

**PHASE SEQUENCE & LOSS MONITOR/RELAYS
SLA - SERIES**

Any system using 3 phase motors needs Phase Monitor protection. These monitors operate independently of motor size or power requirement of the system. When the phase sequence is correct and full line voltage is present on all three phases, the internal relay picks up. When incorrect phase sequence or phase loss occurs or the line voltages fall below the trip point, the relay drops out. Both DELTA and WYE systems may be monitored. In WYE systems, connections to neutral are not required. The LED's glow when all conditions are normal. *NOTE: WHEN A PHASE IS LOST WHILE THE MOTOR IS RUNNING, A CONDITION KNOWN AS REGENERATION OCCURS WHERE A VOLTAGE IS INDUCED INTO THE OPEN PHASE NEARLY EQUAL IN MAGNITUDE TO THE NORMAL PHASE-TO-PHASE VOLTAGE. HOWEVER, WITH THE EXCEPTION OF LIGHTLY LOADED MOTORS, ENOUGH CHANGE IS DETECTED BY THE SLA TO PROVIDE THE REQUIRED PROTECTION WHEN PROPERLY ADJUSTED. PATENT #3,611,050*

VOLTAGE: All Voltages Referenced Are
Phase-to-Phase, 50/60 Hz

ENCLOSURES

- A: Plug In; 1.75" x 2.375" x 3.0"H
- E: Surface Mounted; 4.0" x 4.0" x 3.0"H
- N: Surface Mounted; 3.7" x 2.18" x 1.5"H

DROP OUT:

- 1 ∅ Low: 83% of Setting
- 3 ∅ Low: 90% of Setting

MODEL NUMBER	OPERATING VOLTAGE	DROP OUT		PIN CONFIGURATION	AGENCY APPROVAL	LED	RESET	ENCLOSURE STYLE
		1 ∅ LOW	3 ∅ LOW					
SLA-120-ASA	95-130 Adj	79-108	85-117	Figure 1	● & CSA	Yes	Auto	A
SLA-230-ASA	190-270 Adj	158-224	171-243	Figure 1	● & CSA	Yes	Auto	A
SLA-440-ASA	430-480 Adj	378-461	410-500	Figure 1	---	Yes	Auto	A
SUA-120-ALA	95-130 Adj	79-108	85-117	Figure 1	● & CSA	Yes	Auto	A
SUA-230-ALA	190-270 Adj	158-224	171-243	Figure 1	● & CSA	Yes	Auto	A
SUA-440-ASA	430-480 Adj	378-461	410-500	Figure 1	● & CSA	Yes	Auto	A
*SUA-120-ALAU	95-130 Adj	79-108	85-117	Figure 1	▲ & CSA	Yes	Auto	A
*SUA-230-ALAU	190-270 Adj	158-224	171-243	Figure 1	▲ & CSA	Yes	Auto	A
SLA-120-ALA	95-130 Adj	79-108	85-117	Figure 2	---	No	Auto	A
SLA-230-ALA	190-270 Adj	158-224	171-243	Figure 2	---	No	Auto	A
SLA-120-ALE	95-130 Adj	79-108	85-117	Figure 3	▲ & CSA	Yes	Auto	E
SLA-230-ALE	190-270 Adj	158-224	171-243	Figure 3	▲ & CSA	Yes	Auto	E
SLA-380-ALE	350-440 Adj	290-365	315-396	Figure 3	▲ & CSA	Yes	Auto	E
SLA-440-ALE	430-480 Adj	357-398	387-432	Figure 3	▲ & CSA	Yes	Auto	E
SLA-575-ALE	525-625 Adj	436-519	473-563	Figure 3	▲ & CSA	Yes	Auto	E
SLA-120-ALER	95-130 Adj	79-108	85-117	Figure 3	▲ & CSA	Yes	Manual	E
SLA-230-ALER	190-270 Adj	158-224	171-243	Figure 3	▲ & CSA	Yes	Manual	E
SLA-380-ALER	350-440 Adj	290-365	315-396	Figure 4	▲ & CSA	Yes	Manual	E
SLA-440-ALER	430-480 Adj	357-398	387-432	Figure 4	▲ & CSA	Yes	Manual	E
SLA-120-AFN	120	100	108	Figure 5	●	No	Auto	N
SLA-208-AFN	208	173	187	Figure 5	●	No	Auto	N
SLA-220-AFN	220	183	198	Figure 5	●	No	Auto	N
SLA-230-AFN	230	191	207	Figure 5	●	No	Auto	N
SLA-240-AFN	240	199	216	Figure 5	●	No	Auto	N

*UL LISTED ONLY WHEN USED WITH RB-08 SOCKET

NOTE: ALL MODELS AVAILABLE WITH FIXED OPERATING VOLTAGES.

