DESCRIPTION • INSTALLATION • OPERATION

# INSTRUCTIONS

## OVERLOAD RELAYS

### TYPE MW-51, MW-52 AND MW-53

### For Use With Size 5 Life-Linestarters*

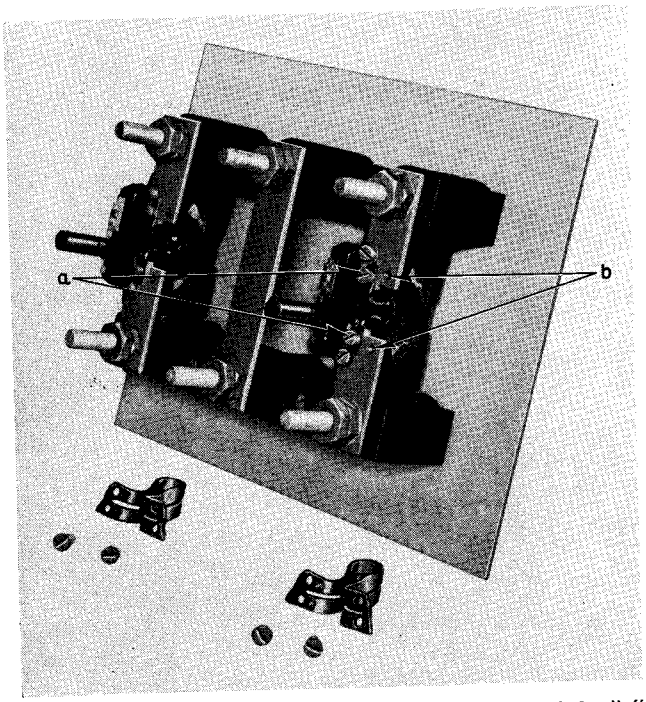


*FIG. 1. Install single heaters, code CA through CJ, using holes "a" as shown. Install double heaters (shown below relay) using holes "a" and "b". Be sure the looped portion enters the recess in the relay.*

**OVERLOAD RELAYS** Type MW-51, 52 and 53 are designed for use with Size 5 Life-Linestarter. It is the purpose of these relays to detect and then protect a load from overloading currents by automatically disconnecting the power. The performance of the relays is such that they will allow motor starting currents to flow during the starting period, but will trip when subject to smaller but long-continued overloads. They will provide protection against abnormal load conditions to current values exceeding locked rotor current.

The MW relays feature a bi-metallic disc which insures the same accuracy and uniformity obtained in precision thermostats. This convex bi-metallic disc after heating, snaps to reverse its convexity, thus insuring a quick-break action of the contacts.

In accordance with the National Electric Code the relay should be protected against short circuits by fuses rated at not more than four times the rated motor current, or by a time limit circuit breaker set at not more than four times the rated motor current.

**Ratings.** The MW-51, 52 and 53 relays are used on circuits of not more than 600 volts, and have contacts which will carry and break a-c currents of the contactor coil up to 2 amperes. The contacts will also handle 50 volt-amperes at a maximum of 1 ampere in a d-c circuit. With heaters properly selected from the heater application table, the relays may be used on circuits from 76 to 308 amperes. For special applications there are heaters available for circuits of lower ratings.

The time required for the relay to trip depends upon the size of the overload, the greater the overload the shorter being the time to trip. This is indicated in the Time Characteristic Curve, Fig. 2, of a relay operating in a 40-degree C (104-degree F) ambient temperature. The curve applies in general when the relay is operated in any ambient temperature as long as the currents are expressed in percentages of the minimum tripping current at that ambient temperature. The minimum tripping current changes with the ambient temperature in approximately the same ratio as the change in load capacity of the motor.

### OPERATION

The MW overload relay has a heater (a calibrated resistor element) placed in series with the load. During an overload

