16	14 3/16	12 1/4
7	18 13/16	16 1/16	14 1/8
8	20 11/16	17 15/16	16

GENERAL PURPOSE FLUSH MOUNTING WITH PULLBOX

No. of Units	Dimensions		
	A	B	C
1	7 9/16	6 3/8	5 9/16
2	9 7/16	8 1/4	7 1/16
3	11 5/16	10 1/8	9 5/16
4	13 3/16	12	11 3/16
5	15 1/16	13 7/8	13 1/16
6	16 15/16	15 3/4	14 15/16
7	18 13/16	17 5/8	16 13/16
8	20 11/16	19 1/2	18 11/16

CONTACT SYMBOLS

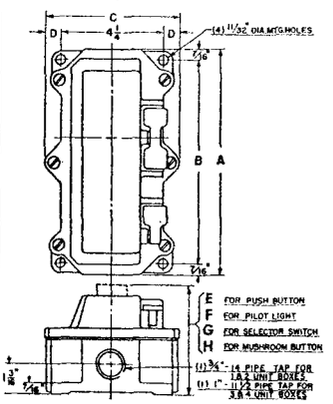


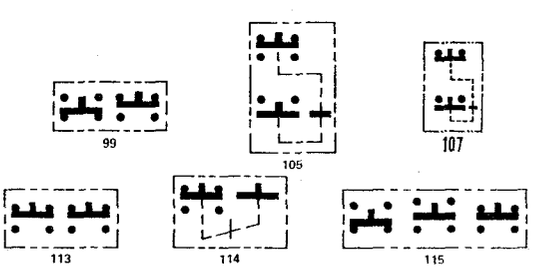
WATERTIGHT, DUSTTIGHT AND HAZARDOUS LOCATIONS ENCLOSURES*

No. of Units	Dimensions			
	A	B	C	D
1	5 1/8	4 1/4	5 1/8	7/16
2	7 1/8	6 1/4	5 1/8	7/16
3	9 1/8	8 1/4	5 1/2	5/8
4	11 1/8	10 1/4	5 1/8	7/16

Dim.	Watertight and Dusttight	Hazardous Locations
E	3 15/16	3 7/8
F	4 21/32	4 11/16
G	4 3/4	5 7/32
H	5 9/32	5 11/32

*Type GW and Type GR enclosures are made of cast grey iron.



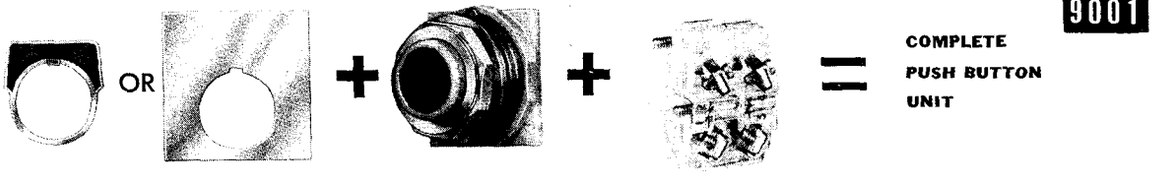


SQD SLV_001096

CONTROL UNITS — HEAVY DUTY OILTIGHT

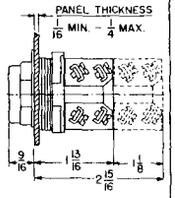
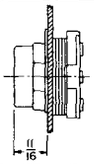
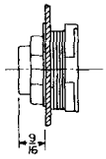
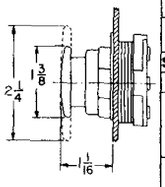
TYPE K — PUSH BUTTON OPERATORS — NON-ILLUMINATED

CLASS 9001



Momentary Operators

Legend Plate and Contact Block Not Included Unless Noted

Description	Approximate Dimensions*	Insert Color	Type	Price
Full Guard		**Operator Only** Universal *Includes one of each color insert from table below.*	KR-1U	**$10.80**
		Black	KR-1B	**10.80**
		Red	KR-1R	**10.80**
		Operator with Contact Block Black with 1 NO-1 NC (KA-1)	KR-1BH13	**22.80**
		Black with 1 NO (KA-2)	KR-1BH5	**16.80**
		Black with 1 NC (KA-3)	KR-1BH6	**16.80**
		Red with 1 NO-1 NC (KA-1)	KR-1RH13	**22.80**
		Red with 1 NO (KA-2)	KR-1RH5	**16.80**
		Red with 1 NC (KA-3)	KR-1RH6	**16.80**
Extended Guard		**Universal** Includes one of each color insert from table below.	KR-2U	**10.80**
		Black	KR-2B	**10.80**
		Red	KR-2R	**10.80**
No Guard		**Universal** Includes one of each color insert from table below.	KR-3U	**10.80**
		Black	KR-3B	**10.80**
		Red	KR-3R	**10.80**
Mushroom Button		**Snap-In Type**		**22.80**
		Color▲ / 1⅜" D. / 2¼" D.		
		Black / KR-4B / KR-5B		
		Red / KR-4R / KR-5R		
		Screw-On with Set Screw Type		**22.80**
		Color▲ / 1⅜" D. / 2¼" D.		
		Black / KR-24B / KR-25B		
		Green / KR-24G / KR-25G		
		Red / KR-24R / KR-25R		
		Yellow / KR-24Y / KR-25Y		
		Basic Operator less mushroom button	KR-20	**10.80**

*** MOUNTING DIMENSIONS — See Page 335.**
▲For colors not listed — see Tables 1 and 2 below.

Application Data

Ring nuts and inserts are field convertible by ordering the ring nut or insert from tables below. Any push button can be converted to a mushroom operator by ordering the mushroom button kit from Table 1 below and inserting mushroom in push button operator stem.

Operators on this page will accept up to six Type KA contact blocks mounted in tandem (total of twelve blocks).

Common Legend Plates

Marking	Type (Black Field Unless Noted)	Type (Aluminum Field Unless Noted)	Price
Blank	KN-200	KN-700	**$1.20**
Blank (Red)	KN-200R	KN-700R	
Start	KN-201	KN-701	
Stop (Red)	KN-202	KN-702	
On	KN-203	KN-703	
Off (Red)	KN-204	KN-704	
Down	KN-210	KN-710	
Up	KN-211	KN-711	
Jog	KN-218	KN-718	
Reset	KN-223	KN-723	
Run	KN-224	KN-724	

For other legend plates — See Page 330.

Standard Contact Blocks

Symbol	Contact Block Only: Type	Contact Block Only: Price	Contact Block Assembled To Operator: Suffix●	Contact Block Assembled To Operator: Price Adder
	KA-1	**$12.00**	H13	**$12.00**
	KA-2	**6.00**	H5	**6.00**
	KA-3	**6.00**	H6	**6.00**

For other contact blocks – ratings – dimensions — See Page 331.
●EXAMPLE: Class 9001 Type KR-3B **H13**. Price is **$22.80**. For other combinations — See Page 332.

Color Inserts

Color	Type	Price Each
Black	T-6BK	**$ .20**
Red	T-6RD	
Green	T-6GN	
Yellow	T-6YW	
Orange	T-6OE	
Blue	T-6BE	
White	T-6WH	
Universal (All Colors)	T-6U	**1.60**

Orders must specify quantity of 10 or multiples of 10.

Mushroom Button Kits

Color	Table 1: For colors not listed for KR-4 or KR-5; order KR-1U and kit below — Type 1⅜" D.	Table 1: Type 2¼" D.	Table 2: For colors not listed for KR-24 or KR-25; order KR-20 and kit below — Type 1⅜" D.	Table 2: Type 2¼" D.	Price
Black	K-16B	K-17B	K-92B	K-93B	**$12.**
Red	K-16R	K-17R	K-92R	K-93R	
Green	K-16G	K-17G	K-92G	K-93G	
Brown	K-16N	K-17N	K-92N	K-93N	
Yellow	K-16Y	K-17Y	K-92Y	K-93Y	
Orange	K-16S	K-17S	K-92S	K-93S	
Blue	K-16L	K-17L	K-92L	K-93L	

Interchangeable Push Button Ring Nuts and Guards

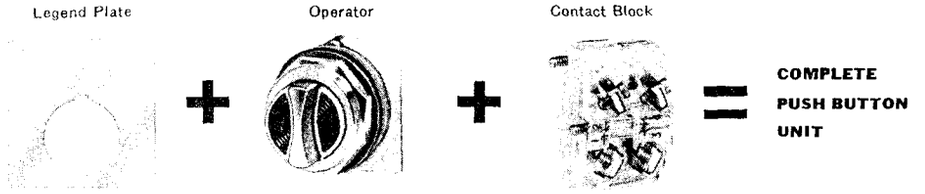
Description	Used On	Type	Price
Ring Nut	KR-3	K-40	**$ 1.20**
Ring Nut	KR-1 KR-4 KR-5	K-41	**1.20**
Ring Nut	KR-20 KR-24 KR-25	K-49	**1.20**
Ring Nut	KR-2	K-42	**1.20**
Mushroom Button Guard	KR-4 KR-24	K-48	**16.00**
Extended Mushroom Button Guard	KR-4	K-56Y	**16.00**

SQD SLV_001097

HEAVY DUTY OILTIGHT CONTROL UNITS

NON-ILLUMINATED — MULTI-FUNCTION OPERATORS — TYPE K

CLASS 9001



APPLICATION DATA

Types KR-6, KR-7 and KR-67: One operator performs same function as two units. **Up to six Type KA contact blocks can be mounted in tandem (total of twelve blocks).**

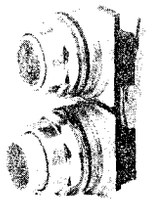
Types KR-8 and KR-9: Type KR-8 requires (1) N.C. KA-1 or KA-3 for "Start" and (1) KA-5 (Page 331) for "Stop." Type KR-9 requires (1) N.C. KA-1 or KA-3.

To convert to illuminated type, order separate light module (Page 326). Order complete factory assembled illuminated operators from Page 321. For any knob color not listed, order KR-8 or KR-9 and separate knob of desired color from below. **Up to two Type KA contact blocks can be mounted in tandem (total of four blocks).**

Types KR-11U and KR-12U: Type KR-11U consists of two maintained, interlocked operators. Pushing on either one releases the other. Type KR-12U consists of one momentary and one maintained operator, interlocked such that pushing on the momentary operator releases the maintained operator. The interlock attachment mounts on either the operators or contact blocks. **A total of two Type KA contact blocks can be mounted side by side on each operator (total of four on either type KR-11U or KR-12U).**

Key operated push buttons are used wherever unauthorized use of a push button is to be discouraged. Examples are locking a "Start" push button in the extended position or locking a "Stop" push button in the depressed position. The operator can also be locked in the flush position — holding all contacts open. **Up to two Type KA contact blocks can be mounted in tandem (total of four blocks).**

Special Purpose Operators — Legend Plate and Contact Block Not Included

Description		Color Insert or Knob	Type	Price
	Momentary Dual Function	**Universal** — includes two inserts of each color from insert table below Black — Red Green — Red	KR-6U KR-6BR KR-6GR	**$22.80** **22.80** **22.80**
	Momentary Interlocked Dual Function	**Universal** — includes two inserts of each color from insert table below Black — Red Green — Red	KR-67U KR-67BR KR-67GR	**34.80** **34.80** **34.80**
	Maintained Interlocked Dual Function	**Universal** — includes two inserts of each color from insert table below Black — Red Green — Red	KR-7U KR-7BR KR-7GR	**34.80** **34.80** **34.80**
	Momentary Push-Pull	None Red Green	KR-8 KR-8R KR-8G	**21.20*** **24.00*** **24.00***
	Maintained Push Pull	None Red Green	KR-9 KR-9R KR-9G	**33.20*** **36.00*** **36.00***
	Both Buttons Maintained Interlocked Assembly	**Universal** — includes two inserts of each color listed on page 319.	KR-11U	**33.60**
	One Button Momentary One Button Maintained Interlocked Assembly	**Universal** — includes two inserts of each color listed on page 319.	KR-12U	**45.60**

*Includes KN-379 legend plate. (Marked: Pull To Start — Push To Stop).

Key Operated Push Buttons — Legend Plate and Contact Block Not Included

Description	Positions In Which Push Button Can Be Locked			Type	Price
	Extended	Flush	Depressed		
Push button operable only with key in lock. Key is removable in locked position only.	X X	.. X .. X	.. .. X X	KR-131 KR-132 KR-133 KR-137	**$34.80**
Push button operable with or without key in lock. Push button can be locked with key only. Key removable in both locked or unlocked position.	X X	.. X .. X	.. .. X X	KR-141 KR-142 KR-143 KR-147	
Unit is set by rotating key, with button in extended position. Key is removable only in this set position. When pushed, the button will then lock in position indicated at right.	.. ..	X ..	.. X	KR-152 KR-153	

All key operated push buttons are furnished as standard with Square D number **E10** key change. See Page 325 for other key changes.

Accessories and Modifications

For others, see Pages 328 thru 330.

Color Inserts For Dual Function Operators

Color	Type	Price
Black Red Green Universal (Includes 2 each of B-19, R-19 and G-19)	B-19 R-19 G-19 U-19	$ .40 .40 .40 2.40
Orders must specify quantity of 10 or multiples of 10.		

Ring Nuts

Used on	Type	Price
KR-6, KR-7, KR-67	K-47	**$1.20**
KR-8	K-58	
KR-9	K-49	
Key Operated Push Button	K-55	
KR-11 and Maintained Button Only of KR-12	K-42	
Mom. of KR-12	K-41	

Knobs For Push-Pull Operators

Color	Type	Price
Red Green Blue Yellow White Black Brown Orange Clear Amber	R-22 G-22 L-22 Y-22 W-22 B-23▲ N-23▲ S-23▲ C-22 A-22	**$2.80**
▲Black, brown, and orange are opaque and for use on non-illuminated operators only.		

Push-Pull Mushroom Adapter

Used to mount mushroom button knobs (Types A-20 thru Y-21; see page 321) on Types KR-8 or KR-9 operators.	
Type	Price
K-54	No charge

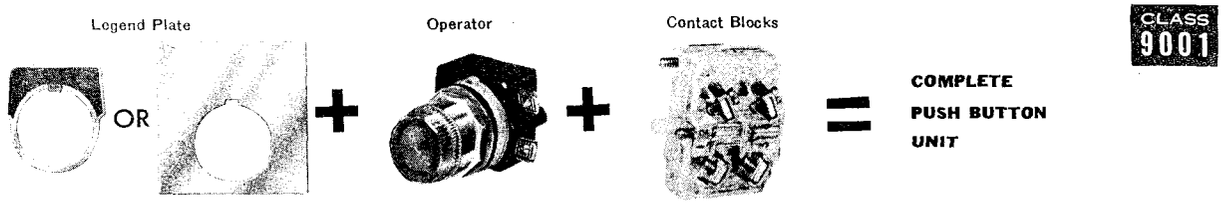
Mounting Dimensions — See Page 335.

SQD SLV_001098

CONTROL UNITS — HEAVY DUTY OILTIGHT

TYPE K — PUSH BUTTON OPERATORS — ILLUMINATED

CLASS 9001



APPLICATION DATA

Types K1L and K2L: Ring nuts and color caps are field convertible. For any color cap or mushroom knob not listed, order operator without color cap and required color cap or mushroom knob (used only on K2L series) from table below. For voltages and types of light modules not listed, see Page 326. **Up to six Type KA contact blocks can be mounted in tandem (total of twelve blocks).**

Types KR-8P and KR-9P: Type KR-8P requires (1) KA-1 (N.C.) or KA-3 for "Start" and (1) KA-5 (Page 331) for "Stop." For any color not listed, order operator without knob and required knob from Page 320. For voltages and types of light modules not listed, see Page 326. **Up to two Type KA contact blocks can be mounted in tandem (total of four blocks).**

Illuminated Push Button Operators

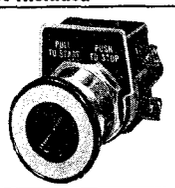
Legend Plate and Contact Block Not Included

Voltage and Frequency (Transformer Type)	Lamp No.	Rated VA	Color Cap	With Guard Type	With Guard Price	Without Guard Type	Without Guard Price
120 v., 60 Hz.; 110 v., 50 Hz.	GE-44	3@ 60 Hz., 6@ 50 Hz.	None	K1L-1	**$44.00**	K2L-1	**$40.00**
			Red	K1L-1R	**46.80**	K2L-1R	**42.80**
			Green	K1L-1G	**46.80**	K2L-1G	**42.80**
240 v., 60 Hz.; 220 v., 50 Hz.	GE-44	3@ 60 Hz., 6@ 50 Hz.	None	K1L-7	**44.00**	K2L-7	**40.00**
			Red	K1L-7R	**46.80**	K2L-7R	**42.80**
			Green	K1L-7G	**46.80**	K2L-7G	**42.80**
480 v., 60 Hz.; 440 v., 50 Hz.	GE-44	3@ 60 Hz., 6@ 50 Hz.	None	K1L-5	**44.00**	K2L-5	**40.00**
			Red	K1L-5R	**46.80**	K2L-5R	**42.80**
			Green	K1L-5G	**46.80**	K2L-5G	**42.80**
600 v., 60 Hz.; 550 v., 50 Hz.	GE-44	3@ 60 Hz., 6@ 50 Hz.	None	K1L-6	**44.00**	K2L-6	**40.00**
			Red	K1L-6R	**46.80**	K2L-6R	**42.80**
			Green	K1L-6G	**46.80**	K2L-6G	**42.80**

For other voltages and types, see page 326.

Illuminated Push-Pull Operators

Contact Block Not Included



Includes Type KN-379 Legend Plate Marked: Pull to Start Push to Stop

Voltage and Frequency (Transformer Type)	Lamp No.	Rated VA	Color Cap	Momentary Contact Type	Momentary Contact Price	Maintained Contact Type	Maintained Contact Price
120 v., 60 Hz.; 110 v., 50 Hz.	GE-44	3@ 60 Hz., 6@ 50 Hz.	None	KR-8P1	**$53.20**	KR-9P1	**$65.20**
			Red	KR-8P1R	**56.00**	KR-9P1R	**68.00**
			Green	KR-8P1G	**56.00**	KR-9P1G	**68.00**
240 v., 60 Hz.; 220 v., 50 Hz.	GE-44	3@ 60 Hz., 6@ 50 Hz.	None	KR-8P7	**53.20**	KR-9P7	**65.20**
			Red	KR-8P7R	**56.00**	KR-9P7R	**68.00**
			Green	KR-8P7G	**56.00**	KR-9P7G	**68.00**
480 v., 60 Hz.; 440 v., 50 Hz.	GE-44	3@ 60 Hz., 6@ 50 Hz.	None	KR-8P5	**53.20**	KR-9P5	**65.20**
			Red	KR-8P5R	**56.00**	KR-9P5R	**68.00**
			Green	KR-8P5G	**56.00**	KR-9P5G	**68.00**
600 v., 60 Hz.; 550 v., 50 Hz.	GE-44	3@ 50 Hz., 6@ 50 Hz.	None	KR-8P6	**53.20**	KR-9P6	**65.20**
			Red	KR-8P6R	**56.00**	KR-9P6R	**68.00**
			Green	KR-8P6G	**56.00**	KR-9P6G	**68.00**

For other voltages and types, see page 326. For separate knobs — see page 320.

Standard Contact Blocks

Symbol	Type	Price
	KA-1	**$12.**
	KA-2	**6.**
	KA-3	**6.**

For other contact blocks and ratings, see page 331.

Contact Blocks Assem. to Operators

Symbol	Suffix (Add to operator type number)	Price Adder
	H13	**$12.**
	H2	**24.**
 KA-5 KA-3	H25* For use with KR-8 and KR-8P	**12.**

Example: Class 9001 Type K1L-1RH2
Price is **$70.80.**
For other Combinations — See Page 332.

*Function of Type KR8_-H25 or Type KR8P_-H25
Unactuated Position; Type KA-5 closed, Type KA-3 held open.
Pull (Start) Position; Both contacts closed.
Push (Stop) Position; Both contacts open.

Common Legend Plates

Marking	Type (Black Field Unless Noted)	Type (Aluminum Field Unless Noted)	Price
Blank	KN-200	KN-700	**$1.20**
Blank (Red)	KN-200R	KN-700R	
Start	KN-201	KN-701	
Stop (Red)	KN-202	KN-702	
On	KN-203	KN-703	
Off (Red)	KN-204	KN-704	
Down	KN-210	KN-710	
Up	KN-211	KN-711	
Jog	KN-218	KN-718	
Reset	KN-223	KN-723	
Run	KN-224	KN-724	

For other legend plates — See Page 330.

Push-Pull Mushroom Adapter — See Page 320

Mounting Dimensions — See Page 335

Accessories and Modifications

Also see Pages 328 thru 330

Ring Nuts

Used On	Type	Price
K1L	K-44	**$5.20**
K2L	K-49	**1.20**
KR-8P KR-9P	K-58 K-49	**1.20**

Color Caps For Illuminated Push Buttons

Color	Standard Type	1⅜" Mushroom Type	2¼" Mushroom Type	Price
Red	R-7	R-20	R-21	**$2.80**
Green	G-7	G-20	G-21	
Amber	A-7	A-20	A-21	
Blue	L-7	L-20	L-21	
Clear	C-7	C-20	C-21	
White	W-7	W-20	W-21	
Yellow	Y-7	Y-20	Y-21	

SQD SLV_001099

HEAVY DUTY OILTIGHT CONTROL UNITS

TYPE K

CLASS 9001

SELECTION GUIDE

Shown below is a simplified method of selecting a selector switch to meet almost any contact sequence. For additional type numbers (spring return — illuminated — key operated) see pages 323-325.

STEP NO. 1

Determine the selector switch contact sequence(s) required (see example below) and locate sequence(s) in Table 1, 2 or 3.

If more than one sequence per operator is required, look for cam type common to all sequences.

Example:

↖	↑	↗
1	0	0
0	1	0
0	0	1

0 = contact open
1 = contact closed

For the above example, use Table 2. For the contact sequences of 100, 010, and 001, cams F and L are common to all 3 sequences.

STEP NO. 2

Go to Table 4 and choose the selector switch type opposite the cam determined in Step No. 1.

For the above example:

Cam F — Type KS46
Cam L — Type KS401

STEP NO. 3

To determine contact blocks required, use Tables 1, 2, or 3.

Example:

For sequence 100 using cam F — use KA-3 mounted on side No. 2.

For sequence 010 using cam F — use KA-3 mounted on side No. 1.

For sequence 001 using cam F — use KA-2 mounted on side No. 1 or 2.

TABLE 1 — 2 Position Selector Switch

If you require contact sequence ↖	↗	Use Sel. Sw. with cam type	Use contact block type ■	Mount on side No. (See Fig. 1)
1	0	E	KA3	1 or 2
0	1	E	KA2	1 or 2

TABLE 2 — 3 Position Selector Switch

If you require contact sequence ↖	↑	↗	Use Sel. Sw. with cam type	Use contact block type ■	Mount on side No. (See Fig. 1)
1	0	0	G	KA2	1
			L	KA2	2
			C E	KA3	1
			B C E F G J	KA3	2
			B G J	KA5*	2
0	1	0	D E J L	KA2	1
			D E	KA2	2
			F	KA3	1
			L	KA3	2
0	0	1	C F	KA2	1 or 2
			B D G L	KA3	1
			D	KA3	2
1	1	0	B	KA5*	1
			B	KA2	1
			C F	KA5*	1 or 2
0	1	1	B G J	KA2	2
			G	KA5*	1
			L	KA5*	2
1	0	1	J	KA3	1
			D E J L	KA5*	1
			D E	KA5*	2

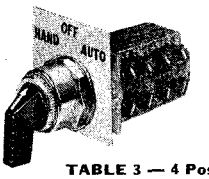


TABLE 3 — 4 Position Selector Switch

If you require contact sequence ↖	↖	↗	↗	Use Sel. Sw. with cam type	Use contact block type ■	Mount on side No. (See Fig. 1)
1	0	0	0	H	(A) KA3	2
0	1	0	0	H	(B) KA2	1
0	0	1	0	H	(C) KA2	2
0	0	0	1	H	(D) KA3	1
1	0	0	1	H	A & D Wired in Parallel	
1	1	0	0	H	A & B Wired in Parallel	
0	1	1	0	H	B & C Wired in Parallel	
0	0	1	1	H	C & D Wired in Parallel	
1	1	1	0	H	A, B & C Wired in Parallel	
0	1	1	1	H	B, C & D Wired in Parallel	
1	0	1	0	H	A & C Wired in Parallel	
0	1	0	1	H	B & D Wired in Parallel	
1	1	0	1	H	KA5*	2
1	0	1	1	H	KA5*	1

TABLE 4 — Maintained Contact Operators

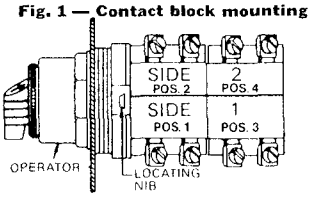
No. of Positions	Cam Type	Non-Illuminated Type	Illuminated, 120 V 60 Hz Transformer Type
2	E	KS11▲	K11J1▲
3	B	KS42▲	K42J1▲
	C	KS43▲	K43J1▲
	D	KS44▲	K44J1▲
	E	KS45▲	K45J1▲
	F	KS46▲	K46J1▲
	G	KS47▲	K47J1▲
	J	KS49▲	K49J1▲
	L	KS401▲	K401J1▲
4	H	KS88▲	K88J1▲

▲Insert knob code letter here. Choose letter from Table 5.

TABLE 5 — Knob Selection

Color	Knob Code — Insert code letter below in place of ▲ in type no. from Table 4. Ex: KS42FR. Standard Knob	Gloved Hand Knob	Coin Operated Knob
Black	B	FB	TB
Red	R	FR	TR
Green	G	FG	TG
Brown	N	FN	TN
Yellow	Y	FY	TY
Orange	S	FS	TS
Blue	L	FL	TL
White	W	FW	TW
Amber	A	FA	TA
Clear	C	FC	TC

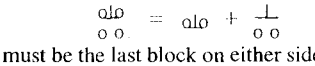
Fig. 1 — Contact block mounting position



Contact blocks may be stacked 2 deep on sides 1 and 2, total of 4 blocks maximum. If more circuits are required, consult local Square D Field Office.

■ One Type KA-1 double-circuit block can be used in place of one Type KA-2 and one Type KA-3 single circuit blocks mounted on the same side.

KA-1 = KA-3 + KA-2



* The KA-5 must be the last block on either side. If more than one KA-5 is required on either side — consult local Square D Field Office.

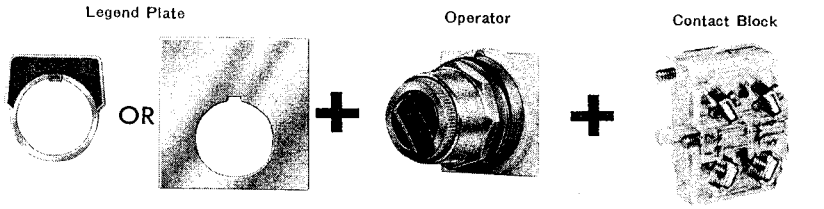
Mounting Dimensions — See Page 335

SQD SLV_001100

CONTROL UNITS — HEAVY DUTY OILTIGHT

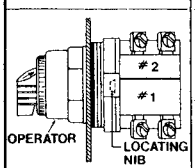
TYPE K — 2 POSITION SELECTOR SWITCH OPERATORS

CLASS 9001



2 Position Selector Switch Operators

Legend Plate and Contact Block Not Included Unless Noted

CONTACT BLOCK REQUIRED			1 — Contact Closed 0 — Contact Open				
Contact Block Position	Quantity and Type	Mount in Position	↖ Left	↗ Right	↖ Left	↗ Right	
 Top View	1-KA-1	#2	1 0	0 1	0 1	1 0	
	1-KA-1	#1	1 0	0 1	0 1	1 0	
NON-ILLUMINATED OPERATORS		CAM	Type		Type		Price
Manual Return							
Operator Only							
Without Knob		E	KS-11		.....		**$12.00**
Standard Black Knob		E	KS-11B		.....		**14.80**
Key Operated (Code 1, 2 or 3)		E	KS-11K*		.....		**38.80**
With Contact Block(s)							
Standard Black Knob							
With 1-KA-1 in Pos. # 2		E	KS-11BH13		.....		**26.80**
With 1-KA-1 in Pos. #1		E	KS-11BH1		.....		**26.80**
With 2-KA-1 in Pos. #1 & 2		E	KS-11BH2		.....		**38.80**
Spring Return from Left							
Without Knob		E	KS-25		.....		**20.00**
Standard Black Knob		E	KS-25B		.....		**22.80**
Key Operated (Code 2 **Only**)		E	KS-25K2		.....		**46.80**
Spring Return from Right							
Without Knob		D	.....		KS-34		**20.00**
Standard Black Knob		D	.....		KS-34B		**22.80**
Key Operated (Code 1 **Only**)		D	.....		KS-34K1		**46.80**
ILLUMINATED OPERATORS With 120 v., 60 Hz.; 110 v. 50 Hz. Transformer Type Light Module		CAM	Type		Type		Price
Manual Return							
Without Knob		E	K-11J1		.....		**$44.00**
Standard Red Knob		E	K-11J1R		.....		**46.80**
Spring Return from Left							
Without Knob		E	K-25J1		.....		**52.00**
Standard Red Knob		E	K-25J1R		.....		**54.80**
Spring Return from Right							
Without Knob		D	.....		K-34J1		**52.00**
Standard Red Knob		D	.....		K-34J1R		**54.80**

For other voltages and types of illuminated operators, see Page 326.

***KEY WITHDRAWAL CODE: For 2 Position Switches.**

Code	↖	↗	Code	↖	↗	Code	↖	↗
1	Yes	No	2	No	Yes	3	Yes	Yes

NOTE:

All key operated selector switches are furnished as standard with Square D number **E10** key changes. See Page 325 for other key changes.

TWO COLOR SELECTOR SWITCH

Used to indicate red in left position and green in right position on illuminated operators. Kit includes knob (standard or gloved hand), lamp shield and instructions for assembly. Can be installed on any new or existing illuminated operator **with transformer type light module** (do not use with other light module types).

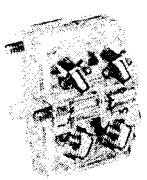
Knob	Type	Price	◐Factory Assembled Form Number	Price Adder
Standard	K-81RG	**$6.**	Y-178	**$5.**
Gloved Hand	K-82RG	**6.**	Y-178-1	**6.**

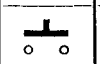
◐Add form number to standard Type number, eg. Type K11J1 Form Y-178.

Application Data

Cams are field convertible. Separate cams are listed on Page 325. For knob colors and types not listed, order operator without knob plus separate knob of desired color and type from table on Page 325. Non-illuminated operators can be converted to illuminated type by ordering the separate light module required from Page 326. **Selector switch operators will accept up to two Type KA contact blocks mounted in tandem (total of four blocks).**

Standard Contact Blocks



Symbol	Type	Price
	KA-1	**$12.**
	KA-2	**6.**
	KA-3	**6.**

For other contact blocks and ratings, see Page 331.

Common Legend Plates

Marking	Type: (Black Field Unless Noted)	Type: (Aluminum Field Unless Noted)	Price
Blank	KN-200	KN-700	
Hand-Auto	KN-240	KN-740	
Man.-Auto	KN-243	KN-743	
Off-On	KN-244	KN-744	
On-Off	KN-245	KN-745	
Open-Close	KN-246	KN-746	
Start-Stop	KN-251	KN-751	**$1.20**
Auto-Off-Hand	KN-258	KN-758	
For-Off-Rev	KN-259	KN-759	
Hand-Off-Auto	KN-260	KN-760	
Man-Off-Auto	KN-262	KN-762	
High-Off-Low	KN-277	KN-777	

For other legend plates — see Page 330.

Contact Blocks Assembled To Operator

Symbol	Contact Block Mounted in Position:	Suffix (Add to operator type number)	Price Adder
	#2	H13	**$12.**
	#1	H1	**12.**
	#2 and #1	H2	**24.**

Example: Class 9001 Type KS-11B**H2** Price is **$38.80**.
For other Combinations — See Page 332.

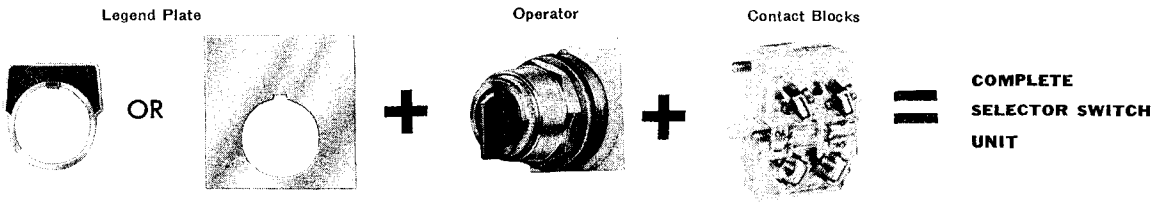
ACCESSORIES AND MODIFICATIONS — See Pages 328 thru 330
DIMENSIONS — See Page 325
MOUNTING DIMENSIONS — See Page 335

SQD SLV_001101

HEAVY DUTY OILTIGHT CONTROL UNITS

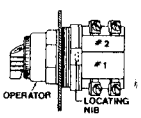
3 POSITION SELECTOR SWITCH OPERATORS — TYPE K

CLASS 9001



3 Position Selector Switch Operators

Legend Plate and Contact Block Not Included Unless Noted

Contact Block Required			1 = Contact Closed 0 = Contact Open								
Contact Block Position	Quantity and Type	Mount in Position	Center ↖ ↑ ↗ Left Right	Center ↖ ↑ ↗ Left Right	Center ↖ ↑ ↗ Left Right	Center ↖ ↑ ↗ Left Right	Center ↖ ↑ ↗ Left Right	Center ↖ ↑ ↗ Left Right	Center ↖ ↑ ↗ Left Right	Center ↖ ↑ ↗ Left Right	
 Top View	1-KA-1	#2	1 0 0 0 1 1	1 0 0 0 0 1	0 0 1 0 1 0	1 0 0 0 - 1 0	1 0 0 0 0 1	1 0 0 0 1 1	1 0 0 0 1 1	0 1 0 1 0 0	
	1-KA-1	#1	0 0 1 1 1 0	1 0 0 0 0 1	0 0 1 0 1 0	1 0 0 0 1 0	0 1 0 0 0 1	0 0 1 1 0 0	1 0 1 0 1 0	0 0 1 0 1 0	
CAM			B	C	D	E	F	G	J	L	
NON-ILLUMINATED OPERATORS			Type	Type	Type	Type	Type	Type	Type	Type	Price
Manual Return											
Operator Only											
Without Knob			KS-42	KS-43	KS-44	KS-45	KS-46	KS-47	KS-49	KS-401	**$12.00**
Standard Black Knob			KS-42B	KS-43B	KS-44B	KS-45B	KS-46B	KS-47B	KS-49B	KS-401B	**14.80**
Key Operated (Code 4 thru 10)			KS-42K*	KS-43K*	KS-44K*	KS-45K*	KS-46K*	KS-47K*	KS-49K*	KS-401K*	**38.80**
With Contact Block(s)											
Standard Black Knob											
With 1-KA-1 in Pos #2			KS-42BH13	KS-43BH13	KS-44BH13	KS-45BH13	KS-46BH13	KS-47BH13	KS-49BH13	KS-401BH13	**26.80**
With 1-KA-1 in Pos #1			KS-42BH1	KS-43BH1	KS-44BH1	KS-45BH1	KS-46BH1	KS-47BH1	KS-49BH1	KS-401BH1	**26.80**
With 2-KA-1 in Pos #1 & 2			KS-42BH2	KS-43BH2	KS-44BH2	KS-45BH2	KS-46BH2	KS-47BH2	KS-49BH2	KS-401BH2	**38.80**
Spring Return — Left to Center											
Without Knob			KS-62	KS-63	KS-64	KS-65	KS-66	KS-67	KS-69	KS-601	**20.00**
Standard Black Knob			KS-62B	KS-63B	KS-64B	KS-65B	KS-66B	KS-67B	KS-69B	KS-601B	**22.80**
Key Operated (Code 5, 6 or 9 **only**)			KS-62K*	KS-63K*	KS-64K*	KS-65K*	KS-66K*	KS-67K*	KS-69K*	KS-601K*	**46.80**
Spring Return — Right to Center											
Without Knob			KS-72	KS-73	KS-74	KS-75	KS-76	KS-77	KS-79	KS-701	**20.00**
Standard Black Knob			KS-72B	KS-73B	KS-74B	KS-75B	KS-76B	KS-77B	KS-79B	KS-701B	**22.80**
Key Operated (Code 4, 5 or 7 **only**)			KS-72K*	KS-73K*	KS-74K*	KS-75K*	KS-76K*	KS-77K*	KS-79K*	KS-701K*	**46.80**
Spring Return — Both Sides to Center											
Without Knob			KS-52	KS-53	KS-54	KS-55	KS-56	KS-57	KS-59	KS-501	**20.00**
Standard Black Knob			KS-52B	KS-53B	KS-54B	KS-55B	KS-56B	KS-57B	KS-59B	KS-501B	**22.80**
Key Operated (Code 5 **only**)			KS-52K5	KS-53K5	KS-54K5	KS-55K5	KS-56K5	KS-57K5	KS-59K5	KS-501K5	**46.80**
ILLUMINATED OPERATORS With 110-120 v., 50-60Hz. transformer type light module			Type	Type	Type	Type	Type	Type	Type	Type	Price
Manual Return											
Without Knob			K-42J1	K-43J1	K-44J1	K-45J1	K-46J1	K-47J1	K-49J1	K-401J1	**44.00**
Standard Red Knob			K-42J1R	K-43J1R	K-44J1R	K-45J1R	K-46J1R	K-47J1R	K-49J1R	K-401J1R	**46.80**
Spring return — Left to Center											
Without Knob			K-62J1	K-63J1	K-64J1	K-65J1	K-66J1	K-67J1	K-69J1	K-601J1	**52.00**
Standard Red Knob			K-62J1R	K-63J1R	K-64J1R	K-65J1R	K-66J1R	K-67J1R	K-69J1R	K-601J1R	**54.80**
Spring return — Right to Center											
Without Knob			K-72J1	K-73J1	K-74J1	K-75J1	K-76J1	K-77J1	K-79J1	K-701J1	**52.00**
Standard Red Knob			K-72J1R	K-73J1R	K-74J1R	K-75J1R	K-76J1R	K-77J1R	K-79J1R	K-701J1R	**54.80**
Spring Return — Both Sides to Center											
Without Knob			K-52J1	K-53J1	K-54J1	K-55J1	K-56J1	K-57J1	K-59J1	K-501J1	**52.00**
Standard Red Knob			K-52J1R	K-53J1R	K-54J1R	K-55J1R	K-56J1R	K-57J1R	K-59J1R	K-501J1R	**54.80**
For other Voltages and Types — see page 326.											

***KEY WITHDRAWAL CODE:**
NOTE: All key operated selector switches are furnished as standard with Square D number **E10** key change. See Page 325 for other key changes.

3-Position Switches							
Code	↖	↑	↗	Code	↖	↑	↗
4	Yes	No	No	**8**	Yes	No	Yes
5	No	Yes	No	**9**	No	Yes	Yes
6	No	No	Yes	**10**	Yes	Yes	Yes
7	Yes	Yes	No				

Application Data, etc. — See Page 325
Mounting Dimensions — See Page 335

Two Color Selector Switch

Used to indicate red in left position, no color (off) in center position and green in right position on illuminated operators. Kit includes knob (either standard or gloved hand), lamp shield and instructions for assembly. Can be installed on any new or existing illuminated operator **with transformer type light module** (do not use with other light module types).

Knob	Type	Price	◐Factory Assembled Form Number	Price Adder
Standard	K-83RG	**$6.**	Y-178	**$6.**
Gloved Hand	K-84RG	**6.**	Y-178-1	**6.**

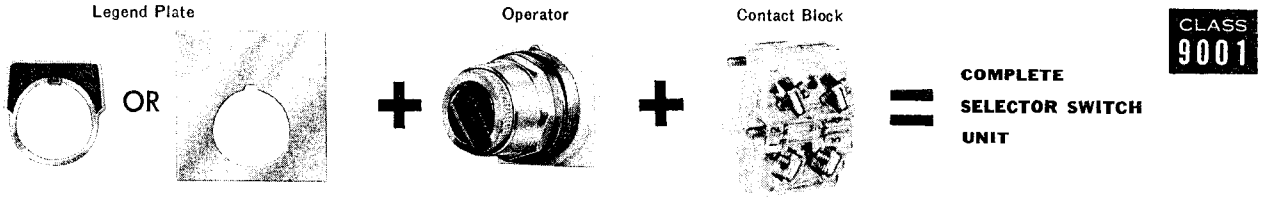
◐Add form number to standard Type number, eg. Type K-43J1 Form Y-178.

SQD SLV_001102

CONTROL UNITS — HEAVY DUTY OILTIGHT

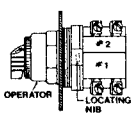
TYPE K — 4 POSITION SELECTOR SWITCH OPERATORS

CLASS 9001



4 Position Selector Switch Operators

Legend Plate and Contact Block Not Included

CONTACT BLOCK REQUIRED			1 = Contact Closed 0 = Contact Open	
Contact Block Position	Quantity and Type	Mount in Position	↖ ↗	Order Contact Blocks From Page 298
 Top View	1-KA-1	#2	1 0 0 0 0 0 1 0	
	1-KA-1	#1	0 0 0 1 0 1 0 0	
NON-ILLUMINATED OPERATORS	Cam		Type	Price
Manual Return Without Knob	H		KS-88	$12.00
Standard Black Knob	H		KS-88B	14.80
Key Operated (Code 11, 13 or 14)	H		KS-88K*	38.80
ILLUMINATED OPERATORS With 110-120 v., 50-60 Hz. transformer type light module	Cam		Type	Price
Manual Return Without Knob	H		K-88J1	$44.00
Standard Red Knob	H		K-88J1R	46.80

For other Voltages and Types — see page 326.

Accessories And Modifications

For Others — See Pages 328 thru 330.

Selector Switch Knobs

(Illuminated and Non-Illuminated Operators)

Color	 Standard Knob Type	 Gloved Hand Knob Type	 Coin Operated◐ Type	Price
Black	B-11▲	B-25▲	B-18▲	$2.80
Red	R-8	R-24	R-16	
Green	G-8	G-24	G-16	
Brown	N-11▲	N-25▲	N-18▲	
Yellow	Y-8	Y-24	Y-16	
Orange	S-11▲	S-25▲	S-18▲	
Blue	L-8	L-24	L-16	
White	W-8	W-24	W-16	
Amber	A-8	A-24	A-16	
Clear	C-8	C-24	C-16	

▲Black, brown, and orange are opaque and for use on non-illuminated operators only.

◐When converting standard or gloved hand knobs to coin operated type, spacer ring nut Type K-43 must also be used.

Cams

Cam	Type	Price
B	K-13B	$1.80
C	K-13C	
D	K-13D	
E	K-13E	
F	K-13F	
G	K-13G	
H	K-13H	
L	K-13L	
J	K-13J	

Orders must specify minimum quantity of 10 or multiple of 10.

Ring Nuts

Description	Type	Price
Selector Switch Ring Nut	K-45	$1.20
Secondary Ring Nut (Holds Knob on selector switches)	K-46	1.20
Spacer Ring Nut for coin operated selector switches	K-43	1.20

Application Data

For knob colors and types not listed, order operator without knob plus separate knob of desired color and type from table below. Non-illuminated operators can be converted to illuminated type by ordering the separate light module required from Page 326. For voltages and types of light modules (illuminated operators) not listed, see Page 326. **Selector switch operators will accept up to two Type KA contact blocks mounted in tandem (total of four blocks).**

***KEY WITHDRAWAL CODE:**

4-Position Switches				
Code	↖	↖	↗	↗
11	Yes	No	No	Yes
12	No	No	No	Yes
13	Yes	No	No	No
14	Yes	Yes	Yes	Yes

NOTE:

All key operated selector switches are furnished as standard with Square D number **E10** key change. Consult local Square D Field Office for other key changes.

CONTACT BLOCKS — See page 331

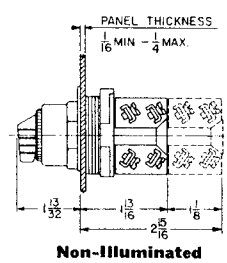
LEGEND PLATES — See page 330

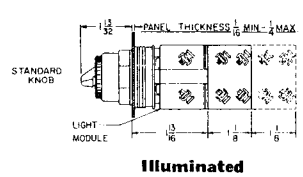
ACCESSORIES AND MODIFICATIONS — See below

DIMENSIONS — See below

MOUNTING DIMENSIONS — See page 335

Approximate Dimensions





KEY INFORMATION

APPLICATION DATA

All key operated devices are furnished as standard with Square D number E10 (key only part no. is 29411-01100, **$2.40 each**) key change. The E-10 supersedes D-10 key change. E-10 and D-10 keys are **Not** interchangeable. Consult local field office on availability of D-10 Key only (29406-01100). The following 24 additional key changes are available at no extra cost:

E11-E13, E15-E18, E20-E26, E28-E33, CH501, CH674, SR251, T107.

Occasionally it is desirable to have several devices with dis-similar key changes, but all operable by a single master key. The following key changes with master keying provisions are available at **$4.00** additional per device.

Key No.	Total Key Changes Available	Master Key	
		Part No.	Price
E36 thru E60	25	29411-51990	$2.40

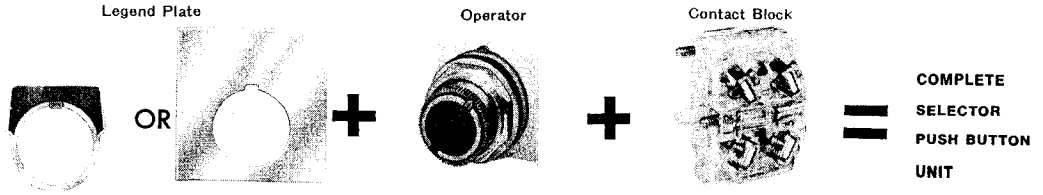
Each device is supplied with two matching keys. Order master keys separately. To order a device with one of the above key changes, insert the desired key number after the basic type number of the operator. (Example: Class 9001 Type KS-42KS**E11**, 9001 Type KR-131**E22**, or 9001 Type LRSA2K3**E42**).

SQD SLV_001103

HEAVY DUTY OILTIGHT CONTROL UNITS

SELECTOR PUSH BUTTON OPERATORS AND LIGHT MODULES — TYPE K

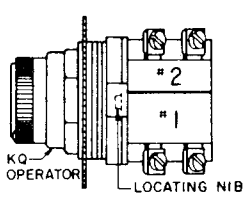
CLASS 9001



SELECTOR PUSH BUTTON OPERATORS
Legend Plate and Contact Block Not Included

Contact Block Required		Two Position Operators: 1 = Contact Closed, 0 = Contact Open; F = Free, D = Depressed												Three Position Operators			Order Contact Blocks From Page 305
Quantity and Type	Mount in Position	Left F D	Right F D	Left F D	Right F D	Left F D	Right F D	Left F D	Right F D	Left F D	Right F D	Left F D	Right F D	Left F D	Center F D	Right F D	
1-KA-1	#2	0 0 0 1	1 0 0 1	0 0 0 1	1 0 0 0	0 0 0 1	1 1 0 0	1 1 0 0	1 0 0 1	1 1 0 0	0 0 0 1	1 0 0 1	0 0 1 1	1 0 0 1	1 0 0 0	1 1 0 0	
1-KA-1	#1	0 0 0 1	1 1 0 0	0 0 0 1	1 0 0 0	1 1 0 0	0 0 0 1	1 0 0 1	1 1 0 0	1 0 0 1	0 0 0 1	1 0 0 1	0 0 1 1	1 1 0 0	1 0 0 0	1 0 0 1	
CAM		P		R		S		T		Y		Z		U			
Color Insert		Type		Type		Type		Type		Type		Type		Type			Price
Without Insert Black		KQ-11 KQ-11B		KQ-12 KQ-12B		KQ-13 KQ-13B		KQ-14 KQ-14B		KQ-15 KQ-15B		KQ-18 KQ-18B		KQ-27 KQ-27B			$22.40 22.80

Contact Block Position



Color Inserts

Color	Type	Price
Black	T-5BK	$.40
Red	T-5RD	.40
Green	T-5GN	.40
Brown	T-5BN	.40
Yellow	T-5YW	.40
Orange	T-5OE	.40
Blue	T-5BE	.40
White	T-5WH	.40

Orders must specify minimum quantity of 10 or multiple of 10.

APPLICATION DATA

Inserts are field convertible. For colors not listed, order operator without insert plus separate color insert from table below. **Up to two Type KA contact blocks can be mounted in tandem (total of four blocks). Selector pushbuttons cannot be illuminated.**

Mounting Dimensions - See Page 335.

LIGHT MODULES

Description	Voltage and Frequency	Operator Assembled With Any Light Module: *Code No.	Price Adjustment	Separate Light Modules: Type	Price	Rated VA	Replacement Lamps★ SERIES A thru F: Lamp No.	Part Number	Price (D14A)	SERIES G: Lamp No.	Part Number	Price (D14A)
Transformer	110-120 V., 50-60 Hz.	1		KM-1		3.3	GE-44●	25501-01005	$3.00	GE-755●	25501-01020	$3.00
	110-120 V., 50-60 Hz. **Flashing Type**	F1		KMF-1		4.3	GE-256	25501-01015	4.00	GE-267	25501-01036	4.00
	110-120 V., 25-30 Hz.	2		KM-2		1.6	GE-1490	25501-01003	3.00	GE-1490	25501-01003	3.00
	208-220 V., 50-60 Hz.	3		KM-3		3.6	GE-44●	25501-01005	3.00	GE-755●	25501-01020	3.00
	220-240 V., 25-30 Hz.	4		KM-4	$32.	1.3	GE-1490	25501-01003	3.00	GE-1490	25501-01003	3.00
	220-440 V., 50-60 Hz.	7		KM-7		3.8	GE-44●	25501-01005	3.00	GE-755●	25501-01020	3.00
	220-240 V., 50-60 Hz. **Flashing Type**	F7	No Change	KMF-7		4.8	GE-256	25501-01015	4.00	GE-267	25501-01036	4.00
	277 V., 50-60 Hz.	8		KM-8		3.9	GE-44●	25501-01005	3.00	GE-755●	25501-01020	3.00
	380-480 V., 50-60 Hz.	5		KM-5		4.9	GE-44●	25501-01005	3.00	GE-755●	25501-01020	3.00
	550-600 V., 50-60 Hz.	6		KM-6		5.7	GE-44●	25501-01005	3.00	GE-755●	25501-01020	3.00
Neon†	120 V., AC	11		KM-11		0.2	CMDK1A5	25501-05014	4.50	NE51H	25501-01013	8.00
	240 V., AC or DC	12		KM-12		0.3	CMDK1A5	25501-05014	4.50	NE51H	25501-01013	8.00
	380 V., AC or DC	13	Deduct	KM-13	$24.	0.5	CMDK1A5	25501-05014	4.50	NE51H	25501-01013	8.00
	480 V., AC or DC	14	$8.	KM-14		0.6	CMDK1A5	25501-05014	4.50	NE51H	25501-01013	8.00
	550 V., AC or DC	15		KM-15 ✓		1.0	CMDK1A5	25501-05014	4.50	NE51H	25501-01013	8.00
Resistor	18 V., AC or DC	33		KM-33		3.2	SYL18ESB	25501-05011	4.00	GE756	25501-01037	3.00
	32 V., AC or DC	23	Deduct	KM-23		1.3	SYL28PSB	25501-05008	4.00	GE757	25501-01002	2.50
	120 V., AC or DC	38	8.	KM-38	$24.	3.0	SYL120PSB	25501-05005	4.00	SYL120MB	25501-01027	3.00
	240 V., AC or DC	25		KM-25		6.0	SYL120PSB	25501-05005	4.00	SYL120MB	25501-01027	3.00
Full Voltage	6 V., AC or DC	31		KM-31		0.9	SYL6PSB	25501-05007	4.00	GE-755●	25501-01020	3.00
	12-14 V., AC or DC	32		KM-32		2.0	SYL12PSB	25501-05003	4.00	GE-756	25501-01037	3.00
	24-28 V., AC or DC	35	Deduct	KM-35		1.2	SYL28PSB	25501-05008	4.00	GE-757	25501-01002	2.50
	48 V., AC or DC	36	8.	KM-36	$24.	2.6	SYL48PSB	25501-05009	4.00	SYL48MB	25501-01025	3.00
	60 V., AC or DC	37		KM-37		3.0	SYL60PSB	25501-05010	4.00	SYL60MB	25501-01026	3.00
Obsolete	110-120 V., 50-60 Hz	9	—	KM-9	—		GE755	25501-01020	3.00	—	—	—
	14 V., AC or DC	21	—	KM-21	—		SYL12PSB	25501-05003	4.00	—	—	—
	18 V., AC or DC	22	—	KM-22	—		SYL12PSB	25501-05003	4.00	—	—	—
	24 V., AC or DC	34	—	KM-34	—		SYL24PSB	25501-05004	4.00	—	—	—

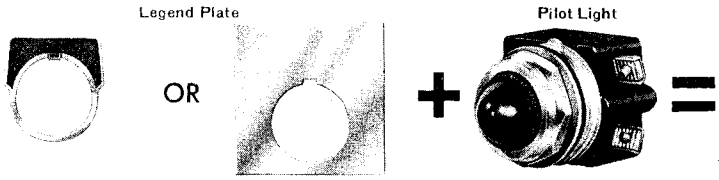
† Should be used with red, amber or clear color caps only.
* For voltages other than listed on preceding pages and page 327 insert proper code number in place of the * per the following and adjust price of operator by the amount shown in table above: K1L-*, K2L-*, KR-8P*, KR-9P*, K-J*, KP-* and KT-*. Example: K1L-**34**R at **$38.80** ($46.80—$8.00)
● GE44 and GE755 are interchangeable (GE755 gives longer life).

SQD SLV_001104

CONTROL UNITS — HEAVY DUTY OILTIGHT

TYPE K — PILOT LIGHTS

CLASS 9001



Description	Style	Standard Pilot Light (Legend Plate Not Included) — Voltage and Frequency	Without Color Cap Type	Price	With Red Color Cap Type*	With Green Color Cap Type*	Price	Push-to-Test Pilot Light (Contact Block Included — but NOT Legend Plate) — Without Color Cap Type	Price	With Red Color Cap Type*	With Green Color Cap Type*	Price	Replacement Lamps
	Transformer	110-120 V., 50-60 Hz.	KP-1	$40.00	KP-1R9	KP-1G9	$42.80	KT-1	$52.00	KT-1R9	KT-1G9	$54.80	See Page 326
		208-220 V., 50-60 Hz.	KP-3	40.00	KP-3R9	KP-3G9	42.80	KT-3	52.00	KT-3R9	KT-3G9	54.80	
		220-240 V., 50-60 Hz.	KP-7	40.00	KP-7R9	KP-7G9	42.80	KT-7	52.00	KT-7R9	KT-7G9	54.80	
		380-480 V., 50-60 Hz.	KP-5	40.00	KP-5R9	KP-5G9	42.80	KT-5	52.00	KT-5R9	KT-5G9	54.80	
		550-600 V., 50-60 Hz.	KP-6	40.00	KP-6R9	KP-6G9	42.80	KT-6	52.00	KT-6R9	KT-6G9	54.80	
		110-120 V., 50-60 Hz. **Flashing Type**	KPF-1	40.00	KPF-1R9	KPF-1G9	42.80	KTF-1	52.00	KTF-1R9	KTF-1G9	54.80	
		220-240 V., 50-60 Hz. **Flashing Type**	KPF-7	40.00	KPF-7R9	KPF-7G9	42.80	KTF-7	52.00	KTF-7R9	KTF-7G9	54.80	
	Neon	120 V., AC	KP-11	32.00	KP-11R9	.....	34.80	KT-11	44.00	KT-11R9	.....	46.80	
		240 V., AC or DC	KP-12	32.00	KP-12R9	.....	34.80	KT-12	44.00	KT-12R9	.....	46.80	
		380 V., AC or DC	KP-13	32.00	KP-13R9	.....	34.80	KT-13	44.00	KT-13R9	.....	46.80	
		480 V., AC or DC	KP-14	32.00	KP-14R9	.....	34.80	KT-14	44.00	KT-14R9	.....	46.80	
		550 V., AC or DC	KP-15	32.00	KP-15R9	.....	34.80	KT-15	44.00	KT-15R9	.....	46.80	
	Resistor	18 V., AC or DC	KP-33	32.00	KP-33R9	KP-33G9	34.80	KT-33	44.00	KT-33R9	KT-33G9	46.80	
		32 V., AC or DC	KP-23	32.00	KP-23R9	KP-23G9	34.80	KT-23	44.00	KT-23R9	KT-23G9	46.80	
		120 V., AC or DC	KP-38	32.00	KP-38R9	KP-38G9	34.80	KT-38	44.00	KT-38R9	KT-38G9	46.80	
		240 V., AC or DC	KP-25	32.00	KP-25R9	KP-25G9	34.80	KT-25	44.00	KT-25R9	KT-25G9	46.80	
	Full Voltage	6 V., AC or DC	KP-31	32.00	KP-31R9	KP-31G9	34.80	KT-31	44.00	KT-31R9	KT-31G9	46.80	
		12-14 V., AC or DC	KP-32	32.00	KP-32R9	KP-32G9	34.80	KT-32	44.00	KT-32R9	KT-32G9	46.80	
		24-28 V., AC or DC	KP-35	32.00	KP-35R9	KP-35G9	34.80	KT-35	44.00	KT-35R9	KT-35G9	46.80	
		48 V., AC or DC	KP-36	32.00	KP-36R9	KP-36G9	34.80	KT-36	44.00	KT-36R9	KT-36G9	46.80	
		60 V., AC or DC	KP-37	32.00	KP-37R9	KP-37G9	34.80	KT-37	44.00	KT-37R9	KT-37G9	46.80	

* Supplied with "plastic" color caps. If "glass" color caps are desired; substitute G6, R6, etc. for G9, R9, etc. Example: KT1G6, KT1R6, etc.

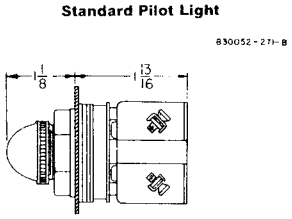
APPLICATION DATA

Type K — Any voltage or type of light module can be factory assembled on any of the above pilot lights per instructions on Page 326. For colors, other than listed, order the pilot light without color cap and order the separate color cap from table at right. The push-to-test pilot light comes assembled and wired with one Type KA-1 (1 N.O. — 1 N.C.) contact block.

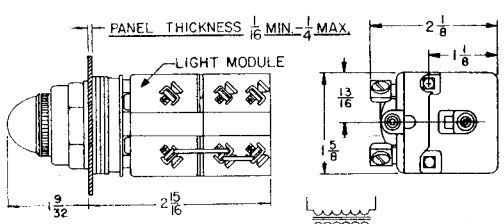
Note: For compact pilot lights (Type J), See page 337.

Approximate Dimensions

Standard Pilot Light



Push-to-Test Pilot Light

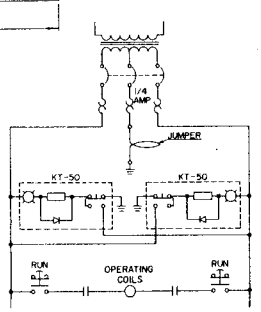


Mounting Dimensions — See Page 335

Push-to-Test Ground Detector Pilot Light
(Contact Block Included — But NOT Legend Plate or Color Cap)

Used in pairs to indicate a grounded condition in a control circuit fed from a grounded center-tapped transformer. The Type KT-50 is commonly used in press control circuits, and fulfills the requirements of the ground detector called for in ANSI B11.1 (1971), Par. E3.6.5. Consult local Square D Field Office for proper application.

Voltage and Frequency	Type	Price
110-120 V., 50-60 Hz.	KT-50	$72.



Common Legend Plates

Marking	Type (Black Field Unless Noted)	Type (Aluminum Field Unless Noted)	Price
Blank	KN-200	KN-700	$1.20
Blank (Red)	KN-200R	KN-700R	
Start	KN-201	KN-701	
Stop (Red)	KN-202	KN-702	
On	KN-203	KN-703	
Off (Red)	KN-204	KN-704	
Down	KN-210	KN-710	
Up	KN-211	KN-711	
Jog	KN-218	KN-718	
Reset	KN-223	KN-723	
Run	KN-224	KN-724	

For other legend plates — See Page 330.

Accessories and Modifications

For Others — See Pages 328 thru 330

Color Caps (For Standard and Push-to-Test Pilot Light)

Color	Plastic	Glass	Price
Red	R-9	R-6	$2.80
Green	G-9	G-6	
Amber	A-9	A-6	
Blue	L-9	L-6	
Clear	C-9	C-6	
White	W-9	W-6	
Yellow	Y-9	Y-6	

Ring Nuts

Used on	Type	Price
KP	K-40	$1.20
KT	K-49	1.20

SQD SLV_001105

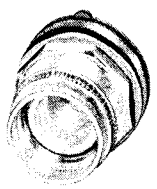
HEAVY DUTY OILTIGHT CONTROL UNITS

TYPE K — BASIC OPERATORS — PADLOCK ATTACHMENTS

CLASS 9001

BASIC OPERATORS

ILLUMINATED PUSH BUTTON WITH FULL GUARD



Less Color Cap And Light Module

Type	Price
K1L	$12.00

STANDARD PILOT LIGHT



Less Color Cap and Light Module

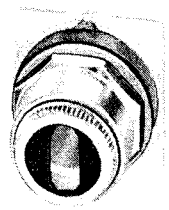
Type	Price
KP	$8.00

ILLUMINATED PUSH BUTTON WITHOUT GUARD AND *PUSH-TO-TEST PILOT LIGHT*



Less Color Cap, Light Module, and Contact Block. (Includes Wires For Push-To-Test)

Type	Price
K2L	$8.00
K2L-S1 (with liner for use as non-illuminated operator)	8.00



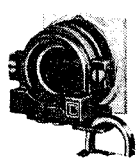
Less Knob and Cam

SELECTOR SWITCH

	Description	Type	Price
Three Position	Manual Return	KS-4	$10.20
	Spring Return Both Sides To Center	KS-5	18.20
	Spring Return Left Side To Center	KS-6	18.20
	Spring Return Right Side To Center	KS-7	18.20

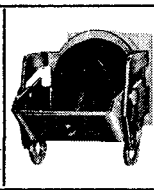
Note: Remove nylon liner before adding light module for illuminated operators.

Padlock Attachments



For non-illuminated push button — Std. or mushroom (KR-4, KR-5 mushroom button only — will not work with KR-24 or KR-25). Holds button in depressed position.

Type	Price
K-4	$12.



For non-illuminated push buttons with protective cap. Holds button in depressed position and can be padlocked.

Type	Price
K-5	$20.



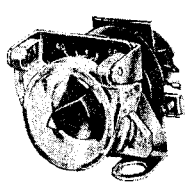
For non-illuminated push buttons, cover type attachment that can be padlocked. Does not hold button in depressed position.

Type	Price
K-6	$12.



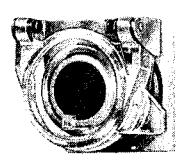
For selector switches and illuminated push buttons without guard. Cover type attachment that can be padlocked to keep unauthorized personnel from tampering with operator.

Type	Price
K-7	$12.



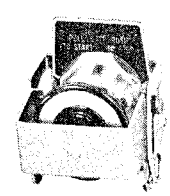
Cover Type Attachment for Padlocking Potentiometer

Type	Price
K-67	$12.



For push buttons, cover type attachment Similar to K-6 shown above EXCEPT without lockout provision and with spring loaded cover.

Type	Price
K-60	$16.



For push-pull operator (Types KR-8 and KR-9) and illuminated push buttons (Types K1L and K2L). Holds button in depressed position.

Type	Price
K-62	$20.

The 9001 K-7 padlock attachment listed above allows any selector switch, with standard knob, to be locked in any position. For those situations when it is desirable to lock the selector switch in one position only, the following devices are available. "X" indicates the position in which the selector switch, with standard knob, can be locked.



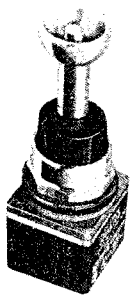
Type K-7C shown

Type	2 Position Maintained	2 Position Spring Return From Right	2 Position Spring Return From Left	3 Position Maintained	3 Position Spring Return From Right	3 Position Spring Return From Left	3 Position Spring Return From Both Sides	4 Position Maintained	Price
K-7A	— —	— —	— —	X — —	X — —	— — —	— — —	X — — —	$20.
K-7B	— —	— —	— —	— X —	— X —	— X —	— X —	— — — —	
K-7C	— —	— —	— —	— — X	— — —	— — X	— — —	— — — X	
K-7D	— —	— —	— —	— — —	— — —	— — —	— — —	— X — —	
K-7E	— —	— —	— —	— — —	— — —	— — —	— — —	— — X —	
K-7F	X —	X —	— —	— — —	— — —	— — —	— — —	— — — —	
K-7G	— X	— —	— X	— — —	— — —	— — —	— — —	— — — —	

SQD SLV_001106

CLASS 9001

Joy Stick Operators
Legend Plate and Contact Block not Included



Joy Stick With Latch

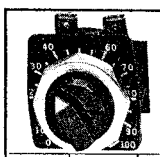
Description			Type (Operator Only) ◄●►	Type (Operator Only) ▲●▼	Type (Operator Only) ◄▲●▼►	Price	Contact Block Only
3 Position-Center Off	Momentary Contact — Spring Return to Center	Without Latch	K31	K71	....	$70.80	For K30-33, order (2) Type KA-3
		With Latch	K30	K70	....	70.80	
	Maintained Contact	Without Latch	K33	K73	....	70.80	For K70-73, order (2) Type KA-2
		With Latch	K32	K72	....	70.80	
5 Position-Center Off	Momentary Contact — Spring Return to Center	Without Latch	....	....	K35	86.80	
		With Latch	....	....	K34	86.80	Order (2) Type KA-1
	Maintained Contact	Without Latch	....	....	K37	86.80	
		With Latch	....	....	K36	86.80	

The joy stick operator is ideal for applications where only one circuit is to be energized at one time. The three position joy-stick closes one circuit each in Up-Down or Right-Left position with all circuits open in center position. The five position operator closes one circuit each in Up, Down, Left and Right positions with all circuits open in center position.

Momentary contact operators spring return to the center position. Maintained operators remain in each position and must be reset manually. Operators with latch cannot be operated until the latch button in center of handle is pressed.

Contact blocks can be mounted side by side and in tandem to a maximum of four blocks.

Potentiometer (With Dial Plate)



Watts	Description	Type	Price
2	Operator only–Single Pot. . . .	K-20	$ 56.
	Operator with Single Pot. . . .	K-21●	80.
	Operator only–Tandem Pot. .	K-22	88.
	Operator with Tandem Pot. .	K-23▲	112.

●▲Complete Type No. by adding suffix No. from table below.
Example: Type K21**05**

Suffix ●	Ohms	Suffix ●	Ohms	Suffix ●	Ohms	Suffix ▲	Ohms Front	Ohms Rear
01	50	07	5000	13	500K	81	500	1000
02	100	08	10K	14	1.0 Meg	82	1000	1000
03	250	09	25K	15	2.5 Meg	83	5000	5000
04	500	10	50K	16	5.0 Meg	84	25K	25K
05	1000	11	100K	17◐	5.0 Meg			
06	2500	12	250K					

◐ For use with 9050 Type T — See Page 421.

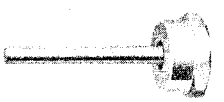
Emergency "Break Glass" Operator



Operator is held in a depressed position by a glass disc. When the glass disc is broken with the hammer, button returns to a normal extended position. Package of 5 discs included with operator.

Type	Price
K-15	$34.80
Package of 5 replacement discs: K-57	4.00

Wobble Stick

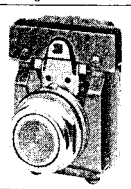


For easy operation of any standard push button

Type	Price
K-8	$12.

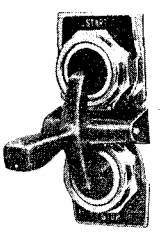
Time Delay Push Button

Timing period is adjustable from 0.1 second to 60 seconds and begins after push button has been released. Devices require the space of two standard operators. Devices include a package of nine color inserts for color coding the push button. Contacts are quick make — quick break. Types listed are full guard versions.



Description	Timed Contact 1 N.O. & 1 N.C.	Timed Contact 2 N.O. & 2 N.C.
Type	KRD1U-H1	KRD1U-H2
Price	$70.80	$130.80

Rocker Arm Operating Lever



Allows two standard push buttons to be operated independently of each other. Price does not include push buttons or legend plates. Order push buttons from Page 319 and legend plates from Page 330 — specify which marking is to be inverted.

Type	Price
K-50	$21.60

Protective Caps



KU-1 **KU-17** **KU-37** **KU-27**

The Type KU protective cap kits are suitable for either dust tight or water tight applications. For dust tight applications standard KN legend plates can be used. For water tight applications separately mounted legend (Type KN-8) plates must be used. The K-1 wrench is used for the installation of these kits.

For Non-Illuminated Push Buttons* Color	Type	Price	Clear Color for	Type	Price
Black	KU-1	$8.	Standard Knob Selector Switch	KU-17	$12.
Red	KU-2	8.	Gloved Hand Cap for use on **std. knob** Selector Switch	KU-18	12.
Blue	KU-3	8.			
Brown	KU-4	8.	Standard Pilot Light and Maintained Contact Push Buttons	KU-27	12.
Green	KU-5	8.			
Yellow	KU-6	8.	Push-to-Test and Illuminated Push Button Without Guard	KU-37	12.
Clear	KU-7	8.			
Clear (Provides Full Guard)	KU-8	12.	Illuminated Push But. With Guard	KU-47	16.

*Use KU-27 for maintained contact push buttons.

Wrench



K-95 K-1

Where Used	Type	Price
For tightening ring nuts on Type K and J control units.	K-95	$12.
For protective cap kits.	K-1	12.

Closing Plates



Description	Type	Round (1½" Dia.) Type	Price
Painted	K-11	K-51	$4.
Chrome Plated	K-12	K-52	4.

MOUNTING DIMENSIONS — See page 335

SQD SLV_001107

CONTROL UNITS — HEAVY DUTY OILTIGHT

TYPE K — LEGEND PLATES

CLASS 9001

Standard Legend Plates — KN-1, KN-2, KN-3, KN-7 and KN-8

Standard Markings	Type				
	2¼" Square			2½" Square	
Unless Noted KN-1,7 Aluminum Field KN-2,3 Black Field KN-8 Blue Field	 KN-100	 KN-200	 KN-300	 KN-700	 KN-800
FOR PUSH BUTTON OR PILOT LIGHT					
Blank	KN-100	KN-200	KN-300	KN-700	KN-800
Blank – Red	KN-100R	KN-200R	KN-300R	KN-700R	KN-800R
Start	KN-101	KN-201	KN-301	KN-701	KN-801
Stop – Red	KN-102	KN-202	KN-302	KN-702	KN-802
On	KN-103	KN-203	KN-303	KN-703	KN-803
Off – Red	KN-104	KN-204	KN-304	KN-704	KN-804
Emerg. Stop – Red	KN-105	KN-205	KN-305	KN-705	KN-805
Forward	KN-106	KN-206	KN-306	KN-706	KN-806
Reverse	KN-107	KN-207	KN-307	KN-707	KN-807
Close	KN-108	KN-208	KN-308	KN-708	KN-808
Open	KN-109	KN-209	KN-309	KN-709	KN-809
Down	KN-110	KN-210	KN-310	KN-710	KN-810
Up	KN-111	KN-211	KN-311	KN-711	KN-811
Fast	KN-112	KN-212	KN-312	KN-712	KN-812
Slow	KN-113	KN-213	KN-313	KN-713	KN-813
High	KN-114	KN-214	KN-314	KN-714	KN-814
Low	KN-115	KN-215	KN-315	KN-715	KN-815
Inch	KN-116	KN-216	KN-316	KN-716	KN-816
In	KN-117	KN-217	KN-317	KN-717	KN-817
Jog	KN-118	KN-218	KN-318	KN-718	KN-818
Jog For.	KN-119	KN-219	KN-319	KN-719	KN-819
Jog. Rev.	KN-120	KN-220	KN-320	KN-720	KN-820
Lower	KN-121	KN-221	KN-321	KN-721	KN-821
Out	KN-122	KN-222	KN-322	KN-722	KN-822
Reset	KN-123	KN-223	KN-323	KN-723	KN-823
Run	KN-124	KN-224	KN-324	KN-724	KN-824
Start Jog	KN-125	KN-225	KN-325	KN-725	KN-825
Test	KN-126	KN-226	KN-326	KN-726	KN-826
Raise	KN-127	KN-227	KN-327	KN-727	KN-827
Decrease	KN-128	KN-228	KN-328	KN-728	KN-828
Increase	KN-129	KN-229	KN-329	KN-729	KN-829
Left	KN-130	KN-230	KN-330	KN-730	KN-830
Right	KN-131	KN-231	KN-331	KN-731	KN-831
Cycle Start	KN-132	KN-232	KN-332	KN-732	KN-832
Feed Start	KN-133	KN-233	KN-333	KN-733	KN-833
Cycle Stop	KN-134	KN-234	KN-334	KN-734	KN-834
Feed Stop	KN-135	KN-235	KN-335	KN-735	KN-835
Motor Run	KN-136	KN-236	KN-336	KN-736	KN-836
Motor Stop	KN-137	KN-237	KN-337	KN-737	KN-837
Power On	KN-138	KN-238	KN-338	KN-738	KN-838
Full Speed	KN-172	KN-272	KN-372	KN-772	KN-872
Low Speed	KN-173	KN-273	KN-373	KN-773	KN-873
Second Speed	KN-174	KN-274	KN-374	KN-774	KN-874
Third Speed	KN-175	KN-275	KN-375	KN-775	KN-875
Pull to Start Push to Stop	KN-179		KN-379	KN-779	
FOR SELECTOR SWITCH OR SELECTOR PUSH BUTTON					
For.-Rev.	KN-139	KN-239	KN-339	KN-739	KN-839
Hand-Auto.	KN-140	KN-240	KN-340	KN-740	KN-840
High-Low	KN-141	KN-241	KN-341	KN-741	KN-841
Jog-Run	KN-142	KN-242	KN-342	KN-742	KN-842
Man.-Auto.	KN-143	KN-243	KN-343	KN-743	KN-843
Off-On	KN-144	KN-244	KN-344	KN-744	KN-844
On-Off	KN-145	KN-245	KN-345	KN-745	KN-845
Open-Close	KN-146	KN-246	KN-346	KN-746	KN-846
Raise-Lower	KN-147	KN-247	KN-347	KN-747	KN-847
Run-Jog	KN-148	KN-248	KN-348	KN-748	KN-848
Safe-Run	KN-149	KN-249	KN-349	KN-749	KN-849
Slow-Fast	KN-150	KN-250	KN-350	KN-750	KN-850
Start-Stop	KN-151	KN-251	KN-351	KN-751	KN-851
Up-Down	KN-153	KN-253	KN-353	KN-753	KN-853
Low-High	KN-154	KN-254	KN-354	KN-754	KN-854
Stop-Start	KN-155	KN-255	KN-355	KN-755	KN-855
Left-Right	KN-156	KN-256	KN-356	KN-756	KN-856
On-Auto	KN-176	KN-276	KN-376	KN-776	KN-876
Summer-Winter	KN-157	KN-257	KN-357	KN-757	KN-857
Auto-Off-Hand	KN-158	KN-258	KN-358	KN-758	KN-858
For.-Off-Rev.	KN-159	KN-259	KN-359	KN-759	KN-859
Hand-Off-Auto	KN-160	KN-260	KN-360	KN-760	KN-860
Jog-Safe-Run	KN-161	KN-261	KN-361	KN-761	KN-861
Man.-Off-Auto	KN-162	KN-262	KN-362	KN-762	KN-862
Open-Off-Close	KN-163	KN-263	KN-363	KN-763	KN-863
Up-Off-Down	KN-164	KN-264	KN-364	KN-764	KN-864
Low-Off-High	KN-165	KN-265	KN-365	KN-765	KN-865
For.-Safe-Rev.	KN-166	KN-266	KN-366	KN-766	KN-866
Jog-Stop-Run	KN-167	KN-267	KN-367	KN-767	KN-867
Slow-Off-Fast	KN-168	KN-268	KN-368	KN-768	KN-868
Summer-Off-Winter	KN-169	KN-269	KN-369	KN-769	KN-869
High-Low-Off	KN-170	KN-270	KN-370	KN-770	KN-870
Raise-Off-Lower	KN-171	KN-271	KN-371	KN-771	KN-871
High-Off-Low	KN-177	KN-277	KN-377	KN-777	KN-877
Auto-Man.-Off	KN-178	KN-278	KN-378	KN-778	KN-878

Special Legend Plates — KN-4, KN-5, KN-6, KN-9



TYPE KN-5 (For Use with Dual Function Operators KR6, KR7 and KR67)

Type	Standard Markings	
	Green	Red
KN-500 KN-501 KN-502	Blank Start On	Blank Stop Off
Type	Black	Black
KN-520 KN-521 KN-522 KN-523 KN-524 KN-525 KN-526	Blank Start On Forward Up High Open	Blank Stop Off Reverse Down Low Close



TYPE KN-4 Double Headed Can be used with all Type KY enclosures but must be mounted horizontally when used with KY-2, 3, or 4.

Type	Standard Markings
KN-400	Blank



TYPE KN-6 Extra Large

For KYAF or customers enclosure only. Minimum spacing between operators must be 2⅝" vert. & 2¼" horizontally.

Type	Standard Markings
KN-600	Blank



TYPE KN-9 (For use with joy stick operators)

Type	Standard Markings
KN-900	Blank

Pricing Information

Legend Plate	Description		Type	Price
KN-1	Standard Markings		Select from Table at Left	$1.20
	Special Marking (Specify Marking Required)	Aluminum Field	KN-199	5.20
		Red Field	KN-199R	
KN-2	Standard Markings		Select from Table at Left	1.20
	Special Marking (Specify Marking Required)	Black Field	KN-299	5.20
		Red Field	KN-299R	
KN-3	Standard Markings		Select from Table at Left	1.20
	Special Marking (Specify Marking Required)	Black Field	KN-399	5.20
		Red Field	KN-399R	
KN-4	Blank		KN-400	2.40
	Any Marking (Specify Marking)		KN-499	6.40
KN-5	Standard Markings		Select from Table above	1.20
	Special Marking (Specify Marking Required)	Black Field	KN-599	5.20
		Green-Red Field	KN-519	
KN-6	Blank	Black Field Red Field	KN-600 KN-600R	2.40
	Any Marking (Specify Marking)	Black Field Red Field	KN-699 KN-699R	6.40
KN-7	Standard Markings		Select from Table at Left	1.20
	Special Marking (Specify Marking Required)	Aluminum Field	KN-799	5.20
		Red Field	KN-799R	
KN-8 (For use with KYC Enclosure)	Standard Markings		Select from Table at Left	1.20
	Special Marking (Specify Marking (Required)	Blue Field	KN-899	5.20
		Red Field	KN-899R	
KN-9	Blank		KN-900	1.20
	Any Marking (Specify Marking)		KN-999	5.20

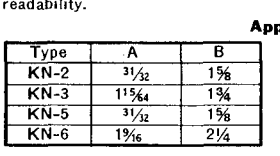
Maximum Number of Lines and Characters for Type KN Legend Plates

Type	KN-1	KN-2	KN-3	KN-4	KN-5	KN-6	KN-7	KN-8	KN-9
Max. No. of Char. per Line	17	18	18	18	8 per field	22	22	18	18 per pos.
Max. No. of Lines	4	2	3	4	2 per field	4	4	2	1 per pos.

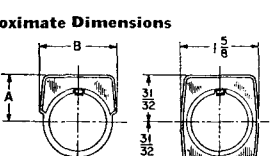
The maximum number of characters and lines given above is a practical maximum and is based on a minimum size of characters to facilitate easy reading. When fewer characters than the maximum are required the size of the characters are changed to permit the best readability.

Approximate Dimensions

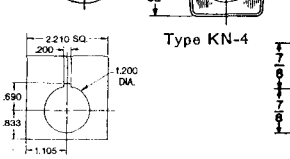
Type	A	B
KN-2	31/32	1⅝
KN-3	1 15/64	1¾
KN-5	31/32	1⅝
KN-6	1 1/16	2¼



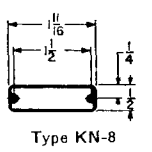
Type KN-7



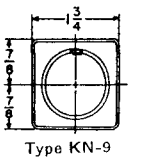
Type KN-4



Type KN-1



Type KN-8



Type KN-9

SQD SLV_001108

HEAVY DUTY OILTIGHT CONTROL UNITS

CONTACT BLOCKS — TYPE K

CLASS 9001

Standard and special purpose contact blocks are molded of an amorphous transparent polyamid material with high impact resistance and resistance to carbon tracking, incorporating double break silver contacts. Improved reliability results from a flexible movable contact blade which provides a scrubbing action with positive wipe.

Logic reed blocks are color coded white to differentiate them from standard blocks and have isolated reed contacts which are sealed to prevent exposure to contaminants, and are designed to provide reliable operation on very low power level applications, and they are UL listed for use on Class I, Division 2 hazardous location applications.

Termination on all contact blocks consists of pressure wire connectors with self lifting clamps. The pressure clamp is free to roll, compensating for wires of varying sizes in any combination from #12 to #18, solid or stranded.

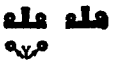
Standard Contact Blocks

Description	Symbol	Type	Price
		KA-1	$12.
		KA-2	6.
		KA-3	6.

Special Purpose Contact Blocks

Description	Symbol	Type	Price
	N.O. Contact Early Closing	KA-4	$12.
	Late Opening	KA-5	6.

Additional Circuit Arrangements Available

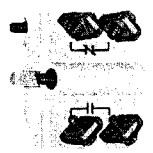
SEQUENCING* N.O. Contact of KA-4 closes before N.O. Contact on KA-1	 KA-4 KA-1	Order One Type KA-4 and One Type KA-1	$24.
OVERLAPPING* N.O. Contact of KA-4 closes before N.C. Contact of KA-5 Opens	 KA-4 KA-5	Order One Type KA-4 and One Type KA-5	18.

*For push buttons or two position selector switches (Types KS-11, KS-25, KS-34, K11J-, K25J- and K34J-) only. For sequencing or overlapping contacts on other operators — consult local Square D Field Office.

MOUNTING DIMENSIONS — See Page 335

Sealed Logic Reed Contact Blocks

Suitable for use on low energy level circuits.

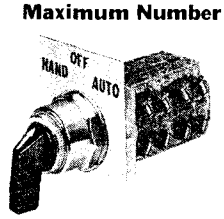
Description	Symbol	Type	Price
		KA-41	$24.
		KA-42	12.
		KA-43	12.
		KA-44	24.
		KA-45	24.

Max. Volts AC/DC	Maximum Load		
	Res.	Ind.	Cont.
32/30	.25A	.10A	.5A
120/100	8VA	3VA	.5A

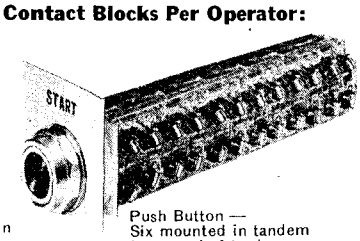
The maximum number of sealed logic reed contact blocks per operator is as indicated for standard contact blocks below, **except**

- On 3 position selector switches with cams "C," "D," "E," "F," "G," or "L," mount logic blocks on **one side only** (either side), maximum 2 in tandem.
- On 4 position selector switches, mount logic blocks on **one side only** (either side), maximum 2 in tandem.
- On joysticks or on Type KR-8 momentary push-pull operators, mount logic blocks on **one side only** (either side), maximum 2 in tandem.

Maximum Number of Contact Blocks Per Operator:

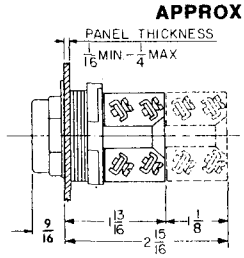


Selector Switch — Two mounted in tandem for a total of four.

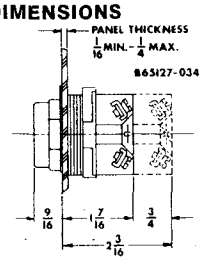


Push Button — Six mounted in tandem for a total of twelve.

APPROXIMATE DIMENSIONS



Types KA-1, KA-4 KA-41 thru KA-45



Types KA-2, KA-3, KA-5

Maximum Current Ratings for Control Circuit Contacts — Types KA-1 through KA-5

Volts	AC — NEMA A600						Volts	DC				
	Inductive 35% Power Factor					Resistive 75% Power Factor		Inductive and Resistive				
	Make		Break					Make and Break				
	Amperes	VA	Amperes	VA	Continuous Carrying Amperes	Make, Break and Continuous Amperes		KA-1	KA-2 KA-3	KA-4	KA-5	Continuous Carrying Amperes
120	60	7200	6	720	10	10	120	1.1	1.1	1.1	1.1	10
240	30	7200	3	720	10	10	240	0.55	0.55	....	0.55	10
480	15	7200	1.5	720	10	10	600	0.2	0.2	....	0.2	10
600	12	7200	1.2	720	10	10						

SQD SLV_001109

CONTROL UNITS — HEAVY DUTY OILTIGHT
TYPE K — CONTACT BLOCKS ASSEMBLED TO OPERATORS

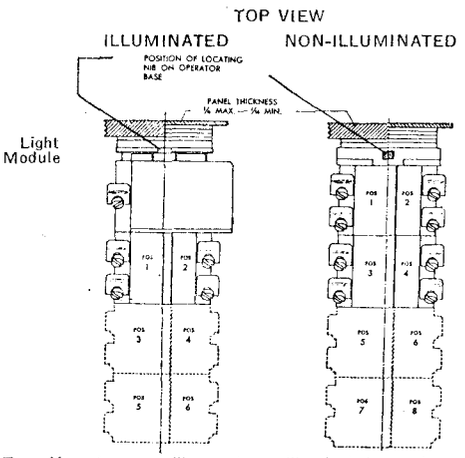
CLASS 9001

LOCATION CHART FOR CONTACT BLOCKS ASSEMBLED TO OPERATORS

The design of the Class 9001 Type K contact blocks allows them to be mounted side by side and/or in tandem. This plus the fact that there are 10 different Type K blocks to choose from produces a great number of combinations of contact blocks which can be mounted behind an operator.

The system illustrated below has been set up to enable an operator and a particular arrangement of contact blocks to be specified by a single type number. Operators and contact blocks will be shipped completely assembled — no additional charge for assembly.

EXAMPLE: A Type KR-1B push button with 2-Type KA-1 contact blocks would be Class 9001 Type KR-1B-**H2.**



Type K enclosures will accept non-illuminated operators with contact blocks mounted in positions 1 thru 4 and illuminated operators with contact blocks mounted in positions 1 and 2 only.

Suffix No. (Add to Operator Type No.)	† Total Circuits	Positions 1	2	3	4	Circuit Symbol*
H1	1 N.O. 1 N.C.	KA-1				
H2	2 N.O. 2 N.C.	KA-1	KA-1			
H3	3 N.O. 3 N.C.	KA-1	KA-1	KA-1		
H4	4 N.O. 4 N.C.	KA-1	KA-1	KA-1	KA-1	
H5	1 N.O.	KA-2				
H6	1 N.C.	KA-3				
H7	2 N.O.	KA-2	KA-2			
H8	2 N.C.	KA-3	KA-3			
H9	1 N.O. 1 E.C. N.O. 2 N.C.	KA-4	KA-1			
H10	1 E.C. N.O. 1 E.O. N.C. 1 N.C.	KA-4	KA-5			
H11	3 N.O. 3 N.C.	KA-1	KA-1		KA-1	
H12	2 N.O. 2 N.C.	KA-2	KA-3	KA-2	KA-3	
H13	1 N.O. 1 N.C.		KA-1			

Suffix No. (Add to Operator Type No.)	† Total Circuits	Positions 1	2	3	4	5	6	7	8	Circuit Symbol*
H14	1 N.C.		KA-3							
H15	2 N.O. 1 N.C.	KA-2	KA-3	KA-2						
H16	2 N.C. 1 N.O.	KA-2	KA-3		KA-3					
H17	2 N.C. 3 N.O.	KA-1	KA-1	KA-2						
H18	1 N.O. 4 N.C.	KA-3	KA-1	KA-3		KA-3				
H19	5 N.O. 5 N.C.	KA-1	KA-1	KA-1	KA-1	KA-1				
H20	8 N.O. 8 N.C.	KA-1	KA-1	KA-1	KA-1	KA-1	KA-1	KA-1	KA-1	
H21	1 N.O. 1 N.C.	KA-2	KA-3							
H22	7 N.O. 7 N.C.	KA-1	KA-1	KA-1	KA-1	KA-1	KA-1	KA-1		
H23	6 N.O. 6 N.C.	KA-1	KA-1	KA-1	KA-1	KA-1	KA-1			

* Circuit symbol applies to push buttons only. For selector switch sequences, see Pages 322 to 326. "H" Suffix numbers for contact block positions selected apply to all push buttons and selector switches.

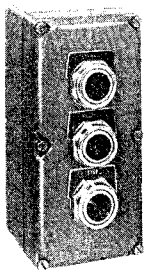
† Explanation: N.O. — Normally Open; N.C. — Normally Closed; E.C. — Early Closing; L.O. — Late Opening

SQD SLV_001110

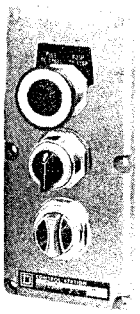
HEAVY DUTY OILTIGHT CONTROL STATIONS

TYPE K

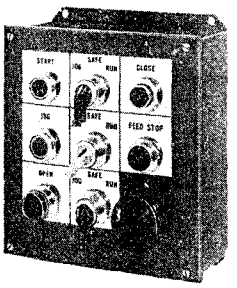
CLASS 9001



Type KYK-31



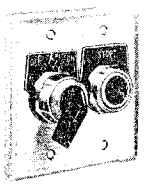
Type KZ-310



Type KYAF-90



Type KYC-300



Type K-26

CONTROL STATIONS — APPLICATION DATA

Class 9001 Type K enclosures are available in NEMA 13 (oiltight and dusttight) and NEMA 4 Stainless Steel (watertight and dusttight). Both types are available completely assembled in standard and custom arrangements and as separate unassembled enclosures. **Enclosures have sufficient depth to accommodate two contact blocks in tandem (total of four blocks) on non-illuminated operators and two contact blocks side-by-side on illuminated operators.**

Operators used are listed on Pages 319-329. On NEMA 4 enclosures (Type KYC), protective caps (Page 329) and separate legend plates (Type KN-8 on Page 330) must be used to maintain the watertight seal.

For Standard Assembled Stations — See Below

For Custom Assembled Stations — See Page 334

For Enclosures Only (Customer Assembly) — See Page 334

Dimensions — See Page 335

STANDARD ASSEMBLED STATIONS — NEMA TYPE 13

No. of Units	Legend Plate Markings and Features	Surface Mounting		Consists of (one each unless noted):			
		Type	Price	Enclosure	Operators	Contact Blocks	Legend Plates
1	Start	KYK-11	**$64.**	KY-1	KR-1B	KA-1	KN-201
	Start (Mushroom Button)	KYK-12	**76.**	KY-1	KR-4B	KA-1	KN-201
	Stop	KYK-13	**64.**	KY-1	KR-1R	KA-1	KN-202
	Stop (Mushroom Button)	KYK-14	**76.**	KY-1	KR-4R	KA-1	KN-202
	Stop (With Lockout)	KYK-15	**76.**	KY-1	KR-1R with K-4	KA-1	KN-202
	Off-On (Selector Switch)	KYK-110	**68.**	KY-1	KS-11B	KA-1	KN-244
	Hand-Off-Auto (Sel. Switch)	KYK-111	**68.**	KY-1	KS-43B	KA-1	KN-260
	To Stop — Break Glass (With "Break Glass" Operator)	KYK-116	**92.**	KY-1	K-15	KA-1	KN-799R
2	Start-Stop	KYK-2i	**92.**	KY-2	KR-1B, KR-1R	(2) KA-1	KN-201, 202
	Start-Stop (Mushroom on Stop)	KYK-22	**104.**	KY-2	KR-1B, KR-4R	(2) KA-1	KN-201, 202
	Start-Stop (Lockout on Stop)	KYK-23	**104.**	KY-2	KR-1B, KR-1R with K-4	(2) KA-1	KN-201, 202
	Up-Down	KYK-25	**92.**	KY-2	(2) KR-1B	(2) KA-1	KN-211, 210
	Start-Stop (Maintained Contact)	KYK-27	**92.**	KY-2	KR-11U	(1) KA-1	KN-201, 202
3	Forward-Reverse-Stop	KYK-31	**124.**	KY-3	(2) KR-1B, KR-1R	(3) KA-1	KN-206, 207, 202
	Up-Down-Stop	KYK-32	**124.**	KY-3	(2) KR-1B, KR-1R	(3) KA-1	KN-211, 210, 202
	Open-Close-Stop	KYK-33	**124.**	KY-3	(2) KR-1B, KR-1R	(3) KA-1	KN-209, 208, 202
	High-Low-Stop	KYK-34	**124.**	KY-3	(2) KR-1B, KR-1R	(3) KA-1	KN-214, 215, 202
	Red 120 VAC Pilot Light — Start-Stop	KYK-317	**132.**	KY-3	KP-1R6, KR-1B, KR-1R	KA-2, KA-3	KN-200, 201, 202

Standard Assembled Stations — NEMA Type 4 (Stainless Steel)

No. of Units	Legend Plate Markings and Features	Type	Price	Assembled Station Consists of (one each unless noted):				
				Enclosure	Operators	Caps	Contact Blocks	Legend Plates
1	Start	KYC-101	**$104.**	KYC-1	KR-1B	KU-1	KA-1	KN-801
	Stop	KYC-103	**98.**	KYC-1	KR-1R	KU-2	KA-3	KN-802
	Stop (Lockout)	KYC-105	**118.**	KYC-1	KR-1R with K-5	KU-2	KA-3	KN-802
	Off-On (Selector Switch)	KYC-110	**112.**	KYC-1	KS-11B	KU-17	KA-1	KN-844
	Hand-Off-Auto (Selector Switch)	KYC-111	**112.**	KYC-1	KS-43B	KU-17	KA-1	KN-860
2	Start-Stop	KYC-201	**134.**	KYC-2	KR-1B, KR-1R	KU-1, KU-2	KA-1, KA-3	KN-801, 802
	Start-Stop (Lockout on Stop)	KYC-203	**154.**	KYC-2	KR-1B, KR-1R with K-5	KU-1, KU-2	KA-1, KA-3	KN-801, 802
	Up-Down	KYC-205	**140.**	KYC-2	(2) KR-1B	(2) KU-1	(2) KA-1	KN-811, 810
	Start-Stop (Maintained Contact)	KYC-210	**148.**	KYC-2	KR-11U	(2) KU-27	(1) KA-1	KN-801, 802
3	Forward-Reverse-Stop	KYC-301	**194.**	KYC-3	(2) KR-1B, KR-1R	(2) KU-1, KU-2	(2) KA-1, KA-3	KN-806, 807, 802
	Up-Down-Stop	KYC-302	**194.**	KYC-3	(2) KR-1B, KR-1R	(2) KU-1, KU-2	(2) KA-1, KA-3	KN-811, 810, 802
	Open-Close-Stop	KYC-303	**194.**	KYC-3	(2) KR-1B, KR-1R	(2) KU-1, KU-2	(2) KA-1, KA-3	KN-809, 808, 802
	High-Low-Stop	KYC-304	**194.**	KYC-3	(2) KR-1B, KR-1R	(2) KU-1, KU-2	(2) KA-1, KA-3	KN-814, 815, 802
	Forward-Reverse-Stop (Lockout on Stop)	KYC-308	**214.**	KYC-3	(2) KR-1B, KR-1R with K-5	(2) KU-1, KU-2	(2) KA-1, KA-3	KN-806, 807, 802
	Up-Down-Stop (Lockout on Stop)	KYC-309	**214.**	KYC-3	(2) KR-1B, KR-1R with K-5	(2) KU-1, KU-2	(2) KA-1, KA-3	KN-811, 810, 802
	Open-Close-Stop (Lockout on Stop)	KYC-310	**214.**	KYC-3	(2) KR-1B, KR-1R with K-5	(2) KU-1, KU-2	(2) KA-1, KA-3	KN-809, 808, 802
	High-Low-Stop (Lockout on Stop)	KYC-311	**214.**	KYC-3	(2) KR-1B, KR-1R with K-5	(2) KU-1, KU-2	(2) KA-1, KA-3	KN-814, 815, 802

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CONTROL STATIONS — HEAVY DUTY
TYPE K — ENCLOSURES AND DIMENSIONS

CLASS 9001

Custom Built Assembled Stations

NEMA Type 13							Ordering Information	NEMA Type 4 Stainless Steel		
	Surface Mounting				Flush Mounting Without Pullbox▲●					
	Cast Aluminum		Sheet Steel (With 2½" Hole Spacings) (Supersedes Type KYA)		Cast Aluminum					
No. of Units	Type●	Base Price	Type	Base Price	Type●	Base Price		No. of Units	Type	Base Price
1	KY-10	$ 40.	KYAF-100	$ 28.	KZ-110	$ 24.	Base prices shown include the enclosure only. The complete price for an assembled station is the sum of this base price plus prices of all control units to be installed. (There is no extra charge for assembly.) Orders must be accompanied with a key sheet or sketch showing all control units in their desired locations. **For nameplate on enclosure with markings as specified add $6.**	1	KYC-100	$ 72.
2	KY-20*	44.	KYAF-200	32.	KZ-210*	24.		2	KYC-200	76.
3	KY-30*	52.	KYAF-300	36.	KZ-310*	28.		3	KYC-300	104.
4	KY-40*	64.	KYAF-400	44.	KZ-410*	40.		4	KYC-400	136.
6	KY-60	80.	KYAF-600	52.	KZ-60	56.		6	KYC-600	200.
9	KY-90	104.	KYAF-900	64.	KZ-90	76.		9	KYC-900	248.
12	KY-120	140.	KYAF-1200	80.	KZ-120	108.		12	KYC-1200	300.
16	KY-160	180.	KYAF-1600	100.	KZ-160	148.		16	KYC-1600	396.
20	.....	.....	KYAF-2000	120.	.....	.....		20	KYC-2000	440.
25	.....	.....	KYAF-2500	140.	.....	.....		25	KYC-2500	560.
								30	KYC-3000	660.

* Types KN-3 and KN-4 legend plates will not fit upright on these enclosures with their long axis vertical.
▲ For machine cavity mounting. Pull box not available.
● Type KN-1 legend plates will not fit on these enclosures.

Enclosures Only (For Customer Assembly)

NEMA Type 13							NEMA Type 4 Stainless Steel		
	Surface Mounting				Flush Mounting Without Pullbox▲●				
	Cast Aluminum		Sheet Steel (With 2½" Hole Spacings) (Supersedes Type KYA)		Cast Aluminum				
No. of Units	Type●	Price	Type	Price	Type●	Price	No. of Units	Type	Price
1	KY-1	$ 40.	KYAF-1	$ 28.	KZ-11	$ 24.	1	KYC-1	$ 72.
2	KY-2*	44.	KYAF-2	32.	KZ-21*	24.	2	KYC-2	76.
3	KY-3*	52.	KYAF-3	36.	KZ-31*	28.	3	KYC-3	104.
4	KY-4*	64.	KYAF-4	44.	KZ-41*	40.	4	KYC-4	136.
6	KY-6	80.	KYAF-6	52.	KZ-6	56.	6	KYC-6	200.
9	KY-9	104.	KYAF-9	64.	KZ-9	76.	9	KYC-9	248.
12	KY-12	140.	KYAF-12	80.	KZ-12	108.	12	KYC-12	300.
16	KY-16	180.	KYAF-16	100.	KZ-16	148.	16	KYC-16	396.
20	....	....	KYAF-20	120.	....	....	20	KYC-20	440.
25	....	....	KYAF-25	140.	....	....	25	KYC-25	560.
							30	KYC-30	660.

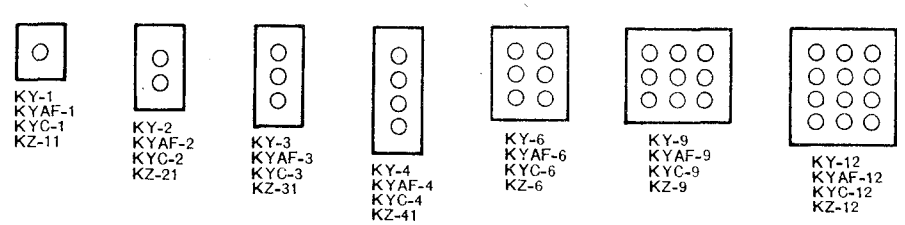
STAINLESS STEEL FLUSH PLATES

Flush plates accept Type K operators and contact blocks. Used with a standard 2 x 3 general purpose switch box, 2½ deep. Two Type K contact blocks mounted in tandem require a 3½ deep box. Although oiltight operators are used, an assembled station is not oiltight. Kits include flush plate, cover screws and a set of liners.

No. of Units	Type	Price
1	K25	$ 8.
2	K26	12.
3	K27	16.
4	K28	24.

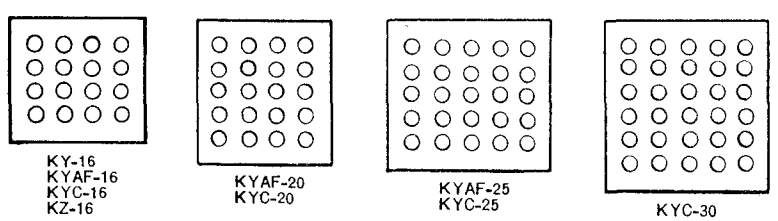
* Types KN-3 and KN-4 legend plates will not fit upright on these enclosures with their long axis vertical.
▲ For machine cavity mounting. Pull box not available.
● Type KN-1 legend plates will not fit on these enclosures.

Location of Control Units



KY-1 KYAF-1 KYC-1 KZ-11
KY-2 KYAF-2 KYC-2 KZ-21
KY-3 KYAF-3 KYC-3 KZ-31
KY-4 KYAF-4 KYC-4 KZ-41
KY-6 KYAF-6 KYC-6 KZ-6
KY-9 KYAF-9 KYC-9 KZ-9
KY-12 KYAF-12 KYC-12 KZ-12

Dimensions continued on page 335



KY-16 KYAF-16 KYC-16 KZ-16
KYAF-20 KYC-20
KYAF-25 KYC-25
KYC-30

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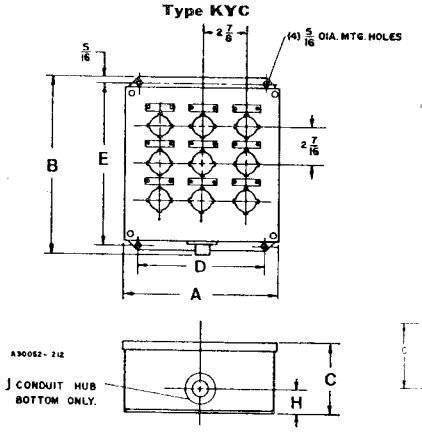
HEAVY DUTY CONTROL STATIONS
DIMENSIONS AND APPLICATION DATA — TYPE K

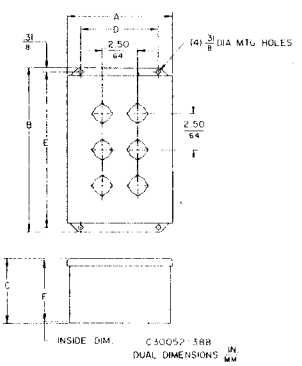
CLASS 9001

APPROXIMATE DIMENSIONS

Type KYC



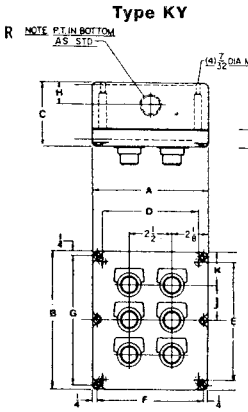
Type KYAF



No. of Units	Overall Dim. A	Overall Dim. B	Overall Dim. C	Mounting Dim. D	Mounting Dim. E	Conduit H	Conduit J
1	3½	8 11/32	3 5/8	1¾	7½	1 11/32	¾
2	3½	8 11/32	3 5/8	1¾	7½	1 11/32	¾
3	3½	10 25/32	3 5/8	1¾	9 15/16	1 11/32	¾
4	3½	13 7/32	3 5/8	1¾	12 3/8	1 11/32	¾
6	7 13/16	11 15/32	4 15/32	5/8	10 5/8	1 9/16	¾
9	10 7/16	11 15/32	4 15/32	8½	10 5/8	1 9/16	1
12	10 7/16	14 1/32	4 15/32	8½	13 1/16	1 9/16	1¼
16	13 1/16	14 1/32	4 15/32	11 1/8	13 1/16	1 9/16	1½
20	13 1/16	16 15/32	4 15/32	11 1/8	15½	1 9/16	1½
25	15 11/16	16 15/32	4 15/32	13¾	15½	1 9/16	(2)1½
30	15 11/16	18 29/32	4 15/32	13¾	17 15/16	1 9/16	(2)1½

NO. OF UNITS	OVERALL DIM A	OVERALL DIM B	OVERALL DIM C	MTG. DIM D	MTG. DIM E	INSIDE DIM F
1	4.18 106	5.24 133	3.59 91	2.25 57	4.62 117	3.37 86
2	4.18 106	7.74 197	3.59 91	2.25 57	7.12 181	3.37 86
3	4.18 106	10.24 260	3.59 91	2.25 57	9.62 244	3.37 86
4	4.18 106	12.74 324	3.59 91	2.25 57	12.12 308	3.37 86
6	7.43 189	11.37 289	4.50 114	1.50 140	10.75 273	4.25 108
9	9.68 246	11.37 289	4.50 114	7.75 197	10.75 273	4.25 108
12	9.68 246	13.87 352	4.50 114	7.75 197	13.25 337	4.25 108
16	11.93 303	13.87 352	4.50 114	10.00 254	13.25 337	4.25 108
20	11.93 303	16.37 416	4.50 114	10.00 254	15.75 400	4.25 108
25	14.18 360	16.37 416	4.50 114	12.25 311	15.75 400	4.25 108

Type KY



Type KZ

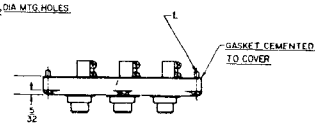


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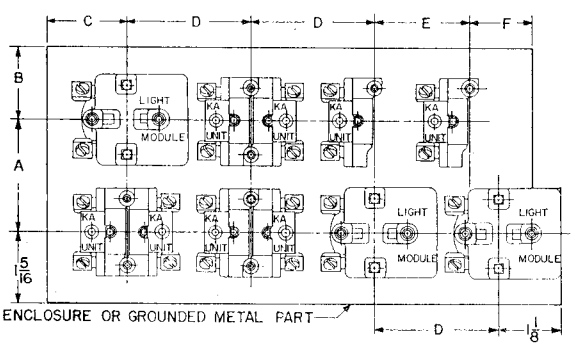
Table for Type KY and KZ

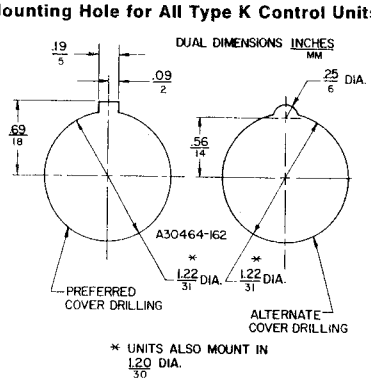
No. Of Units	Overall Dim. A	Overall Dim. B	Overall Dim. C	Mounting Dim. KY D	Mounting Dim. KY E	Mounting Dim. KZ F	Mounting Dim. KZ G	Conduit H	Conduit R	Other Dim. J	Other Dim. K	Other Dim. L
1	3⅝	4	3 17/32	3	2¾	3⅛	3½	1⅛	¾-14	—	2	10-24 x ⅝
2	3⅝	5¾	3 17/32	3	4½	3⅛	5¼	1⅛	¾-14	1¾	2	10-24 x ⅝
3	3⅝	7½	3 17/32	3	6¼	3⅛	7	1⅛	¾-14	1¾	2	10-24 x ⅝
4	3⅝	9¼	3 17/32	3	8	3⅛	8¾	1⅛	¾-14	1¾	2	10-24 x ⅝
6	6¾	8	3 27/32	5⅝	6⅜	6¼	7½	1⅜	¾-14	2	2	8-32
9	9¼	8	3 27/32	8⅛	6⅜	8¾	7½	1⅜	1-11½	2	2	8-32
12	9¼	10	4 5/32	8⅛	8⅜	8¾	9½	1 15/32	1¼-11½	2	2	8-32
16	11¾	10½	4 5/32	10⅝	9⅜	11¼	10	1 15/32	1½-11½	2	2¼	8-32

APPLICATION DATA



C30052-287

Mounting Hole for All Type K Control Units



HOLE PUNCH

The 1.22" diameter hole required to mount Type K operators may be cut with Greenlee knockout punch No. 730-S. The notch may be cut with Greenlee punch No. 730-K. Both punches are available through electrical wholesalers.

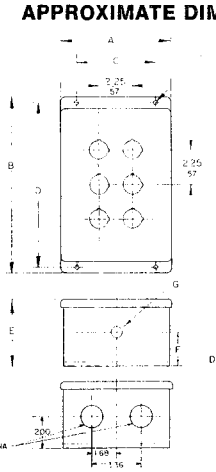
Operator Service Temperature Range:

−22° to + 140° Fahrenheit
−30° to + 60° Celsius

MINIMUM CENTERLINE SPACING FOR TYPE "K" CONTROL UNITS

Legend Plate	Operator	Spacing (Inches) A	B	C	D	E	F
KN-1	All	2¼	1⅜	1 7/16	2¼	2¼	1⅛
KN-2, 5	Standard Pushbutton	1¾	1 5/16	1 7/16	2¼	1 11/16	⅞
	1⅜" Dia. Mushroom B	1¾	1 5/16	1 7/16	2¼	1 11/16	⅞
	2¼" Dia. Mushroom B	2¼	1 5/16	1 7/16	2¼	2¼	1⅛
	Selector Switch Knobs	1¾	1 5/16	1 7/16	2¼	1 11/16	⅞
KN-3	Standard Pushbutton	2	1 5/16	1 7/16	2¼	1¾	⅞
	1⅜" Dia. Mushroom B	2	1 5/16	1 7/16	2¼	1¾	⅞
	2¼" Dia. Mushroom B	2¼	1 5/16	1 7/16	2¼	2¼	1⅛
	Selector Switch Knobs	2	1 5/16	1 7/16	2¼	1¾	⅞
KN-4	Standard Pushbutton	1 15/16	1 5/16	1 7/16	2¼	1⅞	⅞
	1⅜" Dia. Mushroom B	1 15/16	1 5/16	1 7/16	2¼	1⅝	⅞
	2¼" Dia. Mushroom B	2¼	1 5/16	1 7/16	2¼	2¼	1⅛
	Selector Switch Knobs	1 15/16	1 5/16	1 7/16	2¼	1⅞	⅞
KN-6	All	2⅜	1⅜	1 7/16	2¼	2¼	1⅛
KN-7	All	2½	1¾	1 7/16	2½	2½	1¼

APPROXIMATE DIMENSIONS — TYPE SKY



NO. OF UNITS	OVERALL DIM A	OVERALL DIM B	MTG DIM C	MTG DIM D	HEIGHT E	CONDUIT LOCATION F	CONDUIT SIZE G	MTG HOLE H
1	3.50 89	4.88 124	2.38 60.1	4.00 102	3.38 86	1.68 43	750 19	.25 6
2	3.50 89	7.12 181	2.38 60.1	6.25 159	3.38 86	1.68 43	750 19	.25 6
3	3.50 89	9.38 238	2.38 60.1	8.50 216	3.38 86	1.68 43	750 19	.25 6
4	7.38 187	7.50 191	4.00 102	6.75 171	4.81 122	2.00 51	750 19	.31 8
6	7.38 187	9.62 244	4.00 102	8.88 226	4.81 122	2.00 51	750 19	.31 8
9	9.38 238	11.62 295	6.00 152	10.75 273	4.25 108	1.75 44	1.00 25	.31 8
12	9.38 238	11.62 295	6.00 152	10.75 273	4.25 108	1.75 44	1.00 25	.31 8
16	11.38 289	13.62 346	8.00 203	12.75 324	5.25 133	2.00 51	1.50 38	.31 8
20	11.38 289	13.62 346	8.00 203	12.75 324	5.25 133	2.00 51	1.50 38	.31 8
25	13.25 337	15.38 391	10.00 254	14.62 371	6.38 162	2.00 51	1.50 38	.31 8

DUAL DIMENSIONS IN MM
C30464-152

SQD SLV_001113

CONTROL STATIONS AND OPERATORS — HEAVY DUTY

TYPE SK — CORROSION RESISTANT AND WATERTIGHT

CLASS 9001

Standard Assembled Stations — NEMA Type 4X (Glass Reinforced Thermoplastic)

No. of units	Legend Markings and Features	Type	Price	Assembled Station Consists of (one each unless noted): Enclosure	Operators	Protective Caps▲	Contact Blocks	Legend Plates
1	Start	SKY-101	$ 72.00	SKY-1	SKR-1B	KU-1	KA-1	SKN-801W
	Stop	SKY-103	66.00	SKY-1	SKR-1R	KU-2	KA-3	SKN-802R
	Stop (Lockout)	SKY-105	86.00	SKY-1	SKR-1R with K-5	KU-2	KA-3	SKN-802R
	Jog	SKY-107	72.00	SKY-1	SKR-1B	KU-1	KA-1	SKN-818W
	Man-Auto (Sel. Switch)	SKY-108	80.00	SKY-1	SKS-11B	KU-17	KA-1	SKN-843W
	Off-On (Sel. Switch)	SKY-110	80.00	SKY-1	SKS-11B	KU-17	KA-1	SKN-844W
	Hand-Off-Auto (Sel. Switch)	SKY-111	80.00	SKY-1	SKS-43B	KU-17	KA-1	SKN-860W
2	Start-Stop	SKY-201	98.00	SKY-2	SKR-1B, SKR-1R	KU-1, KU-2	KA-1, KA-3	SKN-801W, SKN-802R
	Start-Stop (Lockout on Stop)	SKY-203	118.00	SKY-2	SKR-1B, SKR-1R with K-5	KU-1, KU-2	KA-1, KA-3	SKN-801W, SKN-802R
	Forward-Reverse	SKY-204	104.00	SKY-2	(2) SKR-1B	(2) KU-1	(2) KA-1	SKN-806W, SKN-807W
	Up-Down	SKY-205	104.00	SKY-2	(2) SKR-1B	(2) KU-1	(2) KA-1	SKN-811W, SKN-810W
	Open-Close	SKY-206	104.00	SKY-2	(2) SKR-1B	(2) KU-1	(2) KA-1	SKN-809W, SKN-808W
3	Forward-Reverse-Stop	SKY-301	170.00	SKY-3	(2) SKR-1B, SKR-1R	(2) KU-1, KU-2	(2) KA-1, KA-3	SKN-806W, SKN-807W, SKN-802R
	Up-Down-Stop	SKY-302	170.00	SKY-3	(2) SKR-1B, SKR-1R	(2) KU-1, KU-2	(2) KA-1, KA-3	SKN-811W, SKN-810W, SKN-802R
	Open-Close-Stop	SKY-303	170.00	SKY-3	(2) SKR-1B, SKR-1R	(2) KU-1, KU-2	(2) KA-1, KA-3	SKN-809W, SKN-808W, SKN-802R
	High-Low-Stop	SKY-304	170.00	SKY-3	(2) SKR-1B, SKR-1R	(2) KU-1, KU-2	(2) KA-1, KA-3	SKN-814W, SKN-815W, SKN-802R
	Start-Jog-Stop	SKY-305	170.00	SKY-3	(2) SKR-1B, SKR-1R	(2) KU-1, KU-2	(2) KA-1, KA-3	SKN-801W, SKN-818W, SKN-802R
	Red 120 VAC Pilot Light-Start-Stop	SKY-315A	192.80	SKY-3	SKP-1R6, SKR-1B, SKR-1R	KU-27, KU-1, KU-2	KA-1, KA-3	SKN-801W, SKN-802R

▲Must be installed to comply with NEMA Type 4X rating.

GLASS POLYESTER ENCLOSURES ONLY

(For Customer Assembly)

No. of Units	Type	Price
1	SKY-1	$ 40.
2	SKY-2	40.
3	SKY-3	80.
4	SKY-4	80.
6	SKY-6	200.
9	SKY-9	248.
12	SKY-12	300.
16	SKY-16	396.
20	SKY-20	440.
25	SKY-25	560.

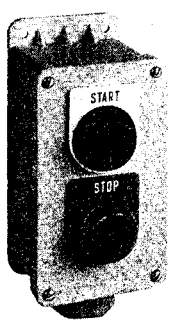
Custom Built Assembled Stations

Ordering Information:

1. Specify the enclosure required by adding "00" to the appropriate Type number from the table at left (example: a custom assembled 2 unit station requires enclosure type SKY-200).
2. Specify Type SK non-metallic operators and Type SKN legend plates from tables below.
3. Specify Type K contact blocks, protective caps, light modules and other accessories from Pages 319 through 332.
4. Orders must include a sketch or key sheet showing the desired operator locations.

Pricing Information:

The complete price of a custom assembled station is the sum of the price of the enclosure (from the table at left) plus the prices of all control units and legend plates specified. There is no charge for assembly.



Type SKY-201

TYPE SK NON-METALLIC PUSH BUTTON OPERATORS AND PILOT LIGHTS•

Description	Type	Price
Standard Push Button, Universal	SKR-1U	$10.80
Illuminated Push Button 120 VAC, Red	SK2L1R	42.80
Pilot Light, 120 VAC, Red	SKP1R9	42.80

TYPE SK NON-METALLIC SELECTOR SWITCH OPERATORS•

Positions	Description	Type	Price
2	Maintained, Black	SKS-11B	$14.80
3	Maintained, Black	SKS-43B	14.80
4	Maintained, Black	SKS-88B	14.80

• Additional Type SK operators are available. From Pages 319-329, choose operator required and add "S" before the Type number, no price change. (Example: SK equivalent of KR-1B would be SKR-1B, KS-43B would be SKS-43B). Operators currently **not** available as Type SK are: KR-4 series, KR-5 series, KR-24 series, KR-25 series, KR-20, KR-6 series, KR-7 series, KR-67 series, KR-9 series, KR11U, KR-12U, K30 thru K73 Joy Sticks, KQ, KR Key Operated Push Buttons, KS Key Operated Selector Switches, K20 thru K23 Potentiometer Operators, K-15 and K-8.

Standard Legend Plates

Standard Markings	Type*	Price	Standard Markings	Type*	Price
Blank-White	SKN-800W	$1.20	Fast	SKN-812W	$1.20
Blank-Red	SKN-800R		Slow	SKN-813W	
Start	SKN-801W		High	SKN-814W	
Stop	SKN-802R		Low	SKN-815W	
On	SKN-803W		Jog	SKN-818W	
Off	SKN-804R		Reset	SKN-823W	
Emerg. Stop	SKN-805R		Run	SKN-824W	
Forward	SKN-806W		For-Rev	SKN-839W	
Reverse	SKN-807W		Jog-Run	SKN-842W	
Close	SKN-808W		Man-Auto	SKN-843W	
Open	SKN-809W		Off-On	SKN-844W	
Down	SKN-810W		Safe-Run	SKN-849W	
Up	SKN-811W		Up-Down	SKN-853W	
			Hand-Off-Auto	SKN-860W	

Non-Standard Legend Plates with Special Legend Marking

(Specify marking required)

Background Color	Type*	Price
White	SKN-899W	$5.20
Red	SKN-899R	

Maximum number of lines for Type SKN legend plates is 2, with a maximum of 14 characters or spaces per line.

*Legend plates with Type numbers ending in "W" have white backgrounds with black lettering and legend plates with Type numbers ending in "R" have red backgrounds with white lettering.

APPLICATION DATA

Type SK operators are NEMA 4 (watertight) without the uses of protective caps.

Type SK operators are NEMA 4X (corrosion resistant) only if Protective Caps are used. Type SK operators are supplied with metal ring nuts.

NEMA 4X control stations are designed for use in areas where they might be exposed to corrosive liquids.

Type SKY enclosures are made of a lightweight glass reinforced thermoplastic, with a neoprene gasket for exclusion of dust, liquids or oil. The standard enclosure color is light gray. Use of non-metallic Type SK operators eliminates the need for ground provision. Conduit hub as shown above is included as standard.

Type SKN legend plates are made of a high impact styrene. Standard legends are hot stamped, but special legends can be engraved on blank legend plates (Types SKN-800W or SKN-800R) with standard engraving tools. The depressions can then be counter-filled with a wipe-on paint stick.

DIMENSIONS: See page 335.

SQD SLV_001114

COMPACT OILTIGHT CONTROL UNITS

PILOT LIGHTS, PUSH-TO-TEST AND REMOTE TEST PILOT LIGHTS — TYPE J

CLASS 9001

APPLICATION DATA

Type J compact pilot lights are designed to be mounted in a .69" (11/16") diameter mounting hole — see dimensions below. For colors other than listed, order the pilot light without color cap (example: Type JP1) and order the separate color cap from the table below.

Type J pilot light terminals will accept up to two #14 wires.

Type JT push-to-test pilot lights have a contact block built into the encapsulated body.

Type JTR remote test pilot lights have dual inputs for one-push remote testing — all you need is a push button with a current rating equal to the total lamp draw as indicated in the table below. Example: Ten Type JTR-38 have a total lamp draw of .25 amps (10 × .025 A).

Remote test lights can also be energized from two separate input signals of the same voltage and polarity, by wiring the "Test" terminal to the second input signal.

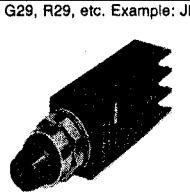
Description	Style	Voltage and Frequency	Without Color Cap Type	Price	With Red Color Cap Type*	With Green Color Cap Type*	Price	Lamp
Standard Pilot Light	Transformer	110-120V., 50-60 Hz	JP-1	**$40.00**	JP-1R29	JP-1G29	**$42.80**	GE755
	Full Voltage	6V., AC or DC	JP-31	**32.00**	JP-31R29	JP-31G29	**34.80**	GE755
		12V., AC or DC	JP-32	**32.00**	JP-32R29	JP-32G29	**34.80**	Syl. 12MB
		24V., AC or DC	JP-34	**32.00**	JP-34R29	JP-34G29	**34.80**	Syl. 24MB
		28V., AC or DC	JP-35	**32.00**	JP-35R29	JP-35G29	**34.80**	Syl. 28MB
		48V., AC or DC	JP-36	**32.00**	JP-36R29	JP-36G29	**34.80**	Syl. 48MB
		60V., AC or DC	JP-37	**32.00**	JP-37R29	JP-37G29	**34.80**	Syl. 60MB
		120V., AC or DC	JP-38	**32.00**	JP-38R29	JP-38G29	**34.80**	Syl. 120MB
Push-To-Test Pilot Light	Transformer	110-120V., 50-60 Hz.	JT-1	**52.00**	JT-1R29	JT-1G29	**54.80**	GE755
	Full Voltage	6V., AC or DC	JT-31	**44.00**	JT-31R29	JT-31G29	**46.80**	GE755
		12V., AC or DC	JT-32	**44.00**	JT-32R29	JT-32G29	**46.80**	Syl. 12MB
		24V., AC or DC	JT-34	**44.00**	JT-34R29	JT-34G29	**46.80**	Syl. 24MB
		28V., AC or DC	JT-35	**44.00**	JT-35R29	JT-35G29	**46.80**	Syl. 28MB
		48V., AC or DC	JT-36	**44.00**	JT-36R29	JT-36G29	**46.80**	Syl. 48MB
		60V., AC or DC	JT-37	**44.00**	JT-37R29	JT-37G29	**46.80**	Syl. 60MB
		120V., AC or DC	JT-38	**44.00**	JT-38R29	JT-38G29	**46.80**	Syl. 120MB
Remote Test Pilot Light	Resistor	6V., AC	JTR-31	**52.00**	JTR-31R29	JTR-31G29	**54.80**	G.E. 1490
	Full Voltage	12V., AC	JTR-32	**52.00**	JTR-32R29	JTR-32G29	**54.80**	Syl. 12MB
		24V., AC	JTR-34	**52.00**	JTR-34R29	JTR-34G29	**54.80**	Syl. 24MB
		28V., AC	JTR-35	**52.00**	JTR-35R29	JTR-35G29	**54.80**	Syl. 28MB
		48V., AC	JTR-36	**52.00**	JTR-36R29	JTR-36G29	**54.80**	Syl. 48MB
		60V., AC	JTR-37	**52.00**	JTR-37R29	JTR-37G29	**54.80**	Syl. 60MB
		120V., AC	JTR-38	**52.00**	JTR-38R29	JTR-38G29	**54.80**	Syl. 120MB

* Supplied with "plastic" color caps. If "glass" color caps are desired, substitute G26, R26, etc., for G29, R29, etc. Example: JP1G26, JP1R26, etc.

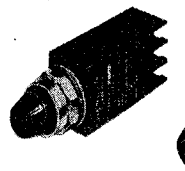
Accessories and Modifications

Color Caps

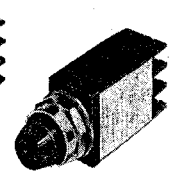
Color	Type J Plastic	Type J Glass	Price
Red	R-29	R-26	**$2.80**
Green	G-29	G-26	
Amber	A-29	A-26	
Blue	L-29	L-26	
Clear	C-29	C-26	
White	W-29	W-26	
Yellow	Y-29	Y-26	



Type JP-1R29



Type JT-1R29



Type JTR-38R29

Legend Plates

Description			Type	Price
	Blank	Black Field	JN-100	**$1.20**
		Red Field	JN-100R	**1.20**
	Special Marking (Specify Marking)	Black Field	JN-199	**5.20**
		Red Field	JN-199R	**5.20**
	Blank	Aluminum Field	JN-700	**1.20**
	Special Marking (Specify Marking)	Aluminum Field	JN-799	**5.20**

Maximum Number of Lines and Characters For Type JN Legend Plates

Type	JN-1	JN-7
Maximum Number of Characters Per Line	8	16
Maximum Number of Lines	2	2

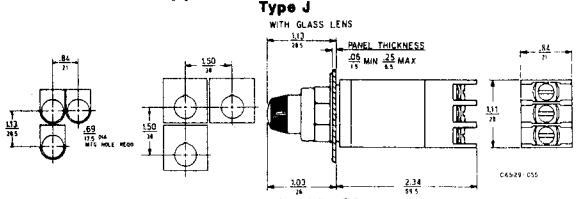
Replacement Lamps

Manufacturer Part Number	Rated Voltage	Rated Current Draw	Square D Part Number	Price (D14A)
GE 755	6.3V	.150A	25501-01020	**$3.00**
G.E. 1490	3V	.160A	25501-01003	
Syl. 12MB	12V	.170A	25501-01022	
Syl. 24MB	24V	.073A	25501-01023	
Syl. 28MB	28V	.040A	25501-01024	
Syl. 48MB	48V	.053A	25501-01025	
Syl. 60MB	60V	.050A	25501-01026	
Syl. 120MB	120V	.025A	25501-01027	

NOTE: Octagonal ring nuts can be tightened with standard tools, or use the reverse end of Square D wrench Class 9001 Type K-95, see page 329.