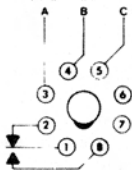


FIGURE 1

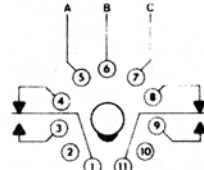


FIGURE 2

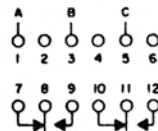


FIGURE 3

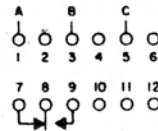


FIGURE 4

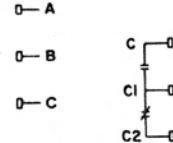


FIGURE 5

- UL Recognized
- ▲ UL Listed

FILE NUMBERS
UL: E55826
CSA: LR40123



PHASE MONITOR RELAYS

Provides microprocessor-based protection for 3 phase systems against phase loss, phase reversal, phase unbalance, and undervoltage. 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 Monitoring Relays 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 four fault conditions will de-energize the relay. Re-energization is automatic upon correction of the fault condition. An LED indicates normal and tripped conditions. The percent phase unbalance is adjustable from 2-10%, and the undervoltage drop-out can be set at 75-95% of operating voltage. The adjustable time delay dropout on undervoltage (0.1-20 seconds) eliminates nuisance tripping caused by momentary voltage fluctuations. **Output:** 10A SPDT (PMP) or DPDT (PMD) @ 240VAC/30VDC.

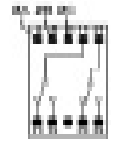
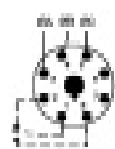
Dimensions: PMP-1.7"x 2.4" x 3.5". PMD-1.8"x 2.75" x 4.4".



PMP Plug-in



PMD Surface-Mount



Operating Voltage 50/60 Hz	Adjustable Undervoltage Drop-out Range	Product Number Plug-inCase (8 pin octal socket)	Socket	Product Number Surface-Mount Case*
208/240V 480V	180-230V 360-460V	PMP240 PMP480**	70169-D 70175	PMD240 PMD480

**Requires 600V-rated socket

* No socket required for PMD240 or PMD480

VOLTAGE MONITOR RELAYS



File E109461

Provides protection to equipment where an over or under voltage condition is potentially damaging. They monitor either AC single phase (50-400hz) or DC (independent of polarity) voltages. No supply (input) voltage is required. The pick-up voltage setting is user-adjustable from 85-115% of the nominal voltage rating. The drop-out voltage setting is fixed at 3% below the pick-up voltage setting. The relay energizes when the monitored voltage is above the pick-up setting. The relay de-energizes when the monitored voltage is below the drop-out setting. The time delay on drop-out is fixed at 50ms. **Output:** 10A DPDT @ 240VAC/30VDC. **Dimensions:** 1.7" x 2.4" x 2.9".

Nominal Voltage	Pick-up Voltage Range	Drop-Out Voltage Range	Product Number	Socket
24V AC	21-27V AC	20-26V AC	VMP024A	8 PIN OCTAL 70169-D
120V AC	102-138V AC	99-134V AC	VMP120A	
240V AC	204-276V AC	198-267V AC	VMP240A	
12V DC	10-14V DC	9-13V DC	VMPO12D	
24V DC	21-27V DC	20-26V DC	VMP024D	



ALTERNATING RELAYS

Used in special applications where the optimization of load usage is required by equalizing the run time of two loads. They are also used where additional capacity is required in case of excess load requirements. This alternating action is initiated by a control switch, such as a float switch, manual switch, timing relay, pressure switch, or other isolated contact. Each time the initiating switch is opened, the output relay contacts will change state, thus alternating the two loads. Two LED indicators show the status of the output relay. As listed, these units come with a three position selector switch. This allows the unit to alternate the two loads as normal, or lock the relay to one load or the other. By locking the Alternating Relay to one load, the other load can be removed for service without rewiring the first load for continuous operation. The selector switch has a low profile to prevent any accidental changes in status. **Output:** 10A SPDT or DPDT Cross-Wired @ 240VAC/30VDC. **Dimensions:** 1.7" x 2.4" x 2.9".



