PMA/PMB series

Three Phase Power Quality Monitor

- Monitors deviation from nominal system voltage, phase imbalance, phase sequence and phase loss.
- Locking potentiometer prevents tampering (PMA only).
- Start-up delay permits staggered restarting (PMB only).
- Four LEDs show nature of temporary/sustained faults.
- 3-wire wye or delta connections for simple installation.
- Calibrated nominal voltage potentiometer assures precise monitoring.
- Superior transient immunity per ANSI C37.40.
- Not fooled by back EMF.
- 8 user-selectable thresholds – 4 undervoltage and 4 phase imbalance – match protection to load.
- Manual or automatic reset for application flexibility.
- Suitable for commonly used grounded or ungrounded three-phase systems.

PMA

PMB

File E60363

File LR29186

Users should thoroughly review the technical data before selecting a product part number. It is recommended that user also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

Function

Three phase power quality monitor.

Monitoring Specifications

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 of 10 consecutive measurements of the threshold point over the operating temperature range.

Response Time: Phase loss and phase reversal: 2 line cycles +5 ms.
Undervoltage and phase imbalance: See Figures 1 and 2 on the following page.

Input Data

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

Maximum Voltage: 132VAC for the 110 to 120VAC model;
264VAC for the 208 to 240VAC model;
484VAC for the 380 to 440VAC model;
528VAC for the 440 to 480VAC model;
650VAC for the 550 to 600VAC model.

Frequency: 50/60 Hz.
Power Requirement: 750mW.
Transient Noise Immunity: ICS 2-230, ANSI C37.40.

Output Data

Arrangement: 1 Form A (SPST-NO) + 1 Form B (SPST-NC).
Rating: 8A @ 250VAC, resistive; 3A @ 30VDC, resistive;
1/4 HP @ 125/250VAC; 275VAC pilot duty.
Expected Mechcanical Life: 10,000,000 operations.
Expected Electrical Life: 100,000 operations at rated resistive load.

Initial Dielectric Strength

Between Input Terminals and Case or Active Circuitry: 2,200V.
Between Relay Contacts and Active Circuitry: 1,500V.

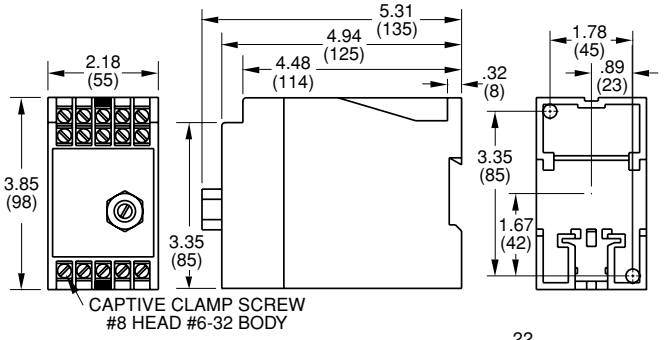
Environmental Data

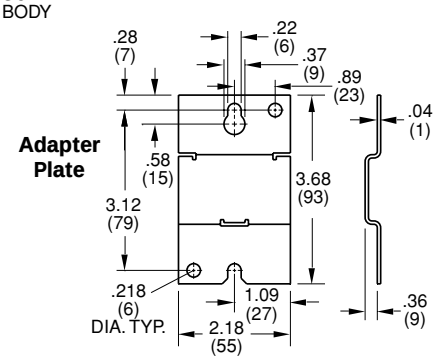
Temperature Range: **Storage:** -40°C to +75°C.
Operating: -10°C to +60°C.

Mechanical Data

Mounting: Can be mounted on a flat surface with two screws or snapped on/off a furnished adapter plate which has been pre-mounted on a flat surface. Can also be mounted on a 300-volt machine tool relay channel using the adapter plate. Direct mounting (no adapter plate used) on a symmetrical DIN track is also possible.
Termination: Screw terminals.
Connections: 3 wire wye or delta.
Vibration: Chatterless operation 5 to 60 Hz., 0.030 in.(0.762 mm) amplitude, 1 minute sweep.
Status Indication: "Contacts Transferred" LED plus four additional LEDs to designate the specific fault that released the relay.
Weight: 24 oz. (625g) approximately.

Outline Dimensions





Ordering Information

PMA	LB	S	L
Series	**Nominal Operating Voltage**		**Phase Imbalance Threshold**
PMA = Power Quality Monitor with Locking Potentiometer	LA = 110 to 120VAC, 50/60 Hz. LB = 208 to 240VAC, 50/60 Hz. LG = 380 to 440VAC, 50/60 Hz. LC = 440 to 480VAC, 50/60 Hz. LD = 550 to 600VAC, 50/60 Hz.	**Status Indicators** S = "Contacts Transferred" and four fault status indicators	L = Low (2-4%) H = High (5-10%)
PMB = Power Quality Monitor with Start-Up Delay			

Authorized distributors are likely to stock the following:

None at present.

