Class RP 23315 *Westinghouse Electric & Manufacturing Company* *I. L. 1826
INSTRUCTIONS AND RENEWAL PARTS DATA
MOTOR APPARATUS
January, 1931

TYPE TA-3 THERMAL OVERLOAD RELAY

INSTRUCTIONS

Construction

The type "TA-3" Thermal overload relay makes use of bimetallic elements to break a circuit when an overload occurs. It has been designed in two sizes to obtain different ranges of current ratings. The relay with bimetal strips .030" thick is used in connection with heaters rated from 1 to 40 amperes. The relay with bimetal strips .040" thick is used in connection with heaters rated from 41 to 95 amperes to give ratings from 41 to 170 amperes.

Installation

To Mount Heaters—To mount heaters (see Fig. 1), remove screws and washers from the heater supports. Place heater so that the U opening straddles the bimetal strip and heater lugs rest on heater supports. Replace washers and screws, and adjust heater to give $\frac{1}{32}$" to $\frac{1}{16}$" clearance between heater and bimetal. Do not bend or change position of bimetal in any way as this will alter the rating.

Heater screws must be kept tight. Periodic inspection is advised to keep these heater screws tight at all times.

Rating

The relay will operate in both A-C. and D-C. circuits up to 600 volts with current ratings from 1 to 170 amperes.

When used in air temperatures that are much different from 40°C., a slight adjustment of the calibration lever will be necessary.

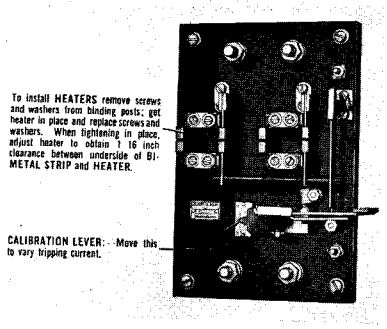


FIG. 1—TYPE TA-3 THERMAL OVERLOAD RELAY SHOWING HOW HEATERS ARE INSTALLED

Heaters

The rating stamped on the heater is the current that will trip the relay in 15 to 20 minutes at 40°C. air temperature. The heater rating should be 115% to 130% of the motor rating. The relay rating may be varied from 80% to 120% of the value stamped on the heater by moving the calibration lever along the calibration scale. If a change in rating greater than 20% is desired, other heaters may easily be applied.

When ratings above 95 amperes are desired two heaters are used in parallel on each pole of the relay. One of the two heaters provides heat for the bimetal while the other serves as a shunt so the relay will pass approximately twice the rating of a single heater. Similar heaters are always used in parallel and will give a relay rating of approximately 180% of the heater rating.

It is desirable to have relay heaters of such a size that relay **will trip at as near to 80% setting** on the desired overload as possible.

Operation

Heaters are located in the circuit leading to the motor and are in close proximity to bimetal strips. When heated, one side of the bimetal strip expands more than the other causing the strip to curl or bend. The movement of the bimetal is transmitted through the push rod to the free end of the latch arm which holds the relay contacts closed. When the latch arm is raised a certain amount, the end falls through an opening in the reset lever, allowing the reset lever to be moved quickly to the left. The contact finger is thus moved away from the stationary contact, breaking the control circuit. Normal motor current passing through the heater will not generate sufficient heat to cause the bimetal to bend enough to trip the relay, but an overload of appreciable duration will cause the bending necessary to trip the latch arm.

A definite period of time is required for the relay to trip depending on the magnitude of the overload. The greater the overload the shorter the time. This time delay is sufficient to allow the motor to be started with the relay in the circuit, but with sustained overload the relay will trip. A shorter time must elapse before the relay can be reset after an overload trip has occurred. The curve (Fig. 2) shows these characteristics.

If relay trips too frequently, the calibrating lever should be set at a higher point on the scale. If the motor is overloaded too heavily without a trip, the lever should be set at a lower point.

To Reset Relay After Overload Trip—To reset by hand, move the reset lever to the right until latch arm falls out of hole in reset lever. At the same time the contact on the right is closed and is held so by the latch arm.

No oiling or attention is necessary except to reset when an overload trip occurs.

The relay will not protect the motor from short-circuit. **Fuses must be used having a current rating equal to four times the full load current of the motor.**

