PHASE MONITOR RELAYS

Product Summary

Phase Monitor Relays provide protection against premature equipment failure caused by voltage faults on 3 Phase systems. All Macromatic Phase Monitor Relays are designed to be compatible with most Wye or Delta systems. In Wye systems, a connection to a neutral is not required. Phase Monitor Relays protect against single phasing regardless of any regenerative voltages.

The Reference Guide below provides general information on the different versions of Phase Monitor Relays offered by Macromatic (see Product Selection on the following pages for further details):

Series	Mounting Style	Phase Loss	Phase Reversal	Phase Unbalance	Under Voltage	Over Voltage	Time Delay on Undervoltage	Approvals *	See Page
PCP	Plug-in *		P					c UL us	6
PLP	Plug-in *	P	P					c UL us	8
PAP	Plug-in *	P	P		P (adj.)		50ms fixed	c UL us	10
PMP	Plug-in *	P	P	P (adj.)	P (adj.)	P (fixed)	0.1 - 20 sec.	c UL us CE	12
PMP-FA	Plug-in *	P	P	P (fixed)	P (fixed)	P (fixed)	4 seconds fixed	c UL us CE	14
PMD	Surface	P	P	P (adj.)	P (adj.)	P (fixed)	0.1 - 20 sec.	c UL us CE	16

* In addition to the above approvals, all Plug-in Products are also UL Listed when used with the appropriate Macromatic socket.

Protection

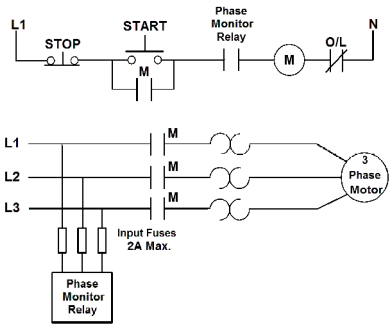
Depending on the unit selected, it will protect three phase equipment against:

- **phase loss** - total loss of one or more of the three phases. Also known as "single phasing." Typically caused by a blown fuse, broken wire, or worn contact. This condition would result in a motor drawing locked rotor current during start-up. In addition, a three phase motor will continue to run after losing a phase, resulting in possible motor burnout.
- **phase reversal -** reversing any two of the three phases will cause a three phase motor to run in the opposite direction. This may cause damage to driven machinery or injury to personnel. The condition usually occurs as a result of mistakes made during routine maintenance or when modifications are made to the circuit.
- **phase unbalance -** unbalance of a three phase system occurs when single phase loads are connected such that one or two of the lines (phases) carry more or less of the load. This could cause motors to run at temperatures above published ratings.
- **undervoltage -** when voltage in all three lines of a three phase system drop simultaneously.
- **overvoltage -** when voltage in all three lines of a three phase system increase simultaneously.

Typical Connections

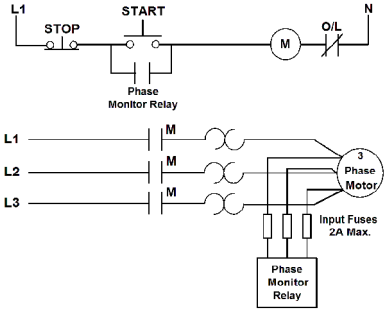
Line Side Monitoring

With the relay connected before the motor starter, the motor can be started in the reverse direction. However, the motor is unprotected against phase failures between the relay and the motor.



Load Side Monitoring

With the relay connected directly to the motor, the total feed lines are monitored. This connection should not be used with reversing motors.



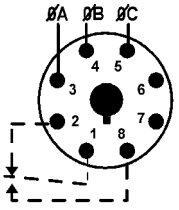
PHASE MONITOR RELAYS

Phase Reversal Only
PCP Series Plug-in

- Protects against phase reversal
- One version works on 208-480V 3 Phase Systems
- LED indicates both normal and fault conditions
- Compact plug-in case utilizing industry-standard 8 pin octal socket
- 10A SPDT output contacts
- c UL us LISTED (with appropriate socket)

The PCP Series Phase Monitor Relays provide protection against phase reversal in a compact plug-in design. One version will work on any 3 phase system from 208V to 480V (a separate 120V-only version is also 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.

The relay is energized and the LED on when the sequence is correct. Any fault will de-energize the relay and turn off the LED. Re-energization is automatic upon correction of the fault condition.

