

# PHASE MONITOR RELAYS

Phase Loss, Phase Reversal, Phase Unbalance, and Under/Over Voltage  
PMP Series Plug-in



- u Universal voltage range of 208-480V on PMPU provides the flexibility to cover a variety of applications with one unit
- u Protects against phase loss, phase reversal, phase unbalance, undervoltage and overvoltage
- u Variety of user-selectable and adjustable settings for the ultimate in three-phase protection
- u Automatic or Manual Reset
- u Multi-Color LED indicates normal condition and defines fault to simplify troubleshooting
- u Compact plug-in case utilizing industry-standard 8 pin octal socket
- u 10A SPDT output contacts

**UL** **US** **CE** **UL LISTED**  
(with appropriate socket)

The PMP Series Phase Monitor Relays utilize a microprocessor-based design to provide protection against phase loss, phase reversal, phase unbalance, undervoltage and overvoltage. The PMPU is a universal voltage product that works on any three-phase system voltage from 208-480V (a separate 120V version is available). These devices are designed to be compatible with most Wye or Delta systems. In Wye systems, a connection to a neutral is not required. PMP Series products protect against unbalanced voltages or single phasing regardless of any regenerative voltages.

The relay is energized when the phase sequence and all voltages are correct. Any one of five fault conditions will de-energize the relay. As standard, re-energization is automatic upon correction of the fault condition. Manual reset is available if a momentary N.C. switch is wired to the appropriate terminals. A multi-color LED indicates normal condition and also provides specific fault indication to simplify troubleshooting.

The PMP Series offers a variety of user-adjustable settings. The percent phase unbalance is adjustable from 2-10%, and also has a "Disable" setting for those applications where poor voltage conditions could cause nuisance tripping. The undervoltage drop-out can be set at 80-95% of operating voltage (overvoltage setting is fixed at 110% of nominal). The adjustable time delay drop-out on undervoltage (0.1-20 seconds) eliminates nuisance tripping caused by momentary voltage fluctuations. There is also an adjustable time delay (1-300 seconds) on both power up and restart after a fault has been cleared.

MOUNTING STYLE	OPERATING VOLTAGE 50/60 Hz	PRODUCT NUMBER	WIRING/SOCKET n
Plug-in	120V	PMP120	8 Pin Octal <b>70169-D</b> 
	208-480V	PMPU *	

\* Requires a 600V-rated socket when used on system voltages greater than 300V.  
n See Page 16 for **Sockets & Accessories**.



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Application Data & Dimensions

## Application Data

### **Phase Loss:**

Unit trips on loss of any Phase A, B or C.

### **Phase Reversal:**

Unit trips if rotation (sequence) of the three phases is anything other than A-B-C.

### **Undervoltage:**

Adjustable from 80-95% of nominal voltage. Unit trips when the average of all three lines is less than the adjusted set point for a period longer than the adjustable time delay drop-out.

### **Overvoltage:**

Fixed at 110% of nominal voltage. Unit trips when the average of all three lines is greater than the fixed set point for a period longer than the time delay drop-out.

### **Phase Unbalance:**

Adjustable from 2 - 10% unbalance. Unit trips when any one of the three lines deviates from the average of all three lines by more than the adjusted set point. There is also a "Disable" setting adjustment that will turn off the Phase Unbalance Protection if nuisance tripping is a problem.

### **Output Contacts:**

SPDT: 10A @ 240V AC/30V DC, 1/2HP @ 240V AC

### **Life:**

Mechanical: 10,000,000 operations

Full Load: 100,000 operations

### **Response Times:**

Power Up & Restart After Fault: 1 - 300 seconds adjustable

Drop-out Due to Fault:

Phase Loss & Reversal 100ms fixed

Phase Unbalance 2 seconds fixed

Undervoltage 0.1 - 20 seconds adjustable

Overvoltage Fixed Time Based on Inverse Time Curve

**Hysteresis:** 2 - 3%

**Load (Burden):** Less than 3VA

**Temperature:** -28° to 65°C (-20° to 150°F)

### **Mounting:**

Uses an 8 pin octal socket. Requires a 600V-rated socket when used on system voltages greater than 300V (Macromatic Product Number 70169-D--see Page 16).

### **Indicator LED:**

LED Status	Indicator
Green Steady	Normal / Relay ON
Green Flashing	Power Up / Restart Delay
Red Steady	Unbalance
Red Flashing	Undervoltage / Overvoltage
Amber Steady	Reversal
Amber Flashing	Loss
Green / Red Alternating	Undervoltage / Overvoltage Trip Pending
Red / Amber Alternating*	Nominal Voltage Set Error

\* Applies to 208-480V units only.

### **Reset:**

As standard, reset is automatic upon correction of fault. When a momentary-contact N.C. switch is wired across the Manual Reset terminals (6 & 7), the unit switches to manual reset mode and remote manual reset is available.

### **Approvals:**



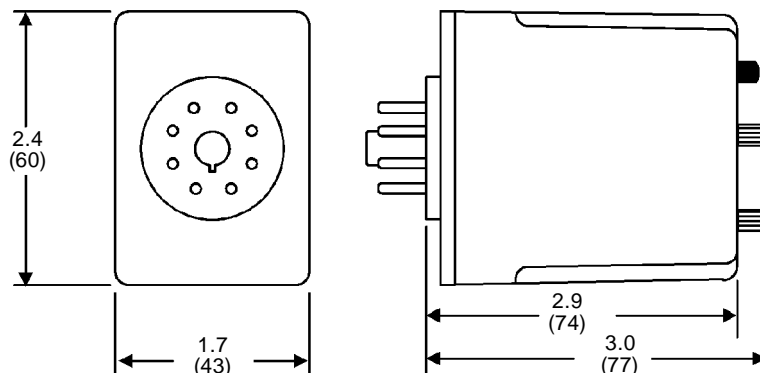
CE Low Voltage & EMC Directives  
EN60947-1, EN60947-5-1



When used with Macromatic socket 70169-D rated 600V

File #E109466

## Dimensions



All Dimensions in Inches (Millimeters)