

A-C AND D-C RELAYS



Type TF and TH – Transistor Sensitive Relays

Standard and Heavy Duty

WHEN ORDERING SPECIFY

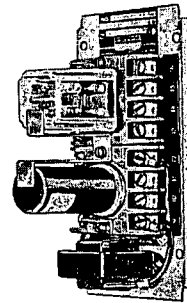
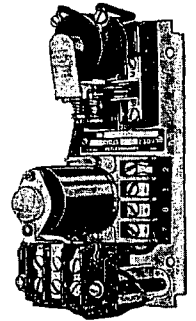
• Catalog number

DESCRIPTION

Type TF and TH relays are resistance sensitive relays. Operation of the control relay occurs when the resistance in the sensing circuit is low enough to permit transistor conduction. Standard or heavy duty relay contacts are available.

Standard duty relay is two pole double throw rated at 10 amperes 115 volts. Contact pick up is 10 milli-seconds, drop out 45 milli-seconds. Relay will operate in temperature range of -25°C to $+80^{\circ}\text{C}$.

Heavy duty relay is rated at 600 volts maximum, control circuit only. Contact pick up is 25 milli-seconds, drop out 20 milli-seconds. Relay will operate in temperature range of -30°C to $+50^{\circ}\text{C}$.

Type TF
Standard DutyType TH
Heavy Duty

TYPE TF STANDARD DUTY

Ratings				Contacts—2 PDT	
10 Amperes, 115 Volts, 60-50 Cycles					
Maximum Ambient Temperature	Type of Transistor	Open Type		General Purpose NEMA 1	
		Cat. No.	Price	Cat. No.	Price
80° C	NPN Silicon	13535-H87	\$37.	13535-H88	\$44.
80° C	PNP Silicon	H98	37.	H99	44.

TYPICAL OPERATIONAL DATA OF STANDARD DUTY

Cat. Nos.	External Terminal Connections Used	D-c Voltage			Current through terminal #11 (Milliamperes)			External Resistance (Ohms) between terminals affording operation	
		Open Circuit	Pick Up	Drop Out	Normal	Pick Up	Drop Out	Pick Up	Drop Out
13535-H87 & H88	#11 and #8	9-10V.	Closed Circuit	---	1.35	0.65	0.12	6,000	35,000
	#11 and #7	37V.	---	---	---	0.67	0.11	11,000	148,000
	#11 and #6	37V.	---	---	---	0.66	0.11	41,000	170,000
	#11 and #10	0	0.75V.	0.65V.	---	0.79	0.19	---	---
INVERSE OPERATION									
With #8 and #11 shorted									
H98 & H99	#11 and #8	9-10V.	---	---	1.35	0.30	0.12	20,000	75,000
	#11 and #7	37V.	---	---	---	0.29	0.11	50,000	300,000
	#11 and #6	37V.	---	---	---	0.28	0.11	110,000	320,000
	#11 and #10	0	0.7V.	0.64V.	---	0.50	0.15	---	---
INVERSE OPERATION									
With #8 and #11 shorted									
								450	350

② To insure protection of the transistor a minimum resistance of 2000 ohms should always be in sensing circuit.

TYPICAL OPERATIONAL DATA OF HEAVY DUTY

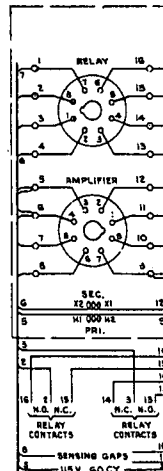
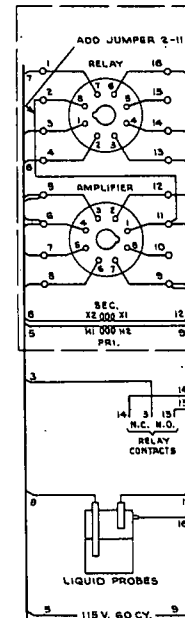
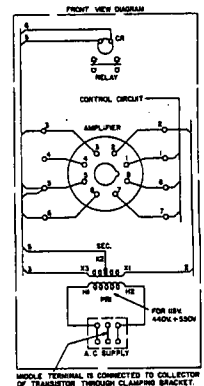
External Terminal Connections Used	D-c Voltage			Current Thru Term. #8 (Milliamperes)			External Resistance Between Terminals #8 and #7 Affording Operation (Ohms)	
	Open Circuit	Pick Up	Drop Out	Normal	Pick Up	Drop Out	Pick Up	Drop Out
#8 and #7	① 8	Closed Circuit	Open Circuit	4.3	2.0	1.0	3,000	6,000
#8 and #4	0	0.2	0.14	---	2.0	1.0	---	---

① #8 and #6—22 volts.

TYPE TH HEAVY DUTY

Ratings						
115, 208/220, 440 and 550 Volts—50, 60 Cycles						
Contact Data			Open Type		General Purpose NEMA 1	
Poles, Throw and Terminals	Contacts	Amperes Non-Inductive 550 Volts Max.			Cat. No.	Price
S PST—2 Term.	N.O.	15	13535-H91	\$41.	13535-H92	\$48.
D PST—4 Term.	N.O.	10	H93	44.	H94	51.
D PST—4 Term.	N.C.	5	H95	45.	H96	52.
S PDT—4 Term.	N.O.—N.C.	10	H89	46.	H90	53.

TYPICAL WIRING DIAGRAMS

Type TF
Standard DutyStandard Duty With
Liquid ProbesType TH
Heavy Duty