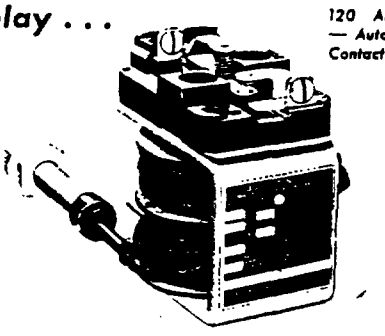
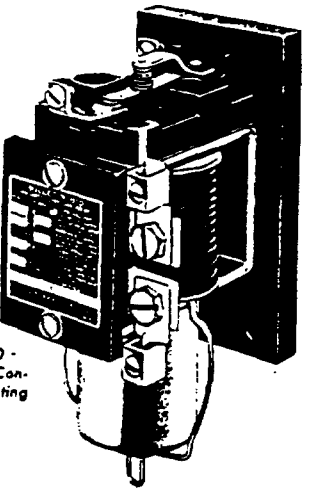
Bulletin 810
Magnetic Overload Relays

March 1, 1962 • • • Bulletin Price Sheet 810

A Versatile Overload Relay . . .



120 Ampere Bulletin 810 — Automatic Reset — NO Contacts — Slate Mounting



60 Ampere Bulletin 810 - Automatic Reset — NC Contacts—Metal Panel Mounting

CHARACTERISTICS

Non-Thermal
Quick Reset
Inverse Time Limit

FEATURES

Adjustable Operating Current
Adjustable Operating Time
NC or NO Contacts
Automatic or Hand Reset
Open or Nema 1 Enclosed

Application • • •

The Bulletin 810 magnetic overload relay is adaptable to various special applications involving both AC and DC motors. Like thermal relays, it has inverse time tripping characteristics; unlike thermal relays, its minimum operating current is independent of temperature changes or cumulative heating. The Bulletin 810 may be used in situations where ambient temperature variations would hamper thermal relays.

Because it is non-thermal, there is no "cooling off" period after an overload operates the relay. The reset action is quick and positive, a definite advantage when shutdowns must be as short as possible.

The Bulletin 810 features an adjustable operating current. The range of adjustment is continuous, with limits of 100% and approximately 200% of the minimum setting. Adjustment is done without tools, without accessory parts.

The operating time, as well as the current, is adjustable. The relay may be set to operate almost instantly under locked rotor conditions; on the other hand, it may be adjusted to provide an operating time comparable to thermal relays. The Bulletin 810 is remarkably versatile, as the *Tripping Curves on page three* indicate.

Ratings and Prices

600 Volts Max. • AC or DC • 60 Cycles Max.

Reset—All relays listed below have NC contacts and an automatic reset. Add **$2.50** list per relay if a NC hand reset relay is desired.

Contacts—Relays are available with NO contacts at no extra charge. Ratings, NC & NO: AC-6A @ 110V, 3 @ 220, 1.5 @ 440, 1.2 @ 550
DC-.4A @ 115V, .2 @ 230, .1 @ 440, .1 @ 550

Slate Mounting—Open type relays are supplied for steel panel mounting. If relays for slate mounting are desired, specify this on your order. The single open relay price applies.

High Voltage Duty—Relays for slate mounting are available in ratings up to 100 amperes @ 2400 volts. Add **$3** list per relay.

Replacement Orders—include serial number of starter.