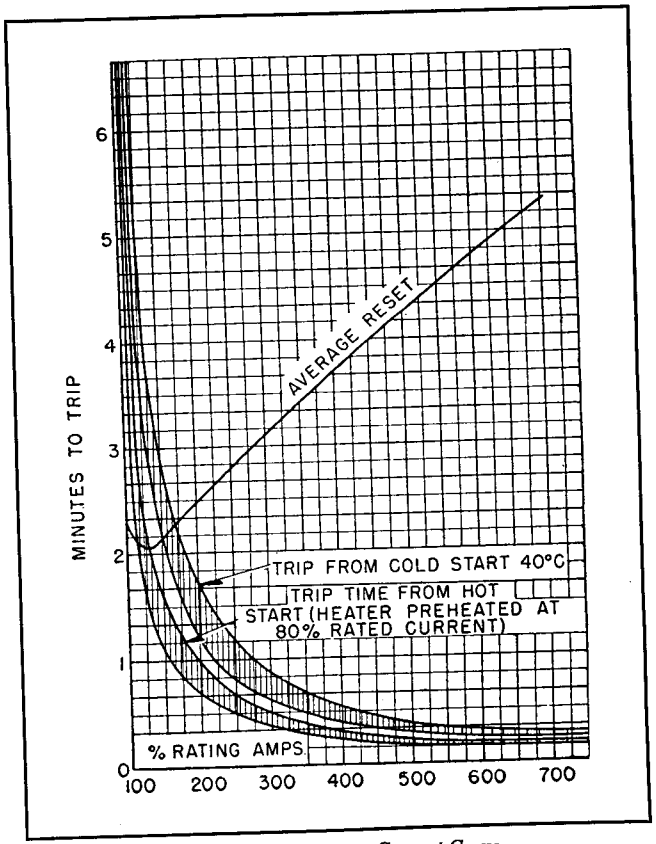


*FIG. 2. Average Time Current Curve.*

DECEMBER, 1953

NEW INFORMATION

*Trade-Mark

## HEATER APPLICATION TABLE

| HEATERS | | OPEN TABLE 25.5 I.S. 10798 | | ENCLOSED TABLE 26.5 I.S. 10799 | |
|---|---|---|---|---|---|
| CODE MARKING | STYLE NUMBER | FULL LOAD CURRENT OF MOTOR (Amperes) Max. 125% Overload Protection | CURRENT RATING AT 40°C ROOM TEMPERATURE (Amperes) | FULL LOAD CURRENT OF MOTOR (Amperes) Max. 125% Overload Protection | CURRENT RATING AT 40°C ROOM TEMPERATURE (Amperes) |
| CA | 1597 771 | 76.0 to 85.4 | 95 | 74.4 to 83.9 | 93 |
| CB | 1597 772 | 85.5 to 95.9 | 107 | 84.0 to 93.4 | 105 |
| CC | 1597 773 | 96.0 to 108 | 120 | 93.5 to 104 | 117 |
| CD | 1597 774 | 109 to 124 | 137 | 105 to 120 | 133 |
| CE | 1597 775 | 125 to 140 | 157 | 121 to 136 | 152 |
| CF | 1597 776 | 141 to 156 | 177 | 137 to 152 | 172 |
| CG | 1597 777 | 157 to 173 | 197 | 153 to 168 | 192 |
| CH | 1597 778 | 174 to 188 | 218 | 169 to 185 | 212 |
| CI | 1597 779 | 189 to 205 | 237 | 186 to 199 | 233 |
| CJ | 1597 780 | 206 to 229 | 257 | 200 to 211 | 250 |
| CG, CG | 1745 083 | 230 to 259 | 287 | 212 to 239 | 265 |
| CH, CH | 1745 084 | 260 to 282 | 325 | 240 to 259 | 300 |
| CI, CI | 1745 085 | 283 to 308 | 354 | 260 to 282 | 325 |

the flow of heat from the heater causes an adjacent convex bi-metallic disc at a definite temperature to suddenly snap, reversing its convexity. The movement of the disc opens double-break silvered contacts connected in series with the operating coil of the contactor, and thus disconnects the power from the load. Once the heater and bi-metallic disc cool sufficiently, the disc will snap back to its original shape. The contacts are now free to close, except for action of a push-rod. The relay may be set for one of three push-rod actions, "Auto", "Hand", and "No Stop". A marked slide controls the action of the push-rod.

When the slide is in the "Hand" position at the time the bi-metal snaps open the contacts, the "Reset-Stop" push-rod moves to engage and retain the contacts in the open position. After the disc has cooled, the push-rod may be depressed to reset the contacts to the closed position. The push-rod may also serve as a stop button by depressing it further to open the contacts.

The "No Stop" position of the slide is similar to the "Hand" position except that a projection now prevents the push-rod from being depressed as a stop button.

When the slide is in the "Auto" (Automatic) position, the push-rod is prevented from holding the contacts in the open position; hence, when the disc cools off, the contacts will automatically close and re-energize the circuits. The push-rod again may serve as a stop button.

### INSTALLATION

The heater is supplied separately, and is to be mounted as indicated in Fig. 1.

Set the slider at "Auto", "Hand", or "No Stop", as desired. DO NOT use the "No Stop" setting if the push-rod is to be used as part of a built-in or local stop button.

All connections must be clean and tight.

For relay without main terminals, order Style No. 1776 902.

### HEATERS

Each heater is identified by a code marking stamped on one terminal near the mounting hole. The Heater Application Table indicates the range of full load motor current to which a given heater may be applied on a Size 5 Life-Linestarter. This range is so selected that the current to produce ultimate tripping of the relay will be approximately 115 to 125 percent of the rated motor current.

These tables are based on motors having 40-degree C continuous ratings. For 50 or 55-degree C motors, select heaters approximately one size smaller, but always with a rating higher than the full load motor amperes. When the room temperature surrounding the motor exceeds that at the starter, assume a decreased motor current of one percent for each degree C difference in temperature and select heaters accordingly. When the room temperature at the starter exceeds that at the motor, assume an increased motor current of one percent for each degree C difference in temperature and select heaters accordingly.

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