






The PLMU Series continuously measures the voltage of each of the three phases to provide protection for 3-phase motors and sensitive loads. Its microcontroller senses under and overvoltage, voltage unbalance, phase loss, and phase reversal. Protection is provided even when regenerated voltages are present. Universal voltage operation and standard base connection allows the PLMU to replace hundreds of competitive part numbers.

For more information see:  
Appendix B, page 166, Figure 18 for dimensional drawing.  
Appendix C, page 168, Figure 13 for connection diagram.

## Operation

Upon application of power, a 0.6s random start delay begins and the PLMU measures the voltage levels and line frequency and selects the voltage range. The output relay is energized and the LED glows green when all voltages are acceptable and the phase sequence is correct. LED flashes green during trip delay, glows red when output de-energizes. Undervoltage, overvoltage, and voltage unbalance must be sensed for continuous trip delay before the relay de-energizes. Re-energization is automatic upon fault correction. The output relay will not energize if a fault condition is sensed as 3-phase input voltage is applied. The LED alternately flashes red/green when phase reversal is sensed. Line voltage is selected with the knob, setting the over and under voltage trip points. Voltage range is automatically selected by the microcontroller.

## Features:

- Protects against phase & reversal; & over, under & unbalanced voltages
  - Octal plug-in
  - Isolated, 10A, SPDT output contacts
  - Operates from 200 to 480VAC
  - LED indicator glows green when voltages are acceptable, red for faults
  - Indicates reverse-phase wiring
  - Simple 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:   

## Auxiliary Products:

- **Panel mount kit:** P/N: BZ1
- **8-pin octal socket:** P/N: OT08PC
- **3-phase fuse block/disconnect:** P/N: FH3P
- **2 Amp fuse:** P/N: P0600-11
- **DIN rail:** P/N: C103PM (AI)

## Available Models:

PLMU11

## Order Table:

Voltage Unbalance	Trip Delay	Part Number
Adjustable 2-10%	Adjustable 0.25-30s	PLMU11

LED Indicator	
Steady Green	Energized
Steady Red	De-energized (tripped on fault)
Flashing Green	Trip Delay
Alternate Flashing Red/Green	Phase Reversal

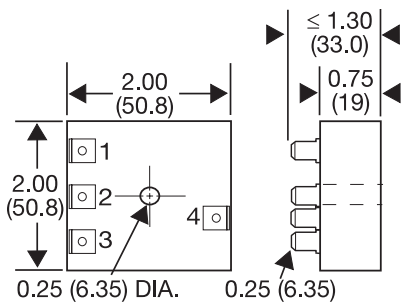
## Specifications

Line Voltage Type	3-phase delta or wye with no connection to neutral	Trip Delay Range	Adjustable from 0.25 - 30s Factory fixed from 2 - 30s ±15% (a minimum order quantity applies)
Line Voltage	200 to 480VAC ±15%, 50/60 Hz ±2 Hz	Severe Unbalance - 2X Selected Unbalance	0.25 - 2s; disabled when the trip delay is less than 2s
Adjustable Voltage Ranges (Automatic Range Selection)	200 to 240VAC, 50/60 Hz 340 to 420VAC, 50 Hz 400 to 480VAC, 60 Hz	Random Start Delay	≅ 0.6s
Maximum Voltage	552VAC	Phase Reversal & Phase Loss Trip Time	≤ 150ms
Phase Sequence	ABC	Phase Loss Setpoint	≥ 15% unbalance
Overvoltage, Undervoltage, & Voltage Unbalance Type	Voltage detection with delayed trip & automatic reset	Reset Type	Automatic
Overvoltage & Undervoltage Undervoltage Trip Point	88 - 92% of adjusted line voltage	Output Type	Energized when voltages are acceptable
Reset Voltage	+2% of trip voltage	Rating	10A resistive @ 240VAC; 1/4 hp @ 125VAC; 1/3 hp @ 250VAC; max. 277VAC
Overvoltage Trip Point	109 - 113% of adjusted line voltage	Life	Mechanical - 1 x 10 <sup>6</sup> ; Electrical - 1 x 10 <sup>7</sup>
Reset Voltage	-2% of trip voltage	Protection	Surge
Voltage Unbalance Trip Point	Adjustable from 2 - 10% Factory fixed from 4 - 10% (a minimum order quantity applies)	Isolation Voltage	≥ 2500V RMS input to output
Reset on Balance (%):		Mechanical	Mounting*
Selected Unbalance	2 3 4 5 6 7 8 9 10	Termination	Plug-in socket rated 600VAC
Reset	1.5 2.5 3.5 4.5 5.4 6.3 7.2 8.1 9	Dimensions	Octal 8-pin plug-in 3.03 x 2.39 x 1.78 in. (77.0 x 60.7 x 45.2 mm)
		Environmental	Operating / Storage Temperature
			-40° to 60°C / -40° to 85°C
			Weight
			≅ 8.6 oz (244 g)

\*CAUTION: Select an octal socket rated for 600VAC operation.

