

File E69543
Project 78ME7356

November 2, 1978

REPORT

on

COMPONENT - PROTECTORS, SUPPLEMENTARY

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Gainesville, Georgia

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DESCRIPTION

PRODUCT COVERED:

Part Nos. M or W, followed by 91, 92, 93, 94, 95 or 96, followed by A, B, C, D, E, M, P, R, S, T, U, W, X or Y, followed by 1 or 2, followed by 1, 3, 5, or 7, followed by 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9 when prefixed with P, followed by 0, 2, 3, 4, 5, 6, 9, 10, 11, 12, 13, 34 or 53 may be followed by P for added pulse tolerance, followed by .02-50 inclusive, may be followed by V, V1, **V2**, V3 or **M**.

May or may not have additional part number as follows: Series M or W, followed by 91, 92, 93, 94, 95, or 96, followed by A, B, C, D, E, R, S, X or Y, followed by 1000 through 1999 or 1999 or 3000 through 3999 inclusive, followed by X1 through X200 inclusive, or .02 through 50 inclusive, may be followed by V, V1, **V2**, V3 or **M**.

GENERAL CHARACTER AND USE:

These devices are 1, 2, 3, 4, 5 or 6 pole supplementary protectors. They are provided with nonreplaceable trip units of the magnetic time delay type or with instantaneous trip. They may be provided with an auxiliary switch.

These devices may be manufactured in two forms of construction which are different as described herein. The terms "old" and "new" are used herein to describe the details of the types of constructions and the ratings applicable thereto.

Protectors with part numbers ending in "M" have been evaluated for Ignition Protection in accordance with UL1500, Ignition Protection Test for Marine Products

RATINGS:

Main Circuits - Maximum amperes per pole

50 A at 65 V dc maximum

50 A at 1 phase, 250 V ac maximum, 400 Hz

50 A at 1 phase, 277 V ac maximum, 50/60 Hz

Main Circuits - Maximum amperes polyphase use

20 A at 3 phase, 250 V ac maximum, 400 Hz

20 A at 3 phase, 480 Y/277 V ac maximum,

50/60 Hz

Auxiliary Switch - 10.1 A, 125/250 V ac

Alternate

Auxiliary Switch - V1 - 5 A, 125/250 V ac

V2 - 10 A, 125 V ac and 10.1 A, 250 V ac

V3 - 0.1 A, 125 V ac

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ENGINEERING CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

Use - For use only in products where the acceptability of the combination is determined by Underwriters Laboratories Inc., such as vending machines, data processing equipment and the like.

Conditions of Acceptability -

1. These devices shall be mounted within an overall enclosure.

2. All old construction devices with alternating-current and direct-current voltage ratings are suitable in circuits protected by fuses rated no more than four times the current rating of the control (minimum 15 A). These devices are suitable for protection of secondary circuits of power supplies, where the short circuit capacity and voltage do not exceed:

Old Construction	
Short Circuit Capacity	Voltage
2000 A	250 V ac max - 30 A max 400 Hz
3500 A	65 V dc max - 50 A max
5000 A	277 V ac max - 30 A max 50/60 Hz

3. All old construction devices with ac voltage ratings as shown below are suitable in circuits protected by K1 fuses rated not more than four times the current rating of the control (min 15 A). These devices are suitable for protection of secondary circuits of power supplies, where the short circuit capacity and voltage do not exceed:

Old Construction	
Short Circuit Capacity	Voltage
5,000 A	277 V ac - 31 to 50 A 50/60 Hz
2,000 A	250 V ac - 31 to 50 A 400 Hz