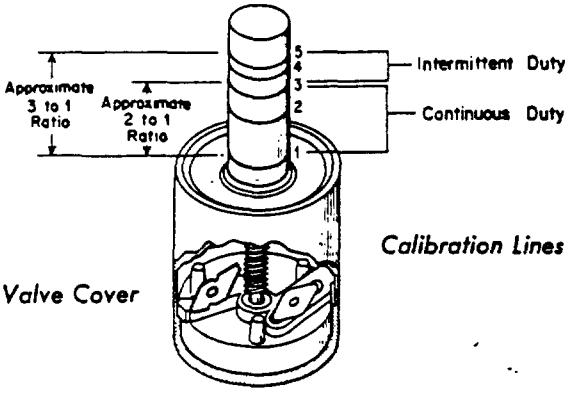
Max. Continuous Current (Amps.)	Form	Relays Per Panel	Nema Type 1 Enclosed		Open Type	
			Catalog No.	Price	Catalog No.	Price
Values thru —60	1RP	1	810CAV4	**$34**	810COV4	**$22**
	2RP	2	CAV5	**62**	COV5	**49**
	3RP	3	CAV6	**99**	COV6	**86**
	4RP	4	CAV7	**121**	—	—
	6RP	6	CAV8	**183**	—	—
	8RP	8	CAV9	**242**	—	—
—120	1RP	1	810DAV4	**37**	810DOV4	**25**
	2RP	2	DAV5	**69**	DOV5	**55**
	3RP	3	DAV6	**110**	DOV6	**95**
	4RP	4	DAV7	**135**	—	—
	6RP	6	DAV8	**201**	—	—
	8RP	8	DAV9	**267**	—	—
—210	1RP	1	810EAV4	**49**	810EOV4	**37**
	2RP	2	EAV5	**86**	EOV5	**73**
	3RP	3	EAV6	**137**	EOV6	**121**
	4RP	4	EAV7	**172**	—	—
	6RP	6	EAV8	**258**	—	—
	8RP	8	EAV9	**341**	—	—
—320	1RP	1	810FAV4	**52**	810FOV4	**40**
	2RP	2	FAV5	**93**	FOV5	**80**
	3RP	3	FAV6	**146**	FOV6	**130**
	4RP	4	FAV7	**185**	—	—
	6RP	5	FAV8	**275**	—	—
	8RP	8	FAV9	**370**	—	—

Discount Schedule A

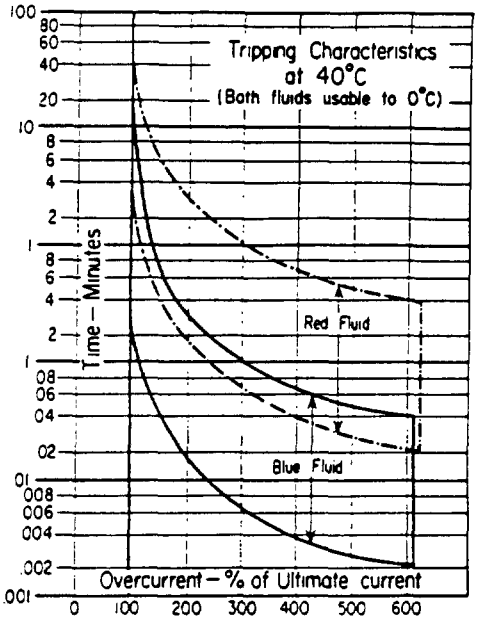
Supersedes Bulletin Price Sheet 810 Dated October 26, 1959

21386

Simple Adjustments Vary the Tripping Characteristics . . .



Dashpot and Core Assembly—The ultimate current, or minimum operating current, is decreased by raising the core on its threaded stem. The operating time at overcurrents is decreased by sliding open the valve cover.



Effects of Ambient Temperature Variations • • •

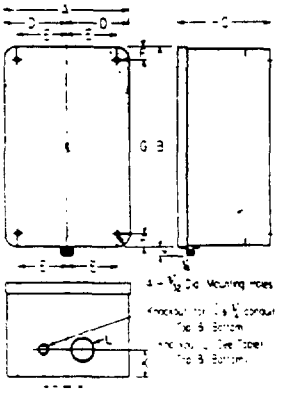
Operating Current—The minimum operating current (100% ultimate current on the Tripping Characteristics) is independent of temperature. Consequently, the relay will operate at the chosen current consistently—regardless of ambient temperature variations at the relay.

Operating Time—The operating time at overcurrents depends on the viscosity of the dashpot fluid as well as the valve opening. The viscosity-temperature relationship of this fluid, however, is favorable; as a result, the operating time at any given overcurrent remains suitably constant over a wide range of temperatures.

Information Required With Orders • • •

1. Catalog number.
2. Relay trip setting, amperes AC or DC (setting will correspond as nearly as possible to the second calibration line unless otherwise specified).
3. Frequency, if AC.
4. Contact arrangement and type of reset (lacking this information, relays are supplied with NC contacts and an automatic reset).
5. Relays per panel and type of mounting (open type relays are supplied for steel panel mounting unless otherwise specified).