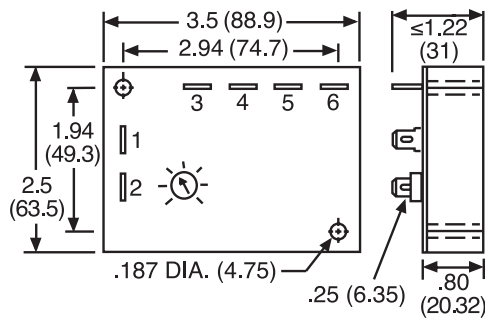
# Appendix B - Dimensional Drawings

FIGURE 13



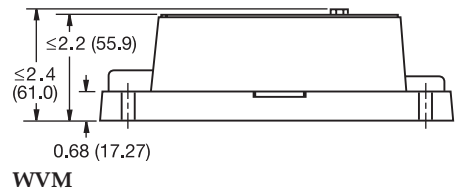
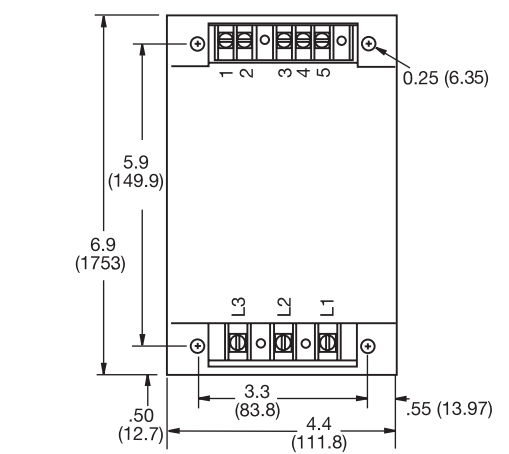
AF

FIGURE 14



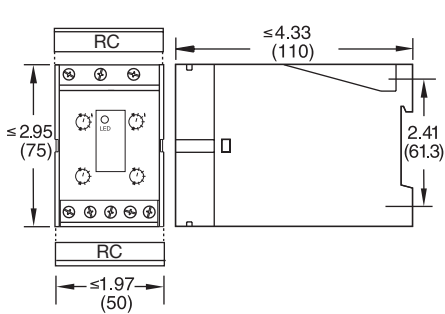
SC3; SC4; SQ

FIGURE 15



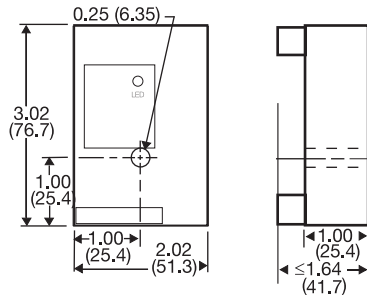
WVM

FIGURE 16



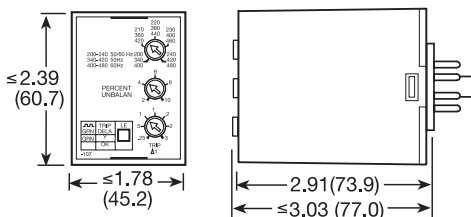
DLMU

FIGURE 17



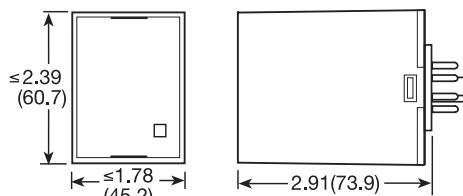
FB9L; HLMU; SCR9L

FIGURE 18



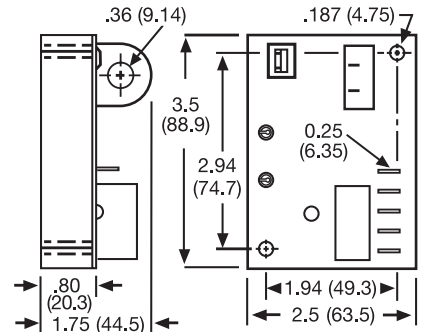
PLMU

FIGURE 19



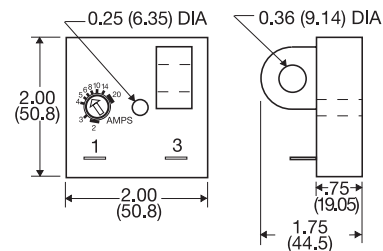
LLC4; LLC6; PLS

FIGURE 20



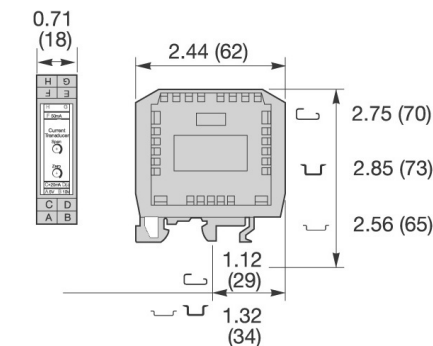
ECS; ECSW (ECS has spade connectors and ECSW has terminal board)

FIGURE 21



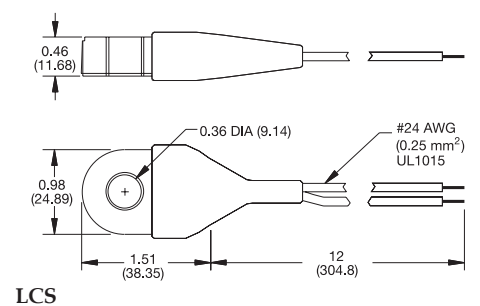
TCS; TCSA

FIGURE 22



DCSA

FIGURE 23

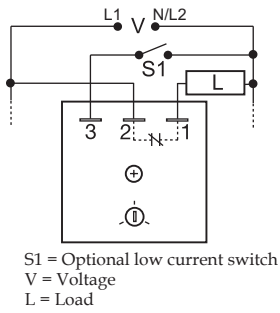


LCS

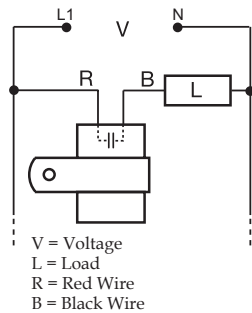
inches (millimeters)

