PMA/PMB Series Power Quality Monitor

1. INTRODUCTION

This instruction sheet covers the operation of the AGASTAT* PMA/PMB Series Power Quality Monitor. Read these instructions thoroughly before operating the monitor.

NOTE *Dimensions in this instruction sheet are in millimeters [with inches in brackets]. Figures are not drawn to scale.*

2. MONITOR OPERATION

When the voltage input parameters are normal, only the "Contacts Transferred" red light emitting diode (LED) will be on. Once the unit has responded to an undesirable circuit condition, by releasing the output relay and simultaneously extinguishing the "Contacts Transferred" LED, the nature of the circuit condition that caused the release will be identified by one of the four status indicators.

The LEDs indicate all simultaneously existing conditions, except in the presence of a phase loss, where all other LEDs are suppressed.

2.1. Start–Up Delay

Each PMB System Voltage Monitor has a start–up delay available, adjustable from zero to five minutes. Start–up delay is set by a screwdriver on the face of the monitor.

2.2. Manual Reset

In the manual reset mode, if the phase loss condition is cleared, then all conditions that existed at the time of the trip are displayed by individual LED's. Fault conditions that existed at the time of the trip, but have since cleared, will be displayed with flashing LED's, indicating that the line is within limits and a reset can be initiated to restart the system. Any line condition(s) which still exceed the selected trip points will produce a steady LED display, and a reset would not be possible. An LED will flash when the corresponding circuit condition has been corrected, thus indicating that the unit is ready for manual reset. When manually reset, the flashing status indicator will extinguish, and the "Contacts Transferred" LED will re–light.

2.3. Automatic Reset

In the automatic reset mode, the fault LEDs will extinguish and the "Contacts Transferred" LED will re–light once the circuit conditions are corrected. Except for a recovery from a lost phase, the Power Quality Monitor will not usually show any flashing LED's, since all parameters return to normal simultaneously. Recovery from multiple trip conditions where one parameter might clear before another will show one flashing LED until the last fault condition clears to normal, at which time the unit will automatically reset.

2.4. Summary of LED Function

- Steady LED light = Parameter currently out of limits.
- Flashing LED = Parameter was out of limit at time of trip, but is now within limits.
- A phase–loss condition suppresses all other LED's until it clears.
- If all parameters return to normal values in the manual reset mode, the "Contacts Transferred" LED also flashes indicating that a manual reset may be made.

The monitor senses the loss or reversal of two or more phases within two line cycles and disables the output approximately 500 milliseconds later. A drop in voltage to less that 75% of normal voltage setting is considered to be a phase loss.

The unit is shipped from the factory in the automatic reset mode, in which the output relay will be automatically transferred when circuit conditions are correct. The manual reset mode may be selected by wiring a normally closed (N.C.) switch between terminals 5 and 10. When all circuit conditions are corrected, the output relay will remain released until this reset switch is opened. The reset switch selected should be one appropriate for dry circuit applications.

3. POWER CONNECTION

Wire the monitor in accordance with Figure 1. The monitor draws about .75 watts from the line. Set the nominal voltage in accordance with Figure 2. If using a PMB, set the start–up delay to 0.0. Set the undervoltage and phase imbalance thresholds selected by jumpers before power is applied. See Figure 3 for terminal identification. If the "Contacts Transferred" LED does not light up on the initial application of power, make sure that no fuses are open, that the phases are connected to terminals A, B, and C in the proper sequence, and that the external reset switch has been opened and re–closed if the unit has been wired for manual reset. If a "Phase Reversal" is indicated on initial installation, interchange the leads to terminal A and C. The monitor will prevent the application of power when undervoltage, phase–imbalance, phase–loss, or phase–reversal conditions are present. If using a PMB, after verifying proper operation, set the Start–Up Delay to the desired time delay.

