

NEW

TYPE DnW "DE-ION" MOTOR WATCHMAN

Manual Motor Starter for A-C. Motors

1 and 3 Phase

1/8 to 7 1/2 Hp.

110 to 600 Volts

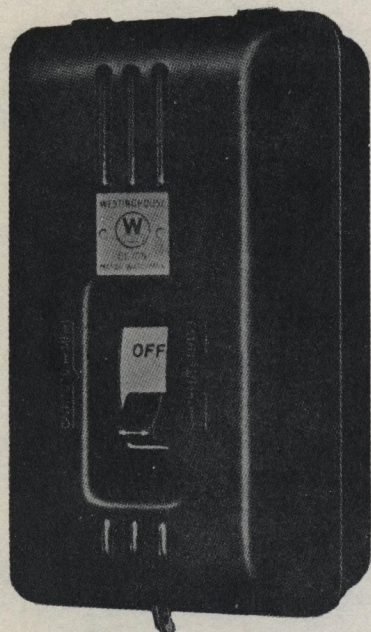


FIG. 1—TYPE DnW "DE-ION" MOTOR WATCHMAN IN STANDARD SURFACE ENCLOSURE

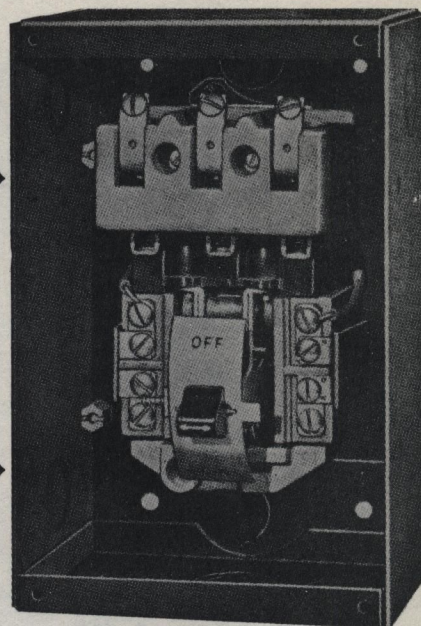


FIG. 2—SIZE 1 TYPE DnW "DE-ION" MOTOR WATCHMAN IN FLUSH ENCLOSURE WITH COVER REMOVED

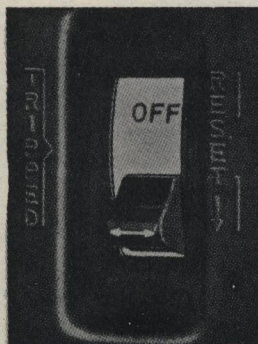
← Indicating Handle

"De-Ion" Arc Quenchers →

Bi-metallic Disc Overload →

DISTINCTIVE FEATURES

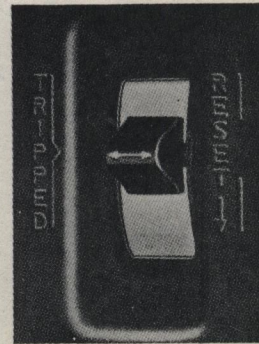
- "DE-ION" ARC QUENCHERS most effectively open circuit and save contacts from burning.
- QUICK-MAKE AND QUICK-BREAK TRIP-FREE toggle operating mechanism.
- POSITIVE INDICATION of all switch positions (On, Off, Tripped).
- BI-METALLIC DISC TYPE overload relay provides inverse time limit motor protection.
- NON-CARBONIZING, NON-WARPING, moisture-proof arc boxes and relays.
- SAFETY INTERLOCK prevents contact with live parts.
- DOUBLE BREAK silver to silver contacts eliminate necessity for flexible shunts.
- STRAIGHT THROUGH WIRING and easily accessible terminals.



OFF



ON



TRIPPED

FIG. 3—THE HANDLE INDICATES

Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.

Org. A, B, D, Y. Agent-Jobbers and Cust. A, X, Y, b, s, X, C.

