

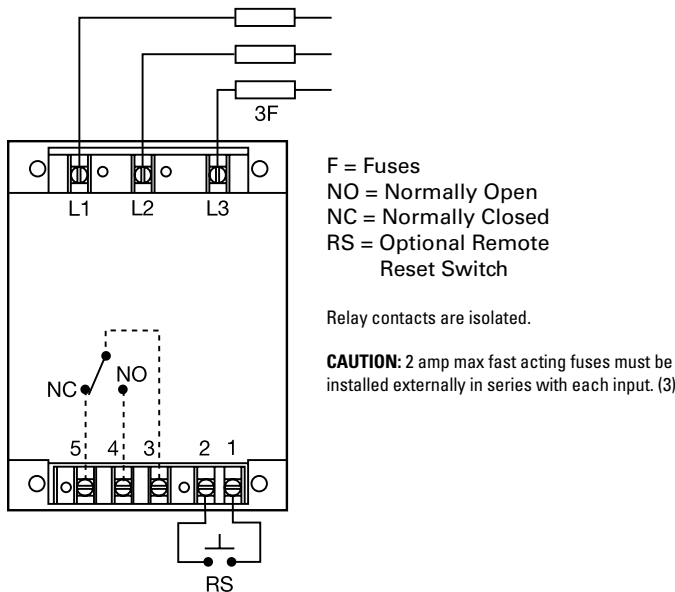
# WVM SERIES



OBSOLETE



## Wiring Diagram



## Description

The WVM Series provides protection against premature equipment (motor) failure caused by voltage faults on the 3-phase line. The WVM's microcontroller design provides reliable protection even if regenerated voltages are present. It combines dependable fault sensing with a 10 fault memory and a 6 LED status display. Part instrument, part control, the WVM protects your equipment when you're not there and displays what happened when you return. The WVM is fully adjustable and includes time delays to prevent nuisance tripping and improve system operation. Time delays include a 0.25 to 30s adjustable trip delay, an adjustable 0.25 to 64m (in 3 ranges) restart delay, plus a unique 3 to 15s true random start delay. The random start delay prevents voltage sags caused by simultaneous restarting of numerous motor loads after a power outage.

## Features & Benefits

FEATURES	BENEFITS
<b>Proprietary microcontroller based circuitry</b>	Constant monitoring to protect against phase loss, phase reversal, over voltage, under voltage, unbalance, and short cycling
<b>Fault memory</b>	Stores the 10 most recent faults, which provides diagnostics for troubleshooting
<b>LED indication</b>	Provides visual indication of existing relay/fault status or faults stored in memory.
<b>Switch selectable automatic restart, delayed automatic restart, and manual reset</b>	Allows user adjustment to handle unique application requirements
<b>Random start delay</b>	Prevents voltage sags caused by simultaneous restarting of multiple motor loads after a power outage

## Operation

The output relay is energized when all conditions are acceptable and the WVM is reset. A restart and/or random start delay may occur before the output relay is energized.

**Field Adjustment:** Select the line voltage listed on the motor's name plate. This automatically sets the over and undervoltage trip points. No further adjustment should be required to achieve maximum equipment protection.

## Ordering Information

MODEL	LINE VOLTAGE	UNBALANCE	TRIP DELAY	SWITCH SELECTABLE RESET METHOD	RESTART DELAY
WVM011AL	500 to 600VAC	2 - 10%	0.25 - 30s	Auto restart upon fault trip	0.25 - 64s
WVM611AH	200 to 240VAC	2 - 10%	0.25 - 30s	Auto restart upon fault trip	0.25 - 64m
WVM611AL	200 to 240VAC	2 - 10%	0.25 - 30s	Auto restart upon fault trip	0.25 - 64s
WVM611RL	200 to 240VAC	2 - 10%	0.25 - 30s	Auto restart upon fault correction	0.25 - 64s
WVM811AH	355 to 425VAC	2 - 10%	0.25 - 30s	Auto restart upon fault trip	0.25 - 64m
WVM811RL	355 to 425VAC	2 - 10%	0.25 - 30s	Auto restart upon fault correction	0.25 - 64s
WVM911AH	400 to 480VAC	2 - 10%	0.25 - 30s	Auto restart upon fault trip	0.25 - 64m
WVM911AL	400 to 480VAC	2 - 10%	0.25 - 30s	Auto restart upon fault trip	0.25 - 64s
WVM911AL-60	400 to 480VAC	2 - 10%	0.25 - 30s	Auto restart upon fault trip	0.25 - 64s, no random start delay
WVM911AN	400 to 480VAC	2 - 10%	0.25 - 30s	Auto restart upon fault trip	6 - 300s
WVM911RH	400 to 480VAC	2 - 10%	0.25 - 30s	Auto restart upon fault correction	0.25 - 64m
WVM911RL	400 to 480VAC	2 - 10%	0.25 - 30s	Auto restart upon fault correction	0.25 - 64s
WVM911RN-60	400 to 480VAC	2 - 10%	0.25 - 30s	Auto restart upon fault correction	6 - 300s, no random start delay

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# WVM SERIES

**Read Memory:** Fault(s) stored in the memory are indicated when the yellow LED is flashing, up to 10 faults are noted.

**Memory Reset:** To clear the memory of all faults stored, rotate selector to Clear Memory for 5 seconds. The yellow LED will turn off.