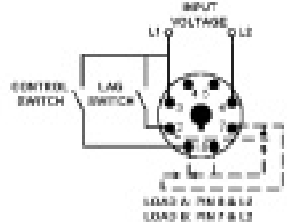
File E109461

File LR45565

Control Voltage	Product Number		Socket
	SPDT Contacts	DPDT Cross-Wired Contacts	
24V AC	ARP024A6R	ARP024A3R	8 PIN
120V AC	ARP120A6R	ARP120A3R	OCTAL
240V AC	ARP240A6R	ARP241A3R	70169-D



SPDT



DPDT Cross-Wired

IN STOCK

3-Phase Voltage Monitors

✓ *Motor Protection Not Fooled by Regenerated Voltages*

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CONTROLS & SENSORS

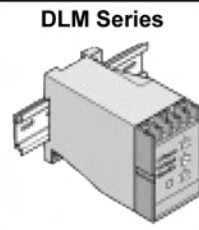
Solid State Protection You Can Rely On



4.50" x 3.13" x 1.35"
(114x80x34mm)



1.78" x 2.39" x 3.03"
(45x61x77mm)



4.33" x 2.95" x 1.97"
(110x75x50mm)

Protection	Phase Loss	●	●	●
	Phase Reversal	●	●	●
	Voltage Unbalance	●	●	●
	Low Voltage	●	●	●
	High Voltage	●	●	●
Adjustable Voltage Ranges	200 to 240VAC	●	●	●
	355 to 425VAC	●	●	●
	400 to 480VAC	●	●	●
	500 to 600VAC	●	●	●
LED Indicators	Normal Operation (ON)	●	●	●
	Trip Delay	2 to 20 Sec. Adj.	0.25 to 30 Sec. Adj.	2 to 20 Adj.
	Voltage Unbalance	2-6% Adj.	2 to 10% Adj.	2 to 8% Adj.
	Output Contacts SPDT (Resistive)	8 Amps	10 Amps	10 Amps
	Agency Approvals			

Part Number	Line Voltage (Adjustable)	Voltage Unbalance	Trip Delay	Connection
PLMU11	200 to 480VAC*	Adj. 2 to 10%	Adj. 0.25 to 30 Seconds	Fig. 1

*Use Socket OT08 Rated for 480VAC Use

Part Number	Line Voltage (Adjustable)	Voltage Unbalance	Trip Delay	Connection
RLM611	240VAC	Adj. 2 to 6%	Adj. 2 to 20 Seconds	Fig. 2
RLM911	480VAC			

Other Voltages and Options Available

Part Number	Line Voltage (Adjustable)	Unbalance (Adjustable)	Trip Delay (Adjustable)	Connection
DLM611	200 to 240VAC	2% to 8%	2 to 20 Secs.	Fig. 3
DLM911	400 to 480VAC			
DLM011	500 to 600VAC			

Other Voltages and Options Available

RLM Series

- Encapsulated
- Low Cost OEM
- .25"(6.35mm) Quick Connects
- Automatic Reset
- Adj. Voltage, Unbalance, & Trip Delay

PLMU Series

- Standard 8 Pin Plug-in Package
- Universal Voltage
- Automatic Reset
- Adj. Voltage, Unbalance & Trip Delay

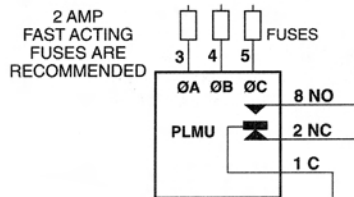
DLM Series

- 35mm DIN Rail or Surface Mounting
- 50mm Package with Touch Proof Terminals
- Encapsulated Circuitry
- Adj. Voltage, Unbalance, & Trip Delay
- Automatic Reset

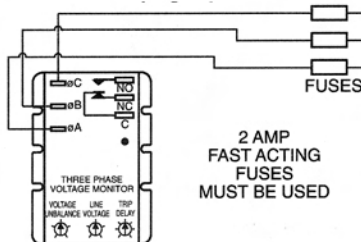
Key Features

- Prevents Motor Burnout
- Prevents Expensive Down Time
- Universal Design – One Monitor for any Size Motor
- 3 Wire Delta or Wye Connection
- New "Easy Set" Design Eliminates Nuisance Tripping
- LED "ON" Indicates Normal Operation

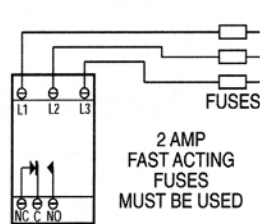
PLMU (Fig. 1)



RLM (Fig. 2)



DLM (Fig. 3)