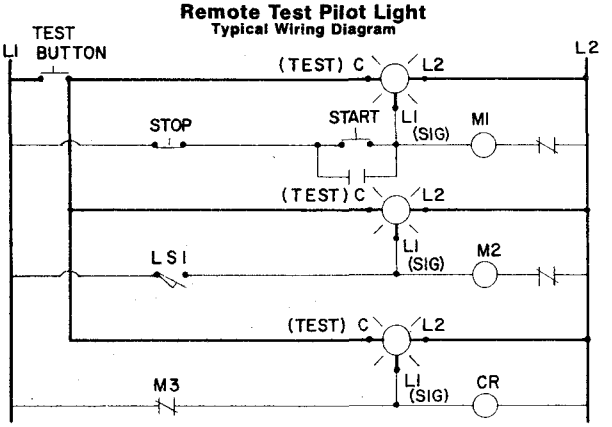
Approximate Dimensions

Type J



Remote Test Pilot Light

Typical Wiring Diagram



SQD SLV_001115

CONTROL STATIONS—HEAVY DUTY

TYPE K—SECURITY CONTROL STATIONS

CLASS 9001

SECURITY CONTROL STATIONS

Application: Control of overhead doors in shopping centers, warehouses, and in residential, commercial, and industrial developments.

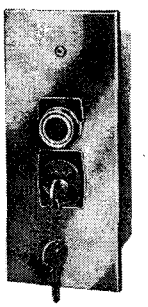
Covers are held securely in place with allen screws. A mechanical interlock prevents removal of the cover, even if the allen screws are removed. A key is required to raise or lower the door and this same key releases the interlock to permit removal of the cover. Locks are builders hardware types, which permits keying station to the rest of the locks in a development.

Stations with Best Lock Company locks give extra flexibility and security as lock cores only can be changed instead of re-keying. These will find wide acceptance in new developments as the contractor can use his construction cores during construction, and the owner can insert different cores (and keys) into the locks when he takes over the building — no need to install new stations or change out entire lock. Cores can be furnished or omitted as indicated. Order replacement cores from the local Best Universal Lock Company representative. Square D is not authorized to supply cores only.

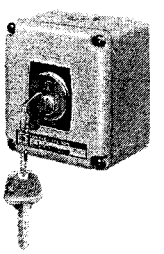
STANDARD FEATURES — ALL STATIONS

- All locks are **random keyed**. Keyed alike, master keying, etc. are available — consult local Square D Field Office.
- Lock nameplate markings: OPEN - CLOSE
- Key operators are all spring return from both sides to center, maintained contact not available. Key withdrawal is in the center position only.
- Electrical Ratings.
  Key operator — same as Class 9007 Type AO-2. One Type AO-2 is used for open, one for closed.
  Pushbutton — same as Class 9001 Type KA-1. (Except Type KZC stations rated 300 volts maximum.)

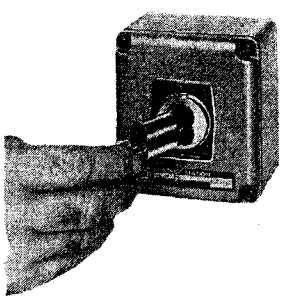
Description	Type of Lock	Lock Finish	Special Features	Cast Aluminum Enclosure▲ Type	Price	Satin Chrome Finish Flush Mtd. W/Box Type	Price
Key Operator Only	Corbin	Chrome		KY-198	**$132.**	KZC-198	**$152.**
	Yale	Brass		KY-199	**132.**	KZC-199	**152.**
	Best	Chrome	Complete With Core* (6 Tumbler Pins)	KY-197	**188.**	KZC-197	**208.**
	Best	Chrome	Lock Cylinder Only — Core Omitted■ (6 Tumbler Pins)	KY-196	**164.**	KZC-196	**184.**
	Best	Chrome	Complete With Core* (7 Tumbler Pins)	KY-195	**192.**	KZC-195	**212.**
	Best	Chrome	Lock Cylinder Only — Core Omitted■ (7 Tumbler Pins)	KY-194	**168.**	KZC-194	**188.**
	Schlage	Chrome		KY-193	**132.**	KZC-193	**152.**
	Sargent	Chrome	Maximum Security Cylinder	KY-192	**240.**	KZC-192	**260.**
Key Operator With Stop Button	Corbin	Chrome		KY-298	**160.**	KZC-298	**180.**
	Yale	Brass		KY-299	**160.**	KZC-299	**180.**
	Best	Chrome	Complete With Core* (6 Tumbler Pins)	KY-297	**216.**	KZC-297	**236.**
	Best	Chrome	Lock Cylinder Only — Core Omitted■ (6 Tumbler Pins)	KY-296	**192.**	KZC-296	**212.**
	Best	Chrome	Complete With Core* (7 Tumbler Pins)	KY-295	**220.**	KZC-295	**240.**
	Best	Chrome	Lock Cylinder Only — Core Omitted■ (7 Tumbler Pins)	KY-294	**196.**	KZC-294	**216.**
	Schlage	Chrome		KY-293	**160.**	KZC-293	**180.**
	Sargent	Chrome	Maximum Security Cylinder	KY-292	**268.**	KZC-292	**288.**



Type KZC-299

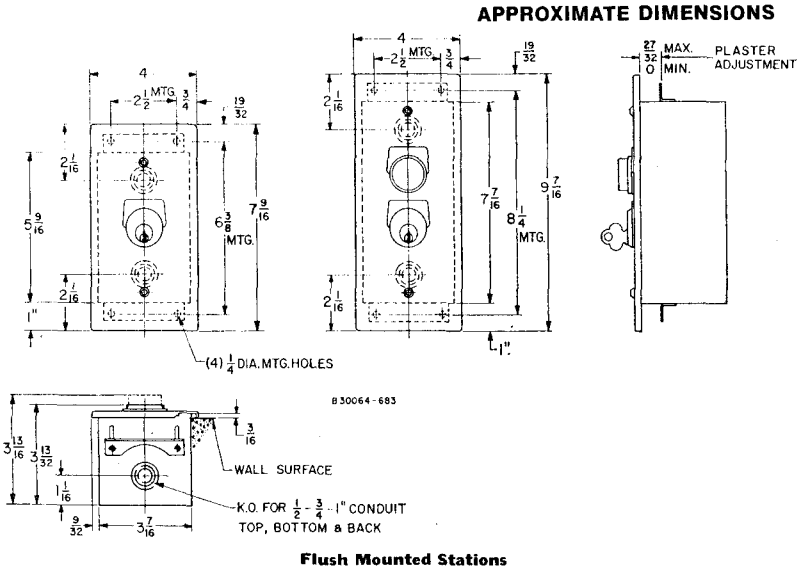


Type KY-192

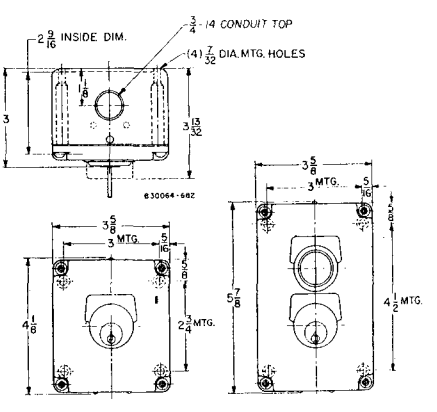


Type KY-195
With Core Removed

APPROXIMATE DIMENSIONS



Flush Mounted Stations



Surface Mounted Stations

SQD SLV_001116

MINIATURE OILTIGHT CONTROL UNITS

MOMENTARY PUSH BUTTONS — NON-ILLUMINATED — TYPE L

CLASS 9001

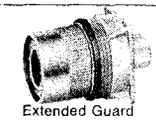


APPLICATION DATA

Type L operators are suitable for use indoors on NEMA 13 oiltight and dusttight enclosures to prevent entry of lint, dust, oil, coolant and other non-corrosive industrial liquids. For NEMA 4 watertight enclosures or for applications where dust, chips, shavings, ice or other foreign materials can build up around the external operator, a protective cap must be used, see page 350 (protective caps available for round operators only). Guards, bezels, inserts and color caps are field convertible by ordering the required guard, bezel, insert or color cap from tables below. Any round push button can be converted to a mushroom operator by ordering the mushroom button from table below. **Non-illuminated operators can be converted to illuminated operators** by adding a color cap and light module. **Round operators can be converted to square** by adding a conversion kit and the desired insert kit from the tables below. All contact blocks are single circuit. A maximum of four contact blocks, NO or NC, can be mounted on non-illuminated operators and a maximum of two contact blocks, NO or NC, can be mounted on illuminated operators.

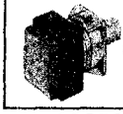
MOMENTARY PUSH BUTTON OPERATORS

ROUND OPERATORS — Legend Plate and Contact Block Not Included.

Description	Insert Color	Type	Price
 Full Guard	**Universal** — includes one of each color insert from table below.	LRR-1U	**$10.80**
	Black	LRR-1B	**10.80**
	Red	LRR-1R	**10.80**
	Other Colors	LRR-1*	**10.80**
 Extended Guard	**Universal** — includes one of each color insert from table below.	LRR-2U	**10.80**
	Black	LRR-2B	**10.80**
	Red	LRR-2R	**10.80**
	Other Colors	LRR-2*	**10.80**
 No Guard	**Universal** — includes one of each color insert from table below.	LRR-3U	**10.80**
	Black	LRR-3B	**10.80**
	Red	LRR-3R	**10.80**
	Other Colors	LRR-3*	**10.80**
 Mushroom Button	1" Dia. Black	LRR-4B	**12.80**
	1" Dia. Red	LRR-4R	**12.80**
	1" Dia. Other Colors	LRR-4▲	**12.80**
	1⅜" Dia. Black	LRR-5B	**12.80**
	1⅜" Dia. Red	LRR-5R	**12.80**
	1⅜" Dia. Other Colors	LRR-5▲	**12.80**

* or ▲ Complete Type number by adding color code letter from tables below.

SQUARE OPERATORS — Blank Legend Insert Included — Contact Block Not Included.

Description	Button Color	Type	Price
 Full Guard	Green	LSR-1G	
	Red	LSR-1R	
	Amber	LSR-1A	**$10.80**
	Blue	LSR-1L	
	Clear	LSR-1C	
 No Guard	Red	LSR-3R	
	Green	LSR-3G	
	Amber	LSR-3A	**10.80**
	Blue	LSR-3L	
	Clear	LSR-3C	
 Domed Button (Mushroom)	Red	LSR-4R	
	Green	LSR-4G	
	Amber	LSR-4A	**12.80**
	Blue	LSR-4L	
	Clear	LSR-4C	

ACCESSORIES AND MODIFICATIONS — ROUND

COLOR INSERTS — NON-ILLUMINATED OPERATORS
Orders must specify quantity of 10 or multiples of 10.

Color	* Code	Type	Price Each
Black	B	LR16B	**$ .20**
Red	R	LR16R	**.20**
Green	G	LR16G	**.20**
Brown	N	LR16N	**.20**
Yellow	Y	LR16Y	**.20**
Orange	S	LR16S	**.20**
Blue	L	LR16L	**.20**
White	W	LR16W	**.20**
Universal (All Colors)	U	LR16U	**1.60**

Example: Green full guard push button is Type LRR1G.

RING NUTS

Used On	Type	Price
LRR-1	LR-41	**$ .80**
LRR-2	LR-42	**.80**
LRR-3 LRR-4 (No Guard)	LR-40	**.80**
LRR-4 (Full Guard)	LR-48	**16.00**
LRR-5 (No Guard)	LR-44	**.80**

MUSHROOM BUTTONS — ROUND OPERATORS

Color	▲ Code	Type 1" Dia.	Type 1⅜" Dia.	Price
Black	B	LR-70B	LR-17B	**$4.80**
Red	R	LR-70R	LR-17R	
Green	G	LR-70G	LR-17G	
Yellow	Y	LR-70Y	LR-17Y	
Blue	L	LR-70L	LR-17L	
White	W	LR-70W	LR-17W	
Amber	A	LR-70A	LR-17A	

Example: Amber 1⅜" Dia. mushroom button operator is Type LRR5A

COMMON LEGEND PLATES — Page 350.
OPERATOR DIMENSIONS — Page 353.

ACCESSORIES AND MODIFICATIONS — SQUARE

ACCESSORIES FOR CONVERSION

From Square to Round



Order: Proper Ring Nut from the Ring Nuts Table and a Round Conversion Kit or the Proper Mushroom Button from the Mushroom Button Table.

Description	Type	Price
Round Conversion Kit (Standard Button and one Universal Insert Kit)	LR-27	**$2.80**

From Round to Square



Order: Square Conversion Kit and an insert kit from the table below.

Description	Type	Price
Square Conversion Kit (Bezel, Ring Nut, Spacers)	LS-70	**$.80**
Bezel only	LS-60	**.40**
Square Ring Nut only	LS-40	**.40**
Spacer only	LW-2	N/C

INSERT KITS
(includes button, blank legend insert and colored button cover)



Color	Full Guard Type	No Guard Type	Price	Domed Button Type	Domed Button Price
Green	LS-71G	LS-72G	**$2.80**	LS-73G	**$4.80**
Red	LS-71R	LS-72R		LS-73R	
Amber	LS-71A	LS-72A		LS-73A	
Blue	LS-71L	LS-72L		LS-73L	
Clear	LS-71C	LS-72C		LS-73C	

STANDARD CONTACT BLOCKS (For Round or Square)

Description	With Pressure Wire Connectors Type	With Slip-On Terminals Type	Price
Single Circuit Normally Closed	LA-1	LB-1	**$6.00**
Single Circuit Normally Open	LA-21	LB-21	**$6.00**

CONTACT BLOCKS ASSEMBLED TO OPERATOR (Round or Square)

Contact Block and Position● I	II	III	IV	Suffix (Add to Operator Type No.)	Price Adder
LA-1	....	....	....	W1	**$6.00**
LB-1	....	....	....	W2	**6.00**
LA-21	....	....	....	W3	**6.00**
LB-21	....	....	....	W4	**6.00**

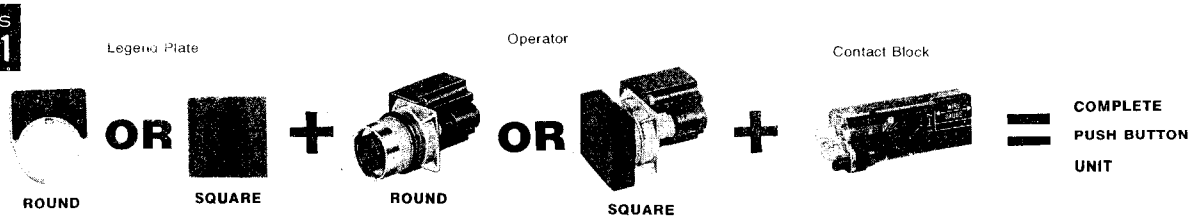
●For Contact Block Position, See Page 351.
Example: Class 9001 Type LRRIB-W3.
Price is **$16.80** ($10.80 plus $6.00)
For other combinations, See Page 351.

SQD SLV_001117

MINIATURE OILTIGHT CONTROL UNITS

TYPE L — MOMENTARY PUSH BUTTONS — ILLUMINATED

CLASS 9001



APPLICATION DATA

Type L operators are suitable for use indoors on NEMA 13 oiltight and dusttight enclosures to prevent entry of lint, dust, oil, coolant and other non-corrosive industrial liquids. For NEMA 4 watertight enclosures or for applications where dust, chips, shavings, ice or other foreign material can build up around the external operator, a protective cap must be used, see page 350 (protective caps available for round operators only).

Guards, bezels, inserts and color caps are field convertible by ordering the required guard, bezel, insert or color cap from tables below and on page 339. Any round push button can be converted to a mushroom operator by ordering the mushroom button from table below. **Non-illuminated operators can be converted to illuminated operators** by adding a color cap and light module. **Round operators can be converted to square** by adding a conversion kit from page 339 and the desired insert kit from the table below. All contact blocks are single circuit. A maximum of two contact blocks, NO or NC, can be mounted on illuminated operators.

MOMENTARY PUSH BUTTON OPERATORS — ILLUMINATED

ROUND OPERATORS — Legend Plates and Contact Blocks Not Included.

Description	Voltage	Color Cap	Type: Pressure Conn.	Type: Slip-On Conn.	Price
 Full Guard	120 Volt 60 Hertz Transformer Style	Red	LR1L-A1R	LR1L-B1R	**$42.80**
		Green	LR1L-A1G	LR1L-B1G	**42.80**
		Other	LR1L-A1✱	LR1L-B1✱	**42.80**
	Other Voltages	Red	LR1L-A●R	LR1L-B●R	**42.80★**
		Other	LR1L-A●✱	LR1L-B●✱	**42.80★**
 No Guard	120 Volt 60 Hertz Transformer Style	Red	LR2L-A1R	LR2L-B1R	**42.80**
		Green	LR2L-A1G	LR2L-B1G	**42.80**
		Other	LR2L-A1✱	LR2L-B1✱	**42.80**
	Other Voltages	Red	LR2L-A●R	LR2L-B●R	**42.80★**
		Other	LR2L-A●✱	LR2L-B●✱	**42.80★**
 1" Dia. Mushroom	120 Volt 60 Hertz Transformer Style	Red	LR4L-A1R	LR4L-B1R	**44.80**
		Green	LR4L-A1G	LR4L-B1G	**44.80**
		Other	LR4L-A1✱	LR4L-B1✱	**44.80**
	Other Voltages	Red	LR4L-A●R	LR4L-B●R	**44.80★**
		Other	LR4L-A●✱	LR4L-B●✱	**44.80★**
 1⅜" Dia. Mushroom	120 Volt 60 Hertz Transformer Style	Red	LR3L-A1R	LR3L-B1R	**44.80**
		Green	LR3L-A1G	LR3L-B1G	**44.80**
		Other	LR3L-A1✱	LR3L-B1✱	**44.80**
	Other Voltages	Red	LR3L-A●R	LR3L-B●R	**44.80★**
		Other	LR3L-A●✱	LR3L-B●✱	**44.80★**

● Complete Type number by adding light module code number from the "Other Voltages" table.
✱ Complete Type number by adding the color code letter from the "Accessories" table below.
★ Adjust price per "Other Voltages" table.

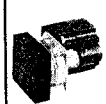
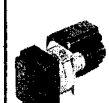
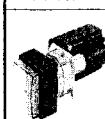
ACCESSORIES AND MODIFICATIONS — ROUND COLOR CAPS AND MUSHROOM CAPS

Color	Code ✱	Type: Color Cap	Price	Type: 1" Dia. Mushroom	Type: 1⅜" Dia. Mushroom	Price
Red	R	LR-57R		LR-70R	LR-17R	
Green	G	LR-57G		LR-70G	LR-17G	
Amber	A	LR-57A	**$2.80**	LR-70A	LR-17A	**$4.80**
Blue	L	LR-57L		LR-70L	LR-17L	
White	W	LR-57W		LR-70W	LR-17W	
Yellow	Y	LR-57Y		LR-70Y	LR-17Y	

✱Example: Amber full guard illuminated push button (120V transformer style) is Type LR1L-A1A.

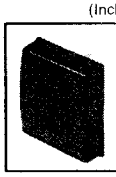
Legend Plates — See Page 350.
Ring Nuts — See Page 339.
Conversion Kits — See Page 339.
Contact Blocks — See Page 351.
Operator Dimensions — See Page 353.

SQUARE OPERATORS — Blank Legend Plate Included — Contact Blocks Not Included.

Description	Voltage	Color Cover	Type: Pressure Conn.	Type: Slip-On Conn.	Price
 Full Guard	120 Volt 60 Hertz Transformer Style	Green	LS1L-A1G	LS1L-B1G	**$42.80**
		Red	LS1L-A1R	LS1L-B1R	**42.80**
		Amber	LS1L-A1A	LS1L-B1A	**42.80**
		Blue	LS1L-A1L	LS1L-B1L	**42.80**
		Clear	LS1L-A1C	LS1L-B1C	**42.80**
	Other Voltages	None†	LS1L-A●	LS1L-B●	**40.00★**
		Green	LS1L-A●G	LS1L-B●G	**42.80★**
		Red	LS1L-A●R	LS1L-B●R	**42.80★**
 No Guard	120 Volt 60 Hertz Transformer Style	Red	LS3L-A1R	LS3L-B1R	**42.80**
		Green	LS3L-A1G	LS3L-B1G	**42.80**
		Amber	LS3L-A1A	LS3L-B1A	**42.80**
		Blue	LS3L-A1L	LS3L-B1L	**42.80**
		Clear	LS3L-A1C	LS3L-B1C	**42.80**
	Other Voltages	Red	LS3L-A●R	LS3L-B●R	**42.80★**
		Green	LS3L-A●G	LS3L-B●G	**42.80★**
 Domed Button (Mushroom)	120 Volt 60 Hertz Transformer Style	Red	LS4L-A1R	LS4L-B1R	**44.80**
		Green	LS4L-A1G	LS4L-B1G	**44.80**
		Amber	LS4L-A1A	LS4L-B1A	**44.80**
		Blue	LS4L-A1L	LS4L-B1L	**44.80**
		Clear	LS4L-A1C	LS4L-B1C	**44.80**
	Other Voltages	Red	LS4L-A●R	LS4L-B●R	**44.80★**
		Green	LS4L-A●G	LS4L-B●G	**44.80★**

● Complete Type number by adding light module code number from the "Other Voltages" table.
★ Adjust price per "Other Voltages" table.
† This operator can be used to get any of the square operators in the above table by adding an insert kit from the table below.

ACCESSORIES AND MODIFICATIONS — SQUARE INSERT KITS
(Includes button, blank legend insert and colored button cover)

 Color	Full Guard Type	No Guard Type	Price	Domed Button Type	Domed Button Price
Green	LS-71G	LS-72G		LS-73G	
Red	LS-71R	LS-72R		LS-73R	
Amber	LS-71A	LS-72A	**$2.80**	LS-73A	**$4.80**
Blue	LS-71L	LS-72L		LS-73L	
Clear	LS-71C	LS-72C		LS-73C	

OTHER VOLTAGES

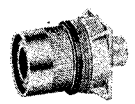
To order round or square illuminated push button operators with voltages other than 120 Volt, 60 Hertz transformer style, insert the Code ● No. from the table at the right in the operator Type number. Price deductions ★ for full voltage or resistor style operators are as shown in the table.
Example: A full guard illuminated push button with a 24 volt full voltage light module is Type LR1LA34, priced at **$32. ($40. minus $8).** For replacement lamps and rated VA see page 348.

Description	Voltage & Frequency	Operator Assembled With Any Light Module: Code ● No.	Operator Assembled With Any Light Module: Price★ Adjustment
Transformer	110-120V, 50-60 Hz.	1	No Change
	208-220V, 50-60 Hz.	3	
	220-240V, 50-60 Hz.	7	
	277V, 50-60 Hz.	8	
Resistor	48V, AC or DC	36	Deduct **$8.**
	60V, AC or DC	37	
	120V, AC or DC	38	
Full Voltage	6V, AC or DC	31	Deduct **$8.**
	12V, AC or DC	32	
	24V, AC or DC	34	
	28V, AC or DC	35	

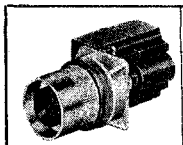
SQD SLV_001118

ALTERNATE ACTION (Push-on, Push-off) — ROUND

Non-illuminated

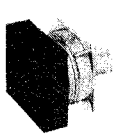
	Description	Type	Price
 Full Guard	Full Guard	LRR-361✱	$26.80
	Extended Guard	LRR-362✱	26.80
 Mushroom Button	No Guard	LRR-363✱	26.80
	1" Dia. Mushroom	LRR-364◐	28.80
	1⅜" Dia. Mushroom	LRR-365◐	28.80

Illuminated

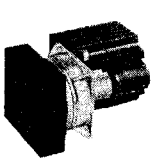
	Description	Type	Price
 Full Guard	Full Guard	LR-361L■●◐	$58.80★
	Extended Guard	LR-362L■●◐	58.80★
 Mushroom Button	No Guard	LR-363L■●◐	58.80★
	1" Dia. Mushroom	LR-364L■●◐	60.80★
	1⅜" Dia. Mushroom	LR-365L■●◐	60.80★

ALTERNATE ACTION (Push-on, Push-off) — SQUARE

Non-illuminated

	Description	Type	Price
 Full Guard	Full Guard	LSR-361▲	$26.80
	No Guard	LSR-363▲	26.80
	Dome Button	LSR-364▲	28.80

Illuminated

	Description	Type	Price
 Full Guard	Full Guard	LS-361L■●▲	$58.80★
	No Guard	LR-363L■●▲	58.80★
	Dome Button	LS-364L■●▲	60.80★

✱ Complete Type number by adding the proper color code letter from the color insert table on Page 339.
■ Insert "A" for pressure wire connectors or "B" for slip-on terminals on the light module.
● Complete Type number by adding light module code number from Page 347.
◐ Complete Type number by adding the proper color code number from the Round color cap table on Page 340.
▲ Complete Type number by adding the proper color code number from the Square insert table on Page 340.

Voltage Code and Replacement Lamps for Multi-field Operators

Voltage	Voltage Code #	Lamp Number	Square D Part Number	Lamp Price (D14A)
6 Volts	51	CM7-7683	25501-04042	$4.00
12 Volts	52	CM7-8097	25501-04043	4.00
24 volts	54	CM7-7839	25501-04044	4.00

Contact Blocks — See Page 351
Legend Plates — See Page 350

DUAL BUTTON OPERATOR — Non-illuminated

Both momentary non-interlocked buttons. Blank legend inserts included.

Description	Type	Price
 Two Full Guard Buttons	LSR-60‡‡	$21.60
 One Full Guard and One No Guard Buttons	LSR-61‡△	21.60
 Two No Guard Buttons	LSR-62△△	21.60

‡ or △ Complete Type number by adding the proper color code letter from the table below.

INSERT KIT FOR DUAL BUTTON OPERATOR

(Includes button, blank legend insert and colored button cover)	Color Code	Full Guard‡	No Guard△	Price
	R	LS-74R	LS-75R	$1.40
	G	LS-74G	LS-75G	
	A	LS-74A	LS-75A	
	L	LS-74L	LS-75L	
	C	LS-74C	LS-75C	

MULTI-FIELD PUSH BUTTON — Illuminated

Single momentary button. Will accept up to 2 Type L contact blocks.

Description		Type	Price
a / b	Two Field	LSR42■# †a †b	$ 68.00
a c / b	Three Field	LSR43■# †a †b †c	112.00
a d / b c	Four Field	LSR44■# †a †b †c †d	136.00

MULTI-FIELD PILOT LIGHT

Description		Type	Price
a / b	Two Field	LSP42■# †a †b	$ 68.00
a c / b	Three Field	LSP43■# †a †b †c	112.00
a d / b c	Four Field	LSP44■# †a †b †c †d	136.00

† For a, b, c, and d insert the color code required: R-Red, G-Green, A-Amber, L-Blue, and C-Clear.
■ Insert "A" for pressure wire connectors or "B" for slip-on terminals on the light module.
Complete Type number by adding voltage code number from the table to the left.

Example: A multi-field pilot light, with four fields, pressure wire connectors on the light module, 24 volts, with a red, green, amber and blue fields. The Type number will be **9001LSP44A54RGAL**. The price is **$136.00**.

SQD SLV_001119

MINIATURE OILTIGHT CONTROL UNITS

SELECTOR SWITCH SELECTION GUIDE — TYPE L

CLASS 9001

Shown below is a simplified method of selecting a selector switch to meet almost any contact sequence. For additional type numbers (spring return — illuminated — key operated) see pages 343-346.

STEP NO. 1

Determine the selector switch contact sequence(s) required (see example below) and locate sequence(s) in Table 1, 2 or 3.

If more than one sequence per operator is required, look for cam type common to all sequences.

A maximum of 4 contact blocks or sequences can be used on non-illuminated selector switches. A maximum of 2 contact blocks or sequences can be used on illuminated selector switches.

Example:

↖	↑	↗
1 0 0	0 1 0	0 0 1
0 = contact open 1 = contact closed		

For the above example, use Table 2. For the contact sequences of 100, 010, and 001, cam 4 is common to all 3 sequences.

STEP NO. 2

Go to Table 4 and choose the selector switch type opposite the cam determined in Step No. 1.

For the above example:

Cam 4 — Type LRSD4.

STEP NO. 3:

To determine contact blocks required, use Tables 1, 2, or 3.

Example:

For sequence 100 using cam 4 — use LA-1 or LB-1 mounted in position no. 4.

For sequence 010 using cam 4 — use LA-1 or LB-1 mounted in position no. 1.

For sequence 001 using cam 4 — use LA-1 or LB-1 mounted in position no. 2.

TABLE 1
2 Position Selector Switch

If you require contact sequence		Use Sel. Sw. with cam No.	Use contact block type	Mount in Position No.
↖	↗			
0	1	2	LA-1 or LB-1	1, 2, 3◆, 4◆
1	0	2	LA-21 or LB-21	1, 2, 3◆, 4◆

TABLE 2
3 Position Selector Switch

If you require contact sequence			Use Sel. Sw. with cam No.	Use Contact Block Type	Mount in Position No.
↖	↑	↗			
1	0	0	1 7 1 2 7 2 4 7	LA-1 or LB-1 LA-21 or LB-21 LA-1 or LB-1 LA-1 or LB-1 LA-21 or LB-21	1 2 3◆ 4◆ 4◆
0	1	0	2 4 5 2 5	LA-1 or LB-1 LA-21 or LB-21 LA-21 or LB-21 LA-1 or LB-1	1 2 3◆ 4◆
0	0	1	5 4 7 1 5 1	LA-1 or LB-1 LA-1 or LB-1 LA-21 or LB-21 LA-1 or LB-1	1 2 3◆ 4◆
1	1	0	5 4 7 1 5 1	LA-21 or LB-21 LA-21 or LB-21 LA-1 or LB-1 LA-21 or LB-21	1 2 3◆ 4◆
0	1	1	1 7 1 2 7 7 2 4	LA-21 or LB-21 LA-1 or LB-1 LA-21 or LB-21 LA-1 or LB-1 LA-21 or LB-21	1 2 3◆ 4◆ 4◆
1	0	1	2 4 5 2 5	LA-21 or LB-21 LA-1 or LB-1 LA-1 or LB-1 LA-21 or LB-21	1 2 3◆ 4◆

◆ These positions cannot be used when illuminated devices are desired. The light module assembly uses positions 3 and 4.

TABLE 3
4 Position Non-Illuminated Switch

If you require contact sequence				Use Sel. Sw. with cam No.	Use contact block type	Mount in Position No.
↖	↖	↗	↗			
1	0	0	0	8	(A) LA-1 or LB-1	1
0	1	0	0	8	(B) LA-1 or LB-1	3
0	0	1	0	8	(C) LA-1 or LB-1	4
0	0	0	1	8	(D) LA-1 or LB-1	2
1	0	0	1	8	A & D Wired in Parallel	
1	1	0	0	8	A & B Wired in Parallel	
0	1	1	0	8	B & C Wired in Parallel	
0	0	1	1	8	C & D Wired in Parallel	
1	0	1	0	8	A & C Wired in Parallel	
0	1	0	1	8	B & D Wired in Parallel	
0	1	1	1	8	LA-21 or LB-21	1
1	0	1	1	8	LA-21 or LB-21	3
1	1	0	1	8	LA-21 or LB-21	4
1	1	1	0	8	LA-21 or LB-21	2

TABLE 4
Maintained Contact

No. of Position	Cam Number	Non-Illuminated		Illuminated — 120V Transf.	
		Round Type	Square Type	Round Type	Square Type
2	2	LRSA2∗	LSSA2∗	LR-A2J●1∗	LS-A2J●1∗
3	1	LRSD1∗	LSSD1∗	LR-D1J●1∗	LS-D1J●1∗
	2	LRSD2∗	LSSD2∗	LR-D2J●1∗	LS-D2J●1∗
	4	LRSD4∗	LSSD4∗	LR-D4J●1∗	LS-D4J●1∗
	5	LRSD5∗	LSSD5∗	LR-D5J●1∗	LS-D5J●1∗
	7	LRSD7∗	LSSD7∗	LR-D7J●1∗	LS-D7J●1∗
4	8	LRSH8∗	LSSH8∗	.....	.....

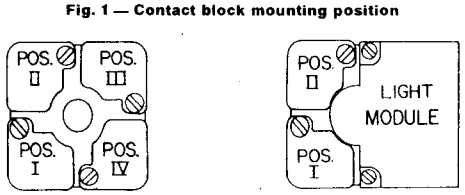
∗ Insert knob color code from table 5.
● Insert "A" for pressure wire connectors or "B" for slip-on terminals on light module.

TABLE 5
Knob Selection

Color	Knob Code — Insert code letter below in place of ∗ in type no. from Table 4. Ex: LRSD4B	
	Standard Knob	Gloved Hand Knob
Black	B	FB
Red	R	FR
Green	G	FG
Yellow	Y†	FY†
Blue	L	FL
White	W	FW
Amber	A	FA

† Not available for square operators.

Fig. 1 — Contact block mounting position



Non-Illuminated Illuminated

A maximum of 4 contact blocks may be used on any "L" operator. On illuminated operators, a maximum of 2 contact blocks may be used, one in position no. 1 and one in position no. 2.

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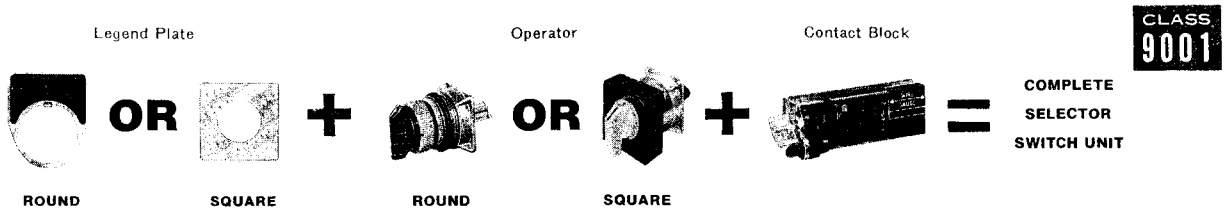
MINIATURE OILTIGHT CONTROL UNITS

2 POSITION — NON-ILLUMINATED & ILLUMINATED — SELECTOR SWITCH OPERATORS

CLASS 9001



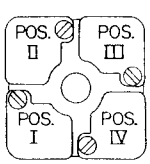
APPLICATION DATA

Type L operators are suitable for use indoors on NEMA 13 oiltight and dusttight enclosures to prevent entry of lint, dust, oil, coolant and other non-corrosive industrial liquids. For NEMA 4 watertight enclosures or for applications where dust, chips, shavings, ice or other foreign material can build up around the external operator, a protective cap must be used, see page 350 (protective caps available for round operators only).

Knobs and cams are field convertible by ordering the required knob or cam from the tables below. **Non-illuminated operators can be converted to illuminated operators** by adding a light module. **Round operators can be converted to square** by adding a conversion kit from page 346 and the desired knob from the tables below.

All contact blocks are single circuit. Non-illuminated operators will accept a maximum of four contact blocks and illuminated operators will accept a maximum of two contact blocks.

2 POSITION SELECTOR SWITCH OPERATORS — Legend Plate and Contact Blocks Not Included

CONTACT BLOCKS REQUIRED			1 = Contact Closed 0 = Contact Open		Order Contact Blocks From Table on Page 351
Contact Block Position	Mount In Position	Quantity and Type	↖	↗	
	I	(1) LA-1 or LB-1 (1) LA-21 or LB-21	0 1	1 0	
	II	(1) LA-1 or LB-1 (1) LA-21 or LB-21	0 1	1 0	
	III	(1) LA-1 or LB-1 (1) LA-21 or LB-21	1 0	0 1	
	IV	(1) LA-1 or LB-1 (1) LA-21 or LB-21	1 0	0 1	
Rear View	Cam (Included with operator)		2		

NON-ILLUMINATED OPERATORS	ROUND TYPE	SQUARE TYPE	PRICE
Manual Return			
Without Knob	LRSA-2	LSSA-2	**$12.00**
Standard Black Knob	LRSA-2B	LSSA-2B	**14.80**
Key Operated (Code 1, 2, or 3)	LRSA-2K‡	LSSA-2K‡	**38.80**
Spring Return From Left			
Without Knob	LRSB-2	LSSB-2	**20.00**
Standard Black Knob	LRSB-2B	LSSB-2B	**22.80**
Key Operated (Code 2 Only)	LRSB-2K2	LSSB-2K2	**46.80**
Spring Return From Right			
Without Knob	LRSC-2	LSSC-2	**20.00**
Standard Black Knob	LRSC-2B	LSSC-2B	**22.80**
Key Operated (Code 1 Only)	LRSC-2K1	LSSC-2K1	**46.80**

ILLUMINATED OPERATORS	ROUND TYPE	SQUARE TYPE	PRICE
Manual Return			
Without Knob — 120V, 60Hz Transformer Style	LRA2J■1	LSA2J■1	**$44.00**
Standard Red Knob — 120V, 60Hz Transformer Style	LRA2J■1R	LSA2J■1R	**46.80**
Without Knob — Other Voltages	LRA2J■●	LSA2J■●	**44.00★**
Standard Red Knob — Other Voltages	LRA2J■●R	LSA2J■●R	**46.80★**
Spring Return From Left			
Without Knob — 120V, 60Hz Transformer Style	LRB2J■1	LSB2J■1	**52.00**
Standard Red Knob — 120V, 60Hz Transformer Style	LRB2J■1R	LSB2J■1R	**54.80**
Without Knob — Other Voltages	LRB2J■●	LSB2J■●	**52.00★**
Standard Red Knob — Other Voltages	LRB2J■●R	LSB2J■●R	**54.80★**
Spring Return From Right			
Without Knob — 120V, 60Hz Transformer Style	LRC2J■1	LSC2J■1	**52.00**
Standard Red Knob — 120V, 60Hz Transformer Style	LRC2J■1R	LSC2J■1R	**54.80**
Without Knob — Other Voltages	LRC2J■●	LSC2J■●	**52.00★**
Standard Red Knob — Other Voltages	LRC2J■●R	LSC2J■●R	**54.80★**

■Insert: "A" for pressure wire connectors or "B" for slip-on terminals on light modules.
●Complete Type number by adding light module code number from the table at right.
★Adjust price per "Other Voltages" table.

‡KEY WITHDRAWAL CODE

Number	↖	↗
1	Yes	No
2	No	Yes
3	Yes	Yes

All key operated selector switches are furnished as standard with Square D number **E10** key change. For other key changes see page 325 or consult local Square D Field Office.

To convert round operators to square, add a conversion kit from page 346 and a knob from tables shown above.

For Legend Plates — See Page 350.
For Standard Contact Blocks — See Page 351.
Operator Dimensions — See Page 353.

ACCESSORIES AND MODIFICATIONS

SELECTOR SWITCH KNOBS — ROUND

Color	Standard Type	Gloved Hand Type	Price
Black▼	LR-61B	LR-67B	**$2.80**
Red	LR-58R	LR-65R	
Green	LR-58G	LR-65G	
Yellow	LR-58Y	LR-65Y	
Blue	LR-58L	LR-65L	
White	LR-58W	LR-65W	
Amber	LR-58A	LR-65A	

SELECTOR SWITCH KNOBS — SQUARE

Color	Standard Type	Gloved Hand Type	Price
Black▼	LS-61B	LS-67B	**$2.80**
Red	LS-58R	LS-65R	
Green	LS-58G	LS-65G	
Blue	LS-58L	LS-65L	
White	LS-58W	LS-65W	
Amber	LS-58A	LS-65A	

▼For use on non-illuminated switches only.

SELECTOR SWITCH CAM — ROUND OR SQUARE

Cam No.	Type	Price
2	LCS-2	**$1.80**

Orders must specify quantity of 5 or multiple of 5.

OTHER VOLTAGES

To order round or square illuminated selector switch operators with voltages other than 120 Volt, 60 Hertz transformer style, insert the Code ● No. from the table below in the operator type number.

★ Price deductions for full voltage or resistor style operators are as shown.

Example: A round manual return illuminated 2 position selector switch with a 24 Volt full voltage light module is Type LRA2JA34, priced at **$36.** ($44. minus $8). For replacement lamps and rated VA see page 348.

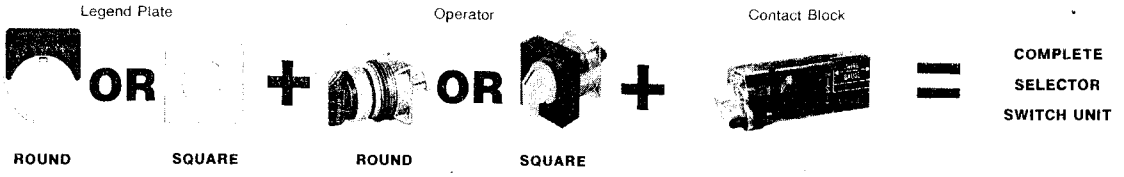
Description	Voltage and Frequency	Operator Assembled With Any Light Module: Code ● No.	Operator Assembled With Any Light Module: Price★ Adjustment
Transformer	110-120V, 50-60 Hz	1	No Change
	110-120V, 25-30 Hz	2	
	208-220V, 50-60 Hz	3	
	220-240V, 50-60 Hz	7	
	277V, 50-60 Hz	8	
Resistor	14V, AC or DC	21	Deduct **$8.**
	18V, AC or DC	22	
	32V, AC or DC	23	
	48V, AC or DC	36	
	60V, AC or DC	37	
	120V, AC or DC	38	
Full Voltage	6V, AC or DC	31	Deduct **$8.**
	12V, AC or DC	32	
	14V, AC or DC	21	
	24V, AC or DC	34	
	28V, AC or DC	35	

SQD SLV_001121

MINIATURE OILTIGHT CONTROL UNITS

NON-ILLUMINATED — 3 POSITION — SELECTOR SWITCH OPERATORS

CLASS 9001



APPLICATION DATA

Type L operators are suitable for use indoors on NEMA 13 oiltight and dusttight enclosures to prevent entry of lint, dust, oil, coolant, and other non-corrosive industrial liquids. For NEMA 4 watertight enclosures or for applications where dust, chips, shavings, ice or other foreign material can build up around the external operator, a protective cap must be used, see page 350 (protective caps available for round operators only).

Knobs and cams are field convertible by ordering the required knob from the table on page 346 or cam from the table below. For colors and types not listed, order operator without knob and separate knob of desired color and type from the table on page 346. **Non-illuminated operators can be converted to illuminated operators** by adding a light module. **Round operators can be converted to square** by adding a conversion kit from page 346 and the desired knob from the table on page 346. All contact blocks are single circuit, NO or NC. Non-illuminated operators will accept a maximum of four contact blocks and illuminated operators will accept a maximum of two contact blocks.

3 POSITION NON-ILLUMINATED SELECTOR SWITCH OPERATORS
Legend Plate and Contact Blocks Not Included

CONTACT BLOCKS REQUIRED			1 = Contacts Closed 0 = Contacts Open					
Contact Block Position (POS. I, II, III, IV — Rear View)	Mount in Position	Quantity and Type	↖ ↑ ↗	↖ ↑ ↗	↖ ↑ ↗	↖ ↑ ↗	↖ ↑ ↗	Order Contact Blocks From Table Below
	I	(1) LA-1 or LB-1 (1) LA-21 or LB-21	1 0 0 0 1 1	0 0 1 1 1 0	0 1 0 1 0 1	1 0 0 0 1 1	0 1 0 1 0 1	
	II	(1) LA-1 or LB-1 (1) LA-21 or LB-21	0 1 1 1 0 0	1 0 1 0 1 0	0 1 1 1 0 0	0 0 1 1 1 0	0 0 1 1 1 0	
	III	(1) LA-1 or LB-1 (1) LA-21 or LB-21	1 1 0 0 0 1	1 1 0 0 0 1	1 0 1 0 1 0	1 0 0 0 1 1	Not Used	
	IV	(1) LA-1 or LB-1 (1) LA-21 or LB-21	0 0 1 1 1 0	0 1 0 1 0 1	1 0 0 0 1 1	0 1 1 1 0 0	1 0 0 0 1 1	
Cam (included with operator)			1	5	2	7	4	
NON-ILLUMINATED OPERATORS			Type	Type	Type	Type	Type	Price
ROUND OPERATORS	**Manual Return** Without Knob Standard Black Knob Key Operated (Code 4-10)		LRSD-1 LRSD-1B LRSD-1K‡	LRSD-5 LRSD-5B LRSD-5K‡	LRSD-2 LRSD-2B LRSD-2K‡	LRSD-7 LRSD-7B LRSD-7K‡	LRSD-4 LRSD-4B LRSD-4K‡	**$12.00** **14.80** **38.80**
	Spring Return — Left to Center Without Knob Standard Black Knob Key Operated (Code 5, 6 or 9 **Only**)		LRSF-1 LRSF-1B LRSF-1K‡	LRSF-5 LRSF-5B LRSF-5K‡	LRSF-2 LRSF-2B LRSF-2K‡	LRSF-7 LRSF-7B LRSF-7K‡	LRSF-4 LRSF-4B LRSF-4K‡	**20.00** **22.80** **46.80**
	Spring Return — Right to Center Without Knob Standard Black Knob Key Operated (Code 4, 5 or 7 **Only**)		LRSG-1 LRSG-1B LRSG-1K‡	LRSG-5 LRSG-5B LRSG-5K‡	LRSG-2 LRSG-2B LRSG-2K‡	LRSG-7 LRSG-7B LRSG-7K‡	LRSG-4 LRSG-4B LRSG-4K‡	**20.00** **22.80** **46.80**
	Spring Return — Both Sides to Center Without Knob Standard Black Knob Key Operated (Code 5 **Only**)		LRSE-1 LRSE-1B LRSE-1K5	LRSE-5 LRSE-5B LRSE-5K5	LRSE-2 LRSE-2B LRSE-2K5	LRSE-7 LRSE-7B LRSE-7K5	LRSE-4 LRSE-4B LRSE-4K5	**20.00** **22.80** **46.80**
SQUARE OPERATORS	**Manual Return** Without Knob Standard Black Knob Key Operated (Code 4-10)		LSSD-1 LSSD-1B LSSD-1K‡	LSSD-5 LSSD-5B LSSD-5K‡	LSSD-2 LSSD-2B LSSD-2K‡	LSSD-7 LSSD-7B LSSD-7K‡	LSSD-4 LSSD-4B LSSD-4K‡	**$12.00** **14.80** **38.80**
	Spring Return — Left to Center Without Knob Standard Black Knob Key Operated (Code 5, 6 or 9 **Only**)		LSSF-1 LSSF-1B LSSF-1K‡	LSSF-5 LSSF-5B LSSF-5K‡	LSSF-2 LSSF-2B LSSF-2K‡	LSSF-7 LSSF-7B LSSF-7K‡	LSSF-4 LSSF-4B LSSF-4K‡	**20.00** **22.80** **46.80**
The legend plate (not included) is needed to hold the knob in place	**Spring Return — Right to Center** Without Knob Standard Black Knob Key Operated (Code 4, 5 or 7 **Only**)		LSSG-1 LSSG-1B LSSG-1K‡	LSSG-5 LSSG-5B LSSG-5K‡	LSSG-2 LSSG-2B LSSG-2K‡	LSSG-7 LSSG-7B LSSG-7K‡	LSSG-4 LSSG 4B LSSG-4K‡	**20.00** **22.80** **46.80**
	Spring Return — Both Sides to Center Without Knob Standard Black Knob Key Operated (Code 5 **Only**)		LSSE-1 LSSE-1B LSSE-1K5	LSSE-5 LSSE-5B LSSE-5K5	LSSE-2 LSSE-2B LSSE-2K5	LSSE-7 LSSE-7B LSSE-7K5	LSSE-4 LSSE-4B LSSE-4K5	**20.00** **22.80** **46.80**

‡Key Withdrawal Code:

No.	↖	↑	↗	No.	↖	↑	↗
4	Yes	No	No	8	Yes	No	Yes
5	No	Yes	No	9	No	Yes	Yes
6	No	No	Yes	10	Yes	Yes	Yes
7	Yes	Yes	No				

SELECTOR SWITCH CAMS

Cam	Type	Price
1 2 4 5 7	LCS-1 LCS-2 LCS-4 LCS-5 LCS-7	**$1.80**
Orders must specify quantity of 5 or multiples of 5.		

All key operated selector switches are furnished as standard with **E10** key change. For other key changes see page 325 or consult local Square D Field Office.

A virtually unlimited number of contact sequences are available. If the sequences listed above do not meet your requirements, consult local Square D Field Office.

STANDARD CONTACT BLOCKS

Description	With Pressure Wire Connectors Type	With Slip-On Terminals Type	Price
Single Circuit Closed	LA-1	LB-1	**$6.**
Single Circuit Open	LA-21	LB-21	**6.**

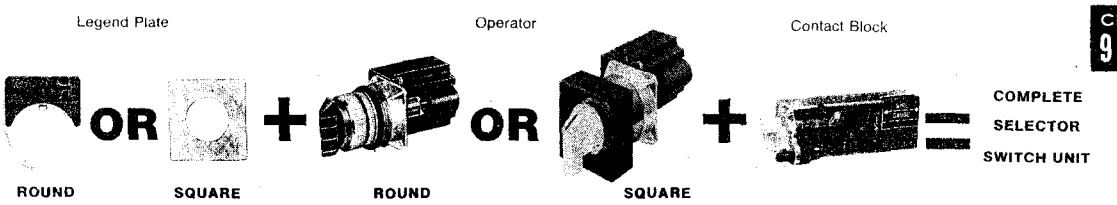
For Contact Blocks Assembled to Operator, See Page 351.
For Selector Switch Knobs, See Page 346.
For Legend Plates, See Page 350.
For Operator Dimensions, See Page 353.
For Ring Nuts, See Page 346.
Conversion Kit, See Page 346.

SQD SLV_001122

MINIATURE OILTIGHT CONTROL UNITS

3 POSITION — ILLUMINATED — SELECTOR SWITCH OPERATORS

CLASS 9001

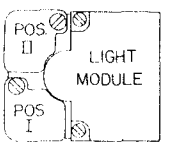
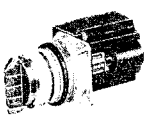


APPLICATION DATA

Type L operators are suitable for use indoors on NEMA 13 oiltight and dusttight enclosures to prevent entry of lint, dust, oil, coolant and other non-corrosive industrial liquids. For NEMA 4 watertight enclosures or for applications where dust, chips, shavings, ice or other foreign material can build up around the external operator, a protective cap must be used, see page 350 (protective caps available for round operators only). **Round operators can be converted to square** by adding a conversion kit and the desired knob from the tables on page 346.

Knobs and cams are field convertible by ordering the required knob from table on page 346, or required cam from table below. All contact blocks are single circuit. Illuminated operators will accept a maximum of two contact blocks.

3 POSITION ILLUMINATED SELECTOR SWITCH OPERATORS — Legend Plate and Contact Blocks Not Included

CONTACT BLOCKS REQUIRED			1 = Contact Closed 0 = Contact Open					
Contact Block Position  Rear View	Mount in Position	Quantity and Type						Order Contact Blocks From Page 351
	I	(1) LA-1 or LB-1 (1) LA-21 or LB-21	1 0 0 0 1 1	0 0 1 1 1 0	0 1 0 1 0 1	1 0 0 0 1 1	0 1 0 1 0 1	
	II	(1) LA-1 or LB-1 (1) LA-21 or LB-21	0 1 1 1 0 0	1 0 1 0 1 0	0 1 1 1 0 0	0 0 1 1 1 0	0 0 1 1 1 0	
Cam (Included with Operator)			1	5	2	7	4	
ILLUMINATED OPERATORS			Type	Type	Type	Type	Type	Price
 **ROUND OPERATORS**	**Manual Return**							
	Without Knob — 120V, 60Hz, transformer		LR-D1J■1	LR-D5J■1	LR-D2J■1	LR-D7J■1	LR-D4J■1	**$44.00**
	Standard Red Knob — 120V, 60Hz, transformer		LR-D1J■1R	LR-D5J■1R	LR-D2J■1R	LR-D7J■1R	LR-D4J■1R	**46.80**
	Without Knob — Other Voltages		LR-D1J■●	LR-D5J■●	LR-D2J■●	LR-D7J■●	LR-D4J■●	**44.00★**
	Standard Red Knob — Other Voltages		LR-D1J■●R	LR-D5J■●R	LR-D2J■●R	LR-D7J■●R	LR-D4J■●R	**46.80★**
	Spring Return — Left to Center							
	Without Knob — 120V, 60Hz, transformer		LR-F1J■1	LR-F5J■1	LR-F2J■1	LR-F7J■1	LR-F4J■1	**52.00**
	Standard Red Knob — 120V, 60Hz, transformer		LR-F1J■1R	LR-F5J■1R	LR-F2J■1R	LR-F7J■1R	LR-F4J■1R	**54.80**
	Without Knob — Other Voltages		LR-F1J■●	LR-F5J■●	LR-F2J■●	LR-F7J■●	LR-F4J■●	**52.00★**
	Standard Red Knob — Other Voltages		LR-F1J■●R	LR-F5J■●R	LR-F2J■●R	LR-F7J■●R	LR-F4J■●R	**54.80★**
	Spring Return — Right to Center							
	Without Knob — 120V, 60Hz transformer		LR-G1J■1	LR-G5J■1	LR-G2J■1	LR-G7J■1	LR-G4J■1	**52.00**
	Standard Red Knob — 120V, 60Hz transformer		LR-G1J■1R	LR-G5J■1R	LR-G2J■1R	LR-G7J■1R	LR-G4J■1R	**54.80**
	Without Knob — Other Voltages		LR-G1J■●	LR-G5J■●	LR-G2J■●	LR-G7J■●	LR-G4J■●	**52.00★**
	Standard Red Knob — Other Voltages		LR-G1J■●R	LR-G5J■●R	LR-G2J■●R	LR-G7J■●R	LR-G4J■●R	**54.80★**
	Spring Return — Both Sides to Center							
	Without Knob — 120V, 60Hz, transformer		LR-E1J■1	LR-E5J■1	LR-E2J■1	LR-E7J■1	LR-E4J■1	**52.00**
	Standard Red Knob — 120V, 60Hz, transformer		LR-E1J■1R	LR-E5J■1R	LR-E2J■1R	LR-E7J■1R	LR-E4J■1R	**54.80**
	Without Knob — Other Voltages		LR-E1J■●	LR-E5J■●	LR-E2J■●	LR-E7J■●	LR-E4J■●	**52.00★**
	Standard Red Knob — Other Voltages		LR-E1J■●R	LR-E5J■●R	LR-E2J■●R	LR-E7J■●R	LR-E4J■●R	**54.80★**
 The legend plate (not included) is needed to hold the knob in place. **SQUARE OPERATORS**	**Manual Return**							
	Without Knob — 120V, 60Hz, transformer		LS-D1J■1	LS-D5J■1	LS-D2J■1	LS-D7J■1	LS-D4J■1	**$44.00**
	Standard Red Knob — 120V, 60Hz, transformer		LS-D1J■1R	LS-D5J■1R	LS-D2J■1R	LS-D7J■1R	LS-D4J■1R	**46.80**
	Without Knob — Other Voltages		LS-D1J■●	LS-D5J■●	LS-D2J■●	LS-D7J■●	LS-D4J■●	**44.00★**
	Standard Red Knob — Other Voltages		LS-D1J■●R	LS-D5J■●R	LS-D2J■●R	LS-D7J■●R	LS-D4J■●R	**46.80★**
	Spring Return — Left to Center							
	Without Knob — 120V, 60Hz, transformer		LS-F1J■1	LS-F5J■1	LS-F2J■1	LS-F7J■1	LS-F4J■1	**52.00**
	Standard Red Knob — 120V, 60 Hz, transformer		LS-F1J■1R	LS-F5J■1R	LS-F2J■1R	LS-F7J■1R	LS-F4J■1R	**54.80**
	Without Knob — Other Voltages		LS-F1J■●	LS-F5J■●	LS-F2J■●	LS-F7J■●	LS-F4J■●	**52.00★**
	Standard Red Knob — Other Voltages		LS-F1J■●R	LS-F5J■●R	LS-F2J■●R	LS-F7J■●R	LS-F4J■●R	**54.80★**
	Spring Return — Right to Center							
	Without Knob — 120V, 60Hz, transformer		LS-G1J■1	LS-G5J■1	LS-G2J■1	LS-G7J■1	LS-G4J■1	**52.00**
	Standard Red Knob — 120V, 60Hz, transformer		LS-G1J■1R	LS-G5J■1R	LS-G2J■1R	LS-G7J■1R	LS-G4J■1R	**54.80**
	Without Knob — Other Voltages		LS-G1J■●	LS-G5J■●	LS-G2J■●	LS-G7J■●	LS-G4J■●	**52.00★**
	Standard Red Knob — Other Voltages		LS-G1J■●R	LS-G5J■●R	LS-G2J■●R	LS-G7J■●R	LS-G4J■●R	**54.80★**
	Spring Return — Both Sides to Center							
	Without Knob — 120V, 60Hz, transformer		LS-E1J■1	LS-E5J■1	LS-E2J■1	LS-E7J■1	LS-E4J■1	**52.00**
	Standard Red Knob — 120V, 60Hz, transformer		LS-E1J■1R	LS-E5J■1R	LS-E2J■1R	LS-E7J■1R	LS-E4J■1R	**54.80**
	Without Knob — Other Voltages		LS-E1J■●	LS-E5J■●	LS-E2J■●	LS-E7J■●	LS-E4J■●	**52.00★**
	Standard Red Knob — Other Voltages		LS-E1J■●R	LS-E5J■●R	LS-E2J■●R	LS-E7J■●R	LS-E4J■●R	**54.80★**

■ Insert "A" for pressure wire connectors or "B" for slip-on terminals on light module.
● Complete Type number by adding light module code number from the table on page 343.
★ See page 343 for possible price deductions.

BEZEL (GUARD)

For Use On	Type	Price
All Square Operators	LS-60	$ .40

SELECTOR SWITCH RING NUTS
(Holds operator to panel)

Description	Type	Price
For Knob Style — Round	LR-43	**$1.20**
For Knob Style — Square	LS-40	**.40**
For Key Operated — Square	LS-41	**.80**

To convert round operators to square, remove round ring nut and knob, add 2 spacers (order spacer as 9001 LW-2, no charge), a bezel, a ring nut from tables above, and a knob from table on page 346.

SELECTOR SWITCH CAMS

Cam	Type	Price
1	LCS-1	
2	LCS-2	
4	LCS-4	**$1.80**
5	LCS-5	
7	LCS-7	

Orders must specify quantity of 5 or multiples of 5.

For Selector Switch Knobs, See Page 346.
For Standard Contact Blocks, See Page 351.
For Contact Blocks Assembled to Operator, See Page 351.
For Legend Plates, See Page 350.
For Operator Dimensions, See Page 353.

SQD SLV_001123

MINIATURE OILTIGHT CONTROL UNITS

NON-ILLUMINATED — 4 POSITION — SELECTOR SWITCH OPERATORS — TYPE L

CLASS 9001



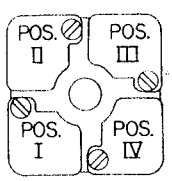
APPLICATION DATA

Type L operators are suitable for use indoors on NEMA 13 oiltight and dusttight enclosures to prevent entry of lint, dust, oil, coolant and other non-corrosive industrial liquids. For NEMA 4 watertight enclosures or for applications where dust, chips, shavings, ice or other foreign material can build up around the external operator, a protective cap must be used, see page 350 (protective caps available for round operators only). **Round operators can be converted to square** by adding a conversion kit from the tables below and the desired insert kit from the tables below.

All contact blocks are single circuit. Non-illuminated operators will accept a maximum of four contact blocks.

NOTE: All key operated selector switches are furnished as standard with Square D number **E10** key change. For other key changes see page 325 or consult local Square D Field Office.

4 POSITION NON-ILLUMINATED SELECTOR SWITCH OPERATORS
Legend Plate and Contact Blocks Not Included

CONTACT BLOCKS REQUIRED			1 = Contact Closed 0 = Contact Open		
Contact Block Position	Mount in Position	Quantity and Type	↖ ↑ ↗		
 Rear View	I	(1) LA-1 or LB-1 (1) LA-21 or LB-21	1 0 0 1	0 0 1 1	**Order Contact Blocks From Table Below**
	II	(1) LA-1 or LB-1 (1) LA-21 or LB-21	0 0 1 1	0 1 1 0	
	III	(1) LA-1 or LB-1 (1) LA-21 or LB-21	0 1 1 0	0 0 1 1	
	IV	(1) LA-1 or LB-1 (1) LA-21 or LB-21	0 0 1 1	1 0 0 1	

NON-ILLUMINATED OPERATORS	Round Type	Square Type	Price
Manual Return			
Without Knob	LRSH-8	LSSH-8	**$12.00**
Standard Black Knob	LRSH-8B	LSSH-8B	**14.80**
With Other Standard Knobs	LRSH-8∗	LSSH-8∗	**14.80**
With Gloved Hand Knobs	LRSH-8F∗	LSSH-8F∗	**14.80**
Key Operated (Code 11, 12, 13 or 14)	LRSH-8K‡	LSSH-8K‡	**38.80**

∗Complete Type number by adding color code letter from table below.
‡Key Withdrawal Code:

No.	↖	↑	↗	→
11	Yes	No	No	Yes
12	No	No	No	Yes
13	Yes	No	No	No
14	Yes	Yes	Yes	Yes

STANDARD CONTACT BLOCKS

Description	With Pressure Wire Connectors Type	With Slip-On Terminals Type	Price
Single Circuit Closed	LA-1	LB-1	**$6.**
Single Circuit Open	LA-21	LB-21	**6.**

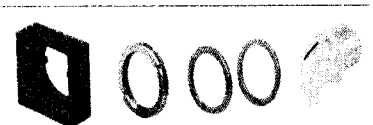
ACCESSORIES FOR CONVERSION

From Square to Round

Order: Proper Knob (table to the left) Proper Ring Nut (see below) Locking Thrust Washer (9001 LW-5).

Description	Type	Price
Standard Selector Switch Ring Nut	LR-43	**$ .80**
Key operated Selector Switch Ring Nut	LR-49	**.80**
Locking Thrust Washer	LW-5	N/C

From Round to Square



Order:
For Standard Selector Switch — Square Conversion Kit (9001 LS-70), Proper Knob (see table to the left), and desired legend plate (see page 350).
For Key Operated Selector Switch — Square Conversion Kit (9001 LS-71), and desired legend plate (see page 350).

Description	Type	Price
Conversion Kit (LS-60, LS-40, 2-LW-2)	LS-70	**$ .80**
Conversion Kit (LS-60, LS-41, 2-LW-2)	LS-71	**.80**
Bezel only	LS-60	**.40**
Standard Selector Switch Ring Nut only	LS-40	**.40**
Key operated Selector Switch Ring Nut only	LS-41	**.40**
Spacers only	LW-2	N/C

ACCESSORIES AND MODIFICATIONS
Selector Switch Knobs — Round and Square

Color	Code ● Letter For Assembled to Operator	Round Standard Type	Round Gloved Hand Type	Square Standard Type	Square Gloved Hand Type	Price
Black	B	LR-61B	LR-67B	LS-61B	LS-67B	**$2.80**
Red	R	LR-58R	LR-65R	LS-58R	LS-65R	
Green	G	LR-58G	LR-65G	LS-58G	LS-65G	
Yellow	Y	LR-58Y	LR-65Y	....	....	
Blue	L	LR-58L	LR-65L	LS-58L	LS-65L	
White	W	LR-58W	LR-65W	LS-58W	LS-65W	
Amber	A	LR-58A	LR-65A	LS-58A	LS-65A	

●Insert code letter for desired color in switch Type number.
Example: Round 4 position switch with black gloved hand knob is Type LRSH8FB.

CONTACT BLOCKS ASSEMBLED TO OPERATOR

Determine contact blocks and mounting position required from operator table above, then select proper "W" suffix number from this table and add to operator type number.
EXAMPLE: Class 9001 Type LRSH8B-W15 Price is **$38.80**
For other combinations — see page 351.

Contact Block and Position I	II	III	IV	Suffix (Add to Operator Type Number)	Price Adder
LA-1	LA-1	LA-1	LA-1	W15	**$24.**
LB-1	LB-1	LB-1	LB-1	W16	**24.**

Standard Legend Plates — See Page 350.
Operator Dimensions — See Page 353.

SQD SLV_001124

MINIATURE OILTIGHT CONTROL UNITS

TYPE L — PILOT LIGHTS AND PUSH-TO-TEST PILOT LIGHTS

CLASS 9001



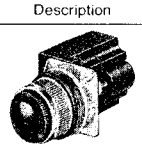
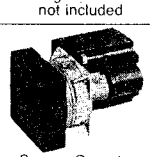
APPLICATION DATA

Type L pilot lights are suitable for use indoors on NEMA 13 oiltight and dusttight enclosures to prevent entry of lint, dust, oil, coolant and other non-corrosive industrial liquids. For NEMA 4 watertight enclosures or for applications where dust, chips, shavings, ice or other foreign material can build up around the external push-to-test operator, a protective cap must be used, see Page 350 (protective caps available for round operators only).

Any voltage or type of light module can be factory assembled on any of the listed pilot lights per the instructions below. For colors other than those listed, order the pilot light without color cap and separate color cap from table below, or order the assembled device by inserting the color code in the operator Type number as indicated below.

Round operators can be converted to Square by adding a Conversion Kit and the desired Insert Kit from the table below.

PILOT LIGHTS

Description	Voltage and Frequency	Color Cap	STANDARD PILOT LIGHT: With Pressure Wire Connectors Type	STANDARD PILOT LIGHT: With Slip-On Terminals Type	STANDARD PILOT LIGHT: Price	PUSH-TO-TEST PILOT LIGHT **Includes** Contact Blocks: With Pressure Wire Connectors Type	PUSH-TO-TEST PILOT LIGHT **Includes** Contact Blocks: With Slip-On Terminals Type	PUSH-TO-TEST PILOT LIGHT **Includes** Contact Blocks: Price
 Round Operators Legend Plate not included	120V, 60HZ Transformer Style	None	LRP-A1	LRP-B1	**$40.00**	LRT-A1	LRT-B1	**$52.00**
		Red Glass	LRP-A1R59	LRP-B1R59	**42.80**	LRT-A1R59	LRT-B1R59	**54.80**
		Green Glass	LRP-A1G59	LRP-B1G59	**42.80**	LRT-A1G59	LRT-B1G59	**54.80**
		Amber Glass	LRP-A1A59	LRP-B1A59	**42.80**	LRT-A1A59	LRT-B1A59	**54.80**
		Other Colors	LRP-A1∗	LRP-B1∗	**42.80**	LRT-A1∗	LRT-B1∗	**54.80**
	Other Voltages	None	LRP-A●	LRP-B●	**40.00★**	LRT-A●	LRT-B●	**52.00★**
		Red Glass	LRP-A●R59	LRP-B●R59	**42.80★**	LRT-A●R59	LRT-B●R59	**54.80★**
		Green Glass	LRP-A●G59	LRP-B●G59	**42.80★**	LRT-A●G59	LRT-B●G59	**54.80★**
		Amber Glass	LRP-A●A59	LRP-B●A59	**42.80★**	LRT-A●A59	LRT-B●A59	**54.80★**
		Other Colors	LRP-A●∗	LRP-B●∗	**42.80★**	LRT-A●∗	LRT-B●∗	**54.80★**
 Square Operators Legend insert included	120V, 60HZ Transformer Style	None	LSP-A1	LSP-B1	**40.00**	LST-A1	LST-B1	**52.00**
		Red	LSP-A1R	LSP-B1R	**42.80**	LST-A1R	LST-B1R	**54.80**
		Green	LSP-A1G	LSP-B1G	**42.80**	LST-A1G	LST-B1G	**54.80**
		Amber	LSP-A1A	LSP-B1A	**42.80**	LST-A1A	LST-B1A	**54.80**
		Other	LSP-A1∗	LSP-B1∗	**42.80**	LST-A1∗	LST-B1∗	**54.80**
	Other Voltages	None	LSP-A●	LSP-B●	**40.00★**	LST-A●	LST-B●	**52.00★**
		Red	LSP-A●R	LSP-B●R	**42.80★**	LST-A●R	LST-B●R	**54.80★**
		Green	LSP-A●G	LSP-B●G	**42.80★**	LST-A●G	LST-B●G	**54.80★**
		Amber	LSP-A●A	LSP-B●A	**42.80★**	LST-A●A	LST-B●A	**54.80★**
		Other	LSP-A●∗	LSP-B●∗	**42.80★**	LST-A●∗	LST-B●∗	**54.80★**

● or ∗ Complete Type number by adding light module code number and color code letter from the tables below.

For multi-lamp pilot lights — See Page 341.

OTHER VOLTAGES

To order round or square pilot lights or push-to-test pilot lights with voltages other than the 120 Volt, 60 Hertz transformer style, insert the Code ● No. from the table at right in the operator Type number.

★ Price deductions for full voltage or resistor style operators are as shown.

Example: A round pilot light with the 24 Volt full voltage light module is Type LRPA**34**. Price is **$32.** ($40. minus $8).

For Replacement lamps and rated VA See page 348.

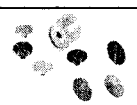
Description	Voltage and Frequency	Operator Assembled With Any Light Module: Code ● No.	Operator Assembled With Any Light Module: Price ★ Adjustment
Transformer	110-120V, 50-60 Hz	1	No Change
	110-120V, 25-30 Hz	2	
	208-220V, 50-60 Hz	3	
	220-240V, 50-60 Hz	7	
	277V, 50-60 Hz	8	
Resistor	14V, AC or DC	21	Deduct **$8.**
	18V, AC or DC	22	
	32V, AC or DC	23	
	48V, AC or DC	36	
	60V, AC or DC	37	
	120V, AC or DC	38	
Full Voltage	6V, AC or DC	31	Deduct **$8.**
	12V, AC or DC	32	
	14V, AC or DC	21	
	24V, AC or DC	34	
	28V, AC or DC	35	

COLOR CAPS FOR STANDARD AND PUSH-TO-TEST PILOT LIGHTS

Description		Color	Color Code ∗For Assy.	Type	Price
For Round Operators	Plastic Lens	Red	R59	LR-59R	**$2.80**
		Green	G59	LR-59G	
		Amber	A59	LR-59A	
		Blue	L59	LR-59L	
		White	W59	LR-59W	
		Yellow	Y59	LR-59Y	
	Glass Lens	Red	R56	LR-56R	**$2.80**
		Green	G56	LR-56G	
		Amber	A56	LR-56A	
		Blue	L56	LR-56L	
		White	W56	LR-56W	
		Yellow	Y56	LR-56Y	
For Square Operators (Includes button, blank legend insert and colored button cover)	Plastic Color Cap Assembly	Red	R	LS-71R	**$2.80**
		Green	G	LS-71G	
		Amber	A	LS-71A	
		Blue	L	LS-71L	
		Clear	C	LS-71C	

Example: For round 120 Volt, 60 Hertz transformer style pilot light assembled with a red glass lens, insert Code ∗ in operator Type number — Type LRPA1**R56.**

ACCESSORIES FOR CONVERSION


Round Conversion Kit

From Square to Round order:
Proper Color Cap
Ring Nut
From Round to Square order:
Proper Color Cap
Conversion Kit


Square Conversion Kit

Description	Type	Price
Round Ring Nut	LR-40	$ .80
Conversion Kit (Bezel, Ring Nut, Spacers)	LS-70	.80
Bezel only	LS-60	.40
Square Ring Nut only	LS-40	.40
Spacers only	LW-2	N/C

For Standard Legend Plates — See page 350.

For Operator Dimensions —See Page 353.

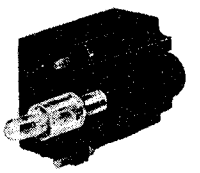
SQD SLV_001125

MINIATURE OILTIGHT CONTROL UNITS

LIGHT MODULES AND BASIC OPERATORS — TYPE L

CLASS 9001

LIGHT MODULES



All Type L illuminated operators listed on pages 340-347 can be assembled with any Type L light module listed below. Operators can be ordered assembled with any light module by following the instructions below or on pages 340, 343, 345 or 347.

Separate operators and light modules can also be ordered for assembly on the job. **Non-illuminated operators can be converted to illuminated operators** by adding a light module and color cap.

Description	Voltage and Frequency	Approximate Rated VA	Lamp Number: Manufacturer's No.	Lamp Number: Square D Part No.	Operator Assembled with any Light Module: ● Code Co.	Operator Assembled with any Light Module: Price Adjustment	Separate Light Modules: With Pressure Wire Connectors Type	Separate Light Modules: With Slip-On Connectors Type	Price
Transformer	110-120V, 50-60 Hz	1.2	GE-86	25501-99004	1	No Change	LMA-1	LMB-1	$32.
	110-120V, 25-30 Hz	1.2	GE-86	25501-99004	2		LMA-2	LMB-2	
	208-220V, 50-60 Hz	1.2	GE-86	25501-99004	3		LMA-3	LMB-3	
	220-240V, 50-60 Hz	1.2	GE-86	25501-99004	7		LMA-7	LMB-7	
	277V, 50-60 Hz	1.2	GE-86	25501-99004	8		LMA-8	LMB-8	
Resistor	14V, AC or DC	1.1	GE-73	25501-99002	21	Deduct $8 From Price in Illuminated Operator Table	LMA-21	LMB-21	24.
	18V, AC or DC	1.5	GE-73	25501-99002	22		LMA-22	LMB-22	
	32V, AC or DC	1.3	GE-85	25501-99003	23		LMA-23	LMB-23	
	48V, AC or DC	1.9	GE-85	25501-99003	36		LMA-36	LMB-36	
	60V, AC or DC	2.4	GE-85	25501-99003	37		LMA-37	LMB-37	
	120V, AC or DC	4.8	GE-85	25501-99003	38		LMA-38	LMB-38	
Full Voltage	6V, AC or DC	1.3	GE-86	25501-99004	31	Deduct $8 From Price In Illuminated Operator Table	LMA-31	LMB-31	24.
	12V, AC or DC	1.0	GE-73	25501-99002	32		LMA-32	LMB-32	
	14V, AC or DC	1.1	GE-73	25501-99002	21		LMA-21	LMB-21	
	24V, AC or DC	1.0	GE-85	25501-99003	34		LMA-34	LMB-34	
	28V, AC or DC	1.1	GE-85	25501-99003	35		LMA-35	LMB-35	

ORDERING INFORMATION

Operator assembled with any light module

1. Select illuminated operator or pilot light (by Type and Price) from Pages 340, 343, 345 or 347.
2. Select code number (●) from table above for light module required.
   Example: For 24 volt full voltage type light module, code number is 34.
3. Insert code number selected in Step 2 in place of ● per following: LR1L-A●, LR1L-B●, LR2L-B●, LR-____JA●, LR-____JB●, LRP-A●, LRP-B●, LRT-A● and LRT-B●.
4. Adjust price of operator or pilot light by the amount shown in table above.
   Example: For Type LR-A2JA34R, price is **$38.80** (46.80 − $8.00).

Separate Light Modules

1. Select light module required by specifying Class, Type and Price from table above.
   Example: Class 9001 Type LMA-34 at **$24.**

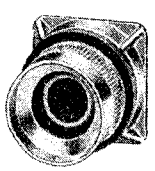
SQUARE D REPLACEMENT LAMPS

Lamp Number	Lamp Voltage	Part Number	Price (D14A)
GE73	14 V.	25501-99002	$4.
GE85	28 V.	25501-99003	4.
GE86	6.3 V.	25501-99004	4.

BASIC OPERATORS

Non-illuminated Push Buttons and Selector Switches can be made illuminated by the addition of a light module and appropriate color cap.

ROUND OPERATORS WITH RING NUT



Less color cap, light module and contact blocks

Operator	Type	Price
Push button with full guard	LR1L	$8.
Standard Pilot Light	LRP	8.
Push button with no guard ring nut and push-to-test pilot light	LR2L	8.

BASIC OPERATOR

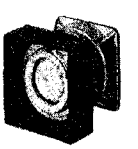


TO COMPLETE OPERATOR ADD:

Push Button	Standard Pilot Light
Round: Proper ring nut (see page 339) and round conversion kit (9001LR-27).	**Round:** Ring nut (9001LR-40), a lens (see page 349) and add light module (see table above).
Square: Square conversion kit (9001LS-70) and color insert kit (see page 339).	**Square:** Square conversion kit (9001LS-70), and color insert kit (see page 349), and a light module (see table above).

Operator	Type	Price
Push button and push-to-test pilot light	LRR	$7.20
Standard pilot light	LP	7.20

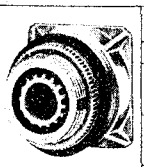
SQUARE OPERATORS WITH BEZEL



Less color insert kit, light module and contact blocks.

Operator	Type	Price
Push Button	LS1L	$8.
Standard Pilot Light	LSP	8.
Push-to-test Pilot Light	LS2L	8.

ROUND
Three Position Selector Switch with Ring Nut



Less Knob and Cam

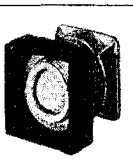
Description	Type	Price
Manual Return	LRSD	$10.20
Spring Return Both Sides To Center	LRSE	18.20
Spring Return Left Side To Center	LRSF	18.20
Spring Return Right Side To Center	LRSG	18.20

BASIC OPERATOR
Three Position Selector Switch

To Complete Operators
SQUARE: Add Square conversion kit (9001 LS-70), a cam (see page 345), and proper knob (see page 346).
ROUND: Add ring nut (9001LR43), a cam (see page 345), and proper knob (see page 346).

Description	Type	Price
Manual return	LD	$ 9.00
Spring return both Sides to center	LE	17.00
Spring return left Side to center	LF	17.00
Spring return right Side to center	LG	17.00

SQUARE
Three Position Selector Switch with Bezel



Less Knob, Legend Plate and Cam

Description	Type	Price
Manual Return	LSSD	$10.20
Spring Return Both Sides To Center	LSSE	18.20
Spring Return Left Side To Center	LSSF	18.20
Spring Return Right Side To Center	LSSG	18.20

SQD SLV_001126

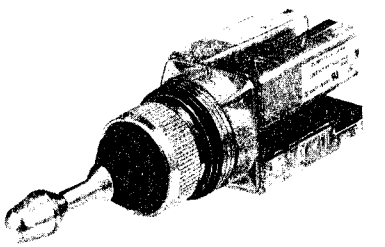
CLASS 9001

APPLICATION DATA

Momentary contact operators spring return to the center position. Maintained contact operators remain in each position and must be reset manually.

JOYSTICK OPERATORS — Round Only

Description	Price Does NOT include contact blocks or legend plate					
	3 Position		5 Position		9 Position	
	Type	Price	Type	Price	Type	Price
Momentary Contact	LRX-4	**$70.80**	LRX-8	**$86.80**	LRX-12	**$110.80**
Maintained Contact	LRX-2	**70.80**	LRX-6	**86.80**	LRX-10	**110.80**



Contact Target Table

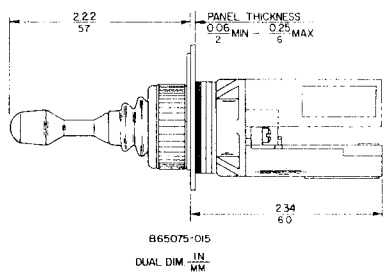
(**Note:** A maximum of 4 isolated single circuit contacts can be used).

Operator	Contact Block Type	Mount in Contact Block Position	Handle Position 1 = Contacts Closed 0 = Contacts Open								
			0°	45°	90°	135°	180°	225°	270°	315°	Center
3 Position	.....	I (Not Used)									
	LA-21 or LB-21 LA-1 or LB-1	II II	0 1				1 0				0 1
	.....	III (Not Used)									
	LA-21 or LB-21 LA-1 or LB-1	IV IV	1 0				0 1				0 1
5 Position	LA-21 or LB-21 LA-1 or LB-1	I I	0 1		0 1		0 1		1 0		0 1
	LA-21 or LB-21 LA-1 or LB-1	II II	0 1		0 1		1 0		0 1		0 1
	LA-21 or LB-21 LA-1 or LB-1	III III	0 1		1 0		0 1		0 1		0 1
	LA-21 or LB-21 LA-1 or LB-1	IV IV	1 0		0 1		0 1		0 1		0 1
9 Position	LA-21 or LB-21 LA-1 or LB-1	I I	0 1	0 1	0 1	0 1	0 1	1 0	1 0	1 0	0 1
	LA-21 or LB-21 LA-1 or LB-1	II II	0 1	0 1	0 1	1 0	1 0	1 0	0 1	0 1	0 1
	LA-21 or LB-21 LA-1 or LB-1	III III	0 1	1 0	1 0	0 1	0 1	0 1	0 1	0 1	0 1
	LA-21 or LB-21 LA-1 or LB-1	IV IV	1 0	1 0	0 1	0 1	0 1	0 1	0 1	1 0	0 1

STANDARD CONTACT BLOCKS

Description	With Pressure Wire Connectors Type	With Slip-On Terminals Type	Price
Single Circuit Closed	LA-1	LB-1	**$6.**
Single Circuit Open	LA-21	LB-21	**6.**

APPROXIMATE DIMENSIONS

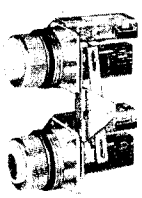


LEGEND PLATE

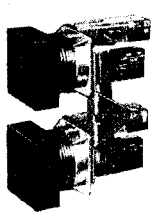
Marking	Type	Price
Blank	LRN-900	**$1.20**

INTERLOCKED PUSH BUTTONS

Includes two maintained push buttons, interlocked to prevent depressing both buttons simultaneously. Each push button (included) accepts one or two contact blocks (not included). Spacing is adjustable from 1½ inches to 1⅞ inches, centerline to centerline. Type LRR11U includes two Type LR16U universal insert kits. Type LSR11 has no color inserts. Order color insert kits for Type LSR11 from table below (two kits per LSR11).



Round



Square

Two Square Insert Kits must be ordered with this operator.

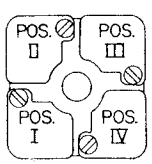
Type	Price	Type	Price
LRR11U	**$33.60**	LSR11	**$28.00**

SQUARE INSERT KITS

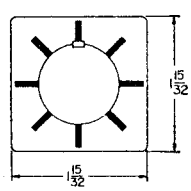
(Includes button, blank legend insert and colored button cover)

Color	Full Guard Type	No Guard Type	Price	Domed Button Type	Domed Button Price
Green Red Amber Blue Clear	LS-71G LS-71R LS-71A LS-71L LS-71C	LS-72G LS-72R LS-72A LS-72L LS-72C	**$2.80**	LS-73G LS-73R LS-73A LS-73L LS-73C	**$4.80**

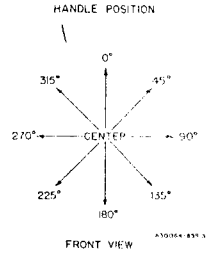
Contact Block Position



REAR VIEW



TYPE LRN-900



FRONT VIEW

POTENTIOMETER (WITH DIAL PLATE)





Watts	Description	Round Type	Square Type	Price
2	Operator only for Single or Tandem Pot	LR-20	LS-20	**$56.**
	Operator with Single Pot ●	LR-21●	LS-21●	**80.**
	Operator with Tandem Pot ▲	LR-23▲	LS-23▲	**112.**

● ▲ Complete Type No. by adding suffix No. from table below.
EXAMPLE: Type LR-2105

Suffix ●	Ohms	Suffix ●	Ohms	Suffix ●	Ohms	Suffix ▲	Ohms Front	Ohms Rear
01	50	06	2500	11	100K	81	500	1000
02	100	07	5000	12	250K	82	1000	1000
03	250	08	10K	13	500K	83	5000	5000
04	500	09	25K	14	1.0 Meg.	84	25K	25K
05	1000	10	50K	15	2.5 Meg.			
				16	5.0 Meg.			

Separate Dial Plate	Type	Price
Round	LRN-905	**$1.20**
Square	LSN-906	**1.20**

SQD SLV_001127

CONTROL UNITS — MINIATURE OILTIGHT

TYPE L LEGEND PLATES AND ACCESSORIES

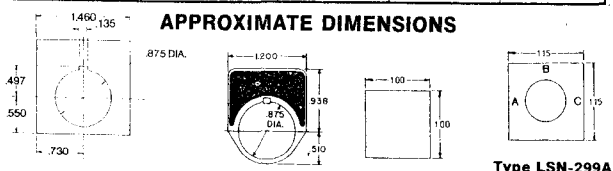
CLASS 9001

LEGEND PLATES

Marking	FOR PUSH BUTTON OR PILOT LIGHT			
	Round		Square (Mylar Insert)	
			Single	Dual
Blank	LRN-100	LRN-200	LSN-200M	LSN-200D
Blank — Red	LRN-100R	LRN-200R	LSN-200M	LSN-200D
Start	LRN-101	LRN-201	LSN-201M	LSN-201D
Stop — Red	LRN-102	LRN-202	LSN-202M	LSN-202D
On	LRN-103	LRN-203	LSN-203M	LSN-203D
Off — Red	LRN-104	LRN-204	LSN-204M	LSN-204D
Emerg. Stop — Red	LRN-105	LRN-205	LSN-205M	LSN-205D
Forward	LRN-106	LRN-206	LSN-206M	LSN-206D
Reverse	LRN-107	LRN-207	LSN-207M	LSN-207D
Close	LRN-108	LRN-208	LSN-208M	LSN-208D
Open	LRN-109	LRN-209	LSN-209M	LSN-209D
Down	LRN-110	LRN-210	LSN-210M	LSN-210D
Up	LRN-111	LRN-211	LSN-211M	LSN-211D
Fast	LRN-112	LRN-212	LSN-212M	LSN-212D
Slow	LRN-113	LRN-213	LSN-213M	LSN-213D
High	LRN-114	LRN-214	LSN-214M	LSN-214D
Low	LRN-115	LRN-215	LSN-215M	LSN-215D
Inch	LRN-116	LRN-216	LSN-216M	LSN-216D
In	LRN-117	LRN-217	LSN-217M	LSN-217D
Jog	LRN-118	LRN-218	LSN-218M	LSN-218D
Jog For.	LRN-119	LRN-219	LSN-219M	LSN-219D
Jog Rev.	LRN-120	LRN-220	LSN-220M	LSN-220D
Lower	LRN-121	LRN-221	LSN-221M	LSN-221D
Out	LRN-122	LRN-222	LSN-222M	LSN-222D
Reset	LRN-123	LRN-223	LSN-223M	LSN-223D
Run	LRN-124	LRN-224	LSN-224M	LSN-224D
Start Jog	LRN-125	LRN-225	LSN-225M	LSN-225D
Test	LRN-126	LRN-226	LSN-226M	LSN-226D
Raise	LRN-127	LRN-227	LSN-227M	LSN-227D
Decrease	LRN-128	LRN-228	LSN-228M	LSN-228D
Increase	LRN-129	LRN-229	LSN-229M	LSN-229D
Left	LRN-130	LRN-230	LSN-230M	LSN-230D
Right	LRN-131	LRN-231	LSN-231M	LSN-231D
Cycle Start	LRN-132	LRN-232	LSN-232M	LSN-232D
Feed Start	LRN-133	LRN-233	LSN-233M	LSN-233D
Cycle Stop	LRN-134	LRN-234	LSN-234M	LSN-234D
Feed Stop	LRN-135	LRN-235	LSN-235M	LSN-235D
Motor Run	LRN-136	LRN-236	LSN-236M	LSN-236D
Motor Stop	LRN-137	LRN-237	LSN-237M	LSN-237D
Power On	LRN-138	LRN-238	LSN-238M	LSN-238D
Full Speed	LRN-172	LRN-272	LSN-272M	LSN-272D
Low Speed	LRN-173	LRN-273	LSN-273M	LSN-273D
Second Speed	LRN-174	LRN-274	LSN-274M	LSN-274D
Third Speed	LRN-175	LRN-275	LSN-275M	LSN-275D

Marking	FOR SELECTOR SWITCHES			
	Round		Square	
			Knob Style	Key Oper.
Blank	LRN-100	LRN-200	LSN-200A	LSN-200K
For.-Rev.	LRN-139	LRN-239	LSN-239A	LSN-239K
Hand-Auto.	LRN-140	LRN-240	LSN-240A	LSN-240K
High-Low	LRN-141	LRN-241	LSN-241A	LSN-241K
Jog-Run	LRN-142	LRN-242	LSN-242A	LSN-242K
Man.-Auto.	LRN-143	LRN-243	LSN-243A	LSN-243K
Off-On	LRN-144	LRN-244	LSN-244A	LSN-244K
On-Off	LRN-145	LRN-245	LSN-245A	LSN-245K
Open-Close	LRN-146	LRN-246	LSN-246A	LSN-246K
Raise-Lower	LRN-147	LRN-247	LSN-247A	LSN-247K
Run-Jog	LRN-148	LRN-248	LSN-248A	LSN-248K
Safe-Run	LRN-149	LRN-249	LSN-249A	LSN-249K
Slow-Fast	LRN-150	LRN-250	LSN-250A	LSN-250K
Start-Stop	LRN-151	LRN-251	LSN-251A	LSN-251K
Up-Down	LRN-153	LRN-253	LSN-253A	LSN-253K
Low-High	LRN-154	LRN-254	LSN-254A	LSN-254K
Stop-Start	LRN-155	LRN-255	LSN-255A	LSN-255K
Left-Right	LRN-156	LRN-256	LSN-256A	LSN-256K
Summer-Winter	LRN-157	LRN-257	LSN-257A	LSN-257K
Auto.-Off-Hand	LRN-158	LRN-258	LSN-258A	LSN-258K
For.-Off-Rev.	LRN-159	LRN-259	LSN-259A	LSN-259K
Hand-Off-Auto.	LRN-160	LRN-260	LSN-260A	LSN-260K
Jog-Safe-Run	LRN-161	LRN-261	LSN-261A	LSN-261K
Man.-Off-Auto.	LRN-162	LRN-262	LSN-262A	LSN-262K
Open-Off-Close	LRN-163	LRN-263	LSN-263A	LSN-263K
Up-Off-Down	LRN-164	LRN-264	LSN-264A	LSN-264K
Low-Off-High	LRN-165	LRN-265	LSN-265A	LSN-265K
For.-Safe-Rev.	LRN-166	LRN-266	LSN-266A	LSN-266K
Jog-Stop-Run	LRN-167	LRN-267	LSN-267A	LSN-267K
Slow-Off-Fast	LRN-168	LRN-268	LSN-268A	LSN-268K
Summer-Off-Winter	LRN-169	LRN-269	LSN-269A	LSN-269K
High-Low-Off	LRN-170	LRN-270	LSN-270A	LSN-270K
Raise-Off-Lower	LRN-171	LRN-271	LSN-271A	LSN-271K
On-Auto.	LRN-176	LRN-276	LSN-276A	LSN-276K
High-Off-Low	LRN-177	LRN-277	LSN-277A	LSN-277K
Auto.-Man.-Off	LRN-178	LRN-278	LSN-278A	LSN-278K

APPROXIMATE DIMENSIONS



Type LRN-1 | Type LRN-2 | Type LSN-299M | Type LSN-299A, Type LSN-299K

PRICING INFORMATION — ROUND

Legend Plate	Description		Type	Price
LRN-1	Standard Markings		Select From Table at Left	$1.20
	Special Marking (Specify Marking Required)	Aluminum Field	LRN-199	5.20
		Red Field	LRN-199R	
LRN-2	Standard Markings		Select From Table at Left	1.20
	Special Marking (Specify Marking Required)	Black Field	LRN-299	5.20
		Red Field	LRN-299R	

PRICING INFORMATION — SQUARE

Legend Plate For	Description	Type	Price
Push Button or Pilot Light (Mylar insert)	Standard Markings	Select from Table at Left	$1.20
	Special Marking (Specify Marking Required)	LSN-299M LSN-299D	5.20
Knob Style Selector Switch	Standard Markings	Select From Table at Left	1.20
	Special Marking (Specify Marking Required)	LSN-299A	5.20
Key Operated Selector Switch	Standard Markings	Select from Table at Left	1.20
	Special Marking (Specify Marking Required)	LSN-299K	5.20

Maximum Number Of Lines And Characters For Type L Legend Plates.

Type	LRN-1	LRN-2	LSN-299 M	LSN-299 D	LSN-299A or LSN-299K A	LSN-299A or LSN-299K B	LSN-299A or LSN-299K C
Max. No. of Characters Per Line	16	11	11	11	1	11	1
Max. No. of Lines	2	2	2	1	7	1	7

ACCESSORIES

Protective Caps Round Operators Only

The Type LRU Protective Caps are suitable for either dusttight or watertight applications.

For Non-illuminated Push Buttons

Color	Type	Price
Black	LRU-1	$8.
Red	LRU-2	8.
Blue	LRU-3	8.
Brown	LRU-4	8.
Green	LRU-5	8.
Yellow	LRU-6	8.

For Selector Switches

Color	Type	Price
Black*	LRU-11	$12.
Clear	LRU-20	

For Illuminated Push Button

Color	Type	Price
Clear	LRU-7	$8.

For Standard Pilot Light and Push-to-Test Pilot Light

Color	Type	Price
Clear	LRU-8	$8.

*For use with non-illuminated operators only.

Padlock Attachments Round Operators Only



Holds standard push button, with or without protective cap, illuminated or non-illuminated in depressed position.

Type	Price
LR-4	$12.

Holds 1" diameter mushroom button, illuminated or non-illuminated in depressed position.

Type	Price
LR-5	$12.

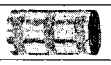
Cover type for standard push button with or without protective cap, 1" diameter mushroom button, standard selector switch and push-to-test pilot light. Operators can be illuminated or non-illuminated. Prevents operation of operator.

Type	Price
LR-6	$12.

Cover type for 1" diameter mushroom button, standard selector switch and push-to-test pilot light, with or without protective cap, illuminated or non-illuminated. Prevents operation of operator.

Type	Price
LR-7	$12.

Wrenches — For Tightening Ring Nuts

Description	Type	Price
 For Round Operators	LR-1	$12.00
 Standard Wrench For Square Operators	LS-1	.50
 Deluxe Wrench for Square Operators	LS-2	12.00

SQD SLV_001128

CLASS 9001



PRESSURE WIRE CONNECTORS

Accepts
One — #14 stranded wire
Two — #16 stranded wires
Two — #18 stranded wires

Description	Type	Price
Single Circuit Closed..	LA-1	$6.
Single Circuit Open...	LA-21	6.



SLIP-ON TERMINALS

Accepts
Commercially available .110″ or .250″ wide by .032″ tab thickness slip-on connectors.

Description	Type	Price
Single Circuit Closed..	LB-1	$6.
Single Circuit Open...	LB-21	6.

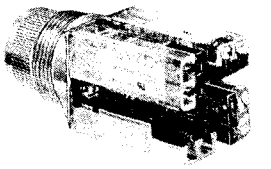
All contact blocks are single circuit with double break fine silver contacts rated 600 Volt, AC or DC. Clear sided blocks have color coded covers:

Single circuit open: Colored black.
Single circuit closed: Colored red.

Normal contact status is indicated on blocks

⊣ ⊢ Indicates contact normally OPEN
⊣ ⊢ Indicates contact normally CLOSED.

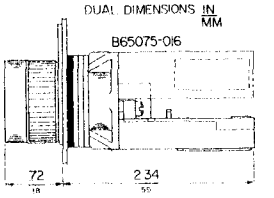
Maximum number of contact blocks:
4 on non-illuminated operator,
2 on illuminated.



SLIP-ON FEMALE CONNECTORS
.110″ x .032″ Tabs

Wire Size	Type	Price Each	Standard Pack Quantity
22-18 AWG	LFC-1	$.60	50△
16-14 AWG	LFC-2	.60	50△

△Orders must specify quantity listed or multiple of quantity listed.



ELECTRICAL CONTACT RATINGS — 600 V MAX.

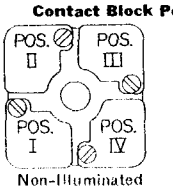
Volts	AC — NEMA B600						DC		
	Inductive 35% Power Factor					Resistive 75% Power Factor		Inductive and Resistive	
	Make		Break		Continuous Carrying Amperes	Make, Break and Continuous Carrying Amperes	Volts	Make and Break Amperes	Continuous Carrying Amperes
	Amps.	VA	Amps.	VA					
120	30	3600	3	360	5	5	120	.22	1.
240	15.	3600	1.5	360	5	5	240	.11	1.
480	7.5	3600	.75	360	5	5	600	.05	1.
600	6	3600	.6	360	5	5			

LOCATION CHART FOR CONTACT BLOCKS ASSEMBLED TO OPERATOR

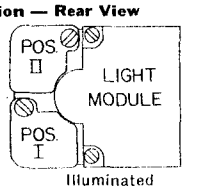
The system illustrated below has been set up to enable an operator and a particular arrangement of contact blocks to be specified by a single type number. The operators and contact blocks will be shipped completely factory assembled — no additional charge for assembly.

EXAMPLE: A Type LRR-1B push button with 1-Type LA-1 and 1-Type LA-21 contact block would be Class 9001 Type LRR-1B-**W5.**

Contact Block Position — Rear View



Non-Illuminated



Illuminated

Suffix No. (Add to Operator Type No.)	Total Circuits† (Contact designation below refers to push buttons only. For selector switch sequences, see pages 342 to 346.)	Contact Block and Mounting Position (For all push buttons. Also for all selector switches, after positions chosen for required contact sequences, pages 342 to 346)			
		I	II	III	IV
W1	1 N.C.	LA-1			
W2	1 N.C.	LB-1			
W3	1 N.O.	LA-21			
W4	1 N.O.	LB-21			
W5	1 N.C., 1 N.O.	LA-1	LA-21		
W6	1 N.C., 1 N.O.	LB-1	LB-21		
W7	2 N.C., 2 N.O.	LA-1	LA-1	LA-21	LA-21
W8	2 N.C., 2 N.O.	LB-1	LB-1	LB-21	LB-21
W9	2 N.O.	LA-21	LA-21		
W10	2 N.O.	LB-21	LB-21		
W11	2 N.O.		LA-21	LA-21	
W12	2 N.O.		LB-21	LB-21	
W13	2 N.O., 2 N.C.	LA-1	LA-21	LA-21	LA-1
W14	2 N.O., 2 N.C.	LB-1	LB-21	LB-21	LB-1
W15	4 N.C.	LA-1	LA-1	LA-1	LA-1
W16	4 N.C.	LB-1	LB-1	LB-1	LB-1
W17	4 N.O.	LA-21	LA-21	LA-21	LA-21
W18	4 N.O.	LB-21	LB-21	LB-21	LB-21
W21	2 N.C., 2 N.O.	LA-1	LA-21	LA-1	LA-21
W22	2 N.C., 2 N.O.	LB-1	LB-21	LB-1	LB-21
W23	1 N.C., 1 N.O.	LA-21	LA-1		
W24	1 N.C., 1 N.O.	LB-21	LB-1		
W25	2 N.C., 2 N.O.	LA-21	LA-1	LA-1	LA-21
W26	2 N.C., 2 N.O.	LB-21	LB-1	LB-1	LB-21
W27	2 N.C.	LA-1	LA-1		
W28	2 N.C.	LB-1	LB-1		
W29	2 N.C.			LA-1	LA-1
W30	2 N.C.			LB-1	LB-1
W31	2 N.C.		LA-1		LA-1

†Contact Designation: N.O. — Normally Open N.C. — Normally Closed

Suffix No. (Add to Operator Type No.)	Total Circuits† (Contact designation below refers to push buttons only. For selector switch sequences, see pages 342 to 346.)	Contact Block and Mounting Position (For all push buttons. Also for all selector switches, after positions chosen for required contact sequences, pages 342 to 346)			
		I	II	III	IV
W32	2 N.C.		LB-1		LB-1
W33	2 N.O.		LA-21		LA-21
W34	2 N.O.		LB-21		LB-21
W35	2 N.C.		LA-1	LA-1	
W36	2 N.C.		LB-1	LB-1	
W37	3 N.C.	LA-1	LA-1		LA-1
W38	3 N.C.	LB-1	LB-1		LB-1
W41	1 N.C., 2 N.O.	LA-21	LA-21		LA-1
W42	1 N.C., 2 N.O.	LB-21	LB-21		LB-1
W43	1 N.O.			LA-21	
W44	1 N.O.			LB-21	
W45	2 N.O.			LA-21	LA-21
W46	2 N.O.			LB-21	LB-21
W49	2 N.O., 2 N.C.	LA-21	LA-1	LA-21	LA-1
W50	2 N.O., 2 N.C.	LB-21	LB-1	LB-21	LB-1
W53	3 N.C.		LA-1	LA-1	LA-1
W54	1 N.C.		LA-1		
W55	1 N.C.		LB-1		
W56	3 N.O.	LA-21	LA-21	LA-21	
W57	2 N.O., 1 N.C.	LB-21	LA-21	LA-21	
W58	2 N.O., 1 N.C.		LA-21	LA-21	LA-1
W59	2 N.O., 1 N.C.		LB-21	LB-21	LB-1
W60	2 N.C.	LA-1		LA-1	
W61	2 N.C.	LB-1		LB-1	
W64	2 N.C., 1 N.O.	LA-1	LA-1	LA-21	
W65	2 N.C., 1 N.O.	LB-1	LB-1	LB-21	
W66	3 N.C., 1 N.O.	LA-1	LA-1	LA-21	LA-1
W67	3 N.C., 1 N.O.	LB-1	LB-1	LB-21	LB-1
W68	3 N.C., 1 N.O.	LA-1	LA-1	LA-1	LA-21
W69	1 N.C.			LA-1	

SQD SLV_001129

CONTROL STATIONS — MINIATURE OILTIGHT

TYPE L

CLASS 9001

APPLICATION DATA

Class 9001 Type L enclosures are available in NEMA 13 (oiltight and dusttight) sheet steel surface mounting type. They are available in custom factory assembled arrangements and as separate unassembled enclosures. Enclosures have sufficient space to accommodate four contact bocks on non-illuminated operators and two contact blocks on illuminated operators.

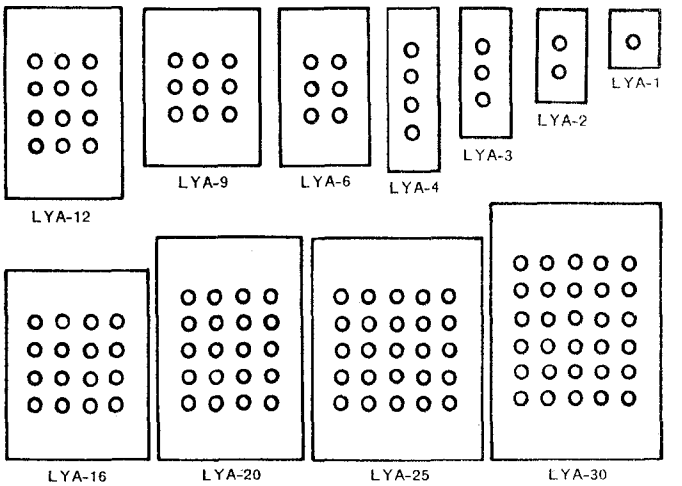
CUSTOM BUILT FACTORY ASSEMBLED STATIONS

NEMA TYPE 13		
Number of Units	Surface Mounting Type	Base Price
1	LYA-100	$ 28.
2	LYA-200	30.
3	LYA-300	32.
4	LYA-400	36.
6	LYA-600	48.
9	LYA-900	56.
12	LYA-1200	72.
16	LYA-1600	92.
20	LYA-2000	120.
25	LYA-2500	144.
30	LYA-3000	160.

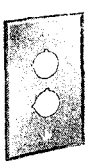
Base prices shown include the enclosure only. The complete price for an assembled station is the sum of this base price plus prices of all control units to be installed. (There is no extra charge for factory assembly.) Orders must be accompanied with a sketch showing all control units in their desired location. For legend plate on enclosure with markings as specified; add **$6.**

ENCLOSURES ONLY FOR CUSTOMER ASSEMBLY

NEMA TYPE 13		
Number of Units	Surface Mounting Type	Base Price
1	LYA-1	$ 28.
2	LYA-2	30.
3	LYA-3	32.
4	LYA-4	36.
6	LYA-6	48.
9	LYA-9	56.
12	LYA-12	72.
16	LYA-16	92.
20	LYA-20	120.
25	LYA-25	144.
30	LYA-30	160.



STAINLESS STEEL FLUSHPLATES For Type L Control Units (Stations Are Not Oiltight)



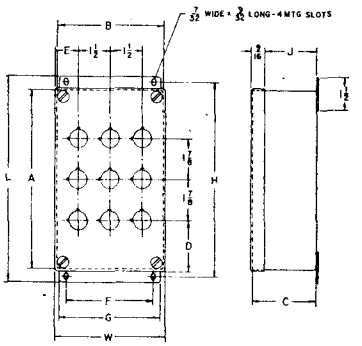
Allows Type L control units to be mounted in standard pullboxes.

Number of Units	Fits Pullbox Size	Type	Price
1	Single Gang	L-25F	$ 8.
2*	Single Gang	L-26F	8.
4	Double Gang	L-27F	12.
6	Triple Gang	L-28F	16.

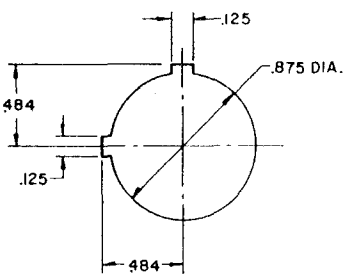
*Can mount only one illuminated operator.

Blank Nameplates For Above

Background	Type	Price
Black	LRN-910	$1.20
Red	LRN-910R	1.20



APPROXIMATE DIMENSIONS



Device Mounting Hole Configuration

Type No.	No. Holes	Enclosure Size A	B	C	D	E	F	G	H	J	Overall L	W
LYA-1	1	3¼	2¾	3½	1 47/64	1 31/64	1⅞	2½	3¾	3 5/32	4¼	2 31/32
LYA-2	2	5⅛	2¾	3½	1 47/64	1 31/64	1⅞	2½	5⅝	3 5/32	6⅛	2 31/32
LYA-3	3	7	2¾	3½	1 47/64	1 31/64	1⅞	2½	7½	3 5/32	8	2 31/32
LYA-4	4	8⅞	2¾	3½	1 47/64	1 31/64	1⅞	2½	9⅜	3 5/32	9⅞	2 31/32
LYA-6	6	8½	5	4¼	2 31/64	1 55/64	4⅛	4¾	9	3 27/32	9½	5 7/32
LYA-9	9	8½	6½	4¼	2 31/64	1 55/64	5⅝	6¼	9	3 27/32	9½	6 23/32
LYA-12	12	10⅜	6½	4¼	2 31/64	1 55/64	5⅝	6¼	10⅞	3 27/32	11⅜	6 23/32
LYA-16	16	10⅜	8	4¼	2 31/64	1 55/64	7⅛	7¾	10⅞	3 27/32	11⅜	8 7/32
LYA-20	20	12¼	8	4¼	2 31/64	1 55/64	7⅛	7¾	12¾	3 27/32	13¼	8 7/32
LYA-25	25	12¼	9½	4¼	2 31/64	1 55/64	8⅝	9¼	12¾	3 27/32	13¼	9 23/32
LYA-30	30	14⅛	9½	4¼	2 31/64	1 55/64	8⅝	9¼	14⅝	3 27/32	15⅛	9 23/32

Round Closing Plates



Description	Type	Price
Grey Painted	LR-51	$4.
Chrome Plated	LR-52	4.

Square Closing Plate



Description	Type	Price
Non-Metallic Black	LS-51	$4.

MINIMUM CENTERLINE SPACING For Type L Control Units

Description		Spacing (Inches) Horizontal	Vertical
Round Operators without Legend Plate	Non-illuminated	1¼	1¼
	Illuminated	1½	1¼
Round Operators with Type LRN-2 Legend Plate	Non-illuminated	1¼	1½
	Illuminated	1½	1½
Square Operators	Non-illuminated	1¼	1¼
	Illuminated	1½	1¼

Service Temperature Range — All Operators:
−22° to +140° Fahrenheit
−30° to +60° Centigrade

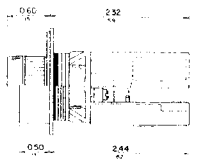
SQD SLV_001130

OPERATOR DIMENSIONS — TYPE L

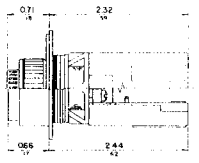
CLASS 9001

APPROXIMATE DIMENSIONS

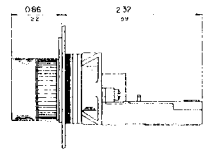
Note: Where both round and square operators are available, round operator dimensions are shown on top, square operator dimensions on the bottom.



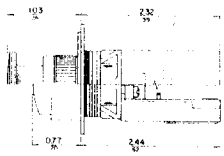
FULL GUARD PUSH BUTTON
ROUND AND SQUARE



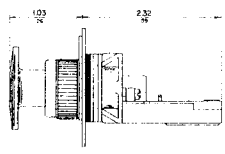
NO GUARD ROUND PUSH BUTTON
AND EXTENDED SQUARE PUSH BUTTON



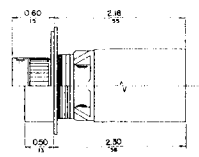
EXTENDED GUARD ROUND PUSH BUTTON



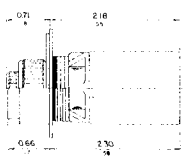
1" DIA. ROUND MUSHROOM BUTTON
AND SQUARE DOMED (MUSHROOM) BUTTON



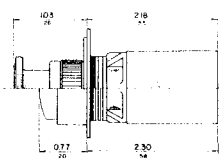
1⅜" DIA. ROUND MUSHROOM BUTTON



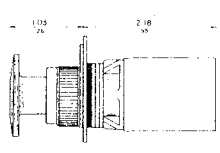
FULL GUARD ILLUMINATED PUSH BUTTON
ROUND AND SQUARE



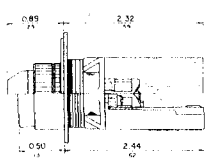
NO GUARD ILLUMINATED ROUND
PUSH BUTTON AND EXTENDED
ILLUMINATED SQUARE PUSH BUTTON



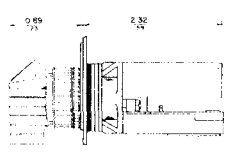
1" DIA. ILLUMINATED ROUND MUSHROOM
BUTTON AND ILLUMINATED
SQUARE DOMED (MUSHROOM) BUTTON



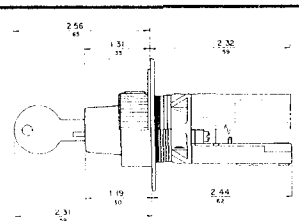
1⅜" DIA. ILLUMINATED ROUND
MUSHROOM BUTTON



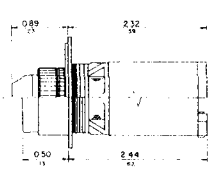
STANDARD KNOB SELECTOR SWITCH
ROUND AND SQUARE



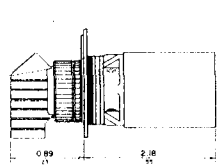
GLOVED HAND KNOB SELECTOR SWITCH
ROUND AND SQUARE



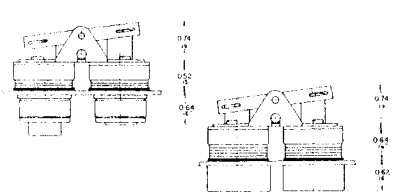
KEY OPERATED SELECTOR SWITCH
ROUND AND SQUARE



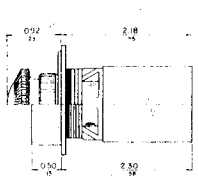
ILLUMINATED STANDARD KNOB SELECTOR
SWITCH ROUND AND SQUARE



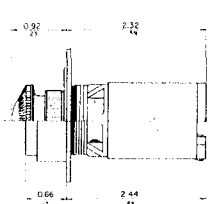
ILLUMINATED GLOVED HAND KNOB SELECTOR
SWITCH ROUND AND SQUARE



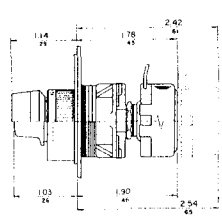
MAINTAINED AND INTERLOCKED PUSH BUTTONS
ROUND AND SQUARE



PILOT LIGHT
ROUND AND SQUARE



PUSH-TO-TEST PILOT LIGHT
ROUND AND SQUARE



POTENTIOMETER OPERATOR
ROUND AND SQUARE

FOR MINIMUM CENTERLINE SPACING SEE PAGE 352

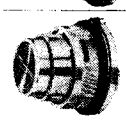
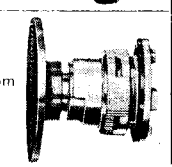
SQD SLV_001131

CONTROL UNITS — HEAVY DUTY OILTIGHT

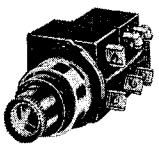
TYPE T

CLASS 9001

Non-Illuminated Push Button Operators
Legend Plate Not Included

Description	Color Insert	Type	Price
Half Guard 	**Universal**—Includes one of each color insert from table below	TR-50	$10.80
	Black	TR-1	10.80
	Red	TR-2	10.80
Full Guard 	**Universal**—Includes one of each color insert from table below	TR-51	10.80
	Black	TR-6	10.80
	Red	TR-7	10.80
Extended Guard 	**Universal**—Includes one of each color insert from table below	TR-52	10.80
	Black	TR-35	10.80
	Red	TR-36	10.80
No Guard 	**Universal**—Includes one of each color insert from table below	TR-53	10.80
	Black	TR-13	10.80
	Red	TR-14	10.80
Mushroom Button 	1⅜" Dia. Black	TR-3	22.80
	1⅜" Dia. Red	TR-4	22.80
	2¼" Dia. Black	TR-10	22.80
	2¼" Dia. Red	TR-11	22.80

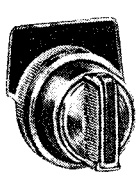
Illuminated Push Button
Contact Blocks (1 N.O.-1 N.C.) Included
Legend Plate Not Included


(Without Guard Shown)

Description	Voltage and Frequency	Without Guard: With Red Color Cap Type	Without Guard: With Green Color Cap Type	Without Guard Price	With Guard: With Red Color Cap Type	With Guard: With Green Color Cap Type	With Guard Price
Transformer	110-120 V., 50-60 Hz.	TP 35R3	TP 35G3	$54.80	TP 41R3	TP 41G3	$58.80
	208-220 V., 50-60 Hz.	TP 37R3	TP 37G3		TP 43R3	TP 43G3	
	380-480 V., 50-60 Hz.	TP 39R3	TP 39G3		TP 45R3	TP 45G3	
	550-600 V., 50-60 Hz.	TP 40R3	TP 40G3		TP 46R3	TP 46G3	
Resistor	120 V., AC or DC	TP 52R3	TP 52G3	$46.80	TP 59R3	TP 59G3	$50.80
	240 V., AC or DC	TP 53R3	TP 53G3		TP 60R3	TP 60G3	
Full Voltage	6 V., AC or DC	TP 47R3	TP 47G3	$46.80	TP 54G3	TP 54G3	$50.80
	12 V., AC or DC	TP 48R3	TP 48G3		TP 55R3	TP 55G3	
	18 V., AC or DC	TP 49R3	TP 49G3		TP 56R3	TP 56G3	
	24 V., AC or DC	TP 50R3	TP 50G3		TP 57R3	TP 57G3	
	28 V., AC or DC	TP 51R3	TP 51G3		TP 58R3	TP 58G3	
	60 V., AC or DC	TP 63R3	TP 63G3		TP 68R3	TP 68G3	
	120 V., AC or DC	TP 52R3	TP 52G3		TP 59R3	TP 59G3	

Type T illuminated operators use Type K light modules. For replacement lamps and VA rating, refer to listing of Type K light modules, page 326.

Selector Switch Operators
Legend Plate Not Included


Selector Switch

Description	Contact Block Required: Quantity and Type	Mount in Position	1 = Contact Closed, 0 = Contact Open: 2 Position Left	2 Position Right	3 Position Center Left	3 Position Center Right	3 Position Left	3 Position Right	3 Position Left	3 Position Right	3 Position Center Left	3 Position Center Right	4 Position
Selector Switch	1-KA-1	#2	1 / 0	0 / 1	1 0 / 0 1	1 0 / 0 1	0 / 1	1 / 0	0 / 1	1 / 0	..... /		1 0 0 0 / 0 0 1 0
	1-KA-1 	#1	1 / 0	0 / 1	0 0 1 / 1 1 0	1 0 0 / 0 0 1	0 / 1	1 / 0	0 / 1	1 / 0	0 1 0 / 0 0 1		0 0 0 1 / 0 1 0 0

	Type	Type	Type	Type	Type	Type	Type	Type	Price
Manual Return									
Standard Black Knob	TS-1	.....	TS-2	TS-3	TS-4	TS-5	TS-6	TS-401	$14.80
Key Operated	TS-1K*	.....	TS-2K*	TS-3K*	TS-4K*	TS-5K*	TS-6K*	TS-400K*	38.80
Spring Return — Left to Center									
Standard Black Knob	TS-14	.....	TS-15	TS-16	TS-17	TS-18	TS-19	.....	22.80
Key Operated	TS-14K2	.....	TS-15K*	TS-16K*	TS-17K*	TS-18K*	TS-19K*	.....	46.80
Spring Return — Right to Center									
Standard Black Knob	.....	TS-27	TS-511	TS-521	TS-531	TS-541	TS-551	.....	22.80
Key Operated	.....	TS-27K1	TS-21K*	TS-22K*	TS-23K*	TS-24K*	TS-25K*	.....	46.80
Spring Return — Both Sides to Center									
Standard Black Knob	.....	.....	TS-8	TS-9	TS-10	TS-11	TS-12	.....	22.80
Key Operated	.....	.....	TS-8K5	TS-9K5	TS-10K5	TS-11K5	TS-12K5	....	46.80

***KEY WITHDRAWAL CODE:** See pages 323-325 for proper code no. All key operated selector switches are furnished as standard with Square D number NQ1101 key change. Refer to local Square D field office for other key changes. TS400 not available with K14 key withdrawal code.

Accessories and Modifications

Color Inserts for Non-Illuminated Push Buttons

Color	Type	Price Each
Black	T-6BK	$.20
Red	T-6RD	
Green	T-6GN	
Yellow	T-6YW	
Orange	T-6OE	
Blue	T-6BE	
White	T-6WH	
Universal (All Colors)	T-6U	1.60

Orders must specify quantity of 10 or multiples of 10.

Separate Color Caps For Illuminated Push Buttons

Color	Type	Price
Red	R3	$2.80
Green	G3	$2.80
Amber	A3	$2.80
Blue	B3	$2.80
Clear	C3	$2.80
White	W3	$2.80

Gloved Hand Knob For Selector Switch

Type	Price
T-7	$16.00

Color Inserts For Selector Switch

Color	Type	Price Each
Black	T-4BK	$.40
Red	T-4RD	.40
Green	T-4GN	.40
Brown	T-4BN	.40
Yellow	T-4YW	.40
Orange	T-4OE	.40
Blue	T-4BE	.40

Orders must specify min. quantity of 10 or multiple of 10

SQD SLV_001132

Pilot Lights
Legend Plate not Included

Description	Voltage and Frequency	Standard Pilot Light: With Red Plastic Color Cap Type	Standard Pilot Light: With Green Plastic Color Cap Type	Standard Pilot Light: Price	Push-To-Test Pilot Light: With Red Glass Color Cap Type	Push-To-Test Pilot Light: With Green Glass Color Cap Type	Push-To-Test Pilot Light: Price
Transformer	110-120 V., 50-60 Hz. 208-220 V., 50-60 Hz. 380-480 V., 50-60 Hz. 550-600 V., 50-60 Hz.	TP-1R1 TP-3R1 TP-5R1 TP-6R1	TP-1G1 TP-3G1 TP-5G1 TP-6G1	$42.80	TP-21R2 TP-23R2 TP-25R2 TP-26R2	TP-21G2 TP-23G2 TP-25G2 TP-26G2	$54.80
Neon	120 V., AC or DC 240 V., AC or DC 380 V., AC or DC 480 V., AC or DC 550 V., AC or DC	TP-7R1 TP-8R1 TP-9R1 TP-10R1 TP-11R1	TP-7G1 TP-8G1 TP-9G1 TP-10G1 TP-11G1	34.80	....	....	....
Resistor	120 V., AC or DC 240 V., AC or DC	TP-19R1 TP-20R1	TP-19G1 TP-20G1	34.80	TP-32R2 TP-33R2	TP-32G2 TP-33G2	46.80
Full Voltage	6 V., AC or DC 12 V., AC or DC 18 V., AC or DC 24 V., AC or DC 28 V., AC or DC 60 V., AC or DC 120 V., AC or DC	TP-12R1 TP-13R1 TP-14R1 TP-15R1 TP-16R1 TP-18R1 TP-19R1	TP-12G1 TP-13G1 TP-14G1 TP-15G1 TP-16G1 TP-18G1 TP-19G1	34.80	TP-27R2 TP-28R2 TP-29R2 TP-30R2 TP-31R2 TP-64R2 TP-32R2	TP-27G2 TP-28G2 TP-29G2 TP-30G2 TP-31G2 TP-64G2 TP-32G2	46.80

Type T illuminated operators use Type K light modules. For replacement lamps and VA rating, refer to listing of Type K light modules, page 326.

Contact Blocks
All Type T Operators Accept Type KA Blocks

Symbol	Type K: Type	Type K: Price	Equivalent Type T: Type	Equivalent Type T: Price
	KA-1	$12.	TA	$18.
	KA-2	6.	TA-2	9.
	KA-3	6.	TA-1	9.
	Two Type KA-1	12. Each	One Type TB	36.
	Two Type KA-2	6. Each	One Type TD	18.
	Two Type KA-3	6. Each	One Type TC	18.

Separate Legend Plates


TN-200

Standard legend plate markings and special markings are *listed on page 330 — order as Type TN rather than Type KN.* Example: Legend plate marked "Forward," order TN-206.

Separate Color Caps for Pilot Lights

Color	Plastic Cap for Standard Pilot Lights Only: Type	Glass Cap for Standard or Push-To-Test Pilot Lights: Type	Price
Red	R1	R2	$2.80
Green	G1	G2	2.80
Amber	A1	A2	2.80
Blue	B1	B2	2.80
Clear	C1	C2	2.80
White	W1	W2	2.80

Adaptor Kits

Allows Type T Operators To Be Mounted In Type K Mounting Hole		
Part Number	Units	Price
30426-542-50	1 Operator	No Charge
30426-542-51	2 Operators	No Charge
30426-542-52	3 Operators	No Charge
30426-542-53	4 Operators	No Charge

Accessories and Modifications

Description	Application	Type	Price
Maintained Contact Attachment	Use with two Type TR push buttons & one contact block	TM-1	$12.00
Push Button Wrench	Simplifies installation of Type T units	T-1	12.00
Wobble Stick Operator	*Momentary contact push button with wobble stick* attachment for easy operation. Price includes a standard legend plate. Deduct **$1.20** if legend plate is not required	TW-1	24.00
Trim Washer	For use where a legend plate is not required	TN-5	1.20
Padlock Attachments			
Latch Type	Holds push button in depressed position	TL-1	12.00
Cover Type	Prevents push button from being depressed	TL-2	12.00
Selector Switch	Prevents operation of selector switch	TL-3	12.00
Latch Type	Same as TL-1 except for use with watertight caps	TL-5	20.00

Watertight Caps

Separately mounted legend plates (Type KN-8 as listed on page 330) must be used to insure a water tight seal.

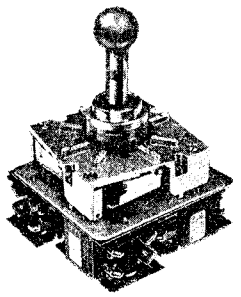
Color	For Push Buttons: Type	For Push Buttons: Price	For Selector Sw.: Type	For Selector Sw.: Price
Black	TU-11	$8.	TU-51	$16.
Red	TU-12	8.	TU-52	16.
Blue	TU-13	8.	TU-53	16.
Brown	TU-14	8.	TU-54	16.
Green	TU-15	8.	TU-55	16.
Yellow	TU-16	8.	TU-56	16.
Clear Silicone Cap — For standard pilot lights			TU-17	$12.
For push-to-test pilot lights and illuminated push buttons			TU-27	12.

SQD SLV_001133

HEAVY DUTY OILTIGHT CONTROL UNITS
TYPE T

CLASS 9001

Four-Way Operator — Joy Stick Type

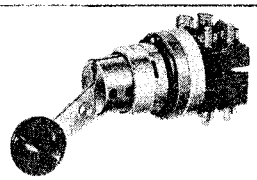


This four way, five position operator (center position neutral) has one lever to operate up to a maximum of eight Type KA1 contact blocks, two maximum in the Up, Down, Left or Right positions. Maintained contact or momentary contact is available, with or without an off position latch. Conversion to any desired combination of momentary contact or maintained contact can easily be accomplished in the field.

Description ✚	Operator Only (Without Contact Blocks)		Operator with 4 Type KA-1 Contact Blocks		Operator with 8 Type KA-1 Contact Blocks	
	Type	Price	Type	Price	Type	Price
Momentary Contact with Off Position Latch	TX-1	$128.	TX-1A	$176.	TX-1B	$224.
Momentary Contact	TX-2	128.	TX-2A	176.	TX-2B	224.
Maintained Contact with Off Position Latch	TX-3	128.	TX-3A	176.	TX-3B	224.
Maintained Contact	TX-4	128.	TX-4A	176.	TX-4B	224.

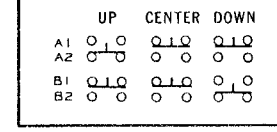
✚Requires use of separately mounted legend plates (not included).

Three-Position Master Switches (not completely oiltight)



Description	Symbol	Type ★	Price
3-Position Master Switch, Complete with Contact Block Maintained Contact. Spring Return to Center.	103 104‡	TS-80E-2 TS-82D-1	$74. 78.

SYMBOL 103



‡Symbol 104 is same as 103 except contacts A1 and B1 are not furnished.
★These switches are furnished with special contact blocks.

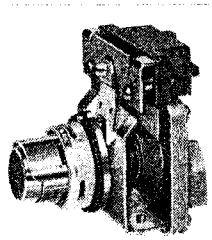
DUST BOOT FOR THREE POSITION MASTER SWITCH	
Type	Price
TU-61	$16.

SELECTOR PUSH BUTTON OPERATORS
Legend Plate and Contact Block Not Included

Contact Blocks Required	Two Position Operators															Three Position Operators		
	1 = Contact Closed, 0 = Contact Open; F = Free, D = Depressed																	
	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right		Left	Center	Right
	F D	F D	F D	F D	F D	F D	F D	F D	F D	F D	F D	F D	F D	F D		F D	F D	F D
2-KA-1 or 1-TB	1 0 0 1	0 0 1 1	1 0 0 1	0 0 0 1	1 0 0 1	0 0 0 1	0 0 0 1	1 0 0 0	1 0 0 1	1 1 0 0	0 0 0 1	1 0 0 1	0 0 0 1	1 1 0 0		1 0 0 1	1 0 0 0	1 1 0 0
	1 0 0 1	0 0 1 1	1 1 0 0	0 0 0 1	1 0 0 1	0 0 0 1	0 0 0 1	1 0 0 0	1 1 0 0	1 0 0 1	0 0 0 1	1 1 0 0	1 1 0 0	0 0 0 1		1 1 0 0	1 0 0 0	1 0 0 1
Non-Illuminated Operators	Type		Type		Type		Type		Type		Type		Type		Price	Type		Price
Half Guard Black Insert	TQ-1		TQ-2		TQ-3		TQ-36		TQ-26		TQ-42		TQ-50		$22.80	TQ-32		$26.80
Full Guard Black Insert	TQ-11		TQ-12		TQ-13		TQ-39		TQ-48		TQ-45		TQ-53		26.80	....		....
Extended Guard Black Insert	TQ-62		TQ-56		TQ-65		TQ-69		TQ-59		TQ-71		TQ-73		26.80	....		....

