I.L. 12476-C
FILING NO. 16-330

DESCRIPTION • OPERATION • MAINTENANCE

INSTRUCTIONS

TYPE MW-11 THERMAL OVERLOAD RELAY

TYPE MW-11 THERMAL OVERLOAD RELAY employs an electrically heated bi-metallic 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 0.49 to 40.0 amperes at not more than 600 volts. The relay contacts will carry and break currents in the contactor coil up to 2 amperes 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, or by a time limit circuit breaker set at not more than four times the rated motor current.

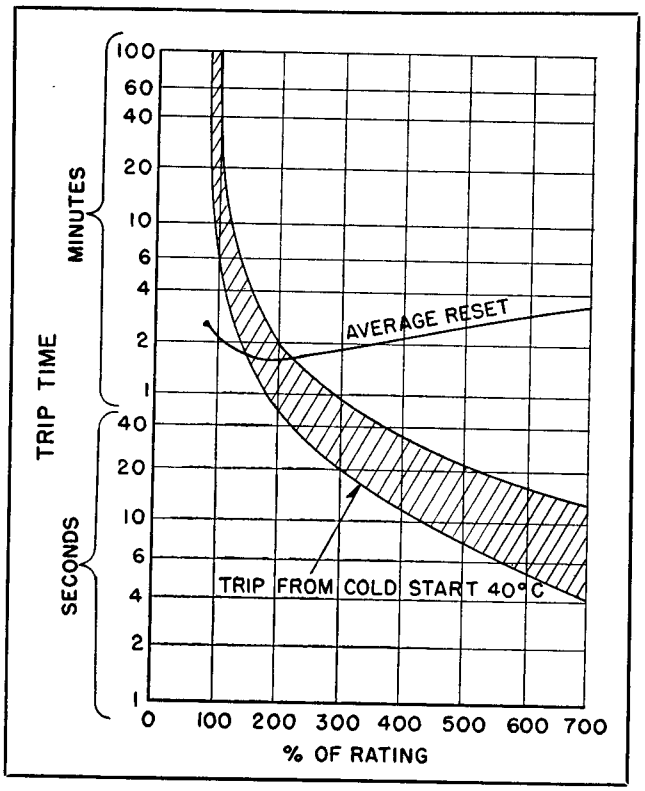

FIG. 2. Average Time Current Curve

CONSTRUCTION AND OPERATION

The overload relay is furnished set for Hand reset operation. The relay may be set for Automatic reset, Hand reset, or Hand reset with no manual means of opening the contacts. The type of operation is determined by the position of the control spring in the notched pushrod; the respective positions (as illustrated in Fig. 1) are indicated by "Auto", "Hand" and "No Stop". The positions are indicated as follows: "Hand", "No Stop" by alignment of spring arm with the ribs on the base, the "Auto" by the spring arm against the upper shoulder of the base. Automatic reset should not be used with two-wire master switch.

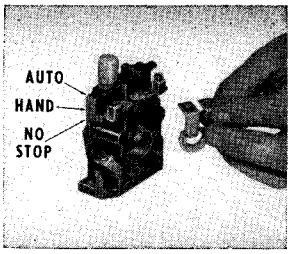

FIG. 1. Thermal Overload Relay, Showing Heater and Installation Method

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 contacts, and when the control spring is in the "Hand" position, initiates the movement of the reset rod which latches the relay contacts in the open position until manually reset. After the disc has cooled sufficiently to resume its normal convexity, resetting may be accomplished by depressing the reset rod.

When the control spring is in the "Auto" position the relay will reset automatically when sufficient time has elapsed for the thermostatic disc to cool sufficiently to snap back to its original position.

When the control spring is in the "Hand" or "Auto" position the reset rod may be used as a spring returned stop button. The relay contacts are opened when the reset rod is fully depressed.

These contacts cannot be opened by depressing the reset rod when the control spring is in the "No Stop" position.

The minimum tripping current changes with the ambient temperature in approximately the same ratio as the change in load capacity of the motor.

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°C. (104°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 rated current 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.

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 approximately 115% to 125% of the rated motor current.

The current rating of the relay (See Table A) 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 A for average applications. When the room temperature surrounding the motor exceeds that at the starter, assume a decreased motor current of 1% 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 1% for each degree C difference in temperature and select heaters accordingly.

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 Tables B and E are for use with enclosed starters when the ambient temperature within the cabinet and immediately surrounding the relay is above the ambient temperature in which the motor operates.

The Style No. of the complete relay is 48A3454G3.