IN STOCK

Motor Protectors

✓ 3 Phase Voltage Monitors

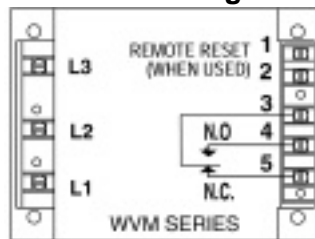
WVM Series (With 10 Fault Memory)

- Protects Against: Phase Loss; Phase Reversal; Low, High, and Unbalanced Voltages; And Short Cycling
- Non-volatile Memory 10 Fault Capacity
- Six Status And Fault Memory Indicators
- Adjustable Line Voltage Automatically Sets the (+10%) High and (-10%) Low Voltage, Trip Points
- Adjustable Voltage Unbalance (2% to 10%)
- Adjustable Restart Delay Prevents Short Cycling (0.25 to 64 Seconds or Minutes)
- True Random Start Delay (3 to 15 Seconds) Prevents Short Cycling
- Adjustable Trip Delay (0.25 to 30 Seconds) Prevents Nuisance Tripping
- 10 Amp SPDT Isolated Relay Contacts
- Switch Selectable Restart Mode: Automatic, Automatic With Delay, or Manual - Manual Reset Onboard or Remote
- Surge Protection IEEE 587-1980 Level B
- Screw Terminals With Captive Wire Clamps For Up to #12 AWG Wire



6.90" x 4.40" x 2.40"
(175x112x61mm)

Connection Diagram

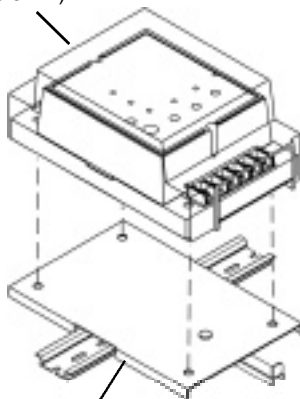


2 Amp Fast Acting Fuses Must be Installed In Series with Line Inputs

Accessories

Clear Tamperproof Cover

The P0500-153 protects against unauthorized adjustment of the trip points. Alignment dimples allow drilling (5 places) for limited access to adjustment knobs and the reset switch. Included are (2) spaces and (5) hole plugs. 7.5" x 4.7" x 2.6" (190.5mm x 119.5mm x 66.3mm)



35mm DIN Rail Adaptor

The P1011-38 provides an easy method of mounting the WLM Series on 35mm DIN rail. Includes four mounting screws. 7" x 4.5" x .33" (177.8mm x 114.3mm x 8.3mm)

Description: The WVM Series provides protection against premature equipment failure caused by adverse voltages. The WVM Series' microcomputer circuitry constantly monitors the three phase voltages for Phase Loss; Phase Reversal; Low, High, and Unbalanced Voltages. It is the first low cost voltage monitor to include a fault memory. The WVM Series not only protects your equipment, but it remembers the type of faults and the order in which they occurred. It provides reliable protection even if regenerated voltages are present. Part instrument and part control the WVM Series detects and protects plus it displays what happened.

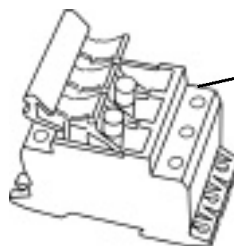
User Friendly Adjustments: The WVM's user friendly adjustment panel can be successfully set without training or instruction sheets. Simply rotate the pointers to select; 1) Line Voltage, 2) Voltage Unbalance, 3) Trip Delay, 4) Auto Restart Delay, and 5) Mode Selector

Protect your Equipment With the Best, Specify SSAC'S WVM Series

Line Voltage	Restart Delay	Reset Method	Part Number
200 to 240VAC	0.25 to 64 Secs.	Switch Selectable	WVM611AL
	0.25 to 64 Mins.		WVM611AH
400 to 480VAC	0.25 to 64 Secs.		WVM911AL
	0.25 to 64 Mins.		WVM911AH
500 to 600VAC	0.25 to 64 Secs.		WVM011AL
	0.25 to 64 Mins.		WVM011AH
200 to 240VAC	None	Manual Reset	WVM611M
400 to 480VAC			WVM911M
500 to 600VAC			WVM011M

Other options and voltages available

All Part numbers Listed are In Stock



Three Phase Fuse Block/Disconnect

The P0700-241 is designed for use with HRC midget fuses rated up to 20 amperes @ 600 volts AC. It can be surface mounted or mounted on 35mm DIN rail. 3.9" x 2.9" x 2.2" (99mm x 73mm x 54mm)



2 Amp @ 500 Volts AC Rated Fuse
P0600-11 2 ampere fast acting fuse.
1.5" x 13/32" (38.1mm x 10.3mm)