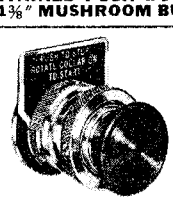
Time Delay Push Button

Timing period is adjustable from 0.2 second to 60 seconds and begins after push button has been released. Devices require the space of two standard operators. Devices include a package of nine color inserts for color coding the push button. Contacts are quick make — quick break. Type listed is half guard version. Legend plate not included.



Description	Timed Contact 1 N.O. & 1 N.C.
Type	TRD-150
Price	$70.80

MAINTAINED PUSH BUTTON WITH 1⅜" MUSHROOM BUTTON



Color	Type	Price
Black	TRM-3	$44. Does Not Include Contact Block But Does Include Legend Plate
Red	TRM-4	
Green	TRM-20	
Brown	TRM-21	
Yellow	TRM-22	
Orange	TRM-23	
Blue	TRM-24	

Button locks in the depressed position—Turning knurled ring releases operator to its normal position. Price includes nameplate: **"Push-to-Stop Rotate Collar CW to Start"**

COLOR INSERTS FOR SELECTOR — PUSH BUTTONS

Black	T-5BK	$.40
Red	T-5RD	.40
Green	T-5GN	.40
Brown	T-5BN	.40
Yellow	T-5YW	.40
Orange	T-50E	.40
Blue	T-5BE	.40

Orders must specify min. quantity of 10 or multiple of 10 in any one color.

Cams

Cam	Type	Price
P	T-3P	$3.20
R	T-3R	
S	T-3S	
T	T-3T	
U	T-3U	
Y	T-3Y	
Z	T-3Z	

Orders must specify minimum quantity of 10 or multiple of 10.

SQD SLV_001134

HEAVY DUTY & STANDARD DUTY — FOOT SWITCHES

TYPES A and C

Foot switches are used to control many industrial processes, while leaving the operator's hands free to perform other functions. Switches are available in a wide choice of contact arrangements, ratings and enclosure styles.

CLASS 9002

CAUTION: ***Misapplication of foot switches on machinery lacking effective point-of-operation safeguards can cause serious injury to the operator of that machinery.***

HEAVY DUTY INDUSTRIAL FOOT SWITCHES

OILTIGHT, WATERTIGHT, DUSTTIGHT AND DRIPTIGHT ENCLOSURE, NEMA TYPES 2, 4 AND 13

Description	Features	Fully Guarded with Pedal Guard, Side Shields and Safety Door		With Oversize Pedal Guard and Side Shields		With Pedal Guard and Side Shields		With Pedal Guard		Without Pedal Guard or Side Shields	
		Type	Price	Type	Price	Type	Price	Type	Price	Type	Price
Single Pole* Double Throw	Spring Return With Mechanical Latch	AW-117	$132.	AW-32	$136.	AW-17	$ 74.	AW-2 AW-7	$ 66. 95.	AW-1	$ 62.
Two Pole* Double Throw	Spring Return With Mechanical Latch	AW-124▲	164.	AW-33	165.	AW-18	103.	AW-14 AW-15	95. 124.	AW-13	91.
Two Stage* (One Pole Each Stage)	Spring Return With Mechanical Latch in 1st Stage With Mechanical Latch in 2nd Stage	AW-119	168.			AW-19	107.	AW-6 AW-9 AW-10	99. 128. 128.	AW-5	95.
Four Stage* (One Pole Each Stage)	Spring Return Spring Return — Crane Control	AW-123	238.			AW-23	173.	AW-22	165.	AW-21 AT-4●	161. 684.
Single Pole Single Throw	Maintained Contact — Ratchet Type					AW-20	103.	AW-12	95.	AW-11	91.

● In NEMA Type 1, General Purpose Enclosure.
▲2 N.O. and 2 N.C. isolated, direct acting contacts.

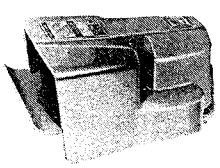
* A single pole snap switch that contains two (2) double break contact elements (1 N.O. and 1 N.C.) must be used on circuits of same polarity.

A double pole snap switch contains two electrically separated sets of contact elements allowing use on circuits of opposite polarity. Each set that contains two double break contact elements (1 N.O. and 1 N.C.) must be used on circuits of same polarity.

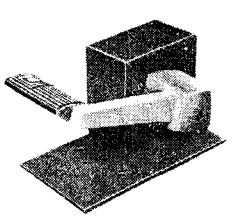
CONTACT SYMBOL — TWO STAGE

Contact Block	Contacts	Pedal		
		Up	Half Down	Full Down
1	A1	0	1	1
	B1	1	0	0
2	A2	1	1	0
	B2	0	0	1

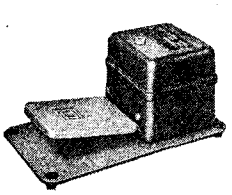
0 = Open 1 = Closed



Fully Guarded Type AW Foot Switch with Pedal Guard, Side Shields and Safety Door



Type AT-4



Type CG-1

MAXIMUM CURRENT RATINGS FOR CONTROL CIRCUIT CONTACTS

Type	Volts	AC AMPERES				Volts	DC AMPERES		
		Inductive 35% Power Factor			**Resistive** 75% Power Factor		**Inductive** and **Resistive**		
							Make and Break		
		Make	Break	Continuous	Make Break and Continuous		Single Throw	Double Throw	Continuous
AW-1 THRU AW-10, AW-17, AW-19, AW-32, AW-117, AW-119, AT-4	120 240 480 600	40 20 10 8	15 10 6 5	15 15 15 15	15 15 15 15	115 230 600	2.0 0.5 0.1	0.5 0.2 0.02	15 15 15
AW-13, AW-14, AW-15, AW-18, AW-33†	0-115 115-600	30 3450 VA	3 345 VA	10 10	10 10	115 230 600	1.0 0.3 0.1	0.2 0.1	10 10 10
AW-11, AW-12, AW-20	 115 230	 36 18	 6 3			 125 250	 2.2 1.1		 ....
AW-21, AW-22, AW-23, AW-123	120 240 480 600	15.0 7.5 3.75 3.0	1.5 0.75 0.375 0.3	10 10 10 10	10 10 10 10	....	....	....	....
AW-124	120 240 480 600	60 30 15 12	6 3 1.5 1.2	10 10 10 10	10 10 10 10	120 240 600	1.1 0.55 0.2	....	10 10 10

† Double throw switches are rated 250 volts dc maximum.

STANDARD DUTY FOOT SWITCHES

300 VOLTS MAX. AC, 250 VOLTS MAX. DC

Contact Arrangement	General Purpose Enclosure		AC Ratings			DC Ratings	
				Max. HP			
	Type	Price	Volts	Poly-phase	Single phase	Volts	Max. HP
2—N.O.	CG-1	$44.	110	1	1	32	¼
2—N.C.	CG-2	60.				110	¼
1—N.O., 1—N.C.	CG-3	60.	220	1	1	220	¼

Contacts are electrically separate — no polarity restrictions.

REPLACEMENT CONTACT PARTS KITS: See Class 9998, Type FS on Page 453.

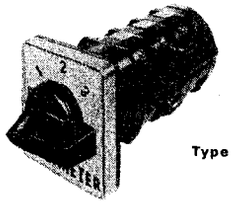
ORDERING INFORMATION REQUIRED: Class and type number.

SQD SLV_001135

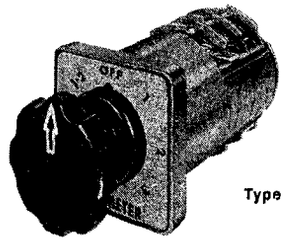
INSTRUMENT CAM SWITCHES

TYPE Z

CLASS 9003



Type ZC6126AA2



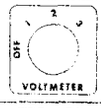
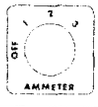
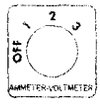
Type ZE6128AK1

Cam switches are similar to selector switches in that circuits are switched by rotating a handle. The primary difference between cam switches and selector switches are the contact ratings (cam switches can have much higher ratings).

All Square D cam switches are UL component recognized or UL listed, CSA certified and approved by many European organizations.

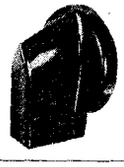
Type ZC switches are supplied with the standard handle (shown in photo above) and the Type ZE is supplied with a fluted handle (shown in photo above). Other handles for Type ZE are available — see table below.

INSTRUMENT CAM SWITCHES

Description	Legend Plate	Continuous Current Rating at 600 VAC	Type Number	Price
Voltmeter: Reads Phase To Neutral		16 Amp.	ZC6126AA2	**$34.**
		25 Amp.	ZE6126AK1	**68.**
Voltmeter: Reads Phase To Phase		16 Amp.	ZC6127AA2	**34.**
		25 Amp.	ZE6127AK1	**68.**
Voltmeter: Reads Phase To Neutral and Phase To Phase		16 Amp.	ZC6128AA2	**51.**
		25 Amp.	ZE6128AK1	**76.**
Ammeter: Reads 2 Current Transformers		16 Amp.	ZC6131AA2	**51.**
		25 Amp.	ZE6131AK1	**76.**
Ammeter: Reads 3 Current Transformers		16 Amp.	ZC6129AA2	**51.**
		25 Amp.	ZE6129AK1	**76.**
Ammeter/Voltmeter: Reads Phase To Phase and 3 Current Transformers		16 Amp.	ZC6130AA2	**74.**
		25 Amp.	ZE6130AK1	**90.**

Instrument cam switches are supplied with handles (Type ZZA2 for Type ZC switches and Type ZZK1 for Type ZE switches). If another style handle is preferred for Type ZE, order standard instrument cam switch from table above and separate handle from table below.

SEPARATE HANDLES

Description	Fits On	Type No.	Price
Black Standard 	ZE	ZZB2	**$4.**
Black Pistol Grip 	ZE	ZZC2	**6.**

REPLACEMENT HANDLES

Description	Fits On	Type No.	Price
Black Standard 	ZC	ZZA2	**$4.**
Black Fluted 	ZE	ZZK1	**6.**

For panel meters — see pages 182-183.

SQD SLV_001136

TYPE NUMBER INDEX

Class 9007 Type	Page
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B52 thru B66	362
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BB	*
BF	362
BLC, BLS	*
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FA	368
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KA, KB	366
LA	367
MA	366
N	371
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PA	382
PB	365
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RA	367
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TA, TB, TS, TU	370
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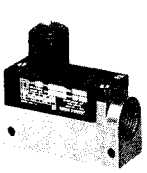
VQ	381
X, Y, Z	371
Y53, Y54	377
31032-65071-	362-377

* Consult local Square D Field Office.

LIMIT SWITCH SELECTION GUIDE

			Description	Page
	HEAVY DUTY PRECISION OIL-TIGHT **TYPE C** Listing on Page 361	New Product — The Type C provides superior electrical and mechanical life and easier installation and wiring. Use Type C on all applications requiring a heavy duty, precision oiltight limit switch. If a particular version or actuator is not yet available, use the Type B.	Lever Type Lever Arms Plunger Type Special Features Special Applications	361 366-368 361 364-365 See Below
	HEAVY DUTY PRECISION OIL-TIGHT **TYPE B** Listing Starts on Page 362	If an equivalent Type C device is not yet available, use the Type B on all applications requiring a heavy duty, precision oiltight limit switch. Although designed for rugged applications, it is also an excellent choice for general or light duty applications. The Types C and B will handle the vast majority of applications and should be selected first unless one of the features listed below is required.	Lever Type Lever Arms Plunger Type Wobble Stick Type Remote Cable Type Special Features Hazardous Location Type Multiple Unit Type Flush Mounting Type Special Applications	362-363 366-368 362-363 363 * 364-365 362-363 364 362-363 See Below
	HEAVY DUTY OIL-TIGHT **TYPE T** FOUNDRY **TYPE FT** Listing Starts on Page 370	If load exceeds Types C and B contact ratings, if a required operating sequence is not available on the Types C and B or if high trip and reset forces are required, use the Type T. Use Type FT in foundries or mills where one or more of the above listed Type T features are required and where hot, falling sand or similar foreign material could cause jamming of other limit switches.	Type T, Heavy Duty Type Lever Arms Type FT, Foundry Type Special Applications	370 371 370 See Below
	PRECISION OIL-TIGHT **TYPE AW** Listing Starts on Page 369	The Type AW is suitable for applications requiring a precision, oiltight limit switch. It is suggested especially for applications requiring a lever type switch for use in extremely low ambients or micrometer adjustment on a plunger type switch.	Lever Type Lever Arms Plunger Type with Micrometer Adj. Flush Mounting Type Duplex Type	369 366-368 369 369 369
LIMIT SWITCHES FOR SPECIAL APPLICATIONS		Either designed for a specific application or found to be particularly useful under certain special conditions.	With Direct Acting Contacts Conveyor Side Guide Switch Slack Cable Switch Crane Safety Limit Switch Lever Type for Low Ambients Plunger Type with Micrometer Adj. Motion Detector	365 * * * 369 369 383
	PROXIMITY **TYPE PS** and **VQ** Listing Starts on Page 379	For use on machines or conveyors where it is necessary to detect the presence or position of parts without physical contact. Particularly well suited for very small parts, odd shaped parts, high speed applications and other applications where conventional limit switches will not perform satisfactorily.	Type PS Type VQ	379-382 381
	SNAP SWITCHES Listing Starts on Page 369	Use snap switches on applications requiring a basic contact mechanism with or without operator where an enclosure is furnished separately or not required. Also use as replacement on many Square D devices.	Basic Snap Switches Limit Switches without Enclosures	369 369
	ENCLOSED PRECISION SWITCHES **Type Y** Listing Starts on Page 376	If there is insufficient space for a Type C or B or if extremely short pretravel or differential is required, use the Type Y.	Type Y	376-378

SQD SLV_001137

LIMIT SWITCHES — APPLICATION DATA

CLASS 9007

APPLICATION DATA

Enclosure Construction

Types C, B, BB, BF, AW, T, FT meet NEMA 2, 4 and 13 requirements — Oiltight, dusttight, watertight, driptight unless otherwise noted.

Type C lever arm types also meets NEMA 6P requirements.

Type C, B, BF, AW, T and FT — die cast zinc construction.

Type BB — 16 gauge steel; Type BR — die cast aluminum body with die cast zinc head.

Corrosion resistant, gray enamel finish. See special features for NEMA 4X requirements.

Type C, B, BR, BF — standard **shaft** seals on **lever arm** types are VITON* Plunger and wobble stick boots are neoprene. All other seals are Buna N.

VITON* seals available in place of Buna N and neoprene.

Ambient Temperature Range

Types C and B —

Low temperature limit: −20°F (−28.9°C) lever type
0°F (−17.8°C) all others

High temperature limit: 185°F (85°C) at full rated load
220°F (104.4°C) with single coil relay or starter load

Type T and FT —
−10°F (−23°C) to 185°F (85°C) ambient at full rated load, up to 220°F (104.4°C) ambient with single coil load.

Type FT will withstand hot falling sand up to 300°F (149°C).

Type AW —
Lever type: −65°F (−54°C) to 185°F (85°C) ambient at full rated load.
Plunger type: 0°F (−17.8°C) to 185°F (85°C) ambient at full rated load.

Contacts

Types C, B, and AW —
Snap action, silver alloy contacts.
Single pole devices use one snap switch with two (2) double break contact elements (1 N.O. and 1 N.C.) that must be used on circuits of same polarity. Two pole devices contain two electrically separated sets of contact elements allowing use on circuits of opposite polarity. Each set contains two double break contact elements (1 N.O. and 1 N.C.) that must be used on circuits of same polarity.

Types T and FT —
SPDT, double break and three point double throw single break. Fine silver contacts. Polarity must be same on double throw contacts.

Operating Sequences

Type B —
Two pole devices can be converted to two stage by rotating the nylon wheel between snap switches with edge of screwdriver blade. Two stage devices can be wired for sequencing operation or for overlapping contacts, see SM-444.

Type AW —
Lever arm types supplied with CCW operation as standard — can be field converted to CW operation.

Types T and FT —
15 sequences available. Most sequences are convertible by removing baseplate and adjusting positioning plate and/or latches.

Terminals

Types C and B —
Self-lifting pressure wire connectors suitable for use with up to two #14 solid or stranded wires on all terminals.

For additional application information see Bulletin SM444.

MAXIMUM CURRENT RATINGS FOR CONTROL CIRCUIT CONTACTS — TYPES C, B, T, FT, and A

Switch Type	Contacts	AC — 50 or 60 Hz							DC			
			Inductive 35% Power Factor					**Resistive** 75% Power Factor		**Inductive and Resistive**		
			Make		Break		Continuous Carrying Amperes	Make, Break and Continuous Carrying Amperes		Make and Break Amperes		Continuous Carrying Amperes
		Volts	Amps.	VA	Amps.	VA			Volts	Single Throw	Double Throw	
B	SPDT, DPDT	120	60	7200	6	720	10	10	120	0.5	0.25	10
		240	30	7200	3	720	10	10	240	0.25	0.1	10
		480	15	7200	1.5	720	10	10	600	0.05	....	10
		600	12	7200	1.2	720	10	10				
C	SPDT, DPDT									Single Pole	Single Pole	
		120	60	7200	6	720	10	10	120	0.55	0.22	10
		240	30	7200	3	720	10	10	240	0.27	0.11	10
		480	15	7200	1.5	720	10	10	600	0.1	...	10
		600	12	7200	1.2	720	10	10				
										Double Pole	Double Pole	
									120	0.22	0.22	10
									240	0.11	0.11	10
									600	....	....	10
AW, AO-2 and AO-6, AB, AP and AS	SPDT, SPST●	120	40	....	15	....	15	15	115	2.0	0.5	15
		240	20	....	10	....	15	15	230	0.5	0.2	15
		480	10	....	6	....	15	15	600	0.1	0.02	15
		600	8	....	5	....	15	15				
AW, CO-3 and CO-6, CB, CC, CP and CS	DPDT, DPST	115	30	3450	3	345	10	10	115	1.0	0.2	10
		230	15	3450	1.5	345	10	10	230	0.3	0.1	10
		460	7.5	3450	0.75	345	10	10	600	0.1	....	10
		575	6	3450	0.6	345	10	10				
AO-1, AC	SPDT, SPST●	120	40	....	15	....	15	15	115	0.5	0.25	15
		240	20	....	10	....	15	15	230	0.25	0.1	15
		480	10	....	6	....	15	15	600	0.05	....	15
		600	8	....	5	....	15	15				
T and FT	SPDT Quick Make and Break	120	150	18,000	25	3000	25	25	120	5.0	....	25
		240	75	18,000	12.5	3000	25	25	230	1.0	....	25
		480	37.5	18,000	6.25	3000	25	25	600	0.2	....	25
		600	30	18,000	5	3000	25	25				
								Make and Break	Continuous			
	Three Point Double Throw Quick Make and Break	120	50	6000	15	1800	25	15	25	....	....	....
		240	25	6000	7.5	1800	25	15	25	....	....	....
		480	12.5	6000	3.75	1800	25	15	25	....	....	....
		600	10	6000	3	1800	25	15	25	....	....	....
	All Slow Make and Break	120	60	7200	6	720	25	10	25	....	....	....
		240	30	7200	3	720	25	10	25	....	....	....
		480	15	7200	1.5	720	25	10	25	....	....	....
		600	12	7200	1.2	720	25	10	25	....	....	....

●SPST versions are rated ½ HP at 110 and 220 VAC.

*Registered trademark of DuPont.

SQD SLV_001138

NEW TYPE C LIMIT SWITCHES

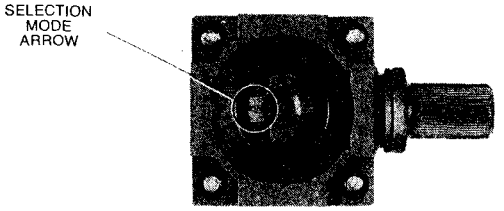
SINGLE POLE & TWO POLE — HEAVY DUTY PRECISION TURRET HEAD TYPE

CLASS 9007

The new Type C is designed for use in all applications requiring a heavy duty, oiltight, watertight limit switch. The Type C provides excellent electrical and mechanical life and ease of installation. In addition, lever arm types are rated NEMA 6P (submersible) as standard although a potted receptacle is recommended to insure a good conduit entry seal.

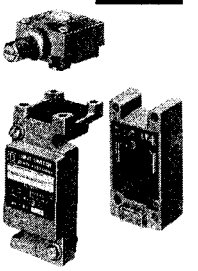
Mode Change — Lever Arm Type

Mode of operation is easily convertible to clockwise, counterclockwise, or both. Simply point the arrow to the letters representing the desired direction — CW, CCW, or CW/CCW. All parts are captive.



Component Compatibility

Heads, bodies and receptacles are individually marked with a type number and can be ordered separately. A minimal inventory allows repair or assembly of any complete device.



Easier to Wire

All terminals, including the ground screw, have self-lifting pressure wire connectors. Single pole configuration has the terminals at two different levels to eliminate interference with previously installed wires and allows wiring straight from conduit — no bending. A cavity is provided below the wiring block to stuff excess wire — no need to cut wires to exact length or pull back into conduit.

Select lever arms from pages 366-368.
Select special features from pages 364-365. See page 360 for ratings and application information and pages 365 for dimensions.
Bold face type numbers indicate most commonly used limit switches.

Type C — Superior electrical/mechanical life and easier installation and wiring.

		Lever Arm Type			• Side Plunger Type			• Top Plunger Type				Plug-in Unit Less Head
		Standard Pre-travel Spring Return	**Neutral Position** Spring Return	**Low Differential** Spring Return	**Side Roller Plunger** Spring Return Vertical Roller†	**Side Push Rod Plunger** Spring Return	**Side Push Rod Plunger Adjustable■** Spring Return	**Top Roller Plunger** Spring Return	**Top Push Rod Plunger** Spring Return	**Top Push Rod Plunger Adjustable■** Spring Return	**Palm Operated** ★	
	Contacts	CW & CCW*	CW & CCW	CW & CCW*								
	Contacts	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type
Standard Box Plug-in	1 N.O. 1 N.C.	**C54B2 $58.**	...	C54A2 **$62.**	C54F **$76.**	C54G **$68.**	C54GD **$72.**	C54D **$68.**	C54E **$64.**	C54ED **$68.**	C54R★ **$64.**	CO54 **$32.**
	2 N.O. 2 N.C.	**C62B2 $70.**	....	C62A2 **$74.**	C62F **$88.**	C62G **$80.**	C62GD **$84.**	C62D **$80.**	C62E **$76.**	C62ED **$80.**	C62R★ **$76.**	CO62 **$44.**
	2 N.O.-2 N.C. Neutral Position	....	**C64BW $74.**	....	....	....	....	....	....	....	....	CO64 **$48.**
	2 N.O.-2 N.C. Two Stage	C66B2 **$82.**	....	C66A2 **$86.**	C66F **$100.**	C66G **$92.**	C66GD **$96.**	C66D **$92.**	C66E **$88.**	C66ED **$92.**	C66R★ **$88.**	CO66 **$56.**
Head Only	Type Number	B **$18.**	BW **$18.**	A **$22.**	F **$36.**	G **$28.**	GD **$32.**	D **$28.**	E **$24.**	ED **$28.**	R★ **$24.**	
Nominal Operating Data	Pre-travel	10°	10°	5°	.08"			.08"				**Plug-in Receptacle only**
	Pre-travel Two Stage — First Stage	10°	....	5°	.08"			.08"				
	Pre-travel Two Stage — First to Second Stage	2½°	....	1½°	.02"			.02"				
	Total Travel	90°	90°	90°	.25"			.25"				
	Differential	4°	4°	2°	.01"			.01"				
	Reverse Overtravel	90°	90°	90°	....			....				CT54 Single Pole **$8.**
	Operating Torque or Force — 1 Pole	5 lb.-in.	5 lb.-in.	5 lb.-in.	4 lbs.			4 lbs.				
	Operating Torque or Force — 2 Pole	5 lb.-in.	5 lb.-in.	5 lb.-in.	4 lbs.			4 lbs.				CT62 Two-Pole or Two-Stage **$8.**
	Repeat Accuracy Linear travel of cam (1½" lever arm)	±.002"	±.002"	±.001"	±.001"			±.001"				CT64 Neutral Position **$8.**
Plug-in Replacement Units	The basic switch and turret head but less plug-in receptacle can be ordered by substituting the letters "CO" for the first C in the type number and deducting **$8.** Example: Open type replacement for Type C54B2 is Type CO54B2 **$50.** each.											

* Mode of operation is field convertible to CW only or CCW only. To order factory converted devices — for CCW only operation, change the "2" at the end of the type number to "1" (Example: C54B**2** becomes C54B**1**) — for CW only operation, delete the "2" at the end of the type number (Example: C54B**2** becomes C54B).

† Can be converted to horizontal roller type in the field. To order horizontal roller version add the letter "H" at the end of the equivalent vertical roller version type number (Example: C54F would become C54F**H**).

★ Price does not include mushroom button. Must be ordered separately from page 365.

■ To lock the nut in the desired position, crimp the slot near the bottom of the nut.

● Cam track of Type C plunger devices is same as Type B non-plug-in device (.22 in less than Type B plug-in). If this creates a problem a Class 9007 Type CT-10 adaptor plate is available. **$4.** list. D1B Discount.

SQD SLV_001139

LIMIT SWITCHES — TYPES B, BR, BF

HEAVY DUTY PRECISION TURRET HEAD TYPE — SINGLE POLE & TWO POLE

CLASS 9007

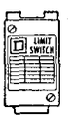
Select lever arms from pages 366-368.

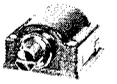
Select special features from pages 364-365. See page 360 for ratings and application information and pages 372-373 for dimensions.

Bold face type numbers indicate most commonly used limit switches.

Shaded areas indicate those Type B devices that will be automatically substituted by the equivalent Type C device as Type B stock is depleted. Type C will be substituted for both plug-in and non-plug-in Type B.







	Contacts	Lever Arm Type: Standard Pre-travel Spring Return, CW & CCW*	Low Differential Spring Return, CW & CCW*	Light Operating‡ Torque Spring Return, CW & CCW*	Extra Light Operating Torque Spring Return, CW & CCW*	Maintained Contact, CW & CCW	Gravity Return Light Operating Torque NEMA 1 Only, CW & CCW*	Side Plunger Type: Side• Roller Plunger Spring Return Vertical Roller† Type	Side• Push Rod Plunger Spring Return	Side Push Rod Plunger Adjustable Spring Return	Side Push Rod Plunger Maintained Contact
		Type	Type	Type	Type	Type	Type	Type	Type	Type	Type
Standard Box Plug-in	1 N.O. 1 N.C.	**B54B2 $58.**	B54A2 **$62.**	B54BN2 **$62.‡**	B54N2 **$70.**	B54C **$70**	B54NC2 **$78.**	B54F **$76.**	B54G **$68.**	B54GD **$72.**	B54H **$80.**
	2 N.O. 2 N.C.	**B62B2 70.**	B62A2 **74.**	B62BN2 **74.‡**	B62N2 **82.**	B62C **82.**	B62NC2 **90.**	B62F **88.**	B62G **80.**	B62GD **84.**	B62H **92.**
	2 N.O.-2 N.C. Neutral Position	**B64B2 74.**	B64A2 **78.**	B64BN2 **78.‡**	B64N2 **86.**	...	...	...	...	...	...
	2 N.O.-2 N.C. Two Stage	B66B2 **82.**	B66A2 **86.**	B66BN2 **86.‡**	B66N2 **94.**	...	...	B66F **100.**	B66G **92.**	B66GD **96.**	...
Compact Box Plug-in	1 N.O. 1 N.C.	B52B2 **58.**	B52A2 **62.**	B52BN2 **62.‡**	B52N2 **70.**	B52C **70.**	B52NC2 **78.**	B52F **76.**	B52G **68.**	B52GD **72.**	B52H **80.**
Non-Plug-in	**Types B51, B53, B61, B63, B65 —** Determine non-plug-in device type number by subtracting 1 from the first two digit number appearing in the type number of the equivalent plug-in device. Example: Non-plug-in equivalent of 9007 B54B2 is the 9007 B53B2. Non-plug-in pricing same as plug-in.										
Hazardous Location Class I Groups B, C, D Class II Groups E, F, G	1 N.O. 1 N.C.	BR53B2 **$106.**	BR53A2 **$110.**	BR53BN2 **$110.‡**	BR53N2 **$118.**	BR53C **$118.**	...	BR53F **$124.**	BR53G **$116.**	BR53GD **$120.**	BR53H **$128.**
	2 N.O. 2 N.C.	BR61B2 **118.**	BR61A2 **122.**	BR61BN2 **122.‡**	BR61N2 **130.**	BR61C **130.**	...	BR61F **132.**	BR61G **128.**	BR61GD **132.**	BR61H **140.**
	2 N.O.-2 N.C. Neutral Position	BR63B2 **130.**	BR63A2 **134.**	BR63BN2 **134.‡**	BR63N2 **142.**	...	...	...	...	...	...
	2 N.O.-2 N.C. Two Stage	BR65B2 **130.**	BR65A2 **134.**	BR65BN2 **134.‡**	BR65N2 **142.**	...	...	BR65F **144.**	BR65G **140.**	BR65GD **144.**	...
Flush Mounting Standard Box	1 N.O. 1 N.C.	BF53B2 **54.**	BF53A2 **58.**	BF53BN2 **58.‡**	BF53N2 **66.**	BF53C **66.**	...	BF53F **72.**	BF53G **64.**	...	BF53H **75.**
	2 N.O. 2 N.C.	BF61B2 **66.**	BF61A2 **70.**	BF61BN2 **70.‡**	BF61N2 **78.**	BF61C **78.**	...	BF61F **84.**	BF61G **76.**	...	BF61H **88.**
	2 N.O.-2 N.C. Neutral Position	BF63B2 **70.**	BF63A2 **74.**	BF63BN2 **74.‡**	BF63N2 **82.**	...	...	...	...	...	...
	2 N.O.-2 N.C. Two Stage	BF65B2 **78.**	BF65A2 **82.**	BF65BN2 **82.‡**	BF65N2 **90.**	...	...	BF65F **96.**	BF65G **88.**	...	...
Compact Flush	1 N.O. 1 N.C.	BF51B2 **54.**	BF51A2 **58.**	BF51BN2 **58.‡**	BF51N2 **66.**	BF51C **66.**	...	BF51F **72.**	BF51G **64.**	...	BF51H **76.**
Head Only	Part Number	31032-036-55 **18.**	31032-036-54 **22.**	31032-036-93 **22.‡**	31032-036-58 **30.**	...	...	31032-335-52 **36.**	31032-336-52 **28.**	31032-032-59 **32.**	...
Nominal Operating Data — Pre-travel		10°	5°	10°	15°	50°	16°	.08″			.14″
Pre-travel Two Stage — Top Sw.		10°	5°	10°	15°	...	...	.08″			...
Pre-travel Two Stage — Second Stage		0° to 2½°	0° to 1¼°	0° to 2½°	0° to 8°	...	...	.00″ to .02″			...
Total Travel		90°	90°	90°	90°	90°	90°	.25″			.25″
Differential		4°	2°	4°	6°	...	7°	.03″			...
Reverse Overtravel		90°	90°	90°	90°	...	90°	...			...
Operating Torque	1 Pole	4½ lb.-in.	4½ lb.-in.	3 lb.-in.	11 oz.-in.	3 lb.-in.	5 oz.-in.	2.5 lbs.			6 lbs.
Operating Torque	2 Pole	5 lb.-in.	5 lb.-in.	4 lb.-in.	16 oz.-in.	3½ lb.-in.	15 oz.-in.	3 lbs.			7 lbs.
Repeat Accuracy — Linear travel of cam (1½″ lever arm)		±.002″	±.001″	±.002″	...	±.002″	...	±.001″			...
Plug-in Replacement Units		The basic switch and turret head but less plug-in receptacle can be ordered by substituting the letters "BO" for the first "B" in the type number and deducting **$8.** Example: Open type replacement for Type B54B is Type BO54B, **$50.** each.									
Plug-in Receptacle only		Standard 1 N.O.-1 N.C. ..... Type BOR54, **$8.** Standard 2 N.O.-2 N.C. ..... Type BOR62, **8.** Compact 1 N.O.-1 N.C. ..... Type BOR52, **8.**									

See opposite page for footnotes.

SQD SLV_001140

TYPES B, BR, BF — LIMIT SWITCHES

SINGLE POLE & TWO POLE — HEAVY DUTY PRECISION TURRET HEAD TYPE

CLASS 9007

Select special features from pages 364-365.
See page 360 for ratings and application information and pages 372-373 for dimensions.
Shaded areas indicate those Type B devices that will be automatically substituted by the equivalent Type C device as Type B stock is depleted. Type C will be substituted for both plug-in and non-plug-in Type B.



	Contacts	Top Plunger Type: Top● Roller Plunger Spring Return	Top Push Rod● Plunger Spring Return	Top Push Rod● Plunger Adjustable■ Spring Return	Palm Operated ★	Wobble Stick DELRIN Extension	Wobble Stick Wire Extension	Wobble Stick Coil Spring Extension	Cat Whisker	Air Operated	Plug-in Unit Less Head
		Type	Type	Type	Type	Type	Type	Type	Type	Type	Part Number
Standard Box Plug-in	1 N.O. 1 N.C.	B54D **$68.**	B54E **$64.**	B54ED **$68.**	B54R★ **$64.**	B54J **$64.**	B54K **$64.**	B54KC **$64.**	B54L **$48.**	B54P **$104.**	31032-450-03 **$32.**
	2 N.O. 2 N.C.	B62D **$80.**	B62E **$76.**	B62ED **$80.**	B62R★ **$76.**	B62J **$76.**	B62K **$76.**	B62KC **$76.**	B62L **$60.**	B62P **$116.**	31032-451-51 **$44.**
	2 N.O.-2 N.C. Neutral Position	...	...	...	...	...	...	...	...	...	31032-452-51 **$48.**
	2 N.O.-2 N.C. Two Stage	B66D **$92.**	B66E **$88.**	B66ED **$92.**	B66R★ **$88.**	B66J **$88.**	B66K **$88.**	B66KC **$88.**	B66L **$76.**	B66P **$128.**	31032-394-51 **$56.**
Compact Box Plug-in	1 N.O. 1 N.C.	B52D **$68.**	B52E **$64.**	B52ED **$68.**	B52R★ **$64.**	B52J **$64.**	B52K **$64.**	B52KC **$64.**	B52L **$48.**	B52P **$104.**	31032-480-51 **$32.**
Non-Plug-in	**Types B51, B53, B61, B63, B65** — Determine non-plug-in device type number by subtracting 1 from the first two digit number appearing in the type number of the equivalent plug-in device. Example: Non-plug-in equivalent of 9007 B54B2 is the 9007 B53B2. Non-plug-in pricing same as plug-in.										
Hazardous Location	1 N.O. 1 N.C.	BR53D **$116.**	BR53E **$112.**	BR53ED **$116.**	BR53R★ **$112.**	BR53J **$112.**	BR53K **$112.**	BR53KC **$112.**	BR53L **$ 96.**	BR53P **$152.**	...
Class I Groups BCD	2 N.O. 2 N.C.	BR61D **$128.**	BR61E **$124.**	BR61ED **$128.**	BR61R★ **$124.**	BR61J **$124.**	BR61K **$124.**	BR61KC **$124.**	BR61L **$108.**	BR61P **$164.**	...
Class II Groups EFG	2 N.O.-2 N.C. Two Stage	BR65D **$140.**	BR65E **$136.**	BR65ED **$140.**	BR65R★ **$136.**	BR65J **$136.**	BR65K **$136.**	BR65KC **$136.**	BR65L **$120.**	BR65P **$176.**	...
Head Only	Part Number	31032-342-52 **$28.**	31032-343-52 **$24.**	31032-026-59 **$28.**	31032-137-67 **$24.★**	31032-084-54 **$24.**	31032-084-55 **$24.**	31032-287-52 **$24.**	31032-081-53 **$8.**	...	...

Nominal Operating Data	Pre-travel		.08″	10° (Any Direction)	20°	Trip Pressure 1 Pole — 25 p.s.i. ±25% 2 Pole — 50 p.s.i. ±25%
	Pre-travel Two Stage	Top Switch	.08″	10° (Any Direction)	20°	
		Second Stage	.00″ to .01″	0° to 2¼°	0° to 4°	
	Total-travel		.25″	90°	90°	
	Differential		.03″	5°	10°	Differential 1 Pole-10-20 p.s.i. 2 Pole-20-40 p.s.i.
	Operating Force	1 Pole	3 lbs.	3 lb.-in.	7 oz.-in.	
		2 Pole	4 lbs.	3½ lb.-in.	10 oz.-in.	
	Repeat Accuracy — Linear Travel of Cam.		±.001″	...	...	Max. Surge Press. 100 p.s.i.
Plug-in Replacement Unit	The basic switch and turret head but less plug-in receptacle can be ordered by substituting the letters "BO" for the first "B" in the type number and deducting **$8**. Example: Open type replacement for Type B54D is Type BO54D, **$60.** each.					
Plug-in receptacle only	Standard 1 N.O.-1 N.C. ..... Type BOR54, **$8.** Standard 2 N.O.-2 N.C. ..... Type BOR62, **8.** Compact 1 N.O.-1 N.C. ..... Type BOR52, **8.**					

* Mode of operation is field convertible to CW only or CCW only. To order factory converted devices — for CCW only operation, change the "2" at the end of the type number to "1" (Example: B54B**2** becomes B54B**1**) — for CW only operation, delete the "2" at the end of the type number (Example: B54B**2** becomes B54B).

● These devices use an improved boot design. Old style devices are identified and may be ordered as Types B — — D — S2, B — — E — S1, B — — F — S2, B — — FH — S2 and B — — G — S1. See page 372 for dimensional differences between new and old versions.

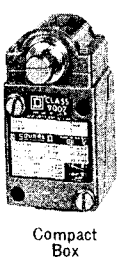
★ Price does not include mushroom button. Must be ordered separately from page 365.

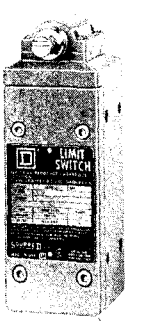
‡ Recommended for applications where telegraphing (recycling) problems have been encountered when standard pretravel devices have been used. The Class 9007 Type MA18S arm is recommended for use on such applications.

† Can be converted to horizontal roller type in the field. To order horizontal roller version add the letter "H" at the end of the equivalent vertical roller version type number (Example: B54F would become B54F**H**).

■ To lock the nut in the desired position, crimp the slot near the bottom of the nut.


Standard Box


Compact Box



Hazardous Location

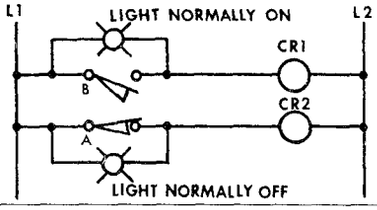
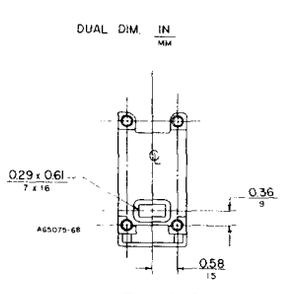
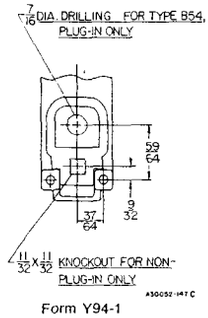

Flush Mounting

SQD SLV_001141

LIMIT SWITCHES
TYPES C AND B SPECIAL FEATURES

CLASS 9007

SPECIAL FEATURES (Do not apply to Types BF or BR unless noted)

Special Features	Form	Price Addition
▲OPTIONAL SHAFT EQUIPPED WITH TYPE T-FT HUB: Any lever arm Type B, BF or BR switch can be furnished with an optional shaft and hub combination which will accept the lever arms normally used with Type T and FT limit switches. To order add S9 as suffix to the device type number. For example, to order a 9007 B54B2 with this modification, order as a 9007 B54B2-S9. See pages 362 and 363 for switches that can be furnished with this modification. See page 371 for lever arms. 	Add S9 as a Suffix to the device Type Number	**$4.00**
SPECIAL CORROSION RESISTANT FINISH (NEMA 4X)	L2	
SPECIAL CHEMICAL RESISTANT COATING	L3	
Quantity of 1-10	L2 or L3	**320.** min. charge
Quantity of 11-99	L2 or L3	**31.20** each
Quantity of 100 or more	L2 or L3	**14.00** each
 **NEON PILOT LIGHT,** 120 VOLTS AC or DC on PLUG-IN TYPE SWITCH (Type C54, C62, C64, C66, B52, B54, B64 or B66):		
Addition of neon pilot light in parallel with N.O. contact (light normally on)	P5	**$12.00**
Addition of neon pilot light in parallel with N.C. contact (light normally off)	P6	**12.00**
Addition of two neon pilot lights, one in parallel with N.O. contact (light normally on), one in parallel with N.C. contact (light normally off)	P7	**30.00**
Addition of two neon pilot lights in parallel with N.O. contacts (lights normally on) (Types C62, C64, C66, B62, B64 or B66 only)	P8	**30.00**
Addition of two neon pilot lights in parallel with N.C. contacts (lights normally off) (Types C62, C64, C66, B62, B64 or B66 only)	P9	**30.00**
PRE-WIRED RECEPTACLE Single pole plug-in limit switch furnished with pre-wired 5 pin Brad Harrison male receptacle (or interchangeable Joy or Cam•Lok receptacle at our convenience) No. 41310. For use with Brad Harrison female portable plug No. 41306, 41307, or 41308 (or equal)	Y190-1	**42.00**
For information on any variation of the above, contact your local Square D Field Office.		
DUST BOOT: Lever type limit switch furnished with a boot around the shaft to protect against abrasive dusts, dirt, grit and sand. Available on all Type B and BR lever type switches	Y33	**4.00**
DUST BOOT ONLY: Can be added in the field to any Type B and BR lever type switch. **Class 9007 Type BT-3, $4.** each.		
GROUND TERMINAL: Limit switch furnished with a terminal grounded to switch enclosure. Available on standard box, non-plug-in, single pole (Type B53) only. Plug-in Types C and B and Type BR devices are furnished with a ground screw as standard.	Y51	**8.00**
GROUND TERMINAL KIT ONLY: Kit includes terminal and necessary screws to install in any Type B53 limit switch. **Class 9007 Type BT-2, $8.** each. Minimum order quantity 10. Must be ordered in miltiples of 10.		
▲POTTED LIMIT SWITCH OR PLUG-IN RECEPTACLE ONLY:		
Single pole plug-in limit switch or receptacle only pre-wired with five #16 wires five feet long and wire entry completely sealed with Epoxy Resin	Y184-1	**24.00**
Two pole plug-in limit switch or receptacle only pre-wired with nine #16 wires five feet long and wire entry completely sealed with Epoxy Resin	Y184-2	**48.00**
Single pole plug-in limit switch or receptacle only pre-wired with five conductor #16 STO cord eight feet long and wire entry completely sealed with Epoxy Resin	Y185-1	**52.00**
Two pole plug-in limit switch or receptacle only pre-wired with nine conductor #16 STO cord eight feet long and wire entry completely sealed with Epoxy Resin	Y185-2	**80.00**
For information on any variation of the above, contact your local Square D field office.		
CONDUIT SEAL ONLY: Conduit seal fits in conduit entrance and excludes liquids. Type B: 5 hole seal — Part #31032-488-01		**.60**
9 hole seal — Part #31032-815-01		**1.20**
MANIFOLD MOUNTING: Box is furnished with a wiring hole and a gasket on the base. **Type C — Form Y205 —** For new applications if the Type C version required is available. Note: For replacement on existing Type B installation, a replacement Type B with Form Y94-1 must be ordered. **Type B — Form Y94-1 —** For existing installations or where Type C version not yet available. Available on all Type B boxes except plug-in compact boxes (Type B52) and two pole plug-in standard boxes (Types B62, B64, B66).  Form Y205  Form Y94-1	Y94-1	**8.00**
	Y205	**8.00**
LOW TEMPERATURE LEVER TYPE LIMIT SWITCH (Types C——A, C——B, B——A, B——B, B——BN, BR——A, BR——B, BR——BN): Limit switch will operate in an ambient temperature range of −40°F to 185°F (Standard limit switch ambient temperature range is −20°F to 185°F). Minimum temperature is based on the absence of freezing moisture or water	Y128	**8.00**
VITON* GASKETS AND SEALS Substitution of Viton gaskets and seals on:		
Lever arm type, standard box	Y140	**14.80**
Lever arm type, compact box	Y140	**8.00**
Plunger type, standard box	Y140	**19.60**
Plunger type, compact box	Y140	**12.80**
Substitution of Viton seal at shaft only of lever arm type switch . . . now standard on A, B, C, BN and N heads — Types C and B	—	—
Substitution of Viton boot only on plunger type switches	Y140-1	**4.00**

▲Not yet available on Type C — consult your local Square D Field Office for availability.
* Registered Trademark of Du Pont.

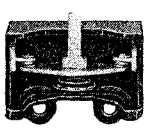
SQD SLV_001142

SPECIAL FEATURES (Do not apply to Types BB, BF or BR unless noted)

Special Features	Form	Price Addition
GOLD FLASHED CONTACTS Substitution of gold flashed contacts for standard silver alloy contacts on Types C, B, BF, BR, or AW limit switches	Y78	**$20.00** per pole
▲DIRECT ACTING CONTACTS: One pole, normally closed, slow make-slow break, direct acting contact mechanism substituted for standard snap switch on Type B, BF or BR devices. This mechanism was designed for use in emergency overtravel applications. The movable contact of this basic switch unit is acted upon directly by the actuating mechanism of the limit switch and is not dependent upon the force exerted by a snap switch blade or spring to open the circuit. Because these contacts are slow make-slow break, they are best suited for applications where they are not actuated during normal operation, but only if abnormal overtravel is encountered. Some applications require a switch to signal the end of travel and abnormal overtravel. A two stage limit switch with a standard snap switch and a direct acting mechanism (Form Y156-2) is recommended. The standard snap switch will signal end of travel and the direct acting mechanism will signal abnormal overtravel.		

ELECTRICAL CONTACT RATINGS

AC — NEMA A600						DC			
Volts	Max. Current — 35% Power Factor					Volts	Maximum Current		
	Make		Break		Continuous Carrying Amps.		Make or Break		Continuous Carrying Amps.
	Amps.	VA	Amps.	VA			Amps.	VA	
120	60	7200	6	720	10	115	1.1	126.5	5
240	30	7200	3	720	10				
480	15	7200	1.5	720	10	230	0.55	126.5	5
600	12	7200	1.2	720	10				



Direct Acting Contact Mechanism (Plug-in Type Shown Without Cover)

Substitution of Direct Acting Contact Unit for:		
Snap Switch of One Pole Limit Switch	Y156-1	**4.00**
Snap Switches of Two Pole Limit Switch	Y156-1	**8.00**
Lower Snap Switch Only of Two Pole Limit Switch	Y156-2	**4.00**

▲Not yet available on Type C. Consult your local Square D Field Office for availability.

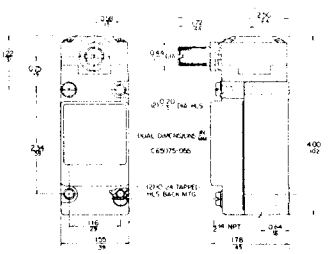
ADAPTORS

Description	Class 9007	Price
Switch with adaptor plate permitting substitution of any Type C or B limit switch with standard box for any Type T limit switch with Style B baseplate	Form Y147	**$ 8.** additional
Adaptor Plate Kit only (plate plus mounting screws) for above	Type BT-1	**4.**
Adaptor Plate Kit permitting direct substitution of any Type C lever arm limit switch with standard box for any Type AW lever arm limit switch.	Type CT-11	**8.**
Conduit connection adaptor — male ½" NPT on one end, female 20 mm on other end.	Type CT-12	**12.**

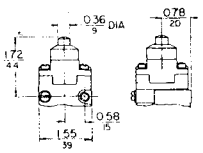
MUSHROOM BUTTON FOR PALM OPERATED TURRET HEAD

Color	1⅜" Dia. Button Type No.	2¼" Dia. Button Type No.	Price
Black	NB-1	PB-1	**$12.**
Red	NB-2	PB-2	**12.**
Green	NB-3	PB-3	**12.**
Yellow	NB-5	PB-5	**12.**

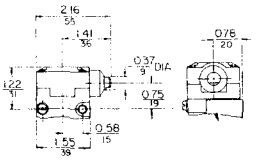
TYPE C APPROXIMATE DIMENSIONS



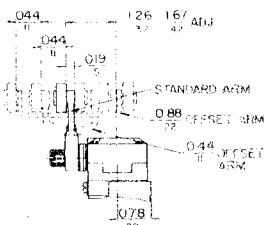
Lever Arm Type
1 pole or 2 pole



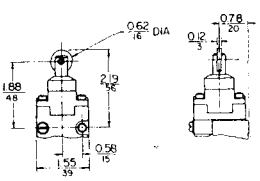
Top Push Rod Plunger Turret Head



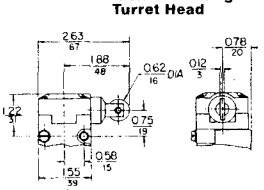
Side Push Rod Plunger Turret Head



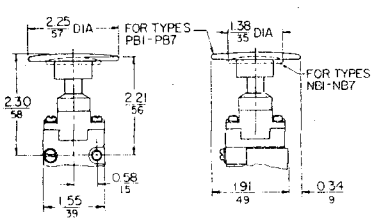
Possible cam tracks with Type MA and KB lever arms



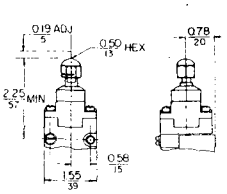
Top Roller Plunger Turret Head



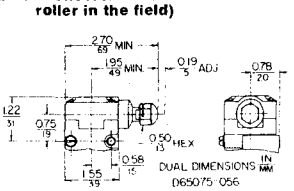
Side Roller Plunger Turret Head
(can be converted to horizontal roller in the field)



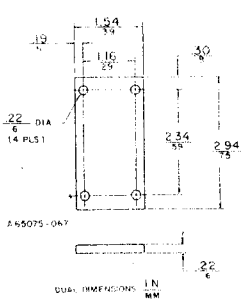
Palm Operated Turret Head



Adjustable Top Push Rod Plunger Turret Head



Adjustable Side Push Rod Plunger Turret Head



CT-10 Adapter Plate

SQD SLV_001143

LIMIT SWITCHES — LEVER ARMS
FOR TYPES C, B & AW

CLASS 9007

Standard roller is hardened oil-impregnated sintered iron.

Bold face type numbers indicate the most commonly used lever arms.

CAST LEVER ARM



Cast Lever Arm

Length of Arm	Roller: Standard ¾" Dia. ¼" Wide		Standard ¾" Dia. ⅝" Wide		Standard ⅝" Dia. ¼" Wide		Standard ⅝" Dia. ⅝" Wide		Nylon ¾" Dia. ¼" Wide		Nylon ⅝" Dia. ¼" Wide		Nylon ⅝" Dia. ⅝" Wide		Nylon★ 1" Dia. ⅝" Wide	
	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price
⅞"	....	....	....	....	AA-1	**$10.**	AA-2	**$10.**	....	....	AA-8	**$10.**	AA-17	**$10.**	....	....
1⅜"	BA-11	**$6.**	BA-12	**$10.**	**BA-1**	**6.**	BA-2	**10.**	BA-18	**$6.**	BA-8	**6.**	BA-17	**10.**	BA-13	**$10.**
1½"	**MA-11**	**6.**	MA-12	**10.**	MA-1	**6.**	MA-2	**10.**	**MA-18**	**6.**	MA-8	**6.**	MA-17	**10.**	MA-13	**10.**
2 "	CA-11	**10.**	CA-12	**10.**	CA-1	**10.**	CA-2	**10.**	CA-18	**10.**	CA-8	**10.**	CA-17	**10.**	CA-13	**10.**
2½"	DA-11	**10.**	DA-12	**10.**	DA-1	**10.**	DA-2	**10.**	DA-18	**10.**	DA-8	**10.**	DA-17	**10.**	DA-13	**10.**
3 "	EA-11	**10.**	EA-12	**10.**	EA-1	**10.**	EA-2	**10.**	EA-18	**10.**	EA-8	**10.**	EA-17	**10.**	EA-13	**10.**

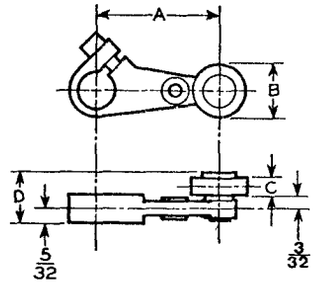
Length of Arm	Nylon 1" Dia. ¼" Wide		Ball Bearing 1 1/16" Dia. ¼" Wide		Standard ¾" Dia. ¼" Wide Roller on Opposite Side to Standard		Standard ⅝" Dia. ¼" Wide Roller on Opposite Side to Standard		Standard ⅝" Dia. ⅝" Wide Roller on Opposite Side to Standard		Without Roller		Standard ¾" Dia. ¼" Wide (MA-11 except Countersunk Roller Pin)		Cable Operated With Eyebolt (⅜" I.D.) Instead of Roller	
	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price
⅞"	....	....	AA-9	**$14.**	....	....	AA-5	**$10.**	AA-6	**$10.**	AA-0	**$10.**	....	....	....	....
1⅜"	BA-4	**$14.**	BA-9	**14.**	BA-15	**$6.**	BA-5	**6.**	BA-6	**10.**	BA-0	**10.**	....	....	....	....
1½"	MA-4	**14.**	MA-9	**14.**	MA-15	**6.**	MA-5	**6.**	MA-6	**10.**	MA-0	**10.**	MA-31	**$6.**	MA-22	**$10.**
2 "	CA-4	**14.**	CA-9	**14.**	CA-15	**10.**	CA-5	**10.**	CA-6	**10.**	CA-0	**10.**	....	....	....	....
2½"	DA-4	**14.**	DA-9	**14.**	DA-15	**10.**	DA-5	**10.**	DA-6	**10.**	DA-0	**10.**	....	....	....	....
3 "	EA-4	**14.**	EA-9	**14.**	EA-15	**10.**	EA-5	**10.**	EA-6	**10.**	EA-0	**10.**	....	....	....	....

FLAT STEEL LEVER ARM



Flat Steel Lever Arm

Length of Arm	Roller: Standard ⅝" Dia. ¼" Wide		Standard ⅝" Dia. ⅝" Wide		Nylon ¾" Dia. ¼" Wide		Nylon 1" Dia. ¼" Wide		None	
	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price
⅞"	AA-1S	**$10.**	AA-2S	**$10.**	....	....	....	....	AA-0S	**$10.**
1⅜"	BA-1S	**6.**	BA-2S	**10.**	....	....	BA-4S	**$14.**	BA-0S	**10.**
1½"	....	....	....	....	MA-18S	**$6.**	....	....	....	....
2 "	CA-1S	**10.**	CA-2S	**10.**	....	....	CA-4S	**14.**	CA-0S	**10.**
2½"	DA-1S	**10.**	DA-2S	**10.**	....	....	DA-4S	**14.**	DA-0S	**10.**
3 "	EA-1S	**10.**	EA-2S	**10.**	....	....	EA-4S	**14.**	EA-0S	**10.**

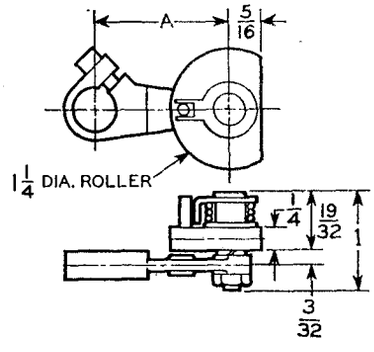


ONE-WAY ROLLER LEVER ARM



One-Way Roller Lever Arm

Length of Arm	1¼" Dia. ¼" Wide Roller: Cast Arm Type	Cast Arm Price	Flat Steel Arm Type	Flat Steel Arm Price
1⅜"	BA-3	**$18.**	BA-3S	**$18.**
1½"	MA-3	**18.**	....	....
2 "	CA-3	**18.**	CA-3S	**18.**
2½"	DA-3	**18.**	DA-3S	**18.**
3 "	EA-3	**18.**	EA-3S	**18.**



OFFSET TYPE LEVER ARMS



Offset Lever Arm 2" Length 7/16" Offset

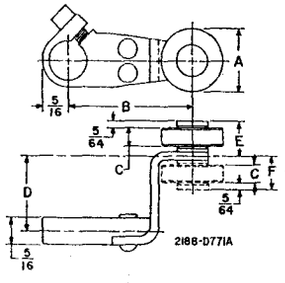
Std. Roller Dia.	Std. Roller Width	Type	Price
⅝	¼	KA-1	**$10.**
⅝	⅝	KA-2	**10.**
¾	¼	KA-11	**10.**
¾	⅝	KA-12	**10.**
Ball Bearing 1 1/16	¼	KA-9	**$14.**
Nylon ¾	¼	KA-18	**$10.**
¾	1	KA-21	**10.**

1½" Length ⅞" Offset

Std. Roller Dia.	Std. Roller Width	Type	Price
¾	¼	KB-11	**$10.**
¾	¼	KB-15▲	**10.**

★ Recommended in place of Types BA-7, CA-7, DA-7, EA-7, and MA-7 lever arms with steel rollers. If necessary the latter arms can still be furnished at **$14.** each.

▲ Roller Inside.



Lever Arm Type	Dim. A	Dim. B	Dim. C	Dim. D	Dim. E	Dim. F
KA-1	⅝	2	¼	7/16	7/16	...
KA-2	⅝	2	⅝	7/16	13/16	...
KA-9	1 1/16	2	¼	7/16	7/16	...
KA-11	¾	2	¼	7/16	7/16	...
KA-18	¾	2	¼	7/16	7/16	...
KA-21	¾	2	1	7/16	1 3/16	...
KB-11	¾	1½	¼	⅞	13/32	...
KB-15	¾	1½	¼	⅞	...	13/32

Approximate shipping weight — ⅛ lb.

CAST LEVER ARM DIMENSIONS

A = Length of Lever Arm
B = Roller Diameter
C = Roller Width
D = C + 5/16"

See Price Table for A, B & C Dimensions

Approximate shipping weights range from ⅛ lb. to ¼ lb.

SQD SLV_001144

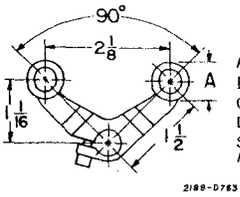
Standard roller is hardened oil-impregnated sintered iron.

90° FORKED LEVER ARMS

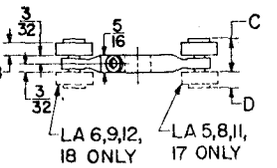


90° Forked Arm 1½" Length

Roller Position	Standard ¾" Dia. ¼" Wide Rollers	Standard ⅝" Dia. ¼" Wide Rollers	Nylon ¾" Dia. ¼" Wide Rollers	Nylon ¾" Dia. 1" Wide Rollers		Ball Bearing 1 1/16" Dia. ¼" Wide Rollers	
	Type	Type	Type	Type	Price	Type	Price
Rollers on Same Side	LA-4	LA-1	LA-16	LA-10	$10.	LA-7	$14.
R.H. Roller on Opp. Side	LA-5	LA-2	LA-17	LA-11	10.	LA-8	14.
L.H. Roller on Opp. Side	LA-6	LA-3	LA-18	LA-12	10.	LA-9	14.



A = Roller Diameter
B = Roller Width
C = B + 5/16"
D = B + ¼"
See Price Table for A & B Dimensions



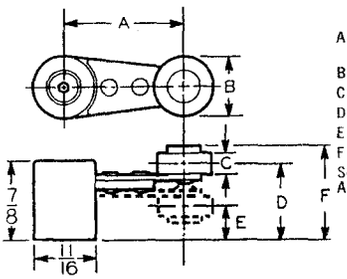
Approximate shipping weight — ¼ lb.

360° ANGULAR ADJUSTABLE LEVER ARMS



360° Angular Adjustable Lever Arm

Length of Arm	Roller (Can be changed from roller outside to roller inside position or vice versa in the field)							
	Standard ⅝" Dia. ¼" Wide		Standard ¾" Dia. ¼" Wide	Nylon ⅝" Dia. ¼" Wide	Nylon ¾" Dia. ¼" Wide	Price	Ball Bearing 1 1/16" Dia. ¼" Wide	
	Roller Outside	Roller Inside	Roller Outside	Roller Outside	Roller Outside		Roller Outside	Price
	Type	Type	Type	Type	Type		Type	
⅞"	AA-1M	AA-5M	AA-11M	AA-8M	AA-18M	$30.	AA-9M	$34.
1⅜"	BA-1M	BA-5M	BA-11M	BA-8M	BA-18M	30.	BA-9M	34.
1½"	MA-1M	MA-5M	MA-11M	MA-8M	MA-18M	30.	MA-9M	34.
2"	CA-1M	CA-5M	CA-11M	CA-8M	CA-18M	30.	CA-9M	34.
2½"	DA-1M	DA-5M	DA-11M	DA-8M	DA-18M	30.	DA-9M	34.
3"	EA-1M	EA-5M	EA-11M	EA-8M	EA-18M	30.	EA-9M	34.



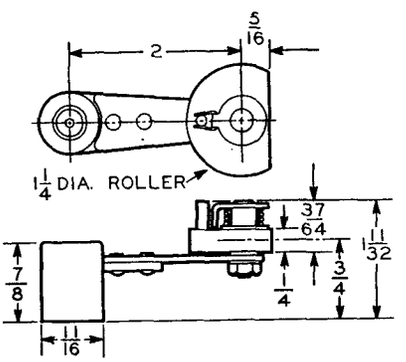
A = Length of Lever Arm
B = Roller Diameter
C = Roller Width
D = 27/32"
E = ⅜"
F = 1 3/64"
See Price Table for A, B & C Dimensions

Approximate shipping weights range from ⅛ lb. to ¼ lb.



ONE-WAY ANGULAR ADJUSTABLE ARM
1¼" Dia.
¼" Wide Roller
2" Length

Type	Price
CA-3M	$38.



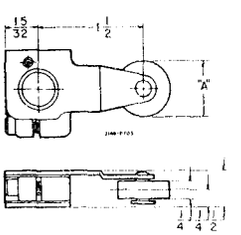
Approximate shipping weight — ¼ lb.

ONE WAY LEVER ARMS

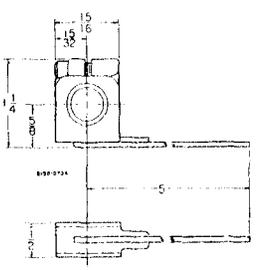


One Way Lever Arm

Length of Arm	Roller						Rod Type	
	Standard ¾" Dia. ¼" Wide		Nylon ¾" Dia. ¼" Wide		Ball Bearing 1 1/16" Dia. ¼" Wide			
	Type	Price	Type	Price	Type	Price	Type	Price
1½"	RA-11	$32.	RA-18	$32.	RA-9	$40.	.....	....
5"	.....	....	.....	....	.....	....	FA-2	$20.



A = Roller Width
Approximate shipping weight — ¼ lb.



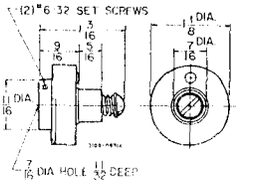


DAMPING ATTACHMENT

Type	Price
GA-1	$20.

Use with any arm to eliminate telegraphing or transfer of contacts due to excessive overtravel and/or snapback on Type AW limit switches. Refer to factory for use with adjustable length and angular adjustable arms. The Type GA-1 is not required for Types B or C limit switches — consult local Square D Field Office for special problems.

Approximate shipping weight — ⅜ lb.



SQD SLV_001145

LIMIT SWITCHES — LEVER ARMS
FOR TYPES C, B & AW

CLASS 9007

Standard roller is hardened oil-impregnated sintered iron.

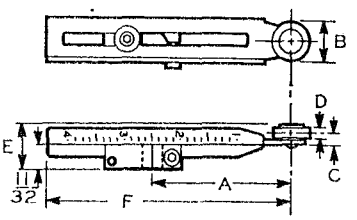
ADJUSTABLE LENGTH LEVER ARMS



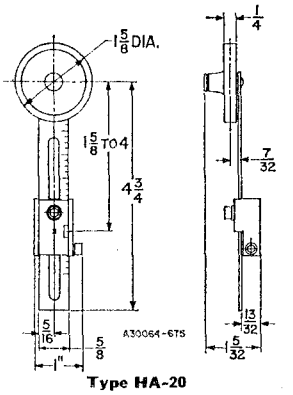
Adjustable Length Lever Arm
Adj. from 7/8" to 4"

Description	Roller												
	Standard 5/8" Dia. 1/4" Wide	Standard 5/8" Dia. 5/8" Wide	Nylon 5/8" Dia. 1/4" Wide	Without Roller		Ball Brg. 1 1/16" Dia. 1/4" Wide	Nylon★ 1" Dia. 5/8" Wide	Delrin▲ 1 5/8" Dia. 1/4" Wide		Nylon 2" Dia. 1/4" Wide		Rubber Tire 2 1/8" Dia. 1/2" Wide	
	Type	Type	Type	Type	Price	Type	Type	Type	Price	Type	Price	Type	Price
Non-bendable	HA-1	HA-2	HA-4	HA-0	$10.	HA-24	HA-22	.....	$14.	.....	....	.....	....
Bendable	HA-5	HA-6	HA-8	HA-9	10.	HA-25	HA-23	HA-20	14.	HA-26	$20.	HA-21	$18.

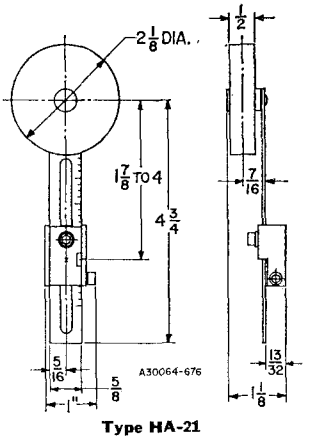
★Recommended in place of Types HA-3 and HA-7 lever arms with steel rollers. If necessary these arms can still be furnished at $14. each.
▲Registered Trademark of DuPont.



Arm Type	Dimensions					
	A	B	C	D	E	F
HA-1, 4	7/8	5/8	3/16	1/4	23/32	4 3/8
HA-2	to	5/8	3/8	5/8	1 3/32	4 3/8
HA-3, 22	4*	1	3/8	5/8	1 3/32	4 3/8
HA-24		1 1/16	3/16	1/4	23/32	4 3/8
HA-5, 8	7/8	5/8	3/16	1/4	23/32	4 3/4
HA-6	to	5/8	3/8	5/8	1 3/32	4 3/4
HA-7, 23	4*	1	3/8	5/8	1 3/32	4 3/4
HA-25		1 1/16	3/16	1/4	23/32	4 3/4
HA-26		2	3/16	1/4	23/32	4 3/4



Type HA-20

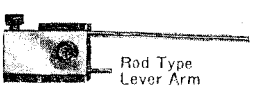


Type HA-21

Approximate shipping weight — 1/4 lb.

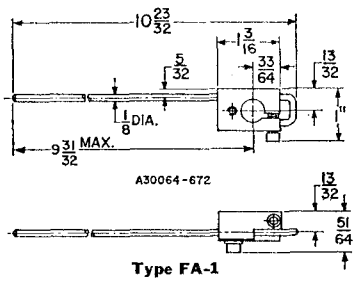
NOTE: Type HA-1 shown.
*With arm and clamp in position shown above, distance from switch shaft to center of arm roller (Dimension A) is adjustable from 7/8" to 3 5/8". By removing arm from clamp, turning clamp upside down and replacing arm, Dimension A is adjustable from 1 1/4" to 4".

ROD TYPE LEVER ARMS

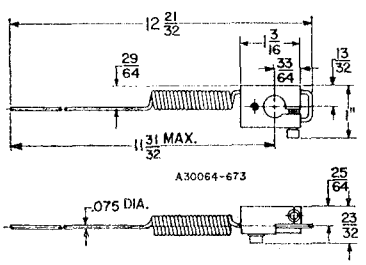


Rod Type Lever Arm

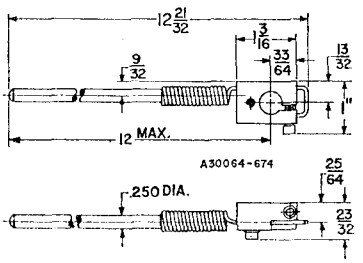
Rod	Type	Price
10" Steel Rod.....	FA-1	$ 10.
12" Spring Rod, Steel...	FA-3	10.
12" Spring Rod, Delrin	FA-5	14.
Looped Rod Arm.....	FA-6	10.
90° Forked Rod 2 1/2" Spring Rods, Steel	LA-19	14.



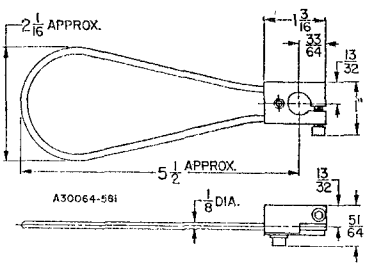
Type FA-1



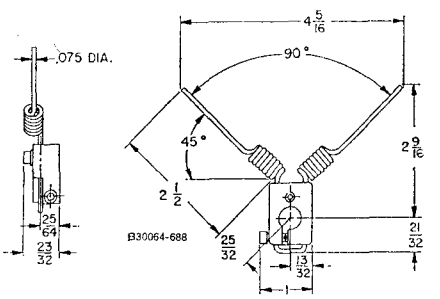
Type FA-3



Type FA-5



Type FA-6



Type LA-19

Approximate shipping weight — 3/8 lb.

SQD SLV_001146

LIMIT SWITCHES — TYPE AW

PRECISION TYPE

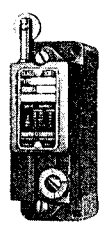
CLASS 9007

LEVER ARM AND PLUNGER TYPES

See page 374 for dimensions. See page 360 for electrical ratings and application information.



Lever Arm Type



Plunger Type

SELECT SWITCH ▼ / SELECT OPERATOR ▶		Lever Arm Type (Without Lever Arm. Select from pages 336-338) CCW Operation		Roller Plunger Type With Micrometer Adjustment		Push Rod Plunger Type With Micrometer Adjustment	
Mounting	Contacts	Type	Price	Type	Price	Type	Price
Surface Mounting Plug-in	1 N.O.-1 N.C.	**AW-16**	**$ 58.**	**AW-36**	**$68.**	AW-46	**$ 64.**
	2 N.O.	◐	◐	AW-39	**80.**	AW-49	**76.**
	2 N.C.	AW-19◐	**70.**	.....	....	.....	....
Surface Mounting Non-Plug-In Standard Box	1 N.O.-1 N.C.	**AW-12**	**58.**	AW-32	**68.**	AW-42	**64.**
Surface Mounting Non-Plug-in Deep Box	1 N.O.-1 N.C.	AW-14	**58.**	AW-34	**68.**	AW-44	**64.**
	2 N.O.-2 N.C.	AW-18	**70.**	AW-38	**80.**	AW-48	**76.**
		AW-20 (Duplex Box)	**94.**				
Open Type (Without Box) Plug-in	1 N.O.-1 N.C.	**AO-16**	**50.**	**AO-36**	**60.**	AO-46	**56.**
	2 N.O.	◐	◐	AO-39	**72.**	AO-49	**68.**
	2 N.C.	AO-19◐	**62.**	.....	....	.....	....
Open Type (Without Box) Non-Plug-in	1 N.O.-1 N.C.	**AO-12**	**50.**	AO-32	**60.**	AO-42	**56.**
	2 N.O.-2 N.C.	AO-18	**62.**	AO-38	**72.**	AO-48	**68.**
Flush Mounting	1 N.O.-1 N.C.	AF-12	**54.**	AF-32	**64.**	AF-42	**60.**
	2 N.O.-2 N.C.	AF-18	**66.**	AF-38	**76.**	AF-48	**72.**
Duplex Surface Mounting	1 N.O.-1 N.C.	AAW-1‡	**144.**	.....	....	AAW-5	**144.**
	2 N.O.-2 N.C.	AAW-4	**156.**	.....	....	.....	....
Duplex Flush Mounting	1 N.O.-1 N.C.	AAF-1‡	**124.**	.....	....	AAF-5	**124.**
Nominal Operating Data — Pre-travel		5°		3/32"		3/32"	
Total-travel		30°		1/4" ± 1/16" Adjustment		1/4" ± 1/16" Adjustment	
Differential		2½°		3/64"		3/64"	
Reverse Over-travel		25°		.....		.....	
Operating Torque or Force		2¾ lb.-in.		3 lbs.		3 lbs.	
Repeat Accuracy		±.002" Linear travel of cam on 1⅜" lever arm		±.001"		±.001"	

Note: A neon pilot light (120V AC or DC) may be furnished on Type AW12, 14, 16, 18, 19 and 20 switches. FORM P5 calls for the light in parallel with N.O. contact (light normally on). FORM P6 calls for the light in parallel with N.C. contact (light normally off). Add **$12.**

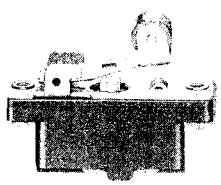
◐2 N.O. contacts only when Type AW-19 or AO-19 is operated in clockwise direction. 2 N.C. contacts only when Type AW-19 or AO-19 is operated in counterclockwise direction.

‡Includes two Type BA-1 lever arms.

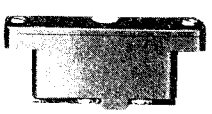
INDUSTRIAL SNAP SWITCHES

INDUSTRIAL SNAP SWITCHES AND LIMIT SWITCHES WITHOUT ENCLOSURES

CLASS 9007



Type AB21



Type AO2

See page 375 for dimensions. See page 360 for electrical ratings.

QUICK MAKE AND BREAK — **600 VOLTS MAX. AC AND DC**

Type of Operator	Contact Arrangement●	Type	Price	Type of Operator	Contact Arrangement●	Type	Price	Type of Operator	Contact Arrangement●	Type	Price
None Basic Snap Switch	1 N.O. 1 N.C.	AO 1	**$11.60**	Rigid Roller Lever Type	2 N.O. 2 N.C.	CB 31 (RH)▲	**$30.20**	Plunger Type Panel Mounting	1 N.O. 1 N.C.	AP 221	**$26.60**
						CB 32 (LH)▲	**30.20**		2 N.O. 2 N.C.	CP 221	**38.20**
	1 N.C.	AO 1A	**11.60**			CB 41▲ (w/o Side Mtg. bracket)	**30.20**		Operator Only	AP 201*	**15.00**
	1 N.O.	AO 1B	**11.60**					Roller Plunger Type Panel Mounting Non-Oiltight	1 N.O. 1 N.C.	AP 321	**32.00**
	1 N.O. 1 N.C.	AO 2	**11.60**			CB 33 (RH)♦	**30.20**			AP 324†	**32.00**
		AO 6 (Plug-in)	**11.60**			CB 34 (LH)♦	**30.20**		2 N.O. 2 N.C.	CP 321	**44.00**
	1 N.C.	AO 2A	**11.60**	Rigid Roller Lever Type One-Way Roller	1 N.O. 1 N.C.	AB 25 (RH)	**24.00**			CP 324†	**44.00**
	1 N.O.	AO 2B	**11.60**			AB 26 (LH)	**24.00**		Operator Only	AP 301*	**20.00**
	2 N.O. 2 N.C.	CO 3	**23.20**		2 N.O. 2 N.C.	CB 35 (RH)	**36.00**			AP 304†*	**20.00**
	2 N.O.	CO 6 (Plug-in)	**23.20**			CB 36 (LH)	**36.00**	Roller Plunger Type Panel Mounting Oiltight	1 N.O. 1 N.C.	AP 323	**34.00**
	Two Stage 2 N.O. 2 N.C.	CO 7	**28.00**	Cabinet Door Type	1 N.O. 1 N.C.	AC 1	**22.00**			AP 325†	**34.00**
Rigid Roller Lever Type	1 N.O. 1 N.C.	AB 21 (RH)▲	**18.60**		2 N.O. 2 N.C.	CC 1	**34.00**		2 N.O. 2 N.C.	CP 323	**46.00**
		AB 22 (LH)▲	**18.60**							CP 325†	**46.00**
		AB 41▲ (w/o Side Mtg. Bracket)	**18.60**	Button Seal Type	1 N.O. 1 N.C.	AS 221	**19.00**		Operator Only	AP 303*	**22.00**
										AP 305†*	**22.00**
		AB 23 (RH)♦	**18.60**		2 N.O. 2 N.C.	CS 221	**31.00**	Mushroom Button Type Panel Mounting	1 N.O. 1 N.C.	AP 222	**29.60**
		AB 24 (LH)♦	**18.60**		Operator Only	AS 201*	**5.40**		2 N.O. 2 N.C.	CP 222	**41.60**
									Operator Only	AP 202*	**16.00**

● Single pole snap switches that contain two (2) double break contact elements (1 N.O. and 1 N.C.) must be used on circuits of same polarity. Two pole snap switches contain two electrically separated sets of contact elements allowing use on circuits of opposite polarity. Each set contains two double break contact elements (1 N.O. and 1 N.C.) that must be used on circuits of same polarity.

† Roller turned 90° from standard (perpendicular to mounting holes).

▲With 7/32" width roller.

♦With 15/32" width roller.

*For use with Type AO and CO basic switches.

SQD SLV_001147

TYPE T & FT*— LIMIT SWITCHES

HEAVY DUTY OILTIGHT TYPE AND FOUNDRY TYPE

CLASS 9007

Complete with Base Plate, Without Lever Arm. Select Lever Arms from Page 371.

See page 360 for application information and electrical ratings. See page 373 for dimensions.

Bold face type numbers indicate most commonly used limit switches.



SELECT OPERATING SEQUENCE

SELECT BASIC SWITCH

UNIVERSAL TYPE

		No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
		Single Pole Double Throw Spring Return CW Only		**Single Pole Double Throw Spring Return CW Only**		**Single Pole Double Throw Maintained Contact**		**Single Pole Double Throw Spring Return Neutral Position**		**Single Pole Double Throw Spring Return CCW Only**		**Single Pole Double Throw Maintained**	
		Initial Position and CCW A B CW A B		Initial Position and CCW A B Intermediate Pos. CW A B Final Pos. CW A B		Spring return of arm to initial position, contact position maintained until operated in reverse direction CCW A B CW A B		Initial Position A B CCW A B CW A B		Initial Position and CW A B CCW A B		Initial Position and CW A B Intermediate Pos. CCW A B Final Pos. CCW A B		CCW A B CW A B If high speed cam or snap-back present use No. 12	
	Base Plate	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price
Surface Mounting	A	TUA1	$ 80.	TUA2	$ 80.	TUA3	$ 80.	TUA4	$ 80.	TUA5	$ 80.	TUA6	$ 80.	TUA7	$ 80.
	B	**TUB1**	80.	TUB2	80.	TUB3	80.	**TUB4**	80.	**TUB5**	80.	TUB6	80.	TUB7	80.
	C	TUC1	80.	TUC2	80.	TUC3	80.	TUC4	80.	TUC5	80.	TUC6	80.	TUC7	80.
	D	TUD1	80.	TUD2	80.	TUD3	80.	TUD4	80.	TUD5	80.	TUD6	80.	TUD7	80.
	●E	TUE1	84.	TUE2	84.	TUE3	84.	TUE4	84.	TUE5	84.	TUE6	84.	TUE7	84.
	●F	TUF1	84.	TUF2	84.	TUF3	84.	TUF4	84.	TUF5	84.	TUF6	84.	TUF7	84.
	●G	TUG1	84.	TUG2	84.	TUG3	84.	TUG4	84.	TUG5	84.	TUG6	84.	TUG7	84.
Flush Mounting	R	TAR1	118.	TAR2	118.	TAR3	118.	TAR4	118.	TAR5	118.	TAR6	118.	TAR7	118.
	S	TAS1	104.	TAS2	104.	TAS3	104.	TAS4	104.	TAS5	104.	TAS6	104.	TAS7	104.
Nominal Operating Data	Pre-travel‡	14°		Int. Pos. 9° Final 16°		7°		6°		14°		Int. Pos. 9° Final 16°		10°	
	Total-travel	88°		88°		81°		81°		88°		88°		85°	
	Differential	12°		5°		7°		5°		12°		5°		12°	
	Oper. Torque	10 lb.-in.		10 lb.-in.		10 lb.-in.		10 lb.-in.		10 lb.-in.		10 lb.-in.		2.5 lb.-in.	
	Repeat Accuracy ◆	±.004"		±.004"		±.004"		±.004"		±.004"		±.004"		±.004"	
To convert sequences remove base plate, pos. plate and latches. Reassemble pos. plate and latches as shown.														*	

UNIVERSAL TYPE | **STANDARD TYPE**

		No. 8		No. 9		No. 10		No. 11		No. 12		No. 1		No. 2		No. 3	
		Single Pole Double Throw Maintained Neutral Position		**Single Pole Double Throw Spring Return Slow Make Slow Break**		**Single Pole Double Throw Spring Return Slow Make Slow Break**		**Single Pole Double Throw Spring Return Slow Make Slow Break**		**Single Pole Double Throw Maintained**		**Single Pole Double Throw Spring Return CW & CCW**		**Single Pole Double Throw Spring Return CW & CCW**		**Single Pole Double Throw Spring Return CW & CCW Slow Make Slow Break**	
		Initial Position A B CCW A B CW A B		Initial Position and CCW A B CW A B		Initial Position A B CCW A B CW A B		Initial Position and CW A B CCW A B		CCW A B CW A B		Initial Position A B CW & CCW A B		Initial Position A B CW & CCW Intermediate Position A B Final Position A B		Initial Position A B CW & CCW A B	
	Base Plate	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price
Surface Mounting	A	TUA8	$ 80.	TUA9	$ 80.	TUA10	$ 80.	TUA11	$ 80.	TUA12	$ 80.	TSA1	$ 80.	TSA2	$ 80.	TSA3	$ 80.
	B	TUB8	80.	TUB9	80.	TUB10	80.	TUB11	80.	**TUB12**	80.	**TSB1**	80.	TSB2	80.	TSB3	80.
	C	TUC8	80.	TUC9	80.	TUC10	80.	TUC11	80.	TUC12	80.	TSC1	80.	TSC2	80.	TSC3	80.
	D	TUD8	80.	TUD9	80.	TUD10	80.	TUD11	80.	TUD12	80.	TSD1	80.	TSD2	80.	TSD3	80.
	●E	TUE8	84.	TUE9	84.	TUE10	84.	TUE11	84.	TUE12	84.	TSE1	84.	TSE2	84.	TSE3	84.
	●F	TUF8	84.	TUF9	84.	TUF10	84.	TUF11	84.	TUF12	84.	TSF1	84.	TSF2	84.	TSF3	84.
	●G	TUG8	84.	TUG9	84.	TUG10	84.	TUG11	84.	TUG12	84.	TSG1	84.	TSG2	84.	TSG3	84.
Flush Mounting	R	TAR8	118.	TAR9	118.	TAR10	118.	TAR11	118.	TAR12	118.	TBR1	118.	TBR2	118.	TBR3	118.
	S	TAS8	104.	TAS9	104.	TAS10	104.	TAS11	104.	TAS12	104.	TBS1	104.	TBS2	104.	TBS3	104.
Nominal Operating Data	Pre-travel‡	6°		12°		3°		12°		45°		14°		Int. Pos. 7.5° Final 16°		9°	
	Total-travel	81°		87°		81°		87°		90°		89°		89°		89°	
	Differential	10°		0°		0°		0°		0°		12°		Int. Pos. 5.5° Final 7.5°		5°	
	Oper. Torque	2.5 lb.-in.		10 lb.-in.		10 lb.-in.		10 lb.-in.		8 lb.-in.		9 lb.-in.		9 lb.-in.		9 lb.-in.	
	Repeat Accuracy ◆	±.004"		±.004"		±.004"		±.004"		±.004"		±.004"		±.004"		±.004"	
To convert sequences remove base plate, pos. plate and latches. Reassemble pos. plate and latches as shown.		*								Not adjustable							

‡Pre-travel listed may vary up to 5° additional for universal switches or up to 2° additional for standard switches due to free travel of lever arm at initial position.
◆Linear travel of cam on 1½" lever arm.
*Remove spring.

Form Q — Substitute transparent cover for standard cover . . . add $4.00 each.

★**Type FT** Foundry Limit Switch — To obtain Type FT, change the "T" at the beginning of the equivalent type number above to "FT" and add $32. to the list price. (Ex: **FT**UB1,$112) Type FT not available in flush mounting.

●Manifold Mount.

SQD SLV_001148

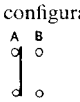
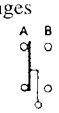
LIMIT SWITCHES — BASE PLATES AND LEVER ARMS FOR TYPES T AND FT

CLASS 9007

THREE POINT CONTACTS — ORDERING INFORMATION

Select Type number of desired contact operating sequence for standard contact switch. Change the letter following "T" or "FT" as shown below. Add **$8.00** to list price.

Contact configuration changes

change U to Y, A to C, S to X, or B to D — from  to 

SEPARATE BASE PLATES

Style	Mounting Holes	Part Number	Price
A	None◐	2934-D32-G1	$4.
B	End	2934-D14-G1	4.
C	Side	2934-D33-G1	4.
D	End	2934-D34-G1	4.
E	End	2934-D14-G2▲	8.
F	Side	2934-D33-G2▲	8.
G	End	2934-D34-G2▲	8.

◐No mounting holes in base plate. Side mounting holes in switch case must be used.

▲Base plate with manifold.

LEVER ARMS FOR TYPES T AND FT LIMIT SWITCHES

Description				Type			
Type of Arm	Length of Arm	Roller Position	Roller Width	¾" Dia. Roller	1" Dia. Roller	1⅜" Dia. Roller	Price
Straight	1½	Optional	¼	B1	B2	B3	$8.
	1½	Optional	½	B12	B13	B14	8.
	2½	Optional	¼	B7	B8	B9	12.
	2½	Optional	½	B22	B23	B24	12.
	2½	None	None	Without Roller B21	....	....	12.
	5	Optional	¼	B19	....	....	12.
	Adj.†	Optional	¼	R18†	R19†	R20†	12.
Offset	1½	Inside Offset●	¼	C1	C2	C3	12.
		Outside Offset●	¼	D1	D2	D3	12.
	1⅞	Outside Offset‡	¼	E4	E5	E6	8.
		Inside Offset‡	¼	F4	F5	F6	8.
120° Forked	1½	Rollers on Same Side	¼	J1	J2	....	28.
	1½	LH Roller on Opp. Side	¼	K1	K2	....	28.
	1½	RH Roller on Opp. Side	¼	N1	N2	....	28.
90° Forked	1½	Rollers on Same Side	¼	X1	X2	....	28.
	1½	RH Roller on Opp. Side	¼	Y1	Y2	....	28.
	1½	LH Roller on Opp. Side	¼	Z1	Z2	....	28.
Cable Operated	1½	None	None	Y3			28.
Rod	Adj.	3/16" Rod (not furnished)	None	R16			16.
	Adj.	¼" Key Stock (not furnished)	None	R17			16.
Ball Bearing	1½	Center	9/32	B16			32.
Weld-On	3½	None	None	G10			4.
1-Way Roller	1½	Outside Offset	¼	D4			40.
Conveyor Side Guide, 8 7/16" long with 1½" dia. 3¼" Delrin roller.				R21*			38.
Cable operated — 2½" long with eyebolt (¾" I.D.) instead of roller.				B27			12.

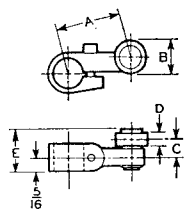
†Roller head assembly for use with Type R-17 arm and a selected length of ¼" key stock. Key stock not furnished.

*Substitute R22 arm when Type B switches with the S9 shaft and hub modification are being used (See page 364). The R22 is similar to the R21 except the roller is ⅞" diameter.

● Dimension D (lever offset) is ⅜".

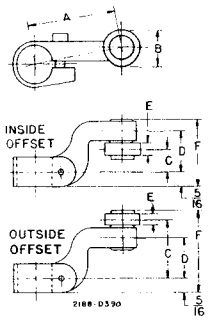
‡ Dimension D (lever offset) is 27/32".

STANDARD ROLLER



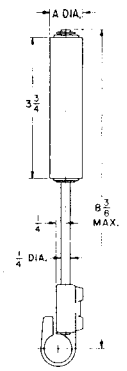
A = Length of Lever Arm
B = Roller Diameter
C# = ¼" + One Half of D
D = Roller Width
E# = 21/32" + D
See Price Table for A, B & D Dimensions. #Deduct 3/64" for B19 arm.

OFFSET TYPE



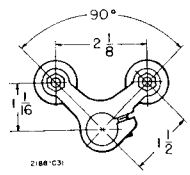
A = Length of Lever Arm
B = Roller Diameter
C = D − ¼" − (½ × E) for Inside Offset Arms
= D + ¼" + (½ × E) for Outside Offset Arms
D = Lever Offset
E = Roller Width
F = D + 5/8" for Inside Offset Arms
= D + E + 21/32" for Outside Offset Arms
See Price Table for A, B, D & E Dimensions.

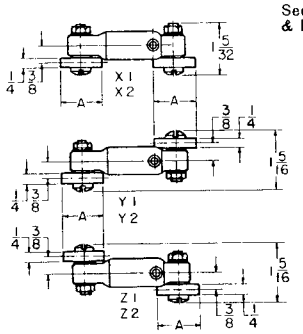
CONVEYOR SIDE GUIDE TYPE



Arm Type	Dim. A
R-21	1½"
R-22	⅞"

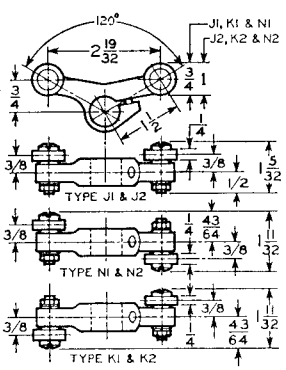
90° FORKED ARM



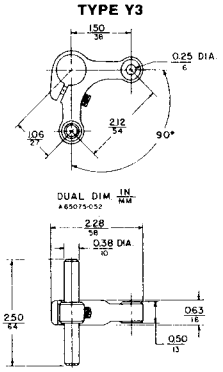


Type	Dim. A
X1, Y1, Z1	¾"
X2, Y2, Z2	1"

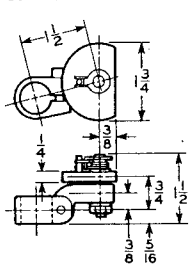
120° FORKED ARM



TYPE Y3

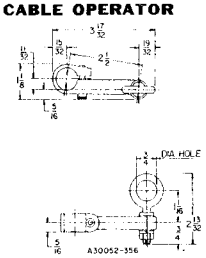


ONE WAY ROLLER

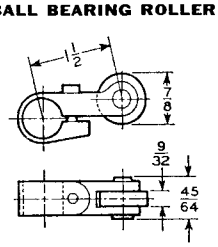


Approximate shipping weight —
¾ lb. for R21
½ lb. for R22
¼ lb. for all others

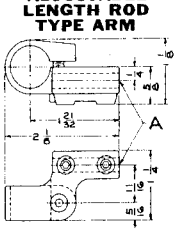
CABLE OPERATOR



BALL BEARING ROLLER

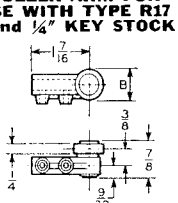


ADJUSTABLE LENGTH ROD TYPE ARM



Types R16 & R17

ROLLER ARM FOR USE WITH TYPE R17 and ¼" KEY STOCK



Types R18, R19 & R20

Type	Dimension A
R16	3/16" Round
R17	¼" Square

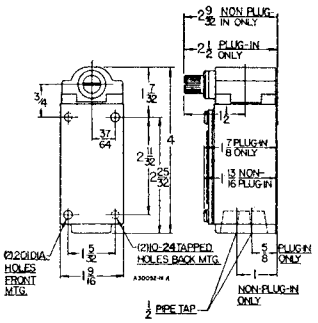
Type	Dimension B
R18	¾"
R19	1 "
R20	1⅜"

SQD SLV_001149

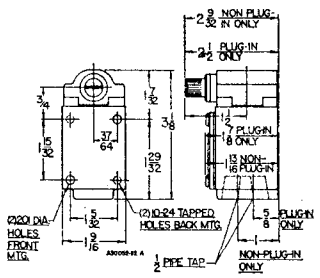
TYPE B — LIMIT SWITCHES
APPROXIMATE DIMENSIONS

CLASS 9007

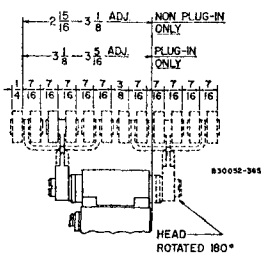
TYPE B



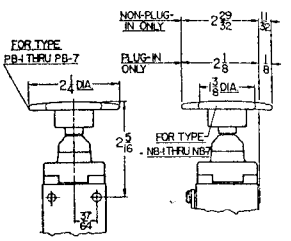
Type B — Lever Type
1 Pole or 2 Pole
Plug-in or Non Plug-in
Standard Box



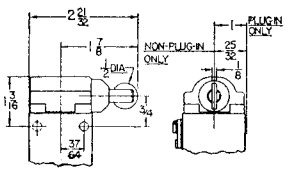
Type B — Lever Type
1 Pole
Plug-in or Non Plug-in
Compact Box



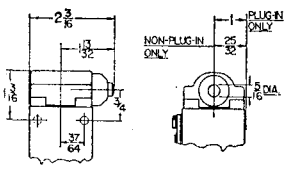
Possible Cam Tracks
Lever Type with MA
and KB Lever Arms



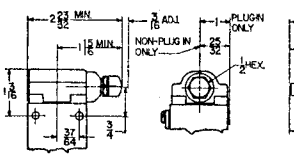
Palm Operated
Turret Head



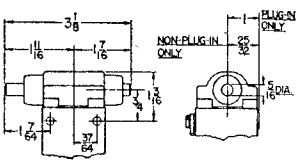
Side Roller Plunger●
Turret Head



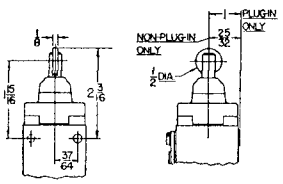
Side Push Rod Plunger★
Turret Head



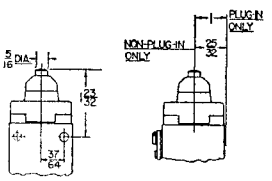
Adjustable
Side Push Rod Plunger
Turret Head



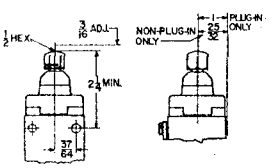
Side Push Rod Plunger
Maintained Contact
Turret Head



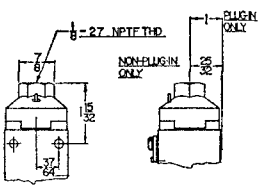
Top Roller Plunger†
Turret Head



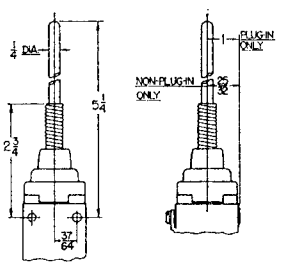
Top Push Rod Plunger★
Turret Head



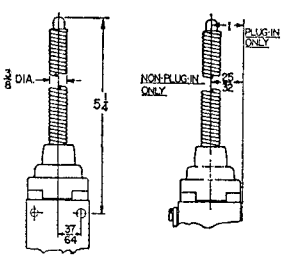
Adjustable
Top Push Rod Plunger
Turret Head



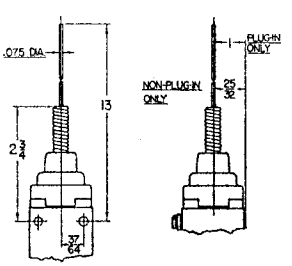
Air Operated
Turret Head



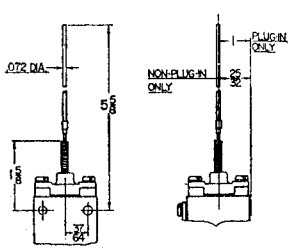
Wobble Stick
DELRIN∗ Extension
Turret Head



Wobble Stick
Coil Spring Extension
Turret Head



Wobble Stick
Wire Extension
Turret Head



Cat Whisker
Turret Head

Approximate shipping weight — 1⅜ lb. standard box, 1⅛ lb. compact box.

● Diameter of F-S2 and FH-S2 roller is ⅝". All other dimensions shown apply to both head versions. See page 362.
★ Plunger length of E-S1 and G-S1 heads is 3/32" less than shown. See pages 362 and 363.
† Diameter of D-S2 roller is ⅝". Plunger length is such that 2⅜16" dimension is correct for both versions. See page 363.
∗ Registered Trademark of DuPont.

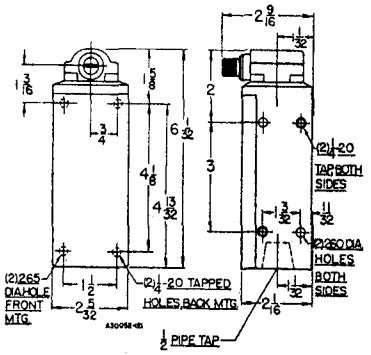
SQD SLV_001150

LIMIT SWITCHES — TYPE BR, BF, T & FT

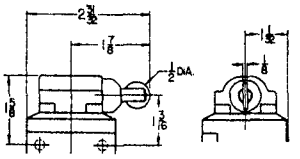
APPROXIMATE DIMENSIONS

CLASS 9007

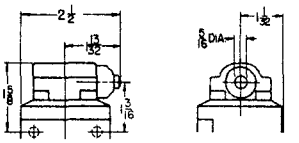
TYPE BR



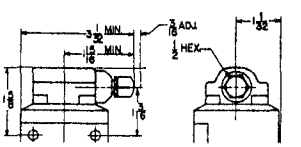
Lever Type



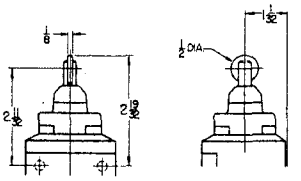
Side Roller Plunger● Turret Head Type BR-F



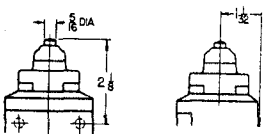
Side Push Rod Plunger★ Turret Head Type BR-G



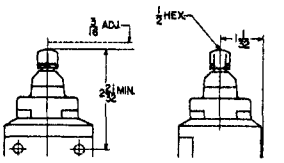
Adjustable Side Push Rod Plunger Turret Head Type BR-GD



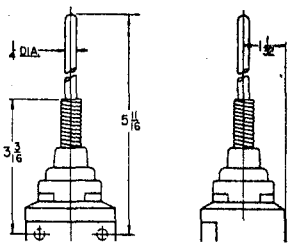
Top Roller Plunger Turret Head† Type BR-D



Top Push Rod Plunger Turret★ Head Type BR-E

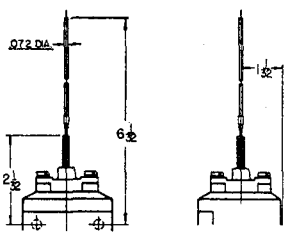


Adjustable Top Push Rod Plunger Turret Head Type BR-ED

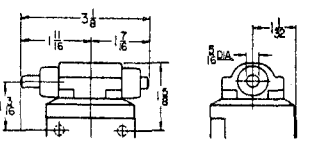


Wobble Stick DELRIN✱ Extension Turret Head Type BR-J
Wire Extension Turret Head Type BR-K

NOTE — For wire extension, dimension from top mounting hole to end of wire is 13 7/16". Wire is .075" dia.



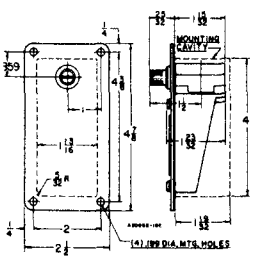
Cat Whisker Turret Head Type BR-L



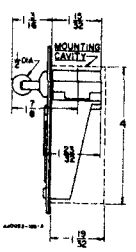
Side Push Rod Plunger Turret Head, Maintained Contact Type BR-H

Approximate shipping weight — 2 3/8 lb.

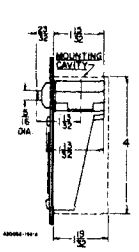
TYPE BF



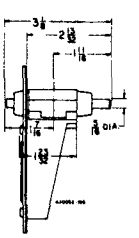
Lever Type



Roller Plunger●



Push Rod Plunger★



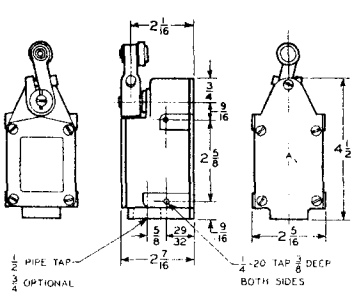
Maintained Push Rod Plunger

NOTE — To obtain dimensions of compact version deduct 7/8" from the overall height, the vertical distance between mounting holes and the mounting cavity height dimensions of the standard size shown.

Approximate shipping weight —
1 1/8 lb. for compact.
1 3/8 lb. for standard.

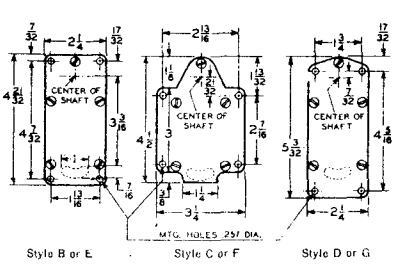
TYPE T

Surface Mounting



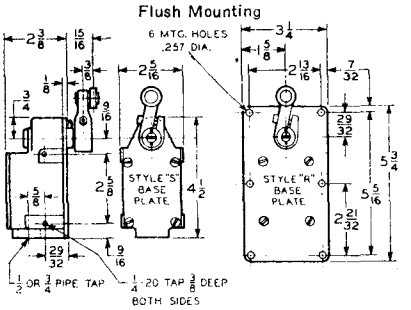
Style A Baseplate Shown

Base Plates‡



Style B or E — Style C or F — Style D or G

Flush Mounting



Approximate shipping weight — 2½ lb.

TYPE FT

Dimensions same as shown for surface mounting Type T except cam track dimension is 2 7/8" (2 1/16" shown for Type T) and overall depth dimension is 3 11/32" (2 7/16" shown for Type T).

● ★ ✱ See page 372 for footnotes.
† Diameter of D-S2 roller is 5/8". Plunger length is such that 2 19/32" dimension is correct for both versions. See page 363.
‡ Styles E, F and G are manifold mount.

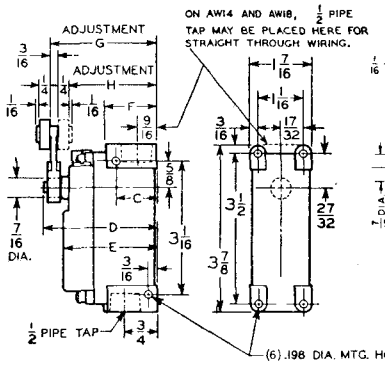
SQD SLV_001151

LIMIT SWITCHES — TYPE AW

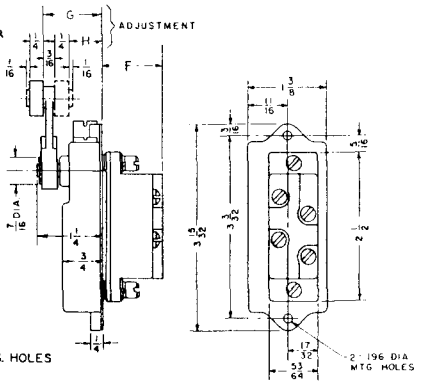
APPROXIMATE DIMENSIONS

CLASS 9007

TYPE AW



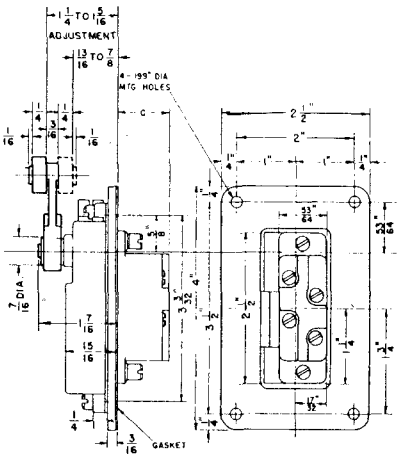
TYPE AO



Type	C	D	E	F	G	H
AW12	15/16	2 11/16	2 3/16	1 5/32	2 1/2-2 9/16	2 1/16-2 1/8
AW14 AW16 AW18 AW19	1 1/4	3	2 1/2	1 15/32	2 13/16-2 7/8	2 3/8-2 7/16
AO12	....	....	....	1 1/32	1 1/16-1 1/8	5/8-11/16
AO18	....	....	....	1 1/8	1 1/16-1 1/8	5/8-11/16

NOTE: Approximate shipping weight of Type AW switches is 1 3/8 lbs.

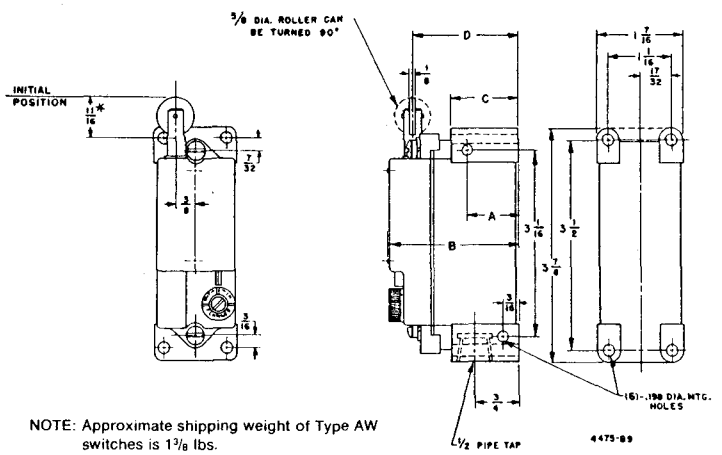
TYPE AF



Type	C
AF12	29/32
AF18	1

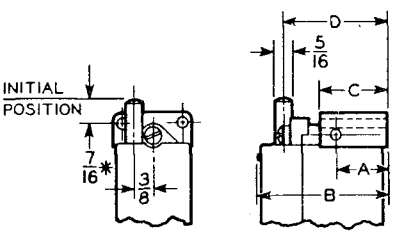
NOTE: Approximate shipping weight of Type AF switches is 1 1/8 lbs.

TYPES AW32, 34, 36, 38 AND 39



NOTE: Approximate shipping weight of Type AW switches is 1 3/8 lbs.

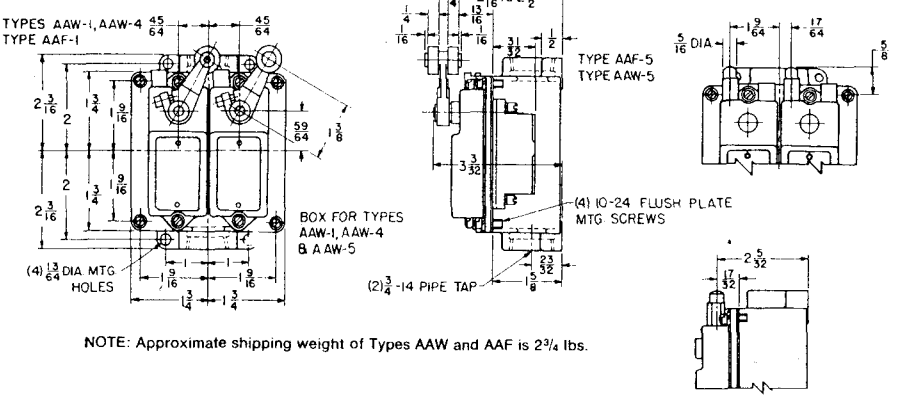
TYPES AW42, 44, 46, 48 AND 49



Type	A	B	C	D
AW-32 & 42	15/16	2 7/32	1 5/32	1 13/16
AW-34, 36, 38, 39, 44, 46, 48 & 49	1 1/4	2 17/32	1 15/32	2 1/8

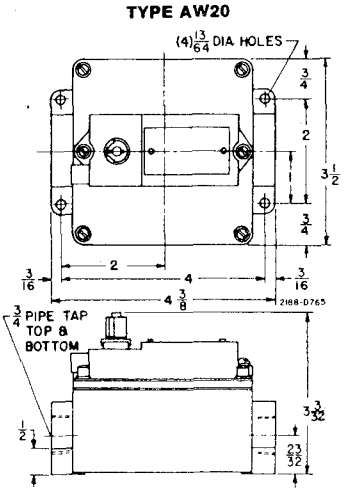
* Plus or minus 1/16 depending upon setting of plunger adjustment. Plunger on Left Hand Side only. For Plunger on Right Hand Side, refer to local Square D Field Office.

TYPES AAW AND AAF



NOTE: Approximate shipping weight of Types AAW and AAF is 2 3/4 lbs.

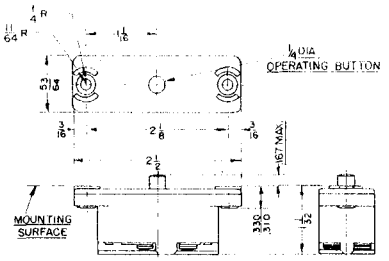
TYPE AW20



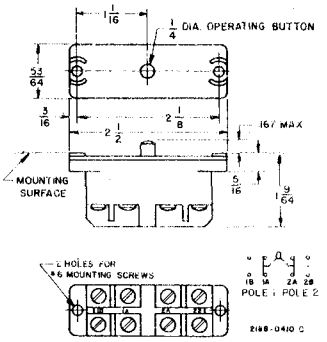
NOTE: Approximate shipping weight is 2 3/4 lbs.

SQD SLV_001152

CLASS 9007



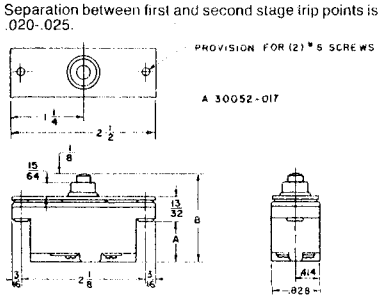
Class 9007 **Type AO**, Single Pole Snap Switch



Class 9007 **Type CO**, Two Pole Snap Switch
Shipping weight of Type AO and CO is ¼ lb.

Operating Data	AO1 1A, 1B	AO2, 2A, 2B
Pretravel	.057-.074	.057-.074
Differential	.015-.025	.035-.046
Total Travel	.103-.125	.103-.125
Oper. Force	7-11 oz.	10-14 oz.
	CO3	CO7
Pretravel 1st Stage	.057-.074	.035-.060
Pretravel 2nd Stage	.....	.060-.085*
Differential	.025-.046	.010-.020
Total Travel	.103-.125	.....
Oper. Force	7-12 oz.	7-12 oz.

* Separation between first and second stage trip points is .020-.025.

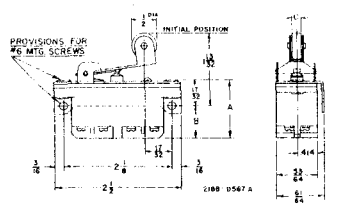


Type AS-221 and CS-221

Type	A	B
AS-221	1 1/16	1 29/64
CS-221	31/32	1 47/64

Operating Data	AS-221	CS-221
Pretravel	3/32	3/32
Differential	.035-.046	.025-.046
Total Travel	1/8 min.	1/8 min.
Oper. Force	26 oz. max.	26 oz. max.
Reset Force	5 oz. min.	5 oz. min.

Note: Type AS-221 shown. Shipping weight ¼ lb.

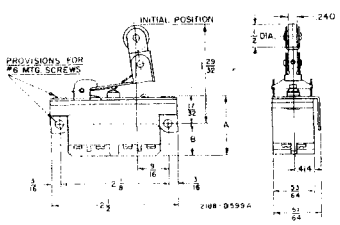


Types AB-21 thru 24 and CB-31 thru 34 (Type CB-31 RH Mounting Shown). **Types AB-41 and CB-41** same as above except without side mounting plate.

Type	A	B	C
AB-21, 22	1 1/32	1/2	7/32
AB-23, 24	1 1/32	1/2	15/32
AB-41	1 1/32	...	7/32

Type	A	B	C
CB-31, 32	1 1/8	19/32	7/32
CB-33, 34	1 1/8	19/32	15/32
CB-41	1 1/8	...	7/32

Operating Data	
Pretravel	5/32
Differential	5/64
Overtravel	1/16
Total Travel	7/32
Operating Force	.8 oz.

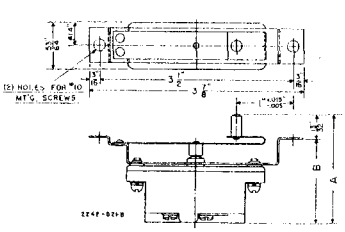


Types AB-25, 26 and CB-35, 36
(Type CB-35 RH Mounting Shown)

Type	A	B	C
AB-25, 26	1 1/32	1/2	7/32
CB-35, 36	1 1/8	19/32	7/32

Operating Data	
Pretravel	5/32
Differential	5/64
Overtravel	1/16
Total Travel	7/32
Operating Force	.8 oz.

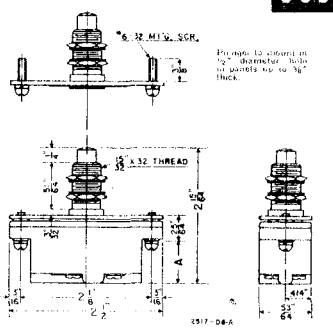
Note: Shipping weight ¼ lb.



Types AC-1 and CC-1

Type	A	B
AC-1	1 29/32	1 1/2
CC-1	2	1 19/32

Note: Type AC-1 shown. Shipping weight ¼ lb.

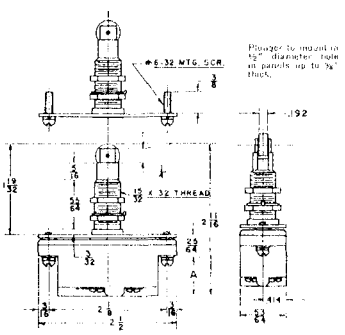


Types AP-201, 221 and CP-221

Type	A
AP-221	4 5/64
CP-221	5 1/64

Operating Data	AP-221
Pretravel	.070-.089
Differential	.035-.046
Overtravel	.161-.180
Total Travel	.231-.269
Operating Force	10-14 oz.
	CP-221
Pretravel	.070-.089
Differential	.025-.046
Overtravel	.161-.180
Total Travel	.231-.269
Operating Force	7-12 oz.

Note: Type AP-221 shown. Shipping weight ¼ lb.



Types AP-301, 303, 304, 305, 321, 323, 324, 325 and CP-321, 323, 324, 325

Type	A
AP-321, 323, 324, 325	4 5/64
CP-321, 323, 324, 325	5 1/64

Operating Data	AP-321, 324	AP-323, 325
Pretravel	.060-.150	.060-.150
Differential	.035-.046	.035-.046
Total Travel	.200-.340	.200-.340
Oper. Force	20 oz. max.	28 oz. max.
	CP-321, 324	CP-323, 325
Pretravel	.060-.150	.060-.150
Differential	.025-.046	.025-.046
Total Travel	.200-.340	.200-.340
Oper. Force	18 oz. max.	26 oz. max.

Note: Type AP-321 shown. Shipping weight ¼ lb.

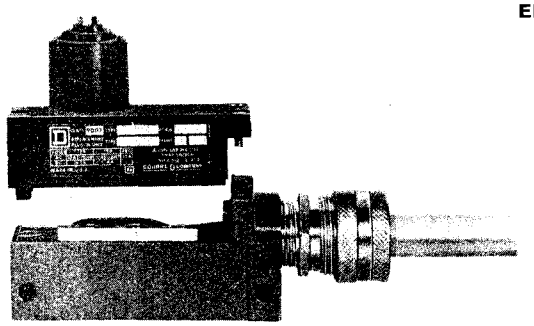
SQD SLV_001153

ENCLOSED PRECISION SWITCHES

TYPE Y

CLASS 9007

Type Y enclosed precision switches are designed for applications in which small size is necessary (because a standard turret head switch won't fit into the available space) or for the precision provided by the short pretravel and low differential.

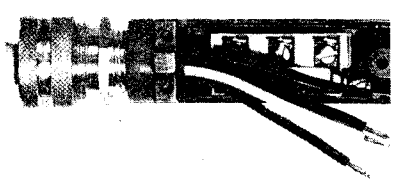


ENCLOSURE STYLES

PLUG-IN CONSTRUCTION cuts wiring time and down time. Plug-in construction is recommended for new applications. The receptacle is mounted and wired (see below) and then the plug-in unit complete with snap switch and actuator is plugged in and secured with three **captive** screws. The plug-in feature makes snap switch replacement fast and easy without disturbing the wiring or conduit. Plug-in devices have self-lifting pressure wire connectors on all terminals including the ground. The NEMA 1, 4 and 13 enclosures can be side mounted with #10 screws or bottom mounted by the #10-24 tapped holes in the bottom of the receptacle. All these plug-in advantages are available at no additional charge over the non-plug-in.

INTERNAL CONSTRUCTION MAKES WIRING EASIER!

1. Cut wires a little longer than necessary (to the end of the enclosure wall)

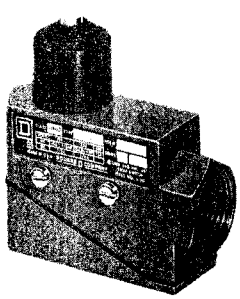


2. Longer wires are easier to insert under terminals.

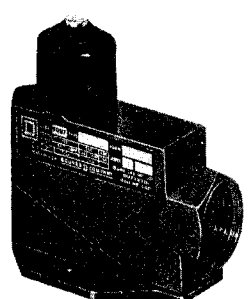


3. There is plenty of room to stuff excess wire.





Side Mounted



Flange Mounted

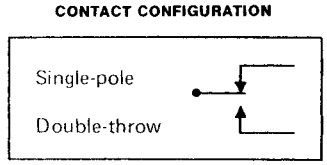
NON-PLUG-IN side mounted NEMA 1 and flange-mounted NEMA 1, 4 and 13 devices are **directly** interchangeable with most equivalent competitive devices. However, non-plug-in units do not offer the ease of installation and replacement of the plug-in devices and are recommended only for **existing** applications **requiring** a device that is directly interchangeable for replacement.

APPLICATION DATA

MAXIMUM CONTACT RATINGS

Device	Volts	125	250	125-480	600
Non-plug-in (Y53, YF53)	AC	⅛ HP	¼ HP	15A	2A
	DC	½ A	¼ A	....	....
Plug-in (Y54)	AC	1/10 HP	⅛ HP	10A	2A
	DC	½ A	¼ A	....	....

CONTACT CONFIGURATION



UL and CSA Listed

OPERATING CHARACTERISTICS

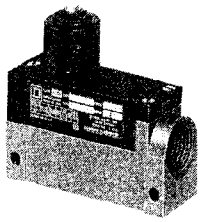
Operator Type*		Pre-Travel			Differential			Overtravel			Operating Force	
		In. Max.	MM Max.	Degrees Typical	In. Max.	MM Max.	Degrees Typical	In. Min.	MM Min.	Degrees Typical	Ounces	Grams
Straight Plunger	Booted	.045	1.143	—	.002	.051	—	.180	4.572	—	9-18	255-510
	Unbooted	.015	.381	—	.002	.051	—	.180	4.572	—	8-14	227-397
Roller Plunger	Booted	.060	1.524	—	.002	.051	—	.180	4.572	—	9-18	255-510
	Unbooted	.015	.381	—	.002	.051	—	.140	3.556	—	8-14	227-397
Roller Arm†	Booted	.150	3.810	6	.005	.127	0.2	.360	9.144	14	8-16	227-454
	Unbooted	.150	3.810	6	.005	.127	0.2	.360	9.144	14	7-14	199-397
Low Force Rod▲	Booted	.400	10.160	4	.018	.457	0.2	1.5	38.1	14	2-5	57-142
	Unbooted	.400	10.160	4	.018	.457	0.2	1.5	38.1	14	2-5	57-142

* Applies to all enclosure styles.
† Linear values at arm angle of 20 degrees.
▲ Linear values at rod angle of 0 degrees.

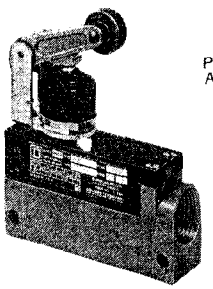
Ambient Temperature Range: Standard limit switch ambient temperature range is +32°F (0°C) to 160°F (71°C). Limit switch with low temperature boot (Form Y214) ambient temperature range is −25°F (−32°C) to 160°F (71°C).

SQD SLV_001154

PLUG-IN TYPE



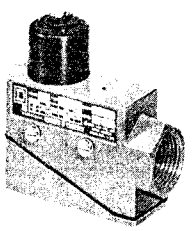
Type Y54E Plug-In Straight Plunger



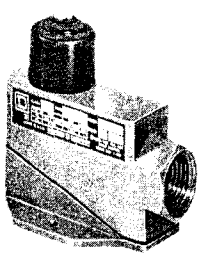
Type Y54B Plug-In Roller Arm Operator

Description	Complete Switch Type	Replacement Parts: Plug-In Unit Less Receptacle	Replacement Parts: Receptacle Only	Replacement Parts: Seal Boot	Replacement Parts: Actuator
	NEMA 1, 4, 13 Enclosure				
Straight Plunger	**Y54E $17.25**	YO54E **$12.95**	YOR54 **$4.30**	65071-517-50 **$2.00**	.....
Roller Arm Operator	**Y54B 25.30**	YO54B **21.00**	YOR54 **4.30**	65071-517-51 **2.00**	65071-518-50 **$10.55**
Low Force Rod Operator	**Y54N 25.30**	YO54N **21.00**	YOR54 **4.30**	65071-517-51 **2.00**	65071-518-51 **10.55**
Parallel Roller Plunger	**Y54D 25.30**	YO54D **21.00**	YOR54 **4.30**	65071-517-52 **2.00**	.....
Cross Roller Plunger	**Y54DC 25.30**	YO54DC **21.00**	YOR54 **4.30**	65071-517-52 **2.00**	.....

NON-PLUG-IN TYPE



Type Y53E Non-plug-in Side Mounting Straight Plunger



Type YF53E Non-Plug-In Flange Mounting Straight Plunger

Description		Mounting	Type	Replacement Parts: Bottom Enclosure	Replacement Parts: Switching Unit	Replacement Parts: Seal Boot	Replacement Parts: Actuator
		NEMA 1 Side Mounting and NEMA 1, 4, 13 Flange Mounting Enclosures					
Straight Plunger	With Boot	Side	Y53E **$17.25**	65071-514-50 **$9.65**	YSO-1 **$12.10**	65071-515-50 **$2.00**	.....
		Flange	YF53E **17.25**	65071-514-51 **9.65**			
	Without Boot	Side	Y53E1 **13.25**	65071-514-50 **9.65**	YSO-2 **10.50**	.....	.....
		Flange	YF53E1 **13.25**	65071-514-51 **9.65**			
Roller Arm Operator	With Boot	Side	Y53B **25.30**	65071-514-50 **9.65**	YSO-1 **12.10**	65071-515-51 **2.00**	65071-516-52 **$10.55**
		Flange	YF53B **25.30**	65071-514-51 **9.65**			
	Without Boot	Side	Y53B1 **22.30**	65071-514-50 **9.65**	YSO-2 **10.50**	.....	65071-516-50 **10.55**
		Flange	YF53B1 **22.30**	65071-514-51 **9.65**			
Low Force Rod Operator	With Boot	Side	Y53N **25.30**	65071-514-50 **9.65**	YSO-1 **12.10**	65071-515-51 **2.00**	65071-516-53 **10.55**
		Flange	YF53N **25.30**	65071-514-51 **9.65**			
	Without Boot	Side	Y53N1 **22.30**	65071-514-50 **9.65**	YSO-2 **10.50**	.....	65071-516-51 **10.55**
		Flange	YF53N1 **22.30**	65071-514-51 **9.65**			
Parallel Roller Plunger	With Boot	Side	Y53D **25.30**	65071-514-50 **9.65**	YSO-5 **18.70**	65071-515-52 **2.00**	.....
		Flange	YF53D **25.30**	65071-514-51 **9.65**			
	Without Boot	Side	Y53D1 **22.30**	65071-514-50 **9.65**	YSO-3 **18.70**	.....	.....
		Flange	YF53D1 **22.30**	65071-514-51 **9.65**			
Cross Roller Plunger	With Boot	Side	Y53DC **25.30**	65071-514-50 **9.65**	YSO-6 **18.70**	65071-515-52 **2.00**	.....
		Flange	YF53DC **25.30**	65071-514-51 **9.65**			
	Without Boot	Side	Y53DC1 **22.30**	65071-514-50 **9.65**	YSO-4 **18.70**	.....	.....
		Flange	YF53DC1 **22.30**	65071-514-51 **9.65**			

WRENCH for tightening adjusting nuts on lever arm type operators: 9007 YW — **$1.00.**

Form Y214 — Substitute low temperature fluorosilicone boot for standard boot on Types Y53B and Y53N. Allows operation in ambient temperatures of − 25°F (−32°C) to 160°F (71°C) .....Add **$5.00** each.

