TYPE MW MOTOR WATCHMAN THERMAL OVERLOAD RELAY
INSTRUCTIONS

Application

The type MW Thermal Overload Relay employs an electrically heated bimetallic disc to open a pair of contacts in the coil circuit of a contactor for the disconnection of power on the occurrence of an overload. Heating of the disc is accomplished by a heating element connected directly in the circuit to be protected. With a proper choice of heaters, the relay may be used on a-c. or d-c. circuits of from 0.5 to 28 amperes at not more than 600 volts. The contacts will carry and break coil currents up to 1 ampere in an a-c. circuit and 50 volt-amperes at a maximum of 1 ampere in a d-c. circuit.

The relay will provide protection against abnormal load conditions to current values exceeding locked rotor current. 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, by a time limit circuit breaker set at not more than four times the rated motor current or by an instantaneous trip circuit breaker.

Construction and Operation

The thermostatic element is a bi metallic disc which suddenly reverses its convexity when it is heated to a given temperature. This acts to separate the double-break silver-plated contacts, and initiates the movement of a reset rod which latches the relay contacts in this position until manually reset. After the disc has cooled sufficiently to resume its normal convexity, resetting may be accomplished by depressing the reset rod.

Under normal operating conditions the reset rod may be used as a spring-returned stop button, separating the relay contacts when fully depressed.

In case automatic resetting of the relay is desired it is necessary only to remove the reset rod. This is accomplished by deflecting the contact spring until clearance is provided for withdrawing the rod.

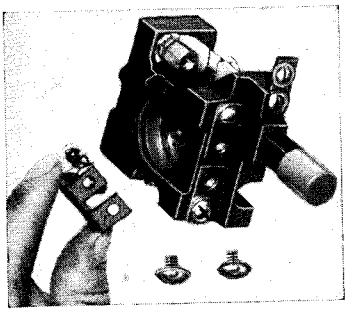
The time required for the relay to trip depends upon the size of the overload, the greater the overload the shorter being the time to trip. This is indicated in the Time Characteristic Curve, Fig. 3, of a relay operating in a 40°C. ambient temperature. The curve applies in general when the relay is operated in any ambient temperature as long as the currents are expressed in percentages of the heater rating at that ambient temperature.

The performance of the relay is such that it will allow motor starting currents to flow during the starting period, but will trip when subjected to smaller but long-continued overloads. A short time must elapse before the relay can be reset.

Installation and Maintenance

The Heater, with its mounting screws, is supplied separately, and is to be mounted as indicated in Fig. 1. **Contact surfaces must be clean and all connections tight.** Periodic inspection is recommended.

No oiling of relay parts is required.



Mount heater with loop shaped portion within cup recess.

FIG. 1—THERMAL OVERLOAD RELAY SHOWING HOW HEATER IS INSTALLED

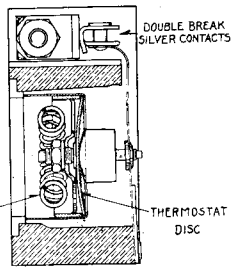


FIG. 2—SECTIONAL VIEW TYPE MW OVERLOAD RELAY WITH RESET ROD REMOVED

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. This range is so selected that the current to produce ultimate tripping of the relay will be between 110% and 125% of the rated motor current.

The current rating of the relay (see Table No. 1) is based on an ambient temperature of 40°C. Standard motor ratings are also based on an ambient temperature of 40°C. For protection of the motor when it and the relay are operated in a common ambient temperature, heaters should be applied according to Heater Table No. 1.

Confining the relay in a small space, such as a starter cabinet, with other apparatus which dissipates heat will raise its ambient temperature, affecting thereby its tripping value. Heater Table No. 2 is for use when the temperature of the air within the cabinet and immediately surrounding the relay is 15°C. above the ambient temperature in which the motor is applied. Heater Table No. 3 is to be used when this temperature difference is 30°C.

Renewal Parts

Type MW Overload Relay Complete ..... S# 972879
Reset push rod ..... S# 899862
Push rod coil spring ..... S# 899855

