TYPE MP THERMAL OVERLOAD RELAY

INSTRUCTIONS

Application

The type MP thermal overload relay makes use of bimetallic thermal elements acuated by electric heaters to operate a contact in the coil circuit of contactors, etc., for the disconnection of power on overloads. It is for use in A-C. or D-C. circuits not to exceed 600 volts. The single contact which is operated by the tripping of any of the thermal elements will carry and break currents up to 6 amperes maximum in A-C. circuits. In D-C. circuits the load should not exceed 50 volt amperes. The following table gives the number of poles and the current ratings, with corresponding type designations.

TYPE DESIGNATION

Type	No. of Poles	Motor Current Range
MP-22	2	11 to 57
MP-23	3	11 to 57
MP-32	2	11 to 106
MP-33	3	11 to 106
MP-42	2	11 to 177
MP-43	3	11 to 177

The relay will give protection against abnormal conditions up to the locked current of the motor. Accidental short circuits which greatly exceed this figure may damage the relay before it has time to act in tripping the contacts, and protection should be afforded, in accordance with National Electrical Code, by use of fuses or a time limit circuit breaker having ratings or settings not in excess of four times, or an instantaneous trip circuit breaker set at not over seven times the motor full load current.

Construction

The thermal element for each pole is complete in itself, and consists of a bimetallic strip mounted on a bracket, with spring actuated trip element moved by the bi-metal to a position on the bracket at which it suddenly trips and operates the contacts of the relay. Insulating base is of non-carbonizing heat resisting composition and carries connecting blocks arranged to support the heaters in the proper position in relation to the bi-metal. Heaters (supplied separately) are available in current steps of about 10% within the ratings of the relay. The relay may be reset after tripping by means of a reset button.

Operation

When the power circuit is closed, heat generated by the current flowing through the heaters cause the bi-metallic strips to bend or warp. The movement of the bi-metal results in tripping a latch which, by action of a spring, suddenly raises the cross bar, causing sudden separation of the control contacts. The time required for the relay to trip depends on the size of the overload, and the greater the overload within the normal operating range the shorter the time. The time lag permits the motor to draw heavy current during the starting period without tripping the relay, but much smaller overload currents long continued will cause the relay to trip. Trip occurs more quickly when previously heated, as by the normal motor current, than when starting cold. A short time must elapse before the relay can be reset. The approximate tripping time to be expected for various overloads is indicated in Fig. 2.

Installation and Maintenance

To Mount Heaters

Remove screws K from the heater supports. Enter the heaters as shown at F, the heater enclosing the bi-metal strip. Replace screws and tighten securely. Make certain that the bi-metal elements can operate the trip latches without interference with the heaters. It is important that cables and terminals connected to the heater supports be of ample current carrying capacity, terminal surfaces, heaters, and heater supports be clean and bright, and all connections be tight. Excessive heat generated at these points will alter the tripping current of the relay. Do not bend or alter the shape of the bi-metal.

Inspection

Periodic inspection is recommended. See that the connections are clean and tight, that the armature bearings are free, that the contacts close with sufficient pressure to carry the stationary contact spring away from the stop, and that the contacts open when any latch L is tripped singly with all others in normal operating position. No oiling is necessary.

Heaters

Each heater is stamped with a code number, which when used in connection with the table below, gives the heater application, based on an ambient temperature of 40° C. For lower ambient temperature, higher currents are required to trip the relay, making possible utilization of the higher capacity which the motor will also have at the lower temperature. The tripping current increases approximately ¾% per degree decrease in air temperature, and vice versa.

