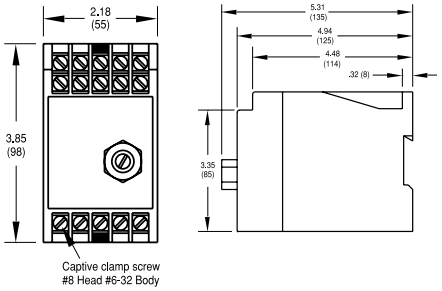
AGASTAT®

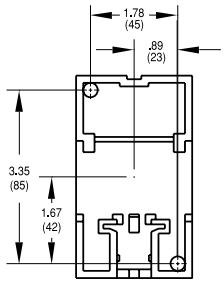
Protective Relays – Series PM Three Phase Power Quality Monitors

DESIGN FEATURES

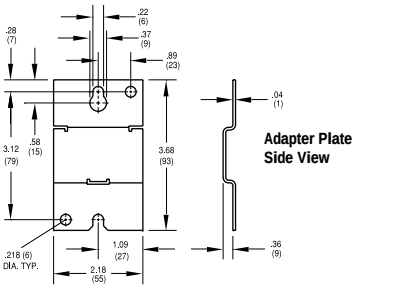
- ♦ Monitors deviations from nominal system voltage, phase imbalance, phase sequence and phase loss - in a single cost effective unit
- ♦ Locking potentiometer prevents unauthorized tampering (PMA only)
- ♦ Start-up delay permits staggered restarting of equipment (PMB only)
- ♦ Four LEDs show nature of temporary and sustained faults
- ♦ Three-wire wye or delta connections for simple installation
- ♦ Calibrated nominal voltage potentiometer assures precise monitoring.
- ♦ Superior transient immunity complies to ANSI C37.40.
- ♦ Not fooled by back EMF.
- ♦ Eight user-selectable thresholds - four undervoltage and four phase imbalance match protection to load.
- ♦ Manual or automatic reset to suit any application.
- ♦ Suitable for all commonly-used grounded or ungrounded three-phase systems.

SPECIFICATIONS

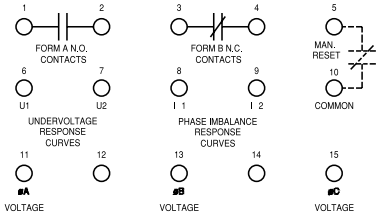




Unit with Adapter Plate
Back View



Adapter Plate
Side View



Threshold Accuracy: ±0.2% of the average of 10 consecutive measurements of the threshold point at any fixed temperature within the operating temperature range. ±2% of the average 10 consecutive measurements of the threshold point over the operating temperature range.

Maximum Voltage:

132 VAC for the 110-120 VAC model
264 VAC for the 208-240 VAC model
484 VAC for the 380-440 VAC model
528 VAC for the 440-480 VAC model
650 VAC for the 550-600 VAC model

Nominal Voltages: 110 to 120 VAC; 208 to 240 VAC 380 to 440 VAC; 440 to 480 VAC; 550 to 600 VAC

Life: Electrical: 100,000 operations at rated resistive loads.
Mechanical: 10,000,000 operations

Dielectric : 2200 Volts between input terminals and case or active circuitry; 1500 volts between relay contacts and active circuitry.

Temperature Range:

Operating: +14°F to +140°F (-10°C to 60°C)
Storage: -40°F to +167°F (-40°C to 75°C)

Mounting: The Series PM Power Quality Monitor can be mounted on a flat surface with two screws or snapped on and off an adapter plate which has mounted on a 300-volt machine tool relay channel using this adapter plate which is furnished with the unit. Direct mounting on a symmetrical DIN track, without the use of this adapter plate, is also possible.

Power Consumption: 0.75 watts

Indicator Lights: All PM Power Quality Monitors are furnished with a "Contacts Transferred" indicator plus four additional indicators which designate the specific fault that released the relay.

Approximate Weight: 1 lb 6 ounces (625 grams)

Frequency: 50/60 Hz

Connections: 3 wire wye or delta

Transient Noise Immunity: ICS 2-230, ANSI C37.40

Response Time: Phase Loss and Phase Reversal 2 line cycles +5 milliseconds. Undervoltage and Phase Imbalance - See Figures 1 and 2, page 35.

Contact Configuration: 1 Form A (normally open) 1 Form B (normally closed).

Contact Ratings:

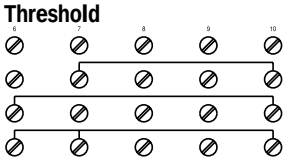
2000 VAC, 250 VAC, 8A Resistive
150W, 5A, 30 VDC resistive
1/4 HP, 125/250 VAC
275 VAC pilot duty

Vibration: Chatterless operation 5 to 60 Hz, 0.030" amplitude, 1 minute sweep

STRAPPING DIAGRAMS

Undervoltage Threshold

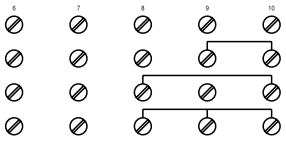
10.0%
14.0%
17.0%
20.0%



Low Phase Imbalance Threshold

Model PMAL*S or PMBL*SL

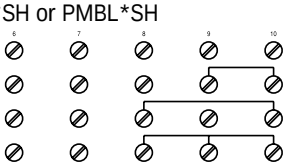
2.0%
3.0%
3.5%
4.0%



High Phase ImbalanceThreshold

Model PMAL*SH or PMBL*SH

5.0%
7.0%
8.5%
10.0%



File No. E60363

File No. LR29186

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Specifications subject to change
Dimensions are for reference only.

