Instructions for Type A Thermal Overload Relays Sizes 1 and 2, 3 Pole Non-Compensated or Ambient Compensated

I.L. 14568-C
File 8200

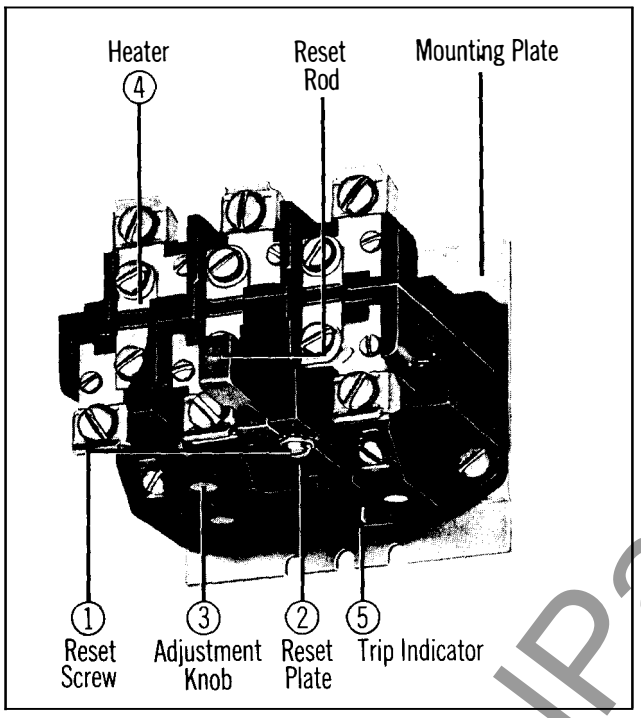

Fig. 1 - *Size 1, 3 Pole Overload Relay for Panel Mounting*

Installation

The Westinghouse Type A, 3 Pole Overload Relay, Figure 1, must be installed in a vertical position with the adjustment knob (3) at the bottom. The relay is accurately calibrated at the factory and should not be tampered with. Installation should be made with the proper wire size for the application and all wires should be securely fastened to the relay.

The relay is available either for panel mounting or for mounting on an A/200 Motor Controller. Overload relays for controller mounting have the necessary hardware and connectors included and should be installed as shown in Figure 3 with the connectors (6) having their slotted ends toward the controller.

General

The Type A, 3 Pole Overload Relay is a bimetallic, overload relay. The following ratings, Table I, apply:

Table I Bimetallic Overload Relay Ratings

Size	Catalog Number		Maximum Amperes
	Non-Compensated	Ambient Compensated	
0, 1	AN13P, AN13A	AA13P, AA13A	26.2
2	AN23P, AN23A	AA23P, AA23A	45.0

The bimetal elements, see Figure 2, are electrically heated by a series of small replaceable heating elements connected directly in the circuit to be protected. Thermal actuation of this device opens a pair of contacts in the coil circuit of a contactor or relay which results in the disconnection of power to the overloaded circuit. With replaceable thermal elements for motors having full load current of .35 to 45 amperes in approximately 10% steps (See Heater Application Table page 4), the relays may be used on circuits of not more than 600 volts. The relay control contacts are rated as shown in Table II.

Table II Control Contacts Ratings

A.C. Volts	A.C. Amperes (N.C.)		A.C. Amperes (N.O.)	
	Make	Break	Make	Break
120	20	2	5	.5
240	10	1	2.5	.25
480	5	.5	1.25	.125
600	4	.4	1	.1
Max. Make Capacity (N.C.) 20 Amps AC				

The relay will provide protection against abnormal load conditions to current values exceeding normal locked rotor current. The relay should be protected against short circuits by providing branch circuit protection per National Electric Code, but not to exceed the maximum fuse ratings listed in Table III.

WARNING: **To provide continued protection against fire and shock hazard, the complete overload relay must be replaced if burnout of the current element occurs.**

Effective September, 1978. Supersedes I.L. 14568-B, dated January, 1977.