HEATER APPLICATION TABLES

FOR SIZES 0, 1 AND 1½ LINESTARTERS

HEATER STYLE NUMBER	HEATER CODE MARKING	TABLE A — OPEN STARTERS 11200, 11210		TABLE B — ENCLOSED STARTERS 11203, 11204, 11206, 11210, 11213, 11214, 11216, 11230, 11950, 11200 (size 1½)		TABLE E — ENCLOSED STARTERS 11200 (sizes 0 & 1)	
		125% Overload Protection Full Load Current of Motor (Amperes) @ 40°C	Heater Current Rating (Amperes) @ 40°C	125% Overload Protection Full Load Current of Motor (Amperes) @ 40°C	Heater Current Rating (Amperes) @ 40°C	125% Overload Protection Full Load Current of Motor (Amperes) @ 40°C	Heater Current Rating (Amperes) @ 40°C
1129 372	X .49	.48 to .51	.59	.46 to .50	.57	.44 to .48	.55
1129 373	Y .55	.52 to .58	.65	.51 to .55	.63	.49 to .54	.61
1129 374	Z .63	.59 to .66	.73	.56 to .63	.70	.55 to .62	.68
966 465	AA .71	.67 to .75	.83	.64 to .71	.80	.63 to .70	.78
966 466	AB .82	.76 to .82	.94	.72 to .79	.90	.71 to .77	.88
966 467	AC .93	.83 to .94	1.03	.80 to .91	1.00	.78 to .88	.97
966 468	AD 1.0	.95 to 1.07	1.18	.92 to 1.03	1.14	.89 to 1.00	1.11
966 470	AF 1.2	1.08 to 1.22	1.35	1.04 to 1.17	1.30	1.01 to 1.14	1.26
966 471	AG 1.4	1.23 to 1.36	1.53	1.18 to 1.31	1.47	1.15 to 1.27	1.43
966 472	AH 1.5	1.37 to 1.51	1.71	1.32 to 1.45	1.64	1.28 to 1.41	1.59
966 473	AI 1.7	1.52 to 1.71	1.90	1.46 to 1.63	1.82	1.42 to 1.59	1.77
966 474	AK 1.9	1.72 to 1.91	2.14	1.64 to 1.83	2.05	1.60 to 1.78	1.99
966 475	AL 2.1	1.92 to 2.18	2.40	1.84 to 2.08	2.30	1.79 to 2.02	2.23
966 476	AM 2.5	2.19 to 2.40	2.73	2.09 to 2.30	2.61	2.03 to 2.23	2.53
966 477	AN 2.7	2.41 to 2.63	3.01	2.31 to 2.49	2.88	2.24 to 2.42	2.79
966 478	AO 3.0	2.64 to 2.90	3.29	2.50 to 2.74	3.12	2.43 to 2.66	3.03
966 479	AP 3.4	2.91 to 3.27	3.63	2.75 to 3.10	3.43	2.67 to 3.01	3.33
966 480	AR 3.8	3.28 to 3.71	4.10	3.11 to 3.50	3.88	3.02 to 3.41	3.77
966 481	AS 4.3	3.72 to 4.14	4.65	3.51 to 3.92	4.39	3.42 to 3.80	4.27
966 482	AT 4.8	4.15 to 4.66	5.19	3.93 to 4.42	4.91	3.81 to 4.28	4.76
966 483	AU 5.4	4.67 to 5.28	5.84	4.43 to 5.00	5.54	4.29 to 4.82	5.35
966 484	AW 6.1	5.29 to 5.98	6.61	5.01 to 5.66	6.26	4.83 to 5.48	6.04
966 485	AX 6.8	5.99 to 6.84	7.48	5.67 to 6.48	7.09	5.49 to 6.30	6.85
966 486	AY 7.7	6.85 to 7.88	8.56	6.49 to 7.48	8.10	6.31 to 7.28	7.88
966 487	AZ 8.5	7.89 to 8.63	9.85	7.49 to 8.15	9.35	7.29 to 7.93	9.10
966 488	BA 9.6	8.64 to 9.75	10.8	8.16 to 9.19	10.2	7.94 to 8.95	9.92
966 489	BB 11	9.76 to 10.7	12.2	9.20 to 10.2	11.5	8.96 to 9.83	11.2
966 490	BC 12	10.8 to 12.0	13.5	10.3 to 11.3	12.8	9.84 to 11.0	12.3
966 491	BD 13	12.1 to 13.3	15.1	11.4 to 12.5	14.2	11.1 to 12.0	13.8
966 493	BF 16	13.4 to 14.7	16.7	12.6 to 13.7	15.7	12.1 to 13.2	15.1
966 494	BG 18	14.8 to 15.9	18.4	13.8 to 14.9	17.2	13.3 to 14.4	16.6
966 495	BH 19	16.0 to 17.2	20.0	15.0 to 16.3	18.7	14.5 to 15.5	18.1
966 496	BI 21	17.3 to 18.7	21.6	16.4 to 17.5	20.4	15.6 to 16.9	19.5
966 497	BK 23	18.8 to 20.1	23.5	17.6 to 18.8	22.0	17.0 to 18.0	21.2
FOR SIZE 0 USE ABOVE HEATERS, CODE X THRU BK							
966 498	BL 25	20.2 to 21.6	25.2	18.9 to 20.2	23.6	18.1 to 19.4	22.6
966 499	BM 27	21.7 to 24.1	27.1	20.3 to 22.4	25.3	19.5 to 21.5	24.3
974 084	BO 31	24.2 to 26.7	30.2	22.5 to 24.9	28.1	21.6 to 23.8	27.0
301 P138G01	BP 32	26.8 to 29.6	33.5	25.0 to 27.7	31.2	23.9 to 26.5	29.8
301 P139G01	BQ 35	29.7 to 32.4	37.1	27.8 to 29.9	34.7	26.6 to 29.0	33.2
FOR SIZE 1 USE ABOVE HEATERS, CODE X THRU BQ							
1040 589	BR 36	32.5 to 35.9	40.6	30.0 to 33.0	37.5		
1040 590	BS 40	36.0 to 40.0	45.0	33.1 to 37.0	41.4		
FOR SIZE 1½ USE ABOVE HEATERS, CODE X THRU BS							

Note: Use Next Lower Code No. Heater for 115% Protection.

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BEAVER PLANT • STANDARD CONTROL DIVISION • BEAVER, PA.
(Rep. 8-66) Printed in U.S.A.