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EVERY HOUSE NEEDS WESTINGHOUSE

TYPE DnW "DE-ION" MOTOR WATCHMAN—Continued

DISTINCTIVE FEATURES

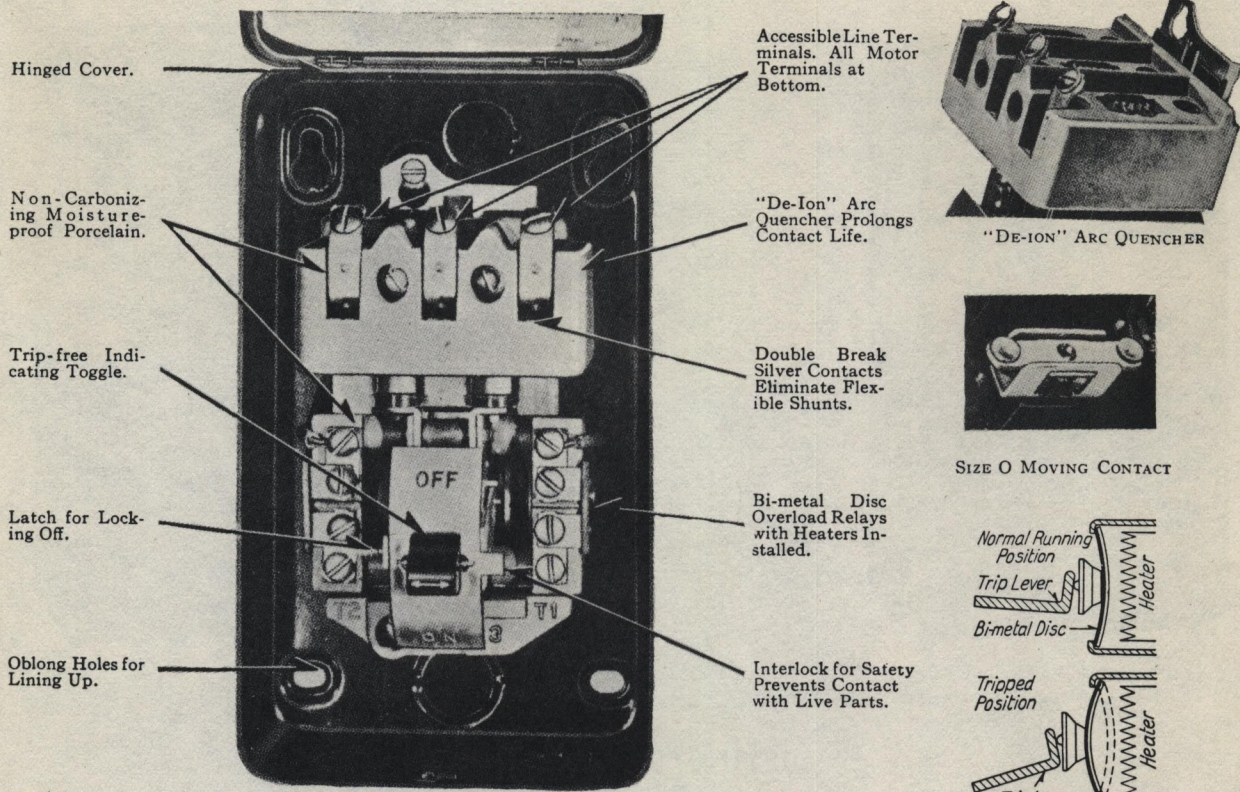


FIG. 4—"DE-ION" MOTOR WATCHMAN CLASS 10-100-SOA WITH HEATERS IN PLACE; SHOWING GENEROUS WIRING SPACE

APPLICATION

The "De-ion" Motor Watchman is a manually operated motor starter, designed for starting, stopping and protecting small single phase and polyphase A-C. motors driving looms, fans, pumps, machine tools, food machinery and many other industrial applications. It may also be used for small D-C. motors which may be started directly across the line.

110 to 600 Volts

Ratings and Nomenclature.