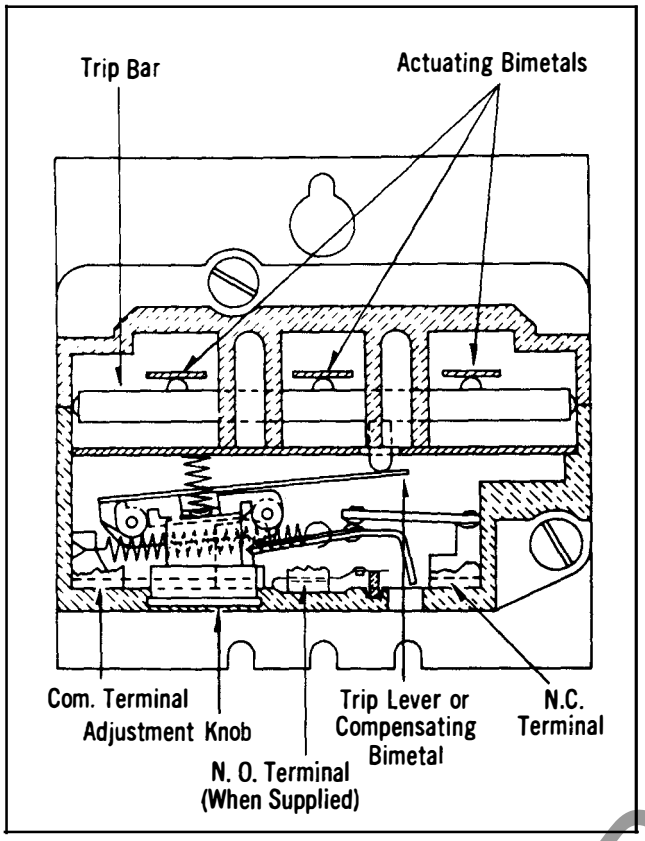

Fig. 2 - *Parts Identification*

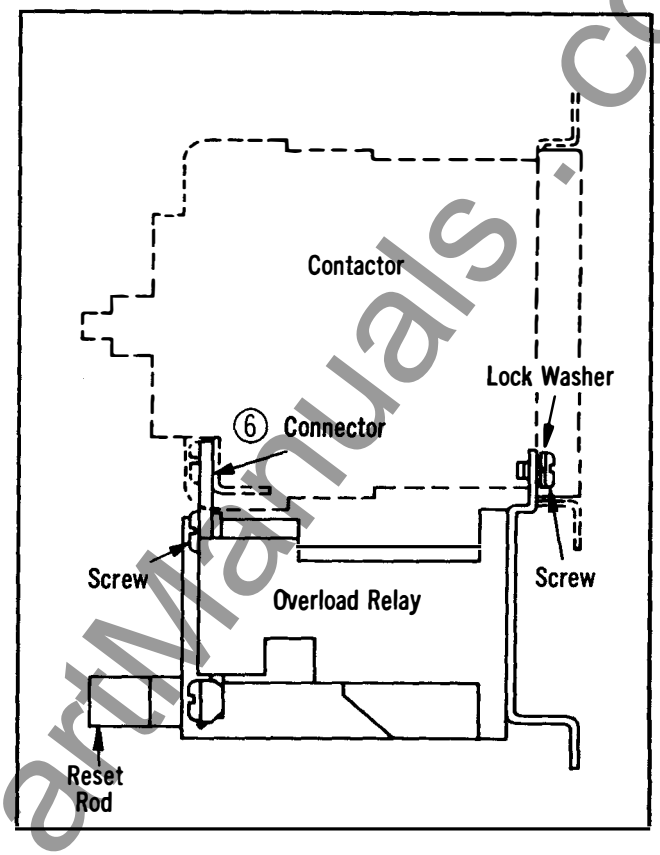

Fig. 3 - *Overload Relay Mounted on A/200 Motor Controller*

Construction Features

Manual or Automatic Reset

The overload relay is normally furnished set for "HAND" reset operation. The relay may be set for either "HAND" or "AUTO" reset by slightly loosening the screw (1) holding the reset plate (2), moving the plate to the proper position marked on the molded case and retightening the screw. (See Figure 1). Automatic reset should not be used with 2-wire master switch or where automatic resetting of the overload relay would restore power to the motor endangering either personnel or equipment.