**Memory Overload:** Only the 10 most recent faults are retained.

**Random Start Delay:** A new 3 to 15s random start delay is selected by the microcontroller when a fault is corrected and when the operating voltage (L1, L2, L3) is applied to the WVM. A random start delay does not occur when the reset is manual.

**Automatic Restart:** Upon fault correction, the output will re-energize after a random start delay.

**Automatic Restart Upon Fault Trip:** When a fault is sensed for the full trip delay, the output de-energizes and a restart delay is initiated. This delay locks out the output for the delay period. Should the fault be corrected by the end of the restart delay, the output will re-energize after a random start delay. A restart delay will also occur when operating voltage (L1, L2, L3) is applied to the WVM.

**Manual Reset:** After a fault condition is corrected, the WVM can be manually reset. There are two methods; a customer supplied remote switch, or the onboard selector switch.

**Manual Reset (Onboard):** Rotate selector switch from the Manual Reset position to Auto Restart w/Delay then back again to Manual Reset within 3 seconds. The output will immediately energize.

**Remote Reset:** Reset (Restart) is accomplished by a momentary contact closure across terminals 1 & 2. The output will immediately energize. Remote switch requirements are  $\geq 10\text{mA}$  @ 20VDC and the reset terminals are not isolated from line voltage. A resistance of  $\leq 20\text{K}\Omega$  across terminals 1 & 2 will cause immediate automatic restart.

**Automatic Restart Upon Fault Correction:** (P/N includes an R) When a fault is sensed for the full trip delay, the output relay de-energizes. Upon correction of the fault, a restart delay begins. At the end of this delay, the output will re-energize after a random start delay. If a fault occurs during restart timing, the restart time delay will be reset to zero, and the output will not energize until the restart delay is completed.

## Accessories



**LPSM003ZXID (Indicating), LPSM003Z (Non-indicating) Fuse Holders**  
Littelfuse POWR-SAFE Dead Front holders provide optimum protection to personnel for Class CC and Midget-Style fuses. 600 VAC/DC



**OKLK002.T Midget Fuse (2 Amp)**  
10 x 38 fast acting, high-interrupting capacity, current-limiting type fuse. 600 Vac/500 Vdc



**C103PM (AL) DIN Rail**  
35 mm aluminum DIN rail available in a 36 in. (91.4 cm) length.

## Specifications

<b>Line Voltage Type</b>	3-phase delta or wye with no connection to neutral	
<b>Operating Voltage</b>	<b>Model</b>	<b>Adj. Line Voltage Range</b>
	240	200-240VAC
	380	355-425VAC
	480	400-480VAC
	600	500-600VAC
<b>AC Line Frequency</b>	50/60 Hz	
<b>Overshoot, Undershoot, &amp; Voltage Unbalance</b>		
<b>Overshoot Trip Point</b>	109-113% of adjusted voltage	
<b>Reset Voltage</b>	-2% of trip point	
<b>Undershoot Trip Point</b>	88-92% of adjusted voltage	
<b>Reset Voltage</b>	+2% of trip point	
<b>Voltage Unbalance</b>	Adjustable from 2-10%*	
<b>Trip Delay</b>	Adjustable from 0.25 - 30s $\pm 15\%$	
<b>Phase Loss</b>	$\geq 15\%$ unbalance	
<b>Response Time</b>	$\leq 200$ ms	
<b>Random Start Delay Range</b>	3 - 15s	
<b>Reset (Restart) Delay</b>		
<b>Low Range</b>	0.25-64s $\pm 15\%$	
<b>Normal Range</b>	6-300s $\pm 15\%$	
<b>High Range</b>	0.25-64m $\pm 15\%$	
<b>Fault Memory</b>		
<b>Type</b>	Nonvolatile RAM	
<b>Capacity</b>	Stores last 10 faults	
<b>Status Indicators</b>	6 LEDs provide existing status & memory readout	
	<i>Note: 50% of operating line voltage must be applied to L1 &amp; L2 for operation of status indicators</i>	
<b>Output Type</b>	Electromechanical relay	
<b>Form</b>	Isolated, SPDT	
<b>Rating</b>	10A resistive @ 250VAC; 6A inductive (0.4 PF) @ 250VAC	
<b>Life</b>	Mechanical - $1 \times 10^7$	
<b>Protection</b>		
<b>Phase Reversal/Failure</b>	ASME A17.1 Rule 210.6	
<b>Motors and Generators</b>	NEMA MG1 14:30, 14:35	
<b>Surge</b>	IEEE 62.41-1991 Level B	
<b>Isolation Voltage</b>	$\geq 2500\text{V}$ RMS input to output	
<b>Mechanical</b>		
<b>Mounting</b>	Surface with 2 or 4 #8 (M4 x 0.7) screws	
<b>Dimensions</b>	<b>H</b> 175.3 mm (6.9"); <b>W</b> 111.8 mm (4.4"); <b>D</b> 61.0 mm (2.4")	
<b>Termination</b>	Screw terminals with captive wire clamps for up to #12 AWG (3.2 mm <sup>2</sup> ) wire	
<b>Environmental</b>		
<b>Operating/Storage Temperature</b>	-40° to 65°C / -40° to 85°C	
<b>Weight</b>	$\approx 25$ oz ( 709 g)	

\* Unbalance reset is 90% of the unbalance setting (i.e. VUB at 5% reset is 4.5%)