4. New construction devices are suitable for use in circuits where the short circuit capacity and voltage do not exceed:

Short Circuit Capability	Voltage
5000 A	1 ph, 277 V ac, 3 ph, 480Y/277 V ac, 50/60 Hz, 20 A max devices
5000 A	1 ph, 277 V ac, 50/60 Hz, devices rated 21-50 A
2500 A	1 ph, 3 ph, 250 V ac max, 400 Hz, 20 A max devices
2500 A	1 ph, 250 V ac max, 400 Hz, devices rated 21-50 A
2000 A	DC, 65 V max, resistive, 50 A max devices
3000 A	1 ph, 48Vdc, 1 and 2 Pole UL1500 Devices
1000 A	3 ph, 250 Vac Max, 3 pole UL1500 Devices
1000 A	1ph, 125/250 Vac, 1 and 2 Pole UL1500 Devices

In all cases noted above **with the exception of the UL1500 "M" Models**, the rating shown is contingent upon the use of a series fuse of the K5 Class, rated at not more than 4 times the supplementary protector rating, but not less than 15 A.

5. Wiring to the terminals of old construction devices shall be suitable for 75°C min or temperature measurements shall be made on the connector wires to determine that the wire insulation is suitable for the temperature involved.

6. Wiring to the terminals of the new construction devices shall be suitable for 105°C min or temperature measurements shall be made on the connector wires to determine that the wire insulation is suitable for the temperature involved.

7. These devices are to be mounted with the axis of the coil in the horizontal position, unless the device is marked "Instantaneous Trip".

8. The switch only pole (Suffixes T, U and W) may only be provided in multipole configurations where at least one pole is a protective type.

9. The voltage coils used on the dual bobbin construction for Types P and M circuit functions have not been investigated for use in steady state conditions. The test record for these devices should be reviewed in the end use application.

10. The "Pulse tolerant" performance of these devices has not been investigated.

CONSTRUCTION DETAILS:

The product shall be constructed in accordance with the following description.

Spacings - The following minimum spacings are maintained, except on Type P circuit function devices where the minimum spacings are 3/32 in. for the tabulation below:

	Through Air	Over Surface
Between any uninsulated live parts and uninsulated live parts of opposite polarity, inherent uninsulated grounded parts, or exposed metal parts.	1/4 in.	3/8 in.

Tolerance - Unless specified otherwise, all indicated dimensions are nominal.

Corrosion Protection - All parts are of corrosion resistant material and are plated or painted as corrosion protection.

Marking - Old construction devices have the manufacturer's name integrally molded in case, the series number will be stamped in white ink on the left hand side of the case, and each pole will be marked with the maximum voltage, frequency, ampere rating and trip curve.

* New construction devices have the manufacturer's name and series number ink stamped in white ink on left hand side of case, and each pole will be marked with the maximum voltage, frequency, ampere rating and trip curve. **The protectors with part numbers ending in "M"** may be marked with the words "Ignition Protected".

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All devices are provided with identification of line and load terminals.

NOMENCLATURE BREAKDOWN:

<u>W</u>	<u>92</u>	<u>P</u>	<u>1</u>	<u>7</u>	<u>P</u>	<u>9</u>	<u>P</u>	<u>30</u>	<u>V1</u>
I	II	III	IV	V	VA	VI	VIA	VII	VIII
I	Circuit Breaker Designation								
	M - Basic series model (Metric mounting)								
	W - Basic series model (American standard mounting)								
II	Number of Poles								
	91 - Single pole								
	92 - Two pole								
	93 - Three pole								
	94 - Four pole								
	95 - Five pole								
	96 - Six pole								
III	Circuit Function								
	A - Series trip with auxiliary switch, with 0.093 Q.C. terminals								
	B - Series trip with auxiliary switch, with 0.110 Q.C. terminals								
	C - Series trip with auxiliary switch, with 0.187 Q.C. terminals								
	D - Series trip with open auxiliary switch								
	E - Series trip with self-enclosed auxiliary switch								
	J - Series trip with 6 mm terminal.								
	K - Series trip with 6 mm terminal and auxiliary switch.								
	M - Dual coil with shunt trip construction voltage coil								
	P - Dual coil with relay trip construction voltage coil								
	R - Relay trip								
	S - Shunt trip								
	T- Switch only								
	U - Switch only with auxiliary switch, with 0.093 Q.C. terminals								
	W - Switch only with auxiliary switch, with 0.110 Q.C. terminals								
	X - Series trip								
	Y - Special circuit								