MOUNTING STYLE	NOMINAL VOLTAGE 50/60 Hz	PRODUCT NUMBER	WIRING/ SOCKETn
Plug-in	120V	PCP1	8 Pin Octal **70169-D**
	208-480V	PCP2 *	 **DIAGRAM 23**

* Requires a 600V-rated socket when used on system voltages greater than 300V.

n See Pages 81 & 82 for **Sockets & Accessories**.

MACROMATIC

800-238-7474

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Application Data

Phase Reversal:
Unit trips if sequence of the three phases is anything other than A-B-C.

Output Contacts:
10A Resistive SPDT @ 240V AC, 1/3HP @ 120/240V AC (N.O.), 1/6HP @ 120/240V AC (N.C.)

Life:
Full Load: 100,000 operations

Response Times:
Operate: 50ms
Release: 50ms

Load (Burden):
3VA

Temperature:
-28º to 65ºC (-20º to 150ºF)

Transient Protection:
10,000 volts for 20 microseconds

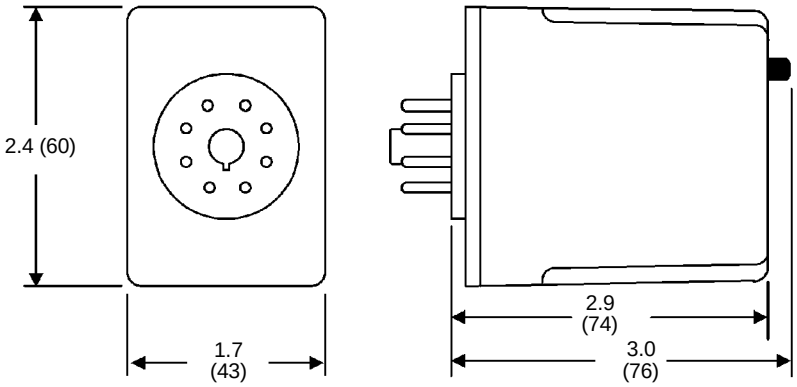
Mounting:
Uses an 8 pin octal socket. Requires a 600V-rated socket when used on system voltages greater than 300V (Macromatic Product Number 70169-D--see Page 81).

Indicator LED:
Red LED on when all conditions are normal, and off when a fault condition has occurred.

Reset:
Automatic upon correction of fault

Approvals:
c US File #E109466
UL LISTED IND. CONT. EQUIP. 50U7. with appropriate socket File #E109466

Dimensions



All Dimensions in Inches (Millimeters)

PHASE MONITOR RELAYS

Phase Loss & Phase Reversal

PLP Series Plug-in

- Protects against phase loss & phase reversal
- LED indicates both normal and fault conditions
- Compact plug-in case utilizing industry-standard 8 pin octal socket
- 10A SPDT output contacts
- c UL us LISTED (with appropriate socket)

The PLP Series Phase Monitor Relays provide protection against phase loss & phase reversal in a compact plug-in design. These devices are designed to be compatible with most Wye or Delta systems. In Wye systems, a connection to a neutral is not required. Phase Monitor Relays protect against single phasing regardless of any regenerative voltages.

The relay is energized and the LED on when all three phases are present and in the correct sequence. Any fault will instantaneously de-energize the relay and turn off the LED. Re-energization is automatic upon correction of the fault condition.

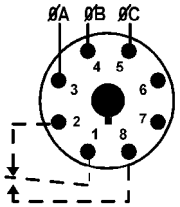
MOUNTING STYLE	NOMINAL VOLTAGE 50/60 Hz	PRODUCT NUMBER	WIRING/ SOCKETn
Plug-in	120V	PLP120	8 Pin Octal **70169-D**
	208V	PLP208	
	240V	PLP240	
	400V	PLP400 *	
	480V	PLP480 *	

DIAGRAM 23

* Requires a 600V-rated socket when used on system voltages greater than 300V.

n See Pages 81 & 82 for **Sockets & Accessories**.

MACROMATIC

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Application Data

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

Phase Reversal:
Unit trips if sequence of the three phases is anything other than A-B-C.

Output Contacts:
10A Resistive SPDT @ 240V AC, 1/3HP @ 120/240V AC (N.O.), 1/6HP @ 120/240V AC (N.C.)

Life:
Full Load: 100,000 operations

Response Times:
Operate: 50ms
Release: 50ms

Load (Burden):
3VA

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

Transient Protection:
10,000 volts for 20 microseconds

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 81).