25 to 60 Cycles

MAXIMUM HORSEPOWER					CLASS NUMBER				
3 PHASE			1 PHASE		Standard Sheet Steel Enclosure NEMA Type I	Flush Type Steel Enclosure NEMA Type Ib	Water-Tight Dust-Tight Cast Iron Enclosure NEMA Types III, IV, V	For Hazardous Locations Class I Group D, Class II Group G NEMA Types VIII, IX	Switch Unit Without Enclosure
110 Volts	208-220 Volts	440-600 Volts	110 Volts	208-220 Volts					
1½	2	2	1	1½	10-100-SO	10-100-PO	10-100-WO	10-100-UO	10-100.O
1½	2	2	1	1½	*10-100-SOA	.....	.....	.....	.....
3	5	7½	1½	3	10-100-S1	10-100-P1	10-100-W1	10-100-U1	10-100.1

* Especially designed for loom motor service, a Size O switch in a Size 1 box.

TYPE DnW "DE-ION" MOTOR WATCHMAN—Continued

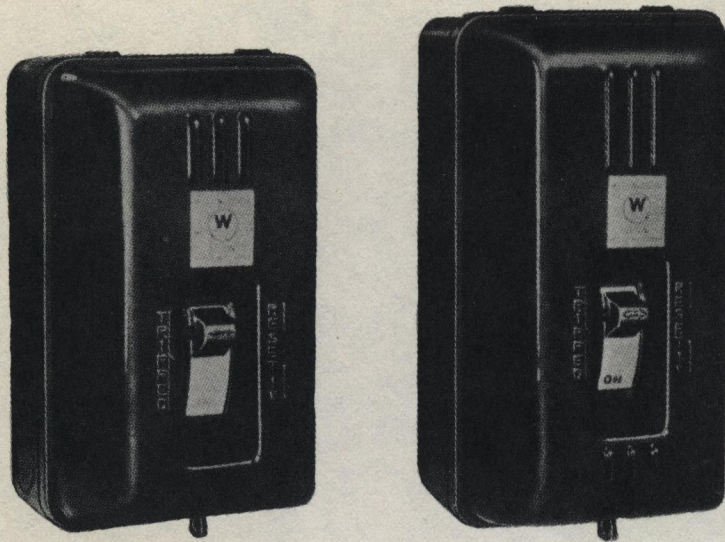


FIG. 5—SIZES 0 AND 1 "DE-ION" MOTOR WATCHMAN STARTERS IN STANDARD SURFACE ENCLOSURES

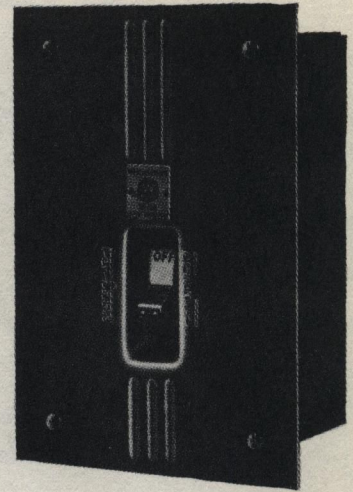


FIG. 6—FLUSH TYPE ENCLOSURE

● OPERATION

These starters are operated by means of a positive toggle mechanism that is:

1. Quick-make and quick-break.
2. Trip free on overload.
3. Indicating of all switch positions (on, off, tripped).
4. Capable of rapid and accurate inching operation.

● CONSTRUCTION

The switch unit is assembled on a rigid steel base. The toggle mechanism operates the moving contact assembly vertically, and is so easy yet positive in operation that rapid inching and accurate control of the machine is possible. The stationary contacts and the "De-ion" grids of the arc quencher are mount-

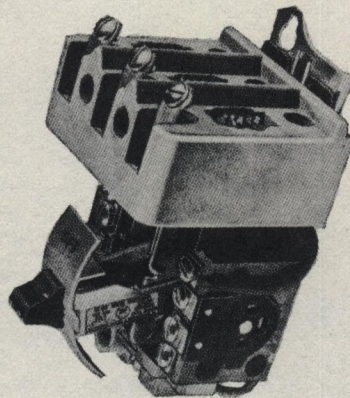


FIG. 7—SWITCH UNIT REMOVED FROM ENCLOSURE; HEATER IN PLACE

concave to convex form and trips a latch on the toggle mechanism, opening the switch.