Adjustable Trip

The trip rating of a specific heater element can be adjusted over a range of approximately 85% to 115%. This is accomplished by turning the adjustment knob (3) on the bottom of the relay to the respective stop position. With replaceable heaters (4) in approximately 10% current increments the relay is capable of being adjusted over this 10% range to permit the desired close protection.

Trip Indication

An immediate visible indication of trip is standard on the Type A overload relay. When an overload occurs, which causes the relay to operate, a trip indicator (5) projects out through a small opening at the bottom of the relay. (See Figure 1).

IMPORTANT: Do not tamper with this trip indicator as it is an integral part in the calibration and tampering therewith may cause changes in trip characteristics.

Positive Contact Break

A follow through contact is provided on the stationary contact terminal of the snap action control switch. This contact provides reliable electrical continuity during toggling of the snap switch, thus eliminating "false" trips sometimes prevalent with thermally operated switches. This contact also allows contact wipe for further reliability.

Ambient Compensation

Overload relays are available with substantially the same trip characteristics for ambient temperatures from -40°C to 75°C (-40°F to 167°F). Due to the inclusion of a compensating bimetal, which maintains a constant travel to trip distance independent of ambient conditions, operation of this bimetallic relay is responsive only to heat generated by the motor overcurrent passing through the heater element. The compensating feature is fully automatic and no adjustments are required over wide fluctuations in ambient temperatures. Overload relays having ambient compensation can be identified by *black* reset rods whereas noncompensated overload relays have *red* reset rods.

SPDT Control Switch

Overload relays are available with a SPDT contact arrangement. The NO contact can be used to electrically operate an alarm to give a remote indication of tripping.

Operation and Performance

The current of an overloaded motor increases the heat generated in the heaters sufficiently to cause the actuating bimetals to bend. The bimetals bend against a common trip bar which in turn operates the control switch. The time required for the overload relay to trip depends upon the magnitude of the overload, the greater the overload, the shorter the time to trip. This is indicated in the characteristic curve, Figure 4. This curve is based on the heater ampere rating at 40°C being 125% of the minimum full load motor current determined by the heater application table. The performance of the relay is such that it will allow motor starting currents to flow during the normal starting period, but will trip when subjected to smaller sustained overloads. After tripping has occurred, a short time must elapse before the relay can be reset by depressing the reset rod.

Heaters

Each heater is identified by a code marking stamped on one terminal. When installing heaters, be sure that connecting surfaces are clean and heaters are attached securely in the proper location with the screws provided. (See Figure 1). Heaters are not included with the relays and must be ordered separately. The trip rating of a heater at 40°C ambient is 125% of the minimum full load current shown in Table III.