HEATER APPLICATION TABLE

Heater Style Number	Heater Code Marking	Full Load Current of Motor — Table No. 1 Relay Ambient Same as Motor Ambient	Table No. 2 Relay Ambient 15° C. Above Motor Ambient	Table No. 3 Relay Ambient 30° C. Above Motor Ambient
966 465	AA	.72 to .79	.63 to .71	.55 to .62
966 466	AB	.80 to .89	.72 to .79	.63 to .71
966 467	AC	.90 to .99	.80 to .89	.72 to .79
966 468	AD	1.00 to 1.04	.90 to .99	.80 to .89
966 469	AE	1.05 to 1.18	1.00 to 1.04	.90 to .99
966 470	AF	1.19 to 1.32	1.05 to 1.18	1.00 to 1.04
966 471	AG	1.33 to 1.49	1.19 to 1.32	1.05 to 1.18
966 472	AH	1.50 to 1.71	1.33 to 1.49	1.19 to 1.32
966 473	AI	1.72 to 1.89	1.50 to 1.71	1.33 to 1.49
966 474	AK	1.90 to 2.09	1.72 to 1.89	1.50 to 1.71
966 475	AL	2.10 to 2.35	1.90 to 2.09	1.72 to 1.89
966 476	AM	2.36 to 2.65	2.10 to 2.35	1.90 to 2.09
966 477	AN	2.66 to 2.98	2.36 to 2.65	2.10 to 2.35
966 478	AO	2.99 to 3.35	2.66 to 2.98	2.36 to 2.65
966 479	AP	3.36 to 3.75	2.99 to 3.35	2.66 to 2.98
966 480	AR	3.76 to 4.21	3.36 to 3.75	2.99 to 3.35
966 481	AS	4.22 to 4.71	3.76 to 4.21	3.36 to 3.75
966 482	AT	4.72 to 5.33	4.22 to 4.71	3.76 to 4.21
966 483	AU	5.34 to 5.94	4.72 to 5.33	4.22 to 4.71
966 484	AW	5.95 to 6.63	5.34 to 5.94	4.72 to 5.33
966 485	AX	6.64 to 7.52	5.95 to 6.63	5.34 to 5.94
966 486	AY	7.53 to 8.51	6.64 to 7.52	5.95 to 6.63
966 487	AZ	8.52 to 9.31	7.53 to 8.51	6.64 to 7.52
966 488	BA	9.32 to 10.5	8.52 to 9.31	7.53 to 8.51
966 489	BB	10.6 to 11.5	9.32 to 10.5	8.52 to 9.31
966 490	BC	11.6 to 12.4	10.6 to 11.5	9.32 to 10.5
966 491	BD	12.5 to 13.4	11.6 to 12.4	10.6 to 11.5
966 492	BE	13.5 to 14.9	12.5 to 13.4	11.6 to 12.4
966 493	BF	15.0 to 17.5	13.5 to 14.9	12.5 to 13.4
966 494	BG	17.6 to 18.2	15.0 to 17.5	13.5 to 14.9
966 495	BH	18.3 to 19.0	17.6 to 18.2	15.0 to 17.5
966 496	BI	19.1 to 20.5	18.3 to 19.0	17.6 to 18.2
966 497	BK	20.6 to 22.6	19.1 to 20.5	18.3 to 19.0
966 498	BL	22.7 to 24.9	20.6 to 22.6	19.1 to 20.5
966 499	BM	25.0 to 28.4	22.7 to 25.8	20.6 to 23.3

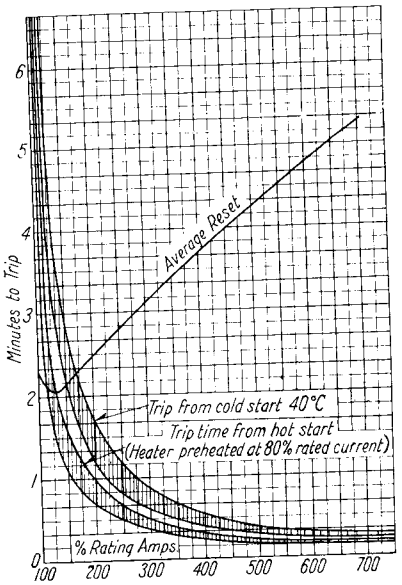


FIG. 3—AVERAGE TIME CURRENT CURVE

Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.

Printed in U.S.A. (Rev. 8-36)

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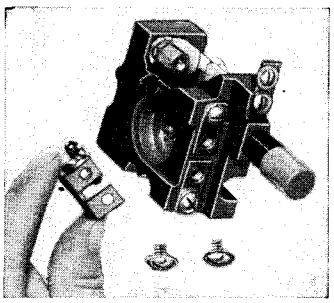

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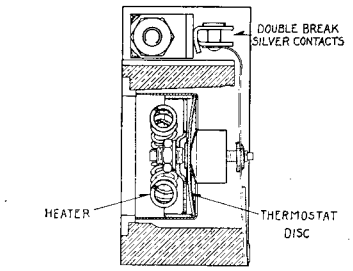