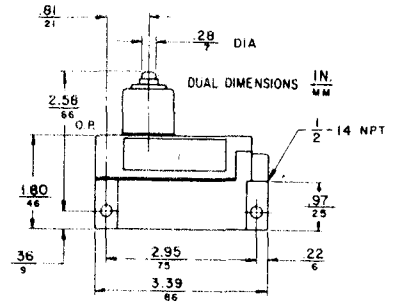
SQD SLV_001155

ENCLOSED PRECISION SWITCHES

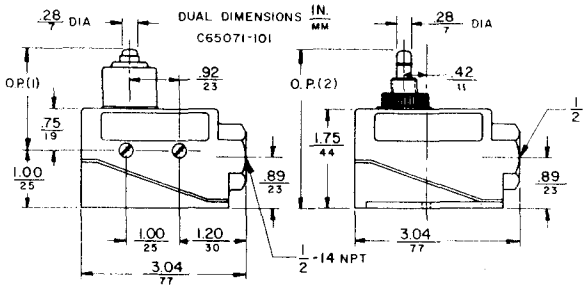
TYPE Y

CLASS 9007

APPROXIMATE DIMENSIONS
SIDE VIEW

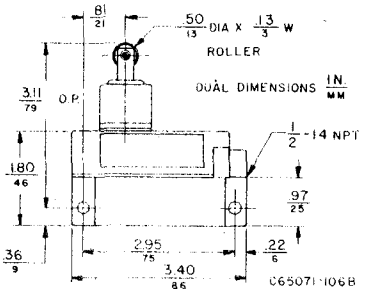


Y54E

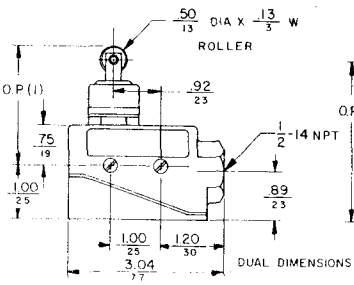


Y53E YF53E1

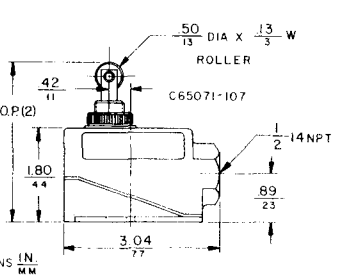
O.P. Values		
	O.P. (1)	O.P. (2)
Y53E	1.72/44	....
YF53E	....	2.72/69
Y53E1	1.50/38	....
YF53E1	....	2.50/64



Y54D — Y54DC

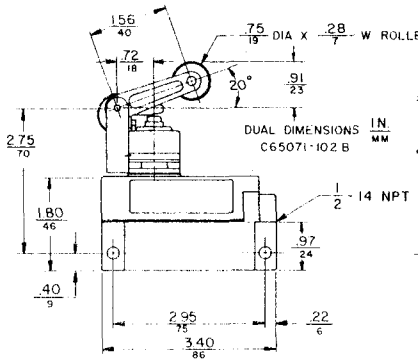


Y53D

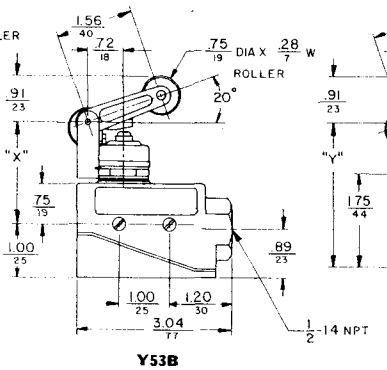


YF53D1

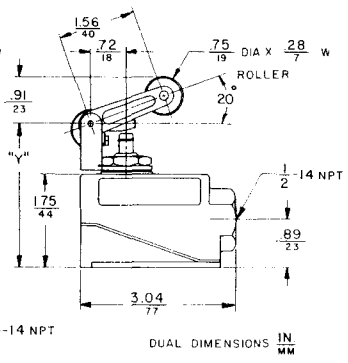
O.P. Values		
	O.P. (1)	O.P. (2)
Y53D	2.22/56	....
Y53D1	1.94/49	....
YF53D	....	3.22/82
YF53D1	....	2.94/75
Y53DC	2.22/56	....
Y53DC1	2.94/49	....
YF53DC	....	3.22/82
YF53DC1	....	2.94/75



Y54B

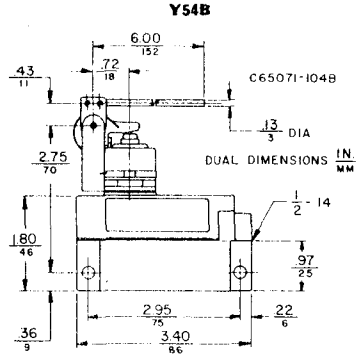


Y53B

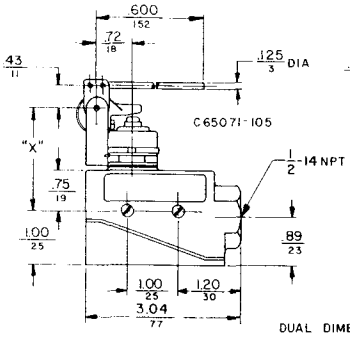


YF53B1

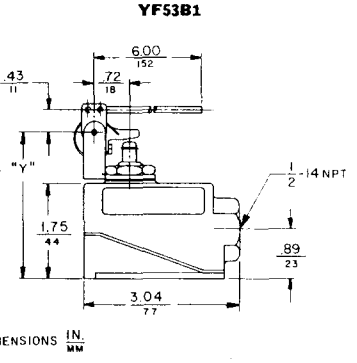
	'X' Dims	'Y' Dims
Y53B	1.91/48	....
Y53B1	1.69/43	....
YF53B	....	2.91/74
YF53B1	....	2.69/68



Y54N



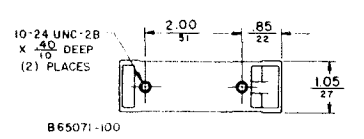
Y53N



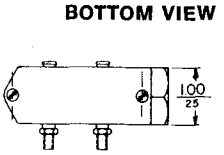
YF53N1

	'X' Dims	'Y' Dims
Y53N	1.91/48	....
Y53N1	1.69/43	....
YF53N	....	2.91/74
YF53N1	....	2.69/68

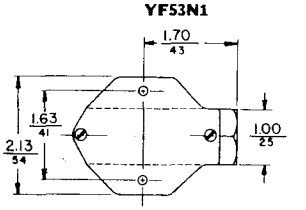
BOTTOM VIEW



All Y54



All Y53



All YF53

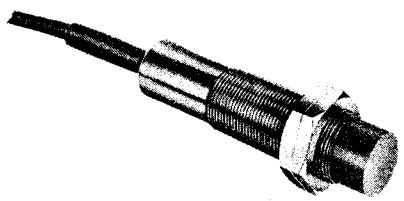
Dual Dimensions: **INCHES** / Millimeters

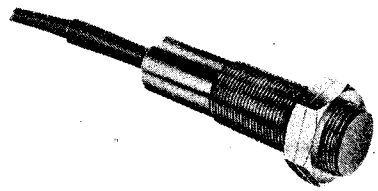
SQD SLV_001156

PROXIMITY LIMIT SWITCHES

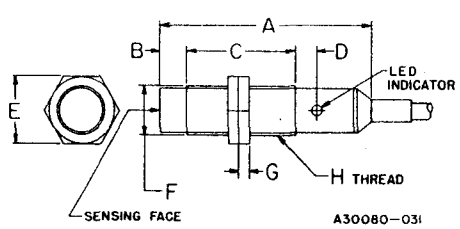
SELF-CONTAINED — ALL METALS SENSITIVE

CLASS 9007



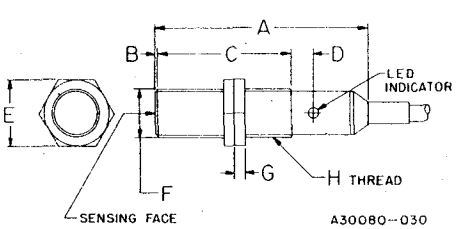


Usage	DC N.O. (Non-embeddable)			DC N.O. (Embeddable)		
Type	**PSD 311** (12 mm dia.)	**PSF 311** (18 mm dia.)	**PSH 311** (30 mm dia.)	**PSD 111** (12 mm dia.)	**PSF 111** (18 mm dia.)	**PSH 111** (30 mm dia.)
Price	**$90.**	**$100.**	**$120.**	**$90.**	**$100.**	**$120.**
Sensitivity Data Sensing Distance (± 10%) Based on Standard Cold Rolled Steel Target*▲	4 mm	8 mm	15 mm	2 mm	5 mm	10 mm
Differential●	.12 mm to .81 mm	.24 mm to 1.6 mm	.45 mm to 3.0 mm	.06 mm to .40 mm	.15 mm to 1.0 mm	.30 to 2 mm
Input Requirements	12 — 48 VDC with 10% maximum ripple			12 — 48 VDC with 10% maximum ripple		
Leakage Current	1.5 ma max.			1.5 ma. max.		
Output Type and Rating	Load current: 5 ma min. — 100 ma max. Voltage Drop: 8V — on state — Note: must be considered in application. LED: on when load is energized Output: 1 N.O. solid state — current sourcing			Load current: 5 ma min. — 100 ma max. Voltage Drop: 8V — on state — Note: must be considered in application. LED: on when load is energized Output: 1 N.O. solid state — current sourcing		
Wiring	2 meter Cord 2 wire device			2 meter Cord 2 wire device		
Repeat Accuracy Based on Constant Temp., Voltage and Perpendicular Movement of Object With Respect to Head.	+.84 mm −.76 mm	+1.24 mm −1.16 mm	+2.33 mm −2.18 mm	+.42 mm −.38 mm	+.78 mm −.73 mm	+1.55 mm −1.45 mm
Temperature Range	−25°C to 70°C			−25°C to 70°C		
Rate of Operation	200/sec	200/sec	100/sec.	200/sec	200/sec	100/sec
Enclosure	NEMA 2, 4, and 13 Completely encapsulated nickel plated brass case with a thermoplastic polyester sensing face.			NEMA 2, 4, and 13 Completely encapsulated nickel plated brass case with a thermoplastic polyester sensing face.		



	A	B	C	D	E	F	G	H
PSD 311	70 / 2.76	5 / .20	35 / 1.38	15 / .59	17 / .67	12 / .47	4 / .16	M12x1
PSF 311	78 / 3.07	10 / .39	40 / 1.57	8 / .31	24 / .94	18 / .71	4 / .16	M18x1
PSH 311	84 / 3.31	11 / .43	40 / 1.57	8 / .31	36 / 1.42	30 / 1.18	5 / .20	M30x1

Dual Dimensions: MM / Inches



	A	B	C	D	E	F	G	H
PSD 111	70 / 2.76	1 / .04	39 / 1.54	15 / .59	17 / .67	12 / .47	4 / .16	M12x1
PSF 111	78 / 3.07	1 / .04	49 / 1.93	8 / .31	24 / .94	18 / .71	4 / .16	M18x1
PSH 111	83 / 3.27	1 / .04	49 / 1.93	8 / .31	36 / 1.42	30 / 1.18	5 / .20	M30x1.5

● At Rated Voltage & 20°C Ambient Temperature

***Standard Target Sizes**
PSD 12mm x 12mm x 1mm thk.
PSF 24mm x 24mm x 1mm thk.
PSH 45mm x 45mm x 1mm thk.

▲For materials other than steel, multiply nominal sensitivity by the following correction factors:
Brass — .45
Aluminum — .40
Copper — .35

SQD SLV_001157

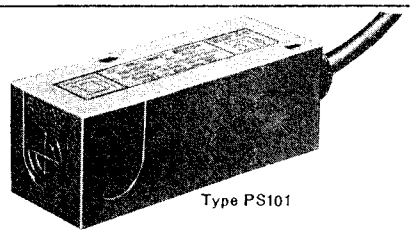
PROXIMITY LIMIT SWITCHES

SELF-CONTAINED — ALL METALS SENSITIVE

CLASS 9007

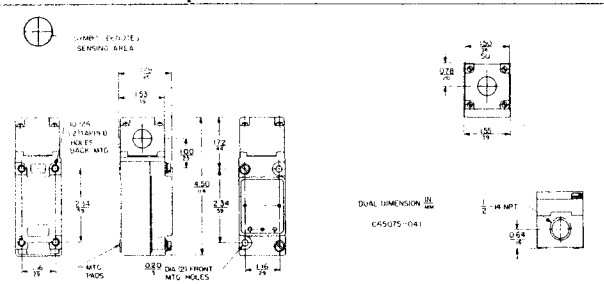


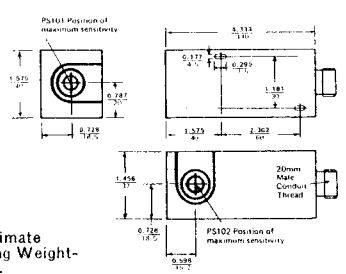
Type PSP 223A



Type PS101

Usage	AC N.O.		AC N.C.		AC N.O.		AC N.C.	
Type	**PSN223A†** (End Sensing)	**PSP223A†** (Side Sensing)	**PSN224A†** (End Sensing)	**PSP224A†** (Side Sensing)	**PS101** (Front Sensing)	**PS102** (Side Sensing)	**PS101 NC** (Front Sensing)	**PS102 NC** (Side Sensing)
Price	**$140.**		**$154.**		Order Quantity 1-24 **$132.**; 25-49 **120.**; 50-99 **111.**; 100-Up **108.** Quantities of PS101, PS101 NC PS102, and PS102 NC on a single order can be combined to determine proper list price.			
Sensitivity Data● Typical Sensitivity Data Based on 1" (25.4mm) Square of 16 Gauge Material: Steel, Aluminum Sheet, Aluminum Foil, Copper, Brass	Fixed Sensitivity Nominal Values Shown. **Sensitivity●**: .500" (13mm), .225" (5.7mm), .385" (9.7mm), .170" (4.3mm), .230" (5.8mm). **Differential**: .03" (.8mm) + .03" (.8mm) − .01" (.25mm). Worst case mounting orientation and over entire temp. range				Fixed Sensitivity Nominal Values Shown. **Sensitivity●**: .59" (15mm), .197" (5mm), .59" (15mm), .197" (5mm), .197" (5mm). **Differential**: .039" (1.0mm) Maximum			
Input Requirements Voltage and Burden Current (Without Load)	60 To 132 VAC 50/60 Hz 2.0 MA Maximum				110-120 V +10% −15%, 50/60 Hz			
Leakage Current	2.0 MA				6.2 MA			
Output Type and Rating	Solid State 1 N.O. or 1 N.C.* with two LED indicators — one is on whenever power is applied to the device, one turns on when the output is conducting. Maximum Inrush of 3.6 Amps, .6 Amp maximum steady state. Load must draw 20 MA to insure proper operation.				Solid State 1 N.O. or N.C. with LED On/Off Indicator* 0.5 Amp. with Maximum Inrush of 10 Amps. Load must draw 80 mA Minimum for proper operation. Leakage Current is 6.2 mA Max.			
Wiring	2 Wire Device. Plug-in construction with self-lifting pressure wire connectors in receptacle. Connect either terminal to Line 1 and the other to Load.				2 Wire Cord — 2 Meters Long. Connect Either Wire to Line 1 and the Other Wire to Load.			
Repeat Accuracy Based on Constant Temp., Voltage and Perpendicular Movement of Object With Respect to Head	± .0015" (.04mm)				±.002" (.05mm)			
Temperature Range	−20°C (−4°F) to 70°C (158°F)				−10°C to 70°C			
Rate of Operation	Up to 20 Oper. Per Sec.				Up to 25 Oper. Per Sec.			
Enclosure	NEMA 2, 4 and 13 Plug-in Zinc Diecast Body Solid State Components Are Completely Encapsulated				NEMA 2, 4 and 13 Completely Epoxy Encapsulated, A.B.S. Plastic Case			





Approximate Shipping Weight- 1⅛ lbs.

* When supply power is first applied to the Class 9007 Type PS2, it is possible for the output triac to conduct for up to 0.5 seconds. All other AC devices contain circuitry to hold output in the off state while the sensing field sets up at initial application of power.

● Types PS-1, 2 and 3 are suitable for flush mounting in metal. Types PSP and PSN can be flush mounted but there will be an increase in sensing distance and differential — consult your local field office. All other versions are not suitable for flush mounting in metal. When adjacent devices are mounted too close together, it is possible for one to interfere with the operation of the other. Types PS101 and PS102 must be mounted a minimum of .24" (6mm) apart. For Types PSN and PSP — consult local Square D field office. The minimum recommended distance between all other devices is equal to the width of the larger switch being used.

★ The operating temperature of the 9007 PS2 is affected by the current that it is switching. It is necessary to add 20° C per ampere of load current to the ambient temperature.

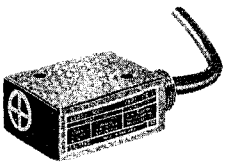
† For replacement plug-in units — change the suffix "A" to "B" and deduct **$8.** from the list price for the appropriate quantity.

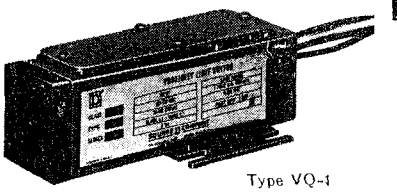
SQD SLV_001158

PROXIMITY LIMIT SWITCHES

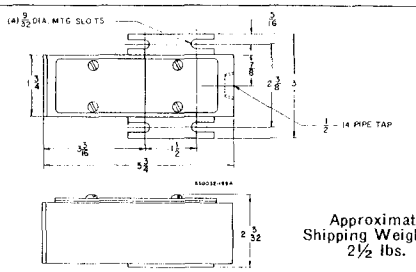
ALL METALS SENSITIVE — SELF-CONTAINED

CLASS 9007





Type VQ-1

Usage	DC	AC or DC	AC
Type	**PS3**	**VQ1**	**VQ2**
Price	**$92.**	**$276.**	**$300.**
Sensitivity Data● Typical Sensitivity Data Based on 1″ (25.4mm) Square of 16 Gauge Material at 20°C: Steel, Aluminum Sheet, Aluminum Foil, Copper, Brass	Fixed Sensitivity Nominal Values Shown at 24 VDC. **Sensitivity● / Differential:** .24″ (6mm) .08″ (2mm) .24″ (6mm) .06″ (1.5mm) .10″ (2.5mm) / .01″ (.25mm) Maximum	Adjustable Sensitivity Nominal Values at Maximum Setting Shown. **Sensitivity● / Differential:** .75″ (19mm) .31″ (8.4mm) .75″ (19mm) .25″ (6.3mm) .30″ (7.6mm) / .05″ (1.2mm) Maximum	
Input Requirements Voltage and Burden Current (Without Load)	12 to 24 VDC with 10% Maximum Ripple 20 mA at 24 VDC 10 mA at 12 VDC	120 VAC +10%, −15%, 25-400 Hz. 115 VDC ±15% 67 mA AC, 55 mA DC	120 VAC +10%, −15%, 25-400 Hz 67 mA AC
Output Type and Ratings	Solid State, 1 N.O., 1 N.C. with LED On/Off Indicator● **Current Sourcing** [Current Flows from Device Output, thru Load, to Common (−)] — N.O. Output = .78 × Supply Voltage with 10K Ω (Minimum Load Resistance) N.C. Output = .51 × Supply Voltage with 10K Ω (Minimum Load Resistance)● **Current Sinking** [Current Flows from Voltage Supply (+), thru Load, to Device Output] — N.O. Output = Supply Voltage with 240Ω (Minimum Load Resistance) N.C. Output = Supply Voltage with 1K Ω (Minimum Load Resistance)● For use with Relay Load see Page 382.	Sealed Reed Relay, 1 N.O.* 0.3 Amps. — 1.8 Amps. Max. Inrush, 0-120 VAC; 1 Amp. at 0-15 VDC; 15 VA at 15-250 VDC	1 N.O. — Solid State* Amplifier Switched by Reed Relay and protected by Replaceable Fuse. 2 Amps. — 15 Amps. Max. Inrush, 120 VAC, 50-60 Hz. (Rating Based on Max. Inrush Duration of 2 Cycles. Mean Current Must Not Exceed 2 Amps. Over 3 Second Period.) Load Must Draw 35 mA Minimum for proper Operation. Leakage Current is 3 mA Max.
Wiring	6 Foot Cord: Red +12 to 24 VDC; Green Common; Blue 1 N.O. Output; Yellow 1 N.C. Output	12 Foot Wires: Black Line 1; White Line 2; 2 Red 1 N.O. Reed Relay Contact	12 Foot Wires: Black Line 1; White Line 2; 2 Red 1 N.O. Triac Output
Repeat Accuracy: Based on Constant Temp., Voltage and Perpendicular Movement of Object With Respect to Head.	±.001″ (.025mm)	±1⁄16″ (.003mm) at Maximum Sensitivity	
Temperature Range Sensitivity Change with Temperature	−20°C to 70°C ±.001″ (.025mm)/°C	−10°C to 60°C	
Rate of Operation	Up to 200 Oper. Per Sec.	Up to 65 Oper. Per Sec.	Up to 50 Oper. Per Sec.
Enclosure	NEMA 2, 4 and 13 Completely Epoxy Encapsulated Stainless Steel Case	Dusttight 16 Gauge Sheet Steel Case Completely Epoxy Encapsulated with the Exception of the Output Reed Relay of the VQ-1 and the Output Fuse of the VQ-2	
Dimensions Same As Types PS-1 and PS-2 See Page 382.		 Approximate Shipping Weight — 2½ lbs.	

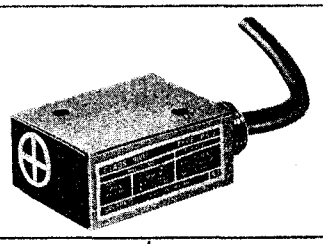
See Page 380 for footnotes.

SQD SLV_001159

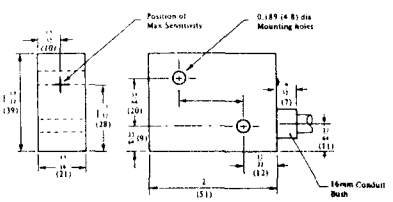
PROXIMITY LIMIT SWITCHES

SELF-CONTAINED — ALL METALS SENSITIVE — ACCESSORIES AND APPLICATION DATA

CLASS 9007



Usage	with NORPAK▲	AC
Type	**PS1**	**PS2**
Price	**$200.**	**$355.**
Sensitivity Data● Typical Sensitivity Data Based on 1″ (25.4mm) Square of 16 Gauge Material at 20°C Steel Aluminum Sheet Aluminum Foil Copper Brass	Adjustable Sensitivity Nominal Values at Maximum Setting Shown **Sensitivity● Differential** .3″ (7.6mm) .01″ (.25mm) .15″ (3.8mm) Typical .3″ (7.6mm) .05″ (1.2mm) .1″ (2.5mm) Maximum .2″ (5mm)	Adjustable Sensitivity Nominal Values at Maximum Setting Shown **Sensitivity● Differential** .3″ (7.6mm) .01″ (.25mm) .15″ (3.8mm) Maximum .3″ (7.6mm) .1″ (2.5mm) .2″ (5mm)
Input Requirements Voltage and Burden Current (Without Load)	+20 VDC +5%, −45% With 5% Maximum Ripple 15 mA DC	120 VAC +10%, −15%, 50/60 Hz. 16 mA AC
Output Type and Ratings	Solid State, 1 N.O., 1 N.C. −10 VDC into 15,000 Ohm Input Resistance (1 Unit of Logic Load into Standard NOR Input)	Solid State, 1 N.O.∗ 1 Amp. with Maximum Surge of 30 Amps. (Mean Current Must Not Exceed 1 Amp. Over 3 Second Period) at 120 VAC. Load Must Draw 70 mA Minimum For Proper Operation. Leakage Current is 5 mA Max.
Wiring	6 Foot Cord Red +20 VDC Green Common Yellow 1 N.O. Output Blue 1 N.C. Output	6 Foot Cord Brown Line 1 Blue Line 2 White 1 N.O. Output Green/Yellow Ground
Repeat Accuracy: Based on Constant Temp., Voltage and Perpendicular Movement of Object With Respect to Head.	±.001″ (.025mm) at Maximum Sensitivity	
Temperature Range Sensitivity Change with Temperature	−40°C to 70°C 0.0001″ Per °C at 0.125″ 0.001″ Per °C at 0.3″ Over Range of 0°C to 60°C	0°C to 70°C 0.0001″ Per °C at 0.125″ 0.0001″ Per °C at 0.3″ Over Range of 0°C to 70°C★
Rate of Operation	Up to 250 Oper. Per Sec.	Up to 25 Oper. Per Sec.
Enclosure	NEMA 2, 4 and 13 Completely Epoxy Encapsulated, Stainless Steel Case	



Dimensions in inches (mm)

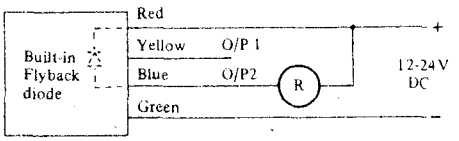
Approximate Shipping Weight — ¾ lb.

TYPE PS3 ADDITIONAL OUTPUT DATA

Relay Operation Using Output 2
The relay is energized when the PS3 senses metal.

Typical Operating Details

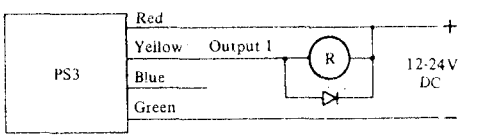
Supply Voltage	Minimum Coil Resistance	Maximum Coil Current
12V	240 ohms	50 m A
24V	240 ohms	100 m A

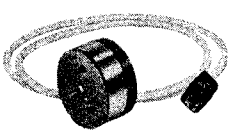


Relay Operations Using Output 1
The relay is energized when the PS3 is not sensing metal. A flyback diode must be connected across the relay coil. A suitable diode is a type 1N 4002 (Square D part No. 27906-12102).

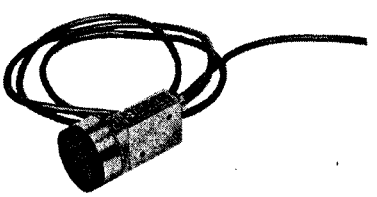
Typical Operating Details

Supply Voltage	Minimum Coil Resistance	Maximum Coil Current
12V	1 Kohm	12 m A
24V	1 Kohm	24 m A





Type PA-3 Form Y914 Probe



Type PA-3 attached directly to face of **PA-1** coupling unit on Type **PS-1** or **PS-2** switch

ACCESSORIES FOR USE WITH TYPE PS1, PS2 AND PS3 SWITCHES

Description	Enclosure (Probe End Only)	Max. Temperature (Probe End Only)	Maximum Sensitivity	Type	Price
Coupling unit used to mount accessory probes‡	....	....	....	PA-1	**$59.00**
½″ diameter remote mounting probe with 3′ cable‡	NEMA 2, 4, 13	120°C	0.125″	PA-2	**64.00**
1⅞″ diameter remote mounting probe with 3′ cable‡	NEMA 2, 4, 13	120°C	0.75″	PA-3 Form Y914	**99.00**
1⅞″ diameter direct mounting probe‡	....	....	0.75″	PA-3	**69.00**
½″ pipe tap adaptor for use with Type PS1, 2 or 3				◆	**8.00**
Isolation transformer for use with Type PS-2 Switches used in AND configurations (120/120 V., 2.6 VA) Number of transformers required = N-1, where N = number of inputs = number of Type PS-2 used.				■	**30.40**

◆ Order by part #30525-179-01.
■ Order by part #1214-S110A
‡ For use with Type PS1 and PS2 switches only.
▲ ∗ ● ★ See page 380 for footnotes.

SQD SLV_001160

MOTION DETECTOR

CLASS 9007

The Class 9007 Type RT1 Transducer is a solid state, completely encapsulated unit, which senses movement of metals across its sensing face and creates a signal proportional to speed. This signal is transmitted to the Class 9007 Type RT2, Output Module, and is interpreted into SPEED and DIRECTION. Two digital outputs switch according to direction and preselected speed. **No mechanical contact with moving objects is involved.**

TRANSDUCER

Type RT1 is to be used on shafts ½" to 3" (12.5 to 75mm) in diameter.

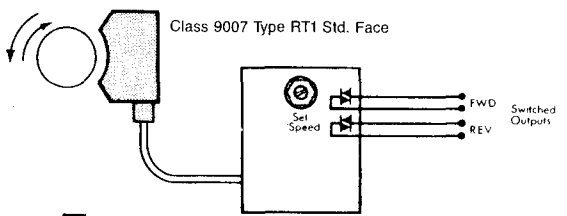
Type RT1-S1 is to be used on shafts larger than 3" (75mm) in diameter and also with flat moving metal for detecting linear motion.

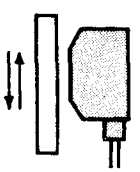
NOTE: All shafts must be smooth, and must run concentric.

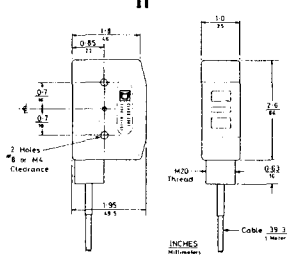
APPLICATION DATA

NEMA Rating:	4, 4X
Detectable Materials:	Ferrous and non-ferrous metal, except not stainless steel.
*Clearance:	2mm nominal
Temperature Range:	−10°C to +60°C
Connecting Cable:	1 meter, 4 wire shielded cable
Cable Extension:	Recommended extension of 4 wire shielded cable up to 10M maximum

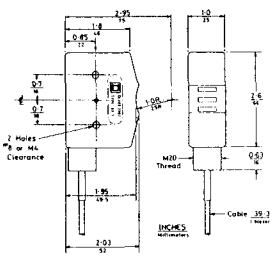
*Clearance is the gap between the moving target and the Transducer. For both rotary and linear motion the target surface must be smooth to maintain a constant clearance.



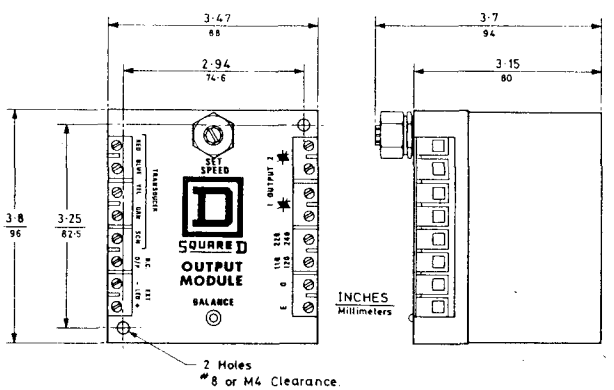




Type RT1-S1 Transducer

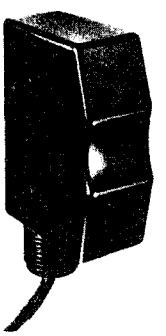


Type RT1 Transducer

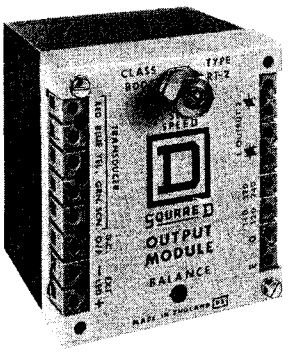


Type RT2 Output Module

APPROXIMATE SHIPPING WEIGHT — RT1 and RT1-S1, ¾ lb. — RT2, 1¾ lb.



Type RT1 Transducer



Type RT2 Output Module

Device		Class 9007 Type	Price
Transducer	Standard Face Flat Face	RT1 RT1-S1	**$ 94.** **166.**
Output Module		RT2	**350.**

OUTPUT MODULE

The Class 9007 Type RT2 Output Module converts signals received from the Type RT1 Transducer into useable signals for control purposes. Forward and Reverse outputs are solid state TRIAC outputs — 500mA maximum continuous; 80mA minimum; 3 amp inrush. Adjustable for speed setting by "set speed" control.

Input Voltage:	110/120V or 220/240V 50/60HZ −15% to +10%
Temperature Range:	−10°C to +60°C

TRIAC OUTPUT SWITCH-ON SPEEDS‡

The table below gives the speeds at which the triac outputs switch-on for maximum and minimum settings for both steel and aluminum. For shaft diameters greater than 3" or for linear motion monitoring, the Type RT1-S1 must be used.

Shaft Diameter	Metal	Potentiometer Setting	Surface Meter/ Sec.	Speed Inches/ Sec.	Speed of Shaft in R.P.M.
1" 25.4mm	Steel	Max. (Fully CW)	0.798	31.42	600
		Min. (Fully CCW)	0.066	2.62	50
	Aluminum	Max. (Fully CW)	1.596	62.84	1200
		Min (Fully CCW)	0.199	7.85	150
3" 76mm	Steel	Max. (Fully CW)	1.995	78.53	500
		Min. (Fully CCW)	0.120	4.71	30
	Aluminum	Max. (Fully CW)	3.989	157.06	1000
		Min. (Fully CCW)	0.359	14.13	90
4" 101.6mm	Steel	Max. (Fully CW)	0.798	31.42	150
		Min. (Fully CCW)	0.066	2.62	12.5
	Aluminum	Max. (Fully CW)	1.596	62.84	300
		Min. (Fully CCW)	0.199	7.85	37.5
6" 152.4mm	Steel	Max. (Fully CW)	0.798	31.42	100
		Min. (Fully CCW)	0.066	2.62	8.33
	Aluminum	Max. (Fully CW)	1.596	62.84	200
		Min. (Fully CCW)	0.199	7.85	25
10" 254mm	Steel	Max. (Fully CW)	0.798	31.42	60
		Min. (Fully CCW)	0.066	2.62	5
	Aluminum	Max. (Fully CW)	1.596	62.84	120
		Min. (Fully CCW)	0.199	7.85	15

‡ These speeds are for triac output switch-on speeds only. There are no limitations on the maximum shaft speeds.

FOR ADDITIONAL APPLICATION INFORMATION — See Product Data M-564.

SQD SLV_001161

FLUID SYSTEM CONTROLS
PRESSURE, TEMPERATURE, VACUUM AND FLOAT SWITCHES

CLASS 9012 THRU 9049

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	FYG	402
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	GHR	402
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	GSG	402
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9025	BCW	404
	BFW	404
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9036	DG	410
	DR	410
	DW	410
	GG	410
	GR	410
	GW	410
	KG	410
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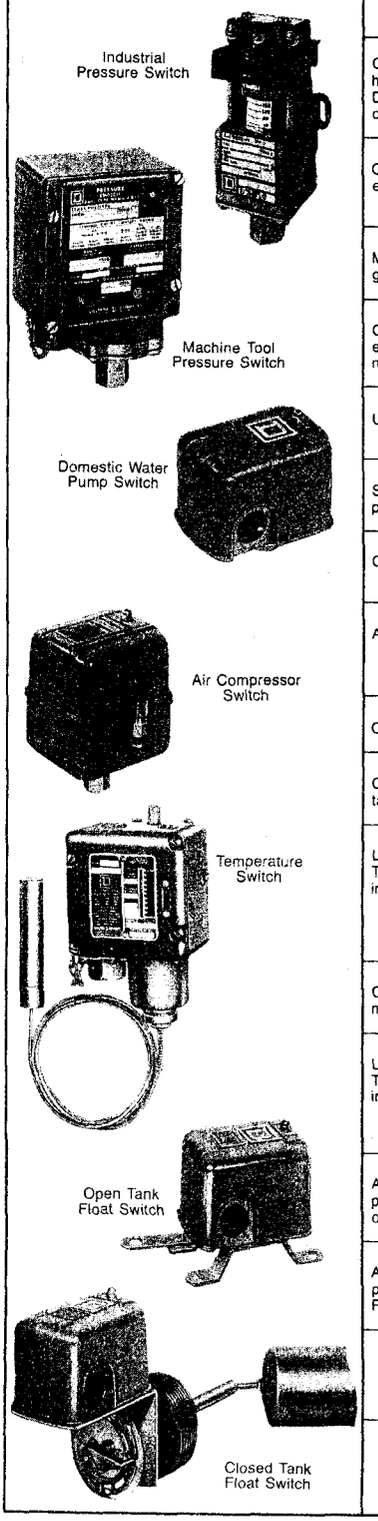

Application	Description	Page
Control circuits of pneumatic and hydraulic systems on machine tools. Designed to meet the requirements of major automobile manufacturers.	Machine Tool Pressure Switch, Class 9012 Type G, NEMA 4 and 13, NEMA 7 and 9, U.L. and CSA Listed.	385
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Liquid Level Control in **Open** Tanks — either pumping in, or pumping out of tank.	Float Switches: External Counter Weight Types: chain or rod operated, Class 9035 Type D. Single Lever Operated Types: Class 9036 Types D, G.	408 410
On-Off Control of Cellar Drainer (Domestic Sump Pump).	Sumptrol® Sump Pump Switch, Class 9036 Type KG.	410
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Alternating **Two** Pumps, plus both pumps run in peak demand situation, optional high water alarm circuit.	Float Operated **Mechanical** Alternator, Class 9038 Type A.	412
Alternating Two Pumps or Compressors — "Electrical" Alternating Required.	**Electrical** Alternator Class 9039 Type H.	413
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	Contact Replacement Kits for Commercial and Domestic Pressure, Float and Vacuum Switches, Class 9998 Type PC.	452

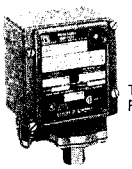
SQD SLV_001162

MACHINE TOOL PRESSURE SWITCH

TYPE G

CLASS 9012

These devices are designed for use in control circuits of pneumatic and hydraulic systems on machine tools, presses, welders, process equipment, molding machines, etc. They can be used in any application, where electrical contacts are to open or close in response to pressure changes, within the electrical and pressure ratings of the switch.



Type GAW-4
Form G5

CLASS 9012 TYPE G — NON-ADJUSTABLE DIFFERENTIAL — NEMA 4 & 13 ENCLOSURE▲

Range on Decreasing Pressure PSIG	Average Differential at Mid Range PSIG (Increases Linearly Over Range)		Range on Increasing Pressure PSIG (Decreasing Set Point Plus Differential)		Maximum Allowable Pressure PSIG	Single Pole Double Throw		Double Pole Double Throw	
SPDT and DPDT	SPDT	DPDT	SPDT	DPDT		Type	Price	Type	Price
DIAPHRAGM ACTUATED Buna N Diaphragm, Zinc Plated Steel Housing									
0-18	.75	1	.75-19	1-20	80	GDW-2	**$ 98.**	GDW-22	**$114.**
0-75	2.5	4	2.5-78	4-80	240	GDW-4	**98.**	GDW-24	**114.**
0-150	5	7	5-157	7-160	475	GDW-5	**95.**	GDW-25	**111.**
30-250	7	9	37-265	9-270	750	GDW-6	**95.**	GDW-26	**111.**
50-425	12	16	62-449	66-457	1300	GEW-1	**190.**	GEW-21	**206.**
80-675	20	27	100-705	107-715	2000	GEW-2	**190.**	GEW-22	**206.**
120-1000	30	40	150-1040	160-1054	3000	GEW-3	**190.**	GEW-23	**206.**
PISTON ACTUATED #440 Stainless Steel Piston, #303 Stainless Steel Housing, Nitrile Diaphragm & O-Ring, Teflon★ Kapseal★★									
120-1000	60	80	180-1100	200-1133	10000	GFW-1	**202.**	GFW-21	**218.**
350-2900	200	266	550-3200	616-3299	15000	GFW-2	**202.**	GFW-22	**218.**
675-5600	350	465	1025-6300	1140-6531	30000	GFW-3	**202.**	GFW-23	**218.**
1000-9000	600	800	1600-10200	1800-10596	45000	GFW-4	**202.**	GFW-24	**218.**

★Registered trademark of du Pont.
★★Registered trademark of Minnesota Rubber Co.
▲UL LISTED INDUSTRIAL CONTROL EQUIPMENT. UL listed for sprinkler alarm service. UL marine listed for use on vessels greater than 65 feet long; where ignition protection is required, use the NEMA 7 & 9 enclosed models. NEMA 4 & 13 devices are CSA listed.

CLASS 9012 TYPE G — ADJUSTABLE DIFFERENTIAL — NEMA 4 & 13 ENCLOSURE▲

Range On Decreasing Pressure PSIG	Adjustable Differential Adds To Decreasing Set Point Increases Linearly Over Range			Range On Increasing Pressure (Decreasing Set Point Plus Differential)		Maximum Allowable Pressure PSIG	Single Pole Double Throw		Double Pole Double Throw	
	With Decreasing Set Point At	Single Pole Differential Adjustment Is	Double Pole Differential Adjustment Is	Single Pole	Double Pole		Type	Price	Type	Price
DIAPHRAGM ACTUATED Buna N Diaphragm, Zinc Plated Steel Housing										
0-18	0 9 18	.75-9 1.3-9.5 1.9-10	1-9.2 1.8-10 2.6-10.7	.75-28	1-28.7	80	GAW-2	**$108.**	GAW-22	**$124.**
0-75	0 40 75	1.5-15 2.6-16 3.8-17	2-15 3.4-16 5-18	1.5-92	2-93	240	GAW-4	**108.**	GAW-24	**124.**
0-150	0 75 150	3-30 5.3-32 7.5-35	4-31 7-33 10-37	3-185	4-187	475	GAW-5	**105.**	GAW-25	**121.**
30-250	30 140 250	6-40 11-45 15-49	8-42 15-49 20-54	36-299	38-304	750	GAW-6	**105.**	GAW-26	**121.**
50-425	50 240 425	12-80 18-86 24-92	16-84 24-92 32-100	62-517	66-525	1300	GBW-1	**200.**	GBW-21	**216.**
80-675	80 375 675	20-125 25-130 30-135	27-132 34-139 40-145	100-810	107-820	2000	GBW-2	**200.**	GBW-22	**216.**
120-1000	120 550 1000	25-200 33-210 40-215	34-209 44-221 54-229	145-1215	154-1229	3000	GBW-3	**200.**	GBW-23	**216.**
PISTON ACTUATED #440 Stainless Steel Piston, #303 Stainless Steel Housing, Nitrile Diaphragm & O-Ring, Teflon★ Kapseal★★										
120-1000	120 550 1000	60-180 80-200 100-220	80-200 107-227 133-253	180-1220	200-1253	10000	GCW-1	**212.**	GCW-21	**228.**
350-2900	350 1625 2900	200-500 250-550 300-600	266-566 333-633 399-699	550-3500	616-3599	15000	GCW-2	**212.**	GCW-22	**228.**
675-5600	675 3150 5600	350-1000 525-1175 700-1350	466-1116 699-1349 931-1581	1025-6950	1141-7181	30000	GCW-3	**212.**	GCW-23	**228.**
1000-9000	1000 5000 9000	600-1600 900-1900 1200-2200	798-1798 1197-2197 1596-2596	1600-11200	1798-11596	45000	GCW-4	**212.**	GCW-24	**212.**

★Registered trademark of du Pont.
★★Registered trademark of Minnesota Rubber Co.
▲UL LISTED INDUSTRIAL CONTROL EQUIPMENT. UL listed for sprinkler alarm service. UL marine listed for use on vessels greater than 65 feet long; where ignition protection is required, use the NEMA 7 & 9 enclosed models. NEMA 4 & 13 devices are CSA listed.

SQD SLV_001163

MACHINE TOOL PRESSURE SWITCH

TYPE G

CLASS 9012

APPLICATION DATA

SERVICE TEMPERATURE LIMITATIONS

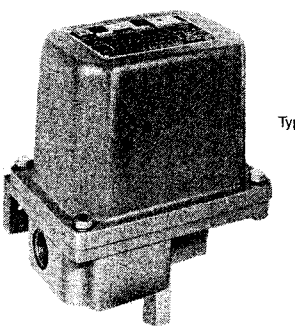
Ambient (Operating)	Pressure Media
Minimum −23°C (−10°F) Maximum +85°C (+185°F)	Minimum −29°C (−20°F) Maximum +120°C (+250°F)

USE ON STEAM — Switches should not be applied directly on steam exceeding 15 PSIG. However, with the installation of a Class 9049 Type A7A steam capillary tubing kit between the pressure and the pressure switch, steam pressures up to 250 PSIG may be applied provided this does not exceed the maximum allowable pressure rating of the switch or the maximum temperature rating at the actuator.

ADJUSTMENTS—Removal of the cover reveals the range adjustment and, on adjustable differential types, it also reveals the differential adjustment. Changes to both adjustments may be made with a screwdriver.

SURGE AND PULSATION DAMPENING—All Type G switches are furnished with pulsation plugs to dampen pressure surges. If further surge dampening is required, a Class 9049 Type A26 surge reducer is recommended. Surge reducers are not recommended for use on air or water.

HAZARDOUS LOCATION TYPES—These devices have cast iron NEMA 7 & 9 enclosures and are suitable for hazardous locations: Class 1, divisions 1 and 2, Groups C and D; Class 2, divisions 1 and 2, Groups E, F and G.



Type GCR-4

CLASS 9012 TYPE G
NON-ADJUSTABLE DIFFERENTIAL — NEMA 7 & 9 ENCLOSURE — CLASS 1 AND 2, GROUP C THRU G▲

Range on Decreasing Pressure PSIG	Average Differential at Mid Range PSIG (Increases Linearly Over Range)		Range on Increasing Pressure PSIG (Decreasing Set Point Plus Differential)		Maximum Allowable Pressure PSIG	Single Pole Double Throw		Double Pole Double Throw	
SPDT and DPDT	SPDT	DPDT	SPDT	DPDT		Type	Price	Type	Price
DIAPHRAGM ACTUATED Buna N Diaphragm, Zinc Plated Steel Housing									
0-18	1	1.3	1-20	1.3-20	80	GDR-2	**$318.**	GDR-22	**$334.**
0-75	4	5	4-79	5-81	240	GDR-4	**318.**	GDR-24	**334.**
0-150	7	9	7-159	9-162	475	GDR-5	**318.**	GDR-25	**334.**
30-250	10	13	40-267	43-273	750	GDR-6	**318.**	GDR-26	**334.**
50-425	17	23	67-442	73-464	1300	GER-1	**410.**	GER-21	**426.**
80-675	27	35	107-704	115-723	2000	GER-2	**410.**	GER-22	**426.**
120-1000	40	53	160-1050	173-1242	3000	GER-3	**410.**	GER-23	**426.**
PISTON ACTUATED #440 Stainless Steel Piston, #303 Stainless Steel Housing, Nitrile Diaphragm & O-Ring, Teflon★ Kapseal★★									
120-1000	70	93	190-1100	213-1147	10000	GFR-1	**422.**	GFR-21	**438.**
350-2900	230	305	580-3230	655-3639	15000	GFR-2	**422.**	GFR-22	**438.**
675-5600	400	532	1075-6350	1207-6598	30000	GFR-3	**422.**	GFR-23	**438.**
1000-9000	700	931	1700-10300	1931-11729	45000	GFR-4	**422.**	GFR-24	**438.**

★ Registered trademark of du Pont.
★★ Registered trademark of Minnesota Rubber Co.
▲ UL LISTED INDUSTRIAL CONTROL EQUIPMENT. UL Listed for Sprinkler Alarm Service. UL Marine Listed for use on vessels greater than 65 feet long; where ignition protection is required, use the NEMA 7 & 9 enclosed models. NEMA 4 & 13 devices are CSA listed.

ORDERING INFORMATION REQUIRED

1. Specify Class 9012 Type ..... Form .....
2. Arrange Form letters in alphabetical order if more than one.

SQD SLV_001164

MACHINE TOOL PRESSURE SWITCH

TYPE G

CLASS 9012

CLASS 9012 TYPE G
ADJUSTABLE DIFFERENTIAL — NEMA 7 & 9 ENCLOSURE — CLASS 1 AND 2, GROUP C THRU G▲

Range on Decreasing Pressure PSIG	Adjustable Differential Adds to Decreasing Set Point Increases Linearly Over Range			Range on Increasing Pressure (Decreasing Set Point Plus Differential)		Maximum Allowable Pressure PSIG	Single Pole Double Throw		Double Pole Double Throw	
	With Decreasing Set Point At	Single Pole Differential Adjustment Is	Double Pole Differential Adjustment Is	Single Pole	Double Pole		Type	Price	Type	Price
DIAPHRAGM ACTUATED Buna N Diaphragm, Zinc Plated Steel Housing										
0-18	0 9 18	1-9.2 1.5-9.7 2.1-10	1.4-9.6 2-10.2 2.8-10.9	1-28	1.4-28.9	80	GAR-2	**$328.**	GAR-22	**$344.**
0-75	0 40 75	2.3-16 3.4-17 4.6-18	3-16 4.6-18 6.2-19	2.3-93	3-94	240	GAR-4	**328.**	GAR-24	**344.**
0-150	0 75 150	4.5-31 6.8-33 9-35	6.32 9-35 12-38	4.5-185	6-188	475	GAR-5	**328.**	GAR-25	**344.**
30-250	30 140 250	8-42 13-47 17-51	11-45 18-52 23-57	38-301	41-307	750	GAR-6	**328.**	GAR-26	**344.**
50-425	50 240 425	16-84 22-90 29-96	22-90 30-98 39-106	66-521	72-531	1300	GBR-1	**420.**	GBR-21	**436.**
80-675	80 375 675	26-130 31-135 36-140	35-139 42-146 48-152	106-815	115-827	2000	GBR-2	**420.**	GBR-22	**436.**
120-1000	120 550 1000	35-210 43-220 50-225	47-222 58-235 67-242	155-1225	167-1242	3000	GBR-3	**420.**	GBR-23	**436.**
PISTON ACTUATED #440 Stainless Steel Piston, #303 Stainless Steel Housing, Nitrile Diaphragm & O-Ring, Teflon★ Kapseal★★										
120-1000	120 550 1000	70-190 90-210 110-230	94-214 120-240 147-267	190-1230	214-1267	10000	GCR-1	**432.**	GCR-21	**448.**
350-2900	350 1625 2900	230-530 280-580 330-630	306-606 373-673 439-739	580-3530	656-3639	15000	GCR-2	**432.**	GCR-22	**448.**
675-5600	675 3150 5600	400-1050 575-1225 750-1400	532-1182 765-1415 998-1648	1075-7000	1207-7248	30000	GCR-3	**432.**	GCR-23	**448.**
1000-9000	1000 5000 9000	700-1700 1000-2000 1300-2300	931-1931 1330-2330 1729-2729	1700-11300	1931-11729	45000	GCR-4	**432.**	GCR-24	**448.**

★Registered trademark of du Pont.
★★Registered trademark of Minnesota Rubber Co.
▲UL LISTED INDUSTRIAL CONTROL EQUIPMENT. UL Listed for Sprinkler Alarm Service. UL marine listed for use on vessels greater than 65 feet long. Where ignition protection is required, use the NEMA 7 & 9 enclosed models. NEMA 4 & 13 devices are CSA listed.

SQD SLV_001165

MACHINE TOOL PRESSURE SWITCH

TYPE G

CLASS 9012

AVAILABLE MODIFICATIONS

Modifications

Description	Applies to These Types Only	Form	Price
Side conduit hub	GAW, GBW, GCW, GDW, GEW, GFW	B2	**$ 8.**
Omit Conduit Hub	GAW, GBW, GCW, GDW, GEW, GFW	B3	N.C.
Removable conduit hub	GAW, GBW, GCW, GDW, GEW, GFW	B4	**8.**
Push button: Manual and automatic reset, nonlocking	GAW, GBW, GCW, GDW, GEW, GFW	E1	**20.**
Pull-to-test	GAW, GBW, GCW, GDW, GEW, GFW	E2	**20.**
Lock out or in on increasing pressure, manual reset only	GDW, GEW, GFW	E3	**12.**
Lock out or in on decreasing pressure manual reset only	GDW, GEW, GFW	E4	**12.**
†Pilot light — lights on decreasing pressure, clear lens cap. 240 volts maximum	GAW, GBW, GCW, GDW, GEW, GFW	G1	**20.**
†Pilot light — lights on increasing pressure, clear lens cap, 240 volts maximum	GAW, GBW, GCW, GDW, GEW, GFW	G2	**20.**
†Pilot light — lights on decreasing pressure red lens cap 240 volts maximum	GAW, GBW, GCW, GDW, GEW, GFW	G5	**20.**
†Pilot light — lights on increasing pressure red lens cap. 240 volts maximum	GAW, GBW, GCW, GDW, GEW, GFW	G6	**20.**
†24 Volts **ONLY** incandescent pilot light **AC** **DC** SP 2400 VA make ST 69 VA 240 VA break DT 28 VA DP 2400 VA make ST 24 VA 240 VA break DT 14 VA	GAW, GBW, GCW, GDW, GEW, GFW		
Lights on decreasing pressure, clear lens		G7	**24.**
Lights on increasing pressure, clear lens		G8	**24.**
Lights on decreasing pressure, red lens		G9	**24.**
Lights on increasing pressure, red lens		G10	**24.**

Modifications (Continued)

Description	Applies to These Types Only	Form	Price
External range adjusting knob (Includes range scale window)	All	K	**$14.**
External Range Adjustment (Slotted for screwdriver; includes range scale window)	All	K1	**10.**
Pulsation plug with .020 orifice in place of standard .060 orifice	GCW, GFW, GCR, GFR	P1	N/C
Omit .060 pulsation plug	GAW, GDW, GAR, GDR	P2	N/C
▲Teflon★ diaphragm and #316 stainless steel housing	GAW, GDW, GAR, GDR	Q2	**24.**
Ethylene propylene diaphragm and #316 stainless steel housing	GBW, GEW, GBR, GER	Q3	**24.**
Viton★ diaphragm and #316 stainless steel housing	GBW, GEW, GBR, GER	Q4	**24.**
Ethylene propylene diaphragm and "O" ring	GCW, GFW, GCR, GFR	Q5	**12.**
Viton★ diaphragm and "O" ring	GCW, GFW, GCR, GFR	Q6	**12.**
Trip Indicator (Can not be combined with pilot light)	All non-adjustable differential types	T4	**12.**
SS legend plate on left side of switch. Max. 2 rows of ¼" characters, 7 per row	All NEMA 4, 13 Types	T5	**4.**
Range scale window	GAW, GBW, GCW, GDW, GEW, GFW	V1	**5.**
NEMA 4X Enclosures	All NEMA 4, 13 Types	W3	**18.**
¼-18 NPT external thread pressure connection	GAW, GDW, GAR, GDR	Z	N/C
Fungus proofing per MIL-T-152B with varnishes per MIL-V-173A	All	Z12	Add 10% to list price
½-14 NPT external thread, ¼-18 NPTF internal thread pressure connection (standard actuator only).	GAW, GDW	Z16	**26.**

★Registered trademark of du Pont.
▲When Teflon is used, minimum differentials are approximately doubled.
† All pilot lights are factory wired to the L2 side of the appropriate contact of the snap switch and terminal No. 9. The installer must connect terminal No. 9 to L2, placing the pilot light in series with the snap switch contacts and in parallel with the load.

SQD SLV_001166

MACHINE TOOL PRESSURE SWITCH

TYPE G

CLASS 9012

MAXIMUM ELECTRICAL CONTACT RATING

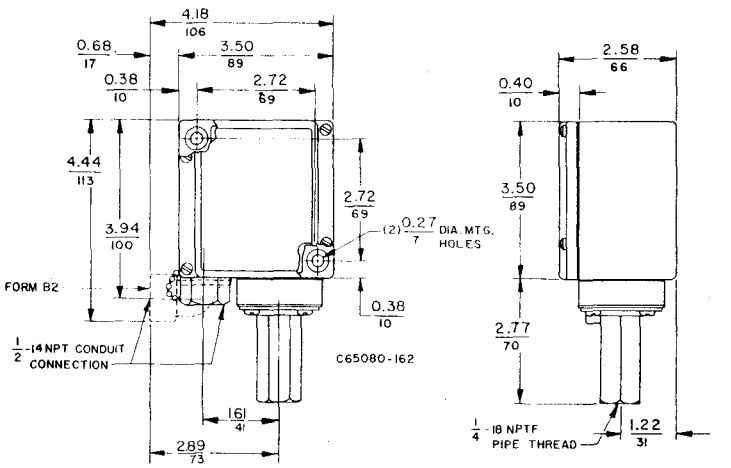
Contact Arrangement	Continuous Carrying Amperes	AC Ratings NEMA A600					DC Ratings		
			Make		Break			Make and Break Amperes	
		Volts	Amps	VA	Amps	VA	Volts	Single Throw	Double Throw
SPDT	10	120	60	7200	6	720	125	.55	.22
	10	240	30	7200	3	720	250	.27	.11
	10	480	15	7200	1.5	720	301 to 600	.10	...
	10	600	12	7200	1.2	720			
DPDT	5	120	30	3600	3	360	125	.22	.11
	5	240	15	3600	1.5	360	250	.11	.05
	5	480	7.5	3600	.75	360	301 to 600	.05	...
	5	600	6	3600	.6	360			

Type	Contact Arrangement	Contact Symbol
Single Pole Double Throw	1 N.O.-1 N.C.	

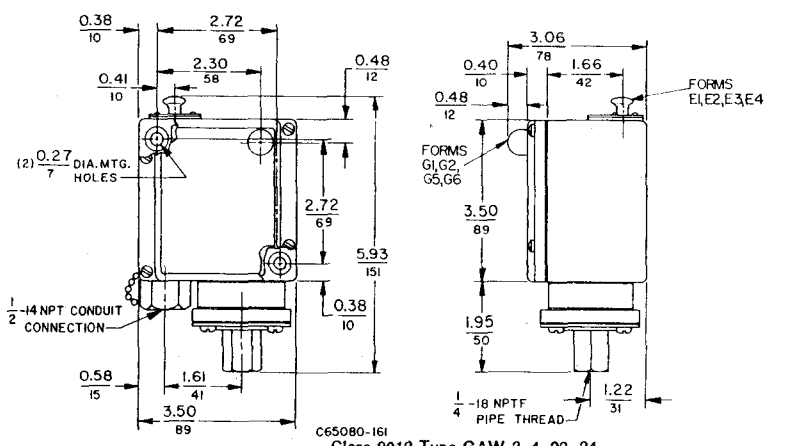
Snap switch contains two (2) double break contact elements (1 N.O. and 1 N.C.) that must be used on circuits of same polarity.

Type	Contact Arrangement	Contact Symbol
Double Pole Double Throw	2 N.O.-2 N.C.	

Snap switch contains two electrically separated sets of contact elements allowing use on circuits of opposite polarity. Each set contains two double break contact elements (1 N.O. and 1 N.C.) that must be used on circuits of same polarity.



Class 9012 Type GCW, GFW



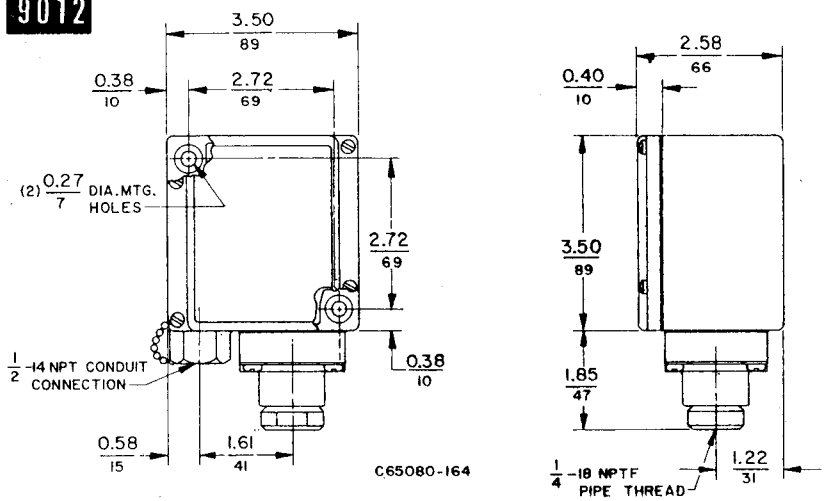
Class 9012 Type GAW-2, 4, 22, 24
GDW-2, 4, 22, 24

Dual Dimensions: **INCHES** / Millimeters

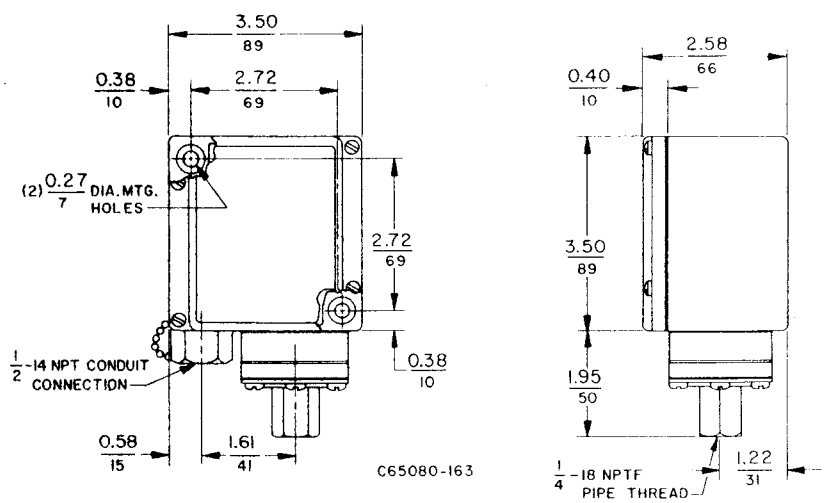
SQD SLV_001167

MACHINE TOOL PRESSURE SWITCH
TYPE G

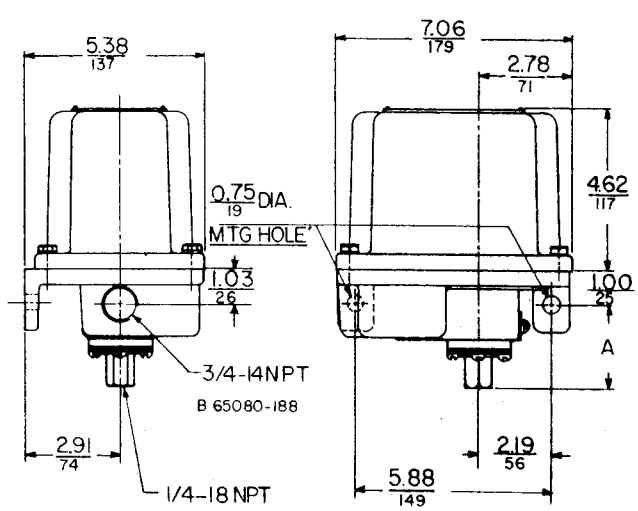
CLASS 9012



Type GBW-1, 2, 3, 21, 22, 23
GEW-1, 2, 3, 21, 22, 23



Type GAW-5, 6, 25, 26
GDW-5, 6, 25, 26



Class 9012 Type GAR, GBR, GCR, GDR, GER, GFR

Class No.	Type	"A" Dim.
9012	GAR 2, 22, 4, 24	2.41
9012	GDR 2, 22, 4, 24	2.41
9012	GAR 5, 25, 6, 26	2.41
9012	GDR 5, 25, 6, 26	2.41
9012	GBR 1, 21, 2, 22, 3, 23	2.38
9012	GER 1, 21, 2, 22, 3, 23	2.38
9012	GCR 1, 21, 2, 22	3.19
9012	GCR 3, 23, 4, 24	3.19
9012	GFR 1, 21, 2, 22	3.19
9012	GFR 3, 23, 4, 24	3.19

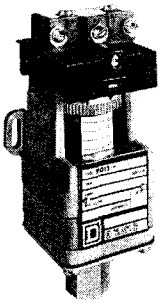
Dual Dimensions: **INCHES** / Millimeters

SQD SLV_001168

INDUSTRIAL PRESSURE SWITCH

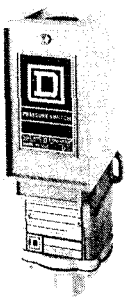
TYPE G

CLASS 9012



Class 9012
Open Type

These devices are designed for use in control circuits of pneumatic and hydraulic systems in a wide variety of applications. Open types or NEMA 1 enclosures are suitable for panel mounting where permitted. For use on air, oil or water.



Class 9012
NEMA 1 encl.

NON-ADJUSTABLE DIFFERENTIAL

CLASS 9012 TYPE G — OPEN TYPE & NEMA 1 ENCLOSURE ▲

Range on Decreasing Pressure PSIG	Approximate Differential at Mid Range Increases Linearly Over Range	Range on Increasing Pressure PSIG Decreasing Set Point Plus Differential	Maximum Allowable Pressure PSIG	Open Type		NEMA 1		NEMA 4, 13	NEMA 4X		NEMA 7, 9
				Type	Price	Type	Price		Type	Price	
DIAPHRAGM ACTUATED Buna N Diaphragm, Zinc Plated Steel Housing											
0-30	5	.5-31	240	GRO-3	**$ 86.**	GRG-3	**$ 90.**	USE NEMA 4X OR SELECT A SWITCH FROM PAGE 385	GRW-3	**$190.**	SELECT A SWITCH FROM PAGES 386 & 387
0-75	1	1-77.5	240	GRO-4	**76.**	GRG-4	**80.**		GRW-4	**180.**	
0-150	2	2-155	475	GRO-5	**66.**	GRG-5	**70.**		GRW-5	**170.**	
30-250	3	33-257.5	750	GRO-6	**76.**	GRG-6	**80.**		GRW-6	**180.**	
50-425	6	56-439	1300	GSO-1	**96.**	GSG-1	**100.**		GSW-1	**200.**	
80-675	10	90-698	2000	GSO-2	**96.**	GSG-2	**100.**		GSW-2	**200.**	
120-1000	16	136-1036	3000	GSO-3	**96.**	GSG-3	**100.**		GSW-3	**200.**	
PISTON ACTUATED #440 Stainless Steel Piston, #303 Stainless Steel Housing, Viton★ Diaphragm & O-Ring, Teflon★ Kapseal★★											
120-1000	50	170-1080	10000	GTO-1	**130.**	GTG-1	**134.**	USE NEMA 4X OR SELECT A SWITCH FROM PAGE 385	GTW-1	**234.**	SELECT A SWITCH FROM PAGES 386 & 387
350-2900	200	550-3155	15000	GTO-2	**130.**	GTG-2	**134.**		GTW-2	**234.**	
675-5600	300	975-6100	30000	GTO-3	**130.**	GTG-3	**134.**		GTW-3	**234.**	
1000-9000	500	1500-10000	45000	GTO-4	**130.**	GTG-4	**134.**		GTW-4	**234.**	

NOTE: If your application requires a piston actuated device with a differential other than those listed above, please consult the factory.

▲UL LISTED INDUSTRIAL CONTROL EQUIPMENT. CSA LISTED INDUSTRIAL CONTROL EQUIP.

★Registered trademark of du Pont.

★★Registered trademark of Minnesota Rubber Co.

SERVICE TEMPERATURE LIMITATIONS

Ambient (Operating)	Pressure Media
Minimum −23°C (−10°F) Maximum +85°C (+185°F)	Minimum −29°C (−20°F) Maximum +120°C (+250°F)

USE ON STEAM — Switches should not be applied directly on steam exceeding 15 PSIG. However, with the installation of a Class 9049 Type A7A steam capillary tubing kit between the pressure and the pressure switch, steam pressures up to 250 PSIG may be applied provided this does not exceed the maximum allowable pressure rating of the switch or the maximum temperature rating at the actuator.

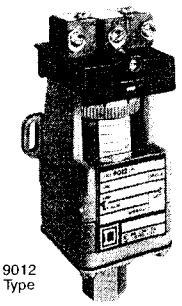
SURGE AND PULSATION DAMPENING — All Type G switches are furnished with pulsation plugs to dampen pressure surges. If further surge dampening is required, a Class 9049 Type A26 surge reducer is recommended. Surge reducers are not recommended for use on air or water.

SQD SLV_001169

INDUSTRIAL PRESSURE SWITCH

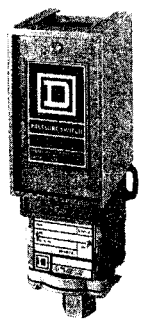
TYPE G

CLASS 9012



Class 9012
Open Type

These devices are designed for use in control circuits of pneumatic and hydraulic systems in a wide variety of applications. Open types or NEMA 1 enclosures are suitable for panel mounting where permitted. For use on air, oil or water.



Class 9012
NEMA 1 Encl.

ADJUSTABLE DIFFERENTIAL

CLASS 9012 TYPE G — OPEN TYPE & NEMA 1 ENCLOSURE▲

Range on Decreasing Pressure PSIG	Adjustable Differential Adds To Decreasing Set Point Increases Linearly Over Range		Range on Increasing Pressure PSIG Decreasing Set Point Plus Differential	Maximum Allowable Pressure PSIG	Open Type		NEMA 1		NEMA 4, 13	NEMA 4X		NEMA 7, 9
	If Decreasing Set Point Is	Then Differential Adjustment Is			Type	Price	Type	Price		Type	Price	
DIAPHRAGM ACTUATED Buna N Diaphragm, Zinc Plated Steel Housing												
0-30	0 15 30	.4-6 .7-6.5 1-7	.4-37	240	GNO-3	**$ 96.**	GNG-3	**$100.**	USE NEMA 4X OR SELECT A SWITCH FROM PAGE 385	GNW-3	**$200.**	SELECT A SWITCH FROM PAGES 386 & 387
0-75	0 40 75	1-8 1.8-8.5 2.5-9.5	1-84.5	240	GNO-4	**86.**	GNG-4	**90.**		GNW-4	**190.**	
0-150	0 75 150	2-16 3.5-17 5-19	2-169	475	GNO-5	**76.**	GNG-5	**80.**		GNW-5	**180.**	
30-250	30 140 250	3-25 5.3-27 7.5-29	33-279	750	GNO-6	**86.**	GNG-6	**90.**		GNW-6	**190.**	
50-425	50 240 425	6-50 10-54 14-58	56-483	1300	GPO-1	**106.**	GPG-1	**110.**		GPW-1	**210.**	
80-675	80 375 675	10-80 17-87 23-93	90-768	2000	GPO-2	**106.**	GPG-2	**110.**		GPW-2	**210.**	
120-1000	120 550 1000	16-130 26-140 36-150	156-1150	3000	GPO-3	**106.**	GPG-3	**110.**		GPW-3	**210.**	
PISTON ACTUATED #440 Stainless Steel Piston, #303 Stainless Steel Housing, Viton★ Diaphragm & O-Ring, Teflon★ Kapseal★★												
120-1000	120 550 1000	50-100 65-115 80-130	170-1130	10000	GQO-1	**140.**	GQG-1	**144.**	USE NEMA 4X OR SELECT A SWITCH FROM PAGE 385	GQW-1	**244.**	SELECT A SWITCH FROM PAGES 386 & 387
350-2900	350 1625 2900	170-370 215-410 255-475	520-3375	15000	GQO-2	**140.**	GQG-2	**144.**		GQW-2	**244.**	
675-5600	675 3150 5600	300-600 450-750 600-900	975-6500	30000	GQO-3	**140.**	GQG-3	**144.**		GQW-3	**244.**	
1000-9000	1000 5000 9000	500-1000 750-1350 1000-1500	1500-10500	45000	GQO-4	**140.**	GQG-4	**144.**		GQW-4	**244.**	

NOTE: If your application requires a piston actuated device with differentials other than those listed above, please consult the factory.

▲UL LISTED INDUSTRIAL CONTROL EQUIPMENT. CSA LISTED INDUSTRIAL CONTROL EQUIPMENT.

★Registered trademark of du Pont.

★★Registered trademark of Minnesota Rubber Co.

SQD SLV_001170

INDUSTRIAL PRESSURE SWITCH

TYPE G

CLASS 9012

AVAILABLE MODIFICATIONS

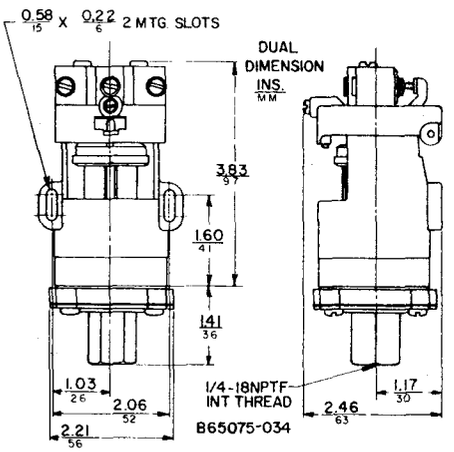
Description	Applies to These Types Only	Form	Price
Pulsation plug with .020 orifice in place of standard .060 orifice	GQW, GTW GQO, GQG, GTO, GTG	P1	N/C
Omit .060 pulsation plug	GNW, GRW GNO, GNG, GRO, GRG	P2	N/C
Teflon* diaphragm◐	GNW, GRW	Q2	$ 8.
Teflon* diaphragm and #316 stainless steel housing◐	GNO, GNG, GRO, GRG	Q2	24.
Ethylene propylene diaphragm	GPW, GSW	Q3	8.
Ethylene propylene diaphragm and #316 stainless steel housing	GPO, GPG, GSO, GSG	Q3	24.
Viton* diaphragm	GPW, GSW	Q4	8.
Viton* diaphragm and #316 stainless steel housing	GPO, GPG, GSO, GSG	Q4	24.
Ethylene propylene diaphragm and O-ring	GQW, GTW GQO, GQG, GTO, GTG	Q5	12.
¼-18 NPT external thread pressure connection	GNW, GRW GNO, GNG, GRO, GRG	Z	N/C
Fungus proofing per MIL-T-152B with varnishes per MIL-V-173A	All	Z12	Add 10% to list price
½-14 NPT external thread, ¼-18 NPTF internal thread pressure connection (standard actuator only)	GNO, GNG, GRO, GRG	Z16	26.

* Registered trademark of du Pont
◐ With Teflon diaphragm, minimum differentials are approximately doubled.

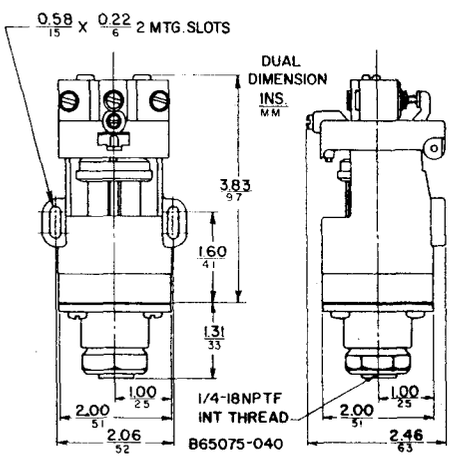
Continuous Carrying Amperes	AC Ratings Volts	AC Ratings Make Amps	AC Ratings Make VA	AC Ratings Break Amps	AC Ratings Break VA	DC Ratings Volts	DC Ratings Make and Break Amperes
10	120	60	7200	6	720	125	.22
10	240	30	7200	3	720	250	.11
10	480	15	7200	1.5	720	—	—
10	600	12	7200	1.2	720	—	—

Contact Arrangement	Contact Symbol
1 N.O.-1 N.C.	

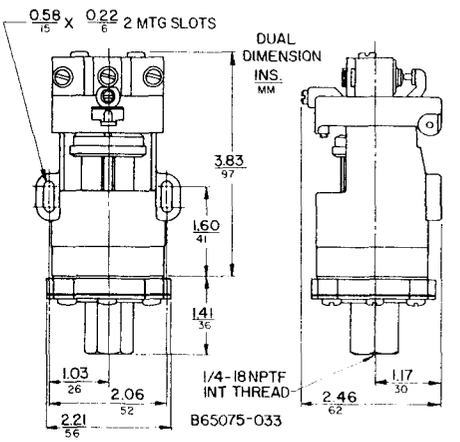
Contacts are single pole, double throw — one circuit normally open and one circuit normally closed. These circuits are not electrically separate and, can not be used on opposite polarities.



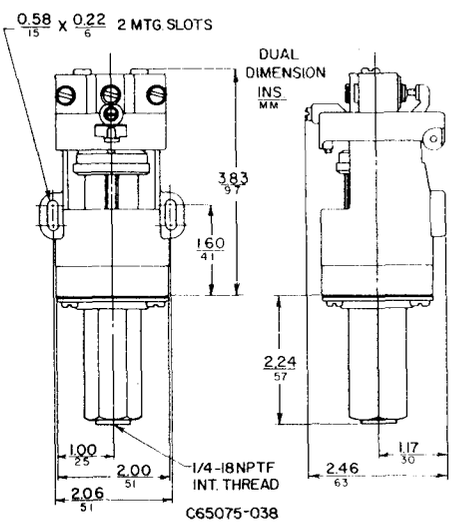
Class 9012 Type GNO, GRO-2, 3, 4



Class 9012 Type GPO, GSO-1, 2, 3



Class 9012 Type GNO, GRO-5, 6



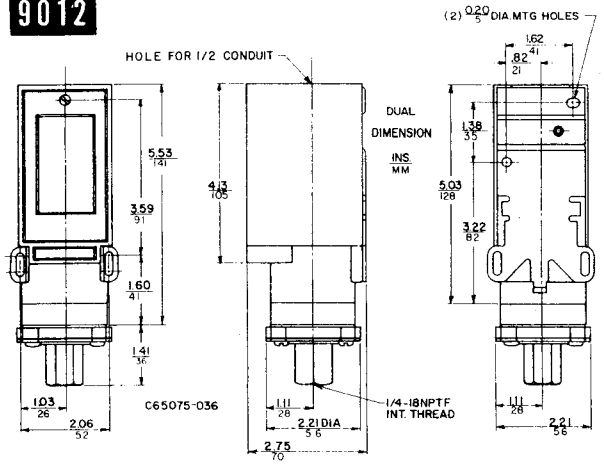
Class 9012 Type GQO, GTO-1, 2, 3, 4

SQD SLV_001171

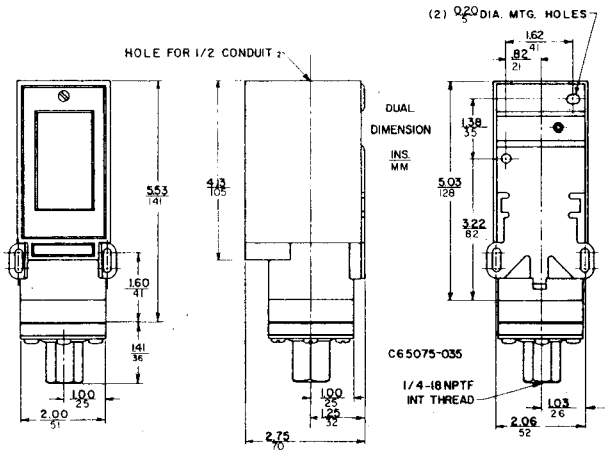
INDUSTRIAL PRESSURE SWITCH

TYPE G

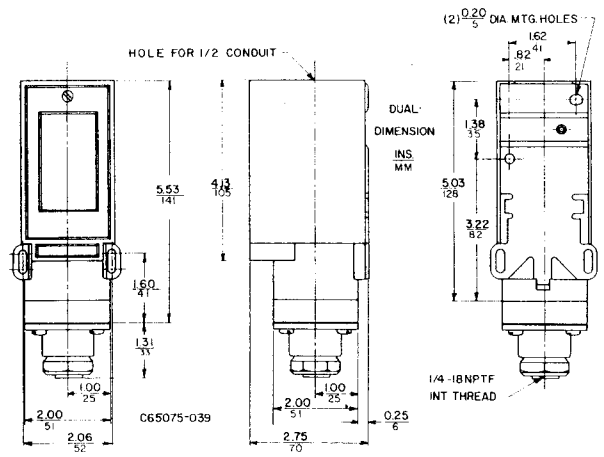
CLASS 9012



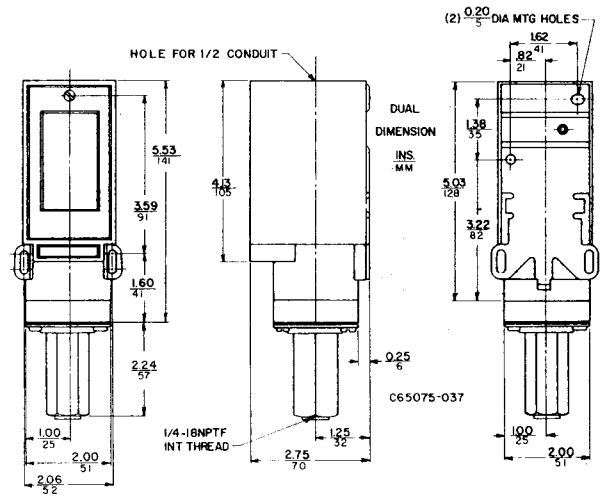
Type GNG, GRG-2, 3, 4



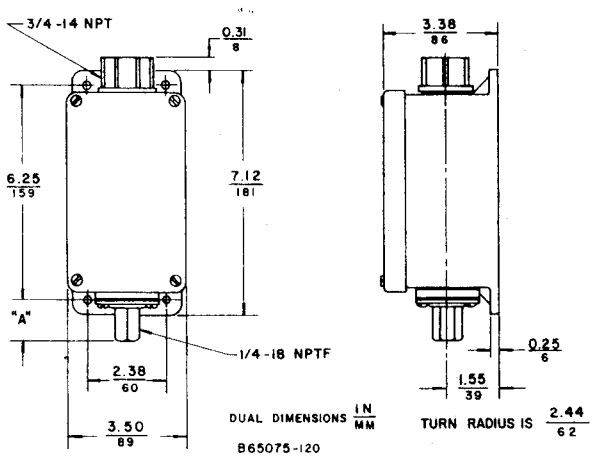
Type GNG, GRG-5, 6



Type GPG, GSG-1, 2, 3



Type GQG, GTG-1, 2, 3, 4

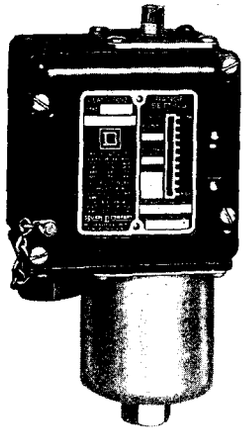


"A" DIM.	TYPE	CLASS	PT.
1.11/28	GNW 3,4,5,6	9012	01
	GRW 3,4,5,6		
1.01/26	GPW 1,2,3		02
	GSW 1,2,3		
1.93/49	GQW 1,2,3,4		03
	GTW 1,2,3,4	9012	

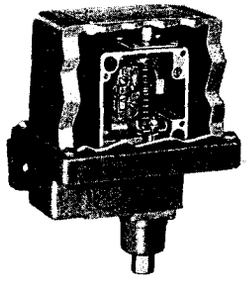
Type GNW, GRW, GPW, GSW, GQW, GTW

SQD SLV_001172

FOR USE IN THE CONTROL CIRCUITS OF WELDING EQUIPMENT, MACHINE TOOLS AND LUBRICATING SYSTEMS



Type ACW
NEMA Type 13 Enclosure



Type ACR with
NEMA Types 7 and 9 Enclosure
Cut-Away to Reveal the
Interior Mechanism

CLASS 9012 — BELLOWS ACTUATED PRESSURE SWITCH
For use on air, oil, water, other liquids and gasses
(Bellows is phosphor bronze, bellows housing and connector are cad. plated steel)

RANGE (P.S.I.) Switch can be adjusted to operate on falling pressure within this range	DIFFERENTIAL (P.S.I.) **Add** to range setting to obtain operating point on **Rising** pressure			Maximum Allowable Pressure (P.S.I.)	Die Cast Aluminum Gasketed, Drip Tight and Oil Resistant Housing **NEMA Type 13**		Cast Iron Enclosure For Hazardous Locations **NEMA Types 7 and 9** Class 1 and 2 Group C thru G	
	ACW	▲	ACR		Type	Price	Type	Price
SINGLE POLE — DOUBLE THROW CONTACTS								**1 N.O.-1 N.C.**
1-10	½-5	¾	1-5	30	ACW-3	**$123.**	ACR-3	**$284.**
1-20	1-6	1¼	2-7	30	ACW-4	**123.**	ACR-4	**284.**
1-75	4-15	4½	10-18	100	ACW-5	**114.**	ACR-5	**275.**
1-110	7-30	9	12-33	255	ACW-1	**106.**	ACR-1	**266.**
20-180	10-30	12	15-33	255	ACW-8	**106.**	ACR-8	**266.**
10-265	15-25	19	25-35	300	ACW-9	**110.**	ACR-9	**310.**
10-300	25-125	30	32-130	600	ACW-2	**107.**	ACR-2	**301.**
75-500	50-120	60	60-125	2000	ACW-6	**211.**	ACR-6	**372.**
150-1000	85-145	105	95-150	2000	ACW-7	**211.**	ACR-7	**372.**
350-1900	150-300	160	160-300	2500	ACW-10	**211.**	ACR-10	**372.**
DOUBLE POLE — DOUBLE THROW CONTACTS								**2 N.O.-2 N.C.**
1-10	¾-7	....	1½-7	30	ACW-23	**$139.**	ACR-23	**$300.**
1-20	2-10	....	3-10	30	ACW-24	**139.**	ACR-24	**300.**
1-75	6-20	....	12-23	100	ACW-25	**130.**	ACR-25	**291.**
1-110	13-40	. .	17-40	255	ACW-21	**122.**	ACR-21	**282.**
20-180	15-40	....	25-45	255	ACW-28	**122.**	ACR-28	**282.**
10-250	23-35	....	38-50	300	ACW-29	**126.**	ACR-29	**326.**
10-300	35-150	....	45-150	600	ACW-22	**123.**	ACR-22	**317.**
75-500	85-160	....	95-165	2000	ACW-26	**227.**	ACR-26	**388.**
150-1000	135-200	....	145-200	2000	ACW-27	**227.**	ACR-27	**388.**
350-1900	240-350	....	250-355	2500	ACW-20	**227.**	ACR-20	**388.**

▲Figures in this column are minimum differentials for devices with Form E5 or E6 time delay modifications.

APPLICATION DATA

Welder Switch — The Type ACW-1 has a calibrated range scale and a trip point indicator. With a range of 1 to 110 p.s.i. and a differential of 7 p.s.i., this device is particularly well adapted for welder control.

Life Expectancy — Normally, the life of the ACW or ACR switching mechanism, excluding the bellows, is about 10 million operations. Bellows life can vary from a few thousand to millions of operations depending on operating pressure, bellows stroke, frequency of operation, presence of corrosive elements and pressure surges. Complete data on this subject is available from the factory. High speed cycling, or pressure dropping or dumping off to zero on each cycle can drastically reduce the life of a bellows actuated switch.

Temperature Limitations and Use on Steam — The use of Form A4, stainless steel bellows, can extend *media* temperature ranges in limited cases. For example, on ACR Types with Form A4, the MAXIMUM *MEDIA* TEMPERATURE is 260°C (500°F). On ACR Types with Form A4P2, the MAXIMUM *MEDIA* TEMPERATURE is 315°C (600°F).

Steam — Switches should not be applied directly on steam exceeding 15 PSIG. However, with the installation of a 9049 A-7A, steam capillary tubing kit, between the pressure system and the pressure switch, steam pressure up to 250 PSIG may be applied, provided this does not exceed the maximum allowable pressure rating of the switch, or the maximum temperature at the bellows.

SERVICE TEMPERATURE LIMITATIONS	
Ambient	Pressure Media
Minimum: −56°C (−70°F) Maximum: +85°C (+185°F)	Minimum: −73°C (−100°F) Maximum: +125°C (+257°F)

SQD SLV_001173

INDUSTRIAL PRESSURE SWITCHES
TYPES ACW AND ACR

CLASS 9012

APPLICATION DATA
Continued

ADJUSTMENTS — The range setting is made by turning the stem on top of the device with a screwdriver. Removal of the front cover reveals the screwdriver differential adjustment in the upper right-hand corner of the device.

SURGE AND PULSATION DAMPENING — ACW and ACR switches are furnished with .060 pulsation plugs to prevent false operation of the switch on minor pressure surges. For surges of greater magnitude a Class 9049 Type A-26 surge reducer or the time delay models (Form E5 or E6) can be used. Timers are pneumatic, function only on surges or spikes (E5) or sudden loss of pressure (E6). See differential footnote on preceding page regarding timers.

HAZARDOUS LOCATION ACR TYPES — These devices have cast iron NEMA 7 and 9 enclosures and are suitable for hazardous locations: Class 1, divisions 1 and 2, Groups C and D; Class 2, divisions 1 and 2, Groups E, F and G.

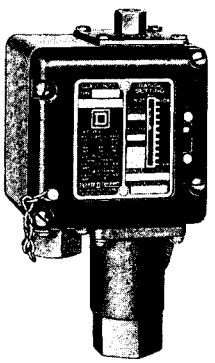
CONTACTS — The contact mechanism used in these devices are: single pole, double throw — Class 9007 Type AO-1 snap switch; double pole, double throw — Class 9007 Type CO-3 snap switch.

MODIFICATIONS AND ACCESSORIES

Description	Applies To These Types Only	Form	Price
Substitute Stainless bellows for standard bellows — For use on pressure media corrosive to brass and steel (bellows, bellows housing and connector are #316 Stainless Steel throughout) Note: On ACW or ACR-6, 7, 10, 20, 26, 27 bellows is Inconel X, bellows housing is #316 Stainless Steel.	ACW or ACR-1, 5, 8, 21, 25, 28	A4	Add $ 96.
	ACW or ACR-2, 22	A4	Add 240.
	ACW or ACR-3, 4, 23, 24	A4	Add 88.
	ACW or ACR-6, 7, 10, 20, 26, 27	A4	Add 324.
	ACW or ACR-9, 29	A4	Add 116.
Conduit hub on side instead of bottom	All ACW Types	B2	Add 7.
Omit conduit hub	All ACW except 3 and 4	B3	Deduct 5.
Omit conduit hub	ACW-3 and 4	B3	Deduct 4.
Push button: Manual and automatic re-set, non-locking	All ACW Types	E1	Add 20.
Push button: "Push-to-Test"	All Single Pole ACW Types	E2	Add 20.
Push button: "Push-to-Test" similar to above except with recessed button	All Single Pole ACW Types	E12	Add 20.
Push button: Lock out or in on rising pressure, manual re-set only	All ACW Types	E3	Add 12.
Push button: Lock out or in on falling pressure, manual re-set only	All ACW Types	E4	Add 12.
Time delay on rising pressure; Range: 0.2 sec. to 60 sec.	Single Pole ACW Types	E5	Add 92.
Time delay on falling pressure; Range: 0.2 sec. to 60 sec.	Single Pole ACW Types	E6	Add 92.
Pilot light — lights on falling pressure, clear lens cap, 250 V. max.	All ACW Types	G1	Add 28.
Pilot light — lights on rising pressure, clear lens cap, 250 V. max.	All ACW Types	G2	Add 28.
Pilot light — lights on falling pressure, red lens cap, 250 V. max.	All ACW Types	G5	Add 28.
Pilot light — lights on rising pressure, red lens cap, 250 V. max.	All ACW Types	G6	Add 28.
Range adjusting knob — fits on range stem and secured with a set screw	All ACW Types	K	Add 4.
Bellows prepared for use on oxygen	All ACW, ACR Types	O1	Add 20.
Omit .060 pulsation plug	All ACW, ACR Types	P2	Optional
Sealing cap to prevent tampering with range adjustment	All ACW Types	V	Add 4.
NEMA 4 watertight enclosure (similar to the NEMA 13 except with watertight gasketing)	All ACW Types	W1	Add 14.
¼" male pipe connection on bellows (not available on S.S. bellows)	ACW or ACR-1, 5, 8, 9, 21, 25, 28, 29	Z	Optional
Range adjustment locking nut. Cannot be added in the field. Prevents unauthorized changing of the range setting	All ACW, ACR Types	Z4	Add 8.
Fungus proofing of devices per MIL-V-173A under Govt. Spec. MIL-T-152B	All ACW, ACR Types	Z12	Add 10% to Price of Device
Special pipe connection on bellows having ½-14 NPT external threads and ¼-18 NPT internal threads (not available on S.S. bellows)	All ACW, ACR except 2, 6, 7, 10, 22, 26, 27, 20	Z16	Add 44.

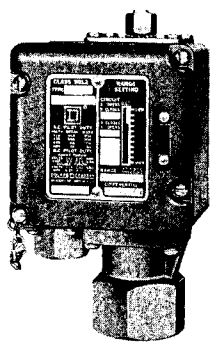
SQD SLV_001174

HIGH PRESSURE HYDRAULIC SWITCH
(WITH STRAIN RELIEF MECHANISM TO ABSORB THE IMPACT OF PRESSURE SURGES)
FOR USE ON OIL OR HYDRAULIC FLUIDS ONLY — In The Control Circuits of Machine Tools and High Pressure Lubricating Systems



Types ADW-3 through 7 and 23 through 27

Types ADW-8, 9 and 28, 29



PISTON ACTUATED (CYLINDER IS CAST IRON; PISTON IS STEEL)

CLASS 9012	SINGLE POLE — DOUBLE THROW CONTACTS						
RANGE SETTING (P.S.I.) Limits of Pressure between which switch can be adjusted to operate on **rising** pressure	DIFFERENTIAL (P.S.I.) **Subtract** from range setting to obtain operating point on **falling** pressure		Maximum Allowable Pressure (P.S.I.)	Type	Price	Type	Price
	Types ADW	Types ADR		Gasketed, Die Cast, Drip Tight and Oil Resistant Housing **NEMA Type 13**		Hazardous Location Enclosure **NEMA Types 7 and 9** Class 1 & 2 Group C thru G	
135–1000	35–135	40–135	10,000	ADW-3	**$211.**	ADR-3	**$372.**
400–3000	100–400	110–400	10,000	ADW-4	**211.**	ADR-4	**372.**
550–5000	125–400	140–400	10,000	ADW-7	**211.**	ADR-7	**372.**
2000–10000	400–1100	500–1100	25,000	ADW-8	**296.**	ADR-8	**456.**
2000–15000	500–1200	625–1200	25,000	ADW-9	**296.**	ADR-9	**456.**
CLASS 9012	**WITH PISTON SEAL**						
135–1000	Increases With Range See Table below		10,000	ADW-5	**215.**	ADR-5	**376.**
400–3000			10,000	ADW-6	**215.**	ADR-6	**376.**
CLASS 9012	**DOUBLE POLE — DOUBLE THROW CONTACTS**						
135–1000	45–200	50–200	10,000	ADW-23	**227.**	ADR-23	**388.**
400–3000	125–500	180–500	10,000	ADW-24	**227.**	ADR-24	**388.**
550–5000	200–600	200–600	10,000	ADW-27	**227.**	ADR-27	**388.**
2000–10000	500–2000	600–2000	25,000	ADW-28	**312.**	ADR-28	**472.**
2000–15000	600–2400	750–2400	25,000	ADW-29	**312.**	ADR-29	**472.**
CLASS 9012	**WITH PISTON SEAL**						
135–1000	Increases With Range See Table below		10,000	ADW-25	**231.**	ADR-25	**392.**
400–3000			10,000	ADW-26	**231.**	ADR-26	**392.**

APPROXIMATE DIFFERENTIALS FOR TYPES ADW-5, 6, 25, 26; ADR-5, 6, 25, 26

Type		ADW-5		ADR-5		ADW-25		ADR-25	
Overall Range	135–1000	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Lower End	135 to 425	70	100	70	100	90	115	90	115
Middle	425 to 715	95	135	95	135	120	160	120	160
Upper End	715–1000	125	150	125	150	150	180	150	180
Type		**ADW-6**		**ADR-6**		**ADW-26**		**ADR-26**	
Overall Range	400–3000	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Lower End	400 to 1265	210	300	210	300	250	350	250	350
Middle	1265 to 2130	310	410	310	410	370	490	370	490
Upper End	2130–3000	400	500	400	500	500	560	500	560

NOTE: Piston actuated devices should be used only with oil or oil based fluids. Use clean oil. System should be filtered to prevent clogging.

TEMPERATURE LIMITATIONS: Ambient: Min −30°C (−22°F) Max +85°C (+185°F)
Pressure Media: Min −30°C (−22°F) Max +125°C (+257°F)

SQD SLV_001175

INDUSTRIAL PRESSURE SWITCHES
TYPES ADW AND ADR

CLASS 9012

APPLICATION DATA

Use with High Flash Point Synthetic Hydraulic Fluids — When phosphate or phosphate ester base or other synthetic fluids which might damage the standard Buna N diaphragm are to be used, Teflon* or Viton* diaphragms and piston seals can be furnished. See modification and accessory table.

Oil Leakage — Slight oil leakage past the piston is normal on the devices that have no piston seal. A 1/8" I.P.T. tapped drain hole in the cylinder wall on the low pressure side of the piston permits piping of the leakage oil back to the reservoir. This hole should never be plugged nor should oil return lines be connected to a high volume discharge system because back pressure on the drain side can damage the diaphragm. Devices with piston seals have no leakage, and although an oil return line is not needed, the drain hole still should never be plugged.

Pressure Connections — All types except the ADW and ADR-8, 9, 28 and 29 have a 3/8"-18 dryseal standard taper inside pipe thread connector. The ADW and ADR-8, 9, 28 and 29 have a 9/16"-18 UNF2B straight thread connector (unified fine inside thread — not a dryseal). The pressure connection is made with a straight thread port seal tube fitting and 3/8" outside diameter tubing.

Surge and Pulsation Dampening — These devices have as standard a .040 orifice pulsation plug. A .020 orifice is available (see Modification and Accessory Table). For heavier duty surge snubbing the Class 9049 A-25 and A-26 surge reducers are available as follows: For all types except the ADW and ADR-8, 9, 28 and 29 use the 9049 A-25. For ADW and ADR-8, 9, 28 and 29 use the 9049 A-26 and a straight thread port seal tube fitting.

Hazardous Location Devices — The ADR's have cast iron NEMA 7 and 9 enclosures and are suitable for hazardous locations: Class 1, divisions 1 and 2, Groups C and D; Class 2, divisions 1 and 2, Groups E, F and G.

Contacts — The contact mechanisms used in these devices are: Single pole, double throw — Class 9007 Type AO-1 snap switch; double pole, double throw — Class 9007 Type CO-3 snap switch. For electrical ratings see ACW, ACR section.

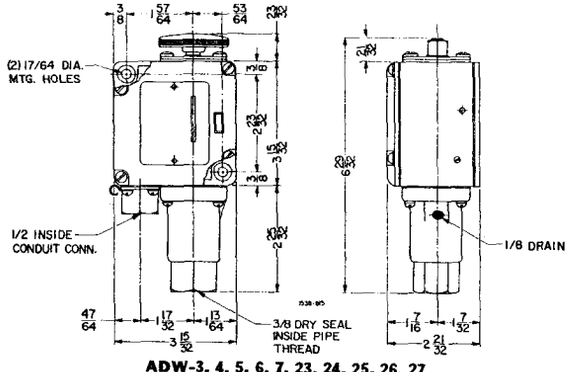
Pilot Lights — The Form G1 pilot light is wired to the B contact and lights when that contact closes on falling pressure. The Form G2 pilot light is wired to the A contact and lights when that contact closes on rising pressure.

MODIFICATIONS AND ACCESSORIES

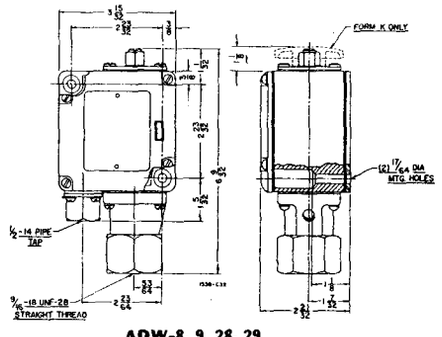
Description	Applies To These Types Only	Form	Price
Conduit hub on side instead of bottom	All ADW	B2	Add $ 7.
Omit conduit hub	All ADW	B3	Deduct 5.
Teflon* diaphragm	All except Piston Seal Types	D1	Add 8.
Teflon* diaphragm and piston seal	Piston Seal Types	D2	Add 12.
Viton* diaphragm	All except Piston Seal Types	D3	Add 8.
Viton* diaphragm and piston seal	Piston Seal Types	D5	Add 12.
Pilot Light — Lights on falling pressure, Clear lens cap, 250 v. max.	All ADW	G1	Add 28.
Pilot Light — Lights on rising pressure, Clear lens cap, 250 v. max.	All ADW	G2	Add 28.
Pilot Light — Lights on falling pressure, Red lens cap, 250 v. max.	All ADW	G5	Add 28.
Pilot Light — Lights on rising pressure, Red lens cap, 250 v. max.	All ADW	G6	Add 28.
Range adjustment knob — Fits on range adjusting stem and secured with set screw	All ADW	K	Add 4.
Pulsation plug with .020 orifice instead of the standard .040	All ADW, ADR	P1	Optional
Sealing cap to prevent tampering with range adjustment	All ADW	V	Add 4.
NEMA 4 Enclosure — Similar to the NEMA 13 except with watertight gasketing	All ADW	W1	Add 14.
Fungus proofing per MIL-V-173A under Gov't. Spec. MIL-T-152B	All ADW, ADR	Z12	Add 10% to Price of Device

*Registered Trade Mark of du Pont.

Approximate Dimensions



ADW-3, 4, 5, 6, 7, 23, 24, 25, 26, 27
Net weight 3 lbs.



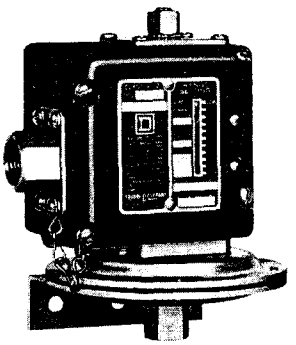
ADW-8, 9, 28, 29
Net weight 2 7/8 lbs.

SQD SLV_001176

INDUSTRIAL PRESSURE SWITCHES

SENSITIVE LOW RANGE TYPE AMW

CLASS 9012



Type AMW-1
with Form Z4 range locking nut

APPLICATION DATA

The 9012 AMW switch is a diaphragm actuated device designed for applications requiring sensitive response to small pressure changes at low pressure ranges. These controls are most commonly employed in the control circuits of machine tools and lubricating systems. The AMW is suitable for systems using air, water or oil as the operating medium.

CLASS 9012 — 1 N.O.-1 N.C.		*SINGLE POLE — DOUBLE THROW CONTACTS			DIAPHRAGM ACTUATED	
Range (P.S.I.) Falling Pressure	Differential (P.S.I.) Adds to Range	Maximum Allowable Pressure	Pressure Connection	Gasketed, Die Cast Drip Tight and Oil Resistant Housing **NEMA Type 13**		Explosion Proof Enclosure **NEMA Types 7 and 9**†	
				Type	Price	Type	Price
.25—2.5	.2—2.0	100 psi	¼" Pipe Tap	AMW-1	**$123.**	AMR-1	**$284.**
25—140	10—20	250 psi		AMW-2	**123.**	AMR-2	**284.**
1—20	See Table△	100 psi		AMW-3	**123.**	AMR-3	**284.**

* Double pole — double throw versions available with same ranges. Minimum differential approximately twice differential of S.P.D.T. switch. To order add digit "2" before existing digits of Type Number (Ex.: AMW-21, 22, 23). Price addition **$16.00** list.

† Classes 1 and 2, Groups C through G.

CLASS 9012	1 N.O.-1 N.C.	SINGLE POLE — DOUBLE THROW CONTACTS*		DIAPHRAGM ACTUATED	
Adjustable Signal Pressure Range (Falling Pressure) Inches of H_2O	Differential (Typical) Inches of H_2O Adds to Signal Pressure Range	Supply Pressure Range P.S.I.	Maximum Allowable Pressure	Gasketed, Die Cast, Drip Tight and Oil Resistant Enclosure **NEMA Type 13**	
				Type	Price
0-1.7 (¼-18 NPTF)	.14 to 1.4 Increases with the Range	15-30★ (⅜ O.D. plastic tubing)	Signal Pressure 2 P.S.I. (4" Hg.) 60 P.S.I.	AMW-1 Form E7	**$168.**

RESPONSE TIME (TRIP PLUS RESET) AMW-1 FORM E7

Supply Pressure		Pressure Switch Differential Setting		
		Minimum	Middle	Maximum
P.S.I.	30	120 MSEC.	140 MSEC.	180 MSEC.
	15	150 MSEC.	180 MSEC.	240 MSEC.

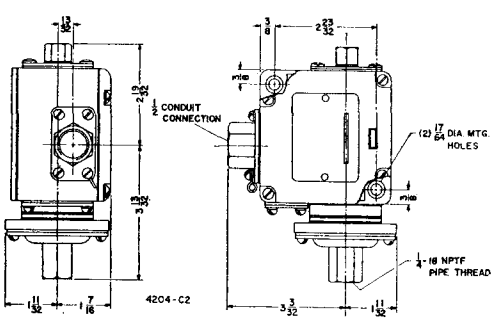
★Supply pressure must be 15 to 30 P.S.I. regulated to ± 1 P.S.I.
Air Consumption: $<9x10^{-4}$ Lbs./Sec.
or approx. ¾ Ft.³/Hr.

△DIFFERENTIALS FOR AMW-3

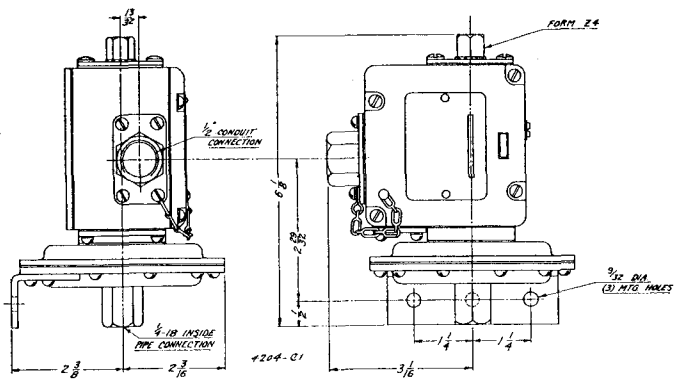
If Range Is	Differential Is
1-6	1-4
7-14	1.5-4
15-20	2-4

The 9012 AMW-1 Form E7 system is a diaphragm actuated device designed for applications requiring extremely sensitive response to small pressure changes at low pressure ranges. It is suitable for air limit switch applications, for sensing low pressure head differences, or for sensing drafts, etc. Addition of the Form E7 pressure amplifier requires a separate source of air (supply pressure), independent of the pressure being monitored (signal pressure).

APPROXIMATE DIMENSIONS



TYPES AMW-2, 22
Net Weight — 2¾ Pounds



TYPES AMW-1, 3, 21, 23
Net Weight — 3¾ Pounds

Dimensions on Form E7 available on request.

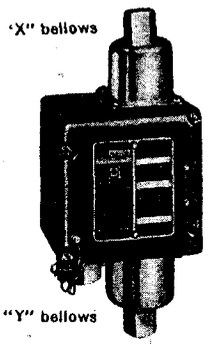
SQD SLV_001177

INDUSTRIAL PRESSURE SWITCHES
DIFFERENTIAL PRESSURE SWITCHES TYPES AEW, AJW

CLASS 9012

DESCRIPTION

Differential pressure switches are used to control, or respond to a change in, the *difference* between two pressures. On these devices the top bellows, identified as the "X" or lower pressure side, works in opposition to the bottom bellows, identified as the "Y" or higher pressure side. These devices can control lower pressure X to maintain a constant difference from variable pressure Y *or* can control higher pressure Y to maintain a constant difference from variable pressure X *or* can initiate an alarm circuit to indicate that a predetermined pressure difference has widened beyond or narrowed below the desired value or can be made to operate when a predetermined pressure difference has been reached as a result of either a widening or a narrowing difference between pressures.



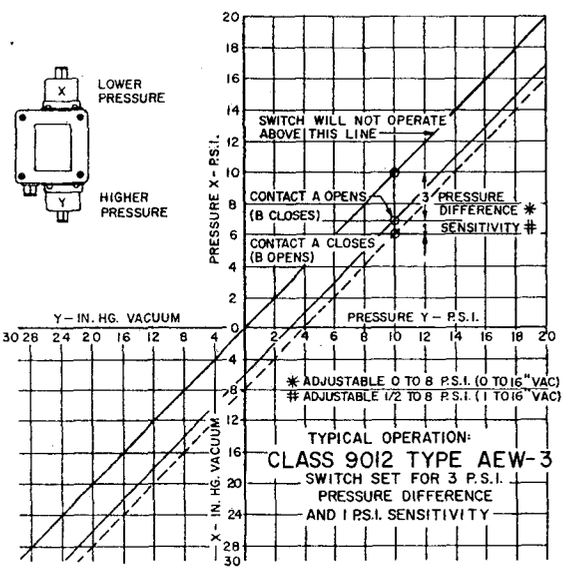
Type AEW-1

CLASS 9012	SINGLE POLE — DOUBLE THROW CONTACTS*		"A" CONTACT N.O. "B" CONTACT N.C.		
Working Pressure Range ("Y" must always be greater than "X")	Maximum Allowable Pressure	★Sensitivity — Between Opening and Closing of Contacts	◐ Adjustable Pressure Differential	Diecast **NEMA Type 13** Enclosure Gasketed, Driptight and Oil Resistant	
				Type	Price
USE ON AIR, OIL OR WATER			**DIAPHRAGM ACTUATED**		
30″ Hg. vac. to 34′ H_2O (15 psi)	20 psi	2½ to 25″ H_2O	0 to 80″ H_2O	AGW-1	$210.
USE ON AIR, OIL OR WATER			**BELLOWS ACTUATED**		
30″ Hg. vac. to 20 psi	30 psi	½ to 8 psi (1 to 16″ Hg.)	0 to 8 psi (0 to 16″ Hg.)	AEW-3	227.
0 to 100 psi	100 psi	4 to 14 psi	0 to 20 psi	AEW-5	210.
0 to 200 psi	255 psi	8 to 20 psi	0 to 40 psi	AEW-1	192.
0 to 300 psi	300 psi	10 to 25 psi	0 to 60 psi	AEW-9	192.
0 to 500 psi	600 psi	30 to 45 psi	0 to 150 psi	AEW-2	240.
USE ON OIL OR HYDRAULIC FLUID ONLY			**PISTON ACTUATED**		
0 to 3,000 psi	10,000 psi	40 to 200 psi	0 to 300 psi	AJW-3	403.
0 to 5,000 psi	10,000 psi	50 to 400 psi	0 to 600 psi	AJW-4	403.

* For DPDT, add prefix "2" to type number. (Ex.: AEW-21, 22, etc.) Add **$16.00. IMPORTANT:** Minimum sensitivity doubles on DP Types.
★ Adds to adjustable pressure differential to obtain operating point on a widening pressure difference.
◐ Switch can be adjusted to operate on a narrowing pressure difference within this range.

Operation — When there is no pressure on either bellows, the pressure difference is zero, "A" contact is open, "B" contact is closed. If pressure is applied to either or both bellows, causing a difference in pressures to occur, this difference must widen in the amount of the desired difference (selected from 4th column above) *plus* the desired sensitivity (selected from 3rd column above) to trip the switch, closing contact "A" and opening contact "B". When the pressure difference narrows once more in the amount of the sensitivity only, the switch resets, opening "A" contact and closing "B" contact as before. The chart shows a 9012 AEW-3 set for a 3 p.s.i. pressure difference and 1 p.s.i. sensitivity. When the difference widens to 4 p.s.i. (differential of 3 plus sensitivity of 1) the switch trips. When the difference narrows to 3 p.s.i. again, the switch resets. **Either or both pressures can be variable but "Y" pressure must always be greater than "X" pressure for the switch to operate.**

Manual Reset Feature — For a pushbutton, manual reset only, specify Form E3. Add **$20.00.** The switch contacts lock when the switch trips on a widening pressure difference. Must be manually reset each cycle. Switch cannot be reset until the pressure difference narrows once more by the amount of the minimum sensitivity shown for the particular device. Available on AEW-1, 2, 5, 9 only.



For other differential pressure switches, operation can be indicated similarly to this chart by substituting the appropriate range scale.

SQD SLV_001178

APPLICATION DATA

The piston assemblies on the AJW controls are suitable for use with oil only and cannot be employed for air or water service. The ⅛" I.P.T. tapped hole entering the cylinder near the top of the piston unit should never be plugged, as its purpose is to allow the piping of leakage oil back to the reservoir. The drain lines should *not* be connected to a high volume discharge system as a back pressure condition could develop which could rupture the diaphragm and allow the switch enclosure to be flooded with oil.

Temperature Limitations: See information under Types ACW, ADW, AMW this catalog.

ELECTRICAL RATINGS

SINGLE POLE

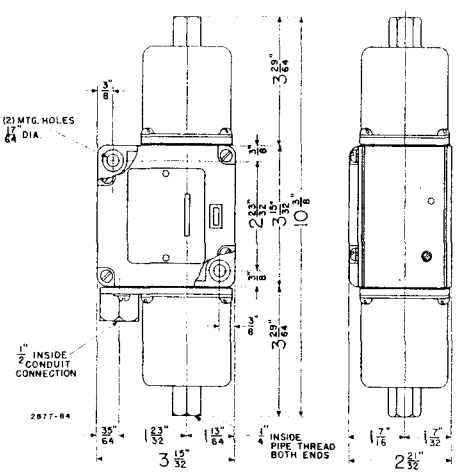
Volts	AC Pilot Duty Amperes ‡		DC Pilot Duty Amperes	
	Break	Make	Double Throw	Single Throw
110	15 A.	40 A.	0.25	0.5
220	10 A.	20 A.	0.1	0.25
440	6 A.	10 A.	....	....
600	5 A.	8 A.	....	0.05

‡Single throw version suitable for ½ hp at 115 and 230 Volts AC.

DOUBLE POLE

Volts	Pilot Duty AC Ampere Rating◆ 10 Amp. 600 V AC Max.		DC Pilot Duty Amperes	
	Break	Make	Double Throw	Single Throw
115	3.0 A.	30 A.	0.2	1.0
230	1.5 A.	15 A.	0.1	0.3
460	.75 A.	7.5 A.	....	....
575	0.6 A.	6 A.	....	0.1

◆Non-Inductive AC continuous ampere rating is 10 amps.



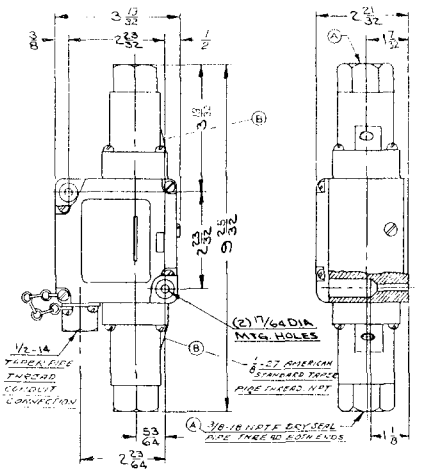
TYPES AEW-3, 23
Net Weight — 3¾ Pounds

(Dimensions for AEW-2, 22 available on request)

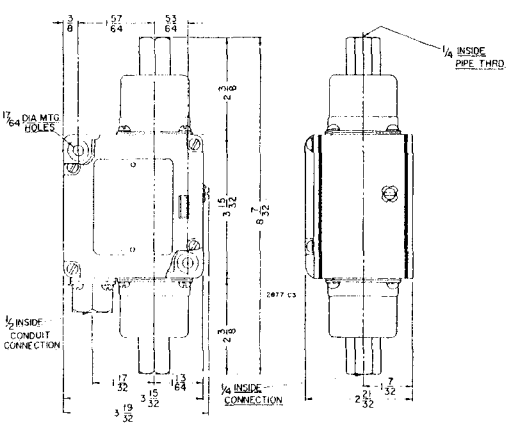
TYPICAL APPLICATIONS

Certain welder installations require frequent adjustment of the pressure regulating valve and correspondingly frequent adjustment of the conventional pressure switch. The pressure switch adjustment can be eliminated entirely by use of a differential pressure switch which automatically adjusts itself to the change in supply pressure as varied by the regulating valve. This assures a predetermined difference between the supply and operating (or cylinder) pressures.

Other uses of Differential Pressure Switches include heating systems where an effort is made to maintain a certain difference between steam supply pressure and steam return pressures to permit proper steam circulation; and also in filtering systems where a change in the difference between upstream and downstream pressures indicates that a filter has become clogged.



TYPES AJW-3, 4, 23, 24
Net Weight — 4¼ Pounds



TYPES AEW-1, 5, 9, 21, 25, 29
Net Weight — 2½ Pounds

ORDERING INFORMATION REQUIRED

1—Specify Class 9012, Type .... .

SQD SLV_001179

PRESSURE SWITCHES
WATER PUMP AND AIR COMPRESSOR TYPES

CLASS 9013

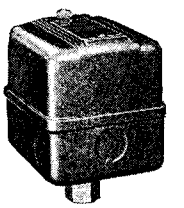
Designed for the control of electrically driven water pumps and air compressors, the Class 9013 devices cover the important electrical ratings for the direct control of motors in the usual pump and compressor applications.

DIAPHRAGM ACTUATED				DIFFERENTIAL INCREASES WITH RANGE		CONTACTS OPEN ON INCREASED PRESSURE					
Application		Pipe Connection	Poles	Pressure Range (PSIG)	† Differential (PSIG)	General Purpose Enclosure **NEMA Type 1**		Watertight Enclosure **NEMA Type 4**		Explosion Proof Enclosure **NEMA Types 7 and 9**	
						Type	Price	Type	Price	Type	Price
Air Compressors or Large Water Pumps	Water or Air	¼" — 18 NPFT internal thd.	2	20-80	● 14-43 ◆ 12-35	GSG-2	**$34.00**	GSW-2	**$188.00**	GSR-2	**$181.00**
				40-200	◆ 18-40 ● 22-60	GHG-2	**34.00**	GHW-2	**188.00**	GHR-2	**181.00**
Domestic Water Pumps	Water	¼" — 18 NPTM	2	20-65	10-30	FSG-9	**10.80**	...	...	...	...
		¼" — 18 NPTF internal thd.		20-80	10-30	FYG-2	**16.20**	...	...	...	...
				20-65	10-30	FSG-2	**10.80**	...	...	...	...

† Minimum differentials shown are at low end of pressure range. Differential widens as range increases.
◆ Use these differentials for NEMA Type 1.
● Use these differentials for NEMA Types 4, 7, 9.

TYPICAL STOCK SETTINGS (PSIG)

GSG-2	GHG-2	FSG-9	FSG-2	FYG-2	GSW-2	GSR-2	GHR-2
20-40 40-60 60-80 30-50	60-80 80-100 120-150 145-175 100-125	20-40 30-50	20-40 30-50 40-60	20-40 60-80 30-50 40-60	20-40	20-40	70-100 125-175

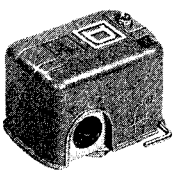


Type GSG-2 or GHG-2

PRICES FOR ADDITIONS AND SPECIAL FEATURES

Feature†	Form Letter	With Type GHG	With Types GHW, GHR	With Types GSW, GSR	With Types FSG, FYG	With Type GSG
Pilot Light	Form G5	....	....	....	**$4.80**	....
Manual Cutout Lever	Form M1	....	....	....	**1.30**	....
Low Pressure Cut-off	Form M4	....	....	....	**3.50●**	....
Pulsation Plug	Form P	**.30**	**.30**	**.30**	**.30**	**.30**
Reverse Action (Contacts Open on Decreased Pressure)	Form R	**$10.60**	**$10.60**	**$10.60**	....	**$10.60**
2-Way Release Valve	Form X	**12.00**	**34.00**	**34.00**	....	**12.00**

● FSG types only.
† Blank space indicates features not available.

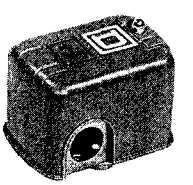


Type FSG, Form G5M4 Low Pressure Cut-off with Pilot Light

ELECTRICAL RATINGS — HORSEPOWER

Type No.	Single Phase AC		Polyphase AC			Direct Current		
	110 V.	220 V.	220 V.	440 V.	550 V.	32 V.	115 V.	230 V.
GSG, GHG	2	3	5	5	5	½	1	1
FYG	1½	2	3	...	...	¼	½‡	½‡
FSG	1	1½	2	...	...	¼	...	...
	1½	2	3	...	...	¼	½	½

‡ ¼ HP with Form M1 or M4, where applicable.



Type FSG-2

ORDERING INFORMATION REQUIRED

1. Specify class and type number of switch.
2. Give cut-out and cut-in pressures within the limits specified.
3. If special features are desired, order as Class 9013, Type . . ., Form . . . selecting the correct form letter from the table above. If more than one form letter is used, arrange letters in alphabetical order as Class 9013, Type GHG-2, Form PX.

NOTE: 9013 Type F is D7A discount.
9013 Type G is D7B discount.

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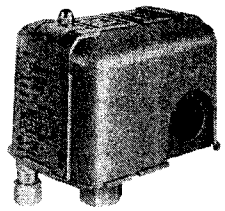


Type FHG-2

PRESSURE & VACUUM SWITCHES

SMALL COMPRESSOR APPLICATIONS

Class 9013 Type FHG Pressure Switches are designed for the control of small electrically driven air compressors. Attention should be given to the electrical rating tables to insure proper application of these switches. UL listed industrial Control Equipment.

CLASS 9013

FOR LOWER HORSEPOWER RATINGS

CLASS 9013	CONTACTS OPEN ON PRESSURE RISE		DIAPHRAGM ACTUATED†		
Cut-Out Range Increasing Pressure (PSIG)●	Approximate Differential Non-Adjustable*	Poles	Pipe Tap	NEMA Type 1 Enclosure Type	NEMA Type 1 Enclosure Price
40-100	20 PSIG	2	¼" I.P.T. ¼" O.P.T.	FHG-2 FHG-9	**$10.80** **10.80**
70-150	30 PSIG	2	¼" I.P.T. ¼" O.P.T.	FHG-12 FHG-19	**10.80** **10.80**

FOR HIGHER HORSEPOWER RAINGS

CLASS 9013	CONTACTS OPEN ON PRESSURE RISE		DIAPHRAGM ACTUATED†		
Cut-Out Range Increasing Pressure (PSIG)●	Approximate Differential Non-Adjustable*	Poles	Pipe Tap	NEMA Type 1 Enclosure Type	NEMA Type 1 Enclosure Price
40-100	20 PSIG	2	¼" I.P.T. ¼" O.P.T.	FHG-22 FHG-29	**$16.20** **16.20**
70-150	30 PSIG	2	¼" I.P.T. ¼" O.P.T.	FHG-32 FHG-39	**16.20** **16.20**

†Diaphragms are Buna N, oil resistant.
*FACTORY SETTING: Rising pressure operating point factory set. Falling pressure operating point determined by inherent differential of the switch.

D7A DISCOUNT

● MAXIMUM ALLOWABLE PRESSURE RATING: 220 PSIG.
TEMPERATURE LIMITATIONS:
MEDIA: MIN. −30°C (−22°F) MAX. +125°C (+257°F)
AMBIENT: MIN. −30°C (−22°F) MAX. +80°C (+176°F)

TWO POLE ELECTRICAL RATINGS (HORSEPOWER)

These switches are designed for long service life on home use (residential) type air compressors. To insure even longer service life on commercial or light industrial applications, it is recommended that the horsepower ratings be reduced as shown below.

MAXIMUM RECOMMENDED FOR RESIDENTIAL/HOUSEHOLD USE

Type FHG-2, 9, 12, 19				Type FHG-22, 29, 32, 39			
Voltage	Single Phase AC	Polyphase AC	DC	Voltage	Single Phase AC	Polyphase AC	DC
115	1½ HP	2 HP	¼ HP	115	2 HP	3 HP	½ HP
230	2 HP	3 HP	¼ Hp	230	3 HP	5 HP	½ HP

MAXIMUM RECOMMENDED FOR INDUSTRIAL/COMMERCIAL USE

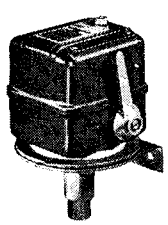
Type FHG-2, 9, 12, 19				Type FHG-22, 29, 32, 39			
Voltage	Single Phase AC	Polyphase AC	DC	Voltage	Single Phase AC	Polyphase AC	DC
115	1 HP	1½ HP	¼ HP	115	1½ HP	2 HP	¼ HP
230	1½ HP	2 HP	¼ Hp	230	2 HP	3 HP	¼ HP

CHANGING OR ADJUSTING PRESSURE SETTINGS: Tighten the range nut down (clockwise) to raise the set points. Back the range nut off (counter-clockwise) to lower the set points.

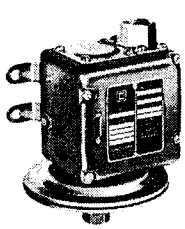
AVAILABLE MODIFICATIONS

Description	Form	Price
Manual Cut-off Lever	M1	**$2.00**
Pulsation Plug	P	**.30**
★Slip-on Connectors on Load Side Terminals	U	NC
Pressure Release Valve	X	**4.20**

★U.L. Component recognized



Class 9016, Type GVG-1
Form E F



Class 9016
Type BMW-2 Form F

VACUUM SWITCHES

CLASS 9016

CLASS 9016 VACUUM SWITCHES ARE DESIGNED FOR AUTOMATIC CONTROL OF VACUUM SYSTEMS. THE SETTINGS OBTAINABLE WITH THESE CONTROLS MAKE THEM IDEAL FOR USE WITH HEATING SYSTEMS EMPLOYING A VACUUM RETURN LINE.

NORMALLY CLOSED CONTACTS (Close on Loss of Vacuum)

Range† (Ins. Hg.)	Differential (Ins. Hg.)	Poles	Stock Settings	Dimensions (Approximate)	Weight	NEMA Type 1 Enclosure	Price
5"–25"	4"–12"◐	2	3"–8", 16½"-25"	4⅜"x7⅛"x4½"	4#	GVG-1	**$62.00**

†Within which device can be set to cut out on increasing vacuum. ◐Differential widens with range.
3-Way lever (Float only — Vacuum and Float — Continuous) can be supplied on GVG Types (See Photo), Specify Form E. Add **$12.50**. Vacuum connection: ¼"–18NPTF. For mounting bracket, specify Form F, add **$8.00**; or may be ordered as separate item: Class 9049 Type A-53. See 9049 Section.

D7B DISCOUNT

DOUBLE POLE — DOUBLE THROW CONTACTS — DIAPHRAGM ACTUATED

Low Operating Point Decreasing Vacuum Range (Ins. of Hg.)	Differential† (Ins. of Hg.) Full Adjustment over Entire Range‡ (Adds to Range)	Poles	Pipe Tap	Gasketed, Die Cast, Driptight and Oil Resistant Housing **NEMA 13** Type	Price
½–16	1½–6▲	2 N.O.-2 N.C.	¼"–18 NPTF	BMW-1	**$108.00**
½–29	2½–8★	2 N.O.-2 N.C.		BMW-2	**108.00**

‡Within Vacuum Limitations.
▲1¼" Minimum Differential at Range of 10" or Less.
†Add differential to Range to obtain high operating point.
★2" Minimum Differential at Range of 20" or Less.

ELECTRICAL RATINGS — BMW

AC Ampere Rating 10 Amp. 600 V. AC Max. AC Rating			DC Amperes	
Volts	Make	Break	Double Throw	Single Throw
115	30 A.	3.0 A.	0.2	1.0
230	15 A.	1.5 A.	0.1	0.3
460	7.5 A.	.75 A.	.....	.....
600	5.7 A.	.57 A.	.....	0.1

SPECIAL FEATURES — BMW TYPES

"Push to Test" Button	Form E2	**$19.00**
Mounting Feet	Form F	**10.00**
Watertight NEMA 4 Enclosure	Form W1	**13.00**

ELECTRICAL RATINGS — GVG TYPES

Voltage	Single Phase AC	Polyphase AC	DC
110 V	2 HP	3 HP	1 HP
220 V	3 HP	5 HP	1 HP
440-550 V	5 HP	5 HP	
32 V			½ HP

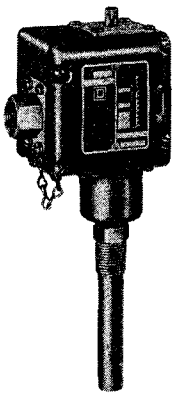
SQD SLV_001181

TEMPERATURE SWITCHES

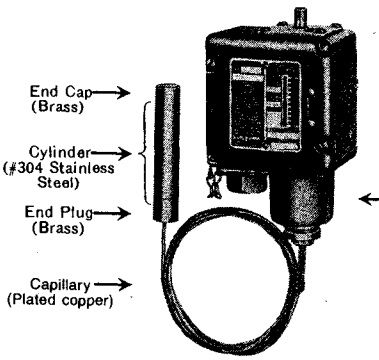
TYPES BCW, BFW

CLASS 9025

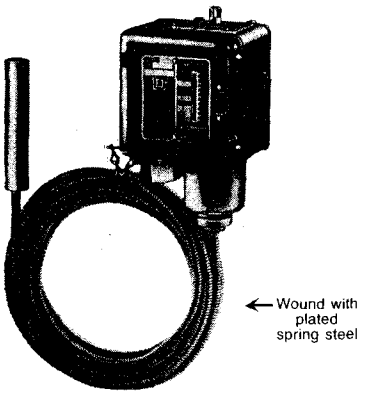
FOR THE AUTOMATIC CONTROL OF TEMPERATURE MAINTAINING EQUIPMENT IN INDUSTRIAL AND GENERAL DUTY APPLICATIONS



Type BFW



Type BCW



Type BCW with armored capillary

INDUSTRIAL TYPE ENCLOSURES ARE DIE CAST ALUMINUM, DRIPTIGHT AND OIL RESISTANT

Heating Types — Except for the BCW and BFW 36 and 46 these temperature controllers are recommended for heating applications **where the temperature to be controlled is higher than the normal or ambient temperature. IMPORTANT:** Where the ambient temperature may vary from a value below the control point to a value above it, the use of a universal or cross ambient bulb would be required. The 9025 BCW and BFW are not intended for this service.