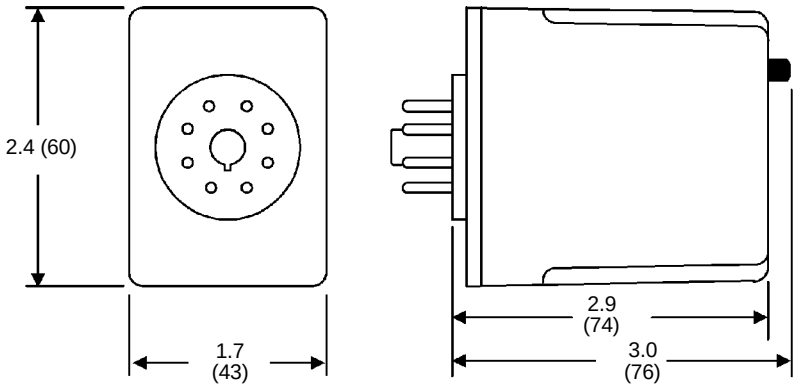
Indicator LED:
Red LED on when all conditions are normal, and off when a fault condition has occurred.

Reset:
Automatic upon correction of fault

Approvals:
c UL us
File #E109466

UL LISTED IND. CONT. EQUIP. 50U7
with appropriate socket
File #E109466

Dimensions



All Dimensions in Inches (Millimeters)

PHASE MONITOR RELAYS

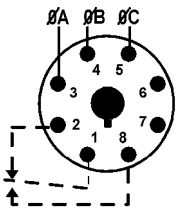
Phase Loss, Phase Reversal & Undervoltage

PAP Series Plug-in

- Protects against phase loss, phase reversal & undervoltage
- Undervoltage setting is adjustable from 75-95% of nominal
- LED indicates both normal and fault conditions
- Compact plug-in case utilizing industry-standard 8 pin octal socket
- 10A SPDT output contacts
- c UL us LISTED (with appropriate socket)

The PAP Series Phase Monitor Relays provide protection against phase loss, phase reversal & undervoltage in a compact plug-in design. These devices are designed to be compatible with most Wye or Delta systems. In Wye systems, a connection to a neutral is not required. Phase Monitor Relays protect against single phasing regardless of any regenerative voltages.

The relay is energized and the LED on when all three phase are present in the correct sequence at a voltage level above the undervoltage setting. The undervoltage drop-out can be set at 75-95% of operating voltage. Any fault will instantaneously de-energize the relay and turn off the LED. Re-energization is automatic upon correction of the fault condition.

MOUNTING STYLE	NOMINAL VOLTAGE 50/60 Hz	UNDER-VOLTAGE RANGE	PRODUCT NUMBER	WIRING/ SOCKETn
Plug-in	120V	90-115V	PAP120	8 Pin Octal **70169-D**
	208V	156-198V	PAP208	
	240V	180-230V	PAP240	
	400V	300-380V	PAP400 *	
	480V	360-460V	PAP480 *	**DIAGRAM 23**

* Requires a 600V-rated socket when used on system voltages greater than 300V.

n See Pages 81 & 82 for **Sockets & Accessories**.

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Application Data

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

Phase Reversal:
Unit trips if sequence of the three phases is anything other than A-B-C.

Undervoltage:
Adjustable over a range per product selection table. Unit trips when the average of all three lines is less than the adjusted set point.

Output Contacts:
10A Resistive SPDT @ 240V AC, 1/3HP @ 120/240V AC (N.O.), 1/6HP @ 120/240V AC (N.C.)

Life:
Full Load: 100,000 operations

Response Times:
Operate: 50ms
Release: 50ms

Load (Burden):
3VA

Temperature:
-28º to 65ºC (-20º to 150ºF)

Transient Protection:
10,000 volts for 20 microseconds

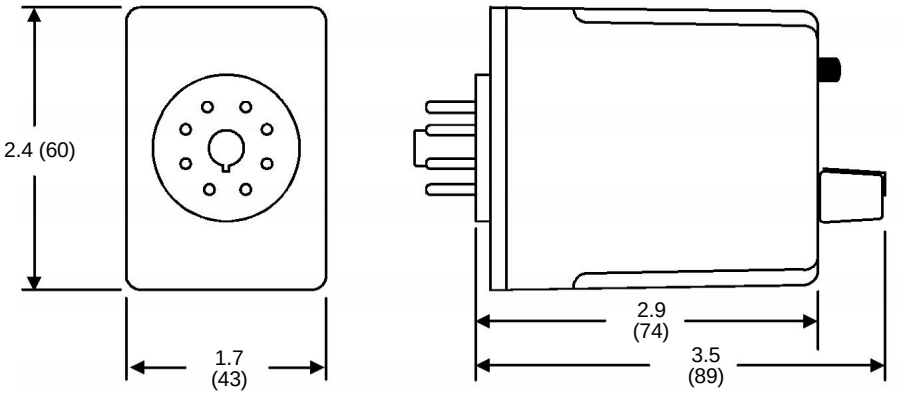
Mounting:
Uses an 8 pin octal socket. Requires a 600V-rated socket when used on system voltages greater than 300V (Macromatic Product Number 70169-D--see Page 81).