Dimensions • Nema Type 1 Enclosure



Form	Maximum Continuous Current • Amperes	Dimensions in Inches										
		A	B	C	D	E	F	G	H	J	K	L
1RP Single Relay	60	6⅜	11⅜	6⅛	3¾₆	2⅛	1¹⁄₁₆	9¼	1¼	⅞	2¹⁄₁₆	1 -1¼
	120	6⅜	11⅜	6⅛	3¾₆	2⅛	1¹⁄₁₆	9¼	1¼	⅞	2¹⁄₁₆	1 -1¼
	210	7⅜	16⅜	7¼	3¹¹⁄₁₆	2⅝	1¹⁄₁₆	14¼	1¼	⅞	2	1½-2
	320	9⅜	21⅜	7¾	4¹¹⁄₁₆	3⅜	1¹⁄₁₆	19¼	1⅜	1⅛	2⅜	2 -2½
2RP Two Relays	60	9⅜	11⅜	6⅛	4¹³⁄₁₆	3⅜	1¹⁄₁₆	9¼	2	1¼	2¹⁄₁₆	1¼-1½
	120	9⅜	11⅜	6⅛	4¹³⁄₁₆	3⅜	1¹⁄₁₆	9¼	2	1¼	2¹⁄₁₆	1¼-1½
	210	10⅜	16⅜	7¼	5¾₆	4⅛	1¹⁄₁₆	14¼	2	1¼	2¹⁄₁₆	2 -2½
	320	12⅜	21⅜	7¹¹⁄₁₆	6¾₆	5⅜	1¹⁄₁₆	19¼	3	1¼	2¹⁄₁₆	2½-3

Bulletin 810 Magnetic Overload Relays

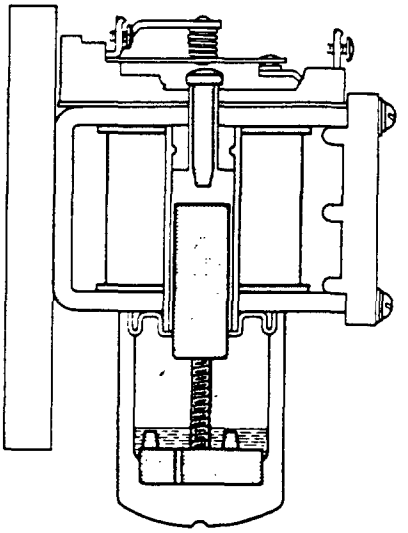
The Bulletin 810 is Well Designed . . .

Trip pin opens contacts when core rises.

Iron core rises in response to electromagnetic force.

Silicone fluid passes thru valve as piston rises.

Valve controls speed of rising piston.



Contacts open with a quick, positive break.

Operating coil carries motor current which produces force on core.

Piston is attached to core, retards motion.

Dashpot has enlarged diameter, frees piston near end of travel.

Moving parts of the Bulletin 810 are shaded in the above cross-sectional view. Motion, indicated by the arrow, is smooth and direct, unaffected by long idle periods.

Operation • • •

Normal Currents—The relay is operated thru the simple vertical movement of the iron core and attached piston. Under normal conditions, the upward electromagnetic force caused by current flowing thru the operating coil is not great enough to lift the core because of the restraining effect of the piston seated at the bottom of the dashpot. The relay remains inoperative.

Overcurrents—When the current increases to the operating point of the relay, the electromagnetic force is increased—enough to unseat the piston, raise the core, and operate the relay. The upward motion of the core, however, is retarded by the viscous flow of a silicone fluid thru a valve in the piston. The core rises slowly until the piston reaches an increased dashpot diameter, where it is suddenly freed; this allows the core to snap up and impart its motion to the trip pin which opens the contacts with a quick, positive break. The time required to complete these steps in the relay's operation decreases with an increase in current. Time and current are inversely related, as the Tripping Characteristics on page three shows.

Reset—Standard models of the Bulletin 810 are automatically reset as soon as the current is interrupted. The core quickly drops, returning the contacts to their normal position. A check valve allows the piston to bypass the fluid in its return to the bottom of the dashpot. The action of hand reset models differs only in that the contacts do not re-close until a lever on the top block is operated. There is no waiting period as with thermal relays.

Adjustment • • •

Operating Current—The minimum current at which the relay will ultimately trip is changed by varying the position of the iron core within the operating coil. To adjust the operating current of the Bulletin 810, a spring clamp is swung forward, allowing the dashpot and core assembly to be removed. Calibration lines on the core correspond to current values stamped on the nameplate. The core is screwed up or down until the line corresponding to the desired operating current is flush with the edge of the dashpot. Currents other than those indicated by the lines are possible by interpolation.