The discs reset themselves when cooled, but the switch mechanism must be "reset" by moving the handle to the extreme "off" position, before the switch may be closed again. The handle cannot be held closed on overload.

The heaters are the same as those used on Size 0 and Size 1 magnetic **LINESTARTERS**; a great convenience when stocking or changing heaters.

Arc boxes and relays are moulded of grey porcelain which will neither absorb moisture, warp nor carbonize. All metal parts are cadmium plated or tinned to resist corrosion.

The switch unit mounts in any enclosure by only one screw at the top of the base. The lower end of the base is hooked into place over a projection in the back of the cabinet.

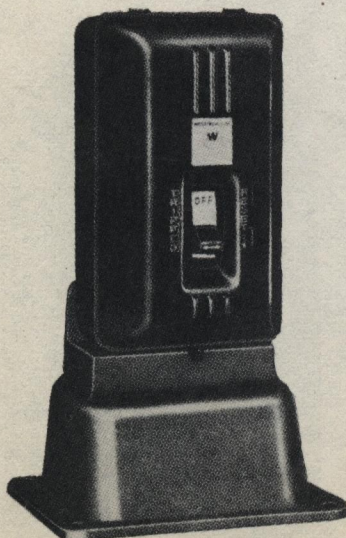


FIG. 8—"DE-ION" MOTOR WATCHMAN ON PEDESTAL

ed in porcelain arc boxes. All contacts are steel-backed silver buttons. Double break silver contacts—plus the "De-ion" arc quenchers—assure minimum contact burning, and eliminate the necessity for flexible shunts. Size 0 and Size 1 starters are similar except that the moving contact assembly of Size 1 starters has a magnetic loop (like Class 11-200-S1 **LINESTARTERS**) to accelerate the movement of the arc into the "De-ion" grids. This also requires a different arc box.

Overload protection is provided by two pre-formed **bi-metallic** disc relays, which operate independently with inverse time limit characteristics. These relays allow ample time in starting and for short peak loads, yet accurately protect the motor. The discs are heated by heaters in the motor circuit. When an overload causes the disc to reach tripping temperature, it snaps from