Indicator LED:
Red LED on when all conditions are normal, and off when a fault condition has occurred.

Reset:
Automatic upon correction of fault

Approvals:
c US File #E109466
UL LISTED IND. CONT. EQUIP. 50U7 with appropriate socket File #E109466

Dimensions



All Dimensions in Inches (Millimeters)

PHASE MONITOR RELAYS

Phase Loss, Phase Reversal, Phase Unbalance, and Under/Over Voltage

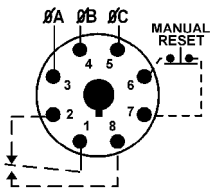
PMP Series Plug-in

- Universal voltage range of 208-480V on PMPU provides the flexibility to cover a variety of applications with one unit
- Protects against phase loss, phase reversal, phase unbalance, undervoltage and overvoltage
- Variety of user-selectable and adjustable settings for the ultimate in three-phase protection
- Automatic or Manual Reset
- Multi-Color LED indicates normal condition and provides fault indication to simplify troubleshooting
- Compact plug-in case utilizing industry-standard 8 pin octal socket
- 10A SPDT output contacts
- c 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 **70169-D**
	208-480V	PMPU *	 **DIAGRAM 104**

* Requires a 600V-rated socket when used on system voltages greater than 300V.

n See Pages 81 & 82 for **Sockets & Accessories**.

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PHASE MONITOR RELAYS

Phase Loss, Phase Reversal, Phase Unbalance, and Under/Over Voltage

PMP Series Plug-in

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 81).

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.

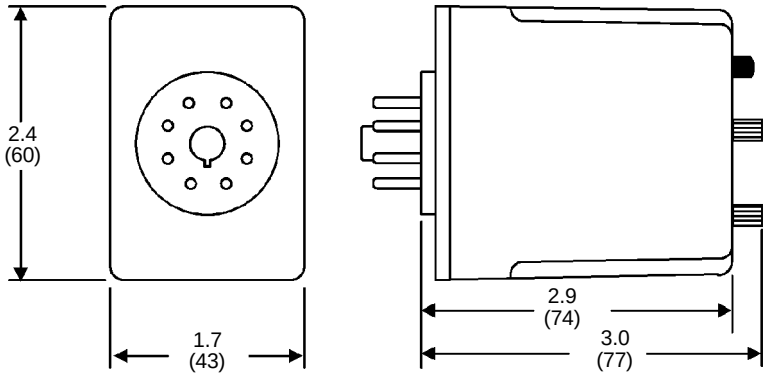
Approvals:

c UL us
File #E109466

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

UL LISTED IND. CONT. EQUIP. 5U07
with appropriate socket
File #E109466

Dimensions



All Dimensions in Inches (Millimeters)

PHASE MONITOR RELAYS

Phase Loss, Phase Reversal, Phase Unbalance, and Under/Over Voltage

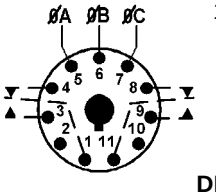
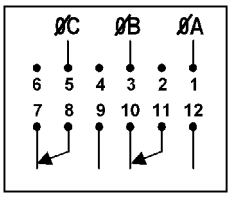
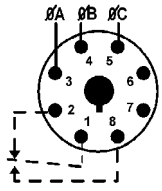
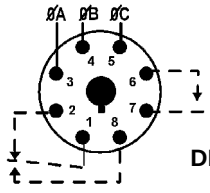
PMP-FA Series Plug-in

- Universal voltage range of 208-480V (208 or 240V on 11 pin) provides the flexibility to cover a variety of applications with one unit
- Protects against phase loss, phase reversal, phase unbalance, undervoltage and overvoltage
- Choose between 11 Pin DPDT, 12 Pin DPDT, 8 Pin SPDT & 8 Pin SPDT/SPNO output configurations
- Automatic Reset
- Multi-Color LED indicates normal condition and provides fault indication to simplify troubleshooting
- Compact plug-in case utilizing industry-standard 8 or 11 pin octal or 12 pin square sockets
- c UL us LISTED (with appropriate socket) (Pending)

The PMP-FA Series Phase Monitor Relays utilize a microprocessor-based design to provide protection against phase loss, phase reversal, phase unbalance, undervoltage and overvoltage, and are compatible with most Wye or Delta systems. They 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. Re-energization is automatic upon correction of the fault condition. A multi-color LED indicates normal condition and also provides specific fault indication to simplify troubleshooting.