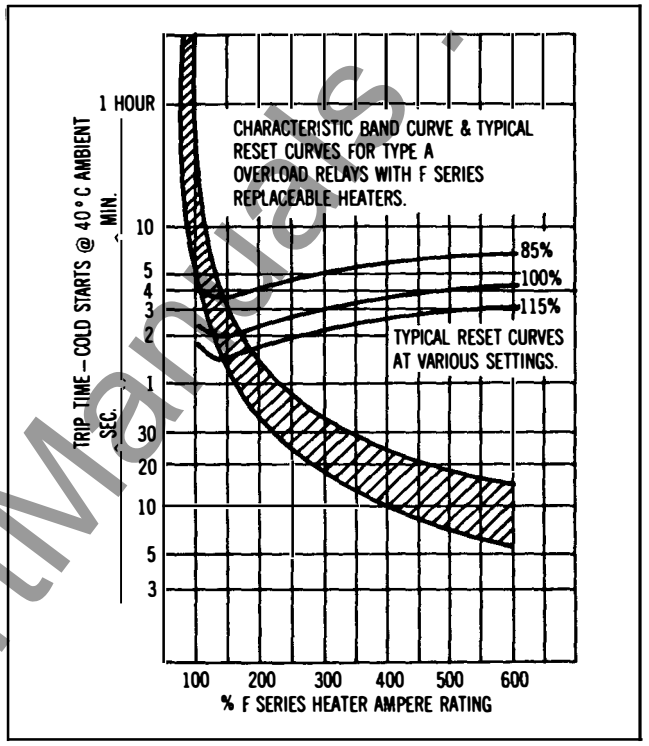

Fig. 4 - *Time-Current Trip and Reset Curves*

Heater Selection

Heaters should be selected on the basis of the actual motor full load current. When motor and overload relay are in the same ambient, the data listed in Table III provides for 40°C rated motors or those with a service factor of 1.15 to 1.25 with 115% to 125% protection. For 50°C or 55°C rated motors, or those with 1.00 service factor or where a maximum of 115% protection is desired, select one size smaller heater than indicated. When noncompensated overload relays are used and motor and relay ambients differ, select heaters from the table using adjusted motor current as follows: Decrease rated motor current 1% for each °C motor ambient exceeds relay ambient; increase rated motor current 1% for each °C relay ambient exceeds motor ambient. For ambient compensated overload relays, select heaters according to the table and selection data above, regardless of the ambient.

Table III F Series Heater Application Table ©

For Use With Three Heaters Only		
Code Marking	Full Load Current of Motor (Amperes) (40°C Ambient)	Max. Prot. Dev. ©
FH03	.25 - .27	15
FH04	.28 - .31	15
FH05	.32 - .34	15
FH06	.35 - .38	15
FH07	.39 - .42	15
FH08	.43 - .46	15
FH09	.47 - .50	15
FH10	.51 - .55	15
FH11	.56 - .62	15
FH12	.63 - .68	15
FH13	.69 - .75	15
FH14	.76 - .83	15
FH15	.84 - .91	15
FH16	.92 - 1.00	15
FH17	1.01 - 1.11	15
FH18	1.12 - 1.22	15
FH19	1.23 - 1.34	15
FH20	1.35 - 1.47	15
FH21	1.48 - 1.62	15
FH22	1.63 - 1.78	15
FH23	1.79 - 1.95	15
FH24	1.96 - 2.15	15
FH25	2.16 - 2.35	15
FH26	2.36 - 2.58	15
FH27	2.59 - 2.83	15
FH28	2.84 - 3.11	15
FH29	3.12 - 3.42	15
FH30	3.43 - 3.73	15
FH31	3.74 - 4.07	15
FH32	4.08 - 4.39	15
FH33	4.40 - 4.87	15
FH34	4.88 - 5.3	20
FH35	5.4 - 5.9	20
FH36	6.0 - 6.4	20
FH37	6.5 - 7.1	25
FH38	7.2 - 7.8	25
FH39	7.9 - 8.5	30
FH40	8.6 - 9.4	30
FH41	9.5 - 10.3	35
FH42	10.4 - 11.3	35
FH43	11.4 - 12.4	40
FH44	12.5 - 13.5	45
FH45	13.6 - 14.9	45
FH46	15.0 - 16.3	50
FH47	16.4 - 18.0	60
Above Heaters for use on Size 0		
FH48	18.1 - 19.8	60
FH49	19.9 - 21.7	70
FH50	21.8 - 23.9	80
FH51	24.0 - 26.2	80
Above Heaters for use on Size 1		
FH52	26.3 - 28.7	90
FH53	28.8 - 31.4	100
FH54	31.5 - 34.5	125
FH55	34.6 - 37.9	125
FH56	38.0 - 41.5	125
FH57	41.6 - 45.0	150
Above Heaters for use on Size 2		

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