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IV Actuator Style

- 1 - Black toggle - one per pole
- 2 - White toggle - one per pole
- 3 - Red toggle - one per pole

V - Maximum Line Voltage of main contact circuit

- 1 - 277 V ac, 50/60 Hz
- 3 - 250 V ac, 400 Hz
- 5 - 65 V dc
- 7 - 277 V ac, 50/60 Hz or 65 V dc maximum
- 8 - 125 V ac, 120/240 Vac, 48 V dc**

VA - 0 through 9 indicates maximum voltage (for circuit function "P" only)

- 0 - 240 V ac, 50/60 Hz
- 1 - 120 V ac, 50/60 Hz
- 2 - 48 V ac, 50/60 Hz
- 3 - 24 V ac, 50/60 Hz
- 4 - 12 V ac, 50/60 Hz
- 5 - 6 V ac, 50/60 Hz
- 6 - 48 V dc
- 7 - 24 V dc
- 8 - 12 V dc
- 9 - 6 V dc

VI - Trip Curve

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- | | |
|---|----------|
| 0 - 277 V ac, 50/60 Hz maximum | 35 |
| 2 - Standard Time Delay Curve #2 | 23,24,25 |
| 3 - Short Time Delay Curve #3 | 36,38,39 |
| 4 - Alternate Standard Time Delay | 26,28 |
| 5 - Alternate Short Time Delay | 27,29 |
| 6 - Special Long Time Delay | 30 |
| 9 - Special Long Time Delay (High Inrush) | 31 |
| 10 - Motor Start Curve #10 (High Inrush) | 37 |
| 11 - Special Long Time Delay | 32 |
| 12 - High Inrush Feature for AC 60 Hz Curve #2 | 33 |
| 13 - High Inrush Feature for AC 60 Hz Curve #3 | 34 |
| 34 - Combination DC & 50/60 Hz, Standard Time Delay Curve 3 | 40 |
| 53 - Long Time Delay (High Inrush) for DC | 41 |

VIA - Added Pulse Tolerance

Blank = No
P = Yes

VII - Ampere Rating

0.2 through 50 A

VIII - VDE Designator

- V - No Auxiliary Switch
- V1 - 5 A, 125/250 V ac
- V2 - 10 A, 125 V ac and/or 10.1 A, 250 V ac
- V3 - 0.1 A, 125 V ac
- M - UL 1500**

NOMENCLATURE BREAKDOWN II:

<u>X</u>	<u>91</u>	<u>X</u>	<u>1004</u>	<u>5</u>	<u>V1</u>
I	II	III	IV	V	VI

I Circuit Breaker Designation

M - Basic series model (Metric mounting)
W - Basic series model (American mounting)

II Number of Poles

91 - Single poles
92 - Two pole
93 - Three pole
94 - Four pole
95 - Five pole
96 - Six pole

III Circuit Function

A - Series trip with auxiliary switch, with 0.093 Q.C. terminals
B - Series trip with auxiliary switch, with 0.110 Q.C. terminals
C - Series trip with auxiliary switch, with 0.187 Q.C. terminals
D - Series trip with open auxiliary switch
E - Series trip with self-enclosed auxiliary switch
R - Relay trip
S - Shunt trip
X - Series trip
Y - Special circuit

IV 1000-1999 or 3000-3999

For manufacturers use. Nonelectrical options.

V Amperes per Pole

X1 through X200 used on multipole configuration, where poles have different ampere (ratings appear on each pole for this case).

or

0.02-50 indicates amperes per pole

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VI VDE Designator

V - No Auxiliary Switch

V1 - 5 A, 125/250 V ac

V2 - 10 A, 125 V ac and/or 10.1 A, 250 V ac

V3 - 0.1 A, 125 V ac