CAUTION *Do NOT apply voltage across terminals 5 and 10. These terminals are to be connected only to external switch for manual reset.*

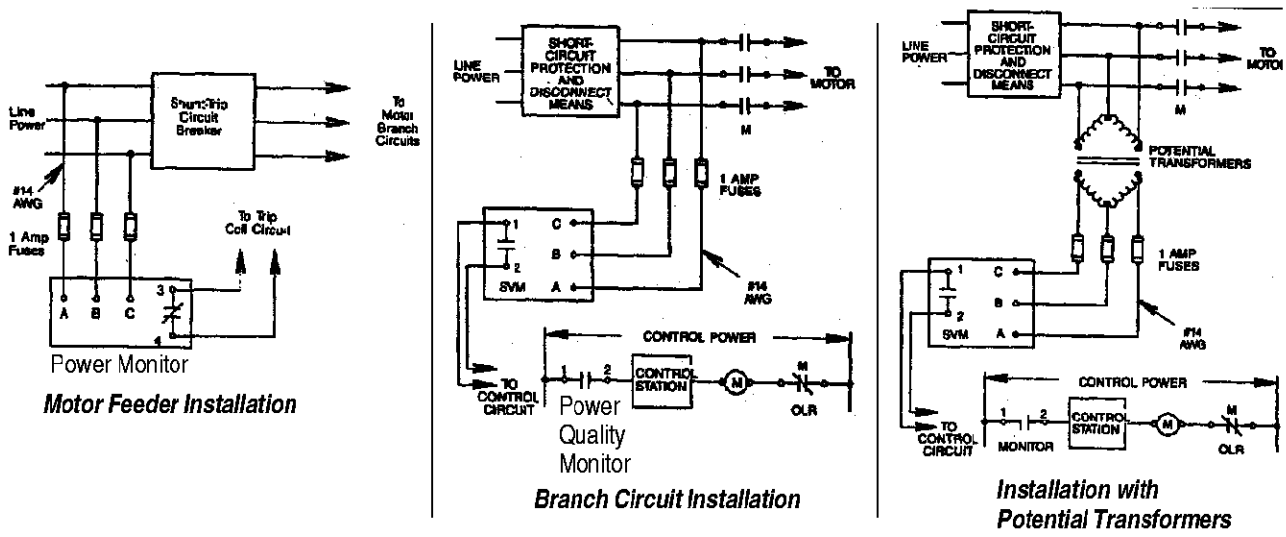


Figure 1

RECOMMENDED SETTINGS●			
3-PHASE MOTOR NAMEPLATE		MONITOR VOLTAGE SETTING	RECOMMENDED UNDERVOLTAGE THRESHOLD
VOLTAGE	FREQ		
115	60	115	10%
200	60	200	14%
220	50	220	10%
230	60	230	10%
380	50	380	10%
415	50	415	10%
440	50	440	10%
460	60	460	10%
575	60	575	10%

●When used with potential transformers, select monitor and setting by transformation ratio.

Figure 2

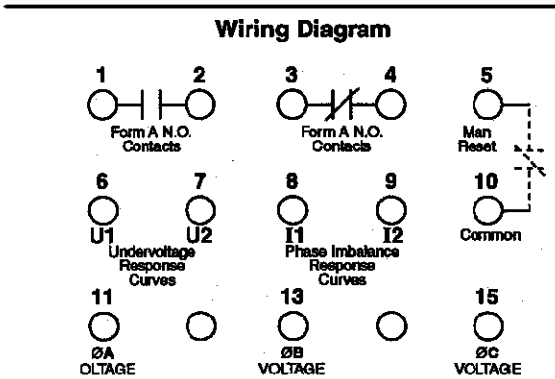


Figure 3

3.1. Low Phase Imbalance Threshold Setting

As shipped from the factory, the monitors will provide phase imbalance protection by responding in accordance with the 2% timing curve shown in Figure 4. One of the three additional timing curves (3%, 3.5%, or 4%) may be selected by jumpering terminals 8, 9, and 10 as shown in Figure 5.