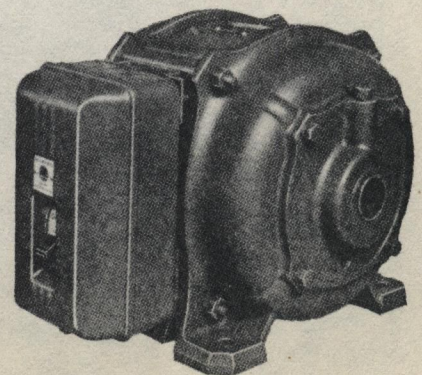


FIG. 9—"DE-ION" MOTOR WATCHMAN MOUNTED ON LOOM MOTOR

TYPE DnW "DE-ION" MOTOR WATCHMAN—Continued

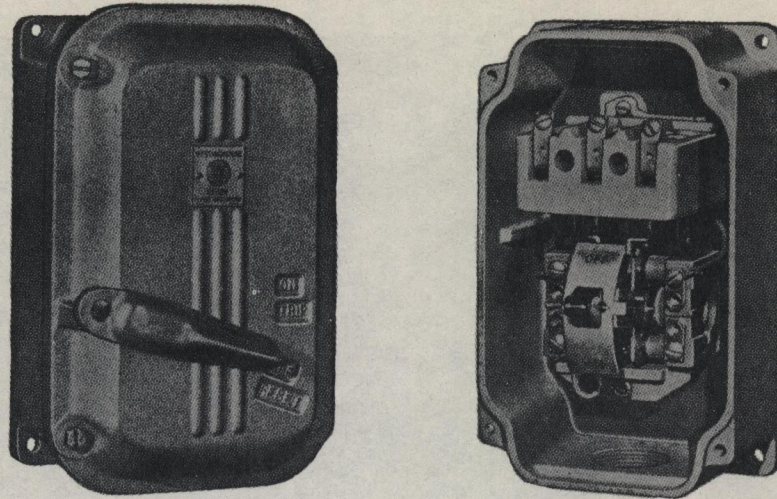


FIG. 10—WATER-TIGHT "DE-ION" MOTOR WATCHMAN

● ENCLOSURES

Standard steel enclosures (Type S, Fig. 5) have deep drawn covers, hinged at the top. The operating handle is recessed in the front of the cover, eliminating projecting pieces, and permitting close mounting in group installations. Keyhole mounting holes at the top and oblong holes at bottom of cabinet make mounting and lining up easy. Ample knockouts for conduit are provided in top, bottom and both sides; and in addition the Size OA and Size 1 switches have two knockouts in the back.

The cover is interlocked for safety so that it cannot be opened unless the switch is in the "off" position. A spring

latch holds the cover closed, and only one padlock is needed to lock both the switch off and the cover closed. A small latch on the switch unit may be swung into position and then the cover locked shut. Finish is baked black enamel.

Flush enclosures (Type P, Fig. 6) for mounting in a plastered wall, or in a recess in a machine casting, consist of a wide flanged flush plate and a folded steel box with an adjustable mounting plate for accurately lining up the switch unit. The box has knockouts in all four sides and is finished baked black enamel. The flush cover is finished in gray lacquer.

Water-tight and dust-tight (Type W, Fig. 10) enclosures are cast iron with tapped conduit holes and with a rubber gasket between cover and box. The

switch is operated by a handle on the front which is arranged for padlocking in the "off" position. Finish is weather-resisting aluminum paint and all hardware is corrosion resisting copper-alloy.

Explosion-protecting (Type U, Fig. 13) enclosures are cast-iron designed in accordance with the specifications of the Underwriters' Laboratories for Class I, Group D; Class II, Group G; or Class III or IV Hazardous Locations. Finish is weather-resisting aluminum paint, and all hardware is corrosion-resisting copper alloy.

For Textile Loom service special mountings are available either on the side or top of the special loom motor (Fig. 9) or on pedestals (Fig. 8) which are designed for floor mounting over a junction box.