FIG. 2—SECTIONAL VIEW TYPE MW OVERLOAD RELAY WITH RESET ROD REMOVED

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966 466-B	AB .82	0.80 to 0.89	0.72 to 0.79	0.63 to 0.71
966 467-B	AC .93	0.90 to 0.99	0.80 to 0.89	0.72 to 0.79
966 468-B	AD 1.0	1.00 to 1.04	0.90 to 0.99	0.80 to 0.89
966 469-B	AE 1.1	1.05 to 1.18	1.00 to 1.04	0.90 to 0.99
966 470-B	AF 1.2	1.19 to 1.32	1.05 to 1.18	1.00 to 1.04
966 471-B	AG 1.4	1.33 to 1.49	1.19 to 1.32	1.05 to 1.18
966 472-B	AH 1.5	1.50 to 1.71	1.33 to 1.49	1.19 to 1.32
966 473-B	AI 1.7	1.72 to 1.89	1.50 to 1.71	1.33 to 1.49
966 474-B	AK 1.9	1.90 to 2.09	1.72 to 1.89	1.50 to 1.71
966 475-B	AL 2.1	2.10 to 2.35	1.90 to 2.09	1.72 to 1.89
966 476-B	AM 2.5	2.36 to 2.65	2.10 to 2.35	1.90 to 2.09
966 477-B	AN 2.7	2.66 to 2.98	2.36 to 2.65	2.10 to 2.35
966 478-C	AO 3.0	2.99 to 3.35	2.66 to 2.98	2.36 to 2.65
966 479-C	AP 3.4	3.36 to 3.75	2.99 to 3.35	2.66 to 2.98
966 480-C	AR 3.8	3.76 to 4.21	3.36 to 3.75	2.99 to 3.35
966 481-B	AS 4.3	4.22 to 4.71	3.76 to 4.21	3.36 to 3.75
966 482-C	AT 4.8	4.72 to 5.33	4.22 to 4.71	3.76 to 4.21
966 483-C	AU 5.4	5.34 to 5.94	4.72 to 5.33	4.22 to 4.71
966 484-C	AW 6.1	5.95 to 6.63	5.34 to 5.94	4.72 to 5.33
966 485-C	AX 6.8	6.64 to 7.52	5.95 to 6.63	5.34 to 5.94
966 486-C	AY 7.7	7.53 to 8.51	6.64 to 7.52	5.95 to 6.63
966 487-B	AZ 8.5	8.52 to 9.31	7.53 to 8.51	6.64 to 7.52
966 488-C	BA 9.6	9.32 to 10.5	8.52 to 9.31	7.53 to 8.51
966 489-B	BB 11.	10.6 to 11.5	9.32 to 10.5	8.52 to 9.31
966 490-B	BC 12.	11.6 to 12.4	10.6 to 11.5	9.32 to 10.5
966 491-B	BD 13.	12.5 to 13.4	11.6 to 12.4	10.6 to 11.5
966 492-C	BE 14.	13.5 to 14.9	12.5 to 13.4	11.6 to 12.4
966 493-D	BF 16.	15.0 to 17.5	13.5 to 14.9	12.5 to 13.4
966 494-C	BG 18.	17.6 to 18.2	15.0 to 17.5	13.5 to 14.9
966 495-C	BH 19.	18.3 to 19.0	17.6 to 18.2	15.0 to 17.5
966 496-C	BI 21.	19.1 to 20.5	18.3 to 19.0	17.6 to 18.2
966 497-D	BK 23.	20.6 to 22.6	19.1 to 20.5	18.3 to 19.0
966 498-D	BL 25.	22.7 to 24.9	20.6 to 22.6	19.1 to 20.5
966 499-C	BM 27.	25.0 to 28.4	22.7 to 24.9	20.6 to 22.6
1 040 588	BN 29.	28.5 to 32.2	25.0 to 28.4	22.7 to 25.0
974 084-A	BO 31.	32.3 to 35.0	28.5 to 32.2	25.0 to 28.4
1 040 589	BR 36.	.....	32.3 to 35.0	28.5 to 32.2
1 040 590	BS 40.	.....	.....	32.3 to 35.0

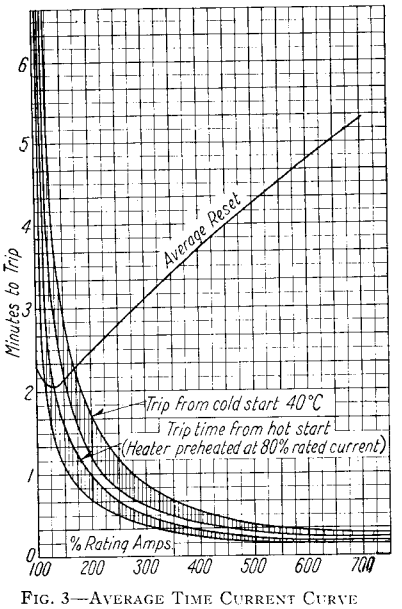

FIG. 3—AVERAGE TIME CURRENT CURVE

Westinghouse Electric & Manufacturing Company
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