The operating current range for continuous coil duty involves the first three calibration lines, as the figure on page three indicates. The fourth and fifth calibration lines apply to intermittent coil duty only, since the currents they represent are above the maximum continuous current rating of the coil. This part of the current range is utilized only in instances where an additional device protects the coil of the Bulletin 810 from sustained overcurrent.

Operating Time—The time required to operate the relay at a particular overcurrent is determined by the rate of flow of a silicone fluid thru an adjustable valve in the piston. This time can be varied by increasing or decreasing the opening of the valve. To make the adjustment, the dashpot assembly is removed, making it possible to lift the piston from the dashpot and rotate the valve cover as required.

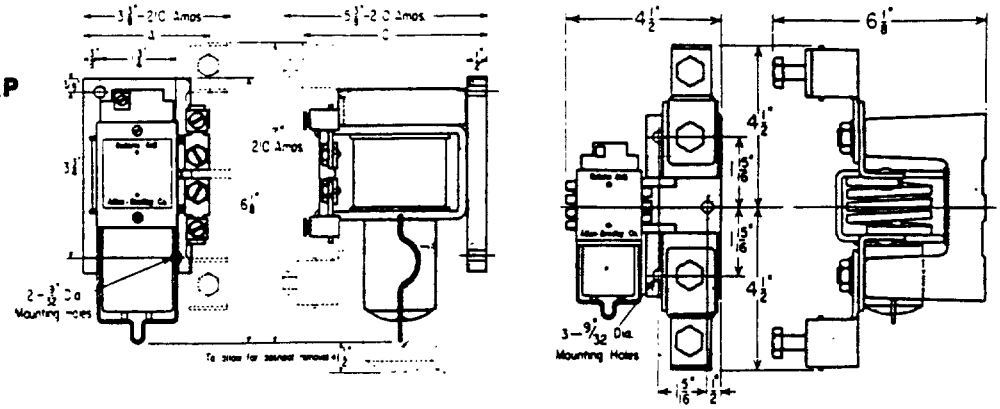
The wide range of operating times possible with the Bulletin 810 is shown in the Tripping Characteristics on page three. The area labeled "Blue Fluid" represents the family of curves possible using the low viscosity fluid normally supplied with the relay. The overlapping area labeled "Red Fluid" represents the family of curves obtainable with a higher viscosity fluid, supplied when necessary. Each area is bounded by curves which represent the operating times with the valve fully opened and closed.

Approximate Dimensions • Metal Panel Mounting

Form 1RP

Left:
60, 120, & 210 Amp.

Right:
320 Amp.



Dimension A
60 Amp: 3"
120 Amp: 3⅜"

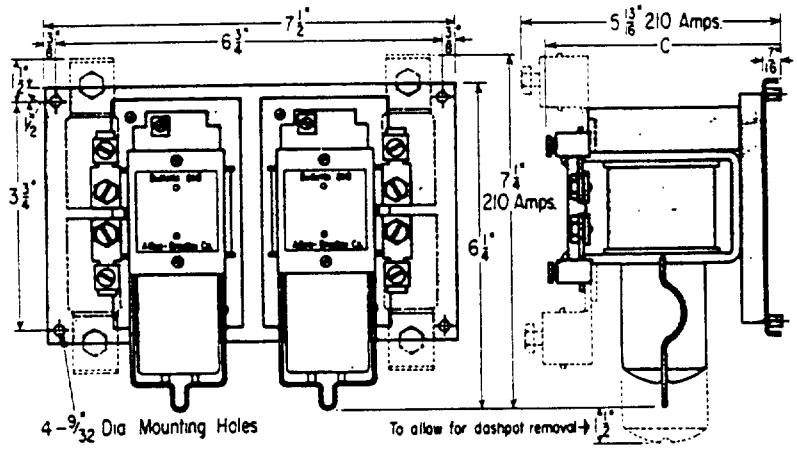
Dimension C
60 Amp: 4⅛"
120 Amp: 4½"

Form 2RP

60 Amp. ("C" = 4 7/16")

120 Amp. ("C" = 4 11/16")

210 Amp.



320 Amp.