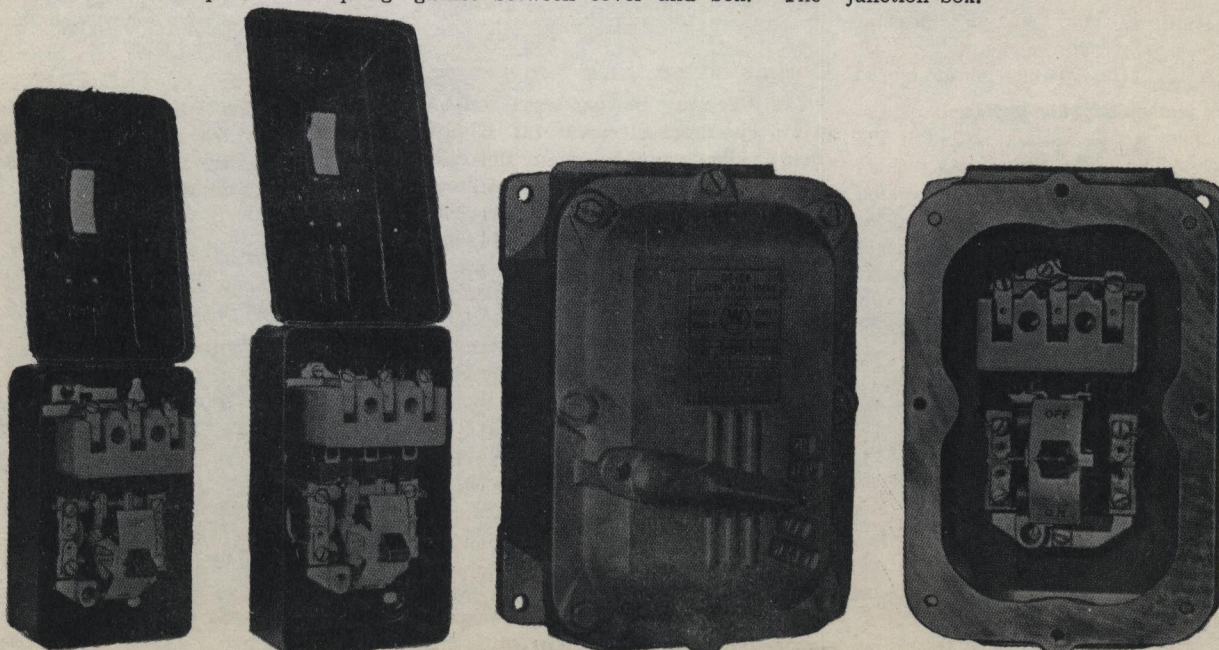


FIG. 11—SIZE O "DE-ION" MOTOR WATCHMAN

FIG. 12—SIZE 1 "DE-ION" MOTOR WATCHMAN

FIG. 13—"DE-ION" WATCHMAN FOR CLASS I GROUP D AND CLASS II GROUP G HAZARDOUS LOCATIONS

TYPE MW MOTOR WATCHMAN THERMAL OVERLOAD RELAY
www.SteamPoweredRadio.COM INSTRUCTIONS

Application

The type MW 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 .49 to 40 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. Con-

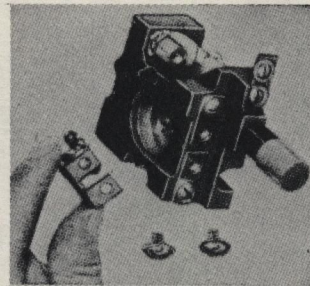


FIG. 1—THERMAL OVERLOAD RELAY SHOWING HOW HEATER IS INSTALLED

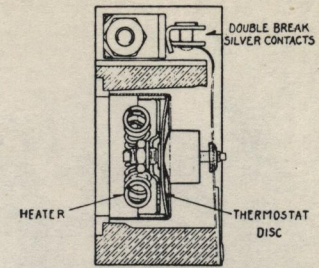


FIG. 2—SECTIONAL VIEW TYPE MW OVERLOAD RELAY WITH RESET ROD REMOVED

tact 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 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 for average applications.

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
1 129 372	X .49	0.50 to 0.54	0.44 to 0.49	0.39 to 0.43
1 129 373	Y .55	0.55 to 0.62	0.50 to 0.54	0.44 to 0.49
1 129 374	Z .63	0.63 to 0.71	0.55 to 0.62	0.50 to 0.54
966 465-B	AA .71	0.72 to 0.79	0.63 to 0.71	0.55 to 0.62
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

* For totally enclosed, splash-proof, drip-proof and all other continuous rated 50° and 55° motors, use one size smaller Heaters.

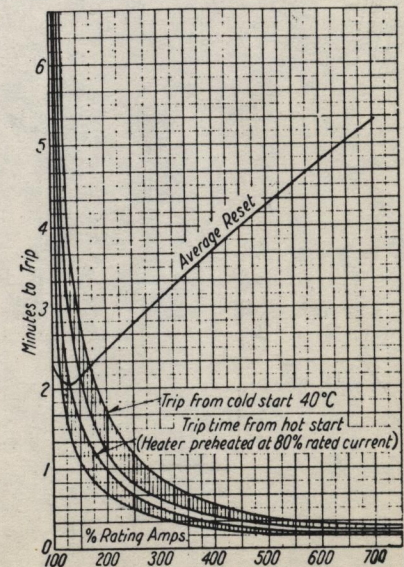


FIG. 3—AVERAGE TIME CURRENT CURVE

Westinghouse Electric & Manufacturing Company
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