Cooling Types — The BCW and BFW 36 and 46 are for applications where the temperature to be controlled is lower than the normal or ambient temperature.

Applications — Controlling the temperature of liquid baths, bearings, internal combustion engines, large air compressors, etc., are possible applications for these devices.

Ambient Temperature Limitations—Minimum: −56°C (−70°F). Maximum: +85°C (+185°F).

Maximum Allowable Temperatures and Pressures — The third column in the table below lists the maximum allowable temperature for each device. The thermal elements of these devices will withstand pressures up to 3,000 p.s.i. The wells described at the end of this section will withstand 2500 p.s.i. The tank fitting should not be subjected to more than 400 p.s.i.

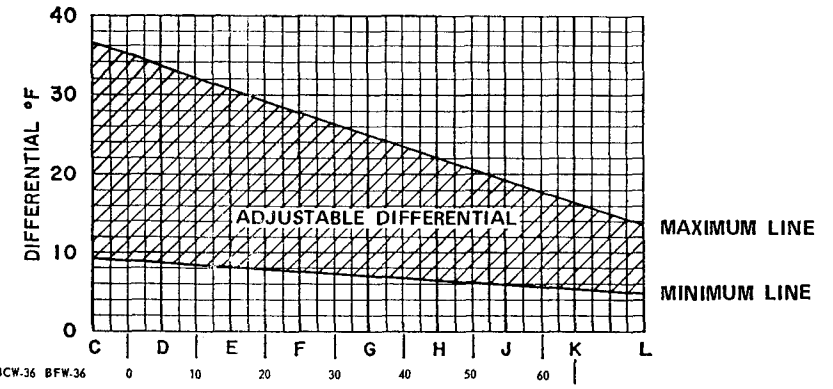
CLASS 9025		NON CROSS AMBIENT HEATING TYPE CONTROLS				NEMA TYPE 13 ENCLOSURES
Range ° F. Falling Temp. (at sea level)	Differential ° F. Adds to Range	Maximum Allowable Temperature	Contact Arrangement	Type	Price	Thermal Element (materials shown in photo above)
0–60★	See Table next page	150° F.	1 N.O.—1 N.C.	BCW 36	$184.	Capillary and Bulb Type
			2 N.O.—2 N.C.	BCW-46	204.	
80–145	See Table next page	190° F.	1 N.O.—1 N.C.	BCW 33	184.	1 1/16" dia. x 3 5/8" long bulb, with 6' of 3/32" dia. tubing
			2 N.O.—2 N.C.	BCW 43	204.	
145–210	See Table next page	260° F.	1 N.O.—1 N.C.	BCW 32	184.	(Vertical or Horizontal Immersion)
			2 N.O.—2 N.C.	BCW 42	204.	
210–275	See Table next page	320° F.	1 N.O.—1 N.C.	BCW 35	184.	When mounting bulb horizontally, side of bulb marked "top" should be up.
			2 N.O.—2 N.C.	BCW 45	204.	
275–340	See Table next page	380° F.	1 N.O.—1 N.C.	BCW 34	184.	
			2 N.O.—2 N.C.	BCW 44	204.	
300–420	See Table page 427	480° F.	1 N.O.—1 N.C.	BCW 54	184.	
			2 N.O.—2 N.C.	BCW 64	204.	
0–60★	See Table next page	150° F.	1 N.O.—1 N.C.	BFW 36	152.	
			2 N.O.—2 N.C.	BFW 46	172.	
80–145	See Table next page	190° F.	1 N.O.—1 N.C.	BFW 33	152.	Direct Connected Type
			2 N.O.—2 N.C.	BFW 43	172.	1 1/16" dia. x 3" long element with 1/2-14 NPT
145–210	See Table next page	260° F.	1 N.O.—1 N.C.	BFW 32	152.	(Vertical Immersion)
			2 N.O.—2 N.C.	BFW 42	172.	

★These are cooling type controls (bulb always cooler than ambient).

SQD SLV_001182

DIFFERENTIAL TABLES (FOR BCW 54, 64 SEE NEXT PAGE)

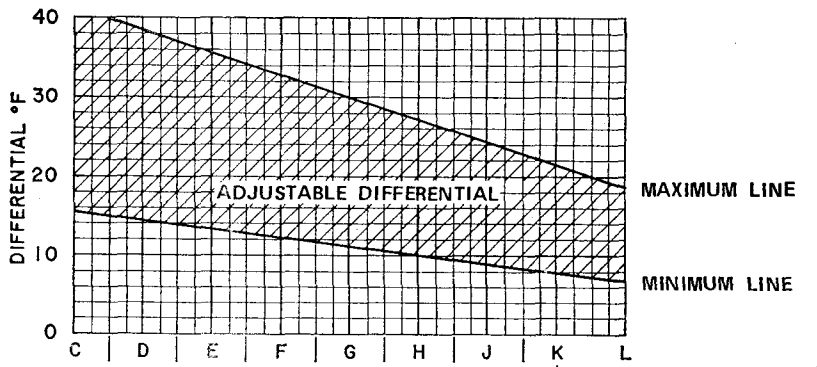
SINGLE POLE TYPES



BCW-36	BFW-36	0	10	20	30	40	50	60	
BCW-33	BFW-33	80	90	100	110	120	130	140	145
BCW-32	BFW-32	145	155	165	175	185	195	205	210
BCW-35		210	220	230	240	250	260	270	275
BCW-34		275	285	295	305	315	325	335	340

RANGE (Low operating temperature) Add differential to range to obtain high operating temperature.

DOUBLE POLE TYPES



BCW-46	BFW-46	0	10	20	30	40	50	60	
BCW-43	BFW-43	80	90	100	110	120	130	140	145
BCW-42	BFW-42	145	155	165	175	185	195	205	210
BCW-45		210	220	230	240	250	260	270	275
BCW-44		275	285	295	305	315	325	335	340

RANGE (Low operating temperature) Add differential to range to obtain high operating temperature.

AVAILABLE MODIFICATIONS	Form	Adder Price
Substitute Side Conduit for Bottom Conduit	B2	$ 7.
Push Button — Manual and Automatic Re-Set, Non-Locking	E1	20.
Push Button — Push-to-Test	E2	20.
Push Button — Lock Out or In on Rising Temperature, Manual Re-Set Only	E3	12.
Push Button — Lock Out or In on Falling Temperature, Manual Re-Set Only	E4	12.
Pilot Light — Lights on Falling Temperature, Clear lens cap	G1	28.
Pilot Light — Lights on Rising Temperature, Clear lens cap	G2	28.
Pilot Light — Lights on Falling Temperature, Red lens cap	G5	28.
Pilot Light — Lights on Rising Temperature, Red lens cap	G6	28.
Range Adjustment Knob	K	4.
Substitute 6′ of Armored Capillary Tubing for Standard Capillary	LA6	6.
Substitute 12′ of Capillary Tubing for Standard Capillary	L12	6.
Substitute 12′ of Armored Capillary Tubing for Standard Capillary	LA12	17.
Substitute 16′ of Capillary Tubing for Standard Capillary	L16	9.
Substitute 16′ of Armored Capillary Tubing for Standard Capillary	LA16	26.
Sealing Cap	V	4.
NEMA 4 Enclosure — Similar to NEMA 12 Except with Watertight Gasketing	W1	14.
Range Locking Nut	Z4	8.
ACCESSORIES		
Class 9049 Type A-8B Tank Fitting — Use with Current BCW Devices — 3/32″ Diam. Tubing	.....	58.
Class 9049 Type A-30 Well — For 9025 BFW Types	Brass	19.
Class 9049 Type A-34 Well — For 9025 BCW Types, Except 36, 46	Brass	20.
Class 9049 Type A-31 Well — For BFW Types	Stainless Steel	66.
Class 9049 Type A-35 Well — For BCW Types, Except 36, 46	Stainless Steel	72.
Class 9049 Type A-38 Well — For BCW-36, 46	Brass	24.
Class 9049 Type A-39 Well — For BCW-36, 46	Stainless Steel	74.

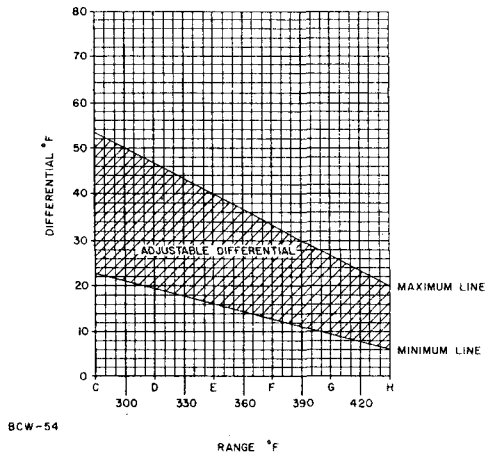
SQD SLV_001183

TEMPERATURE SWITCHES

TYPES BCW, BFW

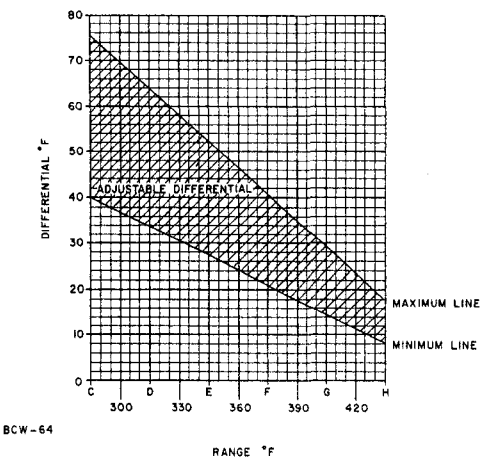
CLASS 9025

DIFFERENTIAL TABLES FOR BCW 54, 64



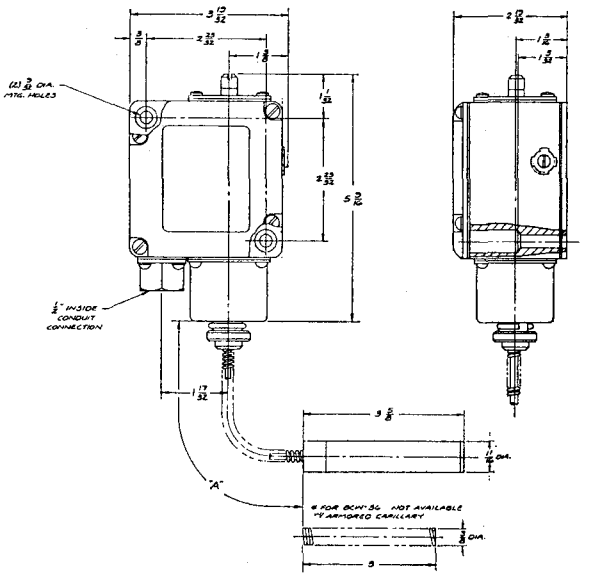
BCW-54

Range (low operating temperature) Add differential to range to obtain high operating temperature.



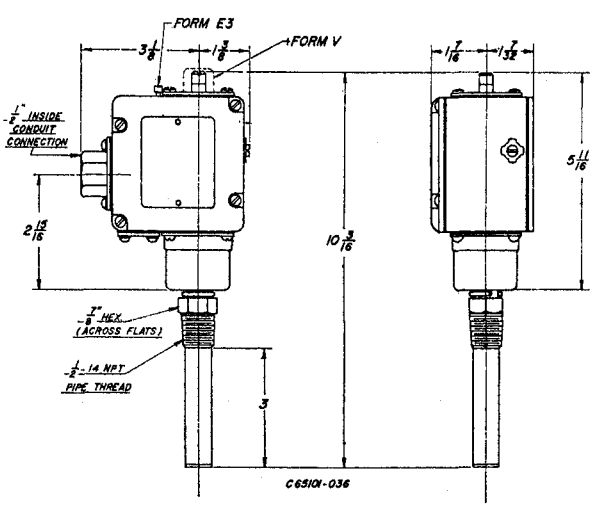
BCW-64

Range (low operating temperature) Add differential to range to obtain high operating temperature.



Length of Capillary Dim. "A"	FORM	
	Without Armor	*With Armor
6 Ft.	Stnd.	LA6
12 Ft.	L12	LA12
16 Ft.	L16	LA16

Type BCW



Type BFW

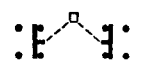
SQD SLV_001184

ELECTRICAL CONTACT RATINGS

Contacts	Volts	AC Inductive Pilot Duty 35% Power Factor: Make Amps.	Make VA	Break Amps.	Break VA	Continuous Carrying Amperes	AC Resistive 75% Power Factor: Make, Break and Continuous Carrying Amperes	Volts	DC Inductive Pilot Duty and Resistive: Make and Break Amperes, Single Throw	Make and Break Amperes, Double Throw	Continuous Carrying Amperes
SPDT, SPST ‡	110	40	....	15	....	15	15	115	0.5	0.25	15
	220	20	....	10	....	15	15	230	0.25	0.1	15
	440	10	....	6	....	15	15	600	0.05	....	15
	600	8	....	5	....	15	15				
DPDT, DPST	115	30	3450	3	345	10	10	115	1.0	0.2	10
	230	15	3450	1.5	345	10	10	230	0.3	0.1	10
	460	7.5	3450	0.75	345	10	10	600	0.1	....	10
	575	6	3450	0.6	345	10	10				

Type	Contact Arrangement	Contact Symbol
Single Pole Double Throw	1 N.O.—1 N.C.	

Snap switch contains two (2) double break contact elements (1 N.O. — and 1 N.C.) that must be used on circuits of same polarity.

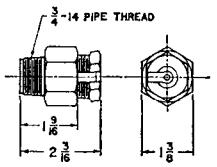
Type	Contact Arrangement	Contact Symbol
Double Pole Double Throw	2 N.O.—2 N.C.	

Snap switch contains two electrically separated sets of contact elements allowing use on circuits of opposite polarity. Each set contains two double break contact elements (1 N.O. and 1 N.C.) that must be used on circuits of same polarity.

TANK FITTING AND WELL

The Class 9049 A-8 tank fittings are used with BCW type controls when the bulb is inserted into a tank or through a metal wall. These brass fittings include two split washers and packing material.

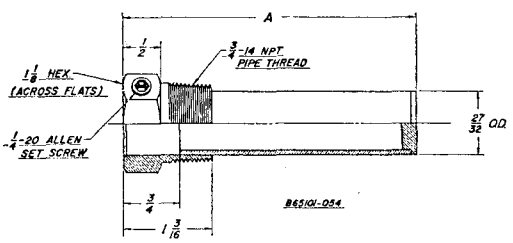
Use of the Class 9049 Type A "well" permits removal of the control without draining the tank or manifold. To insure good conductivity, filling the well with silicone oil is recommended, or silicone grease may be used when bulb mounting is horizontal. The oil recommended is DOW CORNING #710 or #550 fluid. The grease recommended is DOW CORNING #41.



1423-D209
Class 9049 **Type A8-B**



Tank fitting



Class 9049 **Type A-30, A-34, A-31, A-35, A-38, A-39**
A = 3 15/16"



Well

ORDERING INFORMATION REQUIRED

1—Specify Class 9025, Type..... Give settings within the Range and Differential limits shown on these sheets. Stock switches at standard settings will be furnished on all orders unless the quantity is greater than 25 or unless the order states "MUST BE SET".

2—If modifications are desired add the appropriate form letter to the class and type. Arrange form letters in alphabetical sequence when ordering more than one modification.

SQD SLV_001185

FLOAT SWITCHES

TYPE DG, DW, DR CHAIN AND ROD OPERATED

CLASS 9035

BUILD UP A SWITCH TO MEET YOUR REQUIREMENTS FROM THE COMPONENT GROUPS BELOW.

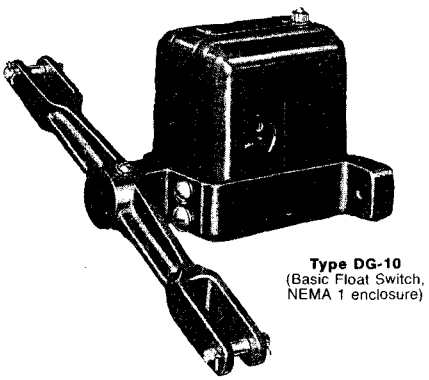
APPLICATION DATA

Class 9035 float switches are designed for the automatic control of A.C. or D.C. pump motor magnetic starters, or for the automatic direct control of light motor loads.

Enclosures — Three enclosures are available for the Class 9035 devices. Type DG is NEMA 1. Type DW is NEMA 4, watertight. Type DR is NEMA 7 and 9 for hazardous locations, Class 1, divisions 1 and 2, groups C and D and Class 2, divisions 1 and 2, groups E, F and G.

Class 9035 float switches are for wall or floor mounting.

Rod accessory kits are furnished with Two 2½ foot sections of tubing and a 7" center hole float, all necessary linkage and hardware, while standard chain accessory kits are furnished with 15 foot chains, 7" tapped at top float, all necessary linkage and hardware. For additional lengths of tubing or chain see kits listed below.

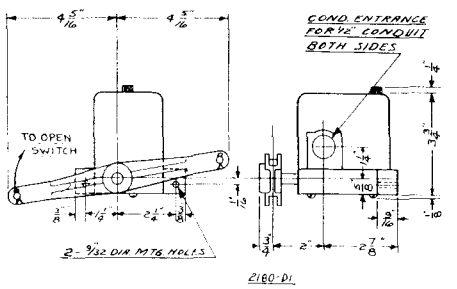


Type DG-10
(Basic Float Switch, NEMA 1 enclosure)

1. Basic 9035 Float Switches	Class	NEMA 1 Type	NEMA 1 Price	Watertight NEMA 4 Type	Watertight NEMA 4 Price	Hazardous Locations NEMA 7 and 9 Type	Hazardous Locations NEMA 7 and 9 Price
Basic Float Switch, 2 Pole ▲	9035	DG-10	**$106.**	DW-10	**$292.**	DR-10	**$286.**
Basic Float Switch, 1 N.O. — 1 N.C.	9035	....	....	DW-11	**312.**	DR-11	**306.**

▲ DG Type: Float on left: Contacts open on rise, close on fall.
Float on right: Contacts close on rise, open on fall.
Lever moves CW: Contacts open.
Lever moves CCW: Contacts close.

▲ DR, DW Types: Float on left: Contacts close on rise, open on fall.
Float on right: Contacts open on rise, close on fall.
Lever moves CW: Contacts close.
Lever moves CCW: Contacts open.



Type DG-10
1⅞" Minimum Travel
Shipping Wgt. 4¼ Lbs.

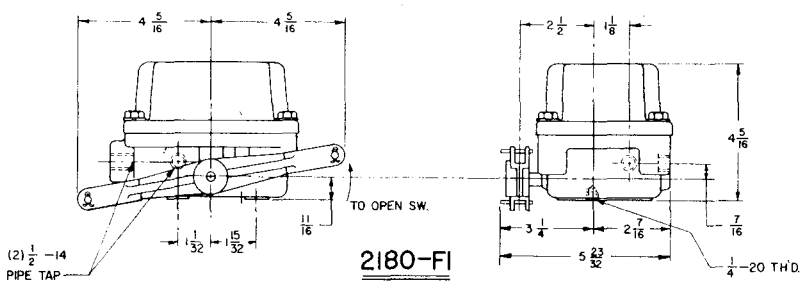
2. FLOAT ACCESSORY KITS, mounting hardware, all linkages included: Class 9049	Class	Type	Price
5' Brass Tubing; #304 S.S., 7" Diam. Float Kit	9049	DRA-1	**$106.**
5' S.S. Tubing; #316 S.S., 7" Diam. Float Kit	9049	DRA-2	**351.**
15' Bronze Chain; #304 S.S., 7" Diam. Float Kit, Pulleys	9049	DCA-1	**106.**
15' S.S. Chain; #316 S.S., 7" Diam. Float Kit, Pulleys	9049	DCA-2	**306.**
15' S.S. Chain; #316 S.S., 7" Diam. Float — Remote Pulleys	9049	DCA-4	**306.**
3. FLOOR MOUNTING KITS, Class 9049			
For Type DG-10	9049	DMS-1	**45.**
For Types DR, DW-10, 11	9049	DMS-2	**51.**
ADDITIONAL CHAIN OR TUBING KITS Adds on to Float Accessory Kits Sold Above. Note: 30' is the maximum recommended length for tubing.			
2½' Section of Brass Tubing, Includes Connector & Counterweight	9049	T2	**12.**
2½' Sect. #316 S.S. Tubing, Includes Connector & Counterweight	9049	T2S	**24.**
5' of Bronze Chain, Includes Connector	9049	C2	**12.**
5' of Stainless Steel Chain, Includes Connector	9049	C2S	**24.**

2 POLE ELECTRICAL RATINGS

Type	Voltage	Single Phase AC	Polyphase AC	DC	
DG-10	115	1½ HP	2 HP	½ HP	Control Circuit Rating: NEMA A600
	230	2 HP	3 HP	½ HP	
DR, DW-10	460/575	....	1 HP	....	

1 POLE ELECTRICAL RATINGS

DR, DW-11	115	1 HP	....	¼ HP	Control Circuit Rating: NEMA A300
	230	1 HP	....	¼ HP	



Type DR, DW-10, 11
¾" Minimum Travel
Shipping Wgt. 9½ lbs.

ORDERING INFORMATION REQUIRED

1—Specify Class 9035 Type .....(Basic Switch)
2—Specify Class 9049 Type .....(Accessory Kit)
3—Specify Class 9049 Type ....(Floor Mounting Kit if desired)

Note — To receive a complete packaged float switch, that is, the two (or three) above components packaged together in a single overpack, add to the basic switch class and type, the suffix letters "R" for rod accessory kit or "C" for chain accessory kit, and "M" for floor mounting kit.

Example: To receive a 9035 DG-10, 9049 DRA-1 and 9049 DMS-1, complete, in one package, specify: 9035 DG-10 R1M1.

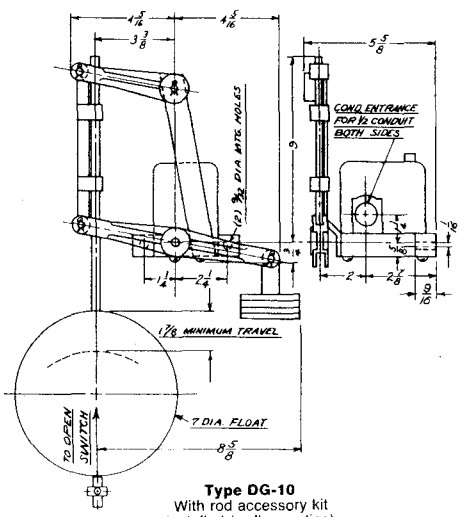
SQD SLV_001186

CHAIN AND ROD OPERATED — FLOAT SWITCHES

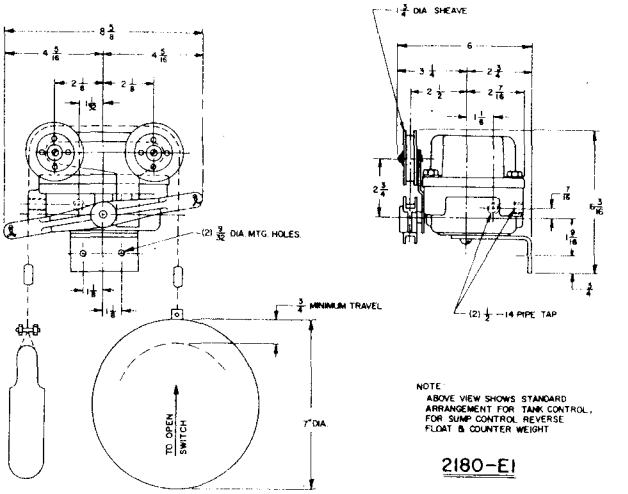
TYPE DG, DW, DR

CLASS 9035

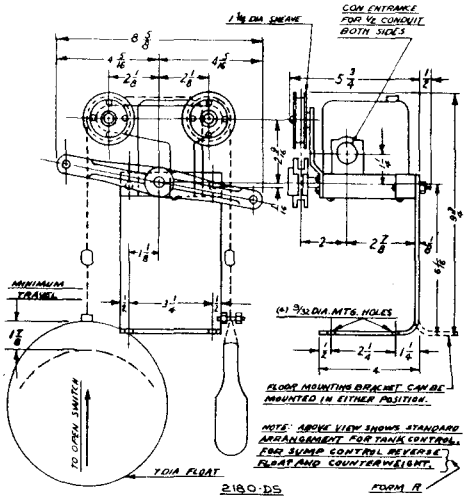
APPROXIMATE DIMENSIONS



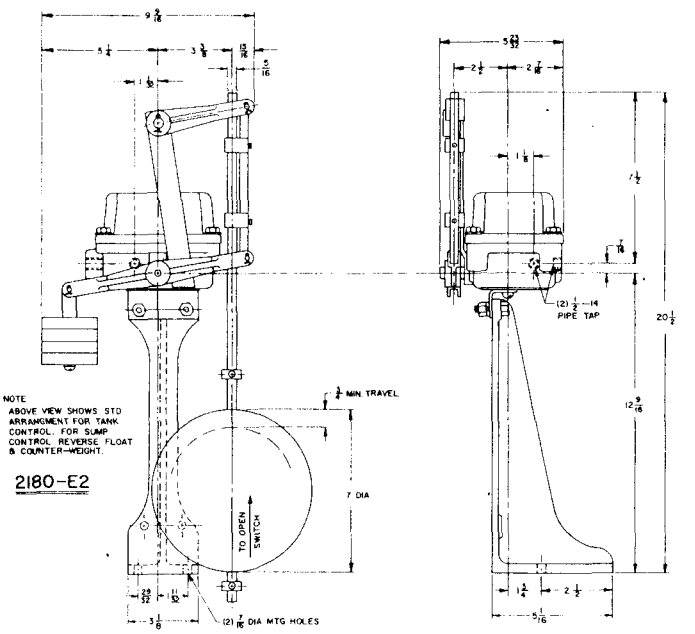
Type DG-10
With rod accessory kit installed (wall mounting)



Type DR or DW
With chain accessory kit installed (wall mounting)



Type DG-10
With chain accessory kit installed (floor mounting)



Type DR or DW
With rod accessory kit installed (floor mounting)

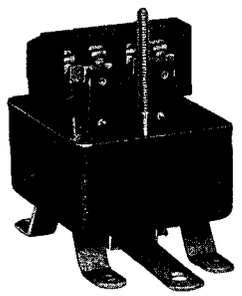
NOTE: You build up the switch of your choice from the component groups on preceding page.

SQD SLV_001187

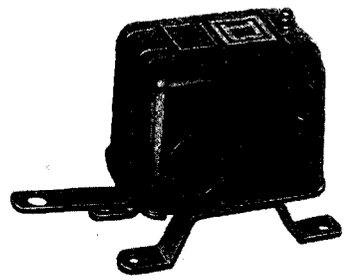
FLOAT SWITCHES

CLASS 9036

For open tank or sump. Use your own float accessories or purchase our Class 9049 float and rod kits.



Type GG-2
(Cover removed)



Type DG-2

FOR OPEN TANK OR SUMP APPLICATIONS

CLASS 9036 — **2 POLE** — **SINGLE LEVER OPERATED**

Description	NEMA 1		Watertight NEMA 4		Hazardous Locations NEMA 7, 9	
	Type	Price	Type	Price	Type	Price
●Contacts Close on Liquid Rise	DG-2	**$22.00**	DW-1	**$113.00**	DR-1	**$117.00**
●Contacts Open on Liquid Rise	DG-2R	**22.00**	DW-1R	**113.00**	DR-1R	**117.00**
△Contacts Close on Liquid Rise	GG-2	**33.00**	GW-1	**144.00**	GR-1	**240.00**
△Contacts Open on Liquid Rise	GG-2R	**33.00**	GW-1R	**144.00**	GR-1R	**240.00**

Order float accessory kits separately from Class 9049 section. Types GW and GR use center hole float. All others use tapped at top float.

ELECTRICAL RATINGS
HORSEPOWER

Type	Single Phase AC			Polyphase AC			DC			Control Circuit
	115 V	230 V	460/575 V	115 V	230 V	460/575 V	32 V	115 V	230 V	
● DG, DW, DR	1½	2	....	2	3	1	¼	½	½	NEMA A600
△ GG, GW, GR	2	3	5	3	5	5	½	1	1	NEMA A600

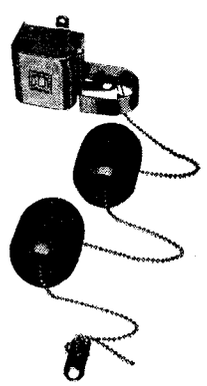
SUMPTROL® FLOAT SWITCHES

These devices are designed specifically for sump pumps or cellar drainers of the small domestic type. Weight operated controls include two weights, 36" chain and compensating spring. Accessories for float operation are not supplied.

CONTACTS CLOSE ON LIQUID RISE

Features	Type of Operation	General Purpose Enclosure **NEMA Type 1**					
		Poles	Type	Price	Poles	Type	Price
With Mounting Bracket and Two Cord Entrances	Weight †	1	KG-7	**$25.40**	2	KG-1	**$27.50**
	Float ††		KG-8	**15.50**		KG-2	**17.60**
With Conduit Bushing	Weight †		KG-9	**25.40**		KG-3	**27.50**
	Float ††		KG-10	**15.50**		KG-4	**17.60**
With Conduit Bushing and One Extra Cord Entrance	Weight †		KG-11	**25.40**		KG-5	**27.50**
	Float ††		KG-12	**15.50**		KG-6	**17.60**

Type KG-8 is current equivalent for 9046CG.
† Bulk packaging quantity—25. Specify individual or bulk packaging on large orders.
†† Bulk packaging quantity—50.



Type KG-1

ELECTRICAL RATINGS — HORSEPOWER

Class 9036	Single Phase AC	DC	
	115-230 V	32 V	115 V
Type KG	½	¼	¼

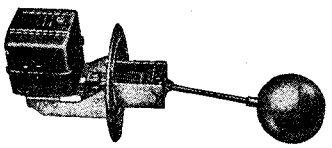
SQD SLV_001188

CLOSED TANK FLOAT SWITCHES

FOR CONDENSATE PUMPS

TYPE G, E

CLASS 9037



Class 9037, Type GG-21
with rod kit and
float kit installed
(Figure 1 Float movement)

Class 9037 controls are primarily used on condensate pumps. Type G switches are flange mounted and float movement is transmitted through a bellows seal.

Build up the switch to meet your exact requirements from the **basic switch**, **float rod** and **float** groups below.

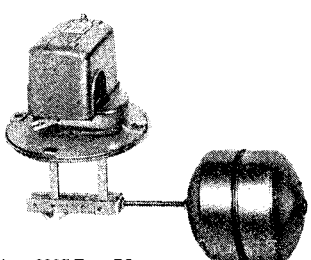
CLASS 9037 TYPE G, 2 POLE CLOSED TANK FLOAT SWITCH

Contacts Close or Open on Liquid Rise: Choice of Operation At Time of Installation by Simply Positioning One Bearing Pin						
BASIC FLOAT SWITCH Figure No. (Float Movement)	NEMA 1		Watertight NEMA 4		Hazardous Locations NEMA 7 & 9	
	Type	Price	Type	Price	Type	Price
Fig. 1 Above and below centerline	GG-21	**$102.**	GW-21	**$315.**	GR-21	**$308.**
Fig. 2 Below centerline	GG-22	**102.**	GW-22	**315.**	GR-22	**308.**
Fig. 3 Vertically Mounted Switch	GG-23	**102.**	GW-23	**315.**	GR-23	**308.**

ELECTRICAL RATINGS (HORSEPOWER)

Class	Type	Single Phase		Polyphase			DC	
		115 V.	230 V.	230 V.	460 V.	575 V.	115 V.	230 V.
9037	GG, GR, GW	2	3	5	5	5	1	1

Control Circuit Rating: 600 VAC Maximum.



Class 9037 Type EG
Shown with **Rod Kit** and
Float Kit installed.

CLASS 9037 TYPE E CONTACTS CLOSE ON RISING LIQUID LEVEL

BASIC 2 POLE FLOAT SWITCH						
NEMA 1		NEMA 4		NEMA 7, 9		
Type	Price	Type	Price	Type	Price	Application
EG-8	**$84.**	EW-8	**$212.**	ER-8	**$205.**	For minimum level change
EG-9	**84.**	EW-9	**212.**	ER-9	**205.**	For maximum level change

CLASS 9049 FLOAT KITS
For Use With 9037 Type G

Description	Class 9049 Type	Price
4" Diameter Ball Float, #304 Stainless Steel	GF-1	**$14.**
4" Diameter Ball Float, #316 Stainless Steel	GF-2	**50.**

NOTE: To calculate horizontal clearance into tank (so that float will not contact side of tank): add 4 inches for float diameter plus length of rod plus $3\frac{5}{16}$ inches.

Recommended size of hole in tank is 4¼ — 4½ inches. O.D. of 6 hole flange is 6½ inches. The .44 inch diameter holes are on 5¾ inch bolt centers.

Max. Tank Pressure: 50 PSI

Max. Temp.: 250°F

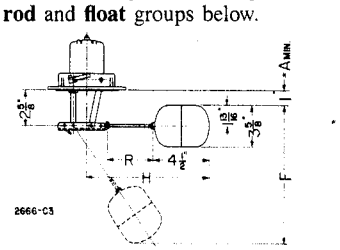
CLASS 9049 ROD KITS
For Use With 9037 Type G

Length of Rod (Inches)	Brass		#316 Stainless Steel	
	9049 Type	Price	9049 Type	Price
△ 3"	GBR-3	**$ 6.**	GSR-3	**$12.**
5"	GBR-5	**6.**	GSR-5	**12.**
7"	GBR-7	**6.**	GSR-7	**12.**
9"	GBR-9	**6.**	GSR-9	**12.**
11"	GBR-11	**6.**	GSR-11	**12.**
13"	GBR-13	**6.**	GSR-13	**12.**
Special Lengths	GBR-99	**25.**	GSR-99	**54.**

△ Do not use 3" rod on GR or GW when contacts open on rise. Leverage force insufficient.

Type E switches are flange mounted and float movement is transmitted through a stuffing box.

Build up the switch to meet your exact requirements from the **basic switch, float rod** and **float** groups below.



ORDER ROD KITS FOR THE 9037 TYPE E FROM THIS TABLE

Class 9049 Rod Kits		EG-8, EW-8, ER-8							EG-9, EW-9, ER-9							
	"R"	"H"	"A"		"F"		Liquid Level Change		"H"	"A"		"F"		Liquid Level Change		Price
			Min	Max	Min	Max	Min	Max		Min	Max	Min	Max	Min	Max	
Type ER-1	1¾"	8¼"	1"	2"	4¾"	6"	1¾"	3"	7½"	1"	4"	6"	9"	3"	6"	**$5.**
Type ER-2	2½"	9"	1"	2"	4¾"	6¼"	1¾"	3¼"	8¼"	1"	4½"	6¼"	9¾"	3¼"	6¾"	**5.**
Type ER-3	3¼"	9½"	1"	2"	4¾"	6½"	1¾"	3½"	9"	1"	5"	6¼"	10¼"	3¼"	7¼"	**5.**
Type ER-5	5¼"	11¾"	1"	2½"	4¾"	6¾"	1¾"	3¾"	11"	1"	6"	6½"	11½"	3½"	8½"	**5.**
Type ER-7	7¼"	13¾"	1"	3"	5"	7¼"	2"	4¼"	13"	1"	7½"	6½"	13"	3½"	10"	**5.**
Type ER-12	12¼"	18¾"	1"	4¼"	5¾"	9"	2¾"	6"	18"	1"	9½"	9"	17.5"	6"	14½"	**5.**

ORDER FLOAT KITS FOR THE 9037 TYPE E FROM THIS TABLE

	Price
#304 S.S. .....Class 9049 Type EF-1	**$14.**
#316 S.S. .....Class 9049 Type EF-2	**41.**

ELECTRICAL RATINGS: 9037 TYPE E

Voltage	Single Phase AC	Polyphase AC	DC	Control Circuit
115	1½ HP	2 HP	½	600 VAC Max.
230	2 HP	3 HP	½	
460/575	....	1 HP	....	

MAX. TANK PRESSURE: 50 PSI MAX. TEMP.: 250°F.

ORDERING INFORMATION REQUIRED

1. Specify Class 9037 Type .....(Basic Switch)
2. Specify Class 9049 Type .....(Rod Kit)
3. Specify Class 9049 Type .....(Float Kit)

NOTE: THE ABOVE COMPONENTS ARE AVAILABLE OVERPACKED IN A SINGLE CARTON. FOR ORDERING INSTRUCTIONS, REFER TO CLASS 9037 SECTION, CONTROL PRODUCTS CATALOG.

SQD SLV_001189

FLOAT SWITCHES AND ALTERNATORS

CLASS 9037

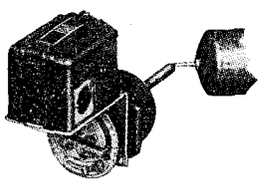
FOR CONDENSATE PUMPS

Class 9037 controls are primarily used on condensate pumps. Type H switches are attached to the tank by means of a 2½ inch screw-in connection. An external pointer indicates the float position within the tank when the unit is mounted. Units come complete with stainless steel float and rod.

CLASS 9037 TYPE H — 2 POLE — CONTACTS CLOSE ON LIQUID RISE▲
Screws in to 2½ Inch Threaded Hole in Side of Tank

Float Position Viewed from Front of Switch Facing Indicator Scale	Float Rod Angle ★	CL To CL	Approximate Water Level Change in Inches. (Field Adjustable)		NEMA 1		Watertight NEMA 4		Hazardous Locations NEMA 7 & 9	
			Min.	Max.	Type	Price	Type	Price	Type	Price
Right	45°	—	2″	5″	HG-3	**$59.**	HW-3	**$170.**	HR-3	**$164.**
Right	90° Offset	3″	2″	4″	HG-5	**59.**	HW-5	**170.**	HR-5	**164.**
Right	90° Offset	4¼″	2″	6″	HG-7	**59.**	HW-7	**170.**	HR-7	**164.**
Right	90° Offset	5″	2″	7″	HG-9	**59.**	HW-9	**170.**	HR-9	**164.**
Right	90° Offset	7″	2″	9″	HG-11	**59.**	HW-11	**170.**	HR-11	**164.**
Left	45°	—	2″	5″	HG-4	**59.**	HW-4	**170.**	HR-4	**164.**
Left	90° Offset	3″	2″	4″	HG-6	**59.**	HW-6	**170.**	HR-6	**164.**
Left	90° Offset	4¼″	2″	6″	HG-8	**59.**	HW-8	**170.**	HR-8	**164.**
Left	90° Offset	5″	2″	7″	HG-10	**59.**	HW-10	**170.**	HR-10	**164.**
Left	90° Offset	7″	2″	9″	HG-12	**59.**	HW-12	**170.**	HR-12	**164.**

▲For contacts to open on rise, add suffix R to type. Same price.



Class 9037, Type HG-3
Float on Right
45° Angle Rod

★ INSTALLATION NOTE: To avoid float making contact with side of tank:

Float Rod Angle	CL To CL	Horizontal clearance required from center of Screw-In Hub to side of tank.
45°		6⅜″
90° Offset	3″	4⅜″
90° Offset	4¼″	5⅝″
90° Offset	5″	6⅜″
90° Offset	7″	8⅜″

ORDERING INFORMATION REQUIRED: Specify Class 9037 Type _____.

CLASS 9038

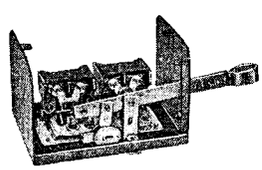
ALTERNATORS

Designed to provide positive motor alternation in the operation of two motors. Function is to equalize motor wear on duplex systems, with the added provision that the alternator will start the second motor where extra capacity under peak load conditions is required.

MECHANICAL ALTERNATOR

Application	Class 9038	General Purpose NEMA Type 1		Watertight and Dusttight NEMA Type 4		Explosion Proof NEMA Type 7, 9	
		Type	Price	Type	Price	Type	Price
For Open Tank or Sump Systems Using Duplex Pumps	Mechanical Alternator †Float Operated	AG-1	**$94.00**	AW-1	**$219.00**	AR-1	**$213.00**

For an additional high water alarm circuit — add suffix N5 to Type. Add **$48.60.**
CLASS 9038 CONTACTS CLOSE ON LIQUID RISE (REVERSE ACTION AVAILABLE — ADD SUFFIX R TO TYPE).
†On Type AG-1 use Class 9049 accessories with tapped at top float.
On Type AW-1 or AR-1 use Class 9049 accessories with center hole float.



Class 9038, Type AG-1
Mechanical Alternator
Float Operated

ELECTRICAL RATINGS (HORSEPOWER)

For Float Switches and Mechanical Alternators Listed Above.

Class	Type	Single Phase		Polyphase			DC	
		115 V.	230 V.	230 V.	460 V.	575 V.	115 V.	230 V.
9037	HG, HW, HR	1½	2	3	1	1	½	½
9038	AG, AW, AR	1½	2	3	1	1	½	½

CONTROL CIRCUIT RATING: NEMA A600

SQD SLV_001190

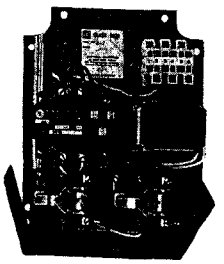
ELECTRICAL ALTERNATOR

TYPE H

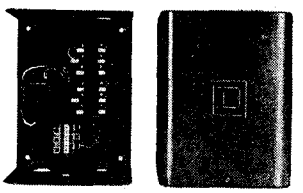
CLASS 9039

ALTERNATORS

Designed to provide positive motor alternation in the operation of two motors. Function is to equalize motor wear on duplex systems, with the added provision that the alternator will start the second motor where extra capacity under peak load conditions is required.



Class 9039 Type HO-2 Electrical Alternator



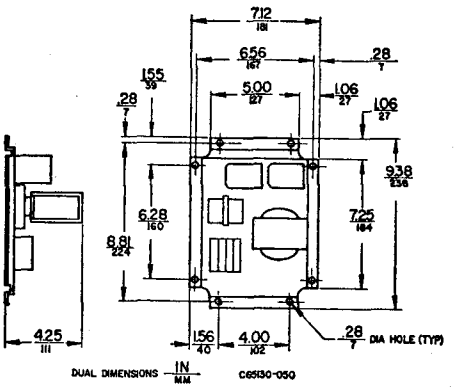
Class 9039 Type HG-21

ELECTRICAL ALTERNATOR

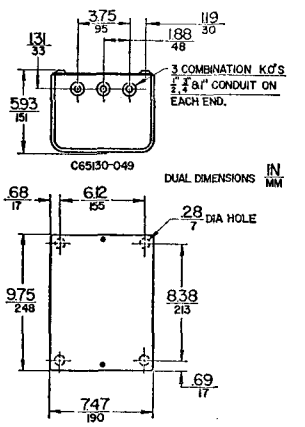
General Duty Applications	Class 9039 Electrical Alternator	AC Power Supply 60 Hz.	Open Type		General Purpose NEMA Type 1	
			Type	Price	Type	Price
Power Circuit Rating 2 Pole Rating 120/240 VAC, 1 HP Single Phase Each Motor, 2 HP Total		120/240 V.	HO-1	$306.	HG-1	$332.
Control Circuit Rating ◐240/480 or 600 V., 690 VA 60 Hz.		240/480 V.	HO-2	356.	HG-2	382.
		600 V.				
DUPLEX — 2 Power Sources Power Circuit Rating 2 Pole Ratings 120/240 VAC, 1 HP Single Phase Each Motor, 2 HP Total		120/240 V.	HO-21	306.	HG-21	332.
DUPLEX — 2 Power Supplies Control Circuit Rating ◐240/480 or 600 V., 690 VA 60 Hz.		240/480 V.	HO-22	364.	HG-22	390.
		600 V.				

◐Specify desired voltage.

APPROXIMATE DIMENSIONS

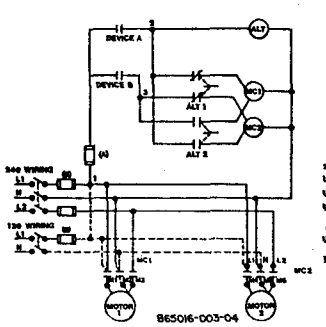


Class 9039 Type HO



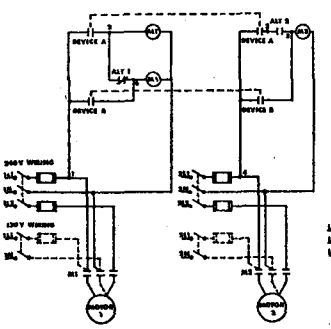
Class 9039 Type HG

WIRING DIAGRAMS



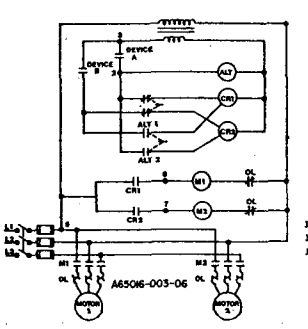
NOTES:
1. Set device A so that its contacts close before device B contacts close.
2. Alt 1 & alt 2 contacts close alternately on successive de-energizations of alt.
3. Control circuit protection (A) required if line overcurrent protection (B) exceeds 45 amps.

Types HG-1 and HO-1



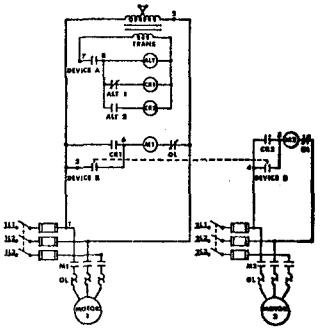
NOTES:
1. Set device A so that its contacts close before device B contacts close.
2. Alt 1 and alt 2 contacts close alternately on successive de-energizations of alt.

Types HG-21 and HO-21



NOTES:
1. Set device A so that its contacts close before device B contacts close.
2. Alt 1 and alt 2 contacts close alternately on successive de-energizations of alt.

Types HG-2 and HO-2



NOTES:
1. Set device A so that its contacts close before device B contacts close.
2. Alt 1 and alt 2 contacts close alternately on successive de-energizations of alt.

Types HG-22 and HO-22

SQD SLV_001191

ACCESSORIES
FOR PRESSURE, FLOAT, VACUUM & TEMPERATURE SWITCHES

CLASS 9049

Type	Description	Applies to Class	Price	Discount Schedule
A-6	7" Tapped at Top Copper Coated Steel Float, 5' Brass Tubing, 2 stops	9036, 9038 AG	$ 47.00	D7B
A-6A	Same as A-6 except tubing is aluminum	9036, 9038 AG	47.00	D7B
A-6C	7" Center Hole Copper Coated Steel Float, 5' Brass Tubing, 4 stops	9036, 9038 AG, AR, AW	66.00	D7B
A-6CA	Same as A-6C except tubing is aluminum	9036, 9038 AG, AR, AW	66.00	D7B
A-6CS	7" Center Hole #316 Stainless Steel Float, 5' S.S. Tubing, 4 S.S. stops	9036, 9038 AG, AR, AW	214.00	D7B
A-6S	7" Tapped at top #316 Stainless Steel Float, 5' S.S. tubing, 2 S.S. stops	9036, 9038 AG	126.00	D7B
A-7A	Steam Capillary, 10', maximum pressure 250 PSIG, ¼" O.P.T.	9012 (except Piston Types ADW, AJW)	56.00	D1B
A-8B	Tank fitting, 400 p.s.i. maximum pressure, ¾" O.P.T.	9025 BCW Types	58.00	D1B
A-11	Range Adjustment Knob, includes set screws	9012, 9025	4.00	D1B
A-12	Two-way Pressure Release Valve, Replacement only. Cannot be added to switch that originally had no valve	9013 GHG, GSG, Form X only	12.00	D7B
A-13	Compensating Spring	9036 GG	5.40	D7B
A-15	Compensating Spring	9038 AG	21.60	D7B
A-17	Sealing Cap for range adjustment	9012, 9025	4.00	D1B
A-19	Compensating Spring	9036 DG	1.10	D7B
A-20	Compensating Spring	9036 DR, DW	1.10	D7B
A-22	Floor Mounting Stand	9038 AG	45.00	D7B
A-23	Floor Mounting Stand	9038 AR, AW	84.00	D7B
A-25	Surge Reducer — For use on oils, coolants, hydraulic fluids but not recommended for air or water	9012 ADW or ADR-3, 4, 5, 6, 7	32.00	D1B
A-26	Surge Reducer — For use on oils, coolants, hydraulic fluids but not recommended for air or water	9012 ACW, ACR, BCO, BCG, G	32.00	D1B
A-30	Brass Well	9025 BFW	19.00	D1B
A-31	Stainless Steel Well	9025 BFW	66.00	D1B
A-34	Brass Well	9025 BCW except 36, 46	20.00	D1B
A-35	Stainless Steel Well	9025 BCW except 36, 46	72.00	D1B
A-38	Brass Well	9025 BCW-36, BCW-46	24.00	D1B
A-39	Stainless Steel Well	9025 BCW-36, BCW-46	74.00	D1B
A-41	Floor Mounting Stand	9036 DR, DW	61.25	D7B
A-48	Two-way Release Valve. Replacement only. Cannot be added to switch that originally had no valve	9013 HHG, HHG-Y Form X only	4.80	D7B
A-49	Two Way Release Valve	9045	13.80	D7B
A-50	Three Way Release Valve	9045	21.40	D7B
A-52	Mtg. Bracket — Replacing OBS, 9013 A with 9013 G	9013 GHG, GSG	5.60	D7B
A-53	Mtg. Bracket — Replacing OBS, 9013 A with 9013 G or for current 9016 GVG	9013 GMG, 9016 GVG	7.70	D7B
A-54	Mtg. Bracket — Replacing OBS, 9036 A with 9036 G	9036 GG	12.90	D7B
A-55	Mtg. Bracket — Replacing 9036 A (S or F1) with 9036 G	9036 GG	16.10	D7B
BF-1	#304 S.S. Float	9038 B	20.00	D7B
BF-2	#316 S.S. Float	9038 B	155.00	D7B
C2	5' Additional Bronze Chain Kit	9035	12.00	D1B
C2S	5' Additional Stainless Steel Chain Kit	9035	24.00	D1B
DCA-1	Bronze Chain, #304 S.S. Float Kit	9035	106.00	D1B
DCA-2	S.S. Chain, #316 S.S. Float Kit	9035	306.00	D1B
DCA-3	Bronze Chain, #304 S.S. Float Kit	9035 Remote Pulleys	106.00	D1B
DCA-4	S.S. Chain, #316 S.S. Float Kit	9035 Remote Pulleys	306.00	D1B
DMS-1	Floor Mounting Kit	9035 DG	45.00	D1B
DMS-2	Floor Mounting Kit	9035 DR, and DW	51.00	D1B
DRA-1	5' Brass Rod, #304 S.S. Float Kit	9035	106.00	D1B
DRA-2	5' S.S. Rod, #316 S.S. Float Kit	9035	351.00	D1B
EF-1	#304 S.S. Float	9037 E, 9038 D	14.00	D7B
EF-2	#316 S.S. Float	9037 E, 9038 D	41.00	D7B
ER-1	1¾" Rod	9037 E, 9038 D	5.00	D7B
ER-2	2½" Rod	9037 E, 9038 D	5.00	D7B
ER-3	3¼" Rod	9037 E, 9038 D	5.00	D7B
ER-5	5¼" Rod	9037 E, 9038 D	5.00	D7B
ER-7	7¼" Rod	9037 E, 9038 D	5.00	D7B
ER-12	12¼" Rod	9037 E, 9038 D	5.00	D7B
GBR-3	3" Brass Rod	9037 G, 9038 B	6.00	D7B
GBR-5	5" Brass Rod	9037 G, 9038 B	6.00	D7B
GBR-7	7" Brass Rod	9037 G, 9038 B	6.00	D7B
GBR-9	9" Brass Rod	9037 G, 9038 B	6.00	D7B
GBR-11	11" Brass rod	9037 G, 9038 B	6.00	D7B
GBR-13	13" Brass Rod	9037 G, 9038 B	6.00	D7B
GBR-99	Special Lengths Brass Rod	9037 G, 9038 B	25.00	D7B
GF-1	#304 S.S. Float	9037 G	14.00	D7B
GF-2	#316 S.S. Float	9037 G	50.00	D7B
GSR-3	3" S.S. Rod	9037 G, 9038 B	12.00	D7B
GSR-5	5" S.S. Rod	9037 G, 9038 B	12.00	D7B
GSR-7	7" S.S. Rod	9037 G, 9038 B	12.00	D7B
GSR-9	9" S.S. Rod	9037 G, 9038 B	12.00	D7B
GSR-11	11" S.S. Rod	9037 G, 9038 B	12.00	D7B
GSR-13	13" S.S. Rod	9037 G, 9038 B	12.00	D7B
GSR-99	Special Lengths S.S. Rod	9037 G, 9038 B	54.00	D7B
T1	Additional Tubing Kit: One 2½' section of brass tubing and connector	9049 A-6, A-6C	11.00	D7B
T1A	Additional Tubing Kit: One 2½' section of aluminum tubing, connector	9049 A-6A, A-6CA	11.00	D7B
T1S	Additional Tubing Kit: One 2½' section of stainless steel tubing, connector	9049 A-6S, A-6CS	19.00	D7B
T2	2½' Brass Tubing, Connector and Counterweight	9035	12.00	D1B
T2S	2½' Stainless Steel Tubing, Connector and Counterweight	9035	24.00	D1B

SQD SLV_001192

TIMING RELAYS
SELECTION GUIDE

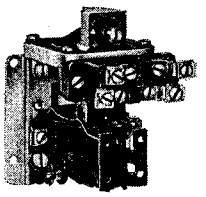
CLASS 9050

PNEUMATIC TYPE

Recommended for applications requiring:

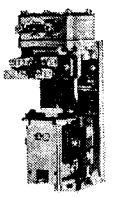
- Good repeat accuracy, ± 10% typical
- Adjustable timing over wide range
- Low cost
- Operation relatively unaffected by temperature and voltage variation
- Wide variety of timed and instantaneous contacts

1 MINUTE TIMING RELAY, TYPES A & H — Page 416



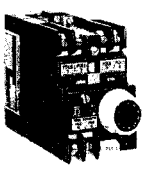
Small size
± 10% repeat accuracy
ON, OFF delay, convertible
SPDT or DPDT timed contacts on Type H
SPDT, DPDT, timed and instantaneous contacts available on Type A
AC, DC, 600 V. max.
Low cost

3 MINUTE TIMING RELAY, TYPES B & C — Page 418



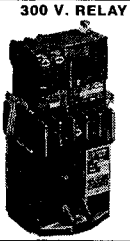
± 10% repeat accuracy
ON, OFF delay, convertible
SPDT, DPDT timed contacts
1 or 2 SPDT instantaneous contacts
AC, DC, 600 V. max.

600 V. RELAY OPERATED TIMER, CLASS 8501 TYPE L — Pages 206-210



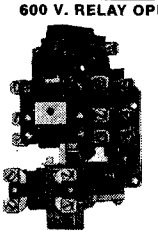
1 minute timing
± 10% repeat accuracy
ON, OFF delay, convertible
2 timed convertible contacts
Up to 4 instantaneous convertible contacts

300 V. RELAY OPERATED TIMER, CLASS 8501 TYPE G — Page 212



1 minute timing
± 15% repeat accuracy
ON, OFF delay, convertible
SPDT timed contacts
Up to 4 instantaneous contacts, convertible

600 V. RELAY OPERATED TIMER, CLASS 8501 TYPE D — Page 220



1 minute timing
± 10% repeat accuracy
ON, OFF delay, convertible
SPDT timed contacts
Up to 4 instantaneous contacts, fixed

PUSH BUTTON OPERATED TIMER, CLASS 9001 TYPE K — Page 329



1 minute timing
± 10% repeat accuracy
Time delay after release
SPDT or DPDT timed contacts
AC or DC

SOLID STATE TYPE

Recommended for applications requiring:

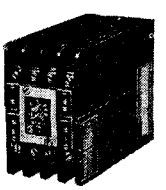
- Extremely long life
- High duty cycle
- Excellent repeat accuracy, ± 2% typical
- Local or remote adjustment
- Immunity to atmospheric contaminants such as dust, moisture, etc.

SOLID STATE TIMING RELAY, TYPE FS — Page 420



5 Timing Ranges:
0.05 to 1 second
0.30 to 30 seconds
3.0 to 180 seconds
0.1 to 10 minutes
.1 to 10 hours
± 1% Repeat Accuracy
10 Amp. Contacts
Timed and Instantaneous Contacts
On, Off Delay, Convertible
Repeat Cycle
120 V. 50/60 Hz.
5 Amp. DPDT Contacts

SOLID STATE TIMING RELAY, TYPE T — Page 421



3 Timing ranges:
0.3 to 30 seconds
0.05 to 5 seconds
0.6 to 60 seconds
± 1% repeat accuracy
ON and OFF delay
Repeat cycle
2 timed, 2 instantaneous contacts
Fixed or convertible contacts
2.5 amp contacts
120 V. 50/60 Hz.

GEN. PURPOSE TIMING RELAY, CLASS 8501 TYPE JCK — Page 228



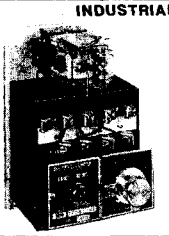
3 minute timing
± 2% repeat accuracy
Plug-in mounting
On and Off delay versions available
Transient protected
Dual AC/DC operation
5 amp. DPDT Contacts

INDUSTRIAL TIMING RELAY, CLASS 8501 TYPE GT — Page 213



30 second timing
± 2% repeat accuracy
ON delay
1 N.O., 1 A. timed contact
120 V., 50/60 Hz.
Mounts on Type G relay, panel or door

INDUSTRIAL TIMING RELAY, TYPE E — Page 417



30 second timing
± 2% repeat accuracy
ON, OFF delay, convertible
2 PDT, 10 A. timed contacts
High resolution adjustment
120, 240 V., 50/60 Hz.

TIME DELAY LOW VOLTAGE RELEASE — Page 419 CLASS 9050, TYPE D



2 seconds standard
4 seconds optional
120, 240, 480, or 600 volts
Overrides momentary power failures

SQD SLV_001193

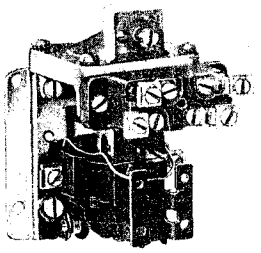
PNEUMATIC TIMING RELAYS

TYPES A AND H

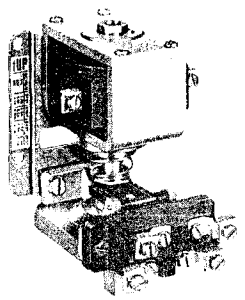
CLASS 9050

Types A and H timing relay features:

- One Minute Timing
- ± 10% Repeat Accuracy
- Small Size
- Low Cost
- On And Off Delay, Convertible
- SPDT or DPDT Timed Contacts
- SPDT or DPDT Instantaneous Contacts (Type A only)



Type AO-10E



Type HO-10E

TYPE A FOR AC OPERATION

Mode of Operation	Number of Contacts				Open Type	Price
	Time Delay		Instantaneous			
	N.O.	N.C.	N.O.	N.C.		
ON DELAY Convertible	1	1	0	0	AO-10E	**$128.**
			1	1	AO-11E	**160.**
			2	2	AO-12E	**172.**
	2	2	0	0	AO-20E	**140.**
			1	1	AO-21E	**172.**
			2	2	AO-22E	**184.**
OFF DELAY Convertible	1	1	0	0	AO-10D	**128.**
			1	1	AO-11D	**160.**
			2	2	AO-12D	**172.**
	2	2	0	0	AO-20D	**140.**
			1	1	AO-21D	**172.**
			2	2	AO-22D	**184.**
ON and OFF DELAY Double Headed	1 per Head 2 per Head	1 per Head 2 per Head	0 0	0 0	AO-110DE AO-220DE	**208.** **232.**

TYPE H FOR DC OPERATION

Mode of Operation	Timed Contacts		Open Type	Price
	N.O.	N.C.		
ON DELAY Convertible	1	1	HO-10E	**$172.**
	2	2	HO-20E	**184.**
OFF DELAY Convertible	1	1	HO-10D	**172.**
	2	2	HO-20D	**184.**

INSTANTANEOUS CONTACT KITS FOR TYPE A TIMING RELAYS

Description*	Class 9999	Price
1 N.O. and 1 N.C. Contact (1PDT)	Type R-33	**$32.**
2 N.O. and 2 N.C. Contacts (2PDT)	Type R-34	**44.**

*Instantaneous contact kits contain a snap switch, mounting bracket, and screws for field installation of instantaneous contacts to Type A timing relays without instantaneous contacts.

APPLICATION DATA

Timing Range: Type A: 0.1 second to 1 minute.
Type H: 0.15 second to 1 minute.

Repeat Accuracy Deviation: ±10% under constant temperature (Per NEMA Standard ICS 2-218.01.07).

Reset Time: Type A: ON delay 29 ms., OFF delay 27 ms average.
Type H: ON delay 50 ms., OFF delay 70 ms average.

Timing Variation With Temperature: Relatively unaffected by ambient temperature in range 20°C to 40°C.

Modes of Operation: ON delay or OFF delay, convertible. ON delay types can be wired for interval-maintained start or repeat cycle (sequencing using two devices).

UL/CSA:
Types A and H timing relays are UL listed under File E14839(N) Guide NKCR and CSA approved under File 6605C Guide 184-N-13.1U.

Input Voltage:
Type A — 6 through 600 volts AC, +10%, −15% of nominal
Type H — 6 through 250 volts DC, +10%, −20% of nominal

Standard Coil Voltages:

Type A —

Frequency	Voltage
60 Hz	6, 12, 24, 48, 120, 240, 277, 480, 600
50 Hz	6, 12, 24, 48, 110, 220, 440, 550

Type H — 6, 12, 24, 48, 115, 230/250 Volts DC

Burden:

Type A —

Coil VA*		
Hz	Inrush	Sealed
60	74	17
50	68	17

*6 to 24V AC coils have VA ratings 120% of the values shown.

Type H —12 Watts Average

Timed and Instantaneous Output Contacts: SPDT or DPDT snap switch. Contacts of each pole must be used on same polarity.

Enclosure: Separate NEMA 1 enclosure for all single headed timers use Class 9991 Type UE-6 (formerly 8501 UE-6). Price **$28.00** each.

TYPES A AND H: MAXIMUM ELECTRICAL CONTACT RATINGS

Contacts	Volts	AC						Volts	DC		
		Inductive 35% Power Factor					Resistive 75% Power Factor		Inductive and Resistive		
		Make		Break		Continuous Carrying Amperes	Make, Break and Continuous Carrying Amperes		Make and Break Amperes		Continuous Carrying Amps.
		Amps.	VA	Amps.	VA				Single Throw	Double Throw	
SPDT Timed or Instantaneous	120	40	....	15	...	15	15	115	2.0	0.5	15
	240	20	....	10	...	15	15	230	0.5	0.2	15
	480	10	....	6	...	15	15	600	0.1	0.02	15
	600	8	....	5	...	15	15				
DPDT Timed or Instantaneous	120	30	3600	3	360	10	10	115	1.0	0.2	10
	240	15	3600	1.5	360	10	10	230	0.3	0.1	10
	480	7.5	3600	0.75	360	10	10	600	0.1	....	10
	600	6	3600	0.6	360	10	10				

ORDERING INFORMATION REQUIRED

1. Class and Type Number. 2. Voltage and frequency of operating coil.

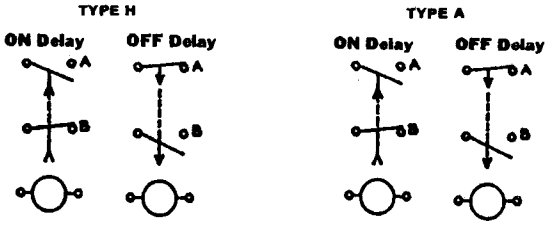
SQD SLV_001194

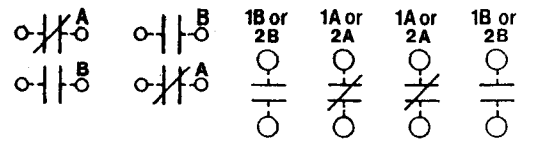
TIMING RELAYS — PNEUMATIC

TYPES A AND H

CLASS 9050

WIRING DIAGRAMS

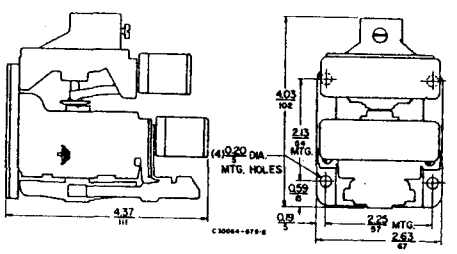




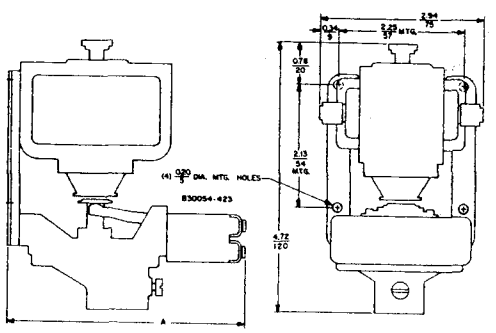
SPDT
ELECTRICAL INTERLOCK
(when furnished)
(same for ON & OFF delay)

DPDT
ELECTRICAL INTERLOCK
(when furnished)
(same for ON & OFF delay)

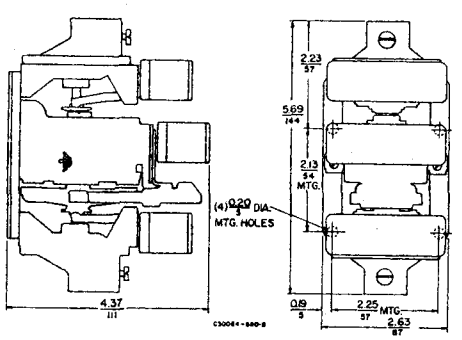
APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS



Type AO
Single Headed Timer
Weight — 2 Lbs.

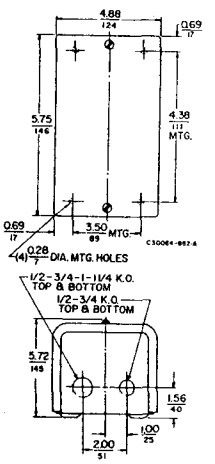


Type HO
Weight — 3 Lbs.



Type AO
Double Headed Timer
Weight — 3 Lbs.

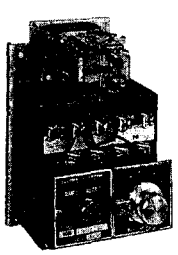
TYPE	DIM. A
HO-10E HO-10D	4.10 104
HO-20E HO-20D	3.75 95



Class 9991 Type UE-6 Enclosure
For Single Headed **Type AO**
and **Type HO** Timing Relays
Weight — 3 Lbs.

TIMING RELAYS — SOLID STATE

TYPE E



Type EO-3

CLASS 9050

Types EO-3 and EO-4 timing relays feature:

- .05 TO 30 SECOND TIMING
- ± 2% REPEAT ACCURACY
- ON AND OFF DELAY, CONVERTIBLE
- SOLID STATE TIMING MODULE
- HIGH RESOLUTION TIMING ADJUSTMENT
- 10 AMPERE DPDT TIMED CONTACTS
- TRANSIENT PROTECTION
- REMOTE ADJUSTMENT
- 120V-60HZ and 240V-60HZ OPERATING VOLTAGES AVAILABLE

Mode of Operation	Timing Range	Open Type		General Purpose Enclosure **NEMA Type 1**	
		Type	Price	Type	Price
ON Delay, OFF Delay Convertible with Wiring Change — See Application Data	.05 to 10 seconds	EO-3	$406.	EG-3	$432.
	.05 to 30 seconds	EO-4	484.	EG-4	510.

ORDERING INFORMATION

1. Class and type number
2. Specify 120 Volts 60 Hertz or 240 Volts 60 Hertz.

Dual Dimensions: **INCHES** / Millimeters

SQD SLV_001195

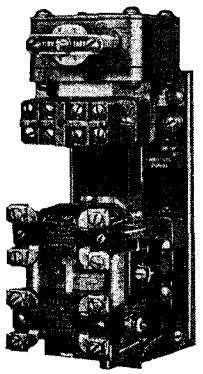
PNEUMATIC TIMING RELAYS

TYPES B AND C

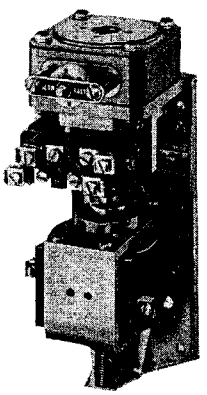
CLASS 9050

Type B ac timing relays and Type C dc timing relays feature:

- 3 Minute Timing
- ± 10% Repeat Accuracy
- ON and OFF Delay, Convertible
- SPDT or DPDT Timed Contacts
- 1 or 2 SPDT Instantaneous Contacts
- Optional Micrometer Dial



Type BO-23D



Type CO-1E

Mode of Operation	Dial	Time Delay Contacts N.O.	Time Delay Contacts N.C.	Instantaneous Contacts N.O.	Instantaneous Contacts N.C.	AC Operated Open Type	AC Operated Price	DC Operated Open Type	DC Operated Price
ON Delay Convertible	Standard Dial	1		0	0	BO-1E	**$200.**	CO-1E	**$220.**
				1	1	BO-2E	**220.**	CO-2E	**240.**
				2	2	BO-3E	**240.**	CO-5E	**260.**
		2		0	0	BO-21E	**260.**	CO-21E	**280.**
				1	1	BO-22E	**280.**	CO-22E	**300.**
				2	2	BO-23E	**300.**	CO-25E	**320.**
	Micrometer Dial	1		0	0	BO-4E	**220.**	CO-3E	**240.**
				1	1	BO-5E	**240.**	CO-4E	**260.**
				2	2	BO-6E	**260.**	CO-6E	**280.**
		2		0	0	BO-24E	**280.**	CO-23E	**300.**
				1	1	BO-25E	**300.**	CO-24E	**320.**
				2	2	BO-26E	**320.**	CO-26E	**340.**
OFF Delay Convertible	Standard Dial	1		0	0	BO-1D	**200.**	CO-1D	**220.**
				1	1	BO-2D	**220.**	CO-2D	**240.**
				2	2	BO-3D	**240.**	CO-5D	**260.**
		2		0	0	BO-21D	**260.**	CO-21D	**280.**
				1	1	BO-22D	**280.**	CO-22D	**300.**
				2	2	BO-23D	**300.**	CO-25D	**320.**
	Micrometer Dial	1		0	0	BO-4D	**220.**	CO-3D	**240.**
				1	1	BO-5D	**240.**	CO-4D	**260.**
				2	2	BO-6D	**260.**	CO-6D	**280.**
		2		0	0	BO-24D	**280.**	CO-23D	**300.**
				1	1	BO-25D	**300.**	CO-24D	**320.**
				2	2	BO-26D	**320.**	CO-26D	**340.**

MODIFICATION KITS FOR TIMING RELAYS

Class	Type	For Timing Relay	Description	Price
9991	BCG	Type B Type C	Separate NEMA 1 General Purpose Enclosure for use with all Type B and C timers	**$40.**
9999	R-4	Type B	1 N.O. and 1 N.C. Instantaneous Contact (1PDT)*	**20.**
	R-5	Type C	2 N.O. and 2 N.C. Instantaneous Contacts (2PDT)*	**20.**
9999	K-5	Type C — D	Parts required to change Type C, dc timing relay from OFF delay to ON delay	**6.**
9999	K-6	Type C — E	Parts required to change Type C, dc timing relay from ON delay to OFF delay	**4.**

* Instantaneous contact kits contain a snap switch, mounting bracket and screws for field installation of instantaneous contacts to timing relays without instantaneous contacts. A second instantaneous contact kit can be added to a timing relay with only one instantaneous contact.

APPLICATION DATA

Timing Range: 0.05 second to 3 minutes for timers without micrometer dial. For timers with a micrometer dial the timing range is 0.2 seconds to 3 minutes. Note: most types B and C timing relays without micrometer dial can be adjusted to 20 minutes. Due to manufacturing tolerances not every timer can be guaranteed adjustable from 3 to 20 minutes.

Repeat Accuracy Deviation:
Under constant temperature (Per NEMA Standard ICS 2-218.01.07):
± 10% to 3 minutes max.
± 12% to 5 minutes max.
± 40% to 20 minutes max.

Reset Time: 34 ms. average

Timing Variation with Temperature: Relatively unaffected by ambient temperature in range 20°C to 40°C.

Modes of Operation: ON delay and OFF delay, convertible. ON delay types can be wired for interval-momentary or maintained start and repeat cycle (sequencing, using two devices).

Input Voltage:
Type B AC Timing Relay:
6 through 600 volts, + 10%, − 15% of nominal.
Type C DC Timing Relay:
6 through 250 volts, + 10%, − 20% of nominal.

UL/CSA:
Types B and C timing relays are UL listed under File E14839(N) Guide NKCR and CSA approved under File 6605C Guide 184-N-13.1U.

ORDERING INFORMATION REQUIRED

1. Class and Type Number.
2. Voltage and frequency of operating coil.

Burden:

Type B — AC			Type C — DC	
	Coil VA*			
Hz	Inrush	Sealed	Volts	Coil Res. (ohms)
60	165	27	115	1055
50	155	27	230	4240

* 6 to 24 VAC coils have VA ratings 120% of values shown.

Timed Output Contacts: SPDT or DPDT snap switch. Contacts of each pole must be used on same polarity.

Instantaneous Output Contacts: 1 or 2 SPDT snap switches. Contacts of each pole must be used on same polarity.

Overlapping Contacts: ON delay timers with instantaneous contacts provide overlap between the instantaneous contact and the timed contact on the reset (non-timing) stroke. For example, the N.C. instantaneous contact will close before the N.O. timed contact opens on the reset stroke.

STANDARD COILS

Frequency	Voltage
60 Hz	6, 12, 24, 48, 120, 240, 277, 480, 600
50 Hz	6, 12, 24, 48, 110, 220, 440, 550
DC	6, 12, 24, 48, 115, 230/250

MODIFICATIONS

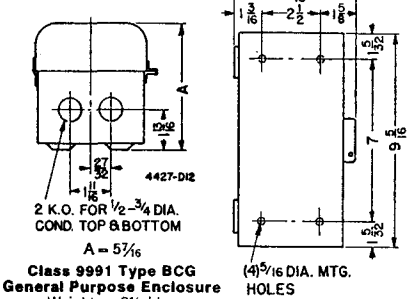
Description	Form	Price Addition
Hardened Magnet Parts For increased magnet life in high cycle rate applications, Type B only	HA	**$24.**

SQD SLV_001196

APPLICATION DATA (Cont.)

ELECTRICAL CONTACT RATINGS

Type	AC Volts	AC Inductive 35% Power Factor — Make Amps.	AC Inductive 35% Power Factor — Make VA	AC Inductive 35% Power Factor — Break Amps.	AC Inductive 35% Power Factor — Break VA	AC Inductive 35% Power Factor — Continuous Carrying Amperes	AC Resistive 75% Power Factor — Make, Break and Continuous Carrying Amperes	DC Volts	DC Inductive and Resistive — Make and Break Amperes — Single Throw Ind.	DC Single Throw Res.	DC Double Throw Ind.	DC Double Throw Res.	DC Continuous Carrying Amperes
Type B SPDT Timed Contacts	120	40	....	15	....	15	15	115	0.5	0.5	0.25	0.25	15
	240	20	....	10	....	15	15	230	0.25	0.25	0.1	0.1	15
	480	10	....	6	....	15	15	600	0.05	0.05	....	....	15
	600	8	....	5	....	15	15						
Type C SPDT Timed Contacts	120	40	....	15	....	15	15	115	2.0	2.0	0.5	0.5	15
	240	20	....	10	....	15	15	230	0.5	0.5	0.2	0.2	15
	480	10	....	6	....	15	15	600	0.1	0.1	0.02	0.02	15
	600	8	....	5	....	15	15						
Types B and C DPDT Timed Contacts	120	30	3600	3	360	10	10	115	1.0	1.0	0.2	0.2	10
	240	15	3600	1.5	360	10	10	230	0.3	0.3	0.1	0.1	10
	480	7.5	3600	0.75	360	10	10	600	0.1	0.1	....	....	10
	600	6	3600	0.6	360	10	10						
Type B (AC only) and Type C Instantaneous Contacts	120	60	7200	6	720	10	10	115	1.1	1.1	0.2	0.2	10
	240	30	7200	3	720	10	10	230	0.25	0.55	0.1	0.1	10
	480	15	7200	1.5	720	10	10	600	0.05	0.2	....	....	10
	600	12	7200	1.2	720	10	10						

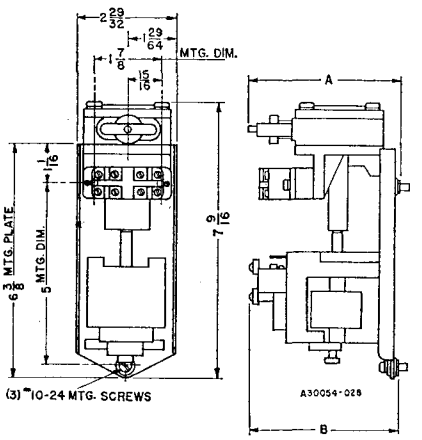


Class 9991 Type BCG General Purpose Enclosure
Weight — 8½ Lbs.

APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS

Type	A	B
BO1, 2, 3, 21, 22, 23 D & E	4¼	4
BO4, 5, 6, 24, 25, 26 D & E	4⅞	4
CO1, 2, 5, 21, 22, 25 D & E	4 3/16	4¼
CO3, 4, 6, 23, 24, 26 D & E	4⅞	4¼

Types BO and CO
Weight — 5 Lbs.



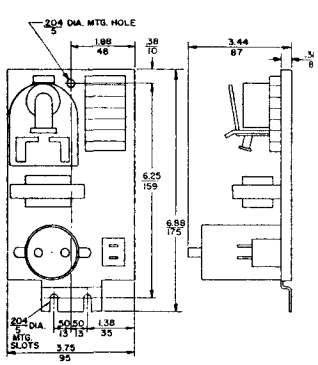
TIMING RELAYS — SOLID STATE

TYPE D

CLASS 9050

TIME DELAY LOW VOLTAGE RELEASE — TYPE D

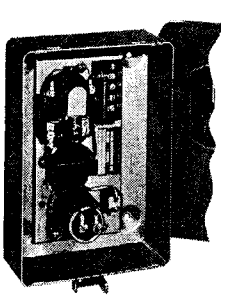
Recommended in three wire control schemes where momentary voltage failures must not require manual restarting of the motor starter. If voltage failure is less than the time setting, the motor starter will automatically restart. If voltage failure exceeds time setting, manual restarting is required. Standard time delay is 2 seconds. 4 seconds maximum available by removing resistor in parallel with relay coil.



Type DO

Dual Dimensions: **INCHES** / Millimeters

Volts	General Purpose Enclosure NEMA Type 1 — Type	Price	Open Type — Type	Price
120	DG-1	**$208.**	DO-1	**$200.**
240, 480 or 600	DG-2	**240.**	DO-2	**232.**



Type DG-1

ORDERING INFORMATION REQUIRED

1. Class and Type Number. 2. Specify Voltage and Frequency.

SQD SLV_001197

TIMING RELAYS — SOLID STATE

TYPES FS AND FSR

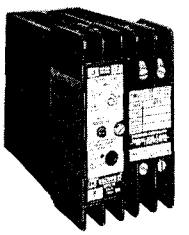
- Convertible ON-OFF Delay
- Timing From 0.05 Seconds to 10 Hours
- Repeat Cycle Version
- ± 1 % Repeat Accuracy
- 10 Ampere Contact Rating
- 1 N.O. & 1 N.C. Timed Contacts

CLASS 9050

The Type FS and FSR timing relays feature solid state accuracy and the flexibility and isolation of a hard contact output. Type FS timers offer convertible ON-OFF delay and instantaneous contacts. Extended time delays are available to ten hours! To indicate timer status, a light emitting diode is off when the timer is deenergized, flashing during timing, and on when the timed output relay is energized.

The Type FSR provides separately adjustable ON and OFF delay times for repeat cycle applications. An indicating light is on when the output relay is energized.

Mode Of Operation	Number of Contacts: Timed N.O.	Timed N.C.	Instantaneous N.O.	Instantaneous N.C.	Timing Range	Type	Price
Convertible ON-OFF Delay (Timers are shipped in the ON delay mode)	1	1	0	0	0.05-1 second	FS-1	**$145.**
					0.3-30 seconds	FS-2	**145.**
					3.0-180 seconds	FS-3	**145.**
					0.1-10 minutes	FS-4	**145.**
					0.1-10 hours	FS-5	**160.**
	1	1	1	1	0.05-1 second	FS-11	**179.**
					0.3-30 seconds	FS-12	**179.**
					3.0-180 seconds	FS-13	**179.**
					0.1-10 minutes	FS-14	**179.**
					0.1-10 hours	FS-15	**193.**
Repeat Cycle	1	1	0	0	0.05-1 second	FSR-1	**221.**
					0.3-30 seconds	FSR-2	**221.**
					3.0-180 seconds	FSR-3	**221.**



Type FS Timing Relay

APPLICATION DATA

Timing Modes: ON delay field convertible to OFF delay; repeat cycle.

Repeat Accuracy: ± 1% at constant temperature; ± 3% from 0°C to 60°C; ± 10% from −29°C to 0°C over the voltage range.

Reset Time:
ON delay: 50 milliseconds
OFF delay: 50 milliseconds
Repeat cycle: Not applicable

Timer Operation:

TIMER OPERATING STATUS TABLE

Timing Mode	Timing Cycle Status	Initiating Contact	Indicating Light	Time Delay N.O. Contact	Inst. N.O. Contact
ON Delay	Before Timing	Open	Off	Open	Open
	During Timing	Closed	Flashing	Open	Closed
	After Timing	Closed	On	Closed	Closed
OFF Delay	Before Timing	Closed	On	Closed	Closed
	During Timing	Open	Flashing	Closed	Open
	After Timing	Open	Off	Open	Open
Repeat Cycle	Before Timing	Open	Off	Open	N.A.
	During Timing	Closed	On	Closed	N.A.
			Off	Open	N.A.

Operating Voltage: Dual rated 120 Volts-60 Hz. and 110 volts-50 Hz. Continuous power is required (L1-L2 permanently connected to AC supply.)

Voltage Range: + 10%, − 15% of nominal.

Burden: 5.5VA maximum.

Operating Temperature Range: − 29°C to + 60°C.

Terminals: Self-lifting pressure wire connectors will accept up to two #14 or 16 solid or stranded wire. The terminals will accept ring lugs or spade lugs up to 5/16 inch wide.

Dial: Marked in percent of maximum time delay. A locking potentiometer is standard.

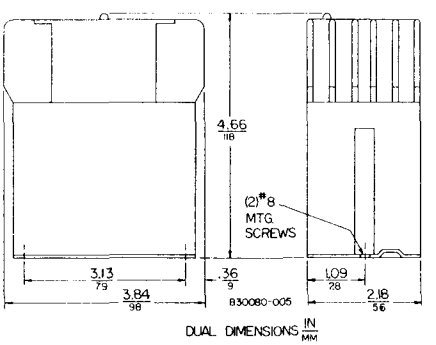
AC Contact Rating:

MAXIMUM ELECTRICAL CONTACT RATINGS

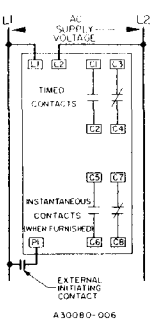
	AC RATINGS — NEMA B150					
	Inductive 35% Power Factor					Resistive 75% Power Factor
	Make		Break		Continuous Amperes	Make, Break and Continuous Amperes
Volts	Amps.	VA	Amps.	VA		
120	30	3600	3	360	10	10

DC Contact Ratings: 7 Ampere inductive make and break current rating at 24VDC; 10 Ampere resistive make, break and continuous current rating at 24VDC.

Approximate Dimensions and Wiring Diagram:

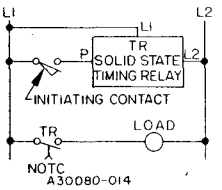


Approximate Dimensions



Wiring Diagram

Typical Elementary Diagram:



Surface Mounting Requirements: Use (2) 8-32 mounting screws. Class 8501 Type L relay mounting track is optional.

Enclosure: Separately packed NEMA 1 sheet steel enclosure. Class 9991 Type UE-7 (formerly Class 8501). Price **$28.00.**

ORDERING INFORMATION REQUIRED:
1. Class and type number. 2. Input voltage

SQD SLV_001198

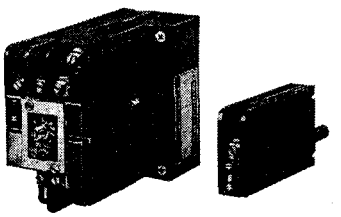
SOLID STATE TIMING RELAYS

TYPE T

CLASS 9050

Because of a unique new timing circuit design, the Type T solid state timing relay can provide full ± 1% repeat accuracy even though line voltage varies as much as 30 volts during a timing cycle or between timing cycles. The Type T also can provide more than ten times the operating life normally expected of timing relays with mechanical contacts because of its solid state contacts. For complete technical information request product data bulletin M-461.

- ± 1% Repeat accuracy
- Unaffected by voltage variations
- Convertible solid state contacts
- Arcless, bounceless switching
- Up to 2 timed contacts
- Up to 2 instantaneous contacts
- Terminals for remote potentiometer
- Transient protected



Type TO-10E3 and LSC

SOLID STATE TIMING RELAYS — 120 VOLTS 50/60 HZ.

Type T timing relays are provided as standard with one Type LSC convertible solid state contact cartridge installed in a timed output space. A second timed output space and two instantaneous output spaces are provided to mount additional contact cartridges to ON and OFF delay timing relays. Repeat cycle devices will not accept additional contact cartridges.

Number of Normally Open Convertible Contacts	Mode of Operation	0.05 to 5.0 Sec. Timing Range		0.3 to 30 Sec. Timing Range		0.6 to 60 Sec. Timing Range	
		Type	Price	Type	Price	Type	Price
1	ON Delay	TO-10E1	$228.	TO-10E2	$228.	TO-10E3	$228.
1	OFF Delay	TO-10D1	228.	TO-10D2	228.	TO-10D3	228.
1	Repeat Cycle	TO-10R1	288.	—	—	TO-10R3	288.

APPLICATION DATA

Timing Ranges: 0.05 to 5 sec., 0.3 to 30 sec. and 0.6 to 60 sec.

Repeat Accuracy:
± 1% at constant temperature
± 5% worst case with extreme temperature variations between −20°C and 65°C.
Unaffected by line voltage variations between 102 volts and 132 volts.

Reset Time:
ON delay: 50 milliseconds required
OFF delay: 50 milliseconds required
Repeat Cycle: Not applicable

Modes of Operation:
ON delay non-convertible. Can be wired to provide interval, maintained start mode.
OFF delay, non-convertible.
Repeat cycle (sequencing). On and off time delays are separately adjustable.

Input Voltage: 120 volts 50/60 Hz. CONTINUOUS POWER REQUIRED. (L1-L2 permanently connected to AC supply.)

Voltage Range: 102-132 VAC

Burden: 67 milliamps

Ambient Temperature Range: −20°C to +65°C.

Initiating Contact Required: N.O. or N.C. contact rated at least 120 volts, 0.1 amps RMS minimum. When a Class 8501 Type LS solid state contact is used for initiation, a ten watt, 3000 ohm resistor must be wired across terminals P1 and L2.

Output Contacts: Each ON delay and OFF delay timing relay has provisions for two timed and two instantaneous contacts.
Each repeat cycle timing relay has provisions for one timed contact. All timing relays include as standard one factory installed Type LSC convertible timed contact. Additional contacts can be ordered separately.

Class 8501 Contact Cartridges Fit Either Timed or Instantaneous Spaces

Description	Type	Price
Solid State Contact Cartridges		
Convertible N.O. or N.C.	LSC	$56.
Fixed N.O.	LSA	42.
Fixed N.C.	LSB	42.
Reed Contact Cartridges — Convertible	LRC	42.

Solid State Contact Data:
Voltage: 24 volts to 132 volts 50/60 Hz.
Maximum Current: Continuous: 2.5 amps RMS at 20°C (68°F). See derating curves for higher temperatures. Allowable inrush 15 amps RMS for 30 msec.
Minimum Current: 35 milliamps.
Open contact leakage current: 3 milliamps maximum.
Closed contact voltage drop. 1.5 volts typical.
Number of contacts that can be connected in series or parallel: 3.
Control Circuit Fusing: Recommended for inductive loads susceptible to jamming which would cause the allowable inrush to be exceeded. Use a fast acting fuse such as a Busmann ABC-3 or KAA-3. This fuse selection provides overload, not short circuit protection.

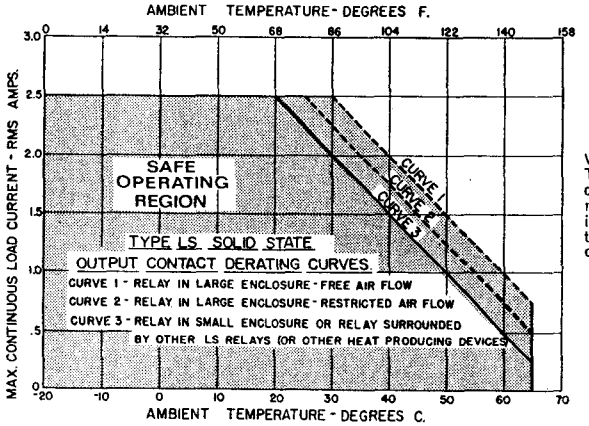
Reed Contact Data:
Maximum switching voltage: 34 vdc or vac peak (24 vrms)
Maximum resistive load: 3 watts
Maximum current (make, break, and carry): .100 Amp.

Transient Protection: Up to two joules for both timer and solid state contact cartridge.

Dial: Marking in seconds.

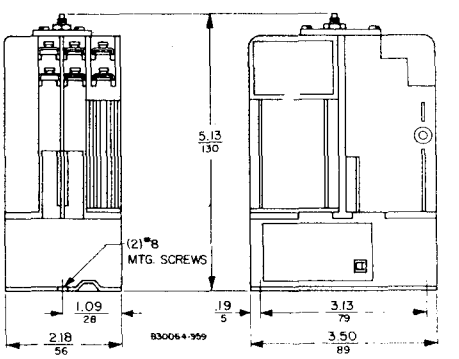
Remote Adjustment: For all three timing ranges, a Class 9001 Type K2117 is recommended for connection to the terminals provided. A twin lead (#18 stranded or larger), twisted pair shielded cable should be used. Maximum distance 100 feet.

Terminals: Pressure wire connectors, accept up to two #14 wires.



Ambient temperature refers to the temperature immediately adjacent to the output contact.

WARNING
The solid state contact may not switch OFF if operated outside the indicated safe operating region.



Approximate Dimensions

ORDERING INFORMATION: Class and type number

Dual Dimensions: **INCHES** / Millimeters

SQD SLV_001199

MAGNETIC CURRENT RELAYS

TYPES A & B

CLASS 9055

Magnetic current relays are used when an increase or decrease in current must be detected, accompanied by the opening or closing of a control circuit contact. SPST (N.C.) contact is supplied on Type A as standard; SPST (N.O.) is available as Form Y44. Type B is supplied with SPDT (N.O. and N.C.) contacts. Both types provide inverse-time delay characteristics which result in progressively faster tripping as current increases. For best results select a relay such that the desired trip current setting will be approximately at the midpoint of the adjustment range or less.

General — Time Delay Trip Type A relays are frequently used for protection of motor windings from continued overcurrent. Underload Trip Type B relays are widely used where a load condition on one motor is to start and stop another motor; on hammer mills, conveyor systems, etc.

MAXIMUM VOLTAGE RATINGS

Type	AC▲		DC	
	Maximum **Coil** Voltage	Maximum **Contact** Voltage	Maximum **Coil** Voltage	Maximum **Contact** Voltage
A	600	600	600	250
B	600	480	600	...

▲60 hertz maximum.

Automatic Reset — Standard feature on Type A & B relays. Hand Reset (Form HR) is available on Type A relays only.

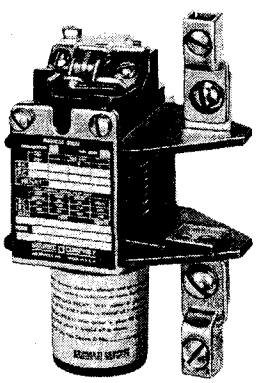
Reset Point — Once the Type A relay has tripped, current must be reduced to a very low value before reset occurs. Therefore, Type A relays should always be wired so that tripping disconnects the load current. On the Type B reset occurs automatically when current drops to 88-90% of the trip current setting on ac, 80-85% on dc.

Adjustable Trip — Over a 2:1 adjustment range; setting at about midpoint or less is recommended.

Adjustable Trip Time—The trip delay can be adjusted by opening or closing by-pass holes in the piston assembly.

Dashpot Oil — R2 oil is provided as standard with Type A relays; R4 oil with Type B. For other oils see Special Features table, page 424. Any oil can be used in any Type A or Type B relay. For time-current characteristic curves consult local Square D Field Office.

Coil Terminals — Pressure wire connectors are furnished on coils rated at 20 amperes ac or less with one terminal on each side of the coil. On larger devices both coil terminals are on the right hand side as standard, and can be field converted to the left hand side if desired. Steel panel mounting relay coils have solderless lugs. Insulating panel mounting relay coils have no lugs.



Type AO 121R

Maximum Continuous Current		Trip Current Adjustment Range Auto or Hand Reset		Time Delay Trip — Open Type★			Underload Trip — Open Type★		
				Steel Panel Mounting	Insulating Panel Mounting		Steel Panel Mounting	Insulating Panel Mounting	
AC	DC	AC	DC	Type	Type	Price	Type	Type	Price
.38 .48 .54 .70	.47 .60 .67 .87	.19-.38 .24-.48 .27-.54 .35-.70	.18-.35 .23-.45 .25-.50 .32-.64	AO 101 AO 102 AO 103 AO 104		$106. 106. 106. 106.	BO 101 BO 102 BO 103 BO 104		$154. 154. 154. 154.
.74 1.04 1.4 2.0	.92 1.30 1.75 2.5	.37-.74 .52-1.04 .7-1.4 1.0-2.0	.34-.68 .48-.96 .65-1.3 .93-1.8	AO 105 AO 106 AO 107 AO 108		106. 106. 106. 106.	BO 105 BO 106 BO 107 BO 108		154. 154. 154. 154.
3.2 4.0 4.8 7.0	4.0 5.0 6.0 8.7	1.6-3.2 2.0-4.0 2.4-4.8 3.5-7.0	1.5-3.0 1.8-3.7 2.2-4.5 3.3-6.5	AO 109 AO 110 AO 111 AO 112		106. 106. 106. 106.	BO 109 BO 110 BO 111 BO 112		154. 154. 154. 154.
8.0 10. 12. 20.	10.0 12.5 15. 25.	4.0-8.0 5.0-10. 6.-12. 10.-20.	3.7-7.5 4.7-9.3 5.6-11.1 9.3-18.6	AO 113 AO 114 AO 115 AO 116		106. 106. 106. 106.	BO 113 BO 114 BO 115 BO 116		154. 154. 154. 154.
32 48 60	40 60 75	16.-32. 24.-48. 30.-60.	15.-30. 22.-45. 28.-56.	AO 117R AO 118R AO 119R	AO 167R AO 168R AO 169R	106. 106. 106.	BO 117R BO 118R BO 119R	BO 167R BO 168R BO 169R	154. 154. 154.
80 120 160	100 150 200	40.-80. 60.-120. 80.-160.	37.-75. 56.-110. 75.-150.	AO 120R AO 121R AO 122R	AO 170R AO 171R AO 172R	120. 120. 178.	BO 120R BO 121R BO 122R	BO 170R BO 171R BO 172R	168. 168. 226.
210 320	260 400	107.-210. 160.-320.	100.-195. 150.-300.	AO 123R AO 124R	AO 173R AO 174R	178. 192.	BO 123R BO 124R	BO 173R BO 174R	226. 240.
420 640	525 800	210.-420. 320.-640.	200.-400. 300.-600.	AO 125R AO 126R	AO 175R‡ AO 176R‡	259. 326.	BO 125R BO 126R	BO 175R‡ BO 176R‡	308. 374.

FOR ENCLOSED VERSIONS, CONSULT LOCAL SQUARE D FIELD OFFICE.

★Relays, rated 32 amperes and above, have both coil terminals on the right hand side as standard. Relays with right hand coil terminals can be field converted to the left hand side. Relays with left hand coil terminals can be ordered from the factory by changing the "R" in the type number to "L". Example: Class 9055 Type AO 117L.

‡DC continuous ratings shown for these relays apply when coil terminals are front connected with suitable lugs. When back connected, dc ratings of Types 175 and 176 are 420 and 640 amperes, respectively.

ORDERING INFORMATION REQUIRED
1. Class and type number.
2. Any special features required.

CONTACT RATINGS — Page 424.
FACTORY MODIFICATIONS AND FORMS — Page 424.
DIMENSIONS — Page 424.
SERVICE BULLETIN — 260AS (Type A)
— 262AS (Type B)

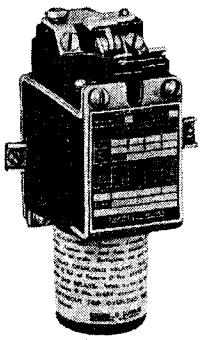
SQD SLV_001200

MAGNETIC CURRENT RELAYS

TYPE N

CLASS 9055

Instantaneous Trip Type N magnetic current relays are used to detect a specific value of current, accompanied by the instantaneous opening or closing of a control circuit contact. Normally closed (SPST) contact is supplied as standard; normally open (SPST) contact is available as Form Y44. For best results select a relay such that the desired trip current setting will be approximately at the midpoint of the adjustment range or less.



Type NO 107

General — Instantaneous Trip Type N relays provide immediate operation on any current above the trip setting. Dashpot oil is not used. Relays with this feature are often used for baler control, where it is necessary to stop the motor when its current reaches a value corresponding to the required baling pressure. Type N relays are also used to stop conveyors when a jam occurs.

Design of control circuits using Type N relays must take into consideration the fact that the Type N will operate during motor acceleration, and the contacts must be bypassed during this period.

Type N relays should be wired so that tripping disconnects the load current. Use Underload Trip Type B relays (Page 422) if relay is to remain energized after tripping.

MAXIMUM VOLTAGE RATINGS

Type	AC▲ Maximum **Coil** Voltage	AC▲ Maximum **Contact** Voltage	DC Maximum **Coil** Voltage	DC Maximum **Contact** Voltage
N	600	600	600	250

▲60 hertz maximum.

Coil Terminals — Pressure wire connectors are furnished on coils rated at 20 amperes ac or less with one terminal on each side of the coil. On larger devices both coil terminals are on the right hand side as standard, and can be field converted to the left hand side if desired. Steel panel mounting relay coils have solderless lugs. Insulating panel mounting relay coils have no lugs.

Automatic Reset — Standard feature on Type N relays. Hand reset (Form HR) is available for use in special circuits.

Adjustable Trip Current — over a 2:1 adjustment range; setting at about midpoint or less is recommended.

Reset Point — Type N relays reset at approximately 80% of the trip current setting on ac, and approximately 67% on dc.

Maximum Continuous Current◐		Trip Current Adjustment Range **Auto Reset**◐		Trip Current Adjustment Range **Hand Reset**◐		**Instantaneous Trip**		
						Open Type★		
AC	DC	AC	DC	AC	DC	Steel Panel Mounting Type	Insulating Panel Mounting Type	Price
.38	.47	.26-.54	.27-.60	.17-.34	.21-.41	NO 101		$120.
.48	.60	.33-.69	.35-.76	.22-.44	.26-.53	NO 102		120.
.54	.67	.36-.76	.38-.84	.24-.48	.29-.58	NO 103		120.
.70	.87	.47-.98	.5-1.1	.31-.62	.38-.75	NO 104		120.
.74	.92	.5-1.1	.53-1.2	.33-.65	.4-.8	NO 105		120.
1.04	1.30	.7-1.5	.75-1.6	.46-.92	.56-1.12	NO 106		120.
1.4	1.75	.9-2.0	1.0-2.2	.62-1.24	.75-1.5	NO 107		120.
2.0	2.5	1.4-2.9	1.5-3.1	.9-1.8	1.1-2.2	NO 108		120.
3.2	4.0	2.2-4.6	2.3-5.0	1.45-2.9	1.75-3.5	NO 109		120.
4.0	5.0	2.8-5.8	2.9-6.2	1.8-3.6	2.2-4.4	NO 110		120.
4.8	6.0	3.3-7.0	3.5-7.5	2.1-4.3	2.6-5.2	NO 111		120.
7.0	8.7	4.8-10.	5.0-11.	3.1-6.2	3.8-7.6	NO 112		120.
8.0	10.0	5.6-11.6	5.8-12.4	3.6-7.2	4.4-8.8	NO 113		120.
10.	12.5	7.0-14.5	7.3-15.5	4.5-9.0	5.4-10.8	NO 114		120.
12.	15.	8.4-17.5	8.8-18.7	5.4-10.8	6.5-13.	NO 115		120.
20.	25.	14.-29.	15.-32.	9.-18.	11.-22.	NO 116		120.
32	40	23.-47.	24.-50.	14.-29.	18.-35.	NO 117R	NO 167R	120.
48	60	34.-69.	35.-74.	21.-43.	26.-52.	NO 118R	NO 168R	120.
60	75	40.-83.	42.-92.	26.-52.	32.-64.	NO 119R	NO 169R	120.
80	100	56.-117.	59.-125.	36.-72.	44.-88.	NO 120R	NO 170R	134.
120	150	82.-170.	85.-182.	52.-104.	64.-128.	NO 121R	NO 171R	134.
160	200	110.-220.	115.-230.	72.-144.	88.-176.	NO 122R	NO 172R	192.
210	260	147.-286.	152.-292.	96.-192.	117.-234.	NO 123R	NO 173R	192.
320	400	230.-470.	230.-540.	144.-287.	175.-350.	NO 124R	NO 174R	206.
420	525	290.-610.	308.-674.	191.-383.	233.-466.	NO 125R	NO 175R‡	274.
640	800	435.-915.	480.-950.	287.-575.	350.-700.	NO 126R	NO 176R‡	340.

FOR ENCLOSED VERSIONS, CONSULT LOCAL SQUARE D FIELD OFFICE.

◐These relays should normally be adjusted to trip at a current value less than the listed maximum continuous current. In special applications requiring the use of a higher trip setting, care should be taken that the coil is not subjected to current in excess of its maximum continuous rating for any prolonged period.

★Relays, rated 32 amperes and above, have both coil terminals on the right hand side as standard. Relays with right hand coil terminals can be field converted to the left hand side. Relays with left hand coil terminals can be ordered from the factory by changing the "R" in the type number to "L". Example: Class 9055 Type NO 117L.

‡DC continuous current ratings shown for these relays apply when coil terminals are front connected with suitable lugs. When back connected dc ratings of Types NO 175R and NO 176R are 420 and 640 amperes, respectively.

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Any special features required.

CONTACT RATINGS — Page 424.
FACTORY MODIFICATIONS AND FORMS — Page 424.
DIMENSIONS — Page 424.
SERVICE BULLETIN — 261AS

SQD SLV_001201

MAGNETIC CURRENT RELAYS

FACTORY MODIFICATIONS AND FORMS, APPLICATION DATA & DIMENSIONS

CLASS 9055

FACTORY MODIFICATIONS AND FORMS

Description of Special Features	Form Letters	Price Addition (Per Relay) Type A	Type B	Type N
Hand reset:				
On open type relay	HR	$10.	....	$10.
Substitute normally open contact for normally closed	Y44	10.	....	10.
Set trip point at factory (specify ampere setting and whether ac or dc)	Y93	24.	$24.	24.
Substitute silicone dashpot oil to provide more accurate tripping time under varying ambient temperatures:				
For normal acceleration time: For Type A relay specify Type R11 oil	....	6.	....	....
For Type B relay specify Type R12 oil	....	....	6.	....
For long acceleration time: For Type A or Type B relay specify Type R10 oil. (Trip setting below midpoint of adjustment range is recommended)	....	6.	6.	....

ACCESSORIES

Description	Type	Price
Dashpot locking strap. (Supplied as standard on Type N. Recommended on all types when subject to vibration.)	Y10	N.C.
Mounting Bracket (Allows types 101 thru 121 to be mounted from the front of panel	Y66	N.C.

RECOMMENDED MINIMUM HORSEPOWER RATINGS

To avoid excessive voltage drop which may be encountered when using these magnetic relays with small motors, the following minimum horsepowers are recommended.

Motor Type	Minimum HP
3-Phase	1½
1-Phase	½

ADDITIONAL DASHPOT OIL (Order by Class and Type Number)

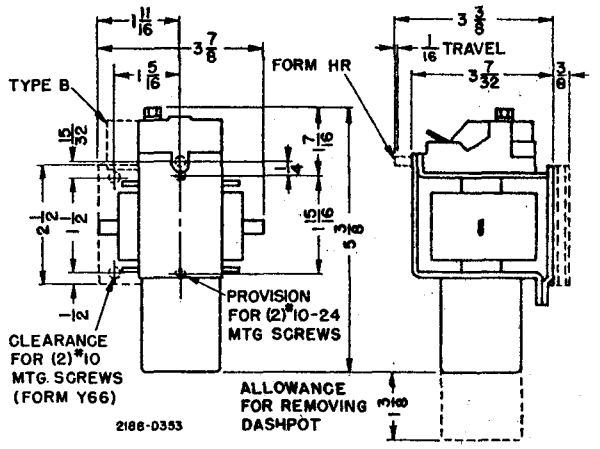
1 Oz. Bottle (Sufficient for One Relay)		1 Pint Container		1 Quart Container		1 Gallon Container	
Type	Price	Type	Price	Type	Price	Type	Price
R2U★	$3.	R2P	$12.	R2Q	$20.	R2G	$ 50.
R4U‡	3.	R4P	12.	R4Q	20.	R4G	50.
R10U	9.	R10P	72.	R10Q	120.	R10G	380.
R11U	9.	R11P	72.	R11Q	120.	R11G	380.
R12U	9.	R12P	72.	R12Q	120.	R12G	380.

★Supplied as standard with Type A relays.
‡Supplied as standard with Type B relays.

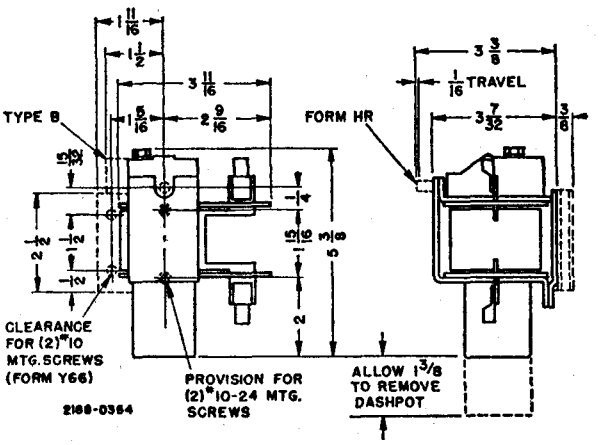
MAXIMUM CURRENT RATINGS FOR CONTROL CIRCUIT CONTACTS

Relay Type	Contact Arrangement	AC Volts	AC Inductive 35% Power Factor Make Amps.	AC Inductive 35% Power Factor Make VA	AC Inductive 35% Power Factor Break Amps.	AC Inductive 35% Power Factor Break VA	AC Inductive 35% Power Factor Continuous Amperes	AC Resistive 75% P. F. Make, Break and Continuous Amperes	DC Volts	DC Inductive and Resistive Make and Break Amps.	DC Inductive and Resistive Make and Break VA	DC Inductive and Resistive Cont. Amps.
A, N	(Standard) or (Form Y44)	120	60	7200	6	720	10	10	125	.8	100	10
		240	30	7200	3	720	10	10	250	.4	100	10
		480	15	7200	1.5	720	10	10	....	....	....	....
		600	12	7200	1.2	720	10	10	....	....	....	....
B		120	60	7200	6	720	15	15	....	....	....	....
		240	30	7200	3	720	15	15	....	....	....	....
		480	15	7200	1.5	720	15	15	....	....	....	....

APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS



Types AO-101 thru 116, BO-101 thru 116, NO-101 thru 116
Weight — 4 Lbs.



Types AO-117R thru 121R, BO-117R thru 121R, NO-117R thru 121R
Weight — 4 Lbs.

NOTE—Only right hand versions are shown. Dimensions also apply to left hand versions, except that all parts are assembled opposite to position shown. Dimensions to left and right of vertical centerline, therefore, would be reversed.

SQD SLV_001202

THERMAL OVERLOAD RELAYS

HAND RESET MELTING ALLOY

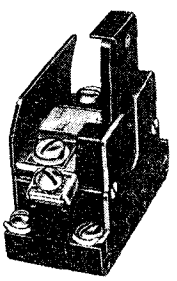
CLASS 9065

- EXCLUSIVE ONE-PIECE THERMAL UNIT
- TRIP FREE RESET MECHANISM ON TYPES F, G & S
- INVERSE TIME DELAY TRIP
- REPLACEABLE CONTACT UNITS ON TYPES F, G & S
- ALARM CONTACT AVAILABLE

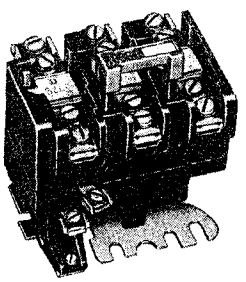
FOR SEPARATE MOUNTING — **600 VOLTS MAX. — AC or DC★**

Size	Maximum Full Load Current (Amperes)	General Purpose Enclosure **NEMA Type 1** Type	Price∗	**Open Type** for Separate Panel Mounting Left Hand Type	Right Hand Type	Price∗	For Terminal Block Channel Mounting Order Open Type Relay and Bracket Kit Below Type	Price	Number of Thermal Units Required
SINGLE POLE CONSTRUCTION (ONE N.C. CONTACT)									
1	25	.....	....	CO-1	CO-1R	**$ 18.**	LM-1	**$ 6.**	
2	45	.....	....	TO-1		**26.**	LM-1	**6.**	
3	86	.....	....	UO-1		**34.**	.....	.....	1
4	133	.....	....	FO-1L	FO-1R	**54.**	.....	.....	
5	266	.....	....	GO-11L	GO-11R	**218.**	.....	.....	
THREE POLE CONSTRUCTION (ONE COMMON N.C. CONTACT ON TYPE S ONLY)									
1	26	SEG-5	**$ .68.**	SEO-5		**$ 36.**	SM-2	**$10.**	
2	45	SEG-8	**104.**	SEO-8		**52.**	SM-2	**10.**	
3	86	SEG-12	**120.**	SEO-12		**68.**	.....	.....	3
4	133	SEG-15	**252.**	SEO-15		**108.**	.....	.....	
5	266	GG-13	**814.**	Use 3 Type GO-11R Relays Listed Above			.....	.....	3

Slow trip (Class 30) and quick trip (Class 10) melting alloy thermal units are available for all Size 1, 2, 5 and 6 and some Size 3 and 4 applications. See page 467 or Consult Local Square D Field Office.



Type CO-1R



Type SEO-5

TO REPLACE AN OVERLOAD RELAY ON AN EXISTING STARTER

Locate **Class 8536** Starter in this Column: NEMA Size	Type	Series	Number of Poles	Order **Class 9065** Overload Relay from this Column: Left Hand Type	Right Hand Type	Price∗	Number of Thermal Units Req.
00	A	B & C	2	AO-4		**$ 24.**	1
			3	AO-5		**42.**	3
	B	A	2-4†	CO-1	CO-1R	**18.**	1
0	SB	A	2	SDO-4		**24.**	1
			3-5	SDO-5		**42.**	3▲
	C	A & B	2-4†	CO-1	CO-1R	**18.**	1
1	SC	A	2	SDO-4		**24.**	1
			3-5	SDO-5		**42.**	3▲
1P	SC	A	2	SDO-10		**32.**	1
	D	A	2-4†	TO-1		**26.**	1
2	SD	A	2	SDO-7		**32.**	1
			3-5	SDO-8		**58.**	3▲
	E	A	2-4†	UO-1		**34.**	1
3	SE	A	2	SDO-11		**40.**	1
			3	SDO-12		**74.**	3
			4	SDO-13		**74.**	2
			5	SDO-14		**74.**	3
	F	C	2-4†	FO-1L	FO-1R	**54.**	1
4	SF	A	3	SDO-15		**116.**	3
			4	SDO-16		**116.**	2
			5	SDO-17		**116.**	3
5	G	B	2-4†	GO-1L	GO-1R	**218.**	1
		C	2-4†	GO-11L	GO-11R	**218.**	1
	SG	A	3‡	SDO-18		**218.**	1
6	H	A, B & C	3	SEO-5		**36.**	3
	SH	A	3	SEO-5		**36.**	3
7	J	A & B	3	SEO-5		**36.**	3
8	K	A & B	3	SEO-5		**36.**	3

★Maximum power circuit rating for separate mounting overload relays, Types C, F, G, T and U, is 600 volts ac or dc; Type S is 600 volts ac only. Maximum control circuit contact rating for Types C, F, G, T, U and SDO-18 is 600 volts ac and 250 volts dc; the remaining Type S versions are 600 volts ac only.

∗**Prices do not include thermal units. For selection, see below.**

†3 and 4 pole starters use one L.H. and one R.H. relay. 2 pole starters use one L.H. relay.

‡Type S Size 5 starters use three Type SDO-18 overload relays per starter.

▲For 4-pole starters used on two phase systems order 2 thermal units plus one Class 9998 Type SO-31 jumper strap kit for every two starters. Each kit includes two jumper straps.

SPECIAL FEATURES — MELTING ALLOY TYPES	Form	Price
Substitute 1-N.O. alarm contact and 1-N.C. contact for standard N.C. contact per relay. (Type S only)	Y34-2	**$16.**
Modify Type U relay to accept Type FB quick trip or SB slow trip thermal units. (Accepts Type C standard trip)	Y21	N.C.
Modify Type SDO-12 relays to accept Type FB quick trip or SB slow trip thermal units, and Type F and Type SDO-15 relays to accept Type FB quick trip thermal units. (Rejects Type CC standard trip units)	Y81	N.C.

ORDERING INFORMATION REQUIRED

1. Class and type number of relay.
2. Any special features required.

THERMAL UNITS

Thermal units should be ordered separately. See Selection Index on page 466.
Standard trip thermal units are priced at **$6.00** each (D1A Discount).

CONTACT RATINGS — Page 427
REPLACEMENT CONTACT UNITS — Class 9998, Page 450
DIMENSIONS — Page 427
EXTERNAL RESET MECHANISMS — Class 9066, Page 427

SQD SLV_001203

THERMAL OVERLOAD RELAYS

AUTOMATIC RESET AND AMBIENT TEMPERATURE-COMPENSATED BIMETALLIC

CLASS 9065

- AUTOMATIC RESET/HAND RESET
- ADJUSTABLE TRIP CURRENT
- TRIP FREE RESET MECHANISM
- AMBIENT TEMPERATURE-COMPENSATED VERSIONS
- SPDT CONTROL CIRCUIT CONTACTS ON TYPE S, SIZES 1, 2, 6, 7 & 8 STARTERS

FOR SEPARATE MOUNTING — **600 VOLTS MAX. — AC or DC★**

Description	Size	Maximum Full Load Current (Amperes)	General Purpose Enclosure **NEMA Type 1** Type	General Purpose Enclosure **NEMA Type 1** Price∗	**Open Type** for Separate Panel Mounting Left Hand Type	**Open Type** for Separate Panel Mounting Right Hand Type	**Open Type** for Separate Panel Mounting Price∗	For Terminal Block Channel Mounting Order Open Type Relay and Bracket Kit Below Type	For Terminal Block Channel Mounting Order Open Type Relay and Bracket Kit Below Price	Number of Thermal Units Required
SINGLE POLE CONSTRUCTION (ONE N.C. CONTACT)										
Non-Compensated	1	25	....	....	ARO-1L	ARO-1R	$ 18.	LB-1	$6.	1
	2	45	....	....	ATO-1L	ATO-1R	26.	LB-1	6.	
	3	86	....	....	AUO-1L	AUO-1R	34.	.....	....	
	4	133	....	....	AFO-1L	AFO-1R	54.	.....	....	
	5	266	....	....	AGO-1L	AGO-1R	218.	.....	....	
THREE POLE CONSTRUCTION (ONE COMMON SPDT CONTACT)										
Non-Compensated	Single Phase 1	26	SEG-5B1	$ 68.	SEO-5B1		$36.	SM-2	$10.	2
	Single Phase 2	45	SEG-8B1	104.	SEO-8B1		52.	SM-2	10.	
	Poly-Phase 1	26	SEG-6B2	68.	SEO-6B2		36.	SM-2	10.	
	Poly-Phase 2	45	SEG-9B2	104.	SEO-9B2		52.	SM-2	10.	3
Ambient Temperature-Compensated	1	26	SEG-6B	76.	SEO-6B		44.	SM-2	10.	3
	2	45	SEG-9B	112.	SEO-9B		60.	SM-2	10.	

TO REPLACE AN OVERLOAD RELAY ON AN EXISTING STARTER

Locate Class 8536 Starter in this Column: NEMA Size	Type	Series	Number of Poles	Form	Order Class 9065 Overload Relay from this Column: Left Hand Type	Right Hand Type	Price∗	Number of Thermal Units Required
	BA	A	2-4†	....	ARO-1L	ARO-1R	$18.	1
0	SB	A & B	Any	B▲	SDO-6B		62.	3
				B1▲	SDO-5B1		54.	2
				B2▲	SDO-6B2		54.	3
	CA	A & B	2-4†	....	ARO-1L	ARO-1R	18.	1
1	SC	A & B	Any	B▲	SDO-6B		62.	3
				B1▲	SDO-5B1		54.	2
				B2▲	SDO-6B2		54.	3
	DA	All	2-4†	....	ATO-1L	ATO-1R	26.	1
2	SD	A	Any	B▲	SDO-9B		86.	3
				B1▲	SDO-8B1		78.	2
				B2▲	SDO-9B2		78.	3
	EA	All	2-4†	....	AUO-1L	AUO-1R	34.	1
3	SE	A	Any	B3◐	AUO-1L		34.	1
				B4◐	AUO-1L		34.	1
				B5◐	SAUO-1L		46.	1
			3	Y59◐	26005-11000		68.	1
4	FA	C	2-4†	....	AFO-1L	AFO-1R	54.	1
	SF	A	Any	B5◐	SAFO-1L		66.	1
			3	Y59◐	26005-11500		86.	1
	GA	B	2-4†	....	AGO-1L	AGO-1R	218.	1
5	SG	A	3	B	SEO-6B		44.	3
				B5	SAGO-1L	SAGO-1R	230.	1
					SAGO-1C‡		230.	1
6	HA	B & C	3	B	SEO-6B		44.	3
	SH	A		B2	SEO-6B2		36.	3
7	J	B	3	B	SEO-6B		44.	3
				B2	SEO-6B2		36.	3
8	KA	B	3	B	SEO-6B		44.	3
				B2	SEO-6B2		36.	3

★Maximum power contact rating for separate mounting overload relays, Types AF, AG, AR, AT and AU, is 600 volts ac or dc; Type S is 600 volts ac only. Maximum control circuit contact rating for Types AF, AG, AR, AT, AU, SAF, SAG, and SAU is 600 volts ac and 250 volts dc; the remaining Type S versions are 600 volts ac only.

∗**Prices do not include thermal units. For selection, see below.**

†3 and 4 pole starters use one L. H. and one R. H. relay. 2 pole starters use one L. H. relay only.

▲B indicates ambient temperature-compensated bimetallic overload relay (requires 3 thermal units).
B1 indicates single phase bimetallic overload (requires 2 thermal units).
B2 indicates polyphase bimetallic overload (requires 3 thermal units).

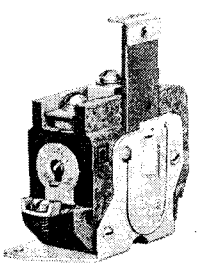
◐Form B3 uses 2 overload relay blocks.
Form B4 uses 3 overload relay blocks.
Form B5 uses 1 overload relay block per phase.
Form Y59 uses 3 overload relay blocks.

‡Class 9065 Type SAGO-1C is the replacement center overload relay for Class 8536 Type SG Form B5 starters.

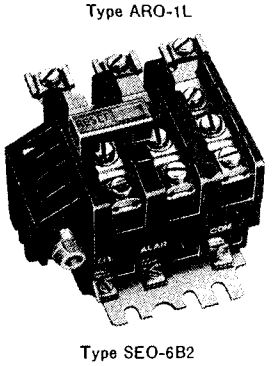
NOTE: Ambient temperature-compensated overload relays are identified by a red adjustment knob.

Bimetallic overload relays are shipped from the factory in the hand reset mode to prevent hazards which could result from an unexpected automatic reset. Reset is field convertible from hand to automatic or vice versa.

Bimetallic overload relays are provided with an adjustment lever or knob which allows the trip current rating to be adjusted from 85% to 115% of its nominal value.



Type ARO-1L



Type SEO-6B2

CONTACT RATINGS — Page 427
DIMENSIONS — Page 427
EXTERNAL RESET MECHANISMS — Class 9066, Page 427

THERMAL UNITS
Thermal units should be ordered separately. See Selection Index on page 464. Standard trip thermal units are priced at **$6.00** ea. (D1A Discount).

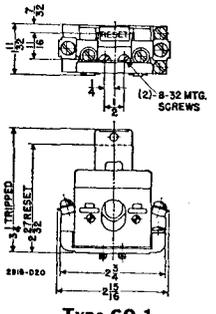
SQD SLV_001204

RATINGS FOR CONTROL CIRCUIT CONTACTS

AC — 50 or 60 Hz.						DC			
Type	Volts (Minimum of 110 volts is recommended)	Inductive 35% Power Factor				Type	Form	Volts	Inductive and Resistive
		Make		Break					Make and Break Amperes
		Amps.	VA	Amps.	VA				
AF, AG, AO, AR, AT, AU C, F, G, T▲, U▲, SG (Form Y34) SAF, SAG, SAU, SDO-18 (NEMA A600 AC Ratings)	120 240 480 600	60 30 15 12	7200 7200 7200 7200	6 3 1.5 1.2	720 720 720 720	AF, AG, AR, AT, AU, SAF, SAG, SAU	Std.	125	.55
SD & SE (Sizes 0-4 & 6-8) T (Form Y34) U (Form Y34) Class 9998 Type SO-1 and SO-2 and Class 9999 Type SO-4 Contact Modules (NEMA B600 AC Ratings)	120 240 480 600	30 15 7.5 6.0	3600 3600 3600 3600	3 1.5 .75 .6	360 350 360 360	C, GO-1, T, U	Std. or Y34	125 250	1.1 .55
						F GO-11 SDO-18	Std.	125 250	.55 .27
							Y34	125	.22
						AO SD & SW (Sizes 0-4 & 6-8)	Std. or Y34	....	....
						SD & SE (Sizes 0-4 & 6-8)	Y34-2	125	.22
						Class 9999 Type SO-4	Std.		

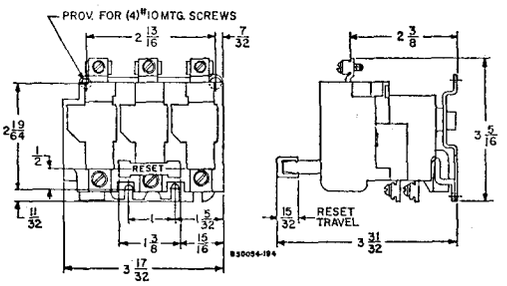
▲Except Form Y34.

APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS

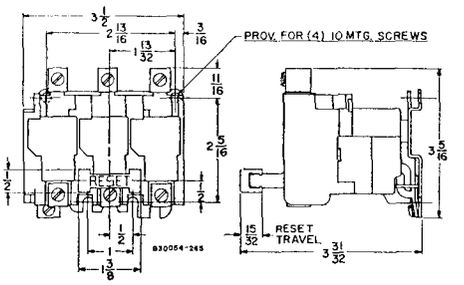


Type CO-1
Weight — ½ Lb.

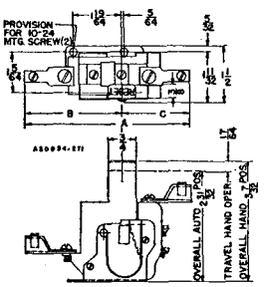
MELTING ALLOY TYPE



Type SEO-5
Weight — 1 Lb.

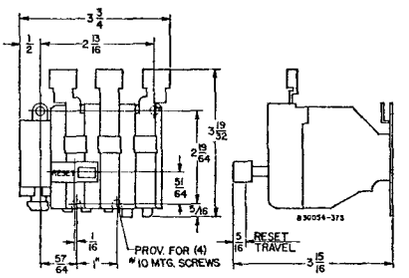


Type SEO-8
Weight — 1¼ Lbs.

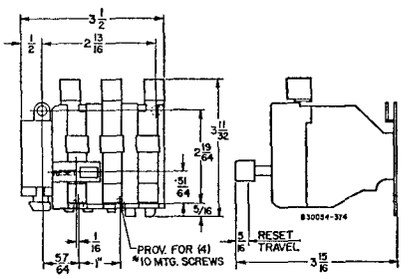


Type	Dimension			Weight (Lbs.)
	A	B	C	
ARO-1L	2⅞	1⅝	1¼	½
ATO-1L	4⅛	2½	1⅝	¾

BIMETALLIC TYPE



Type SEO-5B1, SEO-6B and SEO-6B2
Weight — 1 Lb.



Type SEO-8B1, SEO-9B and SEO-9B2
Weight — 1¼ Lbs.

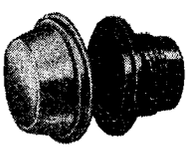
EXTERNAL RESET MECHANISMS

CLASS 9066

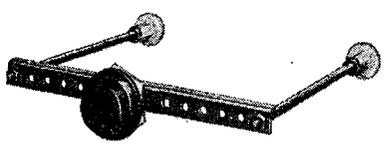
Reset mechanism to be used with magnetic starters and 9065 overload relays.

Type of Enclosure	Reset Mechanism Kit		
	Description	Type	Price
NEMA 1, 12	With 1 Rod With 2 Rods With 3 Rods	RA-1 RA-2 RA-3	**$16.** **20.** **14.**
NEMA 1, 12	Size 0 and 1* Size 2*	RB-1 RB-2	**12.** **12.**
NEMA 4	Use Type RA Kit above and W-1 Kit	W-1	**8.**
NEMA 1	Size 0 and 1▲ Size 2▲ Size 3▲	SC-1 SD-1 SE-1	**2.** **3.** **4.**

*For replacement on Type S Combination Starters NEMA 1, 4 and 12.
▲For replacement on 8536 Type S Starters.



Class 9066 Type W-1



Class 9066 Type RA-2

ORDERING INFORMATION REQUIRED — Class and type number

SQD SLV_001205

MACHINE TOOL CONTROL TRANSFORMERS

TYPE E

CLASS 9070

These Machine Tool control transformers are specifically designed to handle high inrush currents associated with contactors and relays.

