3 Phase Voltage Monitor
DLM Series
Motor Protector

ANSI Device #27/47/59

TEN YEAR 10 WARRANTY

- Protects Against: Phase Loss, Phase Reversal, Overvoltage, Undervoltage, and Voltage Unbalance
- 35 mm DIN Rail or Surface Mounting
- SPDT Isolated 10 A Relay Contacts
- LED Glows when All Conditions are Acceptable
- Line Voltage 110 ... 600 V AC, in 5 Ranges
- 3 Wire Connection for Delta or Wye Systems
- ASME A17.1 rule 210.6
- NEMA MG1 14:30, 14:35
- IEEE C62.41-1991 Level B

Approvals: Listed

Description

The DLM Series continuously measures the voltage of each of the three phases. It separately senses under and over voltage, voltage unbalance including phase loss and phase reversal. Protection is assured during periods of large average voltage fluctuations, or when regenerated voltages are present. It can be mounted on 35 mm DIN rail or surface mounted with two screws. All connections are screw terminals with clamps. Connections can be covered with included removeable covers.

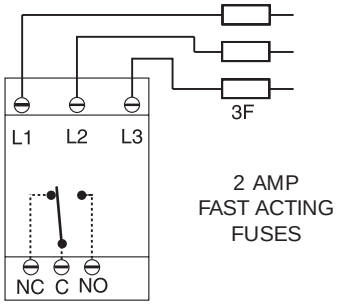
Operation

The output relay is energized and the LED glows when all voltages are acceptable and the phase sequence is correct. Undervoltage, overvoltage, and voltage unbalance must be sensed for 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

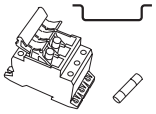


2 AMP
FAST ACTING
FUSES

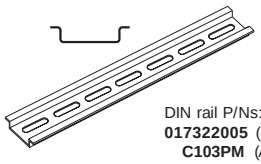
F = Fuses NO = Normally Open
NC = Normally Closed C = Common, Transfer Contact

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

Accessories



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



DIN rail P/Ns:
017322005 (Steel)
C103PM (Al)

See accessory pages for specifications.

Ordering Table

Voltage	Voltage Unbalance	Trip Delay	Part Number
120 V AC	2 ... 8%	2 ... 20 s	DLM411
240 V AC	2 ... 8%	2 ... 20 s	DLM611
380 V AC	2 ... 8%	2 ... 20 s	DLM811
480 V AC	2 ... 8%	2 ... 20 s	DLM911
600 V AC	2 ... 8%	2 ... 20 s	DLM011

DLM02B01 08.15.05

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Technical Data

Line Voltage		
Type		3 phase Delta or Wye with no connection to neutral
Operating Voltage		

Model	Line Voltage Range	Line Voltage Max.	Calibration Frequency
120	110 ... 130 V AC	145 V AC	60 Hz
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
600	500 ... 600 V AC	600 V AC	60 Hz

Line Frequency		50 ... 60 Hz
Phase Sequence		ABC
Overvoltage, Undervoltage & Voltage Unbalance		
Type		Voltage detection with delayed trip & automatic reset
Overvoltage & Undervoltage:		
	Undervoltage Trip Point	88 ... 92% of adjusted line voltage
	Reset Voltage	+3% of trip voltage
	Overvoltage Trip Point	109 ... 113% of adjusted line voltage
	Reset Voltage	-3% of trip voltage
Voltage Unbalance:		
	Trip Unbalance	Adjustable from 2 ... 8%
Trip Delay:	Range	Adjustable from 2 ... 20 s
	Tolerance	Adjustable-Guaranteed range
Phase Reversal		
Response Time -- Phase Reversal		≤100 ms
Reset		Automatic
Output		
Type		Electromechanical relay
Form		Single pole double throw (SPDT)
Rating		10 A resistive @240 V AC; 1/4 hp @125 V AC; 1/3 hp @250 V AC; max. voltage 277 V AC
Life		Mechanical -- 1 x 10^6; Electrical -- 1 x 10^5
Protection		
Surge		IEEE C62.41-1991 Level B
Isolation Voltage		≥ 2500 V RMS input to output
Circuitry		Encapsulated
Mechanical		
Mounting		Surface with 2 #8 (M4 x 0.7) screws or 35 mm DIN rail
Package		4.33 x 2.95 x 1.97 in. (110 x 75 x 50 mm)
Termination		Screw terminals with captive wire clamps for up to #14 AWG (2.5 mm^2) wire Touch proof terminal covers are included
Environmental		
Operating/Storage Temperature		-40℃ ... +60℃ / -40℃ ... +85℃
Humidity		95% relative, non-condensing
Weight	120 & 240 V AC	≅ 8.6 oz (244 g)
	380 ... 600 V AC	≅ 16.3 oz (462 g)

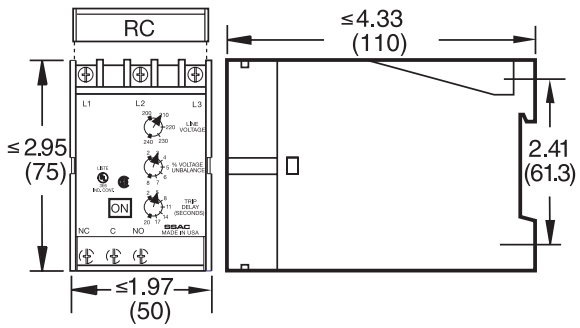
Voltage Unbalance

Selected Unbalance %	Reset %
2	1.8
3	2.7
4	3.6
5	4.5
6	5.4
7	6.3
8	7.2

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.)

7

Mechanical View



Inches (Millimeters)
RC = Removable Terminal Cover

Mounting Note:
Adequate ventilation must be provided.
The Ambient Temperature can not exceed 60° C.
In some installations at 480 and 600 V AC, there must be up to 0.5 in. (12.2 mm) of space between the DLM and other components.