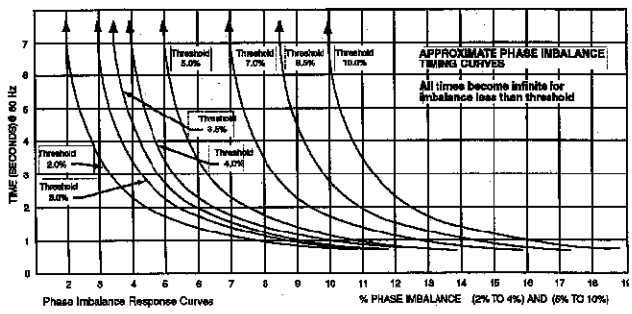


Figure 4

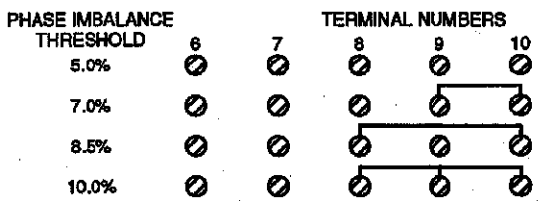
PHASE IMBALANCE THRESHOLD	TERMINAL NUMBERS 6	7	8	9	10
2.0%	⊘	⊘	⊘	⊘	⊘
3.0%	⊘	⊘	⊘	⊘	⊘
3.5%	⊘	⊘	⊘	⊘	⊘
4.0%	⊘	⊘	⊘	⊘	⊘

Low Phase Imbalance Threshold Settings

Figure 5

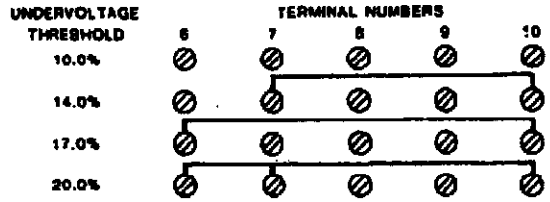
3.2. High Phase Imbalance Threshold Setting

As shipped from the factory, the monitor will provide phase imbalance protection by responding in accordance with the 5% timing curve shown in Figure 4. One of the three additional timing curves (7%, 8.5%, or 10%) may be selected by jumpering terminals 8, 9, and 10 as shown in Figure 6.



High Phase Imbalance Threshold Settings

Figure 6

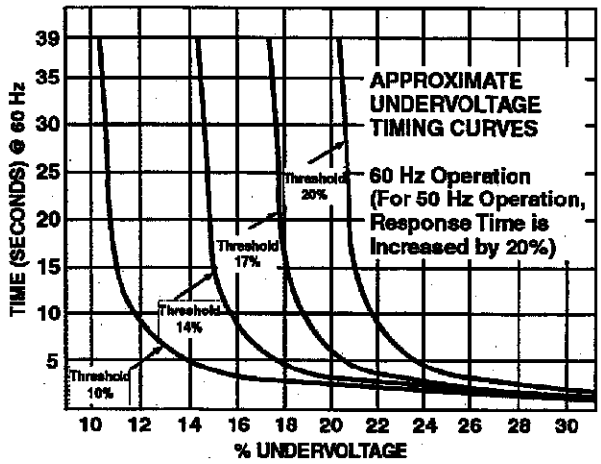


Undervoltage Threshold Settings

Figure 8

3.3. Undervoltage Threshold Setting

Use the undervoltage threshold setting recommended in Figure 2 unless data supplied with the motor indicates a higher percent undervoltage is permissible. The time delays associated with each setting are shown in Figure 7. To obtain an undervoltage threshold setting higher than 10%, jumpers must be added to connect terminals 6 and/or 7 to terminal 10. See Figure 8.



Undervoltage Response Curves

Figure 7

4. REVISION SUMMARY

Per EC 0990–1613–00:

- Initial release of instruction sheet