- component recognition.
- Approval.
- Copper windings.
- Superior voltage regulation.
- 55°C rise maximum.

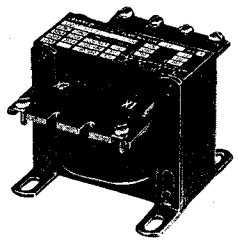


TABLE 1

240/480-120		230/460-115	220/440-110	60/50 Hz		
Continuous VA			Price Each			
			Order Quantity			
60 Hz	50 Hz	Type	1-4	5-24	25-99	100-Up
25	25	EO-17	$ 18.30	$ 15.80	$ 15.00	$ 13.70
50	35	EO-1	23.40	19.40	18.60	16.60
75	75	EO-18	29.20	24.00	23.00	19.40
100	70	EO-2	31.20	26.00	24.60	22.00
150	120	EO-3	36.00	30.20	28.60	26.40
200	200	EO-19	41.40	39.20	34.40	31.40
250	200	EO-15	53.00	45.20	43.00	37.80
300	240	EO-4	57.20	46.80	45.00	41.00
350	280	EO-16	62.00	52.50	50.00	45.50
500	400	EO-51	70.00	64.50	61.00	55.00
750	500	EO-61	89.00	84.50	81.00	78.00
1000	900	EO-71	109.00	104.50	100.00	95.50
1500	1300	EO-81	183.00	181.00	174.00	166.00
2000	1800	EO-91	222.00	212.00	208.00	204.00
3000	3000	EO-10	322.00	322.00	322.00	322.00
5000	5000	EO-11	480.00	480.00	480.00	480.00

TABLE 2

240/480-24		60/50 Hz				
Continuous VA			Price Each			
			Order Quantity			
60 Hz	50 Hz	Type	1-4	5-24	25-99	100-Up
25	25	EO-17	$ 42.10	$ 22.50	$ 18.30	$ 15.30
50	35	EO-1	44.60	25.90	22.60	19.00
75	75	EO-18	52.20	32.10	28.10	23.40
100	70	EO-2	53.20	35.30	30.50	25.50
150	120	EO-3	64.30	41.20	36.60	30.50
200	200	EO-19	80.40	51.20	45.80	37.90
250	200	EO-15	87.00	67.30	58.80	49.70
300	240	EO-4	92.50	70.30	63.80	52.70
350	280	EO-16	99.60	72.40	68.30	57.30
500	400	EO-51	107.10	76.90	74.90	63.30
750	500	EO-61	126.70	102.60	98.00	88.50
1000	900	EO-71	155.20	126.90	121.00	108.40

TABLE 3

Special Voltages							
Continuous VA				Price Each			
				Order Quantity			
60 Hz	50 Hz	Min. Volts	Type	1-4	5-24	25-99	100-Up
25	25	4	EO-17	$ 35.20	$ 21.40	$ 17.00	$ 14.30
50	35	6	EO-1	46.40	24.60	21.60	17.70
75	75	9	EO-18	50.00	30.60	26.20	21.60
100	70	12	EO-2	51.50	33.40	28.60	23.40
150	120	12	EO-3	56.50	37.80	34.40	28.20
200	200	12	EO-19	67.50	46.80	42.60	34.80
250	200	12	EO-15	73.50	57.00	50.50	41.80
300	240	18	EO-4	80.00	61.50	58.00	50.50
350	280	24	EO-16	85.00	64.00	62.50	54.50
500	400	24	EO-51	90.50	71.00	69.50	59.50
750	500	24	EO-61	107.00	93.50	91.00	83.50
1000	900	24	EO-71	129.50	111.50	111.00	100.50
1500	1300	24	EO-81	217.00	197.00	192.00	176.00
2000	1800	48	EO-91	246.00	227.00	223.00	214.00
3000	3000	45	EO-10	357.00	357.00	357.00	357.00
5000	5000	60	EO-11	533.00	533.00	533.00	533.00

SPECIAL TRANSFORMER PRICING

To order Type EO transformers not shown in Table 1 or Table 2, refer to procedure shown below:

A. **SINGLE VOLTAGE RATINGS** — Primary and Secondary

1. 90 V. through 600 V. — Use prices from Table 3.
2. 89 V. or less — Multiply the price from Table 3 by one of the following factors:

VOLTAGE	FACTOR
89 V. - 50 V.	1.1
49 V. - 24 V.	1.2
23 V. to Min. V	1.3

OTHERS — Consult local Square D field office for:

1. Dual Voltage Windings
2. Taps — Rated or Reduced VA
3. 25 Hertz

ORDERING INFORMATION NEEDED

Class, Type, VA Rating, Voltage, Hertz and Fuse Block.

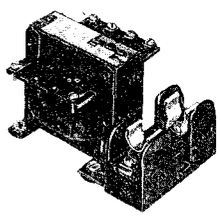
SQD SLV_001206

MACHINE TOOL CONTROL TRANSFORMERS
DIMENSIONS AND ACCESSORIES

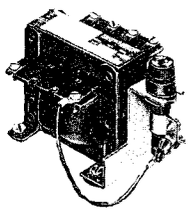
CLASS 9070

SEPARATE NEMA 1 ENCLOSURES FOR TRANSFORMERS — CLASS 9991

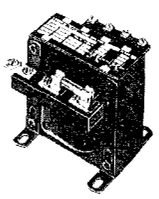
Class 9991 Type	For Use With	Price
TB-1	EO-1, EO-17	**$28.**
TB-2	EO-2, EO-3, EO-4, EO-15, EO-16, EO-18, EO-19	**36.**
TB-3	EO-51, EO-61	**60.**
TB-4	EO-71	**90.**
TB-5	EO-81, EO-91	**90.**



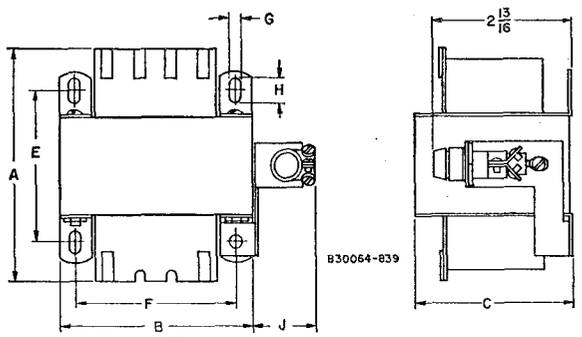
Transformer with Type AP-1



Transformer with Type AP-2



Transformer with Type AP-3



SECONDARY FUSE PROTECTION*

Type	Use On Type E Size (VA).	List Price Each — Order Quantity 1-4	5-24	25-99	100-Up
AP-1	Up to 350▲	**$9.72**	**$9.72**	**$9.72**	**$9.72**
AP-2	Up to 350	**9.72**	**9.72**	**9.72**	**9.72**
AP-3	Up to 150	**2.20**	**2.10**	**1.90**	**1.80**
AP-4	200 to 750	**2.20**	**2.10**	**1.90**	**1.80**

* Not available installed on open type transformers.
▲Above 350VA, use separately mounted Class 9080 Type PF-1 fuse block.

TERMINAL SHORTING BAR KITS

Type	For use on Type E	Qty.	Price
SB-1	25VA to 150VA	100	**$12.00**
SB-2	200VA to 750VA	50	**$10.00**

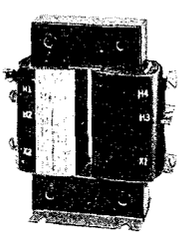
DIMENSIONS AND WEIGHTS

Type	Series	Weight in Pounds	Dimensions A	B	C	E	F	G	H	J (if fuse block used) AP-1	AP-2
EO-17	B	1.9	3 5/16	3	2 1/2	1 3/4	2 1/2	13/64	3/8	1 1/2	1 1/16
EO-1	B	2.2	3 5/16	3	2 1/2	2	2 1/2	13/64	3/8	1 1/2	1 1/16
EO-18	B	3.5	3 25/32	3 3/8	2 13/16	2 3/16	2 13/16	13/64	3/8	1 1/2	1 1/16
EO-2	B	3.8	3 25/32	3 3/8	2 13/16	2 3/8	2 13/16	13/64	3/8	1 1/2	1 1/16
EO-3	B	6.0	4 7/16	3 3/4	3 1/8	2 7/8	3 1/8	13/64	3/8	1 1/2	1 1/16
EO-19	B	7.8	4 13/16	4 1/2	3 3/4	2 1/2	3 3/4	13/64	3/8	1 1/2	1 1/16
EO-15	B	9.2	5 3/16	4 1/2	3 3/4	2 7/8	3 3/4	13/64	3/8	1 1/2	1 1/16
EO-4	B	10.5	5 5/16	4 1/2	3 3/4	3 1/4	3 3/4	13/64	3/8	1 1/2	1 1/16
EO-16	B	13.2	6 3/16	4 1/2	3 3/4	3 13/16	3 3/4	13/64	3/8	1 1/2	1 1/16
EO-51	B	17.2	6 9/16	5 1/4	4 3/8	3 13/16	4 3/8	9/32	13/32	—	—
EO-61	B	24.5	7 15/16	5 1/4	4 3/8	5 1/8	4 3/8	9/32	13/32	—	—
EO-71	B	30.5	7 15/16	6	5	4 3/4	5	9/32	5/8	—	—
EO-81	B	45.0	8 19/32	7 1/16	6 1/32	5 7/8	5 13/16	5/16	1 1/16	—	—
EO-91	B	56.0	9 7/32	7 1/16	6 1/32	6 1/2	5 13/16	5/16	1 1/16	—	—
EO-10	A	72.0	9 7/16	9	7 5/8	5 7/8	7 5/8	7/16	1 1/16	—	—
EO-11	A	115.0	12 1/16	9	7 5/8	8 1/2	7 5/8	7/16	1 1/16	—	—

TYPE G TRANSFORMER KITS

240/480-120 240/480-24 600-120 60/50 Hz

Continuous VA	Used on Class	Type	Price
100	8538	GO-2	**$ 60.**
150	8539	GO-3	**74.**
300		GO-4	**118.**
150	8502 8536	GFT-3	**150.**



AC TO DC SOLID STATE CONVERTER

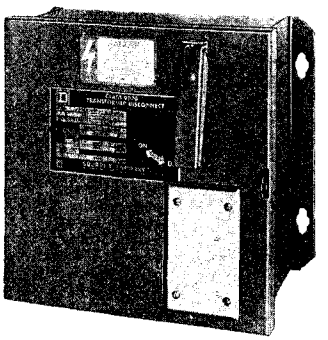
25-450 HERTZ	CLASS 9070		240 VOLTS MAX.	
AC Input	DC Output		Type	Price
Volts	Volts	Max. Amps.		
0—120	0—115	2	HO-1	**$61.06**
121—240	116—230	1	HO-2	**75.60**

SQD SLV_001207

TRANSFORMER DISCONNECTS
TYPE SK

CLASS
9070

Transformer disconnects are designed to mount inside of an enclosure to provide power for lighting when the main disconnect is in the "off" condition. Auxiliary power can also be supplied for a variety of loads such as programmable controllers, small hand tools and portable lights. The standard interior consists of a transformer with a fused, grounded secondary winding and a disconnect switch mechanically interlocked with the enclosure cover when in the "on" position.



Type SK5271-S

TRANSFORMER DISCONNECTS

230/460-115 Volts 60/50 Hertz						
Transformer Continuous VA			Enclosure Size (See Table A)			
60 HZ	50 HZ	Type	Unfused Pri.	Form F30	Form F31	Price
100	70	SK5271-M	1	. . .	1	**$ 246.**
250	200	SK5271-N	1	. . .	1	**290.**
100	70	SK5271-Q	2	2	2	**246.**
250	200	SK5271-R	2	2	2	**290.**
500	400	SK5271-S	2	3	2	**328.**
750	500	SK5271-T	2▲	3	2▲	**390.**
750	500	SK5271-T3	3	. . .	3	**390.**
1000	900	SK5271-U	3	3	3	**548.**
1500	1300	SK5271-V	3	3	3	**618.**
1800	1600	SK5271-W	3	3	3	**700.**
3000	3000	SK5271-X	4	4	. . .	**1182.**

▲Not UL Listed. All other Type designations are UL Listed.

FACTORY MODIFICATIONS

Description	Form	Price Adder
Non-standard voltage transformer (Specify)	. . .	**Add 10%**
Additional fusible circuit on transformer secondary*†	F11	**$16.**
Two primary fuse blocks for 13/16" x 5" fuses* 100 VA — 750 VA 1000 VA — 3000 VA	F30	**50.** **60.**
Two primary fuse blocks for 13/32" x 1 1/2" fuses◐ 100 VA — 750 VA 1000 VA — 1800 VA	F31	**50.** **60.**
Duplex receptacle, cover mounted*	G13	**64.**
GFCI receptacle, Class A GFSR — 120B Feed-Thru cover mounted*	G14	**142.**
Twist-lock receptacle, cover mounted*	G15	**96.**

* Not available on Types M and N
◐ Not available on Type X
† Form F11 not available with Forms G13, G14, G15

TABLE A

DIM.	ENCLOSURE SIZE 1	2	3	4
A	**10.30** 262	**10.80** 274	**14.30** 363	**14.42** 366
B	**2.00** 51	**2.00** 51	**2.33** 60	**3.83** 97
C	**2.65** 67	**6.00** 152	**6.00** 152	**7.00** 178
D	**11.30** 287	**11.80** 300	**15.30** 389	**15.92** 404
E	**7.04** 179	**10.40** 264	**11.05** 281	**13.83** 351
F	**5.79** 147	**6.66** 169	**7.98** 203	**11.66** 296
G	**13.65** 347	**15.00** 380	**20.00** 501	**23.22** 540
H	**1.10** 28	**1.10** 28	**1.10** 28	**.62** 16
I	**.31** 8	**.31** 8	**.31** 8	**.44** 11
J	**1.00** 25	**1.00** 25	**1.00** 25	**1.09** 28

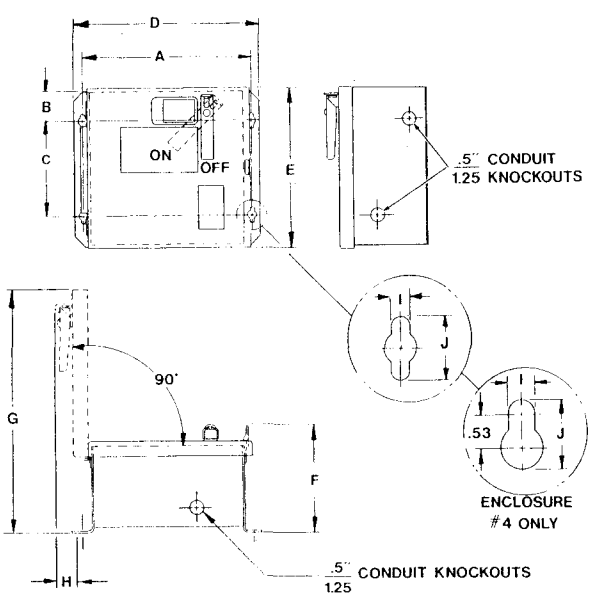


Figure 1

ORDERING INFORMATION REQUIRED

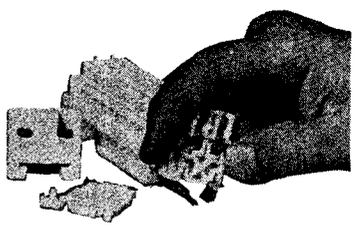
1. Class and type number.
2. Voltage.
3. Any factory modifications required.

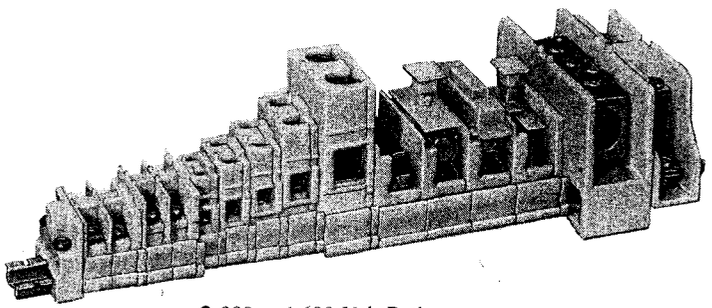
Dual Dimensions: **INCHES** / Millimeters

SQD SLV_001208

TYPE G

Pages 432-436

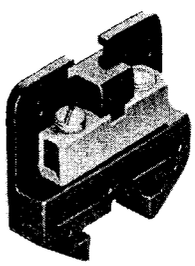




- 300 and 600 Volt Ratings
- UL Component Recognized
- Nylon Material
- Channel Mounted
- Blocks Snap On and Off Channel
- Box Lugs Rated for Copper and Aluminum Wire
- Multiple Conductor Ratings
- High Terminal Density per Foot

TYPE K

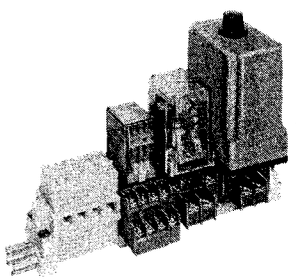
Pages 437-439



- Direct or Channel Mounted 300 Volt
- Channel Mounted 600 Volt
- 300 Volt — Nylon Material
- 600 Volt — Phenolic Material

CHANNEL MOUNTED DEVICES

Page 436



- Terminal Blocks, General Purpose Relays, Overload Relays and Other Devices can be Mounted on 9080 Type GH Channel
- Saves Panel Space and Wiring Time

FUSIBLE TERMINAL BLOCK

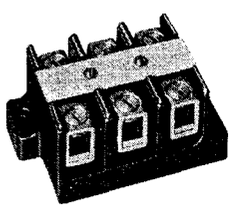
Page 438



- Direct Mounting
- 30 Amp 250 Volt Rating
- Type PF-1 Accepts Class H or K Fuse
- Type PFR-1 Accepts Class R Fuse

UNIT CONSTRUCTION TYPES

Page 439



- 600 Volt Rating
- Single Block Construction
- Solderless Box Lugs, Solder Lugs and Pull-Apart Blocks with Solderless Box Lugs
- Up to 4 Circuits

POWER FUSE HOLDER KITS

Page 54

- 1-200 Amp Rating
- 250 or 600 Volt Rating
- Al/Cu or Copper Only Lugs
- For Classes H, K or R Fuses
- UL Component Recognized, CSA Approved

POWER DISTRIBUTION BLOCKS

Page 54

- #12 — 500 MCM Single or Dual Main Lugs
- #12 — 500 MCM Branch Lugs (1-12 Connections)
- Al/Cu or Copper Only Single Piece Lugs
- 3 Pole
- UL Component Recognized
- 600 Volt Rating

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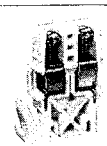
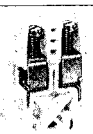
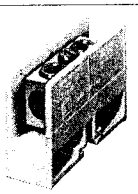
TERMINAL BLOCKS

TYPE G — 300 AND 600 VOLT SECTIONS

CLASS 9080

Terminal Description	Maximum Voltage	Maximum Current◐	Sections			End Barriers†		
			Type	List Price Each	Std. Pack●	Type	List Price Each	Std. Pack●
 Miniature Solderless Box Lug for #22 to #10 AWG wire	300 V	30 A	GM-3	**$ .60**	50	GM-3B	**$.24**	10
 Solderless Box Lug for #22 to #8 AWG wire	300 V	60 A	GB-3	**.74**	50	GB-3B	**.26**	50
 Flat Terminal Connector for #22 to #12 AWG wire Screws are #6-32 x 5/16 inch for Ring or Spade Lugs, 5/16 inch wide maximum.	300 V	20 A	GA-3	**.57**	50	GP-3B	**.24**	10
 Self-Lifting Pressure Wire Connector for #22 to #12 AWG wire	300 V	40 A	GP-3	**.72**	50	GP-3B	**.24**	10
 Solderless Box Lug for #22 to #8 AWG wire	600 V	60 A	GB-6	**.80**	50	GB-6B	**.27**	50
 Solderless Box Lug for #18 to #4 AWG wire	600 V	110 A	GC-6	**1.43**	50	GC-6B	**.38**	10
 Solderless Box Lug for #12 to #1/0 AWG wire.	600 V	180 A	GD-6	**3.12**	10	GD-6B	**.50**	10
 Solderless Box Lug for #6 AWG to 250 MCM wire	600 V	280 A	GE-6	**8.98**	10	None Required		
 Flat Terminal Connector for #22 to #12 AWG wire Screws are #6-32 x 5/16 inch, for Ring or Spade Lugs. 5/16 inch wide maximum.	600 V	20 A	GA-6	**.60**	50	GP-6B	**.30**	10
 Self-Lifting Pressure Wire Connector for #22 to #12 AWG wire.	600 V	40 A	GP-6	**.78**	50	GP-6B	**.30**	10
 Slip-on Connectors for #22 to #12 AWG wire. Tabs accept .250" x .032" Fast-on Connectors.	600 V	20 A	GS-6	**.77**	10	GF-6B	**.44**	10

● Orders must specify standard package quantity or multiples of that quantity.

◐ These maximum current values assume the use of insulated copper conductors with 75°C temperature rating, and are calculated based on NEC Article 310, Table 310-16. In most cases this value is the maximum ampacity of that wire or combination of wires (as listed in the table on page 433) which has the greatest current carrying capacity. The actual maximum allowable current for a particular application is dependent upon the number, size, insulation class and other characteristics of the wires used.

† One end barrier required for each assembly of like sections.

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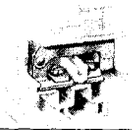
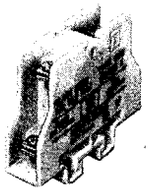
TERMINAL BLOCKS

300 AND 600 VOLT SECTIONS AND WIRE RANGES — TYPE G

CLASS 9080

Terminal Description		Maximum Voltage	Maximum Current◐	Sections Type	Sections List Price Each	Sections Std. Pack●	End Barriers† Type	End Barriers† List Price Each	End Barriers† Std. Pack●
	Fuse Block for $^{13}/_{32}$" Dia. x 1½ ferrule fuse with Self-Lifting Pressure Connectors. Fuse Puller is included as standard. Fuses are **not** included.	600 V	30 A	GF-6	**$3.40**	10	GF-6B	**$.44**	10
	Blown Fuse Indicator/Pullers are neon pilot lights which plug on to the fuse in a standard Type GF-6 Fuse Block.	120-240 V	—	GLP-3	**3.81**	10	None Required		
		277-600 V	—	GLP-6	**3.81**	10			
	Channel mounted thermal — magnetic circuit breaker with solderless box lug. (See Page 436 for circuit breaker application data)	250 VAC 65 VDC	.1 .5 .8 1.0 1.2 1.5 2.0 2.5 3.0 5.0	GCB-01 GCB-05 GCB-08 GCB-10 GCB-12 GCB-15 GCB-20 GCB-25 GCB-30 GCB-50	**15.00** **15.00** **15.00** **15.00** **15.00** **15.00** **18.50** **18.50** **18.50** **18.50**	1 1 1 1 1 1 1 1 1 1	None Required		
		125 VAC 65 VDC	10.0 15.0	GCB-100 GCB-150	**18.50** **18.50**	1 1			
	Circuit Isolating Switch with Self-Lifting Pressure Connectors for #18 to #10 AWG wire. **Note:** Not intended to make or break a live current. Power must be disconnected from the circuit before operation of the switch.	600 V	30 A	GG-6	**3.57**	10	GF-6B	**.44**	10
	Transient Voltage Suppressors with Self-Lifting Pressure Connectors for #18 to #10 AWG wire. Modules have RC circuitry for suppressing transient voltage spikes, generated when opening a coil circuit, to approximately 200% of the peak line voltage.	Used with: All Square D Class 8501 relays and Square D Type S Starters and Contactors Sizes 00-2	120 V	30 A	GT-6	**8.70**	1	None Required		
		All Square D Type S Starters and Contactors Sizes 3-7	120 V	30 A	GU-6	**13.25**	1			

● Orders must specify standard package quantity or multiples of that quantity.

◐ These maximum current values assume the use of insulated copper conductors with 75°C temperature rating, and are calculated based on NEC Article 310, Table 310-16. In most cases this value is the maximum ampacity of that wire or combination of wires (as listed in the table below) which has the greatest current carrying capacity. The actual maximum allowable current for a particular application is dependent upon the number, size, insulation class and other characteristics of the wires used.

† One end barrier required for each assembly of like sections.

Class 9080 Type \ Wire Size	Maximum Allowable Number of Wires★ — Copper AWG 22	20	18	16	14	12	10	8	6	4	2	1	1/0	3/0	4/0	Copper MCM 250	Aluminum AWG 12	10	8	6	4	2	1	1/0	3/0	4/0	Aluminum MCM 250
GA-3	1	1	1	1	1	1																					
GA-6	1	1	1	1	1	1																					
GB-3	10	8	5	4	4	3	1	1																			
GB-6	10	8	5	4	4	3	1	1																			
GC-6			8	6	6	5	4	2	1	1							5	4	2	1	1						
GD-6						7	6	5	3	2	1	1	1				7	6	5	3	2	1	1	1			
GE-6									1	1	1	1	1	1	1	1				5	4	2	1	1	1	1	1
GF-6			4	4	2	1	1																				
GG-6			4	4	2	1	1																				
GM-3	8	5	2	2	1	1	1																				
GP-3	2	2	2	2	2	2																					
GP-6	2	2	2	2	2	2																					
GS-6	2	2	2	2	2	2																					
GT-6			4	4	2	1	1																				
GU-6			4	4	2	1	1																				
GCB				1	1	1	1																				

★ If other combinations are required, contact local Square D field office.

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TERMINAL BLOCKS

TYPE G — ACCESSORIES AND ASSEMBLIES

CLASS 9080

ACCESSORIES

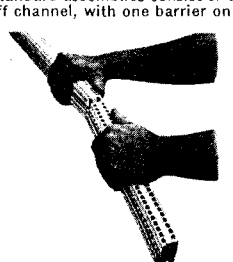
Description	Type	List Price Each	Std. Pack ●
Screw-on End Clamp	GH-10	$ .75	50
Slip-in End Clamp	GH-11	.23	50
2 pole jumper for GM3	GH-70	.12	10
6 pole jumper for GM3	GH-71	.36	10
2 pole jumper for GB3, GB6	GH-72	.19	10
6 pole jumper for GB3, GB6	GH-73	.56	10
2 pole jumper for GC6	GH-74	.21	10
6 pole jumper for GC6	GH-75	.69	10
2 pole jumper for GD6	GH-76	1.05	10
6 pole jumper for GD6	GH-77	1.92	10
Snap-together fanning strip section for GA3, GA6	GH-51	.88	10
Snap-together fanning strip section for GB3, GB6	GH-52	.96	10
Snap-together fanning strip section for GP3, GP6	GH-53	.88	10
25 ft. vinyl strip for Types GA, GB, GC, GD,GE, GP, GM	GH-20	3.80	1
30 adhesive backed strips, 11 in. long, for Type GM3	GH-30	2.47	1
30 adhesive backed strips, 11 in. long, for Types GA, GB, GP	GH-31	2.47	1
30 adhesive backed strips, 11 in. long, for Types GC, GD	GH-32	2.47	1
Marking pen with permanent, fine line, black ink	GH-40	1.50	12
Ganging rod, .125″ dia. x 24″ long, for GF6, GG6	GH-80	3.10	1

●Orders must specify standard package quantity or multiple of that quantity.

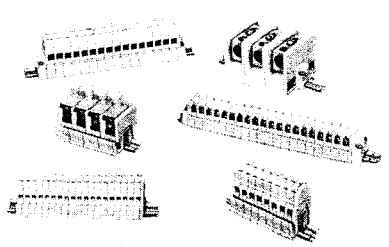
STANDARD ASSEMBLIES★

Description	Type	List Price Each
Assembly of 188 Type GA3	GA3-188BC	$135.00
Assembly of 188 Type GA6	GA6-188BC	140.00
Assembly of 204 Type GB3	GB3-204BC	156.00
Assembly of 204 Type GB6	GB6-204BC	170.00
Assembly of 166 Type GC6	GC6-166BC	300.00
Assembly of 94 Type GF6	GF6-94BC	310.00
Assembly of 94 Type GG6	GG6-94BC	345.00
Assembly of 278 Type GM3	GM3-278BC	180.00
Assembly of 188 Type GP3	GP3-188BC	150.00
Assembly of 188 Type GP6	GP6-188BC	160.00
Assembly of 94 Type GS6	GS6-94BC	95.00

★Standard assemblies consist of 6 feet of sections, mounted on two 3-foot lengths of snap-off channel, with one barrier on each length, with slip-in end clamps.



Standard Assembly



Custom Assemblies



Standard Channel



Snap-off Channel

MOUNTING CHANNEL

Style	Length (inches)	Std. Pack ●	Type	List Price Each
Standard	2	1	GH102	$ .45
	3	1	GH103	.50
	4	1	GH104	.55
	5	1	GH105	.60
	6	1	GH106	.65
	7	1	GH107	.70
	8	1	GH108	.75
	9	1	GH109	.80
	10	1	GH110	.90
	11	1	GH111	.95
	12	1	GH112	1.00
	13	1	GH113	1.05
	14	1	GH114	1.10
	15	1	GH115	1.15
	16	1	GH116	1.20
	17	1	GH117	1.25
	18	1	GH118	1.30
	19	1	GH119	1.35
	20	1	GH120	1.40
	21	1	GH121	1.45
	22	1	GH122	1.50
	23	1	GH123	1.60
	24	1	GH124	1.65
	25	1	GH125	1.70
	26	1	GH126	1.80
	27	1	GH127	1.95
	28	1	GH128	2.05
	36	1	GH136	2.90
	48	1	GH148	4.55
	72	1	GH172	6.85
Snap-off	36	20	GH236	2.90
	48	20	GH248	4.55
	72	20	GH272	6.85

● Orders must specify standard package quantity or multiples of that quantity.

CUSTOM ASSEMBLIES

For Assemblies of 9080 Type	Order 9080 Type	List Price: For First 2-Section Assembly	List Price: Plus, for Each Additional Section
GA3	GA3-_*_	$ 5.37	$ .91
GA6	GA6-_*_	5.60	1.02
GB3	GB3-_*_	5.71	1.14
GB6	GB6-_*_	5.94	1.14
GC6	GC6-_*_	9.03	1.94
GD6	GD6-_*_	16.00	5.31
GE6	GE6-_*_	33.49	10.57
GF6	GF6-_*_	13.60	4.56
GG6	GG6-_*_	12.80	4.17
GM3	GM3-_*_	4.57	1.02
GP3	GP3-_*_	6.30	1.17
GP6	GP6-_*_	8.80	1.71
GS6	GS6-_*_	5.48	1.25
GT6	GT6-_*_	19.25	8.55
GU6	GU6-_*_	26.75	12.15

*Fill in blanks with number of sections desired.

EXAMPLE: An assembly of 25 Class 9080 Type GB-6 can be ordered as 9080 Type GB6-25 at **$32.16** list each [$5.94 + (23 × $1.14)].

Assemblies ordered according to the above table include standard channel, the specified number of sections, one barrier and two screw-on end clamps. Each section has a built-in marking area. If, in addition, removable marking strip is required, add the letter "M" to the end of the Type number (example: Type GB3-___-M) and add $.02 list per section to the total price of the assembly.

For assembly on snap-off channel, add the letter "B" to the end of the Type number (example: GB3-___-B), no price adder.

For assembly with slip-in end clamps, add the letter "C" to the end of the type number (Example: GB3-___-C), and deduct $.94 per assembly.

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APPLICATION DATA

Type G terminal blocks are sectional units for channel mounting. Each assembly of blocks requires one barrier on the open end to provide required electrical clearances.

Voltage Ratings — The 300 V and 600 V voltage ratings are continuous ratings conforming to UL and NEMA standards for clearance between adjacent terminals, over surface and through air.

Temperature Ratings — Type G sections and barriers are molded of a nylon with a maximum service temperature (ambient plus heat rise) of 125° C. The Type GF6 fuse puller and blown fuse indicating pilot lights are nylon, maximum service temperature 105° C.

UL — Standard Type G terminal block sections are UL Component Recognized, File 60616, UL Standard 1059.

Terminals — Types GC-6, GD-6 and GE-6 are tin-plated, making them suitable for use with either copper or aluminum wire. Box lugs for up to #1/0 AWG wire have their terminal hardware recessed into the molding, reducing the chance of contact with current carrying parts. Terminal hardware of these box lugs is captive, so they are shipped with screws backed out to reduce wiring time. These lugs perform a self-locking function. As the terminal screw is tightened, the edges of the lug bite into the screw. The greater the tightening torque, the greater this locking action.

Marking — All sections except Type GE6 have a built-in marking area. Snap-in marking strips are also available.

Wire Strip Gage — Box lug, flat terminal and pressure wire connector sections have a built-in wire strip gage. Stripping wires to the length indicated by this gage assures maximum clamping action. A center post in each section prevents over insertion of wires.

Mounting — All sections except Types GE6, GT6 and GU6 have a removal arm which allows the sections to be snapped on or off the channel by hand or using a screwdriver. Sections are not interlocked, so one section can be removed temporarily from any position along an assembly, allowing the installation of panel mounting screws without disturbing the remainder of the assembly.

Type GH standard or snap-off channel can be used with all Class 9080 sectional terminal blocks. Snap-off channel is serrated at approximately 5/16 inch intervals, and is easily broken off to the required length. Custom assemblies on either standard or snap-off channel are available from stock.

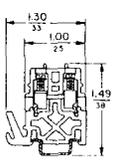
In addition, 6′ assemblies (two 3′ lengths) of most sections are available. Shorter assemblies can easily be snapped from these as needed. These 6′ assemblies have a mark on every 10th section to aid in counting off the desired number of sections.

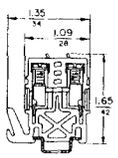
Accessories — Type GH fanning strips (also called separable connectors) are single pole sections which can be snapped together to form an interface between panel and machine wiring, which can then be temporarily separated without getting wires out of sequence.

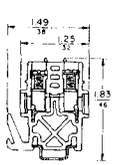
Type G terminal blocks can be mounted on the same channel with Square D channel mounted circuit breakers, plug-in relays, timing relays, AC-DC converters and overload relays (see page 436).

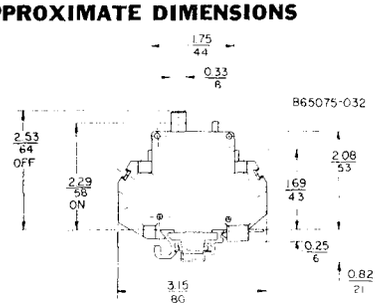
APPROXIMATE DIMENSIONS

SECTIONS

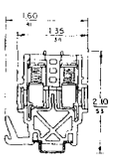

Type GM3

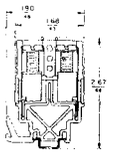

Type GB3

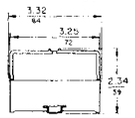

Type GB6

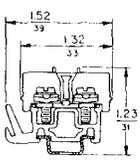


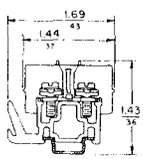
Type GCB

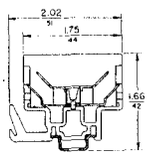

Type GC6

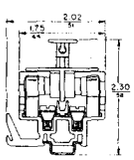

Type GD6

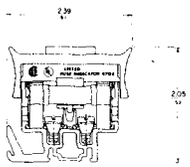

Type GE6

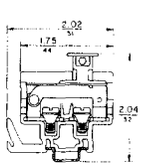

Types GA3 & GP3


Types GA6 & GP6

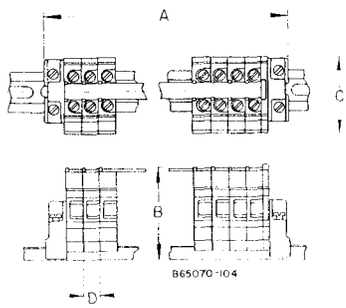

Type GS6


Type GF6


Type GF6 with Type GLP


Type GG6

ASSEMBLIES



Class 9080 Type	Dim. A● (Inches)	Dim. B (In.)	Dim. C (In.)	Dim. D (In.)	Max. Sect. per foot (nominal)
GA3, GP3	.38N + .93	1.25	1.52	.38	32
GA6, GP6	.38N + .93	1.45	1.70	.38	32
GB3	.35N + .93	1.69	1.35	.35	35
GB6	.35N + .93	1.83	1.49	.35	35
GC6	.43N + .93	2.10	1.60	.43	28
GD6	.70N + .93	2.67	1.90	.70	17
GE6	1.17N + .80	2.34	3.32	1.17	10
GF6 (with extractor)	.76N + .93	2.30	2.02	.76	16
GF6 (with blown fuse indicator)	.76N + .93	2.05	2.39	.76	16
GCB	.50N + .80	3.11	3.15	.5	24
GG6	.76N + .93	2.04	2.02	.76	16
GM3	.26N + .93	1.49	1.30	.26	48
GS6	.76N + .93	1.66	2.02	.76	16
GT6, GU6	.75N + .80	2.25	3.40	.75	16

● Where N is total number of sections. If slip-in end clamps used, subtract .8 inches. Slip-in end clamps cannot be used with Types GE6, GT6 and GU6.

Dual Dimensions. **INCHES** / Millimeters

SQD SLV_001213

TERMINAL BLOCKS

TYPE G — APPLICATION DATA AND CHANNEL MOUNTED DEVICES

CLASS 9080

CLASS 9080 TYPE GCB CIRCUIT BREAKERS

Technical Data:

Maximum voltage rating
250VAC/65VDC (GCB-01 through -50)
125VAC/65VDC (GCB-100 and -150)

Maximum interrupting rating 200 amperes, but not exceeding 10,000% (100 times) rated current

Tripping times in seconds at 70°F (21.1°C)

Percent rated current	100%△	200%	300%	400%	500%	600%	1000%	2000% and greater
Tripping time	no trip	10-40	3-18	1.5-9	.8-6	.003-4	.003-2	max. .02

△When several breakers are channel mounted adjacent to each other, the "no trip" current will be 80% of rated current at 70°F.

Selection:

At 70°F (21.1°C)
Use 100% of full load current to select circuit breaker.

For temperatures above 70°F (21.1°C)

1. Find proper current rating of circuit breaker by multiplying actual full load current with factor from table below:

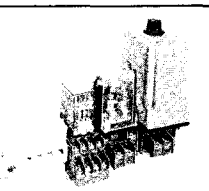
Temperature	100°F (37.8°C)	120°F (48.9°C)	140°F (60°C)	160°F (71.1°C)	180°F (82.2°C)	200°F (93.3°C)
Factor	1.1	1.2	1.3	1.4	1.5	1.6

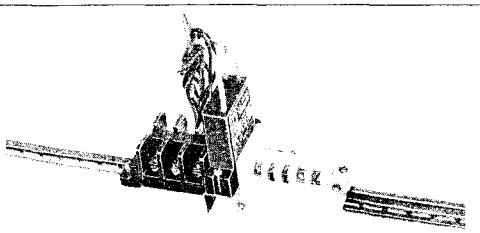
2. Select closest (next higher) ampere rating.

CHANNEL MOUNTED DEVICES

Class 9080 Type GH channel can be used effectively to save panel space and wiring time. This is accomplished by grouping together terminal blocks, general purpose relays and timers, overload relays, etc. This procedure eliminates the load terminal blocks, because both factory and field wiring can be made directly to the device. Described below are those devices which can be mounted on the 9080 Type GH channel, if accompanied with the proper adaptor plate.

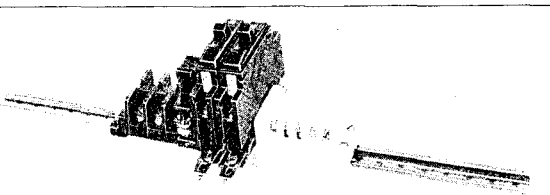
The Types K and R general purpose relays and Type JCK timing relays are designed for multi-pole switching applications below 240 volts. See Class 8501 section for further information.

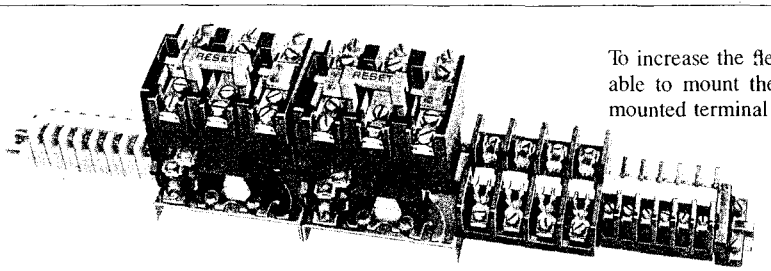




The Type HO solid state converter is a device that converts an AC input voltage to a DC output voltage for DC loads. It can be used with devices such as DC relays, timers, contactors, and starters. It can be mounted by use of an adaptor bracket 30501-276-01. See Class 9070 section for further information.

Individually mounted QOU molded case circuit breakers are UL listed. QOU circuit breakers are available in one, two or three pole types. For channel mounting, order mounting bracket QU-1 for 1 pole; QU-2 for 2 pole and QU-3 for 3 pole. For further information, see Page 58.





To increase the flexibility of a control panel it is sometimes desirable to mount thermal overload relays with Class 9080 channel mounted terminal blocks. They are available for user assembly by ordering an open type overload relay and a mounting bracket kit. Order a Class 9065 Type LB-1 for single-pole overload relays and a Class 9065 Type SM-2 for three-pole overload relays.

SQD SLV_001214

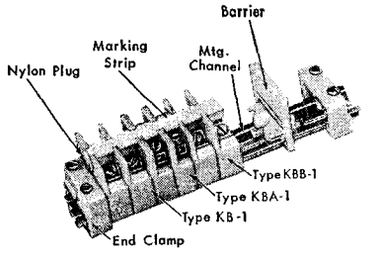
CLASS 9080

TERMINAL BLOCK KITS — FOR CUSTOMER ASSEMBLY

TERMINAL SECTIONS

Description	Type	Price Each	Standard Pack Quantity
Nylon Terminal Section with Pressure Wire Connectors **Wire Size #22 to #14**	KB-1■	**$1.36**	50★
Nylon Terminal Section with Flat Terminal Screws are #6-32 x ¼ inch, for Ring or Spade Lugs, 5/16 inch wide maximum. **Wire Size #22 to #14**	KBB-1■	**.96**	50★
Nylon Terminal Section with Solderless Box Lug — With Pressure Plate **Wire Size #22 to #14**	KBA-1■	**1.12**	50★

Each customer assembly consists of:
1. Required number of Type K — sections.
2. Parts included in Type K-3 or K-4 assembly kit.
3. If channel mounted, required length of mounting channel (page 434).



ASSEMBLY KITS AND COMPONENTS

Description	Type	Price Each	Std. Pack. Qty.
Assembly Kit for Direct Mounting Includes: 1 — Nylon Barrier No. 31047-003-01 1-24 Circuit Marking Strip No. 31047-017-27 1 — Nylon Plug No. 31047-005-01	K-4	**$2.78**	1
Assembly Kit for Channel Mounting Includes: 2 — Nylon End Clamps No. 31047-013-50 Plus all parts included with K-4 kit listed above.	K-3	**4.52**	1
White Marking Strip — 50″ Length	1828-D20-X1	**.80**	1
End Clamp assembly	31047-013-50	**1.00**	100★
Barrier	31047-003-01	**.42**	50★
Nylon Plug (holds in marking strip)	31047-005-01	**.26**	50★
Adhesive Backed Marking Strip Sheet, 27 Strips — 11″ Length	MS-2	**3.94**	1

★Orders must specify quantity listed or multiple of quantity listed.

Mounting Channel Found on Page 434.

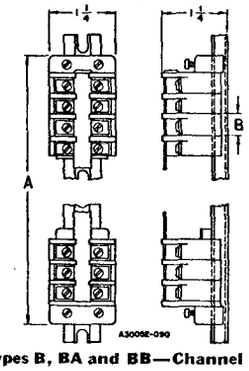
ACCESSORIES

Description			Type	Price Each	Std. Pack Qty.
Barrier — Used Between 300 and 600 Volt Blocks			31047-034-01	**$2.40**	1
	Jumper for Type KBA-1 and KBC-1 Sections	2 Circuit	JBA-2	**.32**	100★
		6 Circuit	JBA-6	**.60**	50★
	Separable Connector For Use with KBA-1 and KBC-1 Sections	6 Circuit	SBA-6	**12.60**	1
		12 Circuit	SBA-12	**17.16**	1

ASSEMBLED TERMINAL BLOCKS◐

No. of Circuits	DIRECT MOUNTED						CHANNEL MOUNTED■					
	Type KB-1 Sections Pressure Wire Conn. **Wire #22 to #14**		Type KBB-1 Sections Flat Terminals **Wire #22 to #14**		Type KBA-1 Sections Solderless Box Lugs **Wire #22 to #14**		Type KB-1 Sections Pressure Wire Conn. **Wire #22 to #14**		Type KBB-1 Sections Flat Terminals **Wire #22 to #14**		Type KBA-1 Sections Solderless Box Lugs **Wire #22 to #14**	
	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price
3	B-3P	**$ 6.40**	BB-3P	**$ 5.20**	BA-3P	**$ 5.60**	B-3	**$ 8.80**	....	....	BA-3	**$ 8.00**
6	B-6P	**10.40**	BB-6P	**8.00**	BA-6P	**9.20**	B-6	**12.80**	BB-6	**$10.40**	BA-6	**11.20**
12	B-12P	**18.80**	BB-12P	**14.00**	BA-12P	**16.00**	B-12	**21.20**	BB-12	**16.40**	BA-12	**18.40**
18	B-18P	**26.80**	BB-18P	**19.60**	BA-18P	**22.40**	B-18	**29.60**	BB-18	**22.40**	BA-18	**25.20**
24	B-24P	**35.20**	BB-24P	**25.60**	BA-24P	**29.20**	B-24	**38.00**	BB-24	**28.40**	BA-24	**32.40**
36	B-36P	**51.20**	BB-36P	**36.80**	BA-36P	**42.80**	B-36	**54.80**	BB-36	**40.40**	BA-36	**44.80**

◐All items listed are stocked.
■UL component recognized, File E60616, Guide XCFR2.

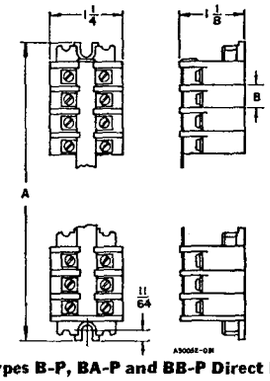


Types B, BA and BB—Channel Mtd.

APPROXIMATE DIMENSIONS

TABLE 1

Type	Dimension B
KB-1 and KBB-1	13/32 (.406)
KBA-1 and KBC-1	3/8 (.375)



Types B-P, BA-P and BB-P Direct Mtd.

CHANNEL MOUNTED
Dim. A = (Dim. B × N)* + 15/16″ (or + .938″)
Mounting Dim. = Dim. A + 5/16″ (or + .312″)
N = Number of circuits.
*When different sections are intermixed, repeat (Dim. B × N) for each type used and add results. Mounting Channel has slots for #8 mounting screws.

DIRECT MOUNTED
Dim. A = (Dim. B × N)* + 25/32″ (or + .781″)
Mounting Dim. = Dim. A − 11/32″ (or − .344″)
N = Number of circuits
*When different sections are intermixed, repeat (Dim. B × N) for each type used and add results. Terminal block base has slot for #8 mounting screw.

ORDERING INFORMATION REQUIRED

1. Class and type number or part number.
2. Specify quantity. Prices apply only when quantities listed or multiple of quantities listed are ordered.

SQD SLV_001215

TERMINAL BLOCKS

TYPE K — 600 VOLT CHANNEL MOUNTED

CLASS 9080

TERMINAL SECTIONS

	Description	Type	Price Each	Std. Pack Qty.★
	Terminal Block Section with Pressure Wire Connectors. **Wire #10 and smaller**	KC-1	**$1.26**	50 ★
	Terminal Block Section with Flat Terminal. Screws are #8-32 x ¼ inch, for Ring or Spade Lugs, 15/32 inch wide maximum. **Wire #10 and smaller**	KCB-1■	**1.00**	50 ★
	Terminal Block Section with tin plated terminals for use with aluminum wire. Screws are #8-32 x ¼ inch, for Ring or Spade Lugs, 15/32 inch wide maximum. **Wire #10 and smaller**	KCBT-1	**1.20**	50 ★
	Terminal Block Section with Solderless Box Lug. **Wire #8 and smaller**	KCA-1	**1.20**	50 ★
	Terminal Block Section with Solderless Box Lug. **Wire #14-4**	KD-1■	**2.36**	50 ★
	Terminal Block Section with Solderless Box Lug. **Wire #10-0**	KE-1	**5.46**	1
	Terminal Block Section with Slip-On connectors on both sides of block. **Wire #18-14‡**	KCS-1	**1.68**	50 ★
	Terminal Block Section with Slip-on connector on one side of block and pressure wire connector on the other. ‡ **Wire #10 and smaller**	KCPS-1	**2.10**	50 ★
	Fusible Terminal Block Section with Pressure Wire Connector. **Wire #10 and smaller**	KH-1	**4.52** ##	1
	Terminal Block Section with Disconnect Switch and Flat Terminal. **Wire #10 and smaller**	KF-1	**9.20**	1
	Terminal Block Section with Disconnect Switch and Pressure Wire Connectors. **Wire #10 and smaller**	KS-1	**16.70**	1



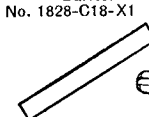
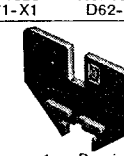
FUSIBLE TERMINAL BLOCK SINGLE CIRCUIT

Pressure Wire Connectors **Wire #10 and Smaller**			
Accepts Class H or K 30 Ampere 250V Fuse		Accepts Class R 30 Ampere 250V Fuse	
Type	Price	Type	Price
PF-1*	**$7.00**	PFR-1*	**$7.00**

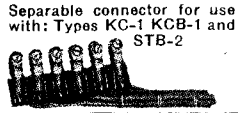
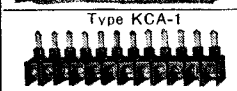
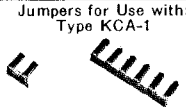
Each customer assembly consists of:

1. Required number of Type K — sections. Sections can be intermixed on same track.
2. Parts included in Type K-1 assembly kit (and KH-2 kit if Type KE-1, KF-1 or KH-1 used).
3. **Mounting channel (see page 434).**

ASSEMBLY KITS AND COMPONENTS

Assembly Kit — Includes:  1 — Barrier No. 1828-C18-X1  2 — End Clamps No. 1828-D57-G1   1-24 Circuit Marking Strip▲ No. 1828-C23-X46; 2-Nylon Plugs No. 1828-D71-X1; 2-Guide Blocks◐ No. 1828-D62-X1	K-1	**$5.88**	1
Kit Includes:   1 — Marker Strip End Plug No. 1828-L20-X1; 1 — Barrier No. 1828-C28-X1	KH-2**	**1.80**	1
White marking strip — 50″ Length	1828-C23-X100	**.80**	1
White marking strip 1-24 Circuits▲	1828-C23-X46	**1.20**	1
Adhesive backed marking strip sheet— 20 strips — 11″ length	MS-1	**2.00**	1
Adhesive backed marking strip sheet for KS-1 322 marking tabs	MS-3	**5.20**	1
End Clamp Assembly	1828-D57-G1	**1.32**	100
Barrier	1828-C18-X1	**.74**	50
Barrier (For KE-1, KF-1 and KH-1)	1828-C28-X1	**1.16**	50
Barrier — Used between 300 and 600 Volt Blocks	31047-034-01	**2.40**	1
Guide Blocks◐	1828-D62-X1	**.20**	100
Nylon Plug (Holds in Marking Strip)	1828-D71-X1	**.20**	100
End Plug (For Types KF-1 and KH-1)	1828-L20-X1	**.58**	50

ACCESSORIES

	No. of Ckts.			
Separable connector for use with: Types KC-1 KCB-1 and STB-2 	6	SC-6	**$10.50**	1
	12	SC-12	**16.80**	1
Type KCA-1 	6	SCA-6	**8.56**	1
	12	SCA-12	**16.80**	1
Jumpers for Use with: Type KCA-1 	2	JCA-2	**.36**	100
	6	JCA-6	**.62**	50

★Orders must specify quantity listed or multiples of quantity listed.
**Includes parts required in addition to Type K-1 kit when Type KE-1, KH-1, or KS-1 sections used. End plug used only on KF-1, KH-1 and KS-1.
##Price does not include fuses. Will accept any 13/32″ dia. by 1½″ long ferrule type fuse.
◐When terminal block length exceeds 12 inches, guide blocks maintain terminal block rigidity.
‡For use with .250 inch wide Slip-On receptacles such as Burndy's "Fingrip" or Amp's "Faston." In general, commercially available receptacles accept #18-14 wire. Receptacles not furnished by Square D Company.
▲30 circuit when used with Type KCA-1 and 20 circuit with KH-1, KE-1 or KF-1.
■UL Component Recognized, File E60616, Guide XCFR2.
*UL Listed, File E40747, Guide 120S3.

ORDERING INFORMATION REQUIRED — See Page 439.

SQD SLV_001216

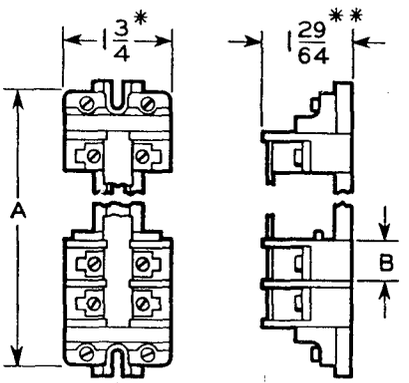
TERMINAL BLOCKS

600 VOLT CHANNEL MOUNTED ASSEMBLIES — TYPE K AND UNIT CONSTRUCTION TYPES

CLASS 9080

No. of Circuits	Pressure Wire Connectors Type KC-1 Sections **Wire # 10 and Smaller**		Flat ■ Terminals Type KCB-1 Sections **Wire # 10 and Smaller**		Tin Plated Terminals Type KCBT-1 Sections **Wire # 10 and Smaller**		Solderless ■ Box Lugs Type KCA-1 Sections **Wire # 8 and Smaller**		Solderless ■ Box Lugs Type KD-1 Sections **Wire # 14-4**		Solderless Box Lugs Type KE-1 Sections **Wire # 10-0**		Fusible Terminal Block With Pressure Wire Connector Type KH-1 Sections **Wire # 10 and Smaller** Prices do not include fuses	
	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price
2		**$ 9.00**	CB-2	**$ 8.40**	CBT-2	**$ 8.80**	CA-2	**$ 8.80**	D-2	**$11.20**	E-2	**$18.60**	H-2	**$16.80**
3		**10.40**	CB-3	**9.60**	CBT-3	**10.20**	CA-3	**10.00**	D-3	**13.60**	E-3	**24.20**	H-3	**21.40**
4		**11.80**	CB-4	**10.60**	CBT-4	**11.40**	CA-4	**11.40**	D-4	**16.20**	E-4	**29.80**	H-4	**26.20**
5		**13.00**	CB-5	**11.80**	CBT-5	**12.80**	CA-5	**12.60**	D-5	**18.60**	E-5	**35.40**	H-5	**30.80**
6		**14.40**	CB-6	**12.80**	CBT-6	**14.00**	CA-6	**13.80**	D-6	**21.00**	E-6	**41.00**	H-6	**35.40**
7		**15.80**	CB-7	**14.00**	CBT-7	**15.40**	CA-7	**15.20**	D-7	**23.60**	E-7	**46.60**	H-7	**40.20**
8		**17.20**	CB-8	**15.00**	CBT-8	**16.60**	CA-8	**16.40**	D-8	**26.00**	E-8	**52.20**	H-8	**44.80**
9		**18.60**	CB-9	**16.20**	CBT-9	**18.00**	CA-9	**17.60**	D-9	**28.40**	E-9	**57.80**	H-9	**49.40**
10		**19.80**	CB-10	**17.20**	CBT-10	**19.20**	CA-10	**18.80**	D-10	**30.80**	E-10	**63.40**	H-10	**54.00**
11		**21.20**	CB-11	**18.40**	CBT-11	**20.60**	CA-11	**20.20**	D-11	**33.40**	E-11	**69.00**	H-11	**58.80**
12		**22.60**	CB-12	**19.40**	CBT-12	**21.80**	CA-12	**21.40**	D-12	**35.80**	E-12	**74.60**	H-12	**63.40**
14		**25.40**	CB-14	**21.60**	.....	.....	CA-14	**24.00**	D-14	**40.80**	.....	.....	.....	.....
15		**26.60**	CB-15	**22.80**	.....	.....	CA-15	**25.20**	D-15	**43.20**	.....	.....	.....	.....
16		**28.00**	CB-16	**23.80**	.....	.....	CA-16	**26.40**	D-16	**45.60**	.....	.....	.....	.....
18		**30.80**	CB-18	**26.00**	.....	.....	CA-18	**29.00**	D-18	**50.60**	.....	.....	.....	.....
24		**39.00**	CB-24	**32.60**	.....	.....	CA-24	**36.60**	D-24	**65.40**	.....	.....	.....	.....
28		**44.40**	CB-28	**37.00**	.....	.....	CA-28	**41.60**	D-28	**75.20**	.....	.....	.....	.....
36		**55.20**	CB-36	**45.80**	.....	.....	CA-36	**51.60**	D-36	**94.80**	.....	.....	.....	.....

APPROXIMATE DIMENSIONS OF CHANNEL MOUNTED TERMINAL BLOCKS



***Dimension is 2 27/32″ for Types E, F, H and KS-1.**
****Dimension is 1 21/32″ for Types E, F, H and KS-1.**

TABLE 1

Type	Dimension B
KC-1, KCB-1, KCBT-1, KCS-1, KCPS-1 & KD-1	5/8″
KCA-1	27/64″
KE-1, KF-1, KH-1 & KS-1	3/4″

SELECTION OF MOUNTING CHANNEL AND MOUNTING DIMENSIONS

1. Determine terminal block length dimension A as follows:
   a. Locate dimension B from Table 1 and multiply times the number of sections to be used. Repeat for each type of section to be used and add results.
   b. Add 1 3/8″ to result of step 1 a. to allow for one barrier and two end clamps. This total equals terminal block length dimension A. Channel mounting dimensions may be figured as dimension A less 1/8″.
2. Select mounting channel from page 434 equal to or larger than dimension A.
   Note: Mounting dimension of factory assembled block may vary slightly from results above due to difference in actual length of channel used.

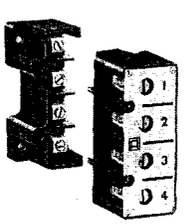
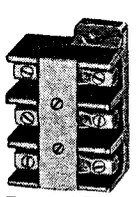
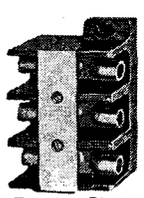
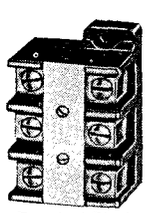
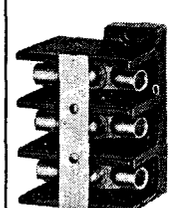
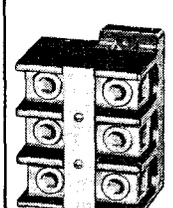
ORDERING INFORMATION REQUIRED

1. Class and type number.
2. For terminal blocks with more circuits than those listed above, order as Class 9080 Type (CBT, CS, CPS, F, H, C, CA, CB, D or E) — the desired number of circuits. Refer to local Square D field office for price.

   EXAMPLE: The block desired is Type CA with 40 circuits; order as Class 9080 Type CA-40.
3. Specify quantity. Prices apply only when quantities listed or multiple of quantities listed are ordered.

UNIT CONSTRUCTION TYPES

CLASS 9080 — **0-600 VOLTS AC OR DC**

Number of Circuits	 Pull-Apart Terminal Blocks Solderless Box Lug **Wire Size: Upper Portable Member — #16-4 Lower Stationary Portion — #16-6**		 Terminal Block with solderless box lugs **Wire #8-4**		 Terminal Block with solder lugs **Wire #8-4**		 Terminal Block with solderless box lugs **Wire #10-0**		 Terminal Block with solder lugs **Wire #10-0**		 Terminal Block with solderless box lugs **Wire #6-250 MCM cable**	
	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price
1	....	....	....	....	....	....	U-1 ■	**$ 8.00**	....	....	V-1■	**$14.00**
2	....	....	....	....	....	....	....	....	....	....	V-2■	**28.00**
3	P-3■	**$32.00**	T-3■	**$18.00**	T-31■	**$18.00**	U-3 ■	**26.00**	U-31■	**$19.20**	V-3■	**36.40**
3	P-4■	**36.00**	....	....	....	....	U-32■	**19.80**	....	....	....	....
4			....	....	....	....	....	....	....	....	....	....

■UL Component Recognized, File E60616, Guide XCFR2.

SQD SLV_001217

OPERATING MECHANISMS

DOOR MOUNTED, VARIABLE DEPTH CONSTRUCTION FOR CIRCUIT BREAKERS

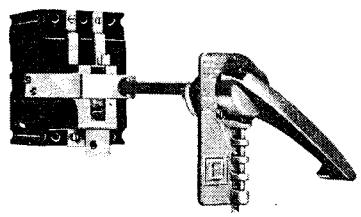
CLASS 9421

CIRCUIT BREAKER OPERATING MECHANISMS

Kits include the internal mechanism, external handle, and mounting hardware — NEMA 12 (Note: Circuit breakers are not included in kits.)

Use With			Operating Mechanism		
Breaker or Interrupter Type	No. of Poles	Frame Size (Amps.)	Mounting Depth Range‡ Min.-Max.	Type	Price
FAL, FHL	2-3	100	6⅛-14	FN-1	**$60.**
KAL, KHL	2-3	225	6½-14	FP-1	**72.**
Q2L	2-3	225	7-13⅜	FP-2	**72.**
LAL, LHL, Q4L	2-3	400	7⅝-14	FR-1	**84.**
MAL, MHL	2-3	1000	8⅜-14	FT-1	**92.**

‡Depth measured from breaker mounting surface to outside of enclosure door (inches).



Type FN-1
(Breaker Not Included)

MODIFICATIONS

Electrical interlocks for Class 9421 circuit breaker operating mechanisms:

Single Pole Double Throw Class 9999 Type R18 — **$30.**◐
Two Pole Double Throw Class 9999 Type R19 — **$58.**◐
◐ D1B Discount

Kit	Instruction Sheet
9421 FN-1	30072-300-18
9421 FP-1	30072-300-21
9421 FR-1	30072-300-41
9421 FT-1	30072-303-05

ORDERING INFORMATION REQUIRED

1. Class and type number of operating mechanism.
2. Order circuit breaker from Pages 59 thru 67.

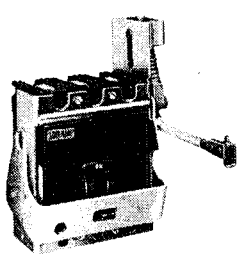
FLANGE MOUNTED FOR CIRCUIT BREAKERS

CLASS 9422

Designed for installation in custom built control enclosures where main or branch circuit protective devices are required. All circuit breaker operating mechanisms are suitable for either right- or left-hand flange mounting, convertible on the job.

VARIABLE DEPTH OPERATING MECHANISMS

Use With			Operating Mechanism					
			Operating Mechanism Only — **Does Not** Include Handle Mechanism		Operating Mechanism **and** Handle Mechanism			
					Includes Type A1 Handle Mechanism		Includes Type A2 Handle Mechanism	
Bkr. or Interr. Type	No. of Poles	Frame Size (Amps.)	Type	Price	Type	Price	Type	Price
FAL, FHL	2-3	100	RN-1	**$32.**	ARN-11	**$ 72.**	ARN-21	**$104.**
KAL, KHL	2-3	225	RP-1	**36.**	ARP-11	**76.**	ARP-21	**108.**
LAL, LHL, Q4L	2-3	400	RR-1	**92.**	ARR-11	**132.**	ARR-21	**164.**
MAL, MHL	2-3	1000	RT-1	**106.**	ART-11	**146.**	ART-21	**178.**



Type RN-1
(Breaker Not Included)

MODIFICATIONS

ELECTRICAL INTERLOCKS — CLASS 9999

Description	Class	Type	Price◐
Single pole, double throw	9999	R26	**$34.**
Double pole, double throw	9999	R27	**64.**

◐ D1B Discount

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Order circuit breaker from Pages 59 thru 67.
3. Select handle mechanism kit from Page 442, if ordering Type R mechanism only.

SQD SLV_001218

OPERATING MECHANISMS WITH DISCONNECT SWITCH

Disc. Switch Size	Variable Depth Mtg. Range Min.-Max.	Maximum Hp Ratings* AC Systems Volts (Motor Volts) 208 (200)	240 (230)	480 (460)	600 (575)	DC Using 2 Poles 250 V. Max.	Fuse Clip Rating (Amperes) Non-Interchangeable Type For Class H, J, K or R Fuses Only. 250 V.	600 V.	Switch and Operating Mechanism Only — **Does Not** Include Handle Mechanism Type	Price	Switch and Operating Mechanism **and** Handle Mechanism — Overpacked. Includes Type A-1 Handle Mechanism Type	Price	Includes Type A-2 Handle Mechanism Type	Price
30 Amp.	6-18.25▲	5	7½	15	20	5	Non-Fusible		RC-1	**$ 92.**	ARC-11	**$132.**	ARC-21	**$164.**
							30	....	RC-2	**104.**	ARC-12	**152.**	ARC-22	**176.**
							60	30	RC-3	**112.**	ARC-13	**152.**	ARC-23	**184.**
							....	60	RC-4	**120.**	ARC-14	**160.**	ARC-24	**192.**
60 Amp.	6.63-18.25▲	15	20	50	60	10	Non-Fusible		TD-1	**108.**	ATD-11	**148.**	ATD-21	**180.**
		15	15	30	50	10	60	30	TD-2	**124.**	ATD-12	**164.**	ATD-22	**196.**
							....	60	TD-3	**136.**	ATD-13	**176.**	ATD-23	**208.**
100 Amp.	7.63-19.25▲	25	30	60	75	20	Non-Fusible		TE-1	**160.**	ATE-11	**200.**	ATE-21	**232.**
							100	100	TE-2	**220.**	ATE-12	**260.**	ATE-22	**292.**
							....	200	TE-3†	**288.**	ATE-13†	**328.**	ATE-23†	**360.**
200 Amp.	9.12-19.25▲	40	60	125	150	40	Non-Fusible		TF-1	**350.**	ATF-11	**390.**	ATF-21	**422.**
							200	200	TF-2	**390.**	ATF-12	**430.**	ATF-22	**462.**
							....	400	TF-3†	**576.**	ATF-13†	**616.**	ATF-23†	**648.**
Fixed Depth	11.38	75	125	250	350	50	Non-Fusible		TG-1●‡	**750.**	For handle selection, see Page 442.			
Adj. Depth 400 Amp	15.87-19 In Steps of .63 in.						400	400	TG-2●‡	**850.**				

▲Class 9422 Type R2, Page 444, will extend mounting depth 7".
* Refers to rating of switch only.
● Commercially available enclosures may not accept type TG operating mechanisms. Contact enclosure manufacturer for availability of enclosures for use with these switches.
‡ Right hand flange mounting only.
† Accommodates Class J fuses only.

DESCRIPTION

Designed for installation in custom built control enclosures where main or branch circuit protective devices are required.

Type R and T kits include a switch and operating mechanism and mounting hardware. See Page 442 for handle mechanism.

Type A kits include a Type R or Type T switch and either a painted or chrome handle mechanism.

Disconnect switches are shipped assembled for right hand operation. All 30 through 200 Amp. devices can be easily converted to left hand operation with no additional parts required.

The 400 Amp. Type TG switches are for right hand mounting only.

CLASS R FUSE KITS

Fusible disconnect switches on this page will accept Class R fuses as standard. A field installable rejection kit is available which, when installed, rejects all but Class R fuses. With the rejection kit and Class R fuses installed, the switch is UL component recognized for use on systems with up to 200,000 RMS symmetrical amperes fault current available.

Switch Ampere Rating	Type	Fuse Clip Rating (Amps.) 250 V. AC	600 V. AC	Class	Type	Price
30 Amp.	RC	30	...	...	HTK-30	▲**$6.10**
30 Amp.	RC	60	30	...	HTK-30H	▲ **6.10**
60 Amp.	TD	60	30	9999	SR-T2	◐**12.00**
60 Amp.	TD	...	60	9999	SR-T3	◐**17.00**
100 Amp.	TE	100	100	9999	SR-4	◐**12.00**
200 Amp.	TF	200	200	9999	SR-4	◐**12.00**
400 Amp.	TG	400	400	9999	SR-5	◐**28.00**

▲ A1-1 Discount ◐ D1B Discount

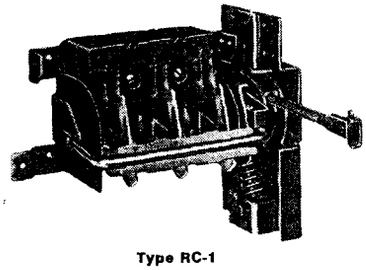
MODIFICATIONS AND SPECIAL FEATURES
See Page 444

ELECTRICAL INTERLOCKS

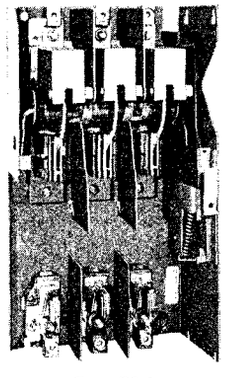
Class 9999 — Optional Accessory for use with Disconnect Switches listed on this page.

For Use On: Disc. Switch Type	Single Pole Interlock Type	Price◐	Two Pole Interlock Type	Price◐
RC, ARC	9999 R6	**$ 30.**	9999 R7	**$ 58.**
TD, ATD	9999 R43	**30.**	9999 R44	**58.**
TE, ATE	9999 R41	**36.**	9999 R42	**48.**
TF, ATF	9999 R8	**34.**	9999 R9	**64.**
TG	9999 35	**106.**	9999 R36	**136.**

◐ D1B Discount



Type RC-1



Type TG-2

LINE LUG DATA

Disconnect Switch Size	Wire Size Minimum — Maximum
30 Ampere	#14-#2 Cu, #10-#2 Al
60 Ampere	#14-#2 Cu, #10-#2 Al
100 Ampere	#10-#0 Cu, #6-#0, Al
200 Ampere	#6-300 MCM, Cu or Al
400 Ampere	#4-500 MCM Cu

SQD SLV_001219

OPERATING MECHANISMS

AIR VALVE INTERLOCKS
HANDLE MECHANISMS

CLASS 9422

Air Valve Interlocks are designed to interlock specific three-way air valves with our Class 9422 Types A-1, 2, 5, 6, 7, 8, 9 or 10 handle mechanisms when mounted to the right hand side of an enclosure. These devices mechanically interlock the air and electrical supplies of a machine so both can be disconnected or padlocked "off" simultaneously. The air valve interlock makes it possible to exhaust the air in machine lines when the handle mechanism is moved to the "off" position, making the machine both electrically and pneumatically inoperative.

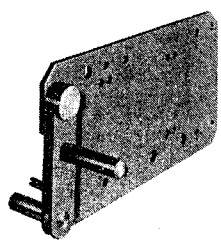
Air Valve Interlocks will only accept specific three-way air valves manufactured by Schrader Bellows listed in the table below.

AIR VALVE INTERLOCKS

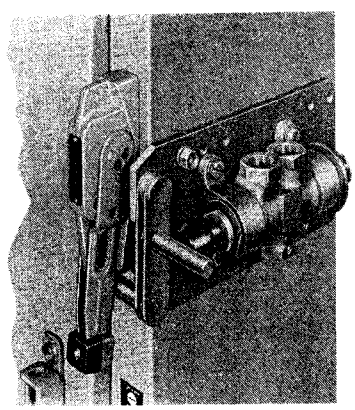
Schrader Bellows Valve Model Number			Class 9422 Air Valve Interlock	
Air Valve Size	Knob Operated*	Lever Operated*	Type	Price*
½" NPT	M048-418-85	M085-418-90	G1	**$144.**
	M085-418-48			
¾" NPT	M048-618-85	M085-618-90	G2	**144.**
	M085-618-48			
1" NPT	M000-80004	M085-818-90	G1	**144.**
1½" NPT	M085-918-85	M090-918-85	G2	**144.**

***Prices do not include air valves or handle mechanism.** For more information on air valves listed above contact Schrader Bellows Division, Scovil, U.S. Route No. 1, Wake Forest, N.C. 27587.

Type G1



Air Valve Interlock Mounted on Enclosure

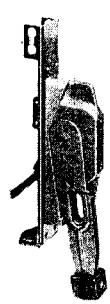


HANDLE MECHANISMS

Handle mechanism kits are used with all disconnect switch and circuit breaker installations. The kits contain all parts necessary for mounting the handle to the flange of the enclosure.

The types A1 through A4, A9 and A10 are suitable for right or left hand flange mounting. Two mounting methods are offered. The Types A5 through A8 handles are designed for right hand mounting only.

Description	Type	Price
6" handle for use with 30-200 ampere switches and all circuit breaker mechanisms.		
Handle mechanism complete for use on NEMA 1, 3, 3R, 4 sheet steel and 12 enclosures	A-1	**$40.**
Handle mechanism complete for use on NEMA 4 stainless steel enclosures. All external metal parts are either stainless steel or a chrome plated non-ferrous die casting.	A-2	**72.**
4" handle for use with 30-200 ampere switches and all circuit breaker mechanisms.		
Similar to Type A-1	A-3	**40.**
Similar to Type A-2	A-4	**72.**
12" handle for use with 400 ampere Type TG-1 and TG-2 disconnect switches only.		
Handle mechanism complete for fixed depth installation in NEMA 1, 3, 3R, 4 sheet steel and 12 enclosures	A-5	**70.**
Handle mechanism complete for fixed depth installation in NEMA 4 stainless steel enclosures. All external metal parts are either stainless steel or a chrome plated non-ferrous die casting.	A-6	**90.**
Similar to Type A-5 except for adjustable depth installation	A-7	**84.**
Similar to Type A-6 except for adjustable depth installation	A-8	**104.**
10" handle for use with Type D2 remote or dual adaptor kit listed on Page 444.		
Similar to Type A-1	A-9	**44.**
Similar to Type A-2	A-10	**76.**



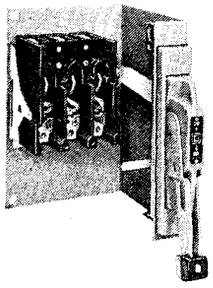
Type A-1

SQD SLV_001220

DISCONNECT SWITCHES

Disconnect Switches listed below are shipped with switch and external handle assembled to a bracket, ready for installation into the enclosure. A trim plate is provided with each kit to eliminate any mounting screws from being accessible from the front and also to provide an attractive installation.

The operating handle used is the Type A-1. Bracket mounted disconnect switches can be used with Class 9423 door closing mechanisms.



Type BC-1

DISCONNECT SWITCHES

Disc. Switch Size	3φ Maximum HP Ratings — AC System Volts (Motor Volts) 208 (200)	240 (230)	480 (460)	600 (575)	DC Using 2 Poles	Fuse Clip Rating Amp.	Volt	Right Hand Flange Mtg. Type	Price
30 Amp.	5	7½	15	20	5	Non-Fusible		BC-1	$132.
						30	250	CC-2	144.
						60	250	CC-3	152.
						30	600	CC-6	152.
						60	600	CC-4	160.
60 Amp.	10	15	30	50	10	Non-Fusible		BD-1	148.
						60	250	CD-2	164.
						30	600	CD-6	164.
						60	600	CD-3	176.
						100	250	CD-4	212.
						100	600	CD-7	212.
100 Amp.	25	30	60	75	20	Non-Fusible		BE-1	200.
						100	250	CE-2	260.
						100	600	CE-5	260.
200 Amp.	40	60	125	150	40	Non-Fusible		TFB-1	418.
						200	250	TFB-2	452.
						200	600	TFB-2	452.
						400	600	TFB-3†	636.

†Accommodates 201-400 Amp. 600V. Class J fuses only.

LINE LUG DATA

Disconnect Switch Size	Wire Size Minimum — Maximum
30 Ampere	#14-#2, Cu or Al
60 Ampere	#14-#2, Cu or Al
100 Ampere	#10-#0, Cu or Al
200 Ampere	#6-300 MCM, Cu or Al*

*For special lugs see page 444.

ELECTRICAL INTERLOCK KITS — CLASS 9999

Optional accessory for use on switches listed above.

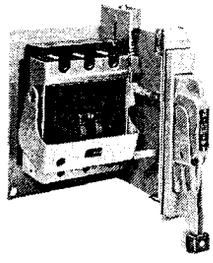
For Use on: Disc. Sw. Ampere Rating	Single Pole Interlock Type	Price◐	Two Pole Interlock Type	Price◐
30, 60 or 100	9999 R-24	$34.	9999 R-25	$64.
200	9999 R-8	34.	9999 R-9	64.

◐ D1B Discount

OPERATING MECHANISMS FOR USE WITH SQUARE D CIRCUIT BREAKERS

Circuit Breaker operating mechanisms listed below are shipped with the external operating handle assembled to a bracket. Circuit breakers are not included and must be ordered separately from Pages 59 thru 67. A trim plate is provided with each kit to eliminate any mounting screws from being accessible from the front and also to provide an attractive installation.

The operating handle used is the Type A-1. Bracket mounted Circuit Breaker Operating Mechanisms can be used with Class 9423 door closing mechanisms.



Type BN-1

CIRCUIT BREAKER OPERATING MECHANISMS

Use With: Bkr. or Interr. Type	No. of Poles	Frame Size (Amps.)	Operating Mechanism: Right Hand Flange Mtg. Type	Price
FAL, FHL	2-3	100	BN-1	$ 72.
KAL, KHL	2-3	225	BP-1	76.
LAL, LHL, Q4L	2-3	400	BR-1	152.

ELECTRICAL INTERLOCK KITS — CLASS 9999

Optional accessory for use with operating mechanisms listed above.

Description	Class	Type	Price◐
Single Pole Double Throw	9999	R26	$34.
Double Pole Double Throw	9999	R27	64.

◐ D1B Discount

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Order circuit breaker from Pages 59 thru 67.

SQD SLV_001221

OPERATING MECHANISMS
ACCESSORIES

CLASS 9422

MODIFICATION KITS AND SPECIAL FEATURES

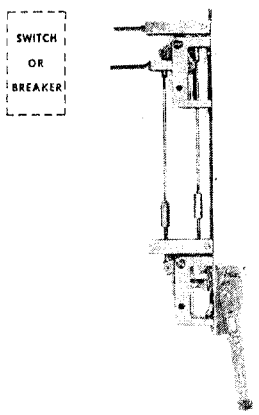
REMOTE OR DUAL ADAPTOR KIT

For the remote or dual operation of 30, 60, 100 and 200 ampere disconnect switches, FA, KA, LA and MA circuit breakers.

Remote Operation — permits mounting the Class 9422 Type A9 or A10 handle mechanism at a lower level than the disconnect device it controls. This arrangement is often required where the disconnect device is mounted too high for personnel to easily reach a conventional operator.

Dual Operation — permits controlling two disconnect devices, one in line with and one remote from a single Class 9422 Type A9 or A10 handle mechanism.

Note: Class 9422 Type A9 or A10 handle **must** be used. Preferred mounting method **must** be used.



Remote Operation Shown (Handle Mechanism Not Included in Kit)

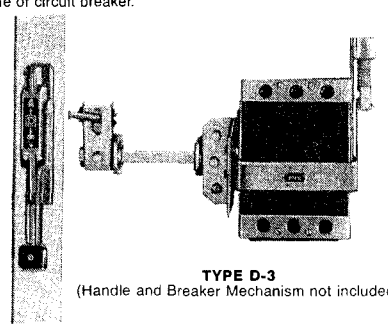
Disconnect Size	Enclosure Mounting Depth	
	Min.	Max.
30A. Disc. Sw.	10⅝	19½
60A. Disc. Sw.	11 11/32	19½
100A. Disc. Sw.	12⅛	20¼
200A. Disc. Sw.	13⅜	20 13/16
FA Ckt. Bkr.	10 21/32	19½
KA Ckt. Bkr.	11⅛	19½
LA Ckt. Bkr.	12⅛	19⅞
MA Ckt. Bkr.	12½	20¼

LATERAL EXTENSION KITS

Designed to allow a horizontal offset for Class 9422 variable depth circuit breaker mechanisms. The kits are intended to be used when the class 9422 Type A1, 2, 3, or 4 handle mechanism is mounted to the center channel of a two or multi-door enclosure. With this arrangement, the breaker mechanism can be mounted either to the right or left of the handle mechanism.

BKR Type	Frame Size (Amps.)	9422 Breaker Mechanism Type	Mounting Depth Min. – Max.	Lateral Extension Type	Lateral Offset* Min. – Max.
FAL, FHL	100	RN-1	5.38 – 17.75 / 137 – 451	D-3	6.44 – 14 / 164 – 356
KAL, KHL	225	RP-1	6.38 – 17.87 / 162 – 454	D-3	6.63 – 14 / 168 – 356
LAL LHL, Q4L	400	RR-1	7.43 – 18.25 / 189 – 464	D-4	7.75 – 14 / 197 – 356
MAL, MHL	1000	RT-1	7.62 – 18.37 / 194 – 467	D-4	9.13 – 14 / 232 – 356

* Offset measured from vertical centerline of flange mounted handle mechanism to the vertical centerline of circuit breaker.

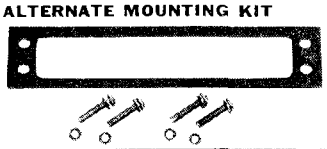


TYPE D-3
(Handle and Breaker Mechanism not included)

Class	Type	Price
9422	D-2	**$70.**

Class	Type	Price
9422	D-3	**$190.**
	D-4	**190.**

ALTERNATE MOUNTING KIT



Permits mounting Class 9422 Type A1 or A2 handle mechanisms in enclosures with flange thickness of 16 gauge to ½ in.

Class	Type	Price
9422	AM-2	**$4.**

CHANNEL/FLANGE SUPPORT KIT

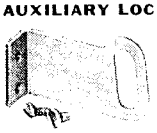


Auxiliary kit recommended for use with 30 and 60 amp. disconnect switches, and FA and KA circuit breaker mechanisms when these devices are to be mounted on the center channel of a multi-door enclosure or when extra rigidity for the flange is required. Supplied as standard with 100 and 200 amp. disconnect switches, and LA and MA circuit breaker mechanisms

Installation details furnished with each kit on instruction sheet 30072-303-11.

Class	Type	Price
9422	C-1	**$12.**

AUXILIARY LOCK PLATE



Auxiliary kit recommended for use with the Class 9422 Type A-1 flange handle to facilitate padlocking the handle in the "OFF" position. Primarily used when the handle is mounted on the center channel of a multi-door enclosure. Also in any case where the enclosure doors interfere with the normal padlock slot in the flange handle.

Meets both the Automotive and JIC specifications.

Class	Type	Price
9422	L-1	**$5.**

SPECIAL LUGS FOR DISCONNECT SWITCHES

Copper Lugs Only — Specify Form Y157. **Exceptions:** 30, 60, and 100 amp bracket mounted switches listed on page 443 are not available with copper lugs	....	....	N/C
Tin Plated Aluminum Lugs For 400 Amp. Type TG Switch — Specify Form Y157-2 (000-750 MCM Cu/Al wire)	....	....	N/C
Anderson Type VCEL Compression Lugs — Specify Form Y157-4. **Exceptions:** All 30 and 60 amp disconnect switches; and all 100 amp bracket mounted switches listed on page 443 are not available with compression lugs	....	....	N/C

OPERATING RODS

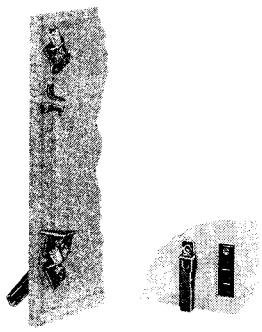
Standard operating rod for use with Class 9422 variable depth mechanisms. Included as standard in each kit	9422	R-1	**$8.**
Extra long operating rod for use with Class 9422 variable depth mechanisms. Can be used as a substitute for the standard rod included in each kit to increase the maximum mounting depth 7". (Two are required for Types ARR, RR, ART, RT, ATE, TE, ATF, TF.)	9422	R-2	**$14.**

SQD SLV_001222

Class 9423 door closing mechanisms listed immediately below are designed to be used to close and seal enclosure doors of single door enclosures. These mechanisms can be used on doors hinged on either the right or left hand side. The door openings listed are recommended. Mechanical interlocking with a Class 9422 Disconnect Device is provided. For ¾″ deep doors (except M10 and M10L).

CLASS 9423

SINGLE DOOR ENCLOSURES TO 60″ HIGH MAXIMUM DOOR OPENING



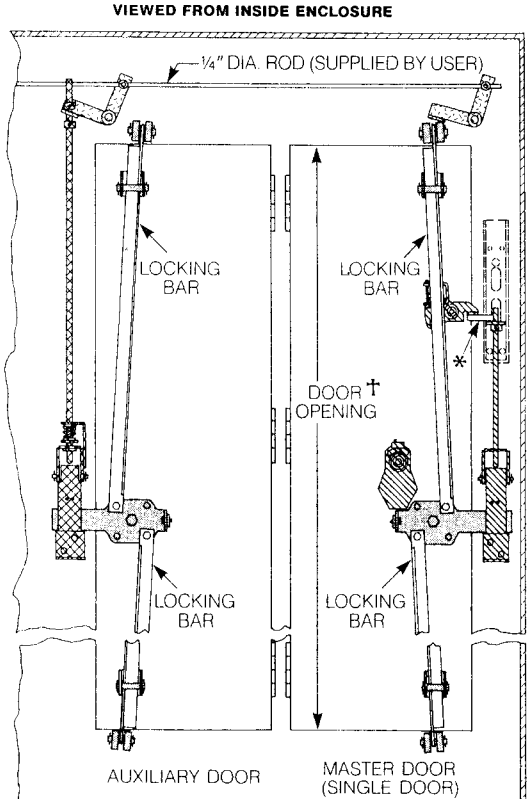
Type M4

Description	Use On (Enclosure Type)	Use In Conjunction With	Operating Handle Length	Maximum Door Opening	Type	Price
Two Point, Roller Latch, Door Closing Mechanism for Use on Enclosures with **DOORS HINGED ON LEFT HAND SIDE**	NEMA 4 and 12 Sheet Steel	Class 9422 Types A1, A5, A7, A9	4″	Less than 39″	M4	**$64.**
			4″	Less than 39″	M10*	**88.**
			6″	60″	M9	**68.**
	NEMA 4 and 12 Stainless Steel	Class 9422 Types A2, A6, A8, A10	4″	Less than 39″	M24	**84.**
Two Point, Roller Latch, Door Closing Mechanism for Use on Enclosures with **DOORS HINGED ON RIGHT HAND SIDE**	NEMA 4 and 12 Sheet Steel	Class 9422 Types A1, A9	4″	Less than 39″	M4L	**64.**
			4″	Less than 39″	M10L*	**88.**
			6″	60″	M9L	**68.**
	NEMA 4 and 12 Stainless Steel	Class 9422 Types A2, A10	4″	Less than 39″	M24L	**84.**
Third Roller Latch Kit for Three Point Locking. Used where 3 Point Locking is Desired or Where Door Opening is 39″ or more.	NEMA 4 and 12 Sheet Steel	Class 9423 Types M4, M4L, M9, M9L	....	....	M3	**14.**
	NEMA 4 and 12 Stainless Steel	Class 9423 Types M24, M24L	....	....	M23	**16.**

*Suitable for door depths of 1⅛″, 1¼″, 1⅜″ and 1½″.

SINGLE OR MULTI-DOOR ENCLOSURES 40″ THRU 60″ DOOR OPENING

VIEWED FROM INSIDE ENCLOSURE



Type M6 Type M5 Type M7 Type M2

*Locking lever extension of the flange mounted handle mechanism.
†Actual enclosure opening — not door height.

SINGLE DOOR ENCLOSURES.
Each door requires:
1 — Type M6 door closing mechanism
1 — Type M6__ __ locking bar kit
1 — Type M5 (when interlocking with a Class 9422 handle mechanism is required)

	Price
TYPE M6 DOOR CLOSING MECHANISM — The Class 9423 Type M6 door closing mechanism is designed to close and seal ¾″ deep doors of single or multi-door NEMA 12 enclosures. The Type M6 can be used on doors hinged on either the left or right hand side. Recommended door openings are from 40″ thru 60″. Vault type handle length is 6″.	**$72.**
TYPE M6__ __ LOCKING BAR KITS — Lock bar kits for the Type M6 door closing mechanism contain two lock bars and are available from stock for door openings from 40″ thru 60″ in increments of one inch. One locking bar kit is required for each Type M6 ordered. To determine the correct locking bar kit, measure the door opening and order the corresponding Type M6__ __ kit. The last two digits indicate the door opening in inches. If the measured door opening results in a fraction, round off to the nearest inch.	**24.**
TYPE M5 — The Class 9423 Type M5 mechanical interlock kit is designed to interlock a Class 9422 handle mechanism (Page 442) with the Type M6 door closing mechanism. This kit prevents opening the master door (or single door) with the disconnect handle in the "ON" position, making it mandatory to use a screw driver to gain entry to the enclosure at any time, regardless of the disconnect handle position.	**60.**

EXAMPLES:

Door Opening	Locking Bar Kit
43⅜″	Type M6**43**
52½″	Type M6**53**

MULTI-DOOR ENCLOSURES WITHOUT INTERLOCKING.
Each Door Requires:
1 — Type M6 door closing mechanism
1 — Type M6__ __ locking bar kit

MULTI-DOOR ENCLOSURES WITH INTERLOCKING.
Master Door requires:
1 — Type M6 door closing mechanism
1 — Type M6__ __ locking bar kit
1 — Type M5 (when interlocking the master door with a Class 9422 handle mechanism is required)
Auxiliary Door(s) requires:
1 — Type M6 door closing mechanism
1 — Type M6__ __ locking bar kit
Quantities of the kits listed below are also required for each auxiliary door(s).

	Price
TYPE M2 — One Type M2 kit, is required for each auxiliary door. This kit is required to interlock the auxiliary door(s) with the master door.	**$72.**
TYPE M7 — The first auxiliary door requires 2 Type M7 kits. Additional auxiliary doors require only 1 Type M7 kit. The ¼″ diameter rod used to interconnect the M7 kits is furnished by the user. If the distance between any two Type M7 kits exceeds 36″, an additional Type M7 kit should be installed to prevent the ¼″ diameter rod from buckling.	**20.**

SQD SLV_001223

DOOR CLOSING MECHANISMS

CLASS 9423

SINGLE OR MULTI-DOOR ENCLOSURES 61″ THRU 91″

SINGLE DOOR ENCLOSURE REQUIRES:
1 — Type M8 door closing mechanism
1 — Type M8__ __ locking bar kit
1 — Type M1 (when interlocking with a Class 9422 handle mechanism is required)

	Price
TYPE M8 DOOR CLOSING MECHANISM The Class 9423 Type M8 door closing mechanism is designed to close and seal 1⅛″ deep doors of single or multi-door NEMA 12 enclosures. The Type M8 can be used on doors hinged on either the left or right hand side. Recommended door openings are from 61″ thru 91″. Vault type handle length is 8″.	**$140.**
TYPE M8__ __ LOCKING BAR KITS Lock bar kits for the Type M8 door closing mechanism contain two lock bars and are available from stock — **odd numbered inches only** — for door openings from 61″ thru 91″. One locking bar kit is required for each Type M8 ordered. To determine the correct locking bar kit, measure the door opening and order the corresponding Type M8__ __ kit. The last two digits indicate the door opening in inches.	**24.**
TYPE M1 The Class 9423 Type M1 mechanical interlock kit is designed to interlock a Class 9422 handle mechanism (Page 442) with the Type M8 door closing mechanism. This kit prevents opening the master door (or single door) with the disconnect handle in the "ON" position, making it mandatory to use a screw driver to gain entry to the enclosure at any time, regardless of the disconnect handle position.	**120.**

EXAMPLES:

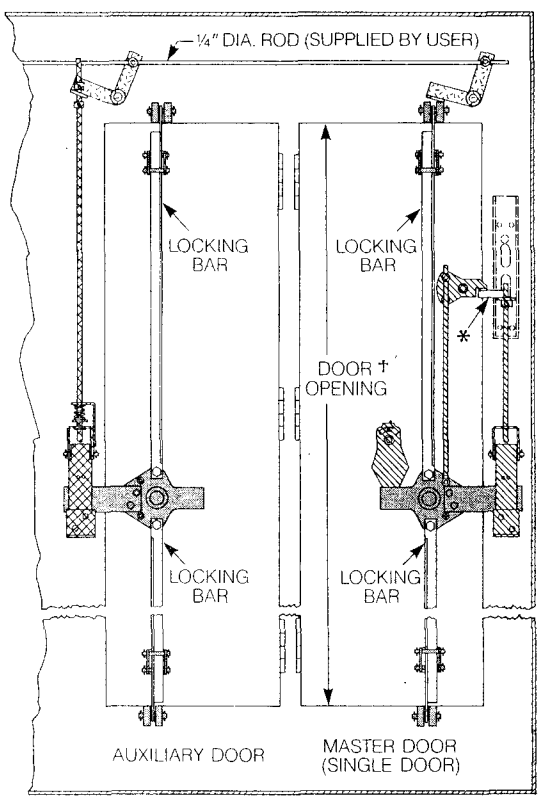
Door Opening	Locking Bar Kit
65″	Type M8**65**
83″	Type M8**83**

MULTI-DOOR ENCLOSURES WITHOUT INTERLOCKING.
Each Door requires:
1 — Type M8 door closing mechanism
1 — Type M8__ __ locking bar kit

MULTI-DOOR ENCLOSURES WITH INTERLOCKING.
Master Door requires:
1 — Type M8 door closing mechanism
1 — Type M8__ __ locking bar kit
1 — Type M1 (when interlocking the master door with a Class 9422 handle mechanism is required)
Auxiliary Door(s) requires:
1 — Type M8 door closing mechanism
1 — Type M8__ __ locking bar kit
Quantities of the kits listed below are also required for each auxiliary door(s).

	Price
TYPE M2 One Type M2 kit is required for each auxiliary door. This kit is required to interlock the auxiliary door(s) with the master door.	**$72.**
TYPE M7 The first auxiliary door requires 2 Type M7 kits. Additional auxiliary doors require only 1 Type M7 kit. The ¼″ diameter rod used to interconnect the M7 kits is furnished by the user. If the distance between any two Type M7 kits exceeds 36″, an additional Type M7 kit should be installed to prevent the ¼″ diameter rod from buckling.	**20.**

VIEWED FROM INSIDE ENCLOSURE



* Locking lever extension of the flange mounted handle mechanism.
† Actual enclosure opening — not door height.

INTERLOCKING HARDWARE FOR DOUBLE DOOR ENCLOSURES WITH BOTH DOORS CLOSING ON A CENTER CHANNEL

For Use With Type M8 Vault Handles Only

Description	Type	Price
The Class 9423 Type M25 Double Door Interlock Kit is designed for use on enclosures with two doors closing on a center channel which has a Class 9422 disconnect device mounted on it. The kit provides for the interlocking of both doors to the disconnect handle with one Class 9423 Type M1 kit. It also prevents the auxiliary door from being opened before the master door is opened, and without the use of a screwdriver to void a mechanical interlock. As you look at the enclosure, the left-hand door is the master door and the right-hand door the auxiliary door.	M25	**$36.**

INSTALLATION

A complete installation requires the following items:

2 — Class 9423 Type M8 vault handles
2 — Locking bar kits (sized according to door opening)
1 — Class 9423 Type M1 Mechanical Interlock Kit
1 — Class 9423 Type M25 Double Door Interlock Kit
1 — Class 9422 Handle Mechanism
1 — Class 9422 Disconnect Device

SQD SLV_001224

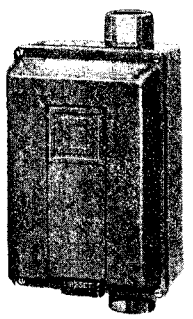
SEPARATE ENCLOSURES
FOR CONTACTORS AND STARTERS

Separate enclosures can be used with open style devices for occasional field assembly of enclosed controls.

Class 9991 **NEMA Types 4 and 12** separate enclosures for Type S devices are provided as standard without closing plates or can be ordered with two closing plates for Sizes 0-2, 30-60 ampere or three closing plates for Sizes 3-4, 100 ampere. When closing plates are removed the cover openings can be used for easy installation of Class 9001 Type K oiltight cover mounted control units.

CLASS 9991

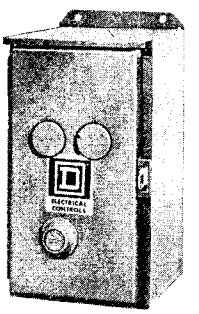
Flush Mounting General Purpose separate enclosures for Type S Sizes 0-2, 30-60 ampere are provided with knock-outs in the cover for field assembly of one Class 9999 push button or selector switch kit and one Class 9999 pilot light kit. (Refer to Class 9999 for selection.) For Type S Size 3, 100-200 ampere, three closing plates are provided for installation of Class 9001 Type K oiltight control units. Cover mounted control units for **NEMA Type 4X** separate enclosures are not available for field assembly.



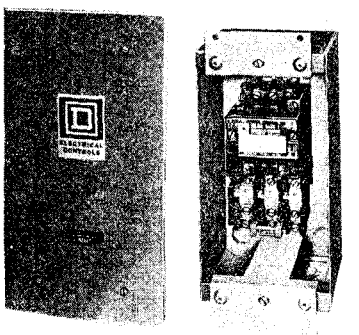
Type SCW-21
NEMA Type 4X
Enclosure



Type SCW-1
NEMA Type 4
Enclosure



Type SCA-11
NEMA Type 12 Enclosure
with 2 cover mounted
closing plates



Flush Mounting Starter "With
Pull Box and Mounting Strap,
Having Plaster Adjustment Feature"

CLASS 9991 SEPARATE ENCLOSURES

For Use With		Enclosure Classification																			
			Watertight, Dusttight and Corrosion-Resistant Glass-Polyester **NEMA Type 4X**		Watertight and Dusttight Stainless Steel **NEMA Type 4**				Dusttight and Driptight Industrial Use **NEMA Type 12 (Type 3 & 3R)‡**				Flush Mounting General Purpose (Components)							
													Flush Plates				Mounting Strap		Pull Box	
					Standard		With Closing Plates		Standard		With Closing Plates		Standard		Stainless Steel					
Class	Types (All Pole Arrangements)	NEMA Size or Amp. Rating	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price
MANUAL STARTERS																				
2510	MBO & MCO	M-0 M-1 M-1P	MW-1	**$136.**	MW-11	**$136.**	....	..	MA-1	**$ 36.**	....	..	MF-1 MF-2	**$ 60.** (with pullbox & plaster adjustment) **36.** (without pullbox but with mtg. strap)						
MAGNETIC CONTACTORS																				
8502★	SBO & SCO	0, 1	SCW-20	**152.**	SCW-1	**152.**	SCW-11	**160.**	SCA-1	**56.**	SCA-11	**64.**	SCF-11	**16.**	SCF-12	**$ 56.**	SCF-2	**$20.**	SCF-1	**$24.**
	SDO	2	SDW-20	**328.**	SDW-1	**328.**	SDW-11	**336.**	SDA-1	**128.**	SDA-11	**136.**	SDF-11	**48.**	SDF-12	**108.**	SDF-2	**28.**	SDF-1	**32.**
	SEO	3	....	..	SEW-1	**488.**	SEW-11	**496.**	SEA-1	**184.**	SEA-11	**192.**	SEF-11	**248.** (Enclosure Complete)						
	SFO	4	....	..	....	..	SFW-11	**876.**	....	..	SFA-11	**520.**	....	..	....	..	....	..	....	..
MAGNETIC STARTERS																				
8536	SBO & SCO	0, 1	SCW-21	**152.**	SCW-1	**152.**	SCW-11	**160.**	SCA-1	**56.**	SCA-11	**64.**	SCF-11	**16.**	SCF-12	**56.**	SCF-2	**20.**	SCF-1	**24.**
	SDO	2	SDW-21	**328.**	SDW-1	**328.**	SDW-11	**336.**	SDA-1	**128.**	SDA-11	**136.**	SDF-11	**48.**	SDF-12	**108.**	SDF-2	**28.**	SDF-1	**32.**
	SEO	3	....	..	SEW-1	**488.**	SEW-11	**496.**	SEA-1	**184.**	SEA-11	**192.**	....	..	....	..	....	..	....	..
	SFO	4	....	..	....	..	SFW-11	**876.**	....	..	SFA-11	**520.**	....	..	....	..	....	..	....	..
LIGHTING CONTACTORS NON-COMBINATION ELECTRICALLY & MECHANICALLY HELD																				
8903★	LO & LLO◐	20 Amp	....	..	LW-1	**144.**	....	..	LA-1	**128.**	....	..	LF-1	**80.** (Includes Flush Plate and Pull Box)						
	SMO	30 Amp	SCW-20	**152.**	SCW-1	**152.**	SCW-11	**160.**	SCA-1	**56.**	SCA-11	**64.**	SCF-11†	**16.**	SCF-12■	**56.**	SCF-2	**20.**	SCF-1	**24.**
	SPO	60 Amp	SDW-20	**328.**	SDW-1	**328.**	SDW-11	**336.**	SDA-1	**128.**	SDA-11	**136.**	SDF-11†	**48.**	SDF-12■	**108.**	SDF-2	**28.**	SDF-1	**32.**
	SQO	100 Amp	....	..	SEW-1	**488.**	SEW-11	**496.**	SEA-1	**184.**	SEA-11	**192.**	SEF-11	**248.** (Enclosure Complete)						
	SVO	200 Amp	....	..	....	..	....	..	....	..	....	..	SEF-11	**248.** (Enclosure Complete)						
REVERSING AND TWO SPEED HORIZONTALLY ARRANGED CONTACTORS AND STARTERS																				
8702★ 8736	SCO SDO	1 2	....	.. ..	SCW-2 SDW-2	**280.** **480.**	....	.. ..	SCA-2 SDA-2	**96.** **192.**	....	.. ..	....	.. ..	....	.. ..	....	.. ..	....	.. ..
8810	SBO & SCO	0, 1	....	..	SCW-3	**400.**	....	..	SCA-3	**148.**	....	..	....	..	....	..	....	..	....	..

★ For contactors, replace reset assembly with proper closing plate; for NEMA Type 4 use Class 9001 Type K52, for NEMA Type 12 use Class 9001 Type K51 or K12 and for Flush Mounting use Class 9999 Type SG-2. Class 9991 Types SCW-20, SDW-20, SEF-11 and LF-1 are designed for contactors only, reset closing plates not required.

‡ Can be modified for NEMA Type 3 raintight and sleet resistant and Type 3R rainproof and sleet resistant applications. For details refer to Page 448.

◐ Separate NEMA Type 1 surface mounted enclosure available. Specify Class 9991 Type LG-1 .... $40. Class 9991 Type L separate enclosures can also be used with Class 8501 Type H relays.

† For electrically held devices only. For mechanically held 30 amp Type SM, order Class 9991 Type SCF-13 .... $16., for 60 amp Type SP, order Class 9991 Type SDF-13 .... $48.

■ For electrically held devices only.

FOR DIMENSIONS REFER TO DEVICE DIGEST SECTION
ORDERING INFORMATION REQUIRED — Class and type number of kit.

SQD SLV_001225

SEPARATE ENCLOSURES
FOR CONTACTORS, STARTERS, RELAYS AND TRANSFORMERS

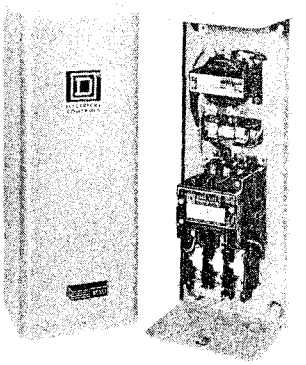
CLASS 9991

NEMA TYPES 1, 4 & 12 ENCLOSURES
For Addition of Control Circuit Transformer Classes 8502 and 8536

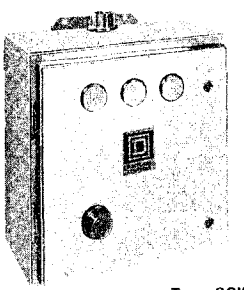
The enclosures listed below will accept Type S, NEMA Sizes 0, 1, 1P and 2 contactors and starters, along with a fused control circuit transformer. Class 9991 Type SCG-1 enclosure cover contains knockouts for field addition of Class 9999 cover mounted control units. All other enclosures listed in table below are provided with three closing plates in the cover for easy installation of Class 9001 Type K oiltight control units.

For Use With				Class 9991 Enclosure						Recommended Class 9070◐ Transformer Selection					Fuse◐ Block
				General Purpose NEMA Type 1		Watertight and Dusttight Stainless Steel NEMA Type 4		Dusttight and Driptight Industrial Use NEMA Type 12 (Type 3 and 3R)‡		Standard		Extra Capacity			
												100VA	150VA	300VA	
Class	Type	NEMA Size	No. of Poles	Type	Price	Type	Price	Type	Price	Type	VA	Type	Type	Type	
*8502 & 8536	SBO & SCO	0 & 1	1-3	SCG-1	**$56.**	SCW-4	**$192.**	SCA-4	**$96.**	EO-1	50VA	EO-2△	EO-3△	....	Class 9080 Type PF-1
			4-5							EO-2	100VA	....	EO-3△	....	
	SDO	2	2-5	SDG-4	**110.**	SDW-4	**398.**	SDA-4	**198.**	EO-2	100VA	....	EO-3	EO-4	

△ For mounting in SCG-1 enclosure a Class 9991 Type S1 adapter bracket is also required .... **$12.** List.
‡ NEMA Type 12 modified for outdoor use (see below).
◐ For price lists and complete descriptions, see Class 9070 and 9080 sections. Note: Class 9991 Type SCG-1 enclosure is provided with a Class 9080 Type PF-1 fuse block as standard.
* For contactors (Class 8502), a separate closing plate is provided with each enclosure to replace the reset mechanism with the exception of Class 9991 Type SCG-1 which requires a separate reset closing plate Class 9999 Type SG-2 .... **$4.00** List.



Type SCG-1
With Starter, Transformer and Fuse Block Installed

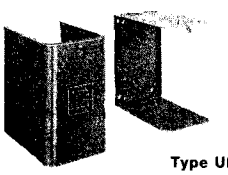


Type SCW-4
NEMA Type 4 Enclosure

NEMA TYPE 1 ENCLOSURES FOR CLASSES 7001, 8501, 8508, 8903, 8910, 9050, 9055 & 9070

For Use With		Enclosure Class 9991	
Class	Type	Type	Price
7001	DO (2-4 pole)	UE-6	**$28.00**
	DO (6-8 pole)	UE-3	**28.00**
	J	UE-6	**28.00**
8501	CO-	UE-1	**14.50**
	DDO- DEO, DO (6-8 pole)	UE-3	**28.00**
	DO (2-4 pole)	UE-6	**28.00**
	GO (2-4 pole w/o attachments)	UE-6	**28.00**
	GO (6-8 pole), GO (2-4 pole w/attachments)	UE-7	**28.00**
	H	LG-1	**40.00**
	LO, LSO	UE-7	**28.00**
8508	DO-20, 22, 40	UE-7	**28.00**
8903	LO, LLO	LG-1	**40.00**
8910	H, J, K, L & M	UE-6	**28.00**
9050	AO (single head)	UE-6	**28.00**
	BO, CO	BCG	**40.00**
	HO	UE-6	**28.00**
	TO	UE-7	**28.00**
9055	AO, BO or NO 101-121	G-1	**72.00**
	AO, BO or NO 122-123	G-2	**72.00**
	AO, BO or NO 124-125	G-3	**72.00**
	AO, BO or NO 126	G-4	**78.00**
9070	EO-1, EO-17	TB-1	**28.00**△
	EO-2, EO-3, EO-4, EO-15, EO-16, EO-18, EO-19	TB-2	**36.00**△
	EO-51, EO-61	TB-3	**60.00**△
	EO-71	TB-4	**90.00**△
	EO-81, EO-91	TB-5	**90.00**△

△ **D8 DISCOUNT**



Type UE-3

OVERSIZED ENCLOSURES
NEMA TYPE 1 FOR CLASS 2510 TYPES F & K

The oversized NEMA Type 1 separate enclosures listed below are for use with Class 2510 Type F Fractional Horsepower Manual Starters and Type K Motor Starting Switches. These enclosures provide additional wiring space for easy installation of open style devices.

For use with Class 2510 Type	Oversized NEMA Type 1 General Purpose	
	Class 9991 Type	Price
FO-1, FO-1P, FO-2, FO-2P, FO-3, FO-3P, FO-4, FO-4P	FE-1	**$8.00**
KO-1, KO-1A, KO-1B, KO-2, KO-2B, KO-2C, KO-3, KO-3A, KO-3B, KO-4, KO-4B, KO-4C	KE-1	**8.00**

OVERSIZED ENCLOSURES
NEMA TYPES 1, 4 & 12 FOR CLASS 8903

The enclosures listed below are for use with electrically and mechanically held open type Class 8903 Type L 20 amp and Type S 30 and 60 amp lighting contactors. These enclosures include a panel with space and drilling for an open type contactor and fused control circuit transformer (Form FT) and/or an auxiliary relay for use with single pole pilot devices (Form R6). In addition, three closing plates are provided as standard for easy installation of Class 9001 Type K oiltight control units. See Class 8903 for selection of transformers and relays.

ENCLOSURE SELECTION

For Use With			Enclosure					
			General Purpose Enclosure NEMA Type 1		Watertight and Dusttight Enclosure Stainless Steel NEMA Type 4		Dusttight and Driptight Industrial Use Enclosure NEMA Type 12*	
			Class 9991		Class 9991		Class 9991	
Class	Type	Ampere Rating	Type	Price	Type	Price	Type	Price
8903	LO, LLO	20 Amp.	**					
	SMO	30 Amp.	SDG-3	**$112.**	SDW-3	**$328.**	SDA-3	**$192.**
	SPO	60 Amp.						

*Suitable for NEMA 3 raintight and sleet resistant and 3R rainproof and sleet resistant applications. For details refer to table at right.
**Class 9991 Type SCG-1 separate enclosure can also be used for Class 8903 Type SMO 30 ampere electrically held lighting contactor if Form FT (control transformer) with or without cover control units is required.

NEMA TYPE 12 MODIFIED FOR OUTDOOR USE

Square D NEMA 12 enclosures may be field modified for outdoor use per the following instructions:

Field Modification for NEMA Type 3 dusttight, raintight and sleet resistant outdoor applications are as follows:

1. Watertight conduit hubs equivalent provision for watertight connection at the conduit entrance shall be used.

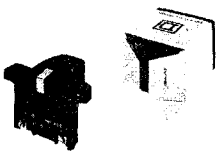
Field Modifications for NEMA Type 3R rainproof and sleet resistant outdoor applications are as follows:

1. Watertight conduit hubs or equivalent provision for watertight connection at the conduit entrance, when the conduit enters at a level higher than the lowest live part, shall be used.
2. Drain holes of 1/8 inch diameter shall be added to the bottom of the enclosure.

ORDERING INFORMATION REQUIRED —
Class and type number of kit.

SQD SLV_001226

COILS



AC Magnet Coil for Type S Starter and Contactor

AC magnet coils are individually packaged in clearly marked cartons for easy stocking and identification. All coils are stamped with the coil part number and the coil voltage and frequency. Epoxy molded coils provide a tough, permanently sealed unit impervious to moisture, oil and mechanical damage.

FOR MAGNETIC CONTACTORS AND STARTERS

CLASSES 8502, 8536, 8538, 8539, 8547, 8549, 8606, 8630, 8640, 8650, 8651, 8702, 8736, 8738, 8739, 8810, 8811, 8812, and 8508, 8903 Electrically and Mechanically Held Latch Coils. (Refer to Table 3 on Page 450 For Listing of Mechanically Held Unlatch Coils.)

AC MAGNET COILS

DEVICES USING COIL				Coil Specification Number	Hz	SUFFIX NUMBERS (Complete Part Number of Coils Consists of Specification Number Followed by Suffix Number as 31041-400-42)											Coil Volt-Amperes		Price
Device	Size	Type	Poles			24 Volts	110-115 Volts	120 Volts	208 Volts	220 Volts	240 Volts	277 Volts	380 Volts	440 Volts	480 Volts	550 Volts	600 Volts	In-rush	Sealed	
Coils for CURRENT Design Magnetic Contactors and Starters	20 Amp.	L	2-6	31071-400	60	23	....	44	50	△	53	55	....	.....	62	....	65	150	30	$ 26.
					50	24	44	45	52	53	54	56	60	62	63	65	66	140	30	
		L	8-12	31071-408	60	23	....	44	50	△	53	55	....	....	62	....	65	180	35	26.
					50	24	44	45	52	53	54	56	....	62	63	65	66	170	35	
		LL	All	31071-411	60	23	....	44	50	△	53	55	....	....	....	....	....	150	....	87.
					50	24	44	45	51	53	54	56	....	....	....	....	....	140	....	
	00 Series B & C	A	All	31012-400	60	23	42	43	49	△	52	55	58	60	61	63	65	118	10.5	26.
					50	25	43	46	....	....	55	....	60	61	64	65	67	115	10	
	0	SB	All	31041-400	60	20	△	42	48	△	51	52	56	△	60	△	62	245	27	30.
					50	22	42	43	....	51	53	....	57	60	61	62	64	232	26	
	1 & 1P 30 Amp.	SC SM	All	31041-400	60	20	△	42	48	△	51	52	56	△	60	△	62	245	27	30.
					50	22	42	43	....	51	53	....	57	60	61	62	64	232	26	
	0, 1 & 1P	SB & SC	All	31041-402	60 50	Dual Voltage Coils: 115/230—01 115/230—03 120/240—02 240/480—04												245 232	27 26	43.
	2 60 Amp.	SD SP	2 & 3	31063-409	60	16	△	38	44	△	47	49	53	△	57	△	60	311	37	39.
					50	17	38	39	....	47	48	....	54	57	58	60	61	296	36	
	2 60 Amp.	SD SP	4 & 5	31063-400	60	16	△	38	44	△	47	49	53	△	57	△	60	438	38	39.
					50	17	38	39	....	47	48	....	54	57	58	60	61	429	37	
	3 100 Amp.	SE SQ	2 & 3	31074-400	60	16	△	38	44	△	47	49	53	△	57	△	60	700	46	78.
					50	17	38	39	....	47	48	....	54	57	58	60	61	678	47	
	3 100 Amp.	SE SQ	4 & 5	31091-400	60	16	△	38	44	△	47	49	53	△	57	△	60	1185	85	78.
					50	17	38	39	....	47	48	....	54	57	58	60	61	1260	89	
	4 200 Amp.	SF SV	All	31091-400	60	16	△	38	44	△	47	49	53	△	57	△	60	1185	85	78.
					50	17	38	39	....	47	48	....	54	57	58	60	61	1260	89	
	5 300 Amp.	SG SX	All	31096-400	60	....	△	09	15	△	18	19	21	△	24	△	29	2970	212	108.
					50	....	09	10	....	18	....	....	22	24	....	29	30	2970	250	
	6 & 7	SH, SJ	2-3	Coil Part Number 31104-400-50 (All System Voltages)																262.
	400, 600 & 800 Amp.	SY, SZ (Elect. Held)																		
	400, 600 & 800 Amp.	SY, SZ (Mech. Held)	2-3	31104-418	60	....	△	09	15	△	18	19	....	△	24	△	29	555	395	262.
					50	....	09	....	....	18	....	....	....	24	....	29	....	530	395	
	8	K (Series A & B)	2-3	Coil Part Number 51030-034-01 (2-Required per Contactor)††																762.
Coils for OBSOLETE Design Magnetic Contactors and Starters	0	B	All	1861-S1	60	R22B◐	R29B	R30A	R32B	R32B	R33A	R33B	....	R35B	R36A	R36B	R37A	160	30	30.
					50	R23B◐	R30A	R31A	....	R33A	R34A	....	R35B	R36A	R37A	R37A	R38A	120	26	
	0	B	All	1861-S14	60 50	Dual Voltage Coils: 115/230—G4 115/230—G5 230/380—G14 220/380—G15 240/480—G6 220/440—G8														43.
	1 30 Amp.	C M	All	2936-S1	60	C19A	C26B	C27A	C29B	C29B	C30A	C30B	....	C32B	C33A	C33B	C34A	170	40	32.
					50	C20A	C27A	C28A	....	C30A	C31A	....	C32B	C33A	C34A	C34A	C35A	125	27	
	1	C	All	2936-S21	60 50	Dual Voltage Coils: 115/230—G4 110/220—G3 240/480—G11 220/440—G11														56.
	2 60 Amp.	D P	2-4	1707-S1	60	T13B	T20A	T21	T23A	T23A	T24	T24A	....	T26A	T26B	T27A	T27B	465	80	39.
					50	T14A	T21	T21A	....	T24	T24A	....	T26A	T26B	T27A	T27B	T28A	400	65	
	3 100 Amp.	E Q	2-4	1775-S1	60	U11A	U17B	U18A	U20D	△	U21A	U21B	....	U23B	U24A	U24B	U25A	800	150	78.
					50	U12A	U18A	U19A	....	U21A	U22A	....	U23B	U24A	U25A	U25A	U26A	600	120	
	4 200 Amp.	F V (Series C)	2-4	1775-S1	60	U11A	△	U18A	U20D	△	U21A	U21B	....	△	U24A	△	U25A	1490	140	78.
					50	U12A	U18A	U19A	....	U21A	U22A	....	U23B	U24A	U25A	U25A	U26A	1200	110	
	4 200 Amp.	F V (Series C)	5	1775-S1	60	....	△	U17B	U20	△	U20B	....	....	△	U23B	△	U24B	1800	160	78.
					50	....	U17B	U18B	....	U20B	U21B	....	....	U24B	U24B	U24B	U25B	1450	125	
	5 300 Amp.	G X (Series B & C)	All	2938-S1	60	....	△	F14A	F16D	△	F17A	F17B	....	△	F20A	△	F21A	2800	290	108.
					50	....	F14A	F14B	....	F17A	F17B	....	F19B	F20A	F21A	F21A	F21B	2000	220	
	6	H (Series A)	2-3	51029-044-	60	....	....	50	51	52	52	....	....	....	53	....	54	5400	650	304.
	6	H (Series B & C)	2-3	51029-074-	60	....	....	50	51	51	51	....	....	....	52	....	53	2900	220	262.
	7	J (Series A & B)	2-3	Coil Part Number 51030-034-01 (2 Required per Contactor)††																762.

††All contactors are supplied with self-contained dc supply consisting of suitable transformer and rectifier to supply 100 volts dc for coil. An ac control relay is also supplied for pilot circuit.

◐VA values for these coils are 120% of the values shown.
△Use next higher voltage, 60 hertz coil.

ORDERING INFORMATION REQUIRED

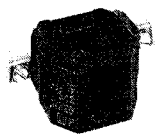
1. Order magnet coils by part number, voltage and frequency.
2. Order magnet coils not listed on Pages 449 & 450 by supplying voltage and frequency and complete identification of starter or contactor for which coil is desired.

SQD SLV_001227

AC MAGNET COILS

COILS

For Classes 8501, 8508, 8910, 8965 and 9050.
(Alsc listed are unlatch coils for Class 8903. Refer to Table 3 below.)



AC Magnet Coil
for Type D Relay

AC MAGNET COILS

DEVICES USING COIL			Coil Specification Number	Hz	SUFFIX NUMBER (Complete Part Number of Coils Consists of Specification Number Followed by Suffix Number as 4323-S1-W38B)												Coil Volt-Amperes		Price
Device	Type	Poles			24 Volts	110-115 Volts	120 Volts	208 Volts	220 Volts	240 Volts	277 Volts	380 Volts	440 Volts	480 Volts	550 Volts	600 Volts	In-rush	Sealed	
TABLE 1					**CLASSES 8501, 8508 AND 9050**														
8501 & 8508 (Relays)	A	All	2183-S44	60 50	Q23A◐ Q24A◐	Q30A Q30B	Q30B Q31A	Q33A	Q33A Q33B	Q33B Q34A	Q34A	.... Q36A	Q36A‡ Q36B	Q36B Q37A	Q37A Q37B	Q37B Q38A	90 55	20 12	**$26.**
	BH & BR	All	1861-S1	60 50	R22B◐ R23B◐	R29B R30A	R30A R31A	R32B	R32B R33A	R33A R34A	R33B	.... R35B	R35B‡ R36A	R36A R37A	R36B R37A	R37A R38A	160 120	30 26	**30.**
	CO(1-14)●	All	4323-S1	60 50	W28A W28B	W35A W35B	W35B W36A	W37B	W38A W38B	W38B W39A	W39A	W40B W41A	W41A‡ W41B	W41B	....	....	14 11	8.6 6.6	**17.**
	DDO DEO	All	2959-S49	60 50	W24B W25B	W31A W31B	W31B W32B	W34A	W34A W34B	W34B W35B	W35A	W36B W37A	W37A W37B	W37B W38B	W38A W38B	W38B	62 52	12 11	**34.**
	DO-20 to DO-42	2-4	2959-S1	60 50	W26A W26B	W32B W33A	W33A W33B	W35B	W35B W36A	W36A W36B	W36B	.... W38B	W38B‡ W39A	W39A W39B	W39B W40A	W40A W40B	58 52	12 11	**34.**
	DO-44 to DO-82	6 & 8	2959-S49	60 50	W24A W26A	W30B W31A	W31A W32A	W33B	W33B W34A	W34A W35A	W34B	....	W36B W37A	W37A W38A	W37B W38A	W38A W39A	100 75	25 22	**34.**
	F	2	31011-400	60 50	37 40	56 58	58 59	65	65 67	67 68	68	....	....	....	....	....	11.5 10.5	8.5 7.8	**21.**
	G	All	31021-400	60 50	39 41	59 60	60 62	67	△ 69	69 71	70 72	....	....	....	....	....	100 90	13 13	**21.**
	H	2-8	31071-400	60 50	23 24	 44	44 45	50 52	△ 53	53 54	55	 60	 62	62 63	 65	65	150 140	30 30	**26.**
	HX	8-12	31071-408	60 50	23 24	 44	44 45	50 52	△ 53	53 54	55	....	 62	62	 65	65	180 170	35 35	**26.**
	L	All	9998 CRL†	60 50	618 518	 801	801 556	665 565	 802	802 569	721	....	 803	803 581	 804	804 586	120 115	17.5 17.5	**21.**
	P	All	2491-S8	60 50	P22B◐ P23B◐	P29B P30A	P30A P31A	P32B	P32B P33A	P33A P34A	P33B	.... P35B	P35B‡ P36A	P36A P37A	P36B P37A	P37A P38A	100 80	40 32	**34.**
9050 (Timer)	A 1E, 1D, 5DE	All	2959-S1-	60 50	W26A W26B	W32B W33A	W33A W33B	W35B	W35B W36A	W36A W36B	W36B	....	W38B W39A	W39A W39B	W39B W40A	W40A W40B	62 52	12 11	**34.**
	A All Others	All	2959-S49-	60 50	W25A W25B	W31B W32A	W32A W32B	W34A W34B	W34B W35A	W35A W35B	W35B W36A	....	W37B W38A	W38A W38B	W38B W39A	W39A W39B	74 68	17 17	**34.**
	B‡‡	All	1861-S1	60 50	R22B R22C	R29B R30A	R30A R30B	R32B	R32B R33A	R33A R33C	....	....	R35‡ R36A	R36A R36C	R36B R37A	R37A R37C	160 120	30 22	**30.**
	B▲	All	31017-400-	60 50	33 34	....	54 55	61	61 63	63 64	65	....	70 72	72 73	73 75	75 76	165 155	27 27	**30.**
TABLE 2					**CLASSES 8910 AND 8965**														
8910 (Contactor)	H, J, K, L, M	All	65108-400	60 50	19 21	39 42	40 43	48 50	48 50	49	51	....	57 60	58*	60 62	61* 63	93 93	11 11	**28.**
8965 (Hoist Contactor)	J	All	1861-S1	60 50	R22A R23B	R29A R30B	R29B R31A	R32B	R32B	R33A R34A	R33B	.... R35B	R35B R35C	R36A	R36B R37B	R36B	200 110	43 23	**30.**
	R	All	31002-400	60 50	19 20	39 40	40 41	47 49	47 49	49 51	....	 57	....	58	59 60	60	76 76	27 27	**23.**
	S & T	All	65108-400	60 50	19 21	39 42	40* 43	48 50	48 50	49	51	....	57 60	58*	60 62	61* 63	93 93	11 11	**28.**
	VSO, VTO SPO	All	65108-403	60 50	18 21	38 41	39 42	47 49	47 49	48 51	....	 56	56 59	57	59 61	60 62	95 95	14 14	**28.**

TABLE 3 **MECHANICALLY HELD *UNLATCH* COILS — CLASSES 8501, 8508 and 8903**

NOTE: A ***latch*** coil is also used with mechanically held devices. For selection of latch coils for Mechanically Held Contactors refer to Page 449. For Latching Relays see TABLE 1.

8501 (Relay)	HL■	2-8	31071-963-■	60 50	50	 52	52	53	 54	54	55	....	 56	56	 57	57	18 17	18 17	**56.**
	HXL■	8-12	31071-964-■	60 50	50	 52	52	53	 54	54	55	....	 56	56	 57	57	18 17	18 17	**56.**
8508 (Relay)	A & P	All	2959-S13	60 50	W24B W25B	W31B W32A	W32A W33A	W34B	W34B W35A	W35A W36A	W35B	.... W37B	W37B‡ W38A	W38A W39A	W38B W39A	W39A W40A	39 28	15 11	**62.**
	D & M1	All	2959-S13	60 50	W23B W24B	W30A W30B	W30B W31B	W33A W33B	W33A W33B	W33B W34B	....	.... W36A	W36A W36B	W36B	W37A W37B	W37B	39 34	12 10	**62.**
8508 (Contactor)	C, D & E	All	1861-S1	60 50	R22B R23B	R29B R30A	R30A R31A	R32B	R32B R33A	R33A R34A	R33B	.... R35B	R35B R36A	R36A R37A	R36B R37A	R37A R38A	....	....	**30.**
8903 (Contactors)	LL■	2-4	31071-963-■	60 50	50	 52	52	53	 54	54	55	....	....	....	....	....	18 17	....	**56.**
		6-10	31071-964-■	60 50	50	 52	52	53	 54	54	55	....	....	....	....	....	18 17	....	**56.**
	SM, SP	All	2959-S13	60 50	W23B W21B	△ W30B	W30B W31B	W33A	△ W33B	W33B W34B	W34A	.... W36A	△ W36B	W36B	△ W37B	W37B	80	....	**62.**
	SQ, SV, SX, SY, SZ, SJ	All	31096-416-	60 50	03	△ 09	09	15	△ 18	18	20	 22	△ 24	24	△ 28	28	550	....	**62.**
	M, P & Q	All	1861-S1	60 50	R22B R23B	R29B R30A	R30A R31A	R32B	R32B R33A	R33A R34A	R33B	.... R35B	R35B R36A	R36A R37A	R36B R37A	R37A R38A	....	....	**30.**
	V	All	1861-S1	60 50	R20C	R27B R28C	R27B R28C	R30A	R30B R32A	R30B R32B	R31B	.... R34B	R33B R34C	R33B R35B	R34B R35C	R35A R36B	....	....	**30.**
	X	All	1861-S1	60 50	R19B	R26B R27B	R26A R27B	R29A R30A	R29A R30A	R29A R30A	R30A	.... R32B	R32B R33B	R32B R33B	R32B R34B	R34A R35A	....	....	**30.**

◐VA values for these coils are 120% of the values shown.
‡Coils also rated 380 volts, 50 hertz.
‡‡Series B (Double Pole) and Series D (Single Pole).
†Replaces Series 31111-400- coil.
●Coils on the Types CO-15 and 16 relays are not replaceable.