Technical Support Center 1-800-522-6752
www.tycoelectronics.com

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OPERATION

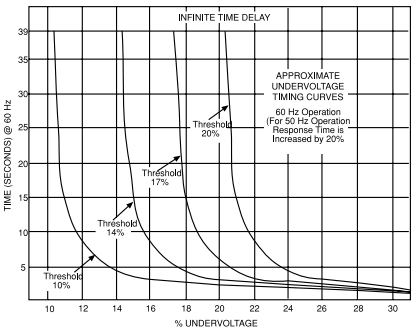
Monitor Operation: When the input voltage parameters are normal, the "Contacts Transferred" LED will be on and relay is energized. Once the unit has responded to a fault by releasing the output relay and simultaneously extinguishing the "Contacts Transferred" LED, the nature of the fault that caused the release will be identified by one of the four fault status indicators. In the automatic reset mode, the status indicator will extinguish and the "Contacts Transferred" LED will re-light once all faults are corrected and restart delay period has expired. In the manual reset mode, the fault indicator will flash when all faults have been corrected, thus indicating that the unit is ready for manual reset. When manually reset, the flashing fault status indicator will extinguish and the "Contacts Transferred" LED will re-light. Series PMA has a fixed start-up delay of approximately 375 milliseconds. Series PMB has a start-up delay, adjustable from 0 to 5 minutes, which permits staggered restarting of motors, etc., affected by a common power outage. If the unit is wired for manual reset, the external reset switch must also be opened.

The output relay will remain in the transferred state until one of the fault conditions occur. (See Figures 1 and 2)

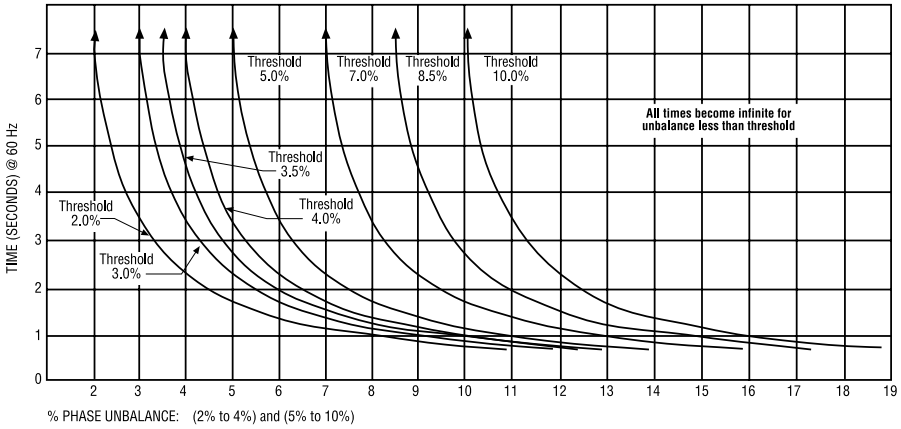
Phase Loss Condition: If the voltage of any phase drops below 68% of the nominal voltage setting for more than two line cycles, the output relay will release. If back EMF accompanies the loss of a phase, the unit will sense the loss as a phase imbalance and the relay will drop out.

Phase Reversal Condition: If any two phases become reversed for more than two line cycles, the output relay will release.

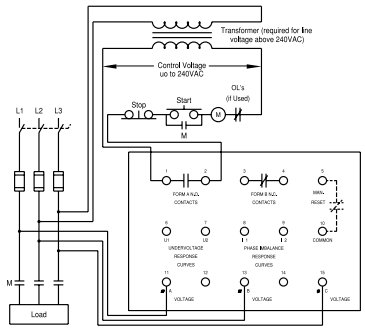
Undervoltage Condition: By strapping, the user can select one of four undervoltage thresholds: 10%, 14%, 17% or 20% below the nominal voltage, which is entered by means of a calibrated potentiometer located on the front panel. When the average voltage drops below the selected threshold, a time delay shown in Fig. 1 is initiated. The unit then continues to monitor the severity of the fault and modifies the time delay accordingly. If the undervoltage condition persists, the time delay will expire and the output relay will release.



Phase Imbalance Condition: The unit continuously averages the three phase voltages and recognizes individual deviations from the average. By strapping, the user can select one of four imbalance thresholds: Either 2.0%, 3.0%, 3.5%, 4.0%, or 5.0%, 7.0%, 8.5%, 10.0% depending on model. When any phase voltage deviates more than the selected percentage from the three phase average, a time delay as shown in Fig. 2 is initiated. The unit then continues to monitor the severity of the fault and modifies the time delay accordingly. If the phase imbalance condition persists, the time delay will expire and the output relay will release.



TYPICAL CONNECTION DIAGRAM



ORDERING INFORMATION

PMA

PMA
Series PMA Power Quality Monitor

LB
Nominal Operating Voltage
LA - 110 to 120 VAC 50/60Hz
LB - 208 to 240 VAC 50/60Hz
LC - 440 to 480 VAC 50/60Hz
LD - 550 to 600 VAC 50/60Hz
LG - 380 to 440 VAC 50/60Hz

S
Status Indicators
S - "Contacts "Transferred" and 4 Fault Status Indicators

L
Phase Imbalance Threshold
L - Low 2-4%
H - High 5-10%

PMB

PMB
Series PMB Power Quality Monitor

LB
Nominal Operating Voltage
LA - 110 to 120 VAC 50/60Hz
LB - 208 to 240 VAC 50/60Hz
LC - 440 to 480 VAC 50/60Hz
LD - 550 to 600 VAC 50/60Hz
LG - 380 to 440 VAC 50/60Hz

S
Status Indicators
S - "Contacts "Transferred" and 4 Fault Status Indicators

L
Phase Imbalance Threshold
L - Low 2-4%
H - High 5-10%

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