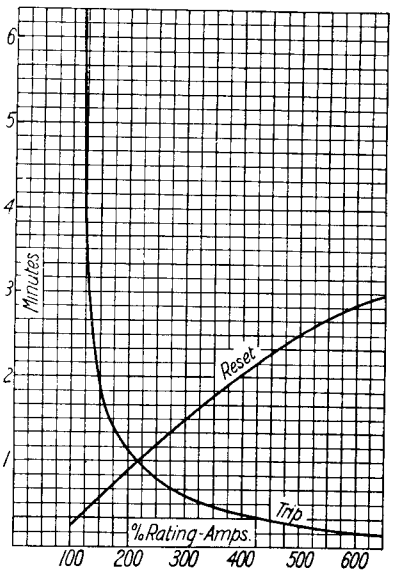
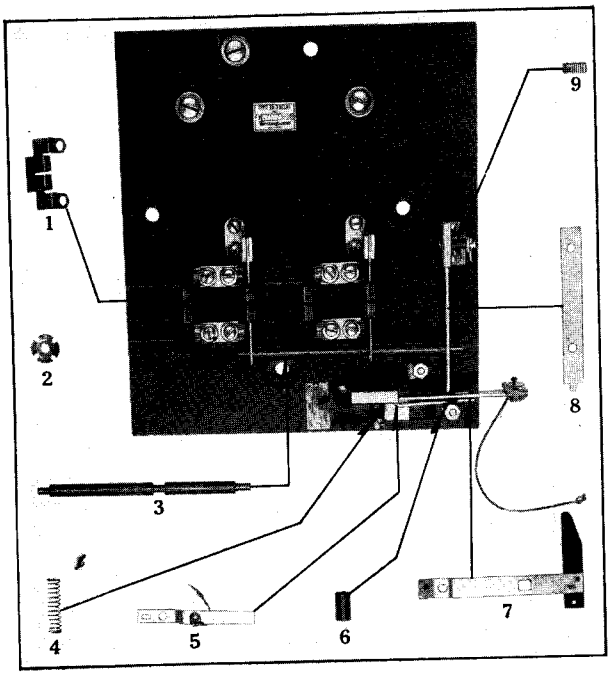


FIG. 2—28°C. AMBIENT TEMPERATURE READINGS TAKEN AT 5-MINUTE INTERVALS FROM RESET

*To be filed as an Instruction Leaflet and as a Renewal Parts Data; for Renewal Parts Data, see reverse side of this sheet.

TYPE TA-3 THERMAL OVERLOAD RELAY
RENEWAL PARTS DATA



Below 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 shut-downs 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 name plate reading. State whether shipment is desired by express, freight or by 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 one dollar, as order-handling and shipping expenses prevent us from billing a smaller amount.

RECOMMENDED STOCK OF RENEWAL PARTS

Style Numbers of Relays 571272, 571273, 711129, 711901

Ref. No.	Name of Party	No. Per Unit	1 Recommended	5 for Stock	Style Number of Part
1	†Heater	2	2	4	†
2	Spring Washer (Back of Panel)	1	0	0	496878
3	Latch Push Rod	1	0	0	575162
4	Contact Finger Spring	1	0	1	526597
5	Contact Finger With Shunt	1	1	2	490053
6	Stationary Contact	1	1	2	467961
7	Reset Lever	1	0	0	490051
8	Latch Arm	1	0	0	478776
9	Latch Spring	1	0	0	485926

†When ordering Heaters, specify style number obtained from table of recommended Heater ratings.

RELAY HEATER RATINGS AND STYLE NUMBERS

Heater Rating	Relay Style No.		Heater Rating	Relay Style No.	
1 to 40 Amperes	571272	(Used on Auto Starters)	1 to 40 Amperes	711901	(Used on Control Panels)
41 to 170 Amperes	571273	(Used on Auto Starters)	41 to 170 Amperes	711129	(Used on Control Panels)

Recommended Heater Ratings for Type TA-3 Relays
(Based on Terminal Current Marked on Motor Name Plate)

Motor Amps. per Terminal	Relay Rating Amps.	Heater Style No. 2 Req'd.	Relay Style No.
.70 to .90	1.0	511342	571272 and 711901
.91 to 1.20	1.4	511341	
1.21 to 1.45	1.7	511263	
1.46 to 1.65	1.9	511264	
1.66 to 1.80	2.1	511265	
1.81 to 2.00	2.3	511261	
2.01 to 2.25	2.6	511262	
2.26 to 2.7	3.1	551944	
2.71 to 3.10	3.6	551941	
3.15 to 3.65	4.2	551942	
3.70 to 4.10	4.7	551943	
4.20 to 4.90	5.7	551937	
5.00 to 5.80	6.7	551938	
5.90 to 6.70	7.7	551939	
6.80 to 7.30	8.4	551940	
7.40 to 7.80	9.0	511343	
7.90 to 9.50	11.0	474419	
9.60 to 11.00	13.0	474420	
11.10 to 13.00	15.0	474421	
13.10 to 14.5	17.0	474422	

Motor Amps. per Terminal	Relay Rating Amps.	Heater Style No. 2 Req'd.	Relay Style No.
14.60 to 17.50	20.0	502915	571272 and 711901
17.60 to 20.0	23.	474425	
20.1 to 22.	26.	474426	
22.1 to 25.	29.	474427	
25.1 to 27.	32.	501695	
27.1 to 31.	36.	474429	
31.1 to 35.	40.	474431	
32. to 35.	41.	501694	571273 and 711129
42.1 to 50.	58.	474432	
50.1 to 58.	68.	474433	
58.1 to 62.	71.	474434	
62.1 to 70.	81.	474436	
70.1 to 83.	95.	539018	

Heater Rating Amps.	Relay Rating Amps.	4 Req'd	
84 to 91	58 104	474432	571273 and 711129
92 to 106	68 120	474433	
107 to 112	71 128	474434	
113 to 126	81 144	474436	
127 to 150	95 170	539018	

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