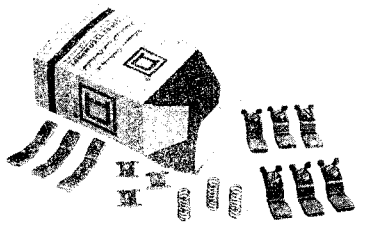
*To be used on 60 hertz only.
▲Series C (Double Pole) and Series E (Single Pole).
△Use next higher voltage, 60 hertz coil.
■Coil numbers include latch assemblies. Do not remove unlatch coil. Complete latch assembly must be replaced.

FOR ORDERING INFORMATION — Refer to Page 449.

SQD SLV_001228

REPLACEMENT PARTS KITS
FOR AC RELAYS, CONTACTORS AND STARTERS

CLASS 9998



Class 9998 Type SL-3 Contact Kit

Class 9998 replacement parts kits are available for servicing the more commonly used Square D relays, contactors, starters, and pressure, vacuum, and float switches. Each kit contains the necessary movable and stationary contacts, contact springs, and additional hardware required to service the devices listed below. When servicing devices having more poles than contained in the corresponding kit, it may be necessary to order an additional kit.

MANUAL STARTER CONTACT KITS

Equipment to Be Serviced		NEMA Size	No. of Poles in Kit	**Class 9998** Parts Kit Type No.	Price
Class	Type				
2205, 2605 Manual Compensator	14 Contact Compensator (1 Kit required) 28 Contact Compensator (2 Kits required)	....	..	PD-1	‡**$150.**
2510 Manual Starters Push Button	B-(Kit includes Contact Block)	M-0	2	BA-22	**72.**
	B-	M-0	3	BA-21	**72.**
	B-(Kit includes Contact Block)	M-0	3	BA-23	**88.**
	C-	M-1	3	CA-21	**88.**
	M-	M-0	3	ML-1	**40.**
	M-	M-1 & M-1P	3	ML-2	**48.**
	W5, W6, W16, W17, W23, W26, W27, W30, W32, W42, W43, W44, W45, W47, W50, W56, W58, W60 and W62	0	3	RA-21	**50.**
	W10, W11, W20, W21, W25, W29, W31, W33, W36, W37, W38, W39, W49, W51, W57, W59, W61 and W63	1	3	SA-21	**60.**
2510 Manual Starters Toggle Type	R-	M-0	3	RA-22	**50.**
	S-	M-1	3	SA-22	**60.**
	T-	M-0	3	ML-1	**40.**
	T-	M-1& M-1P	3	ML-2	**48.**

‡D14A Discount.

RELAY CONTACT KITS

Equipment to Be Serviced		NEMA Size	No. of Poles in Kit	**Class 9998** Parts Kit Type No.	Price
Class	Type				
Magnetic Relays 7001 7008 8501 8508 8990	A-(Series A & B), Q-(Pre-Series A)	....	3	QA-81	**$72.**
	A-(Series C), Q-(Series A)	....	3	QA-82	**72.**
	ARQ-, BH-, B-, R- (15 A. Relay)	....	3	RA-81◆	**50.**
	ARQ-, BH-, B-, R-	....	4	RA-82◆	**60.**
	† DQ-02, 20, 22; DDQ & DEQ 20, 22	....	..	RA-84	**24.**
	DQ-40, 42; DDQ & DEQ-40, 42	....	..	RA-85	**48.**
	DQ-60, 80, 44, 62	....	..	RA-86	**72.**
	DQ-64, 82	....	..	RA-87	**96.**
	GQ-20, 11, 02 (10 A., 300 V. Relay)*	....	..	GG-2	**36.**
	GQ-30, 21, 12, 03*	....	..	GG-3	**42.**
	GQ-40, 31, 22, 13, 04*	....	..	GG-4	**48.**
	GQ-60, 51, 42, 33, 24, 15, 06*	....	..	GG-6	**60.**
	GQ-80, 71, 62, 53, 44, 35, 26, 17, 08*	....	..	GG-8	**72.**
	GDQ-20, 11, 02 (300 Volt dc Relay)*	....	..	GDG-2	**40.**
	GDQ-30, 21, 12, 03*	....	..	GDG-3	**46.**
	GDQ-40, 31, 22, 13, 04*	....	..	GDG-4	**52.**
	GDQ 60, 51, 42, 33, 24, 15, 06*	....	..	GDG-6	**76.**
	GDQ 80, 71, 62, 53, 44, 35, 26, 17, 08*	....	..	GDG-8	**98.**
	H-, HL, HX, HXL, HD	....	3	RA-6	**42.**
	H-, HL, HX, HXL, HD	....	4	RA-7	**56.**
	HM, HML, HXM, HXML, HMD	....	4	RA-5	**78.**

◆ Each kit contains the springs for either 2 or 4 pole or 6 or 8 pole devices.

† For 8501 DQ-22, DDQ-22 or DEQ-22, order two RA-84 kits.

* Kit for Type G, 300 volt, relays consist of 2 complete stationary contact block assemblies and one complete movable contact carrier assembly.

ORDERING INFORMATION REQUIRED —
Order parts kits by class and type number.

MAGNETIC CONTACTOR AND STARTER CONTACT KITS FOR CURRENT DEVICES

Equipment to Be Serviced		NEMA Size or Amp. Rating	No. of Poles in Kit	**Class 9998** Parts Kit Type No.	Price
Class	Type				
8502 8536 8538 8539 8547 8549 8606 8630 8640 8650 8651 8702 8736 8738 8739 8810 8811 8812 8940	A-(Series B & C)	00	3	AA-81	$ **40.**
	SB-	0	3	SL-2	**60.**
	SB-	0	4	SL-12	**80.**
	SB-, SC-(Power Pole Adder)	0 & 1	1	SL-22	**28.**
	SC-	1&1P	3	SL-3	**84.**
	SC-	1	4	SL-13	**112.**
	SD-	2	3	SL-4	**168.**
	SD-	2	4	SL-14	**224.**
	SD-(Power Pole Adder)	2	1	SL-24	**56.**
	SE-	3	2	SL-6	**200.**
	SE-	3	3	SL-7	**300.**
	SF-	4	2	SL-8	**384.**
	SF-	4	3	SL-9	**576.**
	SG-	5	2	SL-10	**952.**
	SG-	5	3	SL-11	**1413.**
	SH-	6	2	SL-25	**1704.**
	SH-	6	3	SL-26	**2538.**
	SJ-	7	2	SL-30	**2470.**
	SJ-	7	3	SL-31	**3696.**
	K-(Series A)	8	3	KA-81	**3872.**
8901 & 8903	L-(For 8903 devices only)	20 Amp.	4	RA-5	**78.**
	SM-, (For 8903 devices only)	30 Amp.	3	SL-3	**84.**
	SM-, (For 8903 devices only)	30 Amp.	4	SL-13	**112.**
	SP-, (Also 8901 Type SM)	60 Amp.	3	SL-4	**168.**
	SP-, (Also 8901 Type SM)	60 Amp.	4	SL-14	**224.**
	SQ-	100 Amp.	2	SL-6	**200.**
	SQ-	100 Amp.	3	SL-7	**300.**
	SV-	150 Amp. 200 Amp.	2	SL-15	**384.**
	SV-	150 Amp. 200 Amp.	3	SL-16	**576.**
	SW, SX-	225 Amp. 260 Amp. 300 Amp.	2	SL-10	**952.**
	SW, SX-	225 Amp. 260 Amp. 300 Amp.	3	SL-11	**1413.**
	SY-	400 Amp.	2	SL-25	**1704.**
	SY-	400 Amp.	3	SL-26	**2538.**
	SZ-	600 Amp.	2	SL-32	**1704.**
	SZ-	600 Amp.	3	SL-33	**2538.**
	SJ-	800 Amp.	2	SL-30	**2470.**
	SJ-	800 Amp.	3	SL-31	**3696.**

MAGNETIC CONTACTOR AND STARTER CONTACT KITS FOR OBSOLETE DEVICES

Equipment to Be Serviced		NEMA Size	No. of Poles in Kit	**Class 9998** Parts Kit Type No.	Price
Class	Type				
8502 8504 8508 8536 8537 8538 8539 8541 8547 8549 8550 8606 8630 8640 8650 8651 8702 8736 8738 8739 8747 8750 8810 8811 8812 8903 8920 8940	A-(For 8702 and 8736 devices only.)	00	3	QA-81	**72.**
	B-(Series A)	0	3	BA-81	**72.**
	B-(Series A)	0	4	BA-82	**92.**
	B-(Pre-Series A), R-	0	3	RA-81	**50.**
	B-(Pre-Series A), R-	0	4	RA-82	**60.**
	C-(Series A & B), M-(30 Amp.)	1	3	CA-81	**102.**
	C-(Series A & B), M-(30 Amp.)	1	4	CA-82	**135.**
	C- & S-(Both Pre-Series A)	1	3	SA-81	**112.**
	C- & S-(Both Pre-Series A)	1	4	SA-82	**144.**
	D-, P-(60 Amp.), T-	2	3	TA-81	**379.**
	D-, P-(60 Amp.), T-	2	4	TA-82	**505.**
	E-Q(100 Amp.), U-	3	2	UA-83	**334.**
	E-Q(100 Amp.), U-	3	3	UA-81	**496.**
	E-Q(100 Amp.), U-	3	4	UA-82	**662.**
	F-(Series A, B)	4	3	FA-81	**1406.**
	F-(Series C)	4	2	FA-85	**831.**
	F-(Series C)	4	3	FA-82	**1237.**
	F-(Series C)	4	4	FA-83	**1654.**
	F-(Series C)	4	5	FA-84	**2054.**
	G-(Vertical Action, Series B and C)	5	1	GA-84	**788.**
	G-(Vertical Action, Series B and C)	5	2	GA-83	**1675.**
	G-(Vertical Action, Series B and C)	5	3	GA-81	**2109.**
	G-(Vertical Action, Series B and C)	5	4	GA-82	**2826.**
	H-(Series A)	6	3	HA-81	**2160.**
	H-(Series B and Series C)	6	3	HA-82	**2160.**
	J-(Series A)	7	3	JA-81	**2920.**

SQD SLV_001229

REPLACEMENT PARTS KITS

CLASS 9998

The following Class 9998 Replacement Parts Kits are available for servicing the more commonly used HI magnetic contactors, starters, controllers, pressure vacuum and float switches, and definite purpose contactors.

FOR HI MEDIUM VOLTAGE CONTROLLERS AND MAGNET CONTROLLERS

Copper contact tips are standard. Silver-faced contact tips are recommended where the contactors remain closed for long periods of time. Each kit contains movable and stationary contacts, necessary hardware and servicing instructions.

Class	Equipment to be Maintained: Type	Equipment to be Maintained: Contactor NEMA Size	No. of Poles in Kit	Parts Kit Type	Price
6815 Magnet Controllers	AD-01 through AD-04 (2-19 amperes)	....	†	MA-1	**$110.**
	AD-13 through AD-16 (19-130 amperes)	....	†	MA-2	**106.**
	SD20 through SD29 (2-30 amperes)	....	†	MA-3	**52.**
	SD30 through SD39 (31-80 amperes)	....	†	MA-4	**52.**
	SD40 through SD49 (81-130 amperes)	....	†	MA-5	**78.**
8110 Medium Voltage Contactors, 8198 Medium Voltage Controllers	DO Series (Old Design)	H3	3	LA-1	‡ **948.**
	E Series (ISO-FLEX)	H3	3	LA-2	‡ **948.**

† Each kit contains complete set of parts to change contacts on both "Lift" and "Drop" contactors.
‡ **D15B Discount.**

D15A DISCOUNT

REPLACEMENT CONTACT KITS
FOR COMMERCIAL AND DOMESTIC PRESSURE, FLOAT AND VACUUM SWITCHES

Equipment To Be Serviced	Class 9998 Type	Price
Obsolete "A" Types Classes 9013, 9016, 9017, 9036 2 Pole Devices Only	PC-1	**$37.00**
Obsolete "G" Types (Pre-Series C) Class 9013, 9036, 9037	PC-2	**21.50**
Obsolete 9016 GVG-1 (Pre-Series C)	PC-5	**40.00**
Class 9013 Type FYG	PC-7	**10.50**
Class 9013 Type HHG, HSG	PC-9	**9.00**
Class 9013 Type FSG	PC-10	**7.00**
Obsolete Class 9036 Type FG-1	PC-10	**7.00**
Obsolete Class 9037 Types FG, HG-1, HG-2, CG, HSG-1, 2; HFG	PC-10	**7.00**
Class 9036 Type DG, DR, DW	PC-15	**14.50**
Obsolete Class 9037 Types HEG, HSG-3, 4	PC-15	**14.50**
Class 9037 Types DG, EG, ER, EW: HG, HR, HW Types 3 thru 12	PC-15	**14.50**

Equipment To Be Serviced	Class 9998 Type	Price
Class 9038 all types (2 Kits Required)	PC-15	**$14.50**
Class 9013 Types HHG-Y, HSG-Y, HSW-Y	PC-17	**12.50**
Class 9013 Type G Series C Above with Form H Above with Form R	PC-205 PC-206 PC-207	**22.00**
Class 9016 Type GVG, Series C	PC-207	**22.00**
Class 9036 GG Series C Above with Form H	PC-205 PC-206	**22.00**
Class 9036 GR, GW; Series C Above with Form H Above with Form R	PC-205 PC-206 PC-207	**22.00**
Class 9037 GG Series C Above with Form H	PC-205 PC-206	**22.00**
Class 9037 GR, GW; Series C Above with Form H	PC-207 PC-206	**22.00**

For a more detailed and complete listing of available parts kits, refer to the 9998 section of your complete Square D Catalog.

D7D DISCOUNT

DEFINITE PURPOSE CONTACTORS
CLASSES 8910 AND 8911

Contacts are silver-cadmium oxide overlay on copper finger and supports. Contact springs are music wire. Each kit contains the movable contacts and stationary contact block required, contact springs and return spring and servicing instructions.

Device to be Serviced			CONTACT PARTS KIT FOR CONTACTORS WITH ALL NORMALLY OPEN POLES — Contact Replacement Kit									CONTACT PARTS KIT FOR CONTACTORS WITH ONE NORMALLY CLOSED POLE — Contact Replacement Kit					
			2-Pole			3-Pole			4-Pole			3-Pole 2 N.O. & 1 N.C.			4-Pole 3 N.O. & 1 N.C.		
Class	Type	Ampere Rating	Class	Type	Price	Class	Type	Price	Class	Type	Price	Class	Type	Price	Class	Type	Price
8910	H	20	9998	LA-12	**$28.**	9998	LA-13	**$35.**	9998	LA-14	**$40.**	9998	LA-15	**$49.**	9998	LA-16	**$55.**
	J	25		LA-22	**28.**		LA-23	**35.**		LA-24	**40.**		LA-25	**50.**		LA-26	**55.**
	K	30		LA-32	**35.**		LA-33	**40.**		LA-34	**44.**		LA-35	**55.**		LA-36	**59.**
	L	40		LA-42	**46.**		LA-43	**50.**		LA-44	**63.**		LA-45	**65.**		LA-46	**78.**
	M	50		LA-52	**59.**		LA-53	**65.**		LA-54	**80.**		LA-55	**65.**		LA-56	**95.**
8911	K	30		....	...		LA-37	**72.**		LA-38	**88.**		....	...		....	...
	M	50		....	...		LA-57	**104.**		LA-58	**120.**		....	...		....	...

D14B DISCOUNT

ORDERING INFORMATION REQUIRED — Class and type number of kit.

SQD SLV_001230

HOIST CONTACTOR CONTACT KITS CLASSES 7702, 8702 & 8965

Equipment To Be Serviced		Class 9998 Parts Kit Type No.	Price
Class	Type		
7702 8702 8965	HO-3, 4, 5, 6, 7, & 8 HG-3, 4, 5, 6, 7, & 8	HA-1	**$84.**
8965	HDO-3, 4, 5, 6, 7, & 8 HDG-3, 4, 5, 6, 7, & 8	HA-1	**84.**
8965	RO-1, 2, 3, 4, 5, & 6 RG-1, 2, 3, 4, 5, & 6	RA-88	**48.**
8702 8965	EQ-1635, EQ-1643, EQ-1933 JO-3, 4, 5, 6, 7 JG-3, 4, 5, 6, 7	JA-2	**112.**
8965	SO-1, 2, 3, 4, 5, 6 SO-21, 22, 23, 24, 25, 26 TO-1, 2, 3, 4, 5, 6 TO-21, 22, 23, 24, 25, 26 SPO-44 SO23-S1 SO2-S1 AO-22 AO-23 BO-32 BO-33 UO-1, thru UO-6	LB-13* LB-14* LB-33* LB-34* LA-17 LB-15* LB-16* LC-22 LC-23 LC-32 LC-33 LB-43	**128.** **164.** **156.** **208.** **67.** **164.** **128.** **34.** **39.** **42.** **48.** **192.**
7702	EQ1390, EQ-1425	JA-1	**132.**
8702	EQ-1329, EQ-1376, JO-1, 2	JA-1	**132.**

▲ Refer to Page 427 for contact ratings.

D14B DISCOUNT

FOOT SWITCH CONTACT KITS CLASS 9002

Class	Type	Class 9998 Parts Kit Type No.	Price
9002	CG1	FS-1	**$13.**
9002	CG2	FS-2	**8.**
9002	CG3	FS-3	**40.**

D14B DISCOUNT



Part No. 31102-514-50

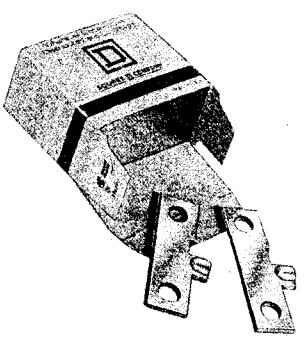
CONTACT UNITS FOR MELTING ALLOY TYPE OVERLOAD RELAYS

One normally closed contact is provided in each overload relay block on Type S starters Sizes 0-4 and Size 6. On the Type S Size 5, a normally closed contact is provided with each of the three overload relay blocks. Contact modules can be easily replaced and are identified in the table below. Alarm circuit contacts are available as an optional feature. A pilot light or alarm bell can be wired in series with this contact to indicate that the overload relay has tripped. For further information on isolated alarm contacts refer to Class 9999 Type SO-4.

Magnetic Starter			Description▲	Parts Kit Number	Price
NEMA Size	Type	Series			
0-4 6-8	SB-SF SH, H, J & K	A A & B	Standard N.C. contact unit.....	Class 9998 Type SO-1	**$12.**
4, 5	F, G	C	Standard N.C. contact unit for L.H. overload relay.....	31006-509-50	**41.**
			N.C. and N.O. alarm (three point) contact unit for L.H. overload relay.....	31006-509-51	**60.**
			Standard N.C. contact unit for R.H. overload relay.....	31006-509-52	**41.**
			N.C. and N.O. alarm (three point) contact unit for R.H. overload relay.....	31006-509-53	**60.**
5	SG	A	Standard N.C. contact unit.....	31102-514-50	**41.**
			N.C. and N.O. alarm (three point) contact unit.....	31102-514-51	**60.**

▲ Refer to Page 427 for contact ratings.

D14A DISCOUNT



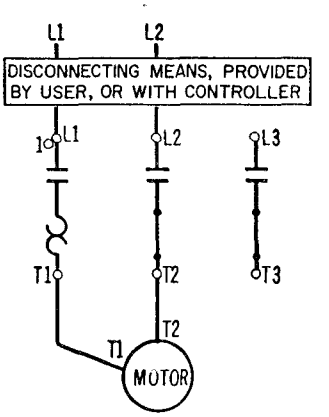
Type SO-31 Jumper Strap

MELTING ALLOY OVERLOAD RELAY JUMPER STRAP KITS

Jumper strap kits are for use on three-phase manual or magnetic starters with melting alloy overload relays only, where a three-phase starter is used to control a single-phase motor. These kits will include two jumper straps, a wiring diagram showing how to wire a three-phase starter to control a single-phase motor, and single-phase (one thermal unit) selection tables.

Class	For Starter		Kit Type No.	Price
	Size	Type		
ALL	00	A	SO-30	**$3.**
	0, 1, 2	SB, SC, SD M & T (Manual)	SO-31	**4.**
	3, 4	SE, SF	SO-32	**6.**
	5	SG	None Available	

D1B DISCOUNT



Three Phase Starter Wired to Control a Single Phase Motor.

ORDERING INFORMATION REQUIRED — Class and type number of kit.

SQD SLV_001231

USER MODIFICATION KITS

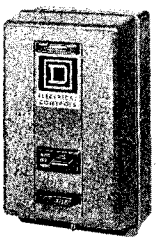
FOR SIZES 00-8 TYPES A, SB-SJ, J AND K CONTACTORS AND STARTERS, TYPES F, K, M AND T MANUAL STARTERS, AND 30-800 AMP TYPES SJ, SM-SZ ELECTRICALLY HELD LIGHTING CONTACTORS

CLASS 9999

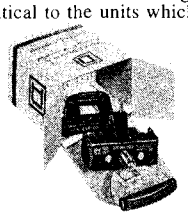
CONTROL UNITS FOR NEMA TYPE 1 ENCLOSURES

For Classes 2510, 2511 and 2512 manual starters and switches, Class 9999 pilot light kits listed below can be added to the cover of the NEMA Type 1 and flush mounted general purpose enclosures.

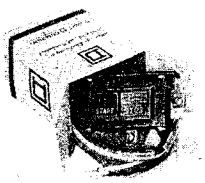
Class 9999 push button, selector switch and pilot light kits can be easily added to the enclosure cover of Classes 8502, 8536, 8538, 8539 contactors and starters and Class 8903 **electrically held** lighting contactors in NEMA Type 1 or flush mounting general purpose enclosures. These kits include the control unit complete with leads and clearly illustrated installation instructions. A knockout is provided in the cover for field addition of either a push button or selector switch. A second knockout allows the field addition of a pilot light unit. NEMA Sizes 5 thru 7 and 200-800 amp Type S devices are provided with three closing plates in the cover for use with Class 9001 Type K oiltight units. All are identical to the units which are factory installed.



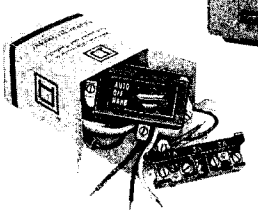
Class 8536 with Push-Button or Selector Switch and Pilot Light



Class 9999 Type SP-2R Pilot Light Kit



Class 9999 Type SA-2 Push Button Kit



Class 9999 Type SC-2 Selector Switch Kit

For Use With					Kit Description											
					Red Pilot Light				Push Button				Selector Switch			
					NEMA Type 1◐ Enclosure Description											
					Hinged		Slip On Cover		Start-Stop		On-Off		Hand-Off-Auto		On-Off	
Class	Type	NEMA Size or Amp Rating	No. of Poles	Voltage	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price	Type	Price
2510	FF & FG	....	....	115-230V	....		PL-10✱	**$12.**	....		....		....		....	
	KF & KG			110-120V			PL-11✱									
				208-240V			PL-12✱	**20.**								
				440-600V			PL-13✱									
2511	KF & KG			110-120V			PL-11†									
				208-240V			PL-12†	**20.**								
				440-600V			PL-13†									
2512	FF & FG			115-230V			(2) PL-10†	**12.**								
	KF & KG			110-120V			(2) PL-11†									
				208-240V			(2) PL-12†	**20.**								
				440-600V			(2) PL-13†									
2510 2511 2512	M & T	M-0, M-1 & M-1P		110-120V	....		MP-1									
				208-240V			MP-2	**20.**								
				440-600V			MP-3									
8502 & 8536	A	00	All	110-120V	....	....	PL-1		A	**$32.**	None Available		SC-1	**$32.**	SC-21	**$32.**
				208-240V			PL-2	**60.**								
				440-600V			PL-3									
	SB & SC	0, 1 & 1P	All	6-600 Volts 50-60 Hertz	SP-12R▲	**$60.**	SP-2R▲	**60.**	SA-2	**32.**	SA-10	**$32.**	SC-2	**32.**	SC-22	**32.**
	SD	2	All		SP-13R▲	**60.**	SP-3R▲	**60.**								
	SE	3	2-3		SP-14R▲	**60.**	SP-4R▲	**60.**								
			4-5		SP-15R▲	**60.**	SP-5R▲	**60.**								
	SF	4	All		SP-15R▲	**60.**	SP-5R▲	**60.**								
	SG-SH, SJ J & K	5-8	All		Use Class 9001 Type K Oiltight Control Units											
8538 8539	SB & SC	0 & 1	All	6-600 Volts 50-60 Hertz	SP-12R▲	**60.**	....	....	SA-2	**32.**	SA-10	**32.**	SC-2	**32.**	SC-22	**32.**
	SD	2	All		SP-13R▲	**60.**	....	....								
	SE	3	All		SP-14R▲	**60.**	....	....								
	SF	4	All		SP-15R▲	**60.**	....	....								
	SG, SH, J, K	5-8	All		Use Class 9001 Type K Oiltight Control Units											
8903	SM	30 amp	All	6-600 Volts 50-60 Hertz	SP-12R▲	**60.**	SP-2R▲	**60.**	SA-2★	**32.**	SA-10★	**32.**	SC-2	**32.**	SC-22	**32.**
	SP	60 amp	All		SP-13R▲	**60.**	SP-3R▲	**60.**								
	SQ	100 amp	2-3		SP-14R▲	**60.**	SP-4R▲	**60.**								
			4-5		SP-15R▲	**60.**	SP-5R▲	**60.**								
	SJ, SV, SX SY, SZ	200-800 amp			Use Class 9001 Type K Oiltight Control Units											

✱ Green pilot light kit also available. For Types F & K use Class 9999 Type PL-11G for 110-120V or Class 9999 Type PL-12G for 208-240V. For Type K ONLY, use Class 9999 Type PL-13G, 440-600V. Kits are priced at **$20.** list.

† Kits include nameplate for Class 2510 devices only. When adding kits to Class 2511 or 2512 devices, the following nameplates are required: (1)-2510 FN-24 for 2511 KF & KG, (1)-2510 FN-42 and (1)-2510 FN-41 for 2512 FF & FG, (1)-2510 FN-21 and (1)-2510 FN-22 for 2512 KF and KG. Green Pilot Light Kit also available, see above footnote.

▲ For green lens ONLY order Class 9999 Type SPG-1, **$4.** list.

★ Also requires N.O. electrical interlock for holding circuit interlock.

◐ Slip-on covers standard for Classes 2510, 11 & 12, 8502 & 8536, sizes 0-4 and 8903, 30-100 amp.

ORDERING INFORMATION — Class and type number of kit

CLOSING PLATES

For Use With			Description	Class 9999	
Class	Type	NEMA Size or Amp. Rating		Type	Price
8502, 8536, 8903	A, SB-SF or SM-SV	00-4 or 30-200 Amp.	For Pilot Light or Reset — Slip-on Cover NEMA Type 1 Enclosure	SG-2	**$4.**
			For Push Button or Selector Switch — Slip-on Cover NEMA Type 1 Enclosure	SG-3	**4.**
8538 & 8539	SB-SF	0-4	For Push Button or Selector Switch — Hinged Cover NEMA Type 1 Enclosure	SG-1	**4.**
			For Pilot Light — Hinged Cover NEMA Type 1 Enclosure	SG-2	**4.**

The closing plates listed above can be used to cover openings left by removal of control units or reset mechanisms.

SQD SLV_001232

USER MODIFICATION KITS — ELECTRICAL INTERLOCKS

Electrical interlock kits for field addition or replacement of electrical interlocks on current manual and magnetic contactors or starters, hoist contactors, and definite purpose contactors.

CLASS 9999

MANUAL AND MAGNETIC CONTACTORS AND STARTERS ELECTRICAL INTERLOCKS

INTERNAL INTERLOCKS

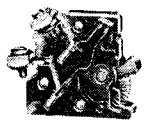
The Class 9999 Type SX-11 is a replacement unit for the N.O. holding circuit interlock supplied as standard on Type S Sizes 00-2 starters and contactors. Class 9999 Type SX-12 is a replacement unit for the N.C. electrical interlock contact which is furnished as standard on Sizes 00-2 mechanically interlocked devices (e.g. Class 8736 reversing starters). Internal interlocks also can be used on Class 2510 Type M & T manual starters. See table below for electrical ratings.

EXTERNAL INTERLOCKS

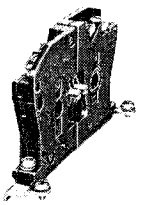
External interlock, Class 9999 Type SX-6, is supplied as standard for the N.O. holding circuit interlock on Type S sizes 3-7 starters and contactors. Additional electrical interlocks can be added to Type S contactors, starters and lighting contactors. These interlocks mount on either side of the basic contactor and are available with convertible or non-convertible contacts. The contacts of the convertible version can be changed from N.O. to N.C. or vice versa in the field. The non-convertible version has fixed contacts, either N.O. or N.C.

Size 8, Type K utilizes the Class 9999 WX-6 convertible electrical interlock.

To determine the number of interlocks which can be added to each Type S contactor or starter, refer to the Class 8536 or Class 8736 section. See table below for electrical ratings.



Internal Electrical Interlock



Double Circuit External Electrical Interlock

Kit Description	Field Convertible Class 9999 Type	Non-Convertible Class 9999 Type	Price
External Electrical Interlock with 1 N.O. contact, L.H. or R.H. mounting	SX-6	SX-13	$ 24.
External Electrical Interlock with 1 N.C. contact, L.H. or R.H. mounting	SX-7	SX-14	24.
External Electrical Interlock with 1 N.O. and 1 N.C. isolated contacts, L.H. or R.H. mounting	SX-8	SX-15	32.
External Electrical Interlock with 1 N.O. overlapping contact, L.H. or R.H. mounting‡	SX-9	SX-16	24.
External Electrical Interlock with 1 N.C. overlapping contact, L.H. or R.H. mounting‡	SX-10	SX-17	24.
Internal Electrical Interlock with 1 N.O. contact, upper L.H. or lower R.H. mounting†	....	SX-11	24.
Internal Electrical Interlock with 1 N.C. contact, upper L.H. or lower R.H. mounting†	....	SX-12	24.
External Electrical Interlock unit (convertible) R.H. mounting 1 N.O. or 1 N.C.*	WX-6	....	172.

‡ Types SX-9 and SX-10 or Types SX-16 and SX-17 must be used together and mounted on the same side of the contactor. They are suitable for applications where it is necessary for a normally open interlock contact to overlap a normally closed interlock contact.
† Types SX-11 and SX-12 not applicable on NEMA sizes 3 or larger.
* Used for size 8 Type K only.

MAXIMUM RATINGS FOR TYPE S ELECTRICAL INTERLOCKS AND TIMERS

Class 9999 Type	Contact Ratings				Class 9999 Type	Contact Ratings			
	Volts AC	AC Only (35% Power Factor)		AC Amps. (75-80% Power Factor)		Volts AC	AC Only (35% Power Factor)		AC Amps. (75-80% Power Factor)
		Make	Carry and Break				Make	Carry and Break	
SX-11, SX-12	120 or Less	30 Amps.	3 Amps.	3	SX6-10	120 or Less	60 Amps.	6 Amps.	6
SK-3, SK-4	120-600	3600 VA	360 VA	3	SX13-17	120-600	7200 VA	720 VA	6

CLASS 8965 HOIST CONTACTORS
ELECTRICAL INTERLOCKS

Device	Interlock Kit				Device	Interlock Kit			
Class 8965 Type	Contact Arrangement	Type of Connector	Class 9999 Type	Price Each	Class 8965 Type	Contact Arrangement	Type of Connector	Class 9999 Type	Price Each
RO-2 & RG-2	2 N.O.	Slip-on	R-10	$14.00	JO-5 or JO-7	1 N.C.	Screw	R-31	$26.00
RO-3 & RG-3	2 N.C.	Slip-on	R-11	14.00	JO-6 or JO-7	1 N.O. & 1 N.C.	Screw	R-32	26.00
RO-5 & RG-5	2 N.O.	Screw	R-12	14.00	SO or TO or UO or VSO or VTO	1 N.O.	Screw	R-20	11.00
RO-6 & RG-6	2 N.C.	Screw	R-13	14.00		1 N.C.	Screw	R-21	11.00
HO-4 & HG-4	2 N.O.	Screw	R-28	12.80		1 N.O.	Slip-on	R-22	11.00
HO-5 & HG-5	2 N.C.	Screw	R-29	12.00					
JO-4 or JO-7	1 N.O.	Screw	R-30	26.00		1 N.C.	Slip-on	R-23	11.00

CLASS 8910 DEFINITE PURPOSE CONTACTORS
ELECTRICAL INTERLOCKS

8910 Device To Be Serviced	Interlock Kit			
	Contact Arrangement	Class	Type	Price Each
Type H, J, K, L or M	1 N.O.	9999	R-20	$11.
	1 N.C.	9999	R-21	11.

ORDERING INFORMATION REQUIRED — Class and type number of kit.

SQD SLV_001233

USER MODIFICATION KITS

FOR SIZE 00-7 TYPES A, SA THRU SH AND SJ CONTACTORS AND STARTERS AND 30-800 AMP TYPES SJ, SM-SZ LIGHTING CONTACTORS

CLASS 9999

POWER POLE ADDERS

A one or two circuit power pole unit can be added to a basic 1, 2 or 3 pole Type S, Size 0, 1, 2, or 30-60 Amp. contactor or starter. Available with normally open or normally closed poles, the power pole adder mounts on either side of the basic contactor with two screws. Only one power pole unit, one or two circuits, can be added. These power pole kits cannot be field added to devices which are mechanically interlocked.

To add an additional power pole unit to a Size 2, or 60 Amp. contactor or starter, it is necessary to replace the coil with a coil designed to handle the additional load. Select a 4 and 5 pole Type S, Size 2 coil from the Coil Selection table on Page 449.

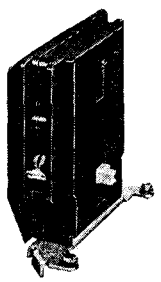
The Sizes 0-2 or 30-60 Amp. power pole kits can be added to Sizes 3-7 or 100-800 Amp. contactors or starters by using a Class 9999 Type SBT-1 adaptor bracket.

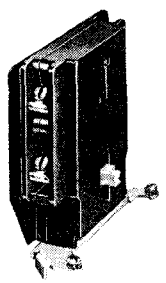
The lugs supplied with Types SB-6 thru 15 are suitable for copper wire only. Types SB-21 thru 25 kits are supplied with lugs suitable for copper and aluminum wire.

Kit Description	Size	Class 9999 Type	Class 9999 Price
One normally open power pole adder	0, 1 & 30 amp. 2 60 amp.	SB-6 SB-11* SB-21*	**$ 44.** **80.** **80.**
One normally closed power pole adder	0, 1 & 30 amp. 2 60 amp	SB-7 SB-12* SB-22*	**44.** **80.** **80.**
One normally open and one normally closed power pole adder	0, 1 & 30 amp. 2 60 amp.	SB-8 SB-13* SB-23*	**88.** **160.** **160.**
Two normally open power pole adder	0, 1 & 30 amp. 2 60 amp.	SB-9 SB-14* SB-24*	**88.** **160.** **160.**
Two normally closed power pole adder	0, 1 & 30 amp. 2 60 amp.	SB-10 SB-15* SB-25*	**88.** **160.** **160.**
Adapter bracket	3-7 & 100-800 amp.	SBT-1	**6.**

*To order a Size 2 or 60 amp. power pole kit complete with a new starter coil, specify Form Y118, voltage and frequency and add **$39.00** to the list price of the kit (e.g. Class 9999 Type SB-11 Form Y118, 120 volts, 60 cycles. Priced at **$119.00** list).

Class 9999 Type SB-6 One Pole Power Pole Adder





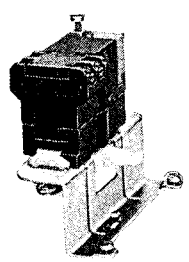
Class 9999 Type SB-9 Two Pole Power Pole Adder

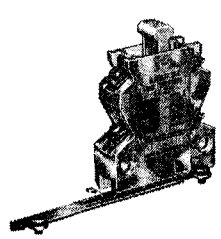
TIMER ATTACHMENTS

A mechanically operated pneumatic timer can be added to Type S Sizes 0-7, and 30-800 Amp. contactors or starters. The timer is available with either on-delay or off-delay and is field convertible. The timing period is adjustable from .2 seconds to 1 minute. Snap switch contains two (2) double break contact elements (1 N.O. & 1 N.C.) that must be used on circuits of same polarity. Timer attachments will not fit in standard NEMA Sizes 0-2 starter enclosures, a larger enclosure is required. For NEMA Sizes 3-6, standard enclosures provide adequate mounting space.

Kit Description	Class 9999 Type	Class 9999 Price
Mechanically operated pneumatic timer, time delay after de-energization (off delay)	SK-3	**$112.**
Mechanically operated pneumatic timer, time delay after energization (on delay)	SK-4	**112.**

Class 9999 Type SK-3 Timer Attachment





Class 9999 Type SF-4 Two Fuse Kit

TRANSIENT SUPPRESSION MODULE

The transient suppression module is designed to be used where the transient voltage, generated when opening the coil circuit, interferes with the proper operation of nearby integrated or solid state control circuits. The module consists of an RC circuit and is designed to suppress the coil voltage transients to approximately 200% of peak coil supply voltage. The module is wired across the coil for Type A, Size 00 and Type S, Sizes 00-5 and is designed for coil voltages of 120 volts only.

The module is supplied mounted to the same bracket used for the external interlocks on Sizes 0-2 contactors or starters and is mounted directly to the baseplate of the contactor or starter on Sizes 3-7. On the Type A, Size 00 a special bracket (Class 9999 Type SFT-1) is necessary to support the module.

Description	Class 9999 Type	Class 9999 Price
For Sizes 00-2	ST-1	**$16.**
For Sizes 3-7	ST-2	**16.**
Bracket for Mtg. Types ST-1 to Type A Size 00	SFT-1	**3.**

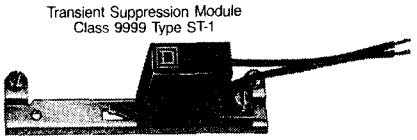
CONTROL CIRCUIT FUSE HOLDER

The control circuit fuse holder is designed to be used on Type S contactors and starters, Sizes 0-7, when either one or two control circuit fuses 600 volts maximum, are required. The Type SF-3 and SF-4 fuse holders will accept standard 600 V Bussman Type KTK or equivalent fuses ($^{13}/_{32}$" x 1½"); 6 amperes maximum. The SFR-3 and SFR-4 will accept Class CC 600 V Bussman Type KTK-R or equivalent fuses only.

Description	Class 9999 Type	Class 9999 Price
Single Fuse Unit*	SF-3	**$16.**
Single Fuse Unit for Class CC Fuse*	SFR-3	**16.**
Two Fuse Unit*	SF-4	**24.**
Two Fuse Unit for Class CC Fuses*	SFR-4	**24.**

*Fuses not included.

Transient Suppression Module Class 9999 Type ST-1



SQD SLV_001234

USER MODIFICATION KITS

FOR SIZES 00-8 TYPES SA-SJ AND K CONTACTORS AND STARTERS AND 30-800 AMP TYPES SJ, SM-SZ LIGHTING CONTACTORS

CLASS 9999

ISOLATED ALARM CONTACTS FOR MELTING ALLOY OVERLOAD RELAYS

Isolated overload relay alarm contacts are available factory installed or in kit form for field installation in Type S, NEMA Sizes 0-6* and Type K, NEMA Size 8 starters. Type S, NEMA Size 7, utilizes a solid state overload which has isolated alarm contacts as a standard feature. The alarm contacts will allow the starter to be used in applications which require isolated contacts, such as inputs to a computer.

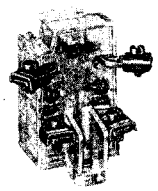
The module is interchangeable with the old style module (Class 9998 Type SO-2) and may be installed on starters already in service. The case is made of a clear plastic (polycarbonate) to allow for visual inspection of contacts.

Both overload and alarm contacts are bifurcated or split for better reliability.

CONTACT UNIT FOR MELTING ALLOY TYPE OVERLOAD RELAYS

Magnetic Starter		Description	Class 9999 Parts Kit Type No.	Price
NEMA Size	Type			
0-6* & 8	SB-SH & K	N.C. and N.O. Isolated Overload-Relay Alarm Contacts	SO-4	**$28.**

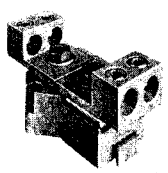
*Isolated alarm contacts **cannot** be added in the field to the Type S size 5 starter. Current transformers and a Size 1 overload block must be used. For factory installation specify form Y34-2.



Type SO-4

SOLID NEUTRAL

The Class 9999 Type SN kit can be used on Type S lighting contactors and other controllers where field addition of a solid neutral is required. Each kit has lugs suitable for both copper and aluminum wire, and mounts with two screws.

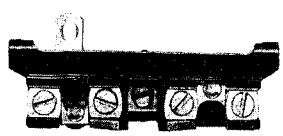


Type SN-4

No. of Lugs	Wire Capacity Per Lug (Cu/Al)	Class 9999	
		Type	Price
4	#14-2/0	SN-1	**$32.**
3	(1) #4-600 MCM or (2) #1/0-250 MCM	SN-2	**96.**
3 (Dual)	(2) #2-600 MCM	SN-3	**152.**
2 (Dual)	(2) #6-350 MCM	SN-4	**96.**

TIE POINT TERMINAL BLOCK

The tie point terminal block provides easy wiring of a H-O-A selector switch or Start-Stop push buttons with separate control. The T-7 terminal block requires no panel space. It simply snaps on Type S Sizes 0-4 contactors and starters by two tabs and is secured to the left hand coil terminal.



Type T-7

Magnetic Contactor or Starter		Class 9999 Type No.	Price
NEMA Size	Type		
0-4	SB-SF	T-7	**$8.**

COMPRESSION LUGS

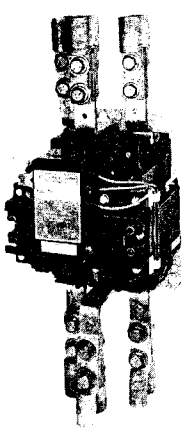
Square D VERSA-CRIMP compression lugs for Type S lighting contactors, 100-800 amperes, are available as a field modification kit (see table below). They are suitable for both copper and aluminum wire.

One VCEL lug is required for each line or load terminal. Each Class 9999 Type AL hardware kit includes mounting hardware for 3 terminals, line or load side.

EXAMPLE: To install compression lugs on a 300 ampere 3 pole device, line and load sides, order six (6) VCEL-060-12H1 lugs and two (2) Class 9999 Type AL-11 hardware kits.

For Use With		Versa-Crimp® Catalog Number	Wire Range Min.-Max.	Hardware Kit Class 9999 Type	Price
Rating	Class 8903 Type				
100 Amp	SQ	VCEL-021-14S1	#8-1/0 AL/CU	None Required	—
200 Amp	SV	VCEL-022-516H1	#1-2/0 AL/CU	None Required	—
		VCEL-024-516H1*	2/0-4/0 AL/CU		
		VCEL-030-516H1	#4-300 MCM AL/CU		
300 Amp	SX	VCEL-050-12H1	2/0-500 MCM AL/CU	AL-11	**$15.**
		VCEL-060-12H1	400-600 MCM AL 400-500 MCM CU		
		VCEL-075-12H1	500-750 MCM AL 500 MCM CU		
400 Amp or 600 Amp	SY or SZ	VCEL-060-12H2*	400-600 MCM AL 400-500 MCM CU	AL-12	**30.**
		VCEL-075-12H2*	500-750 MCM AL 500 MCM CU		
800 Amp	SJ	Compression Lugs for these devices are available only as a factory modification. Order: Form Y157-4 price is **$60.** list per lug. Specify wire size up to 750 MCM AL or 500 MCM CU and number of terminals.			

* One or two lugs may be mounted on each terminal.



Class 8903 With Compression Lugs installed.

ORDERING INFORMATION REQUIRED — Class and type number of kit.

VERSA-CRIMP is a Registered Trademark of Square D Company.

SQD SLV_001235

USER MODIFICATION KITS

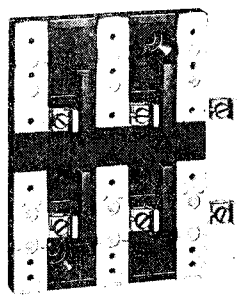
FOR CLASSES 8538, 8738 AND CLASSES 9421, 9422

CLASS 9999

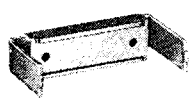
FUSE BLOCK KIT AND MOUNTING BRACKETS FOR FUSE BLOCK

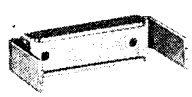
Class 8538 and 8738 Type S non-fusible combination starters can be converted to the fusible type by the installation of a Class 9999 Type SF fuse block kit. Both fusible and non-fusible combination starters have the same size enclosure in NEMA Types 1, 4 and 12 construction permitting this conversion. The fuse clips ARE NOT included with the fuse block and should be ordered separately from the table below.

Kit Description	Starter NEMA Size	Class 9999 Type	Price
Fuse block kit to convert disconnect switch in Class 8538 and 8738 combination starters from non-fusible to fusible. Does not include fuse clips	0, 1 2	SF-1 SF-2	$14. 17.
Two mounting brackets plus hardware for elevating power fuse block in Class 8538 Size 0 and 1 fusible combination starters	....	SF-11	8.



Fuse Block



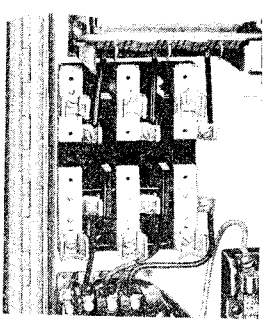


Mounting Brackets

FUSE CLIP KITS

Disconnect switches for fusible Class 8538 and Class 8738 combination starters with flange mounted operating mechanisms have interchangeable fuse clips in NEMA 1, 4 and 12 enclosures, Sizes 0-2. The current Series B NEMA Size 3 and 4 combination starters do not have interchangeable fuse clips; but can be converted to Class R by use of the 9999 SR4 kit. Spacing of fuse clips can be changed from 250 to 600V or vice versa on all sizes. Class 9422 Type RC-5 comes equipped with interchangeable fuse clips. The spacing of the fuse clips can be changed from 250 volt fuse spacing to 600 volt fuse spacing or vice versa. The size of the fuse clips can be changed by the use of a kit. The kit contains six fuse clip assemblies and necessary hardware required for conversion. The fusible horsepower rating can thus be changed easily, affording greater flexibility with minimum stock of parts.

NEMA Starter Size	Disconnect Ampere Rating	NEMA Class H Fuses				NEMA Class R Fuses				NEMA Class J Fuses		
		Fuse Clip Ratings—Amps.				Fuse Clip Ratings—Amps.				Fuse Clip Rating Amps.		
		250 V. Max.	600 V. Max.	Type	Price	250 V. Max.	600 V. Max.	Type	Price	600 V. Max.	Type	Price
0 & 1	30	0-30	....	S1	$ 6.00	0-30	....	SR-1	$ 9.20	....	....	....
0	30	....	0-30	S2	10.00	....	0-30	SR-2	12.00	0-30	SJ-2	$25.00
1	30	31-60	0-30	S2	10.00	31-60	0-30	SR-2	12.00	0-30	SJ-2	25.00
2	60	31-60	0-30	S2	10.00	31-60	0-30	SR-2	12.00	0-30	SJ-2	25.00
2	60	....	31-60	S3	14.00	....	31-60	SR-3	17.00	31-60	SJ-3	30.00
3	100	61-100	61-100	S4◆	40.80	61-100	61-100	SR-4*	12.00	61-100	SJ-4	49.00
3	100	101-200	....	S5◆	75.60	101-200	....	SR-4*	12.00	101-200	SJ-5	75.60
4	200	101-200	101-200	S5◆	75.60	101-200	101-200	SR-4*	12.00	101-200	SJ-5	75.60
5	400	....	....	....	....	201-400	201-400	SR-5*	28.00	....	....	....



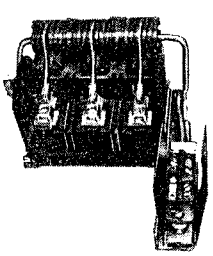
Interchangeable Fuse Clips

* Fuse clips are not provided in the Type SR-4 and SR-5 kits. On new installations Class 9999 Type S fuse clips must also be purchased. Three non-removable pins are supplied and installed only in the latest production devices which have a hole in the lower fuse clips.
◆ Can not be used in current Series B 8538's.

ELECTRICAL INTERLOCK KITS FOR DISCONNECT SWITCHES AND CIRCUIT BREAKERS

Class	Type	SPDT		DPDT	
		Type	Price	Type	Price
8538, 8738	SB, SC, SD (Series A & B), B, C, D	R-6	$30.	R-7	$ 58.
9422	RC, RD				
8538, 8738	SD Series C	R-43	30.	R-44	58.
9422	TD				
8538, 8738	SE△, SF△, E, F	R-8	34.	R-9	64.
9422	TF				
8538, 8738	SE (Series B)	R-41	36.	R-42	48.
9422	TE				
8538, 8738	SF (Series B)	R-39	34.	R-40	64.
8538, 8738	SG	R-35	106.	R-36	136.
8539, 8739	SB, SC, SD, SE, SF, SG	R-26	34.	R-27	64.
9422	RN, RP, RR, RT				
9421	FN, FP, FR, FT	R-18	30.	R-19	58.

△ Series A



Disconnect Electrical Interlock Installed on Disconnect Switch

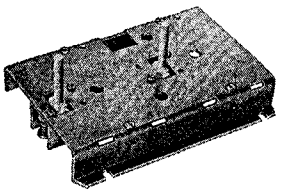
ORDERING INFORMATION REQUIRED

1. Class and type number of kit.
2. Quantity.

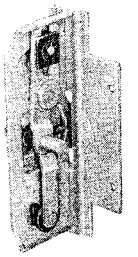
SQD SLV_001236

USER MODIFICATION KITS — MECHANICAL INTERLOCKS

FOR SIZES 00-4 TYPES SA-SF CONTACTORS AND STARTERS



Type SM-1



Type SM-12

MECHANICAL INTERLOCKS

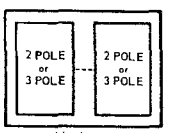
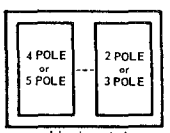
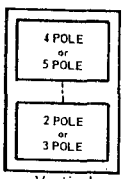
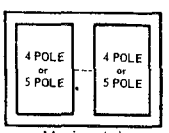
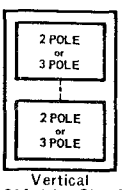
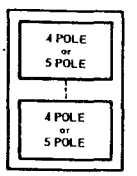
CLASS 9999

Class 9999 Type SM kits are designed to mechanically interlock two Type S contactors or starters Sizes 00 through 4. The beginning stroke of either contact carrier locks the interference, non-jamming type mechanism and prevents the contacts on the other contactor from closing.

Electrical interlocking is necessary for mechanically interlocked reversing and multispeed devices. This interlock prevents the simultaneous energization of both contactor coils. One N.C. electrical interlock (Class 9999 Type SX-7 or SX-12) should be positioned on *each* contactor and wired in series with the coil of the *other* contactor. Refer to Page 455 for complete listing of electrical interlocks.

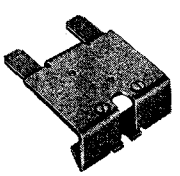
The kits listed below, are also for replacement of the mechanical interlock used in Type S, Classes 8702, 8736, and 8810 devices Sizes 00 through 4.

MECHANICAL INTERLOCK FOR TWO CONTACTORS

The following mechanical interlock kits can be used to interlock 2-5 pole contactors. Mechanical interlocks for horizontal and vertical arrangement are listed in various pole arrangements.	Contactor NEMA Size	Class 9999 Type	Price
 Horizontal Type SM-1 for Size 00-1 Type SM-6 for Size 2 Type SM-12 for Sizes 3 & 4	00†, 0, 1	SM-1	$32.
	0, 1	SM-2	32.
 Horizontal *Type SM-2 for Size 0 or 1 Type SM-7 for Size 2 Type SM-12 for Sizes 3 & 4	0, 1	SM-3	32.
 Vertical *Type SM-2 for Size 0 or 1 Type SM-10 for Size 2 Type SM-11 for Size 3 Type SM-13 for Size 4	0, 1	SM-4	32.
	0, 1	SM-5	32.
 Horizontal Type SM-3 for Size 0 or 1 Type SM-8 for Size 2 Type SM-12 for Sizes 3 & 4	2	SM-6	72.
	2	SM-7	72.
 Vertical Type SM-4 for Size 0 or 1 Type SM-9 for Size 2 Type SM-11 for Size 3 Type SM-13 for Size 4	2	SM-8	72.
	2	SM-9	72.
 Vertical Type SM-5 for Size 0 or 1 Type SM-11 for Size 3 Type SM-13 for Size 4	2	SM-10	72.
	3	SM-11	72.
	3, 4	SM-12	72.
	4	SM-13	72.

*The Type SM-2 interlock is factory assembled for horizontal mounting but can easily be converted to vertical mounting. Conversion instructions are included.

†For replacement only on the NEMA Size 00 Type SA, reversing starters and contactors.



Type SO-11

OVERLOAD RELAY MOUNTING BRACKET

Kit Description	Class 9999 Type	Price
Bracket for one overload relay used with horizontal mechanical interlocks, Types SM-1 through SM-10	SO-11	$ 4.
Bracket for two overload relays used with vertical mechanical interlocks, Types SM-2, SM-4, SM-5, SM-9 and SM-10	SO-12	12.

SQD SLV_001237

USER MODIFICATION KITS — VERTICAL ACTION DEVICES

CLASS 9999

ELECTRICAL INTERLOCKS FOR TYPES B-J CONTACTORS AND STARTERS AND TYPES M-X LIGHTING CONTACTORS.

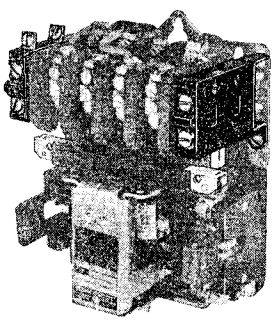
NEMA Size	Device Type	Series★	Type of Mounting	Location	Contact Arrangement∗	Kit Type No.	Price
0	B	Series A	Side Mounted	L. H. or R. H.	1—N. O. 1—N. C. 1—N. O., 1—N. C.	BC-1 BC-2 BC-3	$28. 28. 36.
1	C (8903 M)	Series A & B					
2	D (8903 P)	Series A	Base Mounted Long Terminal	R. H. L. H. R. H. Center L. H.	1—N. O. 1—N. O. 1—N. C. 1—N. O. 1—N. C.	DT-1 DT-2 DT-3 DT-4 DT-9	28.
				R. H. or L. H.	1—N. O., 1—N. C.	DT-12	36.
			KB Unit Side Mtd. For 2 pole or 3 pole starters only. Consult local Square D Field Office for 4 pole starters.	R. H. L. H.	1—N. O. 1—N. O.	DT-5 DT-6	28.
				R. H. L. H.	1—N. O., 1—N. C. 1—N. O., 1—N. C.	DT-10 DT-11	36.
3	E (8903 Q)	Series A	Base Mounted Long Terminal	R. H. L. H. R. H. Center L. H.	1—N. O. 1—N. O. 1—N. C. 1—N. O. 1—N. C.	EU-1 EU-2 EU-3 EU-4 EU-9	28.
				R. H. or L. H.	1—N. O., 1—N. C.	EU-12	36.
			KB Unit Side Mtd. For 2 pole or 3 pole starters only. Consult local Square D Field Office for 4 pole starters.	R. H. L. H.	1—N. O. 1—N. O.	EU-5 EU-6	28.
				R. H. L. H.	1—N. O., 1—N. C. 1—N. O., 1—N. C.	EU-10 EU-11	36.
4	F (8903 V)	Series C	Base Mounted	R. H. L. H. Center R. H. L. H. Center	1—N. O. 1—N. O. 1—N. O. 1—N. C. 1—N. C. 1—N. C.	F-11 F-12 F-13 F-14 F-15 F-16	28.
				Any	1—N. O., 1—N. C.	F-17	36.
4	F (8903 V)	Series A & B	Base Mounted	R. H. L. H. Center R. H. L. H. Center	1—N. O. 1—N. O. 1—N. O. 1—N. C. 1—N. C. 1—N. C.	F-1 F-2 F-3 F-4 F-5 F-6	28.
5	G (8903 X)	Series B & C					
				Any	1—N. O., 1—N. C.	F-7	36.
6	H	Series A	Side Mounted	R. H.	N. O. or N. C. Convertible	WX-5	108.
		Series B	Side Mounted	Any	1—N. O., 1—N. C. 2—N. O. 2—N. C. 1—N. O., 1—N. C. Delayed Break	WX-1 WX-2 WX-3 WX-4	90. 78. 78. 78.
7	J	Series A	Side Mounted	R.H.	N.O. or N.C. Convertible	WX-6	172.

∗Double circuit interlocks (1-N. O., 1-N. C.) must be used on same polarity.

★Series designations listed apply to Class 8502 and 8536 devices only. When a Class 8536 open type starter is supplied in a combination or reduced voltage controller, the controller may have a different Series designation marked on the enclosure nameplate.

To convert one N. O. pole to N. C. on Size 1, Type C, Series A or B, Use Type K-1 Series A Kit $32.00

To convert one N. O. pole to N. C. on Size 0, Type B, Series A, Use Type K-7 Kit 11.00



Size 0 Starter with Side Mounted Interlocks Installed

THIRD OVERLOAD RELAY KITS FOR OPEN TYPE CLASS 8536 TYPES B-G, 3 POLE STARTERS

NEMA Size	Device Type	★ Series	Class 9999 Type Melting Alloy	∗ Price	Bimetallic	∗ Price
0	B	A	J-1	$30.	JA-1	$36.
1	C	A & B	J-1	30.	JA-1	36.
2	D	A	J-2	38.	JA-2	64.
3	E	A	J-3	94.	....	....
4	F	C	J-4	154.	JA-4	154.
5	G	B	J-5	154.	JA-5	154.
5	G	C	J-15	154.	....	....

∗Prices do not include thermal units. Order thermal units separately.

★Series designations listed apply to Class 8502 and 8536 devices only. When a Class 8536 open type starter is supplied in a combination or reduced voltage controller, the controller may have a different Series designation marked on the enclosure nameplate.

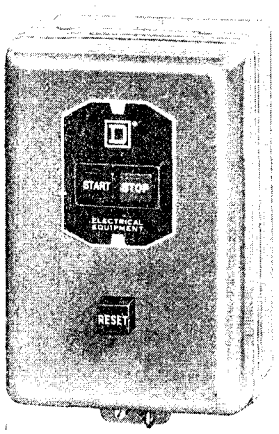
PUSH BUTTON AND SELECTOR SWITCH KITS

FOR FIELD ADDITION TO TYPES B-G MAGNETIC DEVICE TYPES M-X LIGHTING CONTACTORS IN NEMA 1 ENCLOSURE

Class	NEMA Size	Device Type	Series★	Kit Description	Kit Type No.	Price
8502	0	B	Series A	"Start-Stop" momentary contact push button	A-1	$36.
8536	1	C, M∗	Series A & B	"Hand-Off-Auto" selector switch	C-1	36.
8538						
8539	2	D, P∗	Series A	"Start-Stop" momentary contact push button	A-2	36.
8547				"Hand-Off-Auto" selector switch	C-2	36.
8606	3	E, Q∗	Series A			
8630	4	F	Series C	"Start-Stop" momentary contact push button..	A-4	36.
8640		V		"Hand-Off-Auto" selector switch.....	C-4	36.
8650						
8903	5	G, X	Series B & C	Use Class 9001 Type K oiltight units.....	.....	....

★Series designations listed apply to Class 8502 and 8536 devices only. When a Class 8536 open type starter is supplied in a combination or reduced voltage controller, the controller may have a different Series designation marked on the enclosure nameplate.

∗Kits apply to non-combination electrically held Types M, P & Q lighting contactors only. For all others use Class 9001 Type K oiltight units.



Starter With Push Buttons Mounted in Cover

SQD SLV_001238

FACTORY MODIFICATIONS AND FORMS

FOR AC MAGNETIC CONTACTORS & STARTERS

Factory installed modifications are available for the classes of control equipment listed in the respective tables. Prices shown are **additions** to standard equipment prices and are **not** to be used as separate selling prices. Kits are also available for many field modifications and normal parts replacement on most control items. Refer to Classes 9998 and 9999 for complete listings. Standard equipment dimensions and enclosure construction may not apply when certain special features are added. Such cases should be referred to the factory with complete description when accurate dimensions are required.

FULL VOLTAGE CONTROLLERS ONLY

	Factory Modifications	Enclosure Type	Form Letters	NEMA Size 00	0	1	2	3	4	5	6	7	8
	Push Buttons ❸												
	"Start-Stop"	1	A	$ 32.	$ 32.	$ 32.	$ 32.	$ 32.	$ 32.	$ 32.	$ 88.	$ 88.	$ 88.
		4, 4X, 7, 9, 12	A	....	88.	88.	88.	88.	88.	88.	88.	88.	88.
	"Start-Stop" with lockout on "Stop"	1, 4, 12	....	....	100.	100.	100.	100.	100.	100.	100.	100.	100.
	"Start-Stop" (maintained contact)	Any	....	....	100.	100.	100.	100.	100.	100.	100.	100.	100.
	"Start-Stop" push button **and** "Hand-Off-Auto" selector switch	Any	AC	....	176.	176.	176.	176.	176.	176.	176.	176.	176.
	"On-Off"	1	A3	32.	32.	32.	32.	32.	32.	32.	88.	88.	88.
		4, 4X❶, 12	A3	....	88.	88.	88.	88.	88.	88.	88.	88.	88.
PILOT DEVICES IN COVER	Single Oiltight Pushbutton (specify marking)	1, 4, 4X❶, 12	A11	....	88.	88.	88.	88.	88.	88.	88.	88.	88.
	Illuminated Pushbutton (specify marking)	1, 4, 4X❶, 12	....	....	148.	148.	148.	148.	148.	148.	148.	148.	148.
	Selector Switches												
	"Hand-Off-Auto"	1	C	32.	32.	32.	32.	32.	32.	32.	88.	88.	88.
Full Voltage Non-Reversing Controllers Only Classes 8502 8536 8538 8539		4, 4X, 7, 9, 12	C	....	88.	88.	88.	88.	88.	88.	88.	88.	88.
	"On-Off"	1	C6	32.	32.	32.	32.	32.	32.	32.	88.	88.	88.
		4, 4X❶, 7, 9, 12	C6	....	88.	88.	88.	88.	88.	88.	88.	88.	88.
	Oiltight selector switch (specify markings)												
	Two and Three Position	1, 4, 4X❶, 12	....	....	88.	88.	88.	88.	88.	88.	88.	88.	88.
	Four Position	1, 4, 4X❶, 12	....	....	100.	100.	100.	100.	100.	100.	100.	100.	100.
	Illuminated Selector Switch (specify markings)	1, 4, 4X❶, 12	....	....	148.	148.	148.	148.	148.	148.	148.	148.	148.
	Key Operated Selector Switch (specify markings)	1, 4, 4X❶, 12	....	....	112.	112.	112.	112.	112.	112.	112.	112.	112.
	NON-STANDARD markings for Pilot Devices	Any	G12	....	4.	4.	4.	4.	4.	4.	4.	4.	4.
	Pilot Lights (specify color) ❺												
	One pilot light: wired in parallel with coil.												
	Two pilot lights: one wired in parallel with coil, the second wired through an electrical interlock.												
	One light	1, 4, 4X, 12	P	60.❶	60.	60.	60.	60.	60.	60.	60.	60.	60.
	One light	7 & 9	P	....	108.	108.	108.	108.	108.	108.	108.	108.	108.
	Two lights	1, 4, 4X❶, 12	PP	....	264.	264.	264.	264.	264.	264.	264.	264.	264.
	Three or more lights	....	....	Consult local Square D field office									
	Push-to-Test (one)	1, 4, 4X❶, 12	P❷	....	120.	120.	120.	120.	120.	120.	120.	120.	120.
	Push-to-Test (two)	1, 4, 4X❶, 12	PP❷	....	288.	288.	288.	288.	288.	288.	288.	288.	288.
	Push Buttons ❸												
	"Forward-Reverse-Stop"	1, 4, 4X❶, 12	A1	....	160.	160.	160.	160.	160.	160.	160.	160.	160.
	"High-Low-Stop"	1, 4, 12	A2	....	160.	160.	160.	160.	160.	160.	160.	160.	160.
	"Fast-Off-Slow"	1, 4, 12	A9	....	160.	160.	160.	160.	160.	160.	160.	160.	160.
	"High-Low" push button **and** "Hand-Off-Auto" selector switch	1, 4, 12	A10C	....	176.	176.	176.	176.	176.	176.	176.	176.	176.
	Single Oiltight Pushbutton (specify marking)	1, 4, 4X❶, 12	A11	....	88.	88.	88.	88.	88.	88.	88.	88.	88.
	Illuminated Operator (specify marking)	1, 4, 4X, 12	....	....	148.	148.	148.	148.	148.	148.	148.	148.	148.
	Selector Switches												
PILOT DEVICES IN COVER	"Hand-Off-Auto"	1, 4, 4X❶, 7, 9, 12	C	....	88.	88.	88.	88.	88.	88.	88.	88.	88.
	"On-Off"	1, 4, 4X❶, 7, 9, 12	C6	....	88.	88.	88.	88.	88.	88.	88.	88.	88.
	"High-Off-Low"	1, 4, 12	C7	....	88.	88.	88.	88.	88.	88.	88.	88.	88.
Full Voltage Reversing and Multi-Speed Controllers Only Classes 8702 8736 8738 8739 8810 8811 8812	"Forward-Off-Reverse"	1, 4, 4X❶, 12	C14	88.	88.	88.	88.	88.	88.	88.	88.	88.	88.
	"High-Low" **and** "Hand-Off-Auto"	1, 4, 12	CC17	....	176.	176.	176.	176.	176.	176.	176.	176.	176.
	"Forward-Reverse"	1, 4, 4X❶, 12	C19	88.	88.	88.	88.	88.	88.	88.	88.	88.	88.
	"Slow-Fast"	1, 4, 4X❶, 12	C20	....	88.	88.	88.	88.	88.	88.	88.	88.	88.
	"Auto-Off-Low-High"	1, 4, 12	C25	....	176.	176.	176.	176.	176.	176.	176.	176.	176.
	Key Operated Selector Switch (specify markings)	1, 4, 4X❶, 12	....	112.	112.	112.	112.	112.	112.	112.	112.	112.	112.
	Oiltight selector switch (specify markings)												
	Two and Three Position	1, 4, 4X❶, 12	....	....	88.	88.	88.	88.	88.	88.	88.	88.	88.
	Four Position	1, 4, 4X❶, 12	....	....	100.	100.	100.	100.	100.	100.	100.	100.	100.
	NON-STANDARD markings for Pilot Devices	Any	G12	....	4.	4.	4.	4.	4.	4.	4.	4.	4.
	Pilot Lights (specify color) ❺												
	One Pilot Light: one light uses two electrical interlocks.												
	Two Pilot Lights: each light is wired in parallel with a coil.												
	Three Pilot Lights: one light uses two electrical interlocks, the remaining two lights are each wired in parallel with a coil.												
	One light	1, 4, 4X❶, 12	P	156.	156.	156.	156.	156.	156.	156.	156.	156.	156.
		7, 9	P	204.	204.	204.	204.	204.	204.	204.	204.	204.	204.
	Two lights	1, 4, 4X❶, 7, 9, 12	PP	216.	216.	216.	216.	216.	216.	216.	216.	216.	216.
	Three lights	1, 4, 4X❶, 12	PPP	420.	420.	420.	420.	420.	420.	420.	420.	420.	420.
	Four or more lights	....	....	Consult local Square D field office									
	Push-To-Test (one)	1, 4, 4X❶, 12	P❷	216.	216.	216.	216.	216.	216.	216.	216.	216.	216.
	Push-To-Test (two)	1, 4, 4X❶, 12	PP❷	240.	240.	240.	240.	240.	240.	240.	240.	240.	240.
	Push-To-Test (three)	1, 4, 4X❶, 12	PPP❷	456.	456.	456.	456.	456.	456.	456.	456.	456.	456.

❶For Classes 8502, 8536 Type A Size 00 and 8538, 8539 devices; Pilot Lights available at 120 to 600 volt only.
❷Insert "Push-To-Test" before color.
❸All push buttons are momentary contact unless specified otherwise.
❹This adder, used with a NEMA 4X enclosure, applies only to Classes 8538, 8539, 8738, 8739 and 8810 non-reversing.
❺Indicate pilot light color as Form P (red) or Form P (green), etc.

SQD SLV_001239

FACTORY MODIFICATIONS AND FORMS
FOR AC MAGNETIC CONTACTORS & STARTERS

FULL VOLTAGE CONTROLLERS ONLY

CLASSES 8502, 8536, 8538, 8539, 8702, 8736, 8738, 8739, 8810, 8811 and 8812

	Factory Modifications	Enclosure Type	Form Letters	NEMA SIZE 00	0	1	2	3	4	5	6	7	8
	Separate Control Circuit — unfused (specify voltage and frequency)	Any	S	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
CONTROL CIRCUIT	**Fused Control Circuit (without control transformer)**												
	One fuse	1, 4, 4X, 12	F	....	**$ 88.**	**$ 88.**	**$ 88.**	**$ 88.**	**$ 88.**	**$ 88.**	....	....	....
	Two fuses	1, 4, 4X, 12	F4	....	**88.**	**88.**	**88.**	**88.**	**88.**	**88.**	....	....	....
	Control Circuit Transformers ❹												
	Standard capacity (50 or 60 Hz.)												
	One fuse in secondary	1, 4, 4X, 12	FT	....	**108.**	**108.**	**152.**	**224.**	**272.**	**308.**	Std.	Std.	Std.
	One fuse in primary **and** one fuse in secondary	1, 4, 4X, 12	FF1T	....	**196.**	**196.**	**240.**	**312.**	**360.**	**396.**	**88.**	**88.**	**88.**
	Two fuses in primary **and** one fuse in secondary	1, 4, 4X, 12	FF4T	....	**196.**	**196.**	**240.**	**312.**	**360.**	**396.**	**88.**	**88.**	**88.**
	One fuse in primary **and** two fuses in secondary	1, 4, 4X, 12	F1F10T	....	**196.**	**196.**	**240.**	**312.**	**360.**	**396.**	**88.**	**88.**	**88.**
	Two fuses in primary **and** two fuses in secondary	1, 4, 4X, 12	F4F10T	....	**196.**	**196.**	**240.**	**312.**	**360.**	**396.**	**88.**	**88.**	**88.**
	Two fuses in secondary	1, 4, 4X, 12	F10T	....	**108.**	**108.**	**152.**	**224.**	**272.**	**308.**	N.C.	N.C.	N.C.
	One fuse in secondary	7	FT	....	**124.**	**124.**	**208.**	**292.**	**372.**	**428.**	....	....	....
		9	FT	....	**108.**	**108.**	**152.**	**224.**	**272.**	**308.**	....	....	....
FULL VOLTAGE AND MULTI-SPEED CONTROLLERS ONLY CLASSES 8502 8536 8538 8539 8702 8736 8738 8739 8810 8811 8812	Additional capacity (50 or 60 Hz.)												
	One fuse in secondary												
	100 VA additional capacity	1, 4, 4X, 12	FT-11	....	**192.**	**192.**	**248.**	**312.**	**352.**	**392.**	**392.**	**392.**	**392.**
	200 VA additional capacity	1, 4, 4X, 12	FT-12	....	**260.**	**260.**	**324.**	**388.**	**428.**	**428.**	**428.**	**428.**	**428.**
	300 VA additional capacity	1, 4, 4X, 12	FT-13	....	**328.**	**328.**	**400.**	**464.**	**504.**	**504.**	**504.**	**504.**	**504.**
	400 VA additional capacity	1, 4, 4X, 12	FT-14	....	**464.**	**464.**	**552.**	**616.**	**696.**	**696.**	**696.**	**696.**	**696.**
	500 VA additional capacity	1, 4, 4X, 12	FT-15	....	**544.**	**544.**	**632.**	**696.**	**776.**	**776.**	**776.**	**776.**	**776.**
	One fuse in secondary												
	100 VA additional capacity	7	FT-11	....	**208.**	**208.**	**304.**	**380.**	**452.**	**512.**	....	....	....
	100 VA additional capacity	9	FT-11	....	**192.**	**192.**	**248.**	**312.**	**352.**	**392.**	....	....	....
	200 VA additional capacity	9	FT-12	....	**260.**	**260.**	**324.**	**388.**	**428.**	**428.**	....	....	....
	300 VA additional capacity	9	FT-13	....	**328.**	**328.**	**400.**	**464.**	**504.**	**504.**	....	....	....
	Substitute non-standard single primary, and/or single secondary voltage rating on control transformer❹	Any	T1	....	**20.**	**20.**	**20.**	**20.**	**20.**	**20.**	....	....	....
	Substitute dual-voltage magnet coil .....Per Coil	Any	Y5	....	**8.**	**8.**	**8.**	**8.**	....	....	....	....	....
	Control circuit breaker — internally operated	Any	....	....	**348.**	**348.**	**348.**	**348.**	**348.**	**348.**	**348.**	**348.**	....

REDUCED VOLTAGE CONTROLLERS ONLY

CLASSES 8547, 8549, 8604, 8606, 8630, 8640, 8650 and 8651

	Factory Modifications	Enclosure Type	Form Letters	NEMA Size 1 (1 PW 1 YD)	2 (2 PW 2 YD)	3 (3 PW 3 YD)	4 (4 PW 4 YD)	5 (5 PW 5 YD)	6 (6 PW 6 YD)	7 (7 PW 7 YD)	8 (8 PW 8 YD)
	Push Buttons❷										
	"Start-Stop"	Any	A	**$ 88.**	**$ 88.**	**$ 88.**	**$ 88.**	**$ 88.**	**$ 88.**	**$ 88.**	**$ 88.**
	"Forward-Reserve-Stop"	Any	A1	**160.**	**160.**	**160.**	**160.**	**160.**	**160.**	**160.**	**160.**
	Selector Switches										
	"Hand-Off-Auto"	Any	C	**88.**	**88.**	**88.**	**88.**	**88.**	**88.**	**88.**	**88.**
	"On-Off"	Any	C6	**88.**	**88.**	**88.**	**88.**	**88.**	**88.**	**88.**	**88.**
	Pilot Lights (specify color)❶										
	One light "ON" wired in parallel w/"TR" coil	1, 4, 12	P	**60.**	**60.**	**60.**	**60.**	**60.**	**60.**	**60.**	**60.**
	One light "OFF" wired w/N.C. contact on TR	1, 4, 12	P	**108.**	**108.**	**108.**	**108.**	**108.**	**108.**	**108.**	**108.**
	Two lights "ON" and "OFF"	1, 4, 12	PP	**216.**	**216.**	**216.**	**216.**	**216.**	**216.**	**216.**	**216.**
	Push-To-Test (one)	1, 4, 12	P❷	**120.**	**120.**	**120.**	**120.**	**120.**	**120.**	**120.**	**120.**
PILOT DEVICES IN COVER AND CONTROL CIRCUIT	**Separate Control Circuit (Unfused)**										
	"TR" coil only (specify voltage and frequency)	Any	S	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
	All coils (specify voltage and frequency)	Any	Y195	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.
	Fused Control Circuit (without control transformer)										
	One fuse	1, 4, 12	F	**88.**	**88.**	**88.**	**88.**	**88.**	**88.**	....	....
	Two fuses for entire circuit	1, 4, 12	F4	**88.**	**88.**	**88.**	**88.**	**88.**	**88.**	....	....
	Control Circuit Transformer ❹										
	Standard capacity (50 or 60 Hz.)										
	One fuse in secondary	1, 4, 12	FT	**192.**	**248.**	**312.**	**352.**	**392.**	Std.	Std.	Std.
	One fuse in primary **and** one fuse in secondary	1, 4, 12	FF1T	**280.**	**336.**	**400.**	**440.**	**480.**	**88.**	**88.**	**88.**
	Two fuses in primary **and** one fuse in secondary	1, 4, 12	FF4T	**280.**	**336.**	**400.**	**440.**	**480.**	**88.**	**88.**	**88.**
	Two fuses in entire primary circuit **and** one in secondary	1, 4, 12	FF4-1T	**280.**	**336.**	**400.**	**440.**	**480.**	**88.**	**88.**	**88.**
	One fuse in primary **and** two fuses in secondary	1, 4, 12	F1F10T	**280.**	**336.**	**400.**	**440.**	**480.**	**88.**	**88.**	**88.**
	Two fuses in primary **and** two fuses in secondary	1, 4, 12	F4F10T	**280.**	**336.**	**400.**	**440.**	**480.**	**88.**	**88.**	**88.**
	Two fuses in secondary	1, 4, 12	F10T	**280.**	**336.**	**400.**	**440.**	**480.**	**88.**	**88.**	**88.**
	Fused secondary	9	FT	**192.**	**248.**	**312.**	**352.**	....	....	....	....
REDUCED VOLTAGE CONTROLLERS ONLY CLASSES 8547 8549 8604 8606 8630 8640 8650 8651	Additional capacity (50 or 60 Hz.)										
	One fuse in secondary										
	50 VA additional capacity	1, 4, 12	FT-10	**276.**	**332.**	**396.**	**436.**	**476.**	**476.**	**476.**	**476.**
	100 VA additional capacity	1, 4, 12	FT-11	**276.**	**332.**	**396.**	**436.**	**476.**	**476.**	**476.**	**476.**
	200 VA additional capacity	1, 4, 12	FT-12	**344.**	**420.**	**476.**	**508.**	**552.**	**552.**	**552.**	**552.**
	300 VA additional capacity	1, 4, 12	FT-13	**512.**	**568.**	**632.**	**672.**	**712.**	**712.**	**712.**	**712.**
	400 VA additional capacity	1, 4, 12	FT-14	**844.**	**932.**	**992.**	**1076.**	**1076.**	**1076.**	**1076.**	**1076.**
	500 VA additional capacity	1, 4, 12	FT-15	**884.**	**1012.**	**1076.**	**1156.**	**1156.**	**1156.**	**1156.**	**1156.**
	Substitute nonstandard single primary and/or single secondary voltage rating on control transformer❹	Any	T1	**20.**	**20.**	**20.**	**20.**	**20.**	....	....	....
	Substitute dual voltage magnet coil .....Per Coil	Any	Y5	**8.**	**8.**	**8.**	**8.**	....	....	....	....
	Control circuit breaker — internally operated	Any	....	**348.**	**348.**	**348.**	**348.**	**348.**	**348.**	**348.**	**348.**
	Coil transient suppressor .....Per Coil	Any	Y145	**44.**	**44.**	**44.**	**44.**	**44.**	....	....	....

❶ Indicate pilot light color as Form P (red) or Form P (green), etc.
❷ Insert "Push-To-Test" before color.
❸ All push buttons are momentary contact, unless specified otherwise.

❹ Standard voltage ratings are:
60 Hz.: 600-120, 575-115, 550-110, 240/480-120, 240/480-24, 230/460-115, 220/440-110, 208-120, 277-120.
50 Hz.: 575-115, 550-110, 230/460-115, 220/440-110, 380-110.
Other voltages add **$20.**

SQD SLV_001240

FULL VOLTAGE AND REDUCED VOLTAGE CONTROLLERS

CLASSES 8502, 8536, 8538, 8539, 8547, 8549, 8604, 8606, 8630, 8640, 8651, 8702, 8736, 8738, 8739, 8810, 8811 and 8812

	Factory Modifications	Enclosure Type	Form Letters	NEMA Size 0	1 1 PW 1 YD	2 2 PW 2 YD	3 3 PW 3 YD	4 4 PW 4 YD	5 5 PW 5 YD	6 6 PW 6 YD	7 7 PW 7 YD	8 8 PW 8 YD
AUXILIARY RELAYS	Control relay (limited to one relay having maximum of 4 poles)	1, 12	....	$ 204.	$ 204.	$ 204.	$ 204.	$ 320.	$ 360.	$ 360.	$ 360.	$ 360.
	—specify pole arrangement, voltage and type required❶	4, 4X❷, 9	....	312.	312.	312.	312.	424.	472.	472.	472.	472.
	Pneumatic Timing Relay — specify "On" or "Off" delay											
	0.2 Sec. to 1.0 Min.	1, 12	K	336.	336.	336.	336.	336.	336.	336.	336.	336.
		4, 4X❷, 9	K	440.	440.	440.	440.	440.	440.	440.	440.	440.
	1.0 Min. to 3.0 Min.	1, 12	K16	336.	336.	336.	336.	336.	336.	336.	336.	336.
		4, 4X❷, 9	K16	440.	440.	440.	440.	440.	440.	440.	440.	440.
	Pneumatic Timing Attachment — 0.2 sec. to 1.0 min.											
	Addition of Class 9999 Type SK-3 (off delay) attachment	1, 4, 4X❷, 12	K2D	220.	220.	220.	220.	220.	220.	220.	220.	....
	Addition of Class 9999 Type SK-4 (on delay) attachment	1, 4, 4X❷, 12	K2E	220.	220.	220.	220.	220.	220.	220.	220.	....
	Motor driven timing relay❶❸	1, 4, 12	K5	704.	704.	704.	704.	704.	704.	704.	704.	704.
	Phase Reversal Relay❸	1, 12	....	704.	704.	704.	704.	704.	704.	704.	704.	704.
	Phase Failure Relay❸	1, 12	....	740.	740.	740.	780.	780.	1020.	1260.	1260.	1260.
	Phase Failure and Reverse Phase Relay❸	1, 12	....	1000.	1000.	1000.	1040.	1040.	1280.	1520.	1520.	1520.
	Incomplete sequence protection (reduced voltage only)❶	1, 12	....	....	476.	476.	476.	476.	476.	Std.	Std.	476.
	Undervoltage Relay❸	1, 12	....	270.	270.	270.	270.	270.	270.	270.	270.	270.
	Overvoltage Relay❸	....	....	270.	270.	270.	270.	270.	270.	270.	270.	270.
	Under and Overvoltage Relay❸	....	....	500.	500.	500.	500.	500.	500.	500.	500.	500.
	Ground Fault Protection❸ (Can only be used on devices w/circuit breaker disconnects)	....	....	1500.	1500.	1500.	1500.	1500.	1500.	1500.	1500.	1500.
	For multispeed controllers:											
	Compelling relay (requires motor to be started in low speed)	1, 4, 9, 12	R1	264.	264.	264.	264.	264.	264.	264.	264.	264.
	Accelerating relay (provides timed acceleration to selected speed):											
	For Class 8810	1, 4, 9, 12	R2	616.	616.	616.	616.	616.	616.	616.	616.	616.
	For Class 8811	1, 4, 9, 12	R2	1232.	1232.	1232.	1232.	1232.	1232.	1232.	1232.	1232.
	For Class 8812	1, 4, 9, 12	R2	1848.	1848.	1848.	1848.	1848.	1848.	1848.	1848.	1848.
	Decelerating relay (imposes a timing delay during transfer from a higher to a lower speed):											
	For Class 8810	1, 4, 9, 12	R3	616.	616.	616.	616.	616.	616.	616.	616.	616.
	For Class 8811	1, 4, 9, 12	R3	1232.	1232.	1232.	1232.	1232.	1232.	1232.	1232.	1232.
	For Class 8812	1, 4, 9, 12	R3	1848.	1848.	1848.	1848.	1848.	1848.	1848.	1848.	1848.
	Antiplugging timers and relays	1, 4, 9, 12	R10	1080.	1080.	1080.	1080.	1312.	1392.	1392.	1392.	1392.
	Time delay low voltage release relay❸	1, 4, 12	....	440.	440.	440.	440.	440.	440.	440.	440.	440.
	Brake relay	1, 4, 12	....	392.	392.	392.	392.	392.	392.	392.	392.	392.
METERS AND METERING	Current Transformer (E.I. Models 5N, 180)	1, 12	....	280.	280.	280.	280.	280.	280.	280.	280.	280.
	Ammeter in cover (includes current transformer if necessary on Size 2 and up)	1, 12	G9-1	280.	280.	560.	560.	792.	792.	792.	792.	792.
	Ammeter and switch with two current transformers	1, 12	G9-2	....	1200.	1200.	1200.	1200.	1200.	1200.	1200.	1200.
	Ammeter and switch with three current transformers	1, 12	G9-3	....	1480.	1480.	1480.	1480.	1480.	1480.	1480.	1480.
	Voltmeter mounted	1, 12	G9-4	....	792.	792.	792.	792.	792.	792.	792.	792.
	Voltmeter and switch mounted	1, 12	G9-5	....	1200.	1200.	1200.	1200.	1200.	1200.	1200.	1200.
	Elapsed time meter	1, 12	G9-7	....	232.	232.	232.	232.	232.	232.	232.	232.
	Operation counter	1, 12	G9-9	400.	400.	400.	400.	400.	400.	400.	400.	400.
	Wattmeter	1, 12	G9-11	1624.	1624.	1624.	1624.	1624.	1624.	1624.	1624.	1624.
	Watthour meter	1, 12	G9-12	1680.	1680.	1680.	1680.	1680.	1680.	1680.	1680.	1680.
	Varmeter	1, 12	G9-13	1600.	1600.	1600.	1600.	1600.	1600.	1600.	1600.	1600.
	Power factor meter	1, 12	G9-14	1600.	1600.	1600.	1600.	1600.	1600.	1600.	1600.	1600.
ELECTRICAL INTERLOCKS	Additional starter (contactor) electrical interlocks .....Ea. (Special number of additional normally open or closed interlocks required per contactor.)	Any	X	44.	44.	44.	44.	44.	44.	44.	44.	132.
	Auxiliary interlocks installed on disconnect switch or circuit breaker operating mechanism											
	1 N.O.-1 N.C. contacts	1, 4, 12	Y74	44.	44.	44.	44.	44.	116.	116.	....	....
	2 N.O.-2 N.C. contacts	1, 4, 12	Y75	88.	88.	88.	88.	88.	160.	160.	....	....
	(Note: Above contacts do not switch with automatic tripping of circuit breaker. If such operation is required, consult your local Square D field office.)											
ENCLOSURES	Omit enclosure (deduct from NEMA 1 price):											
	Class 8547	1	....	....	40.	96.	304.	440.	888.	1424.	....	....
	Space heater with N.C. interlock	1, 4, 4X, 12	G51	108.	108.	192.	308.	496.	736.	1120.	1120.	1120.
	Function identification plate, with marking as specified	Any	G11	12.	12.	12.	12.	12.	12.	12.	12.	12.
	Convenience receptable (2-wire) mounted in side of enclosure	1, 12	Y31	80.	80.	80.	80.	80.	80.	80.	80.	80.
	Drain and breather installed (SPIN TOP* starters only)	7	Y41	64.	64.	64.	64.	64.	64.	64.	....	....
	Floor mounting angles (not for SPIN TOP* starters)	Any	E	200.	200.	200.	200.	200.	200.	200.	200.	200.
	Cylinder lock (Yale 511-S or equal) on enclosure door	1, 12	....	200.	200.	200.	200.	200.	200.	200.	200.	200.
	Drip hood with corrosion resisting finish Add to List Price	1, 9, 12	....	72.	72.	88.	132.	264.	352.	400.	400.	400.
	Cover gaskets (in combination starters only):											
	For Classes 8538 and 8539	1	Y47	40.	40.	Std.	Std.	Std.	Std.	....	....	....
	For Classes 8738 and 8739	1	Y47	Std.	Std.	Std.	Std.	Std.	Std.	....	....	....
	For full voltage controllers	1	Y47	....	....	....	....	....	....	480.	480.	480.
	For reduced voltage controllers	1	Y47	....	....	....	....	....	....	480.	720.	720.
	Stainless steel watertight device (add to catalog price of sheet steel watertight device):											
	Class 8606	....	Y56	....	....	480.	600.	960.	1340.	2400.	2400.	3400.
	Classes 8630 and 8640	....	Y56	....	Std.	Std.	Std.	Std.	1340.	2400.	2400.	3400.
	Non-standard size or location of conduit openings or hubs. (Specify size and location. Does not apply to SPIN TOP* starters. No deduction for omission of standard conduit provision. Use of standard pipe plug by user recommended instead.)											
	For 2½ inch and smaller conduit .....Each	4, 7, 9	G7	24.	24.	24.	28.	28.	28.	....	....	....
	For 3 inch to 4 inch conduit .....Each	4, 7, 9	G7	60.	60.	60.	60.	60.	60.	....	....	....

❶ If controller has a control transformer, price that transformer with additional capacity for the relay provided.

❷ This adder, used with a NEMA 4X enclosure, applies only to Classes 8538, 8539, 8738, 8739 and 8810 non-reversing.

❸ Controllers must have a 120 V control circuit (either from S or FT).

* SPIN TOP is a Registered Trademark of Square D Company.

SQD SLV_001241

FACTORY MODIFICATIONS AND FORMS
FOR AC MAGNETIC CONTACTORS & STARTERS

FULL VOLTAGE AND REDUCED VOLTAGE CONTROLLERS

CLASSES 8502, 8536, 8538, 8539, 8547, 8549, 8604, 8606, 8630, 8640, 8650, 8651, 8702, 8736, 8738, 8739, 8810, 8811 and 8812

	Factory Modifications	Enclosure Type	Form Letters	NEMA SIZE 00	0	1 1 PW 1 YD	2 2 PW 2 YD	3 3 PW 3 YD	4 4 PW 4 YD	5 5 PW 5 YD	6 6 PW 6 YD	7 7 PW 7 YD	8 8 PW 8 YD
OVERLOAD RELAYS	**Automatic Reset Bimetallic Overload Relays**												
	Single Phase:			Deduct	Deduct	Deduct	Deduct						
	Types SA-SD (Sizes 00-2)❶	Any	B1	$ 6.	$ 6.	$ 6.	$ 6.	....	....	....	....	....	....
	Type SE (Size 3)	Any	B5	....	....	....	....	N.C.	....	....	....	....	....
	Polyphase:												
	Two Element — For 2 phase only												
	Types SB-SD (Sizes 0-2)	Any	B1	....	N.C.	N.C.	N.C.	....	....	....	....	....	....
	Types SE-SF (Sizes 3-4)	Any	B5	....	....	....	....	N.C.	N.C.	....	....	....	....
	Three Element												
	Types SA-SD, SH, SJ and K (Sizes 00-2, 6-8)	Any	B2	N.C.	N.C.	N.C.	N.C.	....	....	....	N.C.	❸	N.C.
	Types SE-SG (Sizes 3-5)	Any	B5	....	....	....	....	N.C.	N.C.	N.C.	....	....	....
	Ambient Compensated Bimetallic Overload Relays												
	Three Element												
	Types SA-SD, SG, SH, SJ & K (Sizes 00-2, 5-8)	Any	B	8.	8.	8.	8.	....	....	8.	8.	❸	8.
	Types SE-SF (Sizes 3 & 4)	Any	Y59	....	....	....	....	8.	8.	....	....	....	....
	Overload Relays — General		....										
	Omit overload protection from combination starters. (Classes 8538, 8539, 8738, 8739 only) Do not use with MAG-GARD* Circuit Breakers. Deduct per Starter	Any	Y76	....	20.	20.	36.	60.	92.	478.	398.	626.	386.
	Substitute 9999 SO-4 isolated alarm contact on melting alloy overload relay	Any	Y34-2	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.
MISCELLANEOUS	Add for reversing service												
	For Class 8606	1, 4, 9, 12	Y64	....	....	....	1576.	1664.	3608.	4312.	7380.	9900.	14744.
	For Classes 8630 and 8640	1, 4, 9, 12	Y64	....	....	576.	1576.	1664.	3608.	4312.	7380.	9900.	14744.
	Add for thermal protector (installed on autotransformer on Class 8606 only)	Any	Y116	....	....	....	160.	160.	160.	160.	160.	....	....
	Coil transient suppressor ..... Per Coil	Any	Y145	44.	44.	44.	44.	44.	44.	44.	....	....	....
	Addition of terminal blocks.												
	Wired, per terminal ..... Each	1, 4, 12	G50❷	....	32.	32.	32.	32.	32.	32.	32.	32.	32.
	Unwired, per terminal ..... Each	1, 4, 12	G50❷	....	16.	16.	16.	16.	16.	16.	16.	16.	16.

❶ Single phase bimetallic overload relays for Type S Sizes 00-2 require **two** (2) thermal units per starter.
❷ Addition of terminal block type 9080 CA or 9080 GB6 only. Number of circuits is same as ending of form number. (Ex: G50-7 is 7 wire terminal block.)
❸ Size 7 uses a solid state overload relay. See Class 8536 for complete details.
* MAG-GARD is a Registered Trademark of Square D Company.

FULL VOLTAGE AND REDUCED VOLTAGE CONTROLLERS

CLASSES 8547, 8549, 8604, 8606, 8650, 8651, 8810, 8811 and 8812

	Factory Modifications	Enclosure Type	Form Letters	NEMA Size 0	1	2	3	4	5	6	7	8
❶ CIRCUIT BREAKER OR DISCONNECT SWITCH	**Addition of main circuit breaker or disconnect switch**											
	Molded case circuit breaker	1❶	Y79-1	$564.	$564.	$688.	$ 748.	$1368.	$2660.	$3916.	$5428.	$ 9200.
		4, 7❶, 9❶	Y79-1	804.	804.	992.	1372.	1992.	3316.	5116.	6628.	10400.
		12	Y79-1	572.	572.	720.	804.	1848.	3044.	4216.	5728.	9500.
	Non-fusible disconnect switch	1	Y79-2	376.	376.	480.	608.	840.	1504.	....	....	....
		4, 9❶	Y79-2	616.	616.	784.	1232.	1496.	2160.	....	....	....
		12	Y79-2	384.	384.	512.	664.	1352.	1664.	....	....	....
	Fusible switch with **30 amp.** fuse clips	1	Y79-3	440.	440.	....	....	....	....	....	....	....
		4	Y79-3	680.	680.	....	....	....	....	....	....	....
		12	Y79-3	448.	448.	....	....	....	....	....	....	....
	Fusible switch with **60 amp.** fuse clips	1	Y79-4	....	440.	512.	....	....	....	....	....	....
		4	Y79-4	....	680.	816.	....	....	....	....	....	....
		12	Y79-4	....	448.	544.	....	....	....	....	....	....
	Fusible switch with **100 amp.** fuse clips	1	Y79-5	....	....	....	656.	....	....	....	....	....
		4	Y79-5	....	....	....	1280.	....	....	....	....	....
		12	Y79-5	....	....	....	712.	....	....	....	....	....
	Fusible switch with **200 amp.** fuse clips	1	Y79-6	....	....	....	816.	1016.	....	....	....	....
		4	Y79-6	....	....	....	1440.	1640.	....	....	....	....
		12	Y79-6	....	....	....	872.	1496.	....	....	....	....
	Fusible switch with **400 amp.** fuse clips	1	Y79-7	....	....	....	....	....	1648.	3100.	....	....
		4	Y79-7	....	....	....	....	....	2304.	4312.	....	....
		12	Y79-7	....	....	....	....	....	1808.	3612.	....	....
	Automatic molded case switch with **600 amp.** fuse clips	1	Y79-8	....	....	....	....	....	....	3876.	....	....
		4	Y79-8	....	....	....	....	....	....	5076.	....	....
		12	Y79-8	....	....	....	....	....	....	4176.	....	....
	Automatic molded case switch with fuse clips **1000 amp.** or less	1	Y79-9	....	....	....	....	....	....	4332.	4332.	360.
		4	Y79-9	....	....	....	....	....	....	5532.	5532.	10160.
		12	Y79-9	....	....	....	....	....	....	4932.	4932.	9560.
	Automatic molded case switch	1	Y79-10	....	....	....	....	....	....	3452.	3652.	8280.
		4	Y79-10	....	....	....	....	....	....	4652.	4852.	9480.
		12	Y79-10	....	....	....	....	....	....	3752.	3952.	8580.

❶ NEMA 7, 9 adders apply to 8810 non-reversing devices Sizes 0, 1 and 2 only.

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CLASS 8630 REDUCED VOLTAGE CONTROLLERS ONLY

	Factory Modifications	Enclosure Type	Form Letters	NEMA Size 1 YD	2 YD	3 YD	4 YD	5 YD	6 YD	7 YD	8 YD
CIRCUIT BREAKER, CIRCUIT INTER-RUPTORS, OR DISCONNECT SWITCH	**Circuit Breakers, Circuit Interruptors or Non-Fusible Disconnects**										
	Molded case circuit breaker	1	Y79-1	**$688.**	**$ 748.**	**$1368.**	**$2660.**	**$3916.**	**$5428.**	**$ 9200.**	**$ 9200.**
		4	Y79-1	**992.**	**1372.**	**1992.**	**3316.**	**5116.**	**6628.**	**10400.**	**10400.**
		12	Y79-1	**720.**	**804.**	**1848.**	**3044.**	**4216.**	**5728.**	**9500.**	**9500.**
	Automatic molded case switch	1	Y79-10	....	....	....	....	**3452.**	**3652.**	**8280.**	**8280.**
		4	Y79-10	....	....	....	....	**4652.**	**4852.**	**9480.**	**9480.**
		12	Y79-10	....	....	....	....	**3752.**	**3952.**	**8580.**	**8580.**
	Non-fusible disconnect switch	1	Y79-2	**480.**	**608.**	**840.**	**1504.**	....	....	....	....
		4	Y79-2	**784.**	**1232.**	**1496.**	**2160.**	....	....	....	....
		12	Y79-2	**512.**	**664.**	**1352.**	**1664.**	....	....	....	....
	Fusible Disconnect Switch with Fuse Clips for Time Delay Fuses ❼										
	30 amp. clips	1	Y79-3	**512.❶**	**656.❶**	....	....	....	....	....	....
		4	Y79-3	**680.❶**	**1280.❶**	....	....	....	....	....	....
		12	Y79-3	**544.❶**	**712.❶**	....	....	....	....	....	....
	60 amp. clips	1	Y79-4	**656.❷**	**656.❷**	**656.❷**	....	....	....	....	....
		4	Y79-4	**1280.❷**	**1280.❷**	**1280.❷**	....	....	....	....	....
		12	Y79-4	**712.❷**	**712.❷**	**712.❷**	....	....	....	....	....
	100 amp. clips	1	Y79-5	....	**1016.❸**	**1016.❸**	....	....	....	....	....
		4	Y79-5	....	**1640.❸**	**1640.❸**	....	....	....	....	....
		12	Y79-5	....	**1496.❸**	**1496.❸**	....	....	....	....	....
	200 amp. clips	1	Y79-6	....	....	**1648.❹**	**1648.❹**	....	....	....	....
		4	Y79-6	....	....	**2304.❹**	**2304.❹**	....	....	....	....
		12	Y79-6	....	....	**1808.❹**	**1808.❹**	....	....	....	....
	400 amp. clips	1	Y79-7	....	....	....	**3876.❺**	**3876.❺**	....	....	....
		4	Y79-7	....	....	....	**5076.❺**	**5076.❺**	....	....	....
		12	Y79-7	....	....	....	**4176.❺**	**4176.❺**	....	....	....
	600 amp. clips❻	1	Y79-8	....	....	....	....	**4076.❹**	**4076.❹**	....	....
		4	Y79-8	....	....	....	....	**5276.❹**	**5276.❹**	....	....
		12	Y79-8	....	....	....	....	**4276.❹**	**4276.❹**	....	....

❶ Not suitable for full load current exceeding 26 amps. Use larger clip and/or Class J clips.
❷ Not suitable for full load current exceeding 52.1 amps. Use larger clip and/or Class J clips.
❸ Not suitable for full load current exceeding 86.9 amps. Use larger clip and/or Class J clips.
❹ Not suitable for full load current exceeding 173 amps. Use larger clip and/or Class J clips.
❺ Not suitable for full load current exceeding 347 amps. Use larger clip and/or Class J clips.
❻ Not suitable for full load current exceeding 521 amps.
❼ Fuses not included. Class K5 fuses recommended.
❽ Uses automatic circuit interrupter as the disconnect means.

CLASS 8640 REDUCED VOLTAGE CONTROLLERS ONLY

NOTE: To comply with Section 430-3 of the National Electrical Code, combination part-winding controllers are provided as follows:

(A) Circuit Breaker: two magnetic, adjustable trip, circuit breakers; one for each motor winding. In the FA and KA frames, a single external operating mechanism to operate the two breakers simultaneously. In KA and LA frames, each breaker has its own operating mechanism, but electrical interlocks prevnet motor operation unless both breakers are closed.

(B) Non-fusible Disconnect: a single 3-pole unfused disconnect of the proper rating for both windings. The user is required to provide proper short-circuit protection external to the controller, using only Class J fuses.

(C) Fusible Disconnect Switch: a single unfused disconnect with two sets of fuse clips (each set of the rating indicated) to provide short-circuit protection for each winding.

CLASS 8640 ONLY

	Factory Modifications	Enclosure Type	Form Letters	NEMA Size 1 PW	2 PW	3 PW	4 PW	5 PW	6 PW
CIRCUIT BREAKER OR DISCONNECT SWITCH	**Main Circuit Breaker or Disconnect Switch** (See **NOTE** above for explanation of circuit breaker or fuse clip arrangement.)								
	Molded case circuit breakers	1	Y79-11	**$688.**	**$ 748.**	**$1368.**	**$2660.**	**$3916.**	....
		4, 9❷	Y79-11	**992.**	**1372.**	**1992.**	**3316.**	**5116.**	....
		12	Y79-11	**720.**	**804.**	**1848.**	**3044.**	**4216.**	....
	Non-fusible disconnect switch	1	Y79-2	**480.**	**608.**	**840.**	**1504.**	**3452.**	....
		4, 9❷	Y79-2	**784.**	**1232.**	**1496.**	**2160.**	**4652.**	....
		12	Y79-2	**512.**	**664.**	**1352.**	**1664.**	**3752.**	....
	Fusible switch with **30 amp.** fuse clips (Two Sets)	1	Y79-31	**512.**	....	....	....	....	....
		4	Y79-31	**816.**	....	....	....	....	....
		12	Y79-31	**544.**	....	....	....	....	....
	Fusible switch with **60 amp.** fuse clips (Two Sets)	1	Y79-41	**596.**	**656.**	**1016.**	....	....	....
		4	Y79-41	**900.**	**1280.**	**1640.**	....	....	....
		12	Y79-41	**628.**	**712.**	**1496.**	....	....	....
	Fusible switch with **100 amp.** fuse clips (Two Sets)	1	Y79-51	....	....	**1016.**	....	....	....
		4	Y79-51	....	....	**1640.**	....	....	....
		12	Y79-51	....	....	**1496.**	....	....	....
	Fusible switch with **200 amp.** fuse clips (Two Sets)	1	Y79-61	....	....	**1448.**	**1648.**	....	....
		4	Y79-61	....	....	**2072.**	**2304.**	....	....
		12	Y79-61	....	....	**1560.**	**1808.**	....	....
	Fusible switch with **400 amp.** fuse clips (Two Sets)	1	Y79-71	....	....	....	**2212.**	**3876.❶**	....
		4	Y79-71	....	....	....	**2868.**	**5076.❶**	....
		12	Y79-71	....	....	....	**2372.**	**4176.❶**	....
	Automatic molded case switch with **600 amp.** fuse clips (Two Sets)	1	Y79-20	....	....	....	....	**4332.**	....
		4	Y79-20	....	....	....	....	**5532.**	....
		12	Y79-20	....	....	....	....	**4932.**	....
	Automatic molded case switch with provisions for **601-800 amp.** Class L fuses (Two Sets)	1	Y79-21	....	....	....	....	**4332.**	**4332.**
		4	Y79-21	....	....	....	....	**5532.**	**5532.**
		12	Y79-21	....	....	....	....	**4932.**	**4932.**
	Automatic molded case switch with provisions for **1000-1200 amp.** Class L fuses (Two Sets)	1	Y79-22	....	....	....	....	**4332.**	**4332.**
		4	Y79-22	....	....	....	....	**5532.**	**5532.**
		12	Y79-22	....	....	....	....	**4932.**	**4932.**

❶ Consists of Automatic molded case switch with two sets of 400-ampere fuse clips.
❷ NEMA Type 1 enclosure modifications not available in size 3PW and larger.

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THERMAL UNIT SELECTION

INSTRUCTIONS

All tables are based on the operation of the motor and controller in the same ambient temperature, 40°C (104°F) or less. All tables except those applying to Class 8198 are based on a 1.15 to 1.25 service factor. Class 8198 tables are based on a 1.0 service factor.

SELECTION PROCEDURE:

1. Determine motor data:
   a. Full load current rating
   b. Service factor
   NOTE: If motor full load current is not known, a tentative thermal unit selection could be made, based on horsepower and voltage. Refer to page 469.
2. Motor and controller in *same ambient temperature:*
   a. All starter classes, except Class 8198:
      1. For 1.15 to 1.25 service factor motors use 100% of motor full load current for thermal unit selection.
      2. For 1.0 service factor motors use 90% of motor full load current for thermal unit selection.
   b. Class 8198 only:
      1. For 1.0 service factor motors use 100% of motor full load current for thermal unit selection.
      2. For 1.15 to 1.25 service factor motors use 110% of motor full load current for thermal unit selection.
3. Motor and controller in *different ambient temperatures:*
   a. Multiply motor full load current by the multiplier in Table A below. Use the resultant full load current for thermal unit selection.
4. Locate proper selection table from index, this page or page 437.
   NOTE: For controllers not listed in this index, see "Overload and Short Circuit Protection Selector," located in Control Products Catalog.
   a. The proper thermal unit number will be found adjacent, to the right of the range of full load currents in which the motor full load current or resultant full load current falls.
5. See page 468 for calculation of trip current rating.

TABLE A — Selection of Thermal Units for Special Applications

Class of Controller	Continuous Duty Motor Service Factor†	Melting Alloy and Non-Compensated Bimetallic Relays — Ambient Temperature of Motor: Same as Controller Ambient	Melting Alloy and Non-Compensated Bimetallic Relays — Ambient Temperature of Motor: Constant 10°C (18°F) Higher Than Controller Ambient	Melting Alloy and Non-Compensated Bimetallic Relays — Ambient Temperature of Motor: Constant 10°C (18°F) Lower Than Controller Ambient	Ambient Temperature-Compensated Relays — Ambient Temperature of Motor: Constant 40°C (104°F) or less, for Any Controller Ambient
		Full Load Current Multiplier			
All Classes, Except 8198	1.15 to 1.25	1.0	0.9	1.05	1.0
	1.0	0.9	0.8	.95	0.9
Class 8198	1.15 to 1.25	1.1	1.0	1.15	1.1
	1.0	1.0	0.9	1.05	1.0

†For intermittent (short time) rated motors consult local Square D Field Office.

INDEX

Controller: Type of Starter	Controller: Class	Controller: Type	Controller: * Series	Controller: Size	Selection Table Number: Melting Alloy — Standard Trip	Selection Table Number: Bimetallic — Non-Compensated	Selection Table Number: Bimetallic — Compensated
Manual Starters FHP	2510 2512 8908	F	A	FHP	43★	..	..
Manual Starters (Small Encl.)	2510	M, T	A	M-0 M-1 M-1P	1◐ 1◐ 1◐	.. .. ..	.. .. ..
Manual Starters (Large Encl.)	2510 2511 2512 8925	M, T	A	M-0 M-1 M-1P	2◐ 2◐ 2◐	.. .. ..	.. .. ..
Manual Str. w/LVP (Small Encl.)	2510	M, T	A	M-0 M-1 M-1P	3◐ 3◐ 3◐	.. .. ..	.. .. ..
Manual Str. w/LVP (Large Encl.)	2510 2511 2512 8908	M, T	A	M-0 M-1 M-1P	4◐ 4◐ 4◐	.. .. ..	.. .. ..
Manual Loom Sw.	2510	MBL, TBL	A	M-0	7◐	..	..
DC Magnetic Starters	7135 7136 7735 7736	C, D	....	1, 2	65◐	..	..
		E	....	3	9	..	..
		F	....	4	10	..	..
		G	....	5	12	..	..
AC Magnetic Starters (Small Enclosure)	8536 8904 ◆ (Starter In Own Enclosure)	A (8536 only)	B, C	00	17★	..	..
		SB	A	0	13◐	8	33
		SC	A	1	13◐	8	33
	8933		A	1P	41◐	..	..
	8998 8999 (Model 3 Control Center) I-Line and QMB Motor Starter Centers	SD	A	2	56◐	62	70
		SE	A	3	18◐	63	37‡
		SF	A	4	54	11	29‡
		SG	A	5	49	38	46
		SH	A	6	21◐	39	47
		J	B	7	26◐	45	45
		K	B	8	26◐	45	45
	8998 8999 (Model 4 Control Center)	SC	A	1 Fusible	66◐	64	33
				1 Circuit Breaker	15◐		
		SD	A	2 Fusible	67◐	57	70
				2 Circuit Breaker	58†◐		
		SE	A	3 Small Encl.	16◐	51	37‡
				3 Large Encl.	68†◐		
		SF	A	4	61	35	29‡
		SG	A	5	24	52	46
		SH	A	6	20◐	48	47
		J	B	7	26◐	45	45
		K	B	8	26◐	45	45

Footnotes — See page 467.

PRICES — PAGE 467

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THERMAL UNIT SELECTION

INDEX

Controller					Selection Table Number		
					Melting Alloy	Bimetallic	
Type of Starter	Class	Type	* Series	Size	Standard Trip	Non-Compensated	Compensated
AC Magnetic Starters (Large Enclosure)	8198	G, S	....	....	5◐	..	6
	8536 (Starter Used in Multi-Motor Panel)	A (8536 only)	B, C	00	14★	..	..
		SA	A	00	53◐	55	25
		SB	A	0	15◐	64	33
	8538 8810 8539 8811 8547 8812 8549 8904■ 8606 8906 8630● 8907 8920 8640▲ 8922 8650 8924 8651 8925 8736 8930 8738 8941 8739	SC	A	1	15◐	64	33
		SD	A	2	58◐	57	70
		SE	A	3	16◐	51	37‡
		SF	A	4	61	35	29‡
		SG*	A	5	24	52	46
		SH	A	6	20◐	48	47
		J	B	7	26◐	45	45
		K	B	8	26◐	45	45
	8940 Well Guard Control	C, BC WC, XC	A	1	..	..	33
		D, BD WD, XD	A	2	..	..	70
		WE, XE	A	3	..	51	..
		WF, XF	A	4	..	35	..
		WG, XG	A	5	..	..	46
		XH	A	6	..	..	47
		XJ	B	7	..	..	45
Separately Mounted Overload Relays	9065	AF	B	4 (133A)	..	30	..
		AG	A	5 (266A)	..	36	..
		AR	A	1 (25A)	..	32	..
		AT	A	2 (45A)	..	60	..
		AU	....	3 (86A)	..	50	..
		C	A	1 (25A)	44◐	..	..
		F	B	4 (133A)	19	..	..
		G	A	5 (266A)	22	..	..
		S	A	1 (26A)	59◐	23	42
				2 (45A)	69◐	27	71
				3 (86A)	34◐	..	..
				4 (133A)	28	..	..
		T	A	2 (45A)	31◐	..	..
		U	....	3 (86A)	40	..	..

QUICK TRIP OR SLOW TRIP APPLICATIONS

Thermal unit selections presented here deal exclusively with standard trip (Class 20) applications.

For quick trip (Class 10) applications, consult local Square D field office.

For slow trip (Class 30) applications, the JB thermal unit, formerly used, has been superseded by the SB thermal unit.

In any application which would normally use a B thermal unit, a slow trip equivalent SB thermal unit can be selected by using the following procedure.

To select Type SB slow trip thermal units, the selection table for a standard Type B thermal unit may be used with the following modifications. For continuous rated motors having service factors of 1.15 to 1.25, select thermal units from the standard Type B using 93% (102% for Class 8198) of the full load current shown on the motor nameplate and then substitute an SB for the B in the thermal unit type number.

Example: A motor with a full load current of 12 amps controlled by an 8536 SCG-3 would require B22 thermal units for standard trip applications and SB19.5 thermal units for slow trip applications. The SB is selected by multiplying 12 amps times 93% for 11.2 amps and using this value to select B19.5's. Then add the S prefix to arrive at SB19.5's. For continuous rated motors having a service factor of 1.0, select thermal units in the same manner using 84% (93% for Class 8198) of full load current shown on the motor nameplate.

In any application except a Size 3 which is already installed and has been using Type JB thermal units, if new thermal units are required, the JB's can be replaced by Type SB thermal units, but a new selection must be made using the procedure above. For Size 3, consult local Square D Field Office.

THERMAL UNIT PRICES

Melting Alloy			Bimetallic		
Type of Trip	Thermal Unit Type	Price	Type of Trip	Thermal Unit Type	Price
Standard	A	$6.	Standard	AR	$6.
	B	6.		AF	6.
	C	6.		AU	6.
	CC	6.			
	D	16.			
	DD	6.			
	GF	20.			
	W	8.			
Quick	FB	10.			
Slow	SB	16.			

* Series letters listed refer to the marking on the nameplate of the basic open type starter. When the starter is supplied in a controller containing other devices, the controller may have a different series letter marked on the enclosure nameplate.
◆ Small enclosure tables apply for Class **8904** non-combination and non-reversing starters. For combination and reversing Class **8904** starters refer to the large enclosure selections, index above.
● For Class **8630** starters divide the delta connected motor full load current by 1.73, and use this quotient to select thermal units.
▲ For Class **8640** starters use the full load current of each motor winding as a basis for thermal unit selection — normally one-half total motor current.
■ Large enclosure tables apply for Class **8904** combination and reversing starters. For non-combination and non-reversing Class **8904** starters refer to small enclosure selections, page 466.
† Use for Autotransformer Starters (Fusible and Circuit Breaker).
‡ Order Type E thermal units by number from Square D Company, Furnas Electric Company, Batavia, Illinois or a Furnas distributor at **$6.00** list each, subject to motor control discounts.
◐ See page 467 for Quick Trip or Slow Trip Applications.
★ Type A thermal units for full load currents lower than those listed in this table are available. For complete information, consult local Square D field office.

Note: For thermal unit selection tables for other devices including obsolete devices, consult local Square D field office.

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THERMAL UNIT SELECTION

CALCULATION OF TRIP CURRENT RATING

Trip Current Rating — Trip current rating is a nominal value which approximates the minimum current to trip an overload relay in an ambient temperature, outside of the enclosure, of 40°C (104°F). In all selection tables, except Class 8198, the trip current rating is 1.25 times the minimum full load current shown for the thermal unit selected. For Class 8198, the trip current rating is 1.15 times the minimum full load current. This applies to bimetallic overload relays with the trip adjustment set at 100 percent.

Calculation Procedure:

1. Use the selection table for the specific controller involved.
2. Find the minimum motor full load current listed for the thermal unit in question.
3. Multiply that current by 1.25 (1.15 for Class 8198). The result is the trip current rating.

Example 1: Determine the thermal unit selection and trip current rating for thermal units in a Class 8536 Type SCG-3 Size 1 magnetic starter used to control a three-phase, 1.15 service factor motor with a full load current of 17.0 amperes, where the motor and controller are both located in a 40°C (104°F) ambient temperature.

1. From Table 13 the proper selection is B32.
2. The minimum motor full load current is 16.0 amperes.
3. Trip current rating is 16.0 × 1.25 = 20.0 amperes.

Protection level is the relationship between trip current rating and full load current. Protection level, in percent, is the trip current rating divided by the motor full load current times 100. In Example 1 the protection level for the B32 thermal unit is: 20.0/17.0 × 100 = 118%.

National Electrical Code, Section 430-32, allows a maximum protection level of 125% for the motor in the above example.

Minimum trip current (also called ultimate current) may vary from the trip current rating value, since ratings are established under standardized test conditions. Factors which influence variations include: the number of thermal units installed, enclosure size, proximity to heat producing devices, size of conductors installed, ambient (room) temperature, and others.

Except for ambient temperature-compensated overload relays, an ambient temperature higher than 40°C would lower the trip current, and a lower temperature would increase it. This variation is not a factor in selecting thermal units for the average application, since most motor ratings are based on an ambient temperature of 40°C, and motor capacity varies with temperature in about the same proportion as the change in trip current. Temperature-compensated relays maintain a nearly constant trip current over a wide range of ambient temperature, and are intended for use where the relay, because of its location, cannot sense changes in the motor ambient temperature.

CALCULATION OF TRIP CURRENT FOR AMBIENT TEMPERATURES OTHER THAN 40° C

For a controller ambient temperature other than 40°C (104°F) trip current can be calculated by applying a correction factor from the curve in Figure 1. The approximate trip current for a particular ambient temperature is the product of (1) the multiplier M corresponding to the temperature and (2) the 40°C trip current rating.

NOTE: Ambient temperature is the temperature surrounding the starter enclosure. Normal temperature rise inside the enclosure has been taken into account in preparing the thermal unit selection tables.

Example 2: Determine the trip current for the motor and controller in Example 1, except the controller is in a 30°C (86°F) ambient temperature. From the curve in Figure 1 the multiplier M is 1.1 at 30°C.

Approximate Trip Current is 16.0 × 1.25 × 1.1 = 22 amperes.

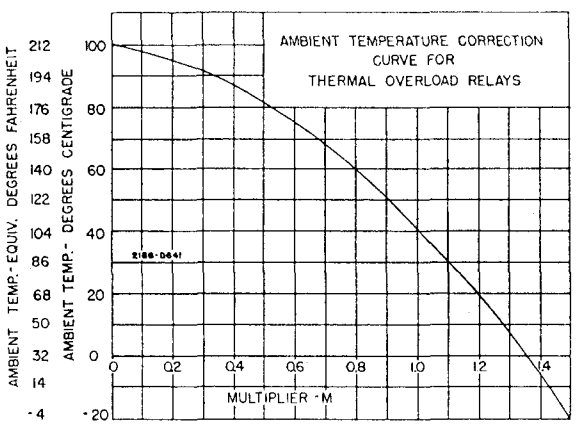

Figure 1

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APPROXIMATE THERMAL UNIT SELECTION BASED ON HORSEPOWER AND VOLTAGE

General — Thermal units selected using approximate full load currents from the table below will provide a trip current between 101% and 125% of full load current for many 4-pole, single speed, normal torque, 60 hz motors. Since full load current rating of different makes and types of motors vary so widely, these selections may not be suitable.

Thermal units should be selected on the basis of motor nameplate full load current and service factor. Thermal unit sizes originally selected on an approximate basis should always be rechecked and corrected at the time of installation if required.

Instructions

1. Locate motor horsepower and voltage.
2. Determine approximate full load current from the table below.
3. Use approximate full load current in place of actual nameplate full load current and follow instructions on page 466.

USE ONLY WHEN MOTOR FULL LOAD CURRENT IS NOT KNOWN.

Motor Horse Power	Motor Full Load Current					
	Three Phase				Single Phase	
	200 V.	230 V.	460 V.	575 V.	115 V.	230 V.
1/20	0.39	0.34	0.17	0.14	1.30	0.65
1/12	0.55	0.48	0.24	0.19	1.90	0.95
1/8	0.74	0.64	0.32	0.26	2.60	1.30
1/6	0.90	0.78	0.39	0.31	3.24	1.62
1/4	1.22	1.06	0.53	0.42	4.40	2.20
1/3	1.52	1.32	0.66	0.53	5.47	2.74
1/2	2.07	1.80	0.90	0.72	7.45	3.73
3/4	2.88	2.50	1.25	1.00	10.1	5.07
1	3.68	3.20	1.60	1.28	12.6	6.31
1½	5.18	4.50	2.25	1.80	17.2	8.59
2	6.67	5.80	2.90	2.32	21.4	10.7
3	9.66	8.40	4.20	3.36	29.1	14.5
5	15.4	13.4	6.68	5.35	42.9	21.4
7½	22.6	19.6	9.82	7.86	58.4	29.2
10	29.7	25.8	12.9	10.3	....	36.3
15	43.6	38.0	19.0	15.2	....	49.4
20	57.4	49.9	24.9	20.0	....	....
25	70.9	61.7	30.8	24.7	....	....
30	84.3	73.3	36.7	29.3	....	....
40	111.	96.4	48.2	38.5	....	....
50	137.	119.	59.6	47.6	....	....
60	163.	142.	70.8	56.6	....	....
75	201.	175.	87.6	70.0	....	....
100	265.	230.	115.	92.0	....	....
125	327.	284.	142.	114.	....	....
150	389.	338.	169.	135.	....	....
200	511.	445.	222.	178.	....	....

NOTE: These currents should not be used for selection of fuses, circuit breakers or wire sizes. See NEC tables 430-148 through 430-150. For motors rated 208-220 volts use 230 V. column. For motors rated 440 to 550 volts use 460 and 575 V. columns, respectively.

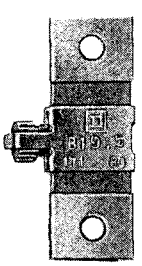

Fig. 1

MOUNTING THERMAL UNITS

Always be certain the correct thermal units are installed in the starter before operating the motor. Thermal units should always be mounted so that their type designation can be read from the front of the starter (see Fig. 1). Melting alloy thermal units should be mounted so that the tooth of the pawl assembly can engage the teeth of the ratchet wheel when the reset button is pushed.

Mounting surfaces of starter and thermal units should be clean and care should be taken to insure that thermal unit mounting screws are fastened securely.