These products offer a universal voltage design that works on any three-phase system voltage from 208-480V (208 or 240V only on the 11 pin DPDT version). The undervoltage drop-out is fixed at 90% & the overvoltage drop-out is fixed at 110% of operating voltage. The time delay drop-out on undervoltage is fixed at 4 seconds. The percent phase unbalance is fixed at 6%. The time delay on both power up and restart after a fault has been cleared is fixed at 2 seconds.

OUTPUT CONFIGURATION	OPERATING VOLTAGE 50/60 Hz	PRODUCT NUMBER *	WIRING/SOCKET n
11 Pin DPDT	208V 240V	PMP208-FA11 PMP240-FA11	 11 Pin Octal **70170-D** **DIAGRAM 173**
12 Pin DPDT	208-480V	PMPU-FA12	 12 Pin **27390D** **DIAGRAM 174**
8 Pin SPDT	208-480V	PMPU-FA8	 8 Pin **70169-D** **DIAGRAM 23**
8 Pin SPDT/ SPNO	208-480V	PMPU-FA8X	 8 Pin **70169-D** **DIAGRAM 175**

* Requires a 600V-rated socket when used on system voltages greater than 300V.

n See Pages 81 & 82 for **Sockets & Accessories**.

MACROMATIC

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PHASE MONITOR RELAYS

Phase Loss, Phase Reversal, Phase Unbalance, and Under/Over Voltage

PMP-FA Series Plug-in

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:
Fixed at 90% of nominal voltage. Unit trips when the average of all three lines is less than the adjusted set point for longer than the fixed 4 second time delay.

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:
Fixed at 6% 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 for longer than the fixed 2 second time delay.

Output Contacts:
10A @ 240V AC/30V DC,
1/2HP @ 120/240V AC (N.O.), 1/3HP @ 120/240V AC (N.C.)
B300 & R300; AC15 & DC13

Life:
Mechanical: 10,000,000 operations
Full Load: 100,000 operations

Response Times:

Power Up & Restart After Fault:	Fixed at 2 seconds
Drop-out Due to Fault:	
Phase Loss & Reversal	100ms fixed
Phase Unbalance	2 seconds fixed
Undervoltage	Fixed at 4 seconds
Overvoltage	Fixed Time Based on Inverse Time Curve

Hysteresis: 2 - 3%

Load (Burden): Less than 3VA

Temperature: -28º to 65ºC (-20º to 150ºF)

Mounting:
Use the appropriate socket as shown in the Product Selection Table on Page 14. Requires a 600V-rated socket when used on system voltages greater than 300V. See Pages 81 & 82 for Sockets & Accessories.

Indicator LED:

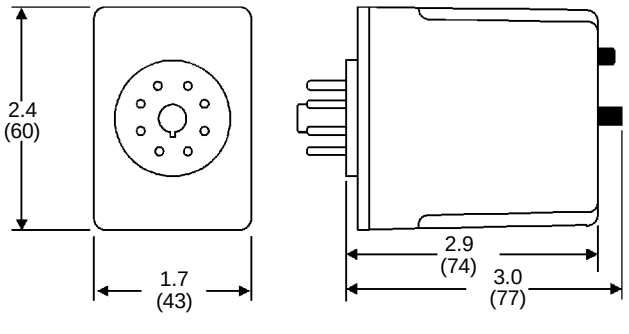
LED Status	Indicator
Green Steady	Normal / Relay ON
Green Flashing	Power Up / Restart Delay
Red Steady	Unbalance
Red Flashing	Undervoltage / Overvoltage
Amber Steady	Reversal
Amber Flashing	Loss
Green / Red Alternating	Undervoltage / Overvoltage Trip Pending
Red / Amber Alternating	Nominal Voltage Set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

Reset:
Reset is automatic upon correction of fault.