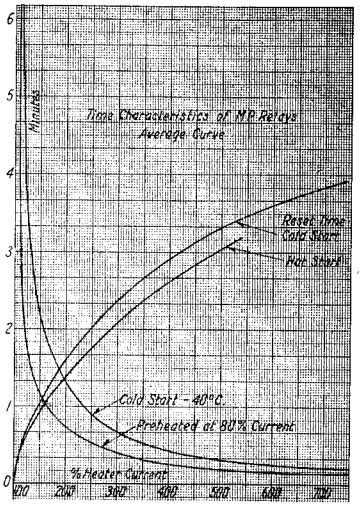


FIG. 2—TYPE MP RELAY CURVE

*TABLE OF HEATER RATINGS— 40° Ambient

Motor Currents	Heater Marking	Style Number
11.4 to 12.5	6C4	967 183
12.6 to 13.7	6C5	967 184
13.8 to 14.9	6C6	967 185
15.0 to 16.7	6C7	967 186
16.8 to 19.1	6A4	967 187
19.2 to 20.9	5C4	967 188
21.0 to 22.8	5C5	967 189
22.9 to 24.9	5C6	967 190
25.0 to 28.4	5C7	967 191
28.5 to 30.8	4C6	967 192
30.9 to 33.2	4C7	967 193
33.3 to 37.4	5A5	967 194
37.5 to 40.6	3C4	967 195
40.7 to 44.1	3C5	967 196
44.2 to 48.1	3C6	967 197
48.2 to 53.3	3C7	967 198
53.4 to 57.7	2C5	967 199
57.8 to 62.5	2C6	967 200
62.6 to 70.1	2C7	967 201
70.2 to 80.9	3A7	967 202
81.0 to 84.9	2A5	967 203
85.0 to 92.9	2A6	967 204
93.0 to 106.	2A7	967 205
107 to 118	3M7	968 290
119 to 129	2M5	968 291
130 to 141	2M6	968 292
142 to 161	2M7	968 293

***For Heater applications in standard Linestarters see Heater Table furnished with the apparatus. For application of heaters in an enclosure in which temperature is as much as 15°C. above room ambient, one heater size larger should be used. If the motor is in a 40°C. ambient and the relay is in a 25°C. ambient, one size smaller heater should be used**

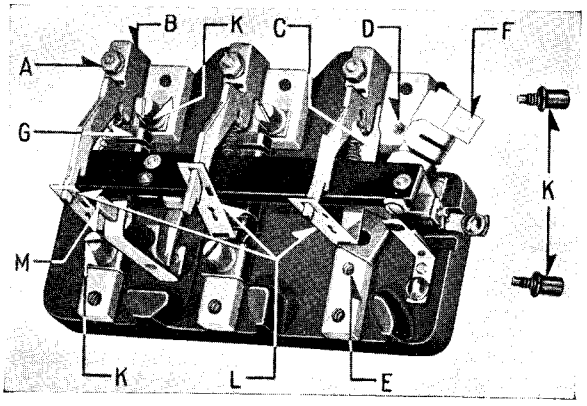
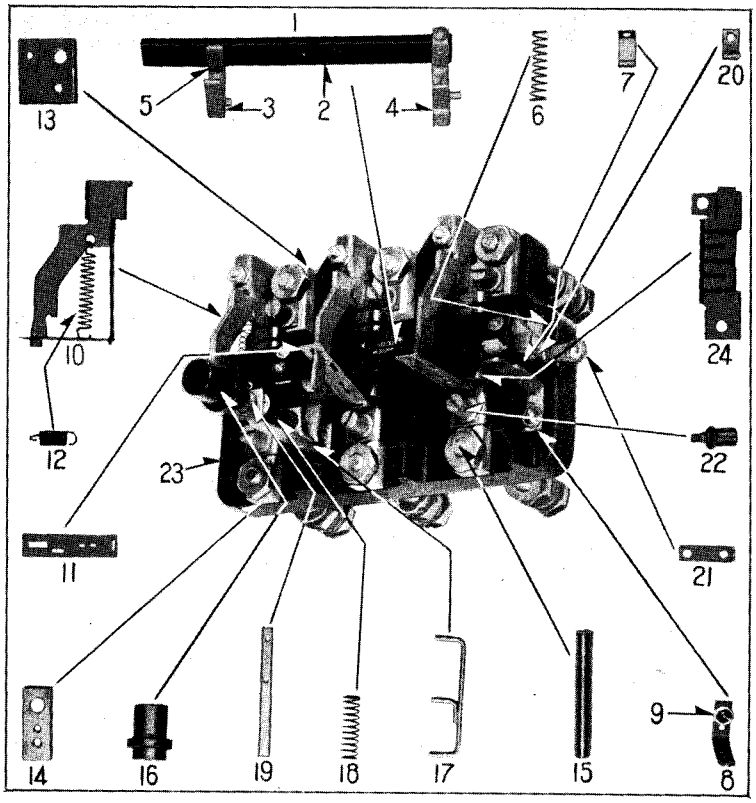