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SELECTION TABLES 1 THRU 6

Table 1

Motor Full-Load Current (Amp.)		Thermal Unit Number
1 T. U.	3 T. U.	
0.33–0.36	0.29–0.32	B 0.44
0.37–0.40	0.33–0.36	B 0.51
0.41–0.45	0.37–0.39	B 0.57
0.46–0.52	0.40–0.47	B 0.63
0.53–0.59	0.48–0.56	B 0.71
0.60–0.66	0.57–0.63	B 0.81
0.67–0.73	0.64–0.69	B 0.92
0.74–0.81	0.70–0.77	B 1.03
0.82–0.91	0.78–0.86	B 1.16
0.92–1.02	0.87–0.96	B 1.30
1.03–1.14	0.97–1.11	B 1.45
1.15–1.29	1.12–1.23	B 1.67
1.30–1.42	1.24–1.37	B 1.88
1.43–1.64	1.38–1.55	B 2.10
1.65–1.80	1.56–1.75	B 2.40
1.81–2.10	1.76–1.92	B 2.65
2.11–2.30	1.93–2.16	B 3.00
2.31–2.61	2.17–2.50	B 3.30
2.62–2.99	2.51–2.81	B 3.70
3.00–3.37	2.82–3.16	B 4.15
3.38–3.94	3.17–3.40	B 4.85
3.95–4.24	3.41–3.76	B 5.50
4.25–4.54	3.77–4.00	B 6.25
4.55–5.29	4.01–4.68	B 6.90
5.30–5.73	4.69–5.18	B 7.70
5.74–6.35	5.19–5.51	B 8.20
6.36–7.08	5.52–6.19	B 9.10
7.09–7.83	6.20–7.12	B 10.2
7.84–8.47	7.13–8.15	B 11.5
8.48–9.83	8.16–8.60	B 12.8
9.84–10.5	8.61–9.21	B 14
10.6–11.4	9.22–10.1	B 15.5
11.5–12.8	10.2–11.2	B 17.5
12.9–13.9	11.3–12.0	B 19.5
14.0–16.1	....	B 22
16.2–18.0	....	B 25
Following Selections for Size M-1 & M-1P Only.		
....	11.3–12.1	B 19.5
....	12.2–13.6	B 22
16.2–17.6	13.7–15.3	B 25
17.7–20.6	15.4–17.3	B 28.0
20.7–23.1	17.4–19.1	B 32
23.2–26.0	19.2–21.7	B 36
....	21.8–24.2	B 40
....	24.3–26.0	B 45
Following Selections For Size M-1P Only.		
23.2–27.1	....	B 36
27.2–29.2	....	B 40
29.3–33.0	....	B 45
33.1–36.0	....	B 50

Table 2

Motor Full-Load Current (Amp.)		Thermal Unit Number
1 T. U.	3 T. U.	
0.35–0.38	0.30–0.32	B 0.44
0.39–0.43	0.33–0.37	B 0.51
0.44–0.48	0.38–0.39	B 0.57
0.49–0.56	0.40–0.48	B 0.63
0.57–0.63	0.49–0.57	B 0.71
0.64–0.71	0.58–0.64	B 0.81
0.72–0.78	0.65–0.70	B 0.92
0.79–0.88	0.71–0.78	B 1.03
0.89–0.99	0.79–0.87	B 1.16
1.00–1.15	0.88–0.98	B 1.30
1.16–1.23	0.99–1.13	B 1.45
1.24–1.43	1.14–1.25	B 1.67
1.44–1.51	1.26–1.40	B 1.88
1.52–1.75	1.41–1.58	B 2.10
1.76–1.93	1.59–1.79	B 2.40
1.94–2.25	1.80–1.91	B 2.65
2.26–2.47	1.92–2.20	B 3.00
2.48–2.81	2.21–2.55	B 3.30
2.82–3.20	2.56–2.87	B 3.70
3.21–3.63	2.88–3.24	B 4.15
3.64–4.19	3.25–3.48	B 4.85
4.20–4.53	3.49–3.85	B 5.50
4.54–4.89	3.86–4.10	B 6.25
4.90–5.68	4.11–4.79	B 6.90
5.69–6.27	4.80–5.31	B 7.70
6.28–6.85	5.32–5.65	B 8.20
6.86–7.73	5.66–6.35	B 9.10
7.74–8.50	6.36–7.31	B 10.2
8.51–9.29	7.32–8.34	B 11.5
9.30–10.4	8.35–8.84	B 12.8
10.5–11.3	8.85–9.47	B 14
11.4–12.3	9.48–10.4	B 15.5
12.4–13.9	10.5–11.5	B 17.5
14.0–15.0	11.6–12.0	B 19.5
15.1–18.0	.....	B 22
Following Selections for Size M-1 & M-1P Only.		
.....	11.6–12.4	B 19.5
15.1–17.4	12.5–14.0	B 22
17.5–19.2	14.1–15.8	B 25
19.3–22.0	15.9–17.8	B 28.0
22.1–24.6	17.9–19.7	B 32
24.7–26.0	19.8–22.4	B 36
.....	22.5–25.1	B 40
.....	25.1–26.0	B 45
Following Selections for Size M-1P Only.		
24.7–29.1	.....	B 36
29.2–31.7	.....	B 40
31.8–36.0	.....	B 45

Table 3

Motor Full-Load Current (Amp.)		Thermal Unit Number
1 T. U.	3 T. U.	
0.29–0.31	0.28–0.29	B 0.44
0.32–0.36	0.30–0.33	B 0.51
0.37–0.39	0.34–0.36	B 0.57
0.40–0.47	0.37–0.44	B 0.63
0.48–0.56	0.45–0.52	B 0.71
0.57–0.63	0.53–0.59	B 0.81
0.64–0.69	0.60–0.64	B 0.92
0.70–0.77	0.65–0.71	B 1.03
0.78–0.86	0.72–0.80	B 1.16
0.87–0.97	0.81–0.90	B 1.30
0.98–1.12	0.91–1.03	B 1.45
1.13–1.24	1.04–1.14	B 1.67
1.25–1.39	1.15–1.27	B 1.88
1.40–1.57	1.28–1.44	B 2.10
1.58–1.78	1.45–1.63	B 2.40
1.79–1.96	1.64–1.79	B 2.65
1.97–2.20	1.80–2.01	B 3.00
2.21–2.41	2.02–2.19	B 3.30
2.42–2.75	2.20–2.52	B 3.70
2.76–3.25	2.53–2.95	B 4.15
3.26–3.50	2.96–3.17	B 4.85
3.51–3.87	3.18–3.50	B 5.50
3.88–4.13	3.51–3.73	B 6.25
4.14–4.69	3.74–4.22	B 6.90
4.70–5.20	4.23–4.68	B 7.70
5.21–5.53	4.69–4.98	B 8.20
5.54–6.23	4.99–5.59	B 9.10
6.24–7.18	5.60–6.43	B 10.2
7.19–8.20	6.44–7.41	B 11.5
8.21–8.98	7.42–8.02	B 12.8
8.99–9.63	8.03–8.59	B 14
9.64–10.6	8.60–9.52	B 15.5
10.7–11.8	9.53–10.5	B 17.5
11.9–12.7	10.6–11.2	B 19.5
12.8–14.3	11.3–12.0	B 22
14.4–16.1	.....	B 25
16.2–18.0	.....	B 28.0
Following Selections for Size M-1 & M-1P Only.		
.....	11.3–12.7	B 22
.....	12.8–14.3	B 25
16.2–18.3	14.4–16.1	B 28.0
18.4–20.2	16.2–17.8	B 32
20.3–23.0	17.9–20.1	B 36
23.1–26.0	20.2–22.6	B 40
.....	22.7–25.5	B 45
.....	25.6–26.0	B 50
Following Selections for Size M-1P Only.		
25.9–29.0	.....	B 45
29.1–30.8	.....	B 50
30.9–32.7	.....	B 56
32.8–36.0	.....	B 62

Table 4

Motor Full-Load Current (Amp.)		Thermal Unit Number
1 T. U.	3 T. U.	
0.32–0.33	0.29–0.30	B 0.44
0.34–0.38	0.31–0.35	B 0.51
0.39–0.41	0.36–0.37	B 0.57
0.42–0.50	0.38–0.45	B 0.63
0.51–0.61	0.46–0.54	B 0.71
0.62–0.68	0.55–0.61	B 0.81
0.69–0.74	0.62–0.66	B 0.92
0.75–0.83	0.67–0.74	B 1.03
0.84–0.93	0.75–0.83	B 1.16
0.94–1.05	0.84–0.93	B 1.30
1.06–1.21	0.94–1.07	B 1.45
1.22–1.34	1.08–1.19	B 1.67
1.35–1.50	1.20–1.33	B 1.88
1.51–1.70	1.34–1.51	B 2.10
1.71–1.93	1.52–1.70	B 2.40
1.94–2.12	1.71–1.87	B 2.65
2.13–2.38	1.88–2.10	B 3.00
2.39–2.61	2.11–2.29	B 3.30
2.62–2.99	2.30–2.63	B 3.70
3.00–3.53	2.64–3.09	B 4.15
3.54–3.80	3.10–3.32	B 4.85
3.81–4.21	3.33–3.67	B 5.50
4.22–4.49	3.68–3.91	B 6.25
4.50–5.10	3.92–4.43	B 6.90
5.11–5.66	4.44–4.91	B 7.70
5.67–6.03	4.92–5.23	B 8.20
6.04–6.79	5.24–5.88	B 9.10
6.80–7.84	5.89–6.77	B 10.2
7.85–8.96	6.78–7.90	B 11.5
8.97–9.82	7.91–8.44	B 12.8
9.83–10.4	8.45–9.05	B 14
10.5–11.6	9.06–9.99	B 15.5
11.7–12.9	10.0–11.0	B 17.5
13.0–13.9	11.1–11.9	B 19.5
14.0–15.7	12.0–12.0	B 22
15.8–18.0	.....	B 25
Following Selections for Size M-1 & M-1P Only.		
.....	12.0–13.4	B 22
.....	13.5–15.1	B 25
17.8–20.1	15.2–17.0	B 28.0
20.2–22.2	17.1–18.9	B 32
22.3–25.3	19.0–21.4	B 36
25.4–26.0	21.5–24.0	B 40
.....	24.1–26.0	B 45
Following Selections for Size M-1P Only.		
25.4–28.4	.....	B 40
28.5–33.1	.....	B 45
33.2–36.0	.....	B 50

TABLE 5

Current Transformer Ratio										Thermal Unit Number
25/5	50/5	75/5	100/5	150/5	200/5	250/5	300/5	400/5	500/5	
Motor Full Load Current										
10.6–11.7	21.1–23.6	31.7–35.4	42.3–47.2	63.4– 70.9	84.5– 94.6	106.–117.	127.–141.	169.–188.	211.–236.	B 3.00
11.8–13.2	23.7–26.5	35.5–39.8	47.3–53.1	71.0– 79.7	94.7–105.	118.–132.	142.–159.	189.–212.	237.–265.	B 3.30
13.3–14.8	26.6–29.6	39.9–44.5	53.2–59.4	79.8– 89.1	106. –118.	133.–148.	160.–177.	213.–237.	266.–296.	B 3.70
14.9–17.2	29.7–34.5	44.6–51.8	59.5–69.2	89.2–103.	119. –138.	149.–172.	178.–207.	238.–276.	297.–345.	B 4.15
17.3–19.6	34.6–39.2	51.9–58.9	69.3–78.6	104. –117.	139. –156.	173.–196.	208.–235.	277.–314.	346.–360.	B 4.85
19.7–22.3	39.3–44.6	59.0–67.0	78.7–89.3	118. –133.	157. –178.	197.–223.	236.–267.	315.–357.	.....	B 5.50

TABLE 6

Current Transformer Ratio										Thermal Unit Number
25/5	50/5	75/5	100/5	150/5	200/5	250/5	300/5	400/5	500/5	
Motor Full Load Current										
10.6–11.9	21.2–23.9	31.8–35.9	42.4–47.9	63.6– 72.0	84.8– 96.0	106.–119.	127.–143.	170.–191.	212.–239.	AR 3.62
12.0–13.4	24.0–26.9	36.0–40.3	48.0–53.8	72.1– 80.8	96.1–107.	120.–134.	144.–161.	192.–215.	240.–269.	AR 3.98
13.5–15.0	27.0–30.0	40.4–45.1	53.9–60.1	80.9– 90.2	108. –119.	135.–150.	162.–180.	216.–240.	270.–300.	AR 4.37
15.1–16.6	30.1–33.4	45.2–50.1	60.2–66.9	90.3– 99.4	120. –133.	151.–166.	181.–200.	241.–267.	301.–334.	AR 4.80
16.7–18.7	33.5–37.5	50.2–56.3	67.0–75.1	100. –112.	134. –149.	167.–187.	201.–225.	268.–300.	335.–360.	AR 5.3
18.8–20.7	37.6–41.4	56.4–62.2	75.2–82.9	113. –124.	150. –165.	188.–207.	226.–248.	301.–331.	.....	AR 5.8
20.8–22.8	41.5–45.7	62.3–68.5	83.0–91.4	125. –136.	166. –182.	208.–228.	249.–274.	332.–365.	.....	AR 6.4

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Table 7

SINGLE PHASE					POLYPHASE				
		Maximum Fuse Rating (Amp.)					Maximum Fuse Rating (Amp.)		
			Group Motor Installation (N.E.C. 430-53)					Group Motor Installation (N.E.C. 430-53)	
Single Phase Motor Full-Load Current (Amp.)	Thermal Unit No.	Single-Motor Installation (N.E.C. 430-52)	Class K-9 or Unclassified Fuse	Class K-5 Fuse	Motor Full-Load Current (Amp.)	Thermal Unit No.	Single Motor Installation (N.E.C. 430-52)	Class K-9 or Unclassified Fuse	Class K-5 Fuse
0.33– 0.36	B 0.44	0.6	15	30	0.29 – 0.32	B 0.44	0.6	15	30
0.37– 0.40	B 0.51	0.8	15	30	0.33 – 0.36	B 0.51	0.6	15	30
0.41– 0.45	B 0.57	0.8	15	30	0.37– 0.39	B 0.57	0.8	15	30
0.46– 0.52	B 0.63	1	15	30	0.40 – 0.47	B 0.63	0.8	15	30
0.53– 0.59	B 0.71	1.125	15	30	0.48– 0.56	B 0.71	1	15	30
0.60– 0.66	B 0.81	1.25	15	30	0.57 – 0.63	B 0.81	1.25	15	30
0.67– 0.73	B 0.92	1.4	15	30	0.64 – 0.69	B 0.92	1.4	15	30
0.74– 0.81	B 1.03	1.6	15	30	0.70– 0.77	B 1.03	1.4	15	30
0.82– 0.91	B 1.16	1.8	20	30	0.78 – 0.86	B 1.16	1.6	20	30
0.92– 1.02	B 1.30	2.0	20	30	0.87 – 0.96	B 1.30	1.8	20	30
1.03– 1.14	B 1.45	2.25	20	30	0.97– 1.11	B 1.45	2	20	30
1.15– 1.29	B 1.67	2.5	20	30	1.12– 1.23	B 1.67	2.5	20	30
1.30– 1.42	B 1.88	2.8	20	30	1.24 – 1.37	B 1.88	2.5	20	30
1.43– 1.64	B 2.10	3.2	25	30	1.38 – 1.55	B 2.10	2.8	25	30
1.65– 1.80	B 2.40	3.5	25	30	1.56– 1.75	B 2.40	3.5	25	30
1.81– 2.10	B 2.65	4.0	25	30	1.76– 1.92	B 2.65	3.5	25	30
2.11– 2.30	B 3.00	4.5	25	30	1.93– 2.16	B 3.00	4	25	30
2.31– 2.61	B 3.30	5.0	30	30	2.17– 2.50	B 3.30	4.5	30	30
2.62– 2.99	B 3.70	5.6	30	30	2.51– 2.81	B 3.70	5.6	30	30
3.00– 3.37	B 4.15	6.25	30	30	2.82– 3.16	B 4.15	6.25	30	30
3.38– 3.94	B 4.85	7	30	30	3.17– 3.40	B 4.85	7	30	30
3.95– 4.24	B 5.50	8	30	30	3.41 – 3.76	B 5.50	7	30	30
4.25– 4.54	B 6.25	9	30	30	3.77– 4.00	B 6.25	8	30	30
4.55– 5.29	B 6.90	10	30	30	4.01– 4.68	B 6.90	9	30	30
5.30– 5.73	B 7.70	10	30	30	4.69– 5.18	B 7.70	10	30	30
5.74– 6.35	B 8.20	12	30	30	5.19– 5.51	B 8.20	10	30	30
6.36– 7.08	B 9.10	12	30	30	5.52– 6.19	B 9.10	12	30	30
7.09– 7.83	B 10.2	15	30	30	6.20– 7.12	B 10.2	12	30	30
7.84– 8.47	B 11.5	17.5	30	30	7.13– 8.15	B 11.5	15	30	30
8.48– 9.83	B 12.8	17.5	30	30	8.16– 8.60	B 12.8	17.5	30	30
9.84–10.5	B 14	20	Group Fusing Restrictions Maximum thermal unit size: B 12.8 Maximum branch-circuit available current: 5,000 amp. symmetrical		8.61– 9.21	B 14	17.5	30	30
10.6 –11.4	B 15.5	20			9.22–10.1	B 15.5	20	Group Fusing Restrictions Maximum thermal unit size: B 14 Maximum branch-circuit available current: 5,000 amp. symmetrical	
11.5 –12.8	B 17.5	25			10.2 –11.2	B 17.5	20		
12.9 –13.9	B 19.5	25					600V. Max.		
14.0 –16.1	B 22.	25							
16.2 –18.0	B 25.	25			11.3 –12.0	B 19.5	20		
							250V. Max.		
							25		

TABLE 8

Motor Full-Load Current (Amp.)			Thermal Unit Number
2 T. U. 1ϕ	2 T. U. 2ϕ	3 T. U.	
0.37 – 0.39	0.37– 0.39	0.30 – 0.31	AR .45
0.40 – 0.42	0.40– 0.42	0.32– 0.34	AR .49
0.43 – 0.46	0.43 – 0.46	0.35 – 0.37	AR .54
0.47 – 0.50	0.47 – 0.50	0.38 – 0.41	AR .59
0.51 – 0.54	0.51 – 0.54	0.42– 0.45	AR .65
0.55 – 0.59	0.55 – 0.59	0.46– 0.49	AR .71
0.60– 0.65	0.60 – 0.65	0.50 – 0.54	AR .78
0.66 – 0.71	0.66 – 0.71	0.55 – 0.56	AR .86
0.72 – 0.78	0.72 – 0.78	0.57– 0.62	AR .95
0.79– 0.86	0.79 – 0.86	0.63 – 0.68	AR 1.05
0.87 – 0.94	0.87 – 0.94	0.69– 0.75	AR 1.15
0.95 – 1.04	0.95 – 1.04	0.76– 0.82	AR 1.26
1.05– 1.14	1.05 – 1.14	0.83 – 0.91	AR 1.39
1.15 – 1.25	1.15 – 1.25	0.92 – 1.00	AR 1.53
1.26– 1.42	1.26 – 1.42	1.01 – 1.18	AR 1.68
1.43 – 1.62	1.43 – 1.62	1.19 – 1.30	AR 1.85
1.63 – 1.75	1.63 – 1.75	1.31– 1.41	AR 2.04
1.76 – 1.91	1.76 – 1.91	1.42 – 1.53	AR 2.24
1.92– 2.07	1.92 – 2.07	1.54 – 1.69	AR 2.46
2.08 – 2.25	2.08 – 2.25	1.70– 1.79	AR 2.71
2.26– 2.47	2.26 – 2.47	1.80– 2.02	AR 2.98
2.48– 2.73	2.48– 2.73	2.03– 2.19	AR 3.28
2.74– 2.99	2.74 – 2.99	2.20– 2.43	AR 3.62
3.00 – 3.31	3.00– 3.31	2.44– 2.81	AR 3.98
3.32 – 3.71	3.32 – 3.71	2.82– 3.12	AR 4.37
3.72– 4.15	3.72 – 4.15	3.13 – 3.47	AR 4.80
4.16– 4.65	4.16 – 4.65	3.48– 3.89	AR 5.3
4.66 – 5.11	4.66– 5.11	3.90– 4.30	AR 5.8
5.12– 5.68	5.12 – 5.68	4.31– 4.69	AR 6.4
5.69 – 6.24	5.69 – 6.24	4.70 – 5.19	AR 7.0
6.25 – 7.15	6.25 – 7.15	5.20 – 5.93	AR 7.7
7.16– 7.84	7.16 – 7.84	5.94 – 6.45	AR 8.5
7.85 – 8.56	7.85 – 8.56	6.46 – 7.08	AR 9.3
8.57– 9.40	8.57– 9.40	7.09– 7.71	AR 10.2
9.41 –10.2	9.41 – 10.2	7.72 – 8.39	AR 11.2
10.3 –10.7	10.3 – 10.7	8.40 – 8.64	AR 12.4
10.8 –12.2	10.8 –12.0	8.65 – 9.74	AR 13.6
12.3 –14.1	....	9.75–11.0	AR 15.4
14.2 –15.9	....	11.1 –12.0	AR 17.6
16.0 –18.0	....	....	AR 20.5
Following Selections for Size 1 Only			
....	10.8 – 12.2	....	AR 13.6
....	12.3 –14.1	....	AR 15.4
....	14.2 –15.9	11.1 –12.4	AR 17.6
16.0 –18.1	16.0 – 18.1	12.5 –13.9	AR 20.5
18.2 –20.8	18.2 – 20.8	14.0 – 15.9	AR 23
20.9 – 23.6	20.9 – 23.6	16.0 –17.7	AR 27
23.7 – 26.0	23.7 – 26.0	17.8 – 20.3	AR 30
....	....	20.4 – 22.8	AR 35
....	....	22.9 – 26.0	AR 40

Table 9

Motor Full Load Current (Amp.)	Thermal Unit Number
15.3–16.7	C 20
16.8–19.8	C 22
19.9–22.8	C 26
22.9–25.8	C 30
25.9–30.4	C 34
30.5–31.9	C 40
32.0–34.2	C 42
34.3–38.8	C 45
38.9–44.2	C 51
44.3–50.2	C 58
50.3–57.1	C 66
57.2–63.2	C 75
63.3–68.6	C 83
68.7–78.6	C 90
78.7–86.9	C 103
87.0–100.0	C 114

Table 10

Motor Full Load Current (Amp.)	Thermal Unit Number
43.6– 47.3	CC 54.5
47.4– 51.3	CC 59.4
51.4– 54.6	CC 64.3
54.7– 59.7	CC 68.5
59.8 – 65.1	CC 74.6
65.2– 70.1	CC 81.5
70.2– 75.1	CC 87.7
75.2– 82.2	CC 94.0
82.3– 89.2	CC 103
89.3– 96.5	CC 112
96.6–104.	CC 121
105. –113.	CC 132
114. –123.	CC 143
124. –132.	CC 156
133. –150.	CC 167

Table 11

Motor Full-Load Current (Amp.)		Thermal Unit Number
2 T. U.	3 T. U.	
33.0–36.1	30.5–33.4	AU 44
36.2–40.2	33.5–37.1	AU 50
40.3–45.5	37.2–42.0	AU 56
45.6–51.3	42.1–47.0	AU 64
51.4–58.5	47.1–53.5	AU 72
58.6–62.6	53.6–57.5	AU 81
62.7–71.3	57.6–64.4	AU 88
71.4–77.1	64.5–69.4	AU 99
77.2–86.9	69.5–77.4	AU 110
87.0–93.3	77.5–83.6	AU 123
93.4–102.	83.7–92.9	AU 135
103.–107.	93.0–100.	AU 152
108.–112.	101.–104.	AU 169
113.–121.	105.–115.	AU 183
122.–123.	116.–119.	AU 198
124.–133.	120.–123.	AU 217
....	124.–133.	AU 235

Table 12

Motor Full Load Current (Amp.)	Thermal Unit Number
92. 100.	DD 112
101.–109.	DD 121
110. 119.	DD 128
120.–131.	DD 140
132.–139.	DD 150
140.–156.	DD 160
157.–166.	DD 185
167.–180.	DD 213
181.–189.	DD 220
190.–209.	DD 230
210.–225.	DD 250
226. 238.	DD 265
239. 263.	DD 280
264.–300.	DD 300

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Table 13

Motor Full-Load Current (Amp.)			Thermal Unit Number
1 T. U.	2 T. U.	3 T. U.	
0.29– 0.31	0.29– 0.31	0.28– 0.30	B 0.44
0.32– 0.34	0.32– 0.34	0.31– 0.34	B 0.51
0.35– 0.38	0.35– 0.38	0.35– 0.37	B 0.57
0.39– 0.45	0.39– 0.45	0.38– 0.44	B 0.63
0.46– 0.54	0.46– 0.54	0.45– 0.53	B 0.71
0.55– 0.61	0.55– 0.61	0.54– 0.59	B 0.81
0.62– 0.66	0.62– 0.66	0.60– 0.64	B 0.92
0.67– 0.73	0.67– 0.73	0.65– 0.72	B 1.03
0.74– 0.81	0.74– 0.81	0.73– 0.80	B 1.16
0.82– 0.94	0.82– 0.94	0.81– 0.90	B 1.30
0.95– 1.05	0.95– 1.05	0.91– 1.03	B 1.45
1.06– 1.22	1.06– 1.22	1.04– 1.14	B 1.67
1.23– 1.34	1.23– 1.34	1.15– 1.27	B 1.88
1.35– 1.51	1.35– 1.51	1.28– 1.43	B 2.10
1.52– 1.71	1.52– 1.71	1.44– 1.62	B 2.40
1.72– 1.93	1.72– 1.93	1.63– 1.77	B 2.65
1.94– 2.14	1.94– 2.14	1.78– 1.97	B 3.00
2.15– 2.40	2.15– 2.40	1.98– 2.32	B 3.30
2.41– 2.72	2.41– 2.72	2.33– 2.51	B 3.70
2.73– 3.15	2.73– 3.15	2.52– 2.99	B 4.15
3.16– 3.55	3.16– 3.55	3.00– 3.42	B 4.85
3.56– 4.00	3.56– 4.00	3.43– 3.75	B 5.50
4.01– 4.40	4.01– 4.40	3.76– 3.98	B 6.25
4.41– 4.88	4.41– 4.88	3.99– 4.48	B 6.90
4.89– 5.19	4.89– 5.19	4.49– 4.93	B 7.70
5.20– 5.73	5.20– 5.73	4.94– 5.21	B 8.20
5.74– 6.39	5.74– 6.39	5.22– 5.84	B 9.10
6.40– 7.13	6.40– 7.13	5.85– 6.67	B 10.2
7.14– 7.90	7.14– 7.90	6.68– 7.54	B 11.5
7.91– 8.55	7.91– 8.55	7.55– 8.14	B 12.8
8.56– 9.53	8.56– 9.53	8.15– 8.72	B 14
9.54–10.6	9.54–10.6	8.73– 9.66	B 15.5
10.7 –11.8	10.7 –11.8	9.67–10.5	B 17.5
11.9 –13.2	11.9 –12.0	10.6 –11.3	B 19.5
13.3 –14.9	....	11.4 –12.0	B 22
15.0 –16.6	....	....	B 25
16.7 –18.0	....	....	B 28.0
Following Selections for Size 1 Only			
....	11.9 –13.2	....	B 19.5
....	13.3 –14.9	11.4 –12.7	B 22
....	15.0 –16.6	12.8 –14.1	B 25
16.7 –18.9	16.7 –18.9	14.2 –15.9	B 28.0
19.0 –21.2	19.0 –21.2	16.0 –17.5	B 32
21.3 –23.0	21.3 –23.0	17.6 –19.7	B 36
23.1 –25.5	23.1 –25.5	19.8 –21.9	B 40
25.6 –26.0	25.6 –26.0	22.0 –24.4	B 45
....	....	24.5 –26.0	B 50

Table 14

Motor Full Load Current Amps.			Thermal Unit Number
1 T. U.	2 T. U.	3 T. U.	
0.43–0.47	0.41–0.45	0.40–0.41	A .49
0.48–0.51	0.46–0.50	0.42–0.46	A .54
0.52–0.56	0.51–0.55	0.47–0.51	A .59
0.57–0.64	0.56–0.62	0.52–0.57	A .65
0.65–0.69	0.63–0.67	0.58–0.62	A .71
0.70–0.76	0.68–0.72	0.63–0.67	A .78
0.77–0.84	0.73–0.81	0.68–0.75	A .86
0.85–0.91	0.82–0.88	0.76–0.80	A .95
0.92–1.01	0.89–0.97	0.81–0.89	A 1.02
1.02–1.15	0.98–1.08	0.90–1.02	A 1.16
1.16–1.23	1.09–1.18	1.03–1.09	A 1.25
1.24–1.37	1.19–1.32	1.10–1.21	A 1.39
1.38–1.45	1.33–1.40	1.22–1.29	A 1.54
1.46–1.56	1.41–1.48	1.30–1.37	A 1.63
1.57–1.67	1.49–1.60	1.38–1.48	A 1.75
1.68–1.77	1.61–1.72	1.49–1.58	A 1.86
1.78–1.92	1.73–1.84	1.59–1.72	A 1.99
1.93–2.09	1.85–2.00	1.73–1.85	A 2.15
2.10–2.31	2.01–2.22	1.86–2.05	A 2.31
2.32–2.56	2.23–2.45	2.06–2.29	A 2.57
2.57–2.92	2.46–2.82	2.30–2.62	A 2.81
2.93–3.16	2.83–3.08	2.63–2.84	A 3.61
3.17–3.48	3.09–3.39	2.85–3.10	A 3.95
3.49–3.83	3.40–3.75	3.11–3.46	A 4.32
3.84–4.24	3.76–4.16	3.47–3.85	A 4.79
4.25–4.62	4.17–4.51	3.86–4.16	A 5.30
4.63–4.92	4.52–4.83	4.17–4.46	A 5.78
4.93–5.61	4.84–5.49	4.47–5.08	A 6.20
5.62–5.85	5.50–5.67	5.09–5.35	A 6.99
5.86–6.36	5.68–6.16	5.36–5.82	A 7.65
6.37–6.99	6.17–6.75	5.83–6.34	A 8.38
7.00–7.67	6.76–7.00	6.35–6.95	A 9.25
7.68–8.15	....	6.96–7.00	A 9.85
8.16–9.00	....	....	A 11.0

Table 15

Motor Full Load Current (Amp.)			Thermal Unit Number
1 T. U.	2 T. U.	3 T. U.	
0.31– 0.33	0.31– 0.33	0.29– 0.31	B 0.44
0.34– 0.36	0.34– 0.36	0.32– 0.36	B 0.51
0.37– 0.40	0.37– 0.40	0.37– 0.38	B 0.57
0.41– 0.48	0.41– 0.48	0.39– 0.46	B 0.63
0.49– 0.57	0.49– 0.57	0.47– 0.55	B 0.71
0.58– 0.64	0.58– 0.64	0.56– 0.61	B 0.81
0.65– 0.70	0.65– 0.70	0.62– 0.66	B 0.92
0.71– 0.77	0.71– 0.77	0.67– 0.75	B 1.03
0.78– 0.85	0.78– 0.85	0.76– 0.83	B 1.16
0.86– 0.99	0.86– 0.99	0.84– 0.93	B 1.30
1.00– 1.10	1.00– 1.10	0.94– 1.06	B 1.45
1.11– 1.28	1.11– 1.28	1.07– 1.18	B 1.67
1.29– 1.41	1.29– 1.41	1.19– 1.31	B 1.88
1.42– 1.58	1.42– 1.58	1.32– 1.47	B 2.10
1.59– 1.80	1.59– 1.80	1.48– 1.67	B 2.40
1.81– 2.03	1.81– 2.03	1.68– 1.83	B 2.65
2.04– 2.25	2.04– 2.25	1.84– 2.04	B 3.00
2.26– 2.51	2.26– 2.51	2.05– 2.38	B 3.30
2.52– 2.83	2.52– 2.83	2.39– 2.60	B 3.70
2.84– 3.29	2.84– 3.29	2.61– 3.13	B 4.15
3.30– 3.75	3.30– 3.75	3.14– 3.59	B 4.85
3.76– 4.22	3.76– 4.22	3.60– 3.94	B 5.50
4.23– 4.65	4.23– 4.65	3.95– 4.19	B 6.25
4.66– 5.16	4.66– 5.16	4.20– 4.72	B 6.90
5.17– 5.53	5.17– 5.53	4.73– 5.21	B 7.70
5.54– 6.09	5.54– 6.09	5.22– 5.51	B 8.20
6.10– 6.80	6.10– 6.80	5.52– 6.17	B 9.10
6.81– 7.60	6.81– 7.60	6.18– 7.07	B 10.2
7.61– 8.35	7.61– 8.35	7.08– 8.05	B 11.5
8.36– 9.04	8.36– 9.04	8.06– 8.69	B 12.8
9.05– 9.99	9.05– 9.99	8.70– 9.32	B 14
10.0 –11.1	10.0 –11.1	9.33–10.2	B 15.5
11.2 –12.3	11.2 –12.0	10.3 –11.3	B 17.5
12.4 –13.7	....	11.4 –12.0	B 19.5
13.8 –15.4	....	....	B 22
15.5 –18.0	....	....	B 25
Following Selections for Size 1 Only			
....	11.2 –12.3	....	B 17.5
....	12.4 –13.7	11.4 –12.1	B 19.5
....	13.8 –15.4	12.2 –13.7	B 22
15.5 –17.2	15.5 –17.2	13.8 –15.2	B 25
17.3 –19.4	17.3 –19.4	15.3 –17.2	B 28.0
19.5 –21.7	19.5 –21.7	17.3 –18.9	B 32
21.8 –23.9	21.8 –23.9	19.0 –21.4	B 36
24.0 –26.0	24.0 –26.0	21.5 –23.7	B 40
....	....	23.8 –26.0	B 45

Table 16

Motor Full-Load Current (Amp.)			Thermal Unit Number
1 T. U.	2 T. U.	3 T. U.	
16.2–17.5	15.1–16.2	14.3–15.4	CC 20.9
17.6–18.8	16.3–17.3	15.5–16.4	CC 22.8
18.9–20.5	17.4–19.5	16.5–18.5	CC 24.6
20.6–22.2	19.6–20.7	18.6–19.6	CC 26.3
22.3–23.7	20.8–22.3	19.7–21.1	CC 28.8
23.8–25.4	22.4–24.0	21.2–22.7	CC 31.0
25.5–27.3	24.1–25.7	22.8–24.4	CC 33.3
27.4–29.3	25.8–27.5	24.5–26.1	CC 36.4
29.4–31.5	27.6–29.6	26.2–28.1	CC 39.6
31.6–33.9	29.7–31.7	28.2–30.0	CC 42.7
34.0–36.2	31.8–33.9	30.1–32.1	CC 46.6
36.3–39.3	34.0–36.6	32.2–34.7	CC 50.1
39.4–42.3	36.7–39.3	34.8–37.3	CC 54.5
42.4–45.3	39.4–42.3	37.4–40.1	CC 59.4
45.4–48.3	42.4–44.9	40.2–42.6	CC 64.3
48.4–52.0	45.0–48.3	42.7–45.8	CC 68.5
52.1–54.9	48.4–50.9	45.9–48.3	CC 74.6
55.0 59.7	51.0–55.5	48.4–52.6	CC 81.5
59.8–65.4	55.6–59.9	52.7–56.8	CC 87.7
65.5–69.6	60.0–64.2	56.9–60.9	CC 94.0
69.7–74.8	64.3–68.7	61.0–65.1	CC 103
74.9–79.7	68.8–71.4	65.2–67.7	CC 112
79.8–83.1	71.5–74.8	67.8–70.9	CC 121
83.2–86.0	74.9–78.0	71.0–73.9	CC 132
....	78.1–80.7	74.0–76.5	CC 143
....	80.8–86.0	76.6–80.2	CC 156
....	....	80.3–83.1	CC 167
....	....	83.2–86.0	CC 180

Table 17

Motor Full Load Current (Amp.)			Thermal Unit Number
1 T. U.	2 T. U.	3 T. U.	
0.42–0.46	0.39–0.43	0.38–0.40	A .49
0.47–0.50	0.44–0.47	0.41–0.44	A .54
0.51–0.55	0.48–0.52	0.45–0.49	A .59
0.56–0.62	0.53–0.58	0.50–0.55	A .65
0.63–0.67	0.59–0.64	0.56–0.60	A .71
0.68–0.73	0.65–0.68	0.61–0.65	A .78
0.74–0.81	0.69–0.77	0.66–0.72	A .86
0.82–0.89	0.78–0.84	0.73–0.79	A .95
0.90–0.98	0.85–0.93	0.80–0.88	A 1.02
0.99–1.12	0.94–1.05	0.89–0.98	A 1.16
1.13–1.20	1.06–1.13	0.99–1.07	A 1.25
1.21–1.34	1.14–1.25	1.08–1.17	A 1.39
1.35–1.41	1.26–1.33	1.18–1.25	A 1.54
1.42–1.51	1.34–1.42	1.26–1.33	A 1.63
1.52–1.62	1.43–1.52	1.34–1.44	A 1.75
1.63–1.73	1.53–1.63	1.45–1.53	A 1.86
1.74–1.86	1.64–1.75	1.54–1.65	A 1.99
1.87–2.02	1.76–1.90	1.66–1.79	A 2.15
2.03–2.25	1.91–2.13	1.80–1.99	A 2.31
2.26–2.46	2.14–2.33	2.00–2.18	A 2.57
2.47–2.77	2.34–2.73	2.19–2.45	A 2.81
2.78–2.99	2.74–2.86	2.46–2.65	A 3.61
3.00–3.26	2.87–3.14	2.66–2.90	A 3.95
3.27–3.59	3.15–3.47	2.91–3.19	A 4.32
3.60–3.99	3.48–3.83	3.20–3.56	A 4.79
4.00–4.42	3.84–4.16	3.57–3.83	A 5.30
4.43–4.61	4.17–4.43	3.84–4.08	A 5.78
4.62–5.23	4.44–5.00	4.09–4.64	A 6.20
5.24–5.39	5.01–5.16	4.65–5.00	A 6.99
5.40–5.88	5.17–5.56	5.01–5.36	A 7.65
5.89–6.56	5.57–6.22	5.37–5.87	A 8.38
6.57–7.18	6.23–6.89	5.88–6.43	A 9.25
7.19–7.80	6.90–7.00	6.44–6.79	A 9.85
7.81–9.00	....	6.80–7.00	A 11.0

Table 18

Motor Full-Load Current (Amp.)			Thermal Unit Number
1 T. U.	2 T. U.	3 T. U.	
15.5–16.4	14.4–15.3	13.6–14.5	CC 20.9
16.5–17.6	15.4–16.4	14.6–15.5	CC 22.8
17.7–19.1	16.5–18.4	15.6–17.4	CC 24.6
19.2–20.4	18.5–19.6	17.5–18.5	CC 26.3
20.5–22.1	19.7–21.0	18.6–19.9	CC 28.8
22.2–23.4	21.1–22.7	20.0–21.5	CC 31.0
23.5–25.6	22.8–24.2	21.6–22.9	CC 33.3
25.7–27.3	24.3–25.9	23.0–24.5	CC 36.4
27.4–29.4	26.0–27.8	24.6–26.3	CC 39.6
29.5–31.5	27.9–29.8	26.4–28.2	CC 42.7
31.6–33.7	29.9–31.7	28.3–30.0	CC 46.6
33.8–36.5	31.8–34.2	30.1–32.3	CC 50.1
36.6–39.1	34.3–36.9	32.4–34.9	CC 54.5
39.2–41.7	37.0–39.8	35.0–37.6	CC 59.4
41.8–44.8	39.9–42.3	37.7–40.0	CC 64.3
44.9–48.0	42.4–45.3	40.1–42.8	CC 68.5
48.1–50.7	45.4–47.9	42.9–45.3	CC 74.6
50.8–54.9	48.0–51.9	45.4–49.1	CC 81.5
55.0–59.9	52.0–56.5	49.2–53.4	CC 87.7
60.0–63.3	56.6–60.7	53.5–57.4	CC 94.0
63.4–67.2	60.8–64.8	57.5–61.3	CC 103
67.3–72.4	64.9–67.1	61.4–63.5	CC 112
72.5–74.9	67.2–70.1	63.6–66.3	CC 121
75.0–77.4	70.2–72.9	66.4–69.0	CC 132
77.5–80.7	73.0–74.9	69.1–70.9	CC 143
80.8–83.1	75.0–77.9	71.0–73.7	CC 156
83.2–86.0	78.0–80.9	73.8–76.5	CC 167
....	81.0–82.9	76.6–78.4	CC 180
....	83.0–86.0	78.5–86.0	CC 196

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Table 19

Motor Full-Load Current (Amp.)	Thermal Unit Number
43.6– 47.3	CC 54.5
47.4– 51.3	CC 59.4
51.4– 54.6	CC 64.3
54.7– 59.7	CC 68.5
59.8– 65.1	CC 74.6
65.2– 70.1	CC 81.5
70.2– 75.1	CC 87.7
75.2– 82.2	CC 94.0
82.3– 89.2	CC 103
89.3– 96.5	CC 112
96.6–104.	CC 121
105. –113.	CC 132
114. –123.	CC 143
124. –133.	CC 156

Table 20

Motor Full-Load Current (Amp.)	Thermal Unit Number
133.–148.	B 1.30
149.–174.	B 1.45
175.–195.	B 1.67
196.–219.	B 1.88
220. 239.	B 2.10
240.–271.	B 2.40
272.–308.	B 2.65
309.–348.	B 3.00
349.–397.	B 3.30
398.–429.	B 3.70
430.–495.	B 4.15
496.–520.	B 4.85

Table 21

Motor Full-Load Current (Amp.)	Thermal Unit Number
128.–140.	B 1.30
141.–163.	B 1.45
164.–179.	B 1.67
180.–201.	B 1.88
202.–227.	B 2.10
228.–251.	B 2.40
252.–278.	B 2.65
279.–308.	B 3.00
309.–346.	B 3.30
347.–380.	B 3.70
381.–426.	B 4.15
427.–454.	B 4.85
455.–489.	B 5.50
490.–520.	B 6.25

Table 22

Motor Full-Load Current (Amp.)	Thermal Unit Number
92.0–100.	DD 112
101. –109.	DD 121
110. –119.	DD 128
120. –131.	DD 140
132. –139.	DD 150
140. –156.	DD 160
157. –166.	DD 185
167. –180.	DD 213
181. –189.	DD 220
190. –209.	DD 230
210. –225.	DD 250
226. –238.	DD 265
239. –266.	DD 280

Table 23

Motor Full-Load Current (Amp.)		Thermal Unit Number
2 or 3 T. U.		
Large Enclosure	Small Enclosure	
0.31–0.32	0.29–0.30	AR .45
0.33–0.36	0.31–0.33	AR .49
0.37–0.39	0.34–0.37	AR .54
0.40–0.43	0.38–0.41	AR .59
0.44–0.47	0.42–0.45	AR .65
0.48–0.52	0.46–0.50	AR .71
0.53–0.58	0.51–0.55	AR .78
0.59–0.60	0.56–0.57	AR .86
0.61–0.62	0.58–0.60	AR .95
0.63–0.69	0.61–0.66	AR 1.05
0.70–0.76	0.67–0.73	AR 1.15
0.77–0.84	0.74–0.81	AR 1.26
0.85–0.93	0.82–0.90	AR 1.39
0.94–1.03	0.91–0.99	AR 1.53
1.04–1.23	1.00–1.18	AR 1.68
1.24–1.35	1.19–1.30	AR 1.85
1.36–1.47	1.31–1.42	AR 2.04
1.48–1.61	1.43–1.49	AR 2.24
1.62–1.76	1.50–1.69	AR 2.46
1.77–1.93	1.70–1.85	AR 2.71
1.94–2.12	1.86–2.03	AR 2.98
2.13–2.35	2.04–2.25	AR 3.28
2.36–2.61	2.26–2.50	AR 3.62
2.62–2.79	2.51–2.68	AR 3.98
2.80–3.14	2.69–3.01	AR 4.37
3.15–3.48	3.02–3.35	AR 4.80
3.49–3.89	3.36–3.74	AR 5.3
3.90–4.30	3.75–4.14	AR 5.8
4.31–4.73	4.15–4.57	AR 6.4
4.74–5.20	4.58–5.03	AR 7.0
5.21–5.95	5.04–5.76	AR 7.7
5.96–6.49	5.77–6.29	AR 8.5
6.50–7.08	6.30–6.87	AR 9.3
7.09–7.77	6.88–7.54	AR 10.2
7.78–8.48	7.55–8.25	AR 11.2
8.49–9.15	8.26–8.60	AR 12.4
9.16–10.3	8.61–9.63	AR 13.6
10.4–11.9	9.64–11.1	AR 15.4
12.0–13.4	11.2–12.5	AR 17.6
13.5–15.4	12.6–14.3	AR 20.5
15.5–17.5	14.4–16.1	AR 23
17.6–19.8	16.2–18.2	AR 27
19.9–22.5	18.3–20.6	AR 30
22.6–26.0	20.7–23.4	AR 35
....	23.5–26.0	AR 40

Table 24

Motor Full-Load Current (Amp.)	Thermal Unit Number
88.2– 95.1	DD 112
95.2 101.	DD 121
102. –111.	DD 128
112. 119.	DD 140
120. –131.	DD 150
132. –149.	DD 160
150. –170.	DD 185
171. –180.	DD 220
181. –197.	DD 240
198. –204.	DD 250
205. –213.	DD 265
214. –237.	DD 280
238. –243.	DD 300
244. – 266.	DD 320

Table 25

Motor Full-Load Current (Amp.)	Thermal Unit Number
0.28–0.30	AR .45
0.31–0.33	AR .49
0.34–0.36	AR .54
0.37–0.39	AR .59
0.40–0.42	AR .65
0.43–0.46	AR .71
0.47–0.50	AR .78
0.51–0.52	AR .86
0.53–0.56	AR .95
0.57–0.60	AR 1.05
0.61–0.66	AR 1.15
0.67–0.73	AR 1.26
0.74–0.81	AR 1.39
0.82–0.90	AR 1.53
0.91–1.05	AR 1.68
1.06–1.15	AR 1.85
1.16–1.25	AR 2.04
1.26–1.35	AR 2.24
1.36–1.47	AR 2.46
1.48–1.58	AR 2.71
1.59–1.74	AR 2.98
1.75–1.94	AR 3.28
1.95–2.20	AR 3.62
2.21–2.47	AR 3.98
2.48–2.76	AR 4.37
2.77–3.07	AR 4.80
3.08–3.45	AR 5.3
3.46–3.81	AR 5.8
3.82–4.20	AR 6.4
4.21–4.65	AR 7.0
4.66–5.29	AR 7.7
5.30–5.84	AR 8.5
5.85–6.27	AR 9.3
6.28–7.00	AR 10.2

Table 26

Size 7	Size 8	
Type J	Type K	
Current Transformer Ratio		
1200/5	2000/5	
Motor Full-Load Current		Thermal Unit Number
166.–187.	277.– 312.	B 1.03
188.–211.	313.– 352.	B 1.16
212.–232.	353.– 388.	B 1.30
233.–267.	389.– 445.	B 1.45
268.–301.	446.– 503.	B 1.67
302.–336.	504.– 561.	B 1.88
337.–383.	562.– 640.	B 2.10
384.–425.	641.– 708.	B 2.40
426.–466.	709.– 777.	B 2.65
467.–522.	778.– 870.	B 3.00
523.–587.	871.– 978.	B 3.30
588.–656.	979.–1093.	B 3.70
657.–764.	1094.–1215.	B 4.15

Table 27

Motor Full-Load Current (Amp.)		Thermal Unit Number
2 or 3 T. U.		
Large Enclosure	Small Enclosure	
4.32–4.93	4.14–4.71	AR 8.5
4.94–5.40	4.72–5.18	AR 9.3
5.41–5.95	5.19–5.74	AR 10.2
5.96–6.13	5.75–5.98	AR 11.2
6.14–6.81	5.99–6.47	AR 12.4
6.82–7.84	6.48–7.42	AR 13.6
7.85–8.97	7.43–8.46	AR 15.4
8.98–10.1	8.47–9.56	AR 17.6
10.2–11.6	9.57–10.9	AR 20.5
11.7–13.2	11.0–12.3	AR 23
13.3–15.0	12.4–14.0	AR 27
15.1–17.1	14.1–15.9	AR 30
17.2–19.6	16.0–18.1	AR 35
19.7–21.9	18.2–20.3	AR 40
22.0–23.8	20.4–22.0	AR 44
23.9–25.6	22.1–23.6	AR 47
25.7–27.9	23.7–25.5	AR 51
28.0–30.5	25.6–27.8	AR 55
30.6–33.0	27.9–30.0	AR 60
33.1–35.7	30.1–32.4	AR 66
35.8–39.5	32.5–35.7	AR 72
39.6–41.5	35.8–38.3	AR 79
41.6–45.0	38.4–40.9	AR 86
....	41.0–45.0	AR 94

Table 28

Motor Full-Load Current (Amp.)		Thermal Unit Number
3 T. U.		
Large Enclosure	Small Enclosure	
45.3–48.2	40.3–42.8	CC 64.3
48.3–52.4	42.9–46.2	CC 68.5
52.5–56.4	46.3–49.8	CC 74.6
56.5–61.2	49.9–54.9	CC 81.5
61.3–66.1	55.0–57.9	CC 87.7
66.2–71.4	58.0–62.5	CC 94.0
71.5–77.0	62.6–67.3	CC 103
77.1–80.7	67.4–73.4	CC 112
80.8–87.7	73.5–78.9	CC 121
87.8–94.9	79.0–84.9	CC 132
95.0–102.	85.0–91.0	CC 143
103.–110.	91.1–97.2	CC 156
111.–117.	97.3–104.	CC 167
118.–133.	105.–121.	CC 180
....	122.–133.	CC 196

Table 29

Motor Full-Load Current	Thermal Unit Number
50.0– 55.9	E 88
56.0– 60.9	E 89
61.0– 65.9	E 91
66.0– 69.9	E 92
70.0– 75.9	E 93
76.0– 81.9	E 94
82.0– 86.9	E 96
87.0– 92.9	E 97
93.0– 97.9	E 98
98.0–107.9	E 99
108.0–113.9	E 101
114.0–125.9	E 102

Table 30

Motor Full-Load Current (Amp.)		Thermal Unit Number
1 T. U.		
Large Enclosure	Small Enclosure	
39.0–42.9	37.0–40.8	AU 44
43.0–48.0	40.9–45.6	AU 50
48.1–54.7	45.7–51.8	AU 56
54.8–62.2	51.9–58.8	AU 64
62.3–71.3	58.9–67.4	AU 72
71.4–76.0	67.5–70.4	AU 81
76.1–85.5	70.5–79.4	AU 88
85.6–92.4	79.5–86.3	AU 99
92.5–103.	86.4–96.7	AU 110
104.–111.	96.8–105.	AU 123
112.–123.	106.–117.	AU 135
124.–133.	118.–133.	AU 152

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Table 31

Motor Full-Load Current (Amp.)	Thermal Unit Number
0.31– 0.35	B 0.44
0.36– 0.39	B 0.51
0.40– 0.44	B 0.57
0.45– 0.50	B 0.63
0.51– 0.58	B 0.71
0.59– 0.65	B 0.81
0.66– 0.73	B 0.92
0.74– 0.82	B 1.03
0.83– 0.92	B 1.16
0.93– 1.03	B 1.30
1.04– 1.19	B 1.45
1.20– 1.34	B 1.67
1.35– 1.50	B 1.88
1.51– 1.67	B 2.10
1.68– 1.89	B 2.40
1.90– 2.14	B 2.65
2.15– 2.36	B 3.00
2.37– 2.65	B 3.30
2.66– 2.97	B 3.70
2.98– 3.47	B 4.15
3.48– 3.94	B 4.85
3.95– 4.44	B 5.50
4.45– 4.94	B 6.25
4.95– 5.52	B 6.90
5.53– 5.88	B 7.70
5.89– 6.52	B 8.20
6.53– 7.31	B 9.10
7.32– 8.21	B 10.2
8.22– 9.18	B 11.5
9.19– 9.90	B 12.8
10.0– 11.0	B 14
11.1 –12.4	B 15.5
12.5 –13.9	B 17.5
14.0 –15.7	B 19.5
15.8 –17.8	B 22
17.9 –20.0	B 25
20.1 –22.9	B 28.0
23.0 –25.7	B 32
25.8 –28.6	B 36
28.7 –32.2	B 40
32.3 –35.8	B 45
35.9 –40.1	B 50
40.2 –45.0	B 56

Table 32

Motor Full-Load Current (Amp.)	Thermal Unit Number
0.33–0.35	AR .45
0.36–0.39	AR .49
0.40–0.42	AR .54
0.43–0.46	AR .59
0.47–0.51	AR .65
0.52–0.56	AR .71
0.57–0.62	AR .78
0.63–0.68	AR .86
0.69–0.75	AR .95
0.76–0.83	AR 1.05
0.84–0.91	AR 1.15
0.92–1.00	AR 1.26
1.01–1.10	AR 1.39
1.11–1.21	AR 1.53
1.22–1.33	AR 1.68
1.34–1.47	AR 1.85
1.48–1.62	AR 2.04
1.63–1.77	AR 2.24
1.78–1.96	AR 2.46
1.97–2.16	AR 2.71
2.17–2.37	AR 2.98
2.38–2.62	AR 3.28
2.63–2.88	AR 3.62
2.89–3.17	AR 3.98
3.18–3.48	AR 4.37
3.49–3.83	AR 4.80
3.84–4.20	AR 5.3
4.21–4.62	AR 5.8
4.63–5.08	AR 6.4
5.09–5.57	AR 7.0
5.58–6.13	AR 7.7
6.14–6.83	AR 8.5
6.84–7.41	AR 9.3
7.42–8.05	AR 10.2
8.06–8.98	AR 11.2
8.99–9.93	AR 12.4
9.94–10.9	AR 13.6
11.0–12.4	AR 15.4
12.5–14.3	AR 17.6
14.4–15.8	AR 20.5
15.9–17.9	AR 23
18.0–20.0	AR 27
20.1–22.4	AR 30
22.5–25.0	AR 35

Table 33

Motor Full-Load Current (Amp.)	Thermal Unit Number
0.28–0.30	AR .45
0.31–0.33	AR .49
0.34–0.36	AR .54
0.37–0.39	AR .59
0.40–0.42	AR .65
0.43–0.46	AR .71
0.47–0.50	AR .78
0.51–0.52	AR .86
0.53–0.56	AR .95
0.57–0.60	AR 1.05
0.61–0.66	AR 1.15
0.67–0.73	AR 1.26
0.74–0.81	AR 1.39
0.82–0.90	AR 1.53
0.91–1.05	AR 1.68
1.06–1.15	AR 1.85
1.16–1.25	AR 2.04
1.26–1.35	AR 2.24
1.36–1.47	AR 2.46
1.48–1.58	AR 2.71
1.59–1.74	AR 2.98
1.75–1.94	AR 3.28
1.95–2.20	AR 3.62
2.21–2.47	AR 3.98
2.48–2.76	AR 4.37
2.77–3.07	AR 4.80
3.08–3.45	AR 5.3
3.46–3.81	AR 5.8
3.82–4.20	AR 6.4
4.21–4.65	AR 7.0
4.66–5.29	AR 7.7
5.30–5.84	AR 8.5
5.85–6.27	AR 9.3
6.28–6.97	AR 10.2
6.98–7.59	AR 11.2
7.60–7.89	AR 12.4
7.90–8.95	AR 13.6
8.96–10.3	AR 15.4
10.4–11.7	AR 17.6
11.8–12.0	AR 20.5
Following Selections for Size 1 Only	
11.8–13.3	AR 20.5
13.4–15.2	AR 23
15.3–17.2	AR 27
17.3–19.7	AR 30
19.8–22.4	AR 35
22.5–26.0	AR 40

Table 34

Motor Full-Load Current (Amp.)	Thermal Unit Number
15.1–16.2	CC 20.9
16.3–17.5	CC 22.8
17.6–19.1	CC 24.6
19.2–20.7	CC 26.3
20.8–22.2	CC 28.8
22.3–24.0	CC 31.0
24.1–25.7	CC 33.3
25.8–27.8	CC 36.4
27.9–30.1	CC 39.6
30.2–32.5	CC 42.7
32.6–35.1	CC 46.6
35.2–38.0	CC 50.1
38.1–41.1	CC 54.5
41.2–44.0	CC 59.4
44.1–47.2	CC 64.3
47.3–51.1	CC 68.5
51.2–55.8	CC 74.6
55.9–59.5	CC 81.5
59.6–64.5	CC 87.7
64.6–69.5	CC 94.0
69.6–75.0	CC 103
75.1–78.1	CC 112
78.2–82.3	CC 121
82.4–86.0	CC 132

Table 35

Motor Full-Load Current (Amp.)		Thermal Unit Number
2 T. U.	3 T. U.	
36.3–39.9	34.7–37.1	AU 44
40.0–44.1	37.2–41.5	AU 50
44.2–50.0	41.6–47.1	AU 56
50.1–56.4	47.2–53.4	AU 64
56.5–64.4	53.5–60.7	AU 72
64.5–68.4	60.8–64.9	AU 81
68.5–77.7	65.0–73.4	AU 88
77.8–84.2	73.5–79.5	AU 99
84.3–94.8	79.6–89.0	AU 110
94.9–101.	89.1–96.9	AU 123
102.–115.	97.0–108.	AU 135
116.–122.	109.–115.	AU 152
123.–133.	116.–120.	AU 169
....	121.–133.	AU 183

Table 36

Motor Full-Load Current (Amp.)	Thermal Unit Number
90.6– 97.4	AF 110
97.5–111.	AF 123
112. –129.	AF 135
130. –149.	AF 150
150. –163.	AF 159
164. – 189.	AF 168
190. – 213.	AF 188
214. –240.	AF 205
241. –266.	AF 220

Table 37

Motor Full-Load Current (Amp.)	Thermal Unit Number
27.1–30.0	E 67
30.1–33.2	E 69
33.3–35.7	E 70
35.8–39.4	E 71
39.5–43.4	E 72
43.5–46.9	E 73
47.0–51.5	E 74
51.6–57.0	E 76
57.1–62.8	E 77
62.9–69.1	E 78
69.2–75.0	E 79
75.1–83.3	E 80

Table 38

Motor Full-Load Current (Amp.)	Thermal Unit Number
85.0– 95.9	AF 123
96.0–108.	AF 135
109. –127.	AF 150
128. –136.	AF 159
137. –147.	AF 168
148. –162.	AF 188
163. –185.	AF 205
186. –202.	AF 220
203. –219.	AF 240
220. –233.	AF 260
234. –266.	AF 308

Table 39

Motor Full-Load Current (Amp.)	Thermal Unit Number
148. 173.	AR 1.68
174. 189.	AR 1.85
190. 205.	AR 2.04
206. 222.	AR 2.24
223. 243.	AR 2.46
244. 261.	AR 2.71
262. 289.	AR 2.98
290. 324.	AR 3.28
325. 367.	AR 3.62
368. 389.	AR 3.98
390. 404.	AR 4.37
405. 451.	AR 4.80
452. 495.	AR 5.3
496. 520.	AR 5.8

Table 40

Motor Full-Load Current (Amp.)	Thermal Unit Number
15.3–16.7	C 20
16.8–19.8	C 22
19.9–22.8	C 26
22.9–25.8	C 30
25.9–30.4	C 34
30.5–31.9	C 40
32.0–34.2	C 42
34.3–38.8	C 45
38.9–44.2	C 51
44.3–50.2	C 58
50.3–57.1	C 66
57.2–63.2	C 75
63.3–68.6	C 83
68.7–78.6	C 90
78.7–86.0	C 103

Table 41

Motor Full-Load Current (Amp.)	Thermal Unit Number
0.81–0.92	B 1.16
0.93–1.07	B 1.30
1.08–1.14	B 1.45
1.15–1.26	B 1.67
1.27–1.49	B 1.88
1.50–1.73	B 2.10
1.74–1.89	B 2.40
1.90–2.16	B 2.65
2.17–2.37	B 3.00
2.38–2.66	B 3.30
2.67–2.99	B 3.70
3.00–3.40	B 4.15
3.41–3.94	B 4.85
3.95–4.15	B 5.50
4.16–4.49	B 6.25
4.50–5.15	B 6.90
5.16–5.77	B 7.70
5.78–6.61	B 8.20
6.62–7.14	B 9.10
7.15–7.97	B 10.2
7.98–8.15	B 11.5
8.16–9.32	B 12.8
9.33–9.97	B 14
9.98–10.7	B 15.5
10.8–12.0	B 17.5
12.1–13.9	B 19.5
14.0–15.7	B 22
15.8–18.4	B 25
18.5–21.6	B 28.0
21.7–24.0	B 32
24.1–28.6	B 36
28.7–30.7	B 40
30.8–33.5	B 45
33.6–36.0	B 56

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Table 42

Motor Full-Load Current (Amp.)	Thermal Unit Number
0.28–0.30	AR .45
0.31–0.33	AR .49
0.34–0.36	AR .54
0.37–0.39	AR .59
0.40–0.42	AR .65
0.43–0.46	AR .71
0.47–0.50	AR .78
0.51–0.52	AR .86
0.53–0.56	AR .95
0.57–0.60	AR 1.05
0.61–0.66	AR 1.15
0.67–0.73	AR 1.26
0.74–0.81	AR 1.39
0.82–0.90	AR 1.53
0.91–1.05	AR 1.68
1.06–1.15	AR 1.85
1.16–1.25	AR 2.04
1.26–1.35	AR 2.24
1.36–1.47	AR 2.46
1.48–1.58	AR 2.71
1.59–1.74	AR 2.98
1.75–1.94	AR 3.28
1.95–2.20	AR 3.62
2.21–2.47	AR 3.98
2.48–2.76	AR 4.37
2.77–3.07	AR 4.80
3.08–3.45	AR 5.3
3.46–3.81	AR 5.8
3.82–4.20	AR 6.4
4.21–4.65	AR 7.0
4.66–5.29	AR 7.7
5.30–5.84	AR 8.5
5.85–6.27	AR 9.3
6.28–6.97	AR 10.2
6.98–7.59	AR 11.2
7.60–7.89	AR 12.4
7.90–8.95	AR 13.6
8.96–10.3	AR 15.4
10.4–11.7	AR 17.6
11.8–13.3	AR 20.5
13.4–15.2	AR 23
15.3–17.2	AR 27
17.3–19.7	AR 30
19.8–22.4	AR 35
22.5–26.0	AR 40

Table 43

Motor Full-Load Current (Amp.)	Thermal Unit Number
0.41–0.44	A .49
0.45–0.49	A .54
0.50–0.53	A .59
0.54–0.58	A .65
0.59–0.65	A .71
0.66–0.71	A .78
0.72–0.78	A .86
0.79–0.85	A .95
0.86–0.96	A 1.02
0.97–1.04	A 1.16
1.05–1.16	A 1.25
1.17–1.29	A 1.39
1.30–1.37	A 1.54
1.38–1.47	A 1.63
1.48–1.56	A 1.75
1.57–1.65	A 1.86
1.66–1.79	A 1.99
1.80–1.95	A 2.15
1.96–2.15	A 2.31
2.16–2.38	A 2.57
2.39–2.75	A 2.81
2.76–2.84	A 3.61
2.85–3.06	A 3.95
3.07–3.45	A 4.32
3.46–3.70	A 4.79
3.71–4.07	A 5.30
4.08–4.32	A 5.78
4.33–4.90	A 6.20
4.91–5.35	A 6.99
5.36–5.85	A 7.65
5.86–6.41	A 8.38
6.42–6.79	A 9.25
6.80–7.57	A 9.85
7.58–8.15	A 11.0
8.16–8.98	A 11.9
8.99–9.67	A 13.2
9.68–9.95	A 14.1
9.96–10.8	A 14.8
10.9–12.1	A 16.2
12.2–13.1	A 17.9
13.2–13.9	A 19.8
14.0–15.0	A 21.3
15.1–16.0	A 25.2

Table 44

Motor Full-Load Current (Amp.)	Thermal Unit Number
0.34– 0.38	B 0.44
0.39– 0.43	B 0.51
0.44– 0.48	B 0.57
0.49– 0.53	B 0.63
0.54– 0.62	B 0.71
0.63– 0.69	B 0.81
0.70– 0.78	B 0.92
0.79– 0.88	B 1.03
0.89– 0.99	B 1.16
1.00– 1.10	B 1.30
1.11– 1.26	B 1.45
1.27– 1.43	B 1.67
1.44– 1.59	B 1.88
1.60– 1.81	B 2.10
1.82– 2.00	B 2.40
2.01– 2.28	B 2.65
2.29– 2.52	B 3.00
2.53– 2.87	B 3.30
2.88– 3.28	B 3.70
3.29– 3.75	B 4.15
3.76– 4.27	B 4.85
4.28– 4.77	B 5.50
4.78– 5.27	B 6.25
5.28– 5.91	B 6.90
5.92– 6.25	B 7.70
6.26– 6.83	B 8.20
6.84– 7.65	B 9.10
7.66– 8.55	B 10.2
8.56– 9.56	B 11.5
9.57–10.3	B 12.8
10.4 –11.3	B 14
11.4 –12.4	B 15.5
12.5 –14.1	B 17.5
14.2 –15.7	B 19.5
15.8 –17.9	B 22
18.0 –20.1	B 25
20.2 –22.5	B 28.0
22.6 –25.0	B 32

Table 45

Size 7	Size 8	
Type J	Type K	
Current Transformer Ratio		
1200/5	2000/5	
Motor Full-Load Current		Thermal Unit Number
Non-Compensated		
136.–150.	227.– 251.	AR 1.05
151.–165.	252.– 276.	AR 1.15
166.–183.	277.– 305.	AR 1.26
184.–202.	306.– 337.	AR 1.39
203.–224.	338.– 373.	AR 1.53
225.–267.	374.– 445.	AR 1.68
268.–293.	446.– 489.	AR 1.85
294.–319.	490.– 532.	AR 2.04
320.–349.	533.– 582.	AR 2.24
350.–381.	583.– 636.	AR 2.46
382.–418.	637.– 697.	AR 2.71
419.–459.	698.– 766.	AR 2.98
460.–509.	767.– 849.	AR 3.28
510.–565.	850.– 942.	AR 3.62
566.–604.	943.–1007.	AR 3.98
605.–697.	1008.–1133.	AR 4.37
680.–753.	.....	AR 4.80
Compensated		
161.–177.	268.– 295.	AR 1.26
178.–196.	296.– 327.	AR 1.39
197.–217.	328.– 363.	AR 1.53
218.–253.	364.– 423.	AR 1.68
254.–277.	424.– 463.	AR 1.85
278.–301.	464.– 503.	AR 2.04
302.–325.	504.– 543.	AR 2.24
326.–354.	544.– 592.	AR 2.46
355.–381.	592.– 635.	AR 2.71
382.–419.	636.– 699.	AR 2.98
420.–467.	700.– 779.	AR 3.28
468.–529.	780.– 883.	AR 3.62
530.–594.	884.– 991.	AR 3.98
595.–664.	992.–1107.	AR 4.37
665.–738.	1108.–1231.	AR 4.80
739.–829.	.....	AR 5.3

Table 46

Motor Full-Load Current (Amp.)	Thermal Unit Number
105.–116.	AR 3.28
117.–132.	AR 3.62
133.–148.	AR 3.98
149.–165.	AR 4.37
166.–184.	AR 4.80
185.–207.	AR 5.3
208.–229.	AR 5.8
230.–266.	AR 6.4

Table 47

Motor Full-Load Current (Amp.)	Thermal Unit Number
146.–169.	AR 1.68
170.–185.	AR 1.85
186.–201.	AR 2.04
202.–217.	AR 2.24
218.–236.	AR 2.46
237.–253.	AR 2.71
254.–279.	AR 2.98
280.–311.	AR 3.28
312.–353.	AR 3.62
354.–396.	AR 3.98
397.–442.	AR 4.37
443.–492.	AR 4.80
493.–520.	AR 5.3

Table 48

Motor Full-Load Current (Amp.)	Thermal Unit Number
158.–187.	AR 1.68
188.–206.	AR 1.85
207.–224.	AR 2.04
225.–244.	AR 2.24
245.–267.	AR 2.46
268.–289.	AR 2.71
290.–324.	AR 2.98
325.–361.	AR 3.28
362.–406.	AR 3.62
407.–445.	AR 3.98
446.–463.	AR 4.37
464.–520.	AR 4.80

Table 49

Motor Full-Load Current (Amp.)	Thermal Unit Number
82.5– 88.2	DD 112
88.3– 95.9	DD 121
96.0–102.	DD 128
103. –109.	DD 140
110. –121.	DD 150
122. –139.	DD 160
140. –154.	DD 185
155. –163.	DD 220
164. –175.	DD 240
176. –184.	DD 250
185. –195.	DD 265
196. –215.	DD 280
216. –224.	DD 300
225. –243.	DD 320
244. –266.	DD 340

Table 50

Motor Full-Load Current (Amp.)	Thermal Unit Number
14.4–16.1	AU 20
16.2–18.6	AU 23
18.7–20.5	AU 26
20.6–23.4	AU 29
23.5–26.9	AU 33
27.0–28.3	AU 38
28.4–30.8	AU 40
30.9–35.0	AU 44
35.1–38.8	AU 50
38.9–44.3	AU 56
44.4–49.3	AU 64
49.4–55.5	AU 72
55.6–61.0	AU 81
61.1–68.6	AU 88
68.7–76.3	AU 99
76.4–86.0	AU 110

Table 51

Motor Full-Load Current (Amp.)	Thermal Unit Number
15.7–17.7	AU 20
17.8–19.9	AU 23
20.0–22.7	AU 26
22.8–25.7	AU 29
25.8–29.1	AU 33
29.2–30.8	AU 38
30.9–34.3	AU 40
34.4–38.3	AU 44
38.4–42.3	AU 50
42.4–47.5	AU 56
47.6–53.0	AU 64
53.1–60.5	AU 72
60.6–64.9	AU 81
65.0–71.5	AU 88
71.6–77.3	AU 99
77.4–86.0	AU 110

Table 52

Motor Full-Load Current (Amp.)	Thermal Unit Number
92.0–103.	AF 123
104. –116.	AF 135
117. –139.	AF 150
140. –150.	AF 159
151. –167.	AF 168
168. –177.	AF 188
178. –205.	AF 205
206. –222.	AF 220
223. –232.	AF 240
233. –247.	AF 260
248. –266.	AF 308

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Table 53

Motor Full-Load Current (Amp.)		Thermal Unit Number
1 T. U.	3 T. U.	
0.31–0.33	0.29–0.31	B 0.44
0.34–0.36	0.32–0.36	B 0.51
0.37–0.40	0.37–0.38	B 0.57
0.41–0.48	0.39–0.46	B 0.63
0.49–0.57	0.47–0.55	B 0.71
0.58–0.64	0.56–0.61	B 0.81
0.65–0.70	0.62–0.66	B 0.92
0.71–0.77	0.67–0.75	B 1.03
0.78–0.85	0.76–0.83	B 1.16
0.86–0.99	0.84–0.93	B 1.30
1.00–1.10	0.94–1.06	B 1.45
1.11–1.28	1.07–1.18	B 1.67
1.29–1.41	1.19–1.31	B 1.88
1.42–1.58	1.32–1.47	B 2.10
1.59–1.80	1.48–1.67	B 2.40
1.81–2.03	1.68–1.83	B 2.65
2.04–2.25	1.84–2.04	B 3.00
2.26–2.51	2.05–2.38	B 3.30
2.52–2.83	2.39–2.60	B 3.70
2.84–3.29	2.61–3.13	B 4.15
3.30–3.75	3.14–3.59	B 4.85
3.76–4.22	3.60–3.94	B 5.50
4.23–4.65	3.95–4.19	B 6.25
4.66–5.16	4.20–4.72	B 6.90
5.17–5.53	4.73–5.21	B 7.70
5.54–6.09	5.22–5.51	B 8.20
6.10–6.80	5.52–6.17	B 9.10
6.81–7.60	6.18–7.00	B 10.2
7.61–8.35	....	B 11.5
8.36–9.00	....	B 12.8

Table 54

Motor Full-Load Current (Amp.)		Thermal Unit Number
2 T. U.	3 T. U.	
43.6– 45.5	41.1– 43.5	CC 64.3
45.6– 49.6	43.6– 46.8	CC 68.5
49.7– 53.1	46.9– 50.0	CC 74.6
53.2– 57.6	50.1– 54.9	CC 81.5
57.7– 62.4	55.0– 57.5	CC 87.7
62.5– 67.5	57.6– 61.8	CC 94.0
67.6– 71.1	61.9– 66.2	CC 103
71.2– 75.9	66.3– 72.4	CC 112
76.0– 81.9	72.5– 78.1	CC 121
82.0– 84.6	78.2– 80.7	CC 132
84.7– 90.7	80.8– 86.5	CC 143
90.8– 98.4	86.6– 93.9	CC 156
98.5–105.	94.0–100.	CC 167
106. –117.	101. –112.	CC 180
118. –123.	113. –117.	CC 196
124. –133.	118. –123.	CC 208
....	124. –133.	CC 219

Table 55

Motor Full-Load Current (Amp.)		Thermal Unit Number
2 T. U.	3 T. U.	
0.38–0.40	0.31–0.33	AR .45
0.41–0.43	0.34–0.36	AR .49
0.44–0.48	0.37–0.39	AR .54
0.49–0.52	0.40–0.43	AR .59
0.53–0.56	0.44–0.47	AR .65
0.57–0.61	0.48–0.51	AR .71
0.62–0.67	0.52–0.56	AR .78
0.68–0.73	0.57–0.58	AR .86
0.74–0.81	0.59–0.64	AR .95
0.82–0.89	0.65–0.70	AR 1.05
0.90–0.97	0.71–0.77	AR 1.15
0.98–1.07	0.78–0.85	AR 1.26
1.08–1.17	0.86–0.94	AR 1.39
1.18–1.31	0.95–1.03	AR 1.53
1.32–1.49	1.04–1.22	AR 1.68
1.50–1.69	1.23–1.34	AR 1.85
1.70–1.83	1.35–1.46	AR 2.04
1.84–2.00	1.47–1.58	AR 2.24
2.01–2.17	1.59–1.76	AR 2.46
2.18–2.35	1.77–1.85	AR 2.71
2.36–2.60	1.86–2.08	AR 2.98
2.61–2.87	2.09–2.27	AR 3.28
2.88–3.14	2.28–2.51	AR 3.62
3.15–3.47	2.52–2.90	AR 3.98
3.48–3.90	2.91–3.23	AR 4.37
3.91–4.36	3.24–3.58	AR 4.80
4.37–4.88	3.59–4.02	AR 5.3
4.89–5.37	4.03–4.43	AR 5.8
5.38–5.97	4.44–4.86	AR 6.4
5.98–6.55	4.87–5.37	AR 7.0
6.56–7.50	5.38–6.12	AR 7.7
7.51–8.23	6.13–6.65	AR 8.5
8.24–9.00	6.66–7.00	AR 9.3

Table 56

Motor Full-Load Current (Amp.)		Thermal Unit Number
1 or 2 T. U.	3 T. U.	
3.29–3.74	3.18–3.40	B 4.85
3.75–4.23	3.41–3.76	B 5.50
4.24–4.68	3.77–4.00	B 6.25
4.69–5.22	4.01–4.57	B 6.90
5.23–5.67	4.58–5.03	B 7.70
5.68–6.13	5.04–5.32	B 8.20
6.14–6.91	5.33–5.97	B 9.10
6.92–7.70	5.98–6.88	B 10.2
7.71–8.56	6.89–7.82	B 11.5
8.57–9.39	7.83–8.47	B 12.8
9.40–10.4	8.48–9.15	B 14
10.5–11.6	9.16–10.1	B 15.5
11.7–12.9	10.2–11.2	B 17.5
13.0–14.6	11.3–12.0	B 19.5
14.7–16.5	12.1–13.6	B 22
16.6–18.5	13.7–15.2	B 25
18.6–21.0	15.3–17.1	B 28.0
21.1–23.6	17.2–19.0	B 32
23.7–26.3	19.1–21.5	B 36
26.4–29.3	21.6–24.1	B 40
29.4–35.1	24.2–27.0	B 45
35.2–36.1	27.1–28.7	B 50
36.2–39.1	28.8–30.4	B 56
39.2–41.5	30.5–32.2	B 62
41.6–45.0	32.3–35.4	B 70
....	35.5–38.2	B 79
....	38.3–45.0	B 88

Table 57

Motor Full-Load Current (Amp.)		Thermal Unit Number
2 T. U.	3 T. U.	
5.09–5.59	5.15–5.97	AR 8.5
5.60–6.11	5.98–6.50	AR 9.3
6.12–6.72	6.51–7.04	AR 10.2
6.73–7.37	7.05–7.59	AR 11.2
7.38–7.67	7.60–7.93	AR 12.4
7.68–8.68	7.94–9.04	AR 13.6
8.69–9.94	9.05–10.2	AR 15.4
9.95–11.1	10.3–11.5	AR 17.6
11.2–12.9	11.6–13.2	AR 20.5
13.0–14.7	13.3–14.9	AR 23
14.8–16.9	15.0–16.9	AR 27
17.0–19.2	17.0–19.3	AR 30
19.3–21.9	19.4–21.7	AR 35
22.0–24.4	21.8–25.0	AR 40
24.5–26.3	25.1–27.0	AR 44
26.4–28.0	27.1–29.1	AR 47
28.1–30.3	29.2–30.8	AR 51
30.4–32.2	30.9–32.9	AR 55
32.3–34.4	33.0–35.0	AR 60
34.5–36.6	35.1–37.1	AR 66
36.7–39.5	37.2–39.1	AR 72
39.6–45.0	39.2–41.5	AR 79
....	41.6–45.0	AR 86

Table 58

Motor Full-Load Current (Amp.)		Thermal Unit Number
1 or 2 T. U.	3 T. U.	
3.37–3.82	3.28–3.51	B 4.85
3.83–4.33	3.52–3.89	B 5.50
4.34–4.79	3.90–4.14	B 6.25
4.80–5.33	4.15–4.73	B 6.90
5.34–5.79	4.74–5.22	B 7.70
5.80–6.27	5.23–5.53	B 8.20
6.28–7.03	5.54–6.21	B 9.10
7.04–7.88	6.22–7.17	B 10.2
7.89–8.73	7.18–8.19	B 11.5
8.74–9.55	8.20–8.90	B 12.8
9.56–10.6	8.91–9.57	B 14
10.7–11.8	9.58–10.6	B 15.5
11.9–13.1	10.7–11.8	B 17.5
13.2–14.9	11.9–12.7	B 19.5
15.0–16.9	12.8–14.4	B 22
17.0–18.8	14.5–16.1	B 25
18.9–21.5	16.2–18.2	B 28.0
21.6–24.1	18.3–20.2	B 32
24.2–26.8	20.3–22.8	B 36
26.9–29.9	22.9–25.6	B 40
30.0–35.5	25.7–28.8	B 45
35.6–36.5	28.9–30.6	B 50
36.6–39.6	30.7–32.4	B 56
39.7–41.5	32.5–34.6	B 62
41.6–45.0	34.7–38.6	B 70
....	38.7–45.0	B 79

Table 59

Motor Full-Load Current (Amp.)		Thermal Unit Number
1 or 2 T. U.	3 T. U.	
0.34–0.38	0.29–0.31	B 0.44
0.39–0.43	0.32–0.35	B 0.51
0.44–0.47	0.36–0.38	B 0.57
0.48–0.53	0.39–0.46	B 0.63
0.54–0.60	0.47–0.55	B 0.71
0.61–0.68	0.56–0.62	B 0.81
0.69–0.76	0.63–0.67	B 0.92
0.77–0.86	0.68–0.75	B 1.03
0.87–0.97	0.76–0.84	B 1.16
0.98–1.07	0.85–0.95	B 1.30
1.08–1.23	0.96–1.09	B 1.45
1.24–1.39	1.10–1.21	B 1.67
1.40–1.55	1.22–1.35	B 1.88
1.56–1.77	1.36–1.53	B 2.10
1.78–1.96	1.54–1.73	B 2.40
1.97–2.15	1.74–1.90	B 2.65
2.16–2.41	1.91–2.14	B 3.00
2.42–2.71	2.15–2.34	B 3.30
2.72–3.03	2.35–2.67	B 3.70
3.04–3.53	2.68–3.22	B 4.15
3.54–4.01	3.23–3.48	B 4.85
4.02–4.56	3.49–3.87	B 5.50
4.57–5.03	3.88–4.14	B 6.25
5.04–5.59	4.15–4.73	B 6.90
5.60–5.95	4.74–5.28	B 7.70
5.96–6.58	5.29–5.64	B 8.20
6.59–7.31	5.65–6.39	B 9.10
7.32–8.15	6.40–7.43	B 10.2
8.16–9.13	7.44–8.55	B 11.5
9.14–9.91	8.56–9.40	B 12.8
9.92–10.7	9.41–10.0	B 14
10.8–12.1	10.1–11.2	B 15.5
12.2–13.5	11.3–12.5	B 17.5
13.6–15.1	12.6–13.5	B 19.5
15.2–17.0	13.6–15.4	B 22
17.1–18.9	15.5–17.5	B 25
19.0–21.5	17.6–19.9	B 28.0
21.6–24.0	20.0–22.2	B 32
24.1–26.0	22.3–25.5	B 36
....	25.6–26.0	B 40

Table 60

Motor Full-Load Current (Amp.)	Thermal Unit Number
6.84–7.49	AR 9.3
7.50–8.05	AR 10.2
8.06–9.10	AR 11.2
9.11–9.99	AR 12.4
10.0–11.1	AR 13.6
11.2–12.7	AR 15.4
12.8–14.8	AR 17.6
14.9–16.6	AR 20.5
16.7–19.3	AR 23
19.4–21.4	AR 27
21.5–25.1	AR 30
25.2–28.3	AR 35
28.4–31.2	AR 40
31.3–33.3	AR 44
33.4–35.7	AR 47
35.8–38.5	AR 51
38.6–41.5	AR 55
41.6–45.0	AR 60

Table 61

Motor Full-Load Current (Amp.)		Thermal Unit Number
2 T. U.	3 T. U.	
46.8–50.0	45.3–48.2	CC 64.3
50.1–54.2	48.3–52.4	CC 68.5
54.3–58.3	52.5–56.4	CC 74.6
58.4–63.6	56.5–61.2	CC 81.5
63.7–68.5	61.3–66.1	CC 87.7
68.6–74.0	66.2–71.4	CC 94.0
74.1–79.8	71.5–77.0	CC 103
79.9–83.0	77.1–79.0	CC 112
83.1–88.9	79.1–84.7	CC 121
89.0–95.6	84.8–91.1	CC 132
95.7–102.	91.2–98.1	CC 143
103.–109.	98.2–104.	CC 156
110.–119.	105.–113.	CC 167
120.–133.	114.–123.	CC 180
....	124.–133.	CC 196

Table 62

Motor Full-Load Current (Amp.)		Thermal Unit Number
2 T. U.	3 T. U.	
4.83–5.33	4.90–5.68	AR 8.5
5.34–5.84	5.69–6.19	AR 9.3
5.85–6.43	6.20–6.71	AR 10.2
6.44–7.03	6.72–7.14	AR 11.2
7.04–7.30	7.15–7.49	AR 12.4
7.31–8.29	7.50–8.48	AR 13.6
8.30–9.49	8.49–9.66	AR 15.4
9.50–10.7	9.67–10.8	AR 17.6
10.8–12.3	10.9–12.4	AR 20.5
12.4–14.0	12.5–13.9	AR 23
14.1–16.0	14.0–15.7	AR 27
16.1–18.4	15.8–18.1	AR 30
18.5–21.0	18.2–20.3	AR 35
21.1–23.0	20.4–23.0	AR 40
23.1–25.5	23.1–25.2	AR 44
25.6–26.7	25.3–26.6	AR 47
26.8–28.3	26.7–28.2	AR 51
28.4–30.3	28.3–30.2	AR 55
30.4–32.5	30.3–32.3	AR 60
32.6–34.5	32.4–34.3	AR 66
34.6–37.6	34.4–36.7	AR 72
37.7–39.7	36.8–39.3	AR 79
39.8–41.4	39.4–45.0	AR 86
41.5–45.0	....	AR 94

Table 63

Motor Full-Load Current (Amp.)	Thermal Unit Number
15.1–17.0	AU 20
17.1–19.1	AU 23
19.2–21.8	AU 26
21.9–24.5	AU 29
24.6–27.9	AU 33
28.0–29.5	AU 38
29.6–32.9	AU 40
33.0–36.6	AU 44
36.7–40.3	AU 50
40.4–45.1	AU 56
45.2–50.4	AU 64
50.5–57.3	AU 72
57.4–62.4	AU 81
62.5–68.3	AU 88
68.4–73.9	AU 99
74.0–80.6	AU 110
80.7–86.0	AU 123

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TABLE 64

Motor Full-Load Current (Amp.)			Thermal Unit Number
2 T. U. 1ϕ	2 T. U. 2ϕ	3 T. U.	
0.38– 0.40	0.38– 0.40	0.31– 0.33	AR .45
0.41– 0.43	0.41– 0.43	0.34– 0.36	AR .49
0.44– 0.48	0.44– 0.48	0.37– 0.39	AR .54
0.49– 0.52	0.49– 0.52	0.40– 0.43	AR .59
0.53– 0.56	0.53– 0.56	0.44– 0.47	AR .65
0.57– 0.61	0.57– 0.61	0.48– 0.51	AR .71
0.62– 0.67	0.62– 0.67	0.52– 0.56	AR .78
0.68– 0.73	0.68– 0.73	0.57– 0.58	AR .86
0.74– 0.81	0.74– 0.81	0.59– 0.64	AR .95
0.82– 0.89	0.82– 0.89	0.65– 0.70	AR 1.05
0.90– 0.97	0.90– 0.97	0.71– 0.77	AR 1.15
0.98– 1.07	0.98– 1.07	0.78– 0.85	AR 1.26
1.08– 1.17	1.08– 1.17	0.86– 0.94	AR 1.39
1.18– 1.31	1.18– 1.31	0.95– 1.03	AR 1.53
1.32– 1.49	1.32– 1.49	1.04– 1.22	AR 1.68
1.50– 1.69	1.50– 1.69	1.23– 1.34	AR 1.85
1.70– 1.83	1.70– 1.83	1.35– 1.46	AR 2.04
1.84– 2.00	1.84– 2.00	1.47– 1.58	AR 2.24
2.01– 2.17	2.01– 2.17	1.59– 1.76	AR 2.46
2.18– 2.35	2.18– 2.35	1.77– 1.85	AR 2.71
2.36– 2.60	2.36– 2.60	1.86– 2.08	AR 2.98
2.61– 2.87	2.61– 2.87	2.09– 2.27	AR 3.28
2.88– 3.14	2.88– 3.14	2.28– 2.51	AR 3.62
3.15– 3.47	3.15– 3.47	2.52– 2.90	AR 3.98
3.48– 3.90	3.48– 3.90	2.91– 3.23	AR 4.37
3.91– 4.36	3.91– 4.36	3.24– 3.58	AR 4.80
4.37– 4.88	4.37– 4.88	3.59– 4.02	AR 5.3
4.89– 5.37	4.89– 5.37	4.03– 4.43	AR 5.8
5.38– 5.97	5.38– 5.97	4.44– 4.86	AR 6.4
5.98– 6.55	5.98– 6.55	4.87– 5.37	AR 7.0
6.56– 7.50	6.56– 7.50	5.38– 6.12	AR 7.7
7.51– 8.23	7.51– 8.23	6.13– 6.65	AR 8.5
8.24– 8.99	8.24– 8.99	6.66– 7.31	AR 9.3
9.00– 9.86	9.00– 9.86	7.32– 7.96	AR 10.2
9.87–10.7	9.87–10.7	7.97– 8.69	AR 11.2
10.8 –11.2	10.8 –11.2	8.70– 8.99	AR 12.4
11.3 –12.8	11.3 –12.0	9.00–10.1	AR 13.6
12.9 –14.8	....	10.2–11.5	AR 15.4
14.9 –16.7	....	11.6–12.0	AR 17.6
16.8 –18.0	....	....	AR 20.5
Following Selections for Size 1 Only			
....	11.3 –12.8	....	AR 13.6
....	12.9 –14.8	....	AR 15.4
....	14.9 –16.7	11.6 –13.0	AR 17.6
16.8 –19.0	16.8 –19.0	13.1 –14.6	AR 20.5
19.1 –22.0	19.1 –22.0	14.7 –16.5	AR 23
22.1 –24.9	22.1 –24.9	16.6 –18.5	AR 27
25.0 –26.0	25.0 –26.0	18.6 –21.0	AR 30
....	....	21.1 –23.6	AR 35
....	....	23.7 –26.0	AR 40

Table 65

Motor Full Load Current (Amp.)	Thermal Unit Number
0.31–0.35	B 0.44
0.36–0.39	B 0.51
0.40–0.44	B 0.57
0.45–0.50	B 0.63
0.51–0.58	B 0.71
0.59–0.65	B 0.81
0.66–0.73	B 0.92
0.74–0.82	B 1.03
0.83–0.92	B 1.16
0.93–1.03	B 1.30
1.04–1.19	B 1.45
1.20–1.34	B 1.67
1.35–1.50	B 1.88
1.51–1.67	B 2.10
1.68–1.89	B 2.40
1.90–2.14	B 2.65
2.15–2.36	B 3.00
2.37–2.65	B 3.30
2.66–2.97	B 3.70
2.98–3.47	B 4.15
3.48–3.94	B 4.85
3.95–4.44	B 5.50
4.45–4.94	B 6.25
4.95–5.52	B 6.90
5.53–5.88	B 7.70
5.89–6.52	B 8.20
6.53–7.31	B 9.10
7.32–8.21	B 10.2
8.22–9.18	B 11.5
9.19–9.90	B 12.8
10.0–11.0	B 14
11.1–12.4	B 15.5
12.5–13.9	B 17.5
14.0–15.7	B 19.5
15.8–17.8	B 22
17.9–20.0	B 25
20.1–22.9	B 28.0
23.0–25.0	B 32
Following Selections For Size 2 Only	
23.0–25.7	B 32
25.8–28.6	B 36
28.7–32.2	B 40
32.3–35.8	B 45
35.9–40.1	B 50
40.2–44.4	B 56
44.5–50.0	B 62

Table 66

Motor Full-Load Current (Amp.)	Thermal Unit Number
0.31–0.32	B 0.44
0.33–0.36	B 0.51
0.37–0.41	B 0.57
0.42–0.49	B 0.63
0.50–0.54	B 0.71
0.55–0.61	B 0.81
0.62–0.67	B 0.92
0.68–0.76	B 1.03
0.77–0.87	B 1.16
0.88–0.98	B 1.30
0.99–1.05	B 1.45
1.06–1.25	B 1.67
1.26–1.33	B 1.88
1.34–1.56	B 2.10
1.57–1.71	B 2.40
1.72–1.97	B 2.65
1.98–2.15	B 3.00
2.16–2.42	B 3.30
2.43–2.78	B 3.70
2.79–3.28	B 4.15
3.29–3.88	B 4.85
3.89–4.13	B 5.50
4.14–4.43	B 6.25
4.44–4.96	B 6.90
4.97–5.35	B 7.70
5.36–5.91	B 8.20
5.92–6.79	B 9.10
6.80–7.56	B 10.2
7.57–7.83	B 11.5
7.84–8.09	B 12.8
8.10–9.51	B 14
9.52–10.1	B 15.5
10.2–11.3	B 17.5
11.4–13.1	B 19.5
13.2–14.9	B 22
15.0–16.1	B 25
16.2–17.8	B 28.0
17.9–19.1	B 32
19.2–22.4	B 36
22.5–23.5	B 40
23.6–26.0	B 45

Table 67

Motor Full-Load Current (Amp.)	Thermal Unit Number
3.79–4.14	B 5.50
4.15–4.44	B 6.25
4.45–5.22	B 6.90
5.23–5.29	B 7.70
5.30–5.99	B 8.20
6.00–6.82	B 9.10
6.83–7.68	B 10.2
7.69–7.92	B 11.5
7.93–8.47	B 12.8
8.48–9.99	B 14
10.0–10.8	B 15.5
10.9–12.3	B 17.5
12.4–12.9	B 19.5
13.0–15.1	B 22
15.2–16.7	B 25
16.8–17.9	B 28.0
18.0–20.1	B 32
20.2–23.8	B 36
23.9–25.8	B 40
25.9–28.3	B 45
28.4–29.6	B 50
29.7–32.1	B 56
32.2–34.4	B 62
34.5–38.3	B 70
38.4–39.9	B 79
40.0–45.0	B 88

Table 68

Motor Full-Load Current (Amp.)	Thermal Unit Number
14.9–16.1	CC 20.9
16.2–17.3	CC 22.8
17.4–19.5	CC 24.6
19.6–20.7	CC 26.3
20.8–22.4	CC 28.8
22.5–23.9	CC 31.0
24.0–25.8	CC 33.3
25.9–27.6	CC 36.4
27.7–29.7	CC 39.6
29.8–31.8	CC 42.7
31.9–34.2	CC 46.6
34.3–37.0	CC 50.1
37.1–39.6	CC 54.5
39.7–42.5	CC 59.4
42.6–45.0	CC 64.3
45.1–48.6	CC 68.5
48.7–51.2	CC 74.6
51.3–56.0	CC 81.5
56.1–60.1	CC 87.7
60.2–64.3	CC 94.0
64.4–68.9	CC 103
69.0–71.9	CC 112
72.0–75.4	CC 121
75.5–78.9	CC 132
79.0–82.1	CC 143
82.2–86.0	CC 156

Table 69

Motor Full-Load Current (Amp.)		Thermal Unit Number
1 or 2 T. U.	3 T. U.	
3.46–3.90	3.38–3.65	B 4.85
3.91–4.44	3.66–4.07	B 5.50
4.45–4.91	4.08–4.36	B 6.25
4.92–5.51	4.37–5.19	B 6.90
5.52–5.84	5.20–5.59	B 7.70
5.85–6.54	5.60–5.98	B 8.20
6.55–7.33	5.99–6.78	B 9.10
7.34–8.31	6.79–7.91	B 10.2
8.32–9.22	7.92–9.12	B 11.5
9.23–10.0	9.13–10.0	B 12.8
10.1–11.2	10.1–10.7	B 14
11.3–12.5	10.8–12.0	B 15.5
12.6–14.2	12.1–13.5	B 17.5
14.3–16.1	13.6–14.6	B 19.5
16.2–18.4	14.7–16.7	B 22
18.5–20.5	16.8–18.9	B 25
20.6–23.2	19.0–21.6	B 28.0
23.3–26.6	21.7–24.1	B 32
26.7–29.6	24.2–27.6	B 36
29.7–33.5	27.7–31.2	B 40
33.6–37.2	31.3–35.5	B 45
37.3–41.5	35.6–37.8	B 50
41.6–45.0	37.9–41.5	B 56
....	41.6–45.0	B 62

Table 70

Motor Full-Load Current (Amp.)	Thermal Unit Number
4.24–4.62	AR 8.5
4.63–5.05	AR 9.3
5.06–5.54	AR 10.2
5.55–6.13	AR 11.2
6.14–6.44	AR 12.4
6.45–7.48	AR 13.6
7.49–8.55	AR 15.4
8.56–9.74	AR 17.6
9.75–11.1	AR 20.5
11.2–12.7	AR 23
12.8–14.4	AR 27
14.5–16.4	AR 30
16.5–18.9	AR 35
19.0–21.6	AR 40
21.7–23.3	AR 44
23.4–24.9	AR 47
25.0–26.9	AR 51
27.0–29.1	AR 55
29.2–31.3	AR 60
31.4–33.5	AR 66
33.6–36.9	AR 72
37.0–39.1	AR 79
39.2–40.9	AR 86
41.0–45.0	AR 94

Table 71

Motor Full-Load Current (Amp.)	Thermal Unit Number
3.98– 4.53	AR 8.5
4.54– 5.03	AR 9.3
5.04– 5.46	AR 10.2
5.47– 6.01	AR 11.2
6.02– 6.31	AR 12.4
6.32– 7.19	AR 13.6
7.20– 8.29	AR 15.4
8.30– 9.49	AR 17.6
9.50–11.0	AR 20.5
11.1 –12.6	AR 23
12.7 –14.3	AR 27
14.4 –16.5	AR 30
16.6 –19.2	AR 35
19.3 –21.9	AR 40
22.0 –23.8	AR 44
23.9 –25.5	AR 47
25.6 –27.7	AR 51
27.8 –30.1	AR 55
30.2 –32.5	AR 60
32.6 –34.8	AR 66
34.9 –38.5	AR 72
38.6 –41.5	AR 79
41.6 –45.0	AR 86

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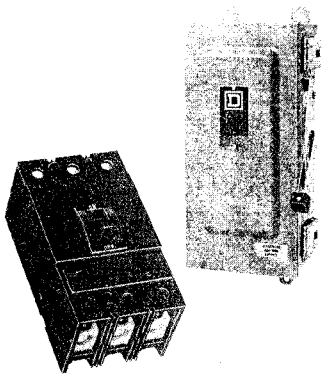
SINGLE MOTOR BRANCH CIRCUITS

SELECTION TABLES FOR CONDUCTORS, SAFETY SWITCHES AND THERMAL-MAGNETIC CIRCUIT BREAKERS

Based on 1981 NEC Tables 430-147, 430-148 & 430-150



■Ordinary service for normal starting duty only with acceleration time of 10 seconds or less. Refer to Company for recommended circuit breaker selection for longer acceleration times.

▲Heavy Service is Jogging or Plugging Duty or Cycling Load with over 25 starts per hour or over 5 starts per minute. For Busway Plug-in Units, See Page 126.

★1981 NEC Article 430-22 (a) for Single Motor. Smaller conductors may be permitted for light duty-cycle service per 430-22 (a) Exception No. 1. DC motors operating from a rectified source will require larger conductors per 430-22 (a) Exception No. 2. For arc welders, see 630-21.

†Motor full load currents thru 200 HP are taken from Tables 430-147, 148 and 150 of the 1981 NEC. Above 200 HP from UL 98. Select wire size, circuit breakers, or fuses on basis of horsepower rather than nameplate full load current per 1981 NEC Article 430-6. **Do not use these values to select overload relay thermal units.** See Digest 161, page 469 for selection of thermal units when **actual** full load current **is not** known. The voltages listed are rated motor voltages. Corresponding nominal system voltages are 110 to 120, 200 to 208, 220 to 240, 440 to 480 and 550 to 600 volts.

‡Size of switch only is shown in tables above. Fuses should be selected not to exceed maximum per cent of full-load current as given in 1981 NEC Table 430-152. Above 50 horsepower dc switches are not horsepower rated by UL as Motor Circuit Switches, but as General Use Switches only and are not necessarily capable of interrupting the maximum operating overload current of a motor. See 1981 NEC Article 100 for definition of General Use Switch.

◐Thermal-Magnetic Breaker recommended trip ratings are approximate for average conditions and based on trip characteristics of Square D breakers and 1981 NEC Tables 430-152 for Inverse Time C/B requirements for squirrel cage and wound-rotor motors with code letters B to E, inclusive for a trip rating not to exceed 200% of the Full-Load Current. Lower trip ratings are required for motors with code letter A and higher trip ratings for motors without code letters or with code letters F to V inclusive.
Under some conditions the next size larger switch or breaker trip may be necessary to accommodate the starting of the motor and is permitted according to 1981 NEC 430-52, Exception No. 2. For explanation of Code Letter Marking, See 1981 NEC Table 430-7 (b).

∗QMB SWITCHES

Amp.	Max. Horsepower Ratings 460V.	575V.	250V. D.C.
400A.	250	...	50
600A.	300	...	..

200V. and 230V. H.P. Ratings as shown.

HORSEPOWER RATINGS: Squirrel-Cage and Wound-Rotor Motors with Code Letters B to E Operating at Usual Speeds, Three Phase 60 Hz. ac				One Phase 60 Hz. ac		Average Direct Current Motors Operating at Base Speed		† Full Load. Amps	◐I-LINE Thermal-Magnetic Non-Adjustable Inverse Time Circuit Breaker		‡ Heavy Duty Switch with Time Delay Fuses	★Minimum Wire & Conduit 75°C Copper Field Installed Sized For 125% FLA		
200 Volts	230 Volts	460 Volts	575 Volts	115 Volts	230 Volts	120 V. DC	240 V. DC		■ Ordinary Service	▲ Heavy Service		AWG (MCM)	Conduit 3 W. THWN XHHW	Conduit 3 W. THW
.....	2	.....	.....	.....	.....	.....	.....	**6.8**	**15FA**	**15FA**				
.....	.....	.....	.....	.....	¾	.....	.....	**6.9**	**15FA**	**15FA**				
.....	.....	.....	.....	⅓	.....	.....	.....	**7.2**	**15FA**	**15FA**				
.....	.....	5	.....	.....	.....	¾	.....	**7.6**	**15FA**	**15FA**				
2	.....	.....	.....	.....	.....	.....	.....	**7.82**	**15FA**	**15FA**				
.....	.....	.....	.....	.....	1	.....	.....	**8.0**	**15FA**	**20FA**		#14	½″	½″
.....	.....	.....	7½	.....	.....	.....	.....	**9.0**	**15FA**	**20FA**				
.....	3	.....	.....	.....	.....	.....	.....	**9.6**	**20FA**	**20FA**				
.....	.....	.....	.....	½	.....	.....	.....	**9.8**	**20FA**	**20FA**				
.....	.....	.....	.....	.....	1½	.....	.....	**10.0**	**20FA**	**20FA**				
3	.....	7½	10	.....	.....	.....	.....	**11.0**	**20FA**	**25FA**				
.....	.....	.....	.....	.....	2	.....	.....	**12.0**	**25FA**	**25FA**	**30 A.**			
.....	.....	.....	.....	¾	.....	.....	.....	**13.8**	**25FA**	**30FA**				
.....	.....	10	.....	.....	.....	.....	.....	**14.0**	**25FA**	**30FA**				
.....	5	.....	.....	.....	.....	.....	.....	**15.2**	**30FA**	**35FA**		#12	½″	½″
.....	.....	.....	.....	1	.....	.....	.....	**16.0**	**30FA**	**35FA**				
.....	.....	.....	15	.....	3	2	.....	**17.0**	**35FA**	**35FA**				
5	.....	.....	.....	.....	.....	.....	.....	**17.5**	**35FA**	**35FA**				
.....	.....	.....	.....	1½	.....	.....	5	**20.0**	**40FA**	**40FA**				
.....	.....	15	.....	.....	.....	.....	.....	**21**	**40FA**	**45FA**		#10	½″	½″
.....	7½	.....	20	.....	.....	.....	.....	**22**	**45FA**	**45FA**				
.....	.....	.....	.....	2	.....	.....	.....	**24**	**50FA**	**50FA**				
7½	.....	.....	.....	.....	.....	.....	.....	**25.3**	**50FA**	**50FA**				
.....	.....	20	25	.....	.....	.....	.....	**27**	**60FA**	**60FA**				
.....	10	.....	.....	.....	5	.....	.....	**28**	**60FA**	**60FA**				
10	.....	.....	30	.....	.....	.....	.....	**32**	**60FA**	**70FA**		# 8	•½″	¾″
.....	.....	25	.....	3	.....	.....	.....	**34**	**70FA**	**70FA**				
.....	.....	30	.....	.....	7½	5	.....	**40**	**80FA**	**80FA**	**60 A.**			
.....	.....	.....	40	.....	.....	.....	.....	**41**	**80FA**	**90FA**				
.....	15	.....	.....	.....	.....	.....	.....	**42**	**80FA**	**90FA**				
15	.....	.....	.....	.....	.....	.....	.....	**48.3**	**90FA**	**100FA**		# 6	¾″	1″
.....	.....	.....	.....	.....	10	.....	.....	**50**	**90FA**	**100FA**				
.....	.....	40	50	.....	.....	.....	.....	**52**	**90FA**	**110KA**				
.....	20	.....	.....	.....	.....	.....	.....	**54**	**90FA**	**110KA**				
.....	.....	.....	.....	.....	.....	.....	15	**55**	**90FA**	**90FA**				
.....	.....	.....	.....	5	.....	.....	.....	**56**	**90FA**	**110KA**				
.....	.....	.....	.....	.....	.....	7½	.....	**58**	**90FA**	**90FA**		# 4	1″	1″
20	.....	.....	60	.....	.....	.....	.....	**62**	**100FA**	**125KA**				
.....	.....	50	.....	.....	.....	.....	.....	**65**	**100FA**	**150KA**	**100 A.**			
.....	25	.....	.....	.....	.....	.....	.....	**68**	**100FA**	**150KA**				
.....	.....	.....	.....	.....	.....	.....	20	**72**	**110KA**	**110KA**				
.....	.....	.....	.....	.....	.....	10	.....	**76**	**125KA**	**125KA**				
.....	.....	60	75	.....	.....	.....	.....	**77**	**110KA**	**175KA**		# 3	1″	1¼″
25	.....	.....	.....	.....	.....	.....	.....	**78.2**	**110KA**	**175KA**				
.....	30	.....	.....	7½	.....	.....	.....	**80**	**110KA**	**175KA**				
.....	.....	.....	.....	.....	.....	.....	25	**89**	**125KA**	**150KA**		# 2	1″	1¼″
30	.....	.....	.....	.....	.....	.....	.....	**92**	**125KA**	**200LA**				
.....	.....	75	.....	.....	.....	.....	.....	**96**	**125KA**	**200LA**				
.....	.....	.....	100	.....	.....	.....	.....	**99**	**150KA**	**200LA**				
.....	.....	.....	.....	10	.....	.....	.....	**100**	**150KA**	**200LA**		# 1	1¼″	1¼″
.....	40	.....	.....	.....	.....	.....	.....	**104**	**150KA**	**225LA**				
.....	.....	.....	.....	.....	.....	.....	30	**106**	**175KA**	**175KA**				
40	.....	.....	.....	.....	.....	.....	.....	**120**	**175KA**	**250LA**	**200 A.**	0	1¼″	1½″
.....	.....	100	.....	.....	.....	.....	.....	**124**	**200KA**	**250LA**				
.....	.....	.....	125	.....	.....	.....	.....	**125**	**200KA**	**250LA**		00	1½″	1½″
.....	50	.....	.....	.....	.....	.....	.....	**130**	**200KA**	**300LA**				
.....	.....	.....	.....	.....	.....	.....	40	**140**	**200LA**	**225LA**				
.....	.....	.....	150	.....	.....	.....	.....	**144**	**200LA**	**300LA**				
50	.....	.....	.....	.....	.....	.....	.....	**150**	**200LA**	**300LA**		000	1½″	2″
.....	60	.....	.....	.....	.....	.....	.....	**154**	**225LA**	**350LA**				
.....	.....	125	.....	.....	.....	.....	.....	**156**	**225LA**	**350LA**				
.....	.....	.....	.....	.....	.....	.....	50∗	**173**	**250LA**	**300LA**				
60	.....	.....	.....	.....	.....	.....	.....	**177**	**250LA**	**400MA**		0000	2″	2″
.....	.....	150∗	.....	.....	.....	.....	.....	**180**	**250LA**	**400MA**				
.....	75	.....	200∗	.....	.....	.....	.....	**192**	**250LA**	**400MA**		(250)	2″	2½″
.....	.....	.....	.....	.....	.....	.....	60∗	**206**	**300LA**	**350MA**		(300)	2″	2½″
75	.....	.....	.....	.....	.....	.....	.....	**221**	**300LA**	**450MA**				
.....	.....	200∗	.....	.....	.....	.....	.....	**240**	**350LA**	**500MA**				
.....	.....	.....	250∗	.....	.....	.....	.....	**242**	**350LA**	**500MA**	∗**400 A.**	(350)	2½″	2½″
.....	100	.....	.....	.....	.....	.....	.....	**248**	**350LA**	**500MA**				
.....	.....	.....	.....	.....	.....	.....	75∗	**255**	**400LA**	**400MA**		(400)	2½″	3″
100	.....	.....	.....	.....	.....	.....	.....	**285**	**400LA**	**600MA**				
.....	.....	.....	300∗	.....	.....	.....	.....	**289**	**400LA**	**600MA**		(500)	3″	3″
.....	.....	250∗	.....	.....	.....	.....	.....	**302**	**400LA**	**700MA**				
.....	125	.....	.....	.....	.....	.....	.....	**312**	**450MA**	**700MA**		2-000	2—1½″	2—2″
.....	.....	.....	350∗	.....	.....	.....	.....	**336**	**500MA**	**700MA**				
.....	.....	.....	.....	.....	.....	.....	100∗	**341**	**500MA**	**600MA**				
125	.....	.....	.....	.....	.....	.....	.....	**359**	**500MA**	**800MA**		2-0000	2—2″	2—2″
.....	150	.....	.....	.....	.....	.....	.....	**360**	**500MA**	**800MA**				
.....	.....	300∗	.....	.....	.....	.....	.....	**361**	**500MA**	**800MA**				
.....	.....	.....	400∗	.....	.....	.....	.....	**382**	**500MA**	**800MA**		2-(250)	2—2″	2—2½″
150	.....	350∗	.....	.....	.....	.....	.....	**414**	**600MA**	**800NH**	∗**600 A.**	2-(300)	2—2″	2—2½″
.....	.....	.....	.....	.....	.....	.....	125∗	**425**	**700MA**	**700MA**				
.....	.....	.....	500∗	.....	.....	.....	.....	**472**	**700MA**					
.....	.....	400∗	.....	.....	.....	.....	.....	**477**	**700MA**	**1000NH**		2-(350)	2—2½″	2—2½″
.....	200	.....	.....	.....	.....	.....	.....	**480**	**700MA**	**1000NH**				
.....	.....	.....	.....	.....	.....	.....	150	**506**	**800MA**	**800NH**				
200	.....	.....	.....	.....	.....	.....	.....	**552**	**800MA**	**1200NH**				
.....	.....	500	.....	.....	.....	.....	.....	**590**	**800MA**	**1200NH**	.....	3-(300)	3—2″	3—2½″
.....	250	.....	.....	.....	.....	.....	.....	**602**	**800MA**	**1200NH**				
.....	.....	.....	.....	.....	.....	.....	200	**675**	**1000MA**	**1200NH**				

•#8 XHHW requires ¾″ conduit for 3 W.

Consult Square D field office for circuit breaker selection on constant horsepower multi-speed motors.

I-LINE is a Registered Trademark of Square D Company.

SQD SLV_001256

CONDITIONS OF SALE

Distributors and Other Commercial Customers

NOTE: The following Conditions of Sale are subject to change. All Sales Transactions are subject to the latest published Conditions of Sale of the Square D Company and to any Special Conditions of Sale which may be contained in applicable Square D quotations and acknowledgements. Modified consumer product warranties are provided to consumers.

1. ACCEPTANCE, GOVERNING PROVISIONS, AND CANCELLATIONS. No order for Square D equipment or services shall be binding upon Square D until accepted by a writing of an authorized official of Square D or by shipment or other performance of such order. Any such order shall be subject to these Conditions of Sale, and acceptance shall be expressly conditioned on assent to such Conditions, which assent shall be deemed given unless purchaser shall expressly notify Square D to the contrary prior to any shipment or other performance of an order by Square D and, in any event, within five (5) days after receipt of any acknowledgement or confirmation of such order.

No order accepted by Square D may be altered or modified by purchaser unless agreed to in a writing signed by an authorized official of Square D; and no such order may be cancelled or terminated except upon payment of Square D's loss, damage and expense arising from such cancellation or termination.

No modified or other conditions will be recognized by Square D unless specifically agreed to in writing and failure of Square D to object to provisions contained in any purchase order or other communication from a purchaser (including, without limitation, penalty clauses of any kind) shall not be construed as a waiver of these Conditions nor an acceptance of any such provisions.

Unless otherwise agreed in writing by a duly authorized representative of Square D, products sold hereunder are not intended for use in or in connection with a nuclear facility or activity. If so used, Square D disclaims all liability for any nuclear damage, injury or contamination, and purchaser shall indemnify Square D against any such liability, whether as a result of breach of contract, warranty, tort (including negligence) or otherwise.

Any contract for sale and these Conditions shall be governed by and construed according to the laws of the State of Illinois.

2. QUOTATIONS AND PRICES. Written quotations are conditioned upon acceptance by purchaser within thirty (30) days from date issued and shall be considered as offers by Square D to sell during such thirty (30) day period unless sooner terminated by notice. Other Square D publications are maintained as sources of general information and are not quotations or offers to sell.

All prices are subject to change without notice. In the event of a net price change, the price of equipment on order but unshipped will be adjusted to the price in effect at the time of shipment. Downward adjustment of prices shall apply only to unshipped portions of outstanding orders.

Orders amounting to less than $50.00 net will be billed at $50.00.

All clerical errors are subject to correction.

3. PAYMENT TERMS. Except as may otherwise be stated in quotations, discount schedules, catalogs, or other Square D publications, terms of payment to purchasers of satisfactory credit are 2% cash discount for payment by the 10th proximo and net invoice amount for payment by the 25th proximo. The cash discount does not apply to schedules F, J1, J2, PA1, PD1, PD2, PD3 and PE1.

Square D reserves the right at any time to demand full or partial payment before proceeding with a contract of sale if, in its judgment, the financial conditon of purchaser shall not justify the terms of payment specified. If delivery is delayed or deferred by purchaser beyond the scheduled date, payment shall be due in full when Square D is prepared to ship and the equipment may be stored at the risk and expense of purchaser. If purchaser defaults when any payment is due, then the whole contract price shall become due and payable upon demand, or Square D, at its option, without prejudice to other lawful remedies, may defer delivery or cancel the contract for sale.

4. TAXES AND OTHER CHARGES. Any manufacturer's tax, retailer's occupation tax, use tax, sales tax, excise tax (except the Federal excise tax on vehicles), duty, custom, inspection or testing fee, or other tax, fee or charge of any nature whatsoever, imposed by any governmental authority, on or measured by any transaction between Square D and purchaser, shall be paid by purchaser in addition to the prices quoted or invoiced. In the event Square D shall be required to pay any such tax, fee or charge, purchaser shall reimburse Square D therefor; or, in lieu of such payment, purchaser shall provide Square D at the time the order is submitted with an exemption certificate or other document acceptable to the authority imposing the same. Purchase orders must state the existence and amount of any such tax, fee or charge which it shall be Square D's responsibility to collect from purchaser and pay.

5. DELIVERY. Delivery of equipment to a carrier at any Square D plant or other shipping point shall constitute delivery to purchaser; and, regardless of freight payment, title and all risk of loss or damage in transit shall pass to purchaser at that time.

Great care is taken in packing Square D equipment. Square D cannot be held responsible for breakage after having received "in good order" receipts from the transportation company. All claims for loss and damage must be made by purchaser to the carrier.

Claims for shortages or other errors must be made in writing to Square D within 30 days after receipt of shipment, and failure to give such notice shall constitute unqualified acceptance and a waiver of all such claims by purchaser.

Except as may otherwise be stated in quotations, discount schedules, catalogs, or other Square D publications, freight will be allowed to the common carrier free delivery point nearest the destination on shipments within **THE UNITED STATES EXCLUDING ALASKA AND HAWAII,** except that such freight shall be prepaid but not allowed (1) on shipments of Sun Dial products, (2) on shipments of Trine products, or of any combination of Anderson and Bodendieck products, having a net invoice price of less than Five Hundred Dollars ($500), and (3) on shipments of distribution equipment having a total list price of less than Two Thousand Dollars ($2,000).

For shipment to **ANY OTHER DESTINATION, INCLUDING ALASKA AND HAWAII,** consult a Square D field office for current publication showing shipping terms that apply.

No allowance will be made in lieu of transportation if purchaser accepts shipment at factory, warehouse, freight station, or otherwise supplies its own transportation.

Method and route of shipment will be at the discretion of Square D unless purchaser shall specify otherwise, and any additional expense of the method or route of shipment specified by purchaser shall be borne by purchaser.

Square D reserves the right to make delivery in installments, unless otherwise expressly stipulated in the contract for sale; and all such installments when separately invoiced shall be paid for when due per invoice, without regard to subsequent deliveries. Delay in delivery of any installment shall not relieve purchaser of its obligations to accept remaining deliveries. Square D shall not be liable for any damage as a result of any delay due to any cause beyond Square D's reasonable control, including, without limitation, an act of God; act of purchaser or Square D's supplier; embargo or other governmental act, regulation or request; fire; accident; strike; slowdown; war; riot; delay in transportation; and inability to obtain necessary labor, materials or manufacturing facilities. In the event of any such delay, the date of delivery shall be extended for a period equal to the time lost by reason of the delay.

6. SUBSTITUTES. Square D may furnish suitable substitutes for materials unobtainable because of priorities or regulations established by governmental authority or non-availability of materials from suppliers, and assumes no liability for deviation from published dimensions and descriptive information not essential to proper performance of the product.

7. WARRANTIES TO DISTRIBUTORS AND OTHER COMMERCIAL CUSTOMERS. Square D warrants equipment manufactured by it to be free from defects in materials and workmanship for a period of one (1) year from date of shipment by Square D. If within such period any such equipment shall be proved to Square D's satisfaction to be so defective, such equipment shall be repaired or replaced at Square D's option. This warranty shall not apply (a) to equipment not manufactured by Square D, (b) to equipment which shall have been repaired or altered by others than Square D so as, in its judgment, to affect the same adversely, or (c) to equipment which shall have been subjected to negligence, accident or damage by circumstances beyond Square D's control, or to improper operation, maintenance or storage, or to other than normal use or service. With respect to equipment not manufactured by Square D, the warranty obligations of Square D shall in all respects conform and be limited to the warranty actually extended to Square D by its supplier. The foregoing warranties do not cover reimbursement for transportation, removal, installation, or other expenses which may be incurred in connection with repair or replacement.

Except as may be expressly provided in an authorized writing by Square D, Square D shall not be subject to any other obligations or liabilities whatsoever with respect to equipment manufactured by Square D or services rendered by Square D.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES EXCEPT WARRANTIES OF TITLE, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

8. CONSEQUENTIAL DAMAGES. Anything to the contrary herein contained notwithstanding, **SQUARE D SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, CONTINGENT OR INCIDENTAL DAMAGES WHATSOEVER.**

9. RETURN OF EQUIPMENT. No equipment may be returned without first obtaining Square D's written permission and a returned material identification tag.

Equipment accepted for credit, not involving a Square D error, shall be subject to a minimum service charge of $20.00 or 10% of the invoice price, whichever is greater, plus all transportation charges incurred by Square D.

Returned equipment must be securely packed to reach Square D without damage; any cost incurred by Square D to put equipment in first class condition will be charged to purchaser.

10. PATENTS. As to equipment proposed and furnished by Square D, Square D shall defend any suit or proceeding brought against purchaser so far as based on a claim that said equipment constitutes an infringement of any patent of the United States, if notified promptly in writing and given authority, information, and assistance at Square D's expense for the defense of the same. In event of a final award of costs and damages, Square D shall pay such award. In event the use of said equipment by purchaser is enjoined in such a suit, Square D shall, at its own expense, either (a) procure for purchaser the right to continue using said equipment, (b) modify said equipment to render it non-infringing, (c) replace said equipment with non-infringing equipment, or (d) refund the purchase price (less depreciation) and the transportation and installation costs of said equipment. Square D will not be responsible for any compromise or settlement made without its written consent.

The foregoing states the entire liability of Square D for patent infringement, and in no event shall Square D be liable if the infringement charge is based on the use of Square D equipment for a purpose other than that for which sold by Square D. As to any equipment furnished by Square D to purchaser and manufactured in accordance with designs proposed by purchaser, purchaser shall indemnify Square D against any award made against Square D for patent, trademark, or copyright infringements.

11. PATTERNS AND TOOLS. Notice will be given if special patterns or tools are required to complete any order. Charges for such patterns or tools do not convey title thereto or the right to remove them from Square D's plant. If patterns or tools are not used for a period of two years, Square D shall have the right to scrap them without notice.

Rev. 6-1-81

*Changed since issue of 6-16-80

SQD SLV_001257

SPECIAL CONDITIONS OF SALE

The following clauses set forth Special Conditions of Sale which may, at the purchaser's election, be made applicable to the order or quotation to which this is referenced. Purchaser is requested to indicate his election by checking the appropriate box adjacent to each of the following special clauses and returning a copy of this form with his order. The price quoted on the attached quotation(s) will be appropriately increased depending upon which, if any, of the special clauses is (are) elected.

EXTENDED WARRANTY FOR ELECTRO-MECHANICAL EQUIPMENT

Reject ☐ **Accept 1 year** ☐ **Accept 2 years** ☐

The standard Square D warranty pertaining to repair or replacement of defective equipment applies for a period of one (1) year from date of shipment by Square D. At purchaser's election, this warranty may be extended for an additional period of either one (1) or two (2) years. If purchaser elects a one-year extension, one percent (1%) of the net invoice price shall be added. If purchaser elects a two-year extension, three percent (3%) of the net invoice price shall be added. This option does not apply to magnets, energy management systems, programmable controllers or solid state welder controls.

EXTENDED WARRANTY FOR SOLID STATE EQUIPMENT

Reject ☐ **Accept 1 year** ☐

The standard Square D warranty pertaining to repair or replacement of defective equipment applies for a period of one (1) year from date of shipment by Square D. At the purchaser's election, the Warranty for energy management systems, programmable controllers, or solid state welder control may be extended for an additional period of one (1) year. For this extension, five percent (5%) of the net invoice price shall be added.

SPECIAL WARRANTY FOR DRY-TYPE TRANSFORMERS ONLY

Reject ☐ **Accept 1 year** ☐ **Accept 2 years** ☒

The standard Square D warranty, and any extended warranty (see above), limits the liability of Square D to the repair or replacement of defective parts during the warranty period. This warranty specifically excludes reimbursement for transportation, removal, installation, or other expenses which may be incurred in connection with repair or replacement.

For an addition of two percent (2%) per warranty year to the net invoice price of each transformer, the warranty coverage shall include, during the warranty period, reimbursement of the direct costs of:

1. Removal of a defective transformer or part thereof;
2. Transporting it to and from the place of repair; and
3. Re-installation of the transformer at the original site.

Such special warranty, which may be chosen to cover a period not exceeding that of the standard or extended warranty (see above) selected, will not include the costs of providing temporary power or removing or replacing other apparatus or structures, or costs of transportation beyond a common carrier free delivery point in the United States (excluding Alaska and Hawaii). Further, the obligation of Square D for expenses and costs arising under this special warranty coverage will not exceed 50% of the net invoice price of the transformer. Purchaser shall retain full responsibility for any loss or damage in transit unless purchaser has elected to take the Extended Risk of Loss coverage (see below).

THIS IS AN EXAMPLE OF SPECIAL CONDITIONS AVAILABLE FOR SOME SPECIFIC CONSTRUCTION TYPE JOBS

DELIVERY EXTENDED RISK OF LOSS

Reject ☐ **Accept** ☐

Normally, delivery of equipment to a carrier at any Square D plant or other shipping point shall constitute delivery to purchaser; and, regardless of whether Square D or the purchaser pays freight charges, title and all risk of loss or damage in transit shall pass to purchaser at that time. However, for a price addition of one percent (1%) of the net invoice price, Square D will retain title until delivered FOB at the purchaser's address within the continental United States only and all risk of loss or damage in transit to the common carrier free delivery point in the United States nearest the destination.

If the purchaser elects this option, his obligations shall be as follows:

Purchaser shall have the responsibility of inspecting the equipment for apparent loss or damage upon its arrival at the free delivery point.

In the event of apparent shipping loss or damage, purchaser shall make written notation of the loss on carrier's delivery receipt and, within 72 hours of delivery, shall notify the local Square D Field Office.

In the event of concealed damage which occurred during transit and was discovered subsequent to delivery, purchaser shall report such damage immediately upon discovery, but in no event later than 15 days after delivery, to the delivering carrier, and, within 72 hours of discovery, shall notify the local Square D Field Office. If in either event notification is not made, Square D shall not be liable for loss or damage in transit.

(Revised 4-81)

SQD SLV_001258

1981 NATIONAL ELECTRICAL CODE—WIRE & CONDUIT TABLES

ALLOWABLE AMPACITIES OF INSULATED CONDUCTORS RATED 0-2000 VOLTS, BASED ON AMBIENT TEMPERATURE OF 30° C (86° F)

TRADE SIZE OF CONDUIT OR TUBING BASED ON 1981 NEC CHAPTER 9, TABLE 1 FOR 40% FILL AND TABLES 3A, 3B, 3C & 4—NEW WORK OR REWIRING. REFER TO 1981 NEC CHAPTER 9 FOR MAXIMUM NUMBER OF CONDUCTORS IN TRADE SIZES OF CONDUIT OR TUBING. PROPERTIES OF CONDUCTORS MUST AGREE WITH 1981 NEC CHAPTER 9 TABLE 8.

(UNDERLINED INSULATION TYPE INDICATES DRY LOCATION ONLY RATINGS)

Table 310-16 Ampacity Insulated Copper	Table 310-16 Ampacity Insulated Aluminum & Copper Clad Aluminum	60° C (140° F) TW UF (14-4/0)			75° C (167° F) *THWN, *XHHW			75° C (167° F) *THW *RHW-USE Without Outer Covering			▲ 90° C (194° F) FEP (14-2), *THHN FEPB (14-8), *XHHW			▲ 90° C (194° F) FEPB (6-2) *RHH-Without Outer Covering		
		Wire Size	Conduit 3W	‡Conduit 3Ø 4W	Wire Size	Conduit 3W	‡Conduit 3Ø 4W	Wire Size	Conduit 3W	‡Conduit 3Ø 4W	Wire Size	Conduit 3W	‡Conduit 3Ø 4W	Wire Size	Conduit 3W	‡Conduit 3Ø 4W
15	....	#14†	½	½	#14†	½	½	■14†	½	½	....	....	....	....	....	....
15	....	....	....	....	....	....	....	....	....	....	#14†	½	½	#14†	½	½
20	15	#12†	½	½	#12†	½	½	■12†	½	½	....	....	....	....	....	....
20	20	....	....	....	....	....	....	....	....	....	#12†	½	½	#12†	½	½
30	25	#10†	½	½	#10†	½	½	■10†	½	½	....	....	....	....	....	....
40	30	#8	¾	¾	....	....	....	....	....	....	....	....	....	....	....	....
40	35	....	....	....	....	....	....	....	....	....	#10†	½	½	#10†	½	½
50	40	....	....	....	#8	½•	¾	■8	¾	1	....	....	....	....	....	....
55	40	#6	1	1	....	....	....	....	....	....	....	....	....	....	....	....
55	45	....	....	....	....	....	....	....	....	....	#8	½•	¾	#8	¾	1
65	50	....	....	....	#6	¾	¾◆	#6	1	1	....	....	....	....	....	....
70	55	#4	1	1¼	....	....	....	....	....	....	....	....	....	....	....	....
75	60	....	....	....	....	....	....	....	....	....	#6	¾	¾◆	#6	1	1
85	65	#3	1¼	1¼	....	....	....	....	....	....	....	....	....	....	....	....
85 (100*)	65	....	....	....	#4	1	1	#4	1	1¼	....	....	....	....	....	....
95	75	#2	1¼	1¼	....	....	....	....	....	....	....	....	....	....	....	....
95 (100*)	75	....	....	....	....	....	....	....	....	....	#4	1	1	#4	1	1¼
100 (110*)	75	....	....	....	#3	1	1¼	#3	1¼	1¼	....	....	....	....	....	....
110	85	#1	1¼	1½	....	....	....	....	....	....	....	....	....	....	....	....
110 (110*)	85	....	....	....	....	....	....	....	....	....	#3	1	1¼	#3	1¼	1¼
115 (125*)	90 (100*)	....	....	....	#2	1	1¼	#2	1¼	1¼	....	....	....	....	....	....
125	100	0	1½	2	....	....	....	....	....	....	....	....	....	....	....	....
130 (125*)	100 (100*)	....	....	....	....	....	....	....	....	....	#2	1	1¼	#2	1¼	1¼
130 (150*)	100 (110*)	....	....	....	#1	1¼	1½	#1	1¼	1½	....	....	....	....	....	....
145	115	00	1½	2	....	....	....	....	....	....	....	....	....	....	....	....
150 (150*)	115 (110*)	....	....	....	....	....	....	....	....	....	#1	1¼	1½	#1	1¼	1½
150 (175*)	120 (125*)	....	....	....	0	1¼	1½	0	1½	2	....	....	....	....	....	....
165	130	000	2	2	....	....	....	....	....	....	....	....	....	....	....	....
170 (175*)	135 (125*)	....	....	....	....	....	....	....	....	....	0	1¼	1½	0	1½	2
175 (200*)	135 (150*)	....	....	....	00	1½	2	00	1½	2	....	....	....	....	....	....
195	150	0000	2	2½	....	....	....	....	....	....	....	....	....	....	....	....
195 (200*)	150 (150*)	....	....	....	....	....	....	....	....	....	00	1½	2	00	1½	2
200	155 (175*)	....	....	....	000	1½	2	000	2	2	....	....	....	....	....	....
215	170	250M	2½	2½	....	....	....	....	....	....	....	....	....	....	....	....
225	175 (175*)	....	....	....	....	....	....	....	....	....	000	1½	2	000	2	2
230	180 (200*)	....	....	....	0000	2	2	0000	2	2½	....	....	....	....	....	....
240	190	300M	2½	3	....	....	....	....	....	....	....	....	....	....	....	....
255	205	....	....	....	250M	2	2½	250M	2½	2½	....	....	....	....	....	....
260	205 (200*)	....	....	....	....	....	....	....	....	....	0000	2	2	0000	2	2½
260	210	350M	2½	3	....	....	....	....	....	....	....	....	....	....	....	....
280	225	400M	3	3	....	....	....	....	....	....	....	....	....	....	....	....
285	230	....	....	....	300M	2	2½	300M	2½	3	....	....	....	....	....	....
290	230	....	....	....	....	....	....	....	....	....	250M	2	2½	250M	2½	2½
310	250	....	....	....	350M	2½	3	350M	2½	3	....	....	....	....	....	....
320	255	....	....	....	....	....	....	....	....	....	300M	2	2½	300M	2½	3
320	260	500M	3	3½	....	....	....	....	....	....	....	....	....	....	....	....
335	270	....	....	....	400M	2½	3	400M	3	3	....	....	....	....	....	....
350	280	....	....	....	....	....	....	....	....	....	350M	2½	3	350M	2½	3
355	285	600M	3	3½	....	....	....	....	....	....	....	....	....	....	....	....
380	305	....	....	....	....	....	....	....	....	....	400M	2½	3	400M	3	3
380	310	....	....	....	500M	3	3	500M	3	3½	....	....	....	....	....	....
385	310	700M	3½	4	....	....	....	....	....	....	....	....	....	....	....	....
400	320	750M	3½	4	....	....	....	....	....	....	....	....	....	....	....	....
420	340	....	....	....	600M	3	3½	600M	3	3½	....	....	....	....	....	....
430	350	....	....	....	....	....	....	....	....	....	500M	3	3	500M	3	3½
460	375	....	....	....	700M	3	3½	700M	3½	4	....	....	....	....	....	....
475	385	....	....	....	750M	3½	4	750M	3½	4	600M	3	3½	600M	3	3½
520	420	....	....	....	....	....	....	....	....	....	700M	3	3½	700M	3½	4
535	435	....	....	....	....	....	....	....	....	....	750M	3½	4	750M	3½	4

* Ratings for three-wire, single-phase residential service entrance conductors and three-wire, single-phase feeder that carries the total current supplied by that service. (1981 NEC Note 3 to Table 310-16 for conductor types RHH-RHW-THW-THWN-THHN-XHHW.)

‡ (On a 4-wire, 3-phase wye circuit where the major portion of the load consists of electric-discharge lighting, data processing or similar equipment, see notes 8 & 10 to 1981 NEC Table 310-16.)

◆ #6 XHHW requires 1" conduit for 3Ø 4W

• #8 XHHW requires ¾" conduit for 3W

■ Special 90° C rating for THW (14-8) within electric discharge lighting equipment per 1981 NEC Article 410-31 and Table 310-13

▲ For panelboard branch circuits, wire size should be no smaller than shown above for 75° C wire. 90° C wire should be used for locations where ambient temperature above 30° C is expected, and then derated per correction factors in 1981 NEC Table 310-16.

† The load current rating and the overcurrent protection for conductor types marked with an obelisk (†) shall not exceed 15 amperes for 14 AWG, 20 amperes for 12 AWG, and 30 amperes for 10 AWG copper; or 15 amperes for 12 AWG and 25 amperes for 10 AWG aluminum and copper-clad aluminum. (These are the values shown in this table). (For ambient temperatures higher than 30° C. (86° F.) or for more than 3 line conductors in one raceway or cable, the ambient temperature correction factors in NEC Table 310-16, and Note 8 should be applied to the ampacity values shown in Table 310-16.)

NEC 220-2 (a) Continuous Loads.

The continuous load supplied by a branch circuit shall not exceed 80 percent of the branch-circuit rating. (See Exceptions in NEC)

NEC 220-10 (b) Continuous and Noncontinuous Loads.

Where a feeder supplies continuous loads or any combination of continuous and noncontinuous loads, neither the ampere rating of the overcurrent device nor the ampacity of the feeder conductors shall be less than the noncontinuous load plus 125 percent of the continuous load. (See Exceptions in NEC)

NEC 430-22 (a) Single Motor Circuit Conductors.

Branch-circuit conductors supplying a single motor shall have an ampacity not less than 125 percent of the motor full-load current rating. (See exceptions in NEC)

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