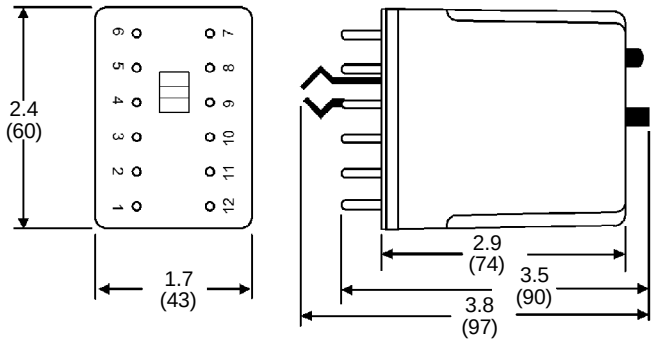
Approvals:
c UL us
File #E109466

UL LISTED IND. CONT. EQUIP. 5U07
with appropriate socket
File #E109466

Dimensions



8 & 11 Pin Products Only



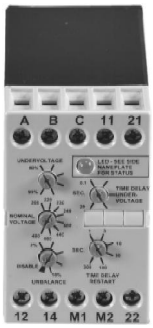
12 Pin Products Only

All Dimensions in Inches (Millimeters)

PHASE MONITOR RELAYS

Phase Loss, Phase Reversal, Phase Unbalance, and Under/Over Voltage

PMD Series Surface-Mount



- Universal voltage range of 208-480V on PMDU provides the flexibility to cover a variety of applications with one unit
- Protects against phase loss, phase reversal, phase unbalance, undervoltage and overvoltage
- Variety of user-selectable and adjustable settings for the ultimate in three-phase protection
- Automatic or Manual Reset
- Multi-Color LED indicates normal condition and provides fault indication to simplify troubleshooting
- 45mm DIN-style surface-mount case
- 10A SPDT & SPNC output contacts
- c UL us CE

The PMD Series Phase Monitor Relays utilize a microprocessor-based design to provide protection against phase loss, phase reversal, phase unbalance, undervoltage and overvoltage. The PMDU is a universal voltage product that works on any three-phase system voltage from 208-480V (separate 120V & 575V versions are 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. PMD 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 PMD 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 u	WIRING n
Surface-Mount	120V	PMD120	ØA ØB ØC A B C 11 21 12 14 M1 M2 22 MANUAL RESET **DIAGRAM 105**
	208-480V	PMDU	
	575V	PMD600	

u To order PMD units with a second N.O. contact instead of the N.C. (terminals 21-22), add a suffix “-A1” to the Product Number, i.e., PMDU-A1. To order PMD units with DPDT output contacts instead of one SPDT and one SPNC, **but** with no manual reset feature, add a suffix “-A2” to the Product Number, i.e., PMDU-A2.

n See Page 82 for **Accessories**.

MACROMATIC

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PHASE MONITOR RELAYS

Phase Loss, Phase Reversal, Phase Unbalance, and Under/Over Voltage PMD Series Surface-Mount

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:
10A SPDT & SPNC @ 240V AC/30VDC,
1/2HP @ 120/240V AC (N.O.), 1/3HP @ 120/240V AC (N.C.)

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:
Does not require a socket. Can either be mounted directly on 35mm DIN track with no additional parts or to a back-panel with two screws.

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

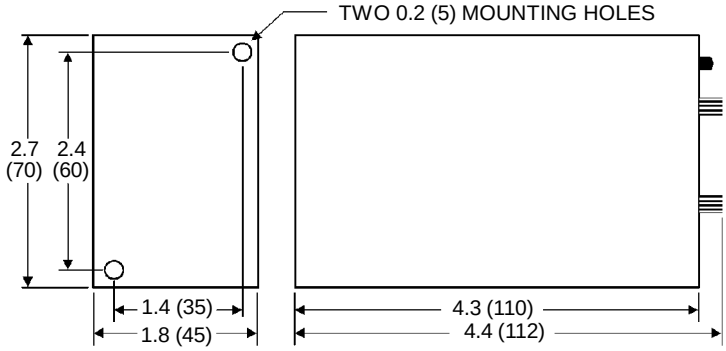
* Applies to 208-480V units only.

Reset:
As standard, reset is automatic upon correction of fault. When a momentary-contact N.C. switch is wired across the Manual Reset terminals (5 & 6), the unit switches to manual reset mode and remote manual reset is available.

Approvals:
c UL us
File #E109466

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

Dimensions



All Dimensions in Inches (Millimeters)