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.

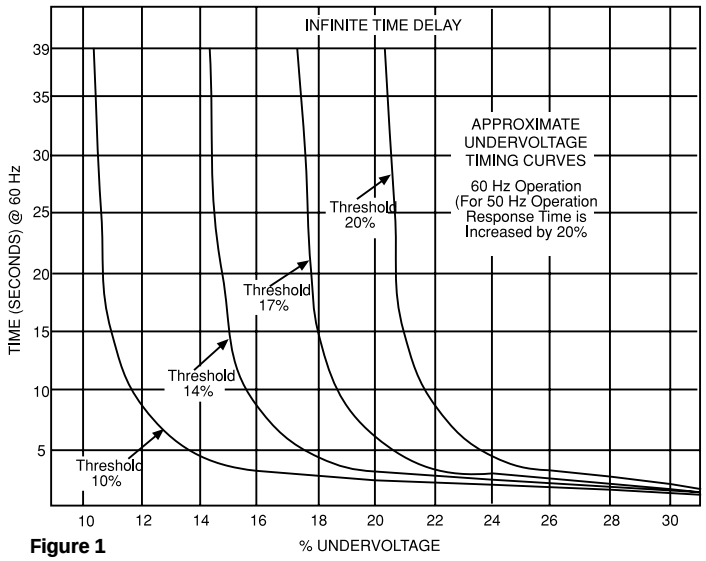


Figure 1

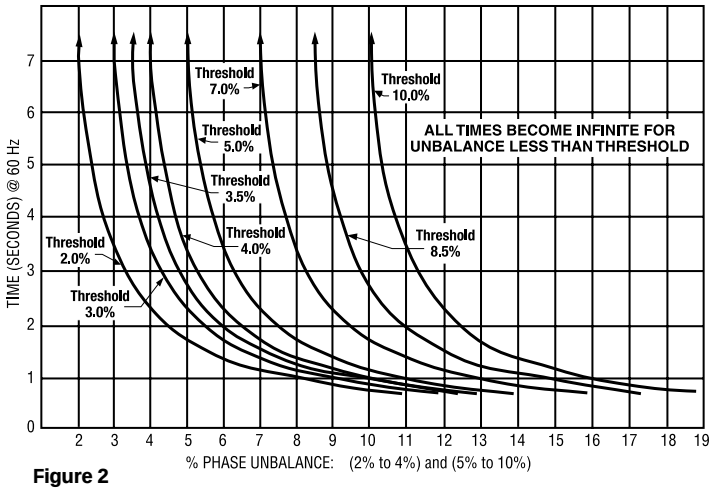
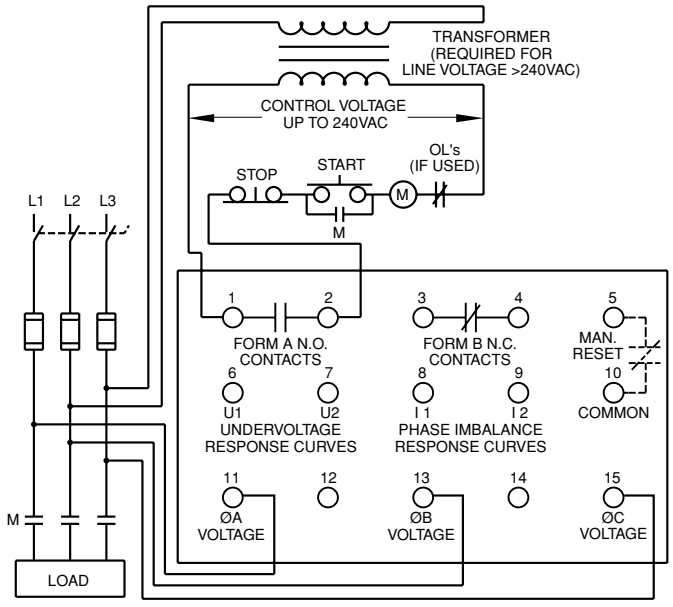


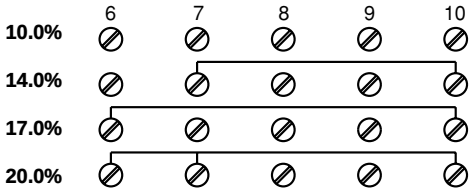
Figure 2

Typical Connection Diagram



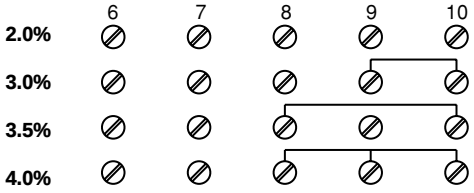
Strapping Diagrams

Undervoltage Threshold



Low Phase Imbalance Threshold

Model PMAL*SL or PMBL*SL



High Phase Imbalance Threshold

Model PMAL*SH or PMBL*SH