

3 Phase Voltage Monitor

RLM Series

Motor Protector



ANSI Device #47/27



- Protects Against: Phase Loss, Phase Reversal, Undervoltage & Unbalance Voltages
- Industrial Packaging with Encapsulated Circuitry
- Fully Adjustable or Factory Fixed
- SPDT Isolated 8 A Contacts
- LED Glows When All Conditions are Acceptable
- Line Voltages 200 ... 480 V AC in 3 Ranges
- ASME A17.1 rule 210.6
- NEMA MG1 14:30, 14:35
- IEEE C62.41-1991 Level B

Approvals:

Description

The RLM Series of encapsulated three phase voltage monitors continuously measures the voltage of each of the three phases. Its circuit design separately senses Phase Reversal, Undervoltage, and Voltage Unbalance including Phase Loss. Protection is assured during periods of large average voltage fluctuations, or when regenerated voltages are present. Both Delta and Wye systems can be monitored; no connection to neutral is required.

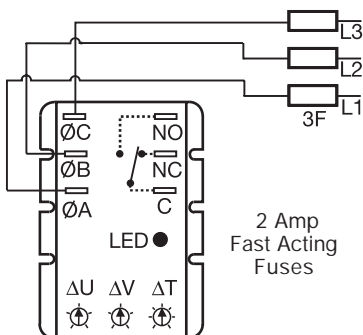
Operation

The output relay is energized and the LED glows when all voltages are acceptable and the phase sequence is correct. Undervoltage and voltage unbalance must be sensed for a continuous trip delay period before the relay and the LED are de-energized. Re-energization is automatic upon correction of the fault condition. The output relay will not energize if a fault condition is sensed as power is applied.

Field Adjustment:

Set voltage, trip delay, and voltage unbalance percentage (consult equipment manufacturer's specifications). Make connection to all three line phases as shown in the connection diagram. Apply power. If the relay fails to energize, check the wiring of all 3 phases, voltage, and phase sequence. If phase sequence is incorrect, swap any two wires. No further adjustment should be required to achieve maximum equipment protection.

Connection



- F = Fuses
- ØA = Phase A = L1
- ØB = Phase B = L2
- ØC = Phase C = L3
- ΔU = Unbalance Adjustment
- ΔV = Line Voltage Adjustment
- ΔT = Trip Delay Adjustment

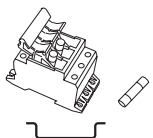
Dashed lines are internal connections.

CAUTION: 2 amp max. fast acting fuse must be installed externally in series with each input.

Accessories



Female quick connect
P/Ns:
P1015-13 (AWG 10/12)
P1015-64 (AWG 14/16)
P1015-14 (AWG 18/22)



3-phase fuse block/disconnect
P/N: P0700-241
2 Amp Fuse
P/N: P0600-11

See accessory pages for specifications.

Ordering Table

RLM Series	X Line Voltage	X Voltage Unbalance	X Trip Delay
	-6 - 240 V AC	-1 - Adjustable: 2 ... 6 %	-1 - Adjustable: 2 ... 20 s
	-9 - 480 V AC	-Fixed: Specify: 4, 5, 6, 7, or 8 %	-Fixed: Specify delay in s, 2 ... 20 s in 1 s increments (insert 0 before 2 ... 9)
	-8 - 380 V AC	-1 - Adjustable: 2 ... 8 % (380 V AC only)	
		-Fixed: Specify: 4, 5, 6, 7, or 8 %	

Example P/N: RLM611 Fixed - RLM9405

RLM9405 is a 480 V AC 60 Hz unit, unbalance fixed at 4%, trip delay fixed at 5 seconds.

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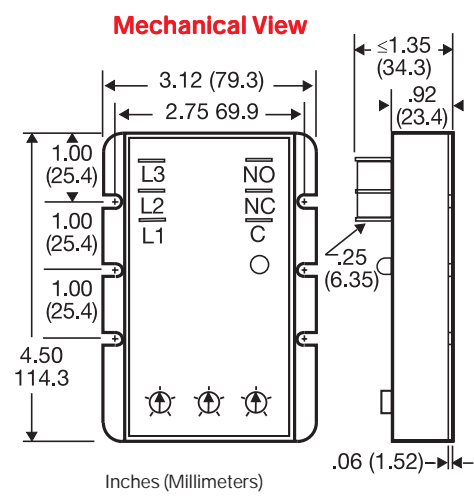
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Technical Data

Line Voltage		3 phase Delta or Wye with no connection to neutral					
Type		UL	CSA	Model	Line Voltage Range	Line Voltage Max.	Calibration Frequency
Operating Voltage		•	•	240	200 ... 240 V AC	270 V AC	60 Hz
		•		380	360 ... 430 V AC	480 V AC	50 Hz
		•	•	480	400 ... 480 V AC	530 V AC	60 Hz
Line Frequency		50 ... 60 Hz					
Phase Sequence		ABC					
Undervoltage and Voltage Unbalance		Voltage detection with delayed trip & automatic reset				Voltage Unbalance	
Type		88 ... 92% of adjusted line voltage				Selected Unbalance %	
Undervoltage:	Trip Voltage	+3% of trip voltage				Reset %	
	Reset Voltage						
Voltage Unbalance:	Trip Unbalance	240 & 480 V AC Adj. 2 ... 6%				2	1.8
		380 V AC Adj. 2 ... 8%; or fixed at 4, 5, 6, 7, or 8%				3	2.7
Trip Delay:	Range	Adjustable or Factory fixed from 2 ... 20 s				4	3.6
	Tolerance	Adjustable: Guaranteed range; Factory fixed: +/-15%				5	4.5
						6	5.4
						7	6.3
						8	7.2
Phase Reversal		Response Time -- Phase Reversal					
	Reset	≤100 ms					
Output		Automatic					
Type		Electromechanical relay					
Form		Single pole double throw (SPDT)					
Rating		8 A resistive at 240 V AC; 1/4 hp at 125 V AC; 1/3 hp at 250 V AC; max. voltage 277 V AC					
Life		Mechanical -- 1 x 10 ⁶					
		Electrical -- 1 x 10 ⁵					
Protection		IEEE C62.41-1991 Level B					
Surge		≥ 2500 V RMS input to output					
Isolation Voltage		Encapsulated					
Circuitry							
Mechanical		Surface mount with two #8 (M4 x 0.7) screws					
Mounting		4.5 x 3.12 x 1.35 in (114.3 x 79.3 x 34.3 mm)					
Package		0.25 in. (6.35 mm) male quick connect terminals					
Termination							
Environmental		Operating Temperature					
		-40°C ... +60°C					
		Storage Temperature					
		-40°C ... +85°C					
		Humidity					
		95% relative, non-condensing					
		Weight					
		≅ 8.7 oz (247 g)					

Note: A 60 Hz unit used on 50 Hz will shift by -1. A 50 Hz unit used on 60 Hz will shift by +1. (Ex. 4% unbalance on 60 Hz, would be 3% unbalance on 50 Hz.)



RLM02B01 10.06.04