FIG. 1—OVERLOAD RELAY

TYPE MP THERMAL OVERLOAD RELAY
RENEWAL PARTS DATA



RECOMMENDED STOCK OF RENEWAL PARTS

Style Number of Relay		Style Number of Part		No. Per Relay		Relays in Use	
	MP-22	... ...	974 340				
	MP-23	... ...	974 341				
	MP-32	941 863	... ...				
	MP-33	941 864	... ...				
	MP-42	941 865	... ...				
	MP-43	941 866	... ...				
Ref. No.	Description of Part			MP 22, 32, 42	MP 23, 33, 43	1 Recommended For Stock	5
1	Cross Bar Complete	948 556	974 096	1	1	0	0
2	Cross Bar	884 649	974 010	1	1	0	0
3	Reset Arm	884 654	884 654	1	1	0	0
4	Moving Contact	884 655	884 655	1	1	1	2
5	Rivet—Tubular	816 258	816 258	3	3	1	2
6	Operating Spring	919 859	919 859	1	1	0	1
7	Shunting Spring	940 907	940 907	1	1	0	1
8	Stationary Contact Complete	948 557	948 557	1	1	0	0
9	Washer Head Screw	540 190	540 190	1	1	0	0
10	Bimetal Trip Unit	947 856	947 856	2	3	1	2
11	Latch	884 660	884 660	2	3	0	0
12	Latch Spring	884 651	884 651	2	3	0	1
13	Connection Block—Large	884 661	974 005	2	3	0	0
14	Connection Block—Small	884 662	974 006	2	3	0	0
15	Stud	361 719	559 187	4	6	0	0
16	Reset Button	884 650	884 650	1	1	0	0
17	Reset Button Bracket	884 664	884 664	1	1	0	0
18	Reset Button Spring	272 770	919 859	1	1	0	1
19	Reset Lever	884 666	884 666	1	1	0	0
20	Bearing Bracket	884 656	884 656	2	2	0	0
21	Terminal Strap	884 657	884 657	1	1	0	0
22	Heater Screw	884 671	884 671	4	6	2	4
23	Base	884 653	973 657	1	1	0	0
24	Heater	†	†	2	3	2	4

Parts indented are included in the part under which they are indented.
† When ordering heaters, specify code number obtained from table of heater ratings.

This is a list of the Renewal Parts and the quantities of each that we recommend should be stocked by the user of this apparatus to minimize interrupted operation caused by breakdowns. The parts recommended are those most subject to wear in normal operation or those subject to damage or breakage due to possible abnormal conditions.

This list of Renewal Parts is given only as a guide. When continuous operation is a primary consideration, additional insurance against shutdowns is desirable. Under such conditions more renewal parts should be carried, the amount depending upon the severity of the service and the time required to secure renewals.

ORDERING INSTRUCTIONS

Name the part and give its style number. Give the complete nameplate reading. State whether shipment is desired by express, freight or parcel post. Send all orders or correspondence to nearest Sales Office of the company. Small orders should be combined so as to amount to a value of at least $1.00 net. Where the total of the sale is less than this, the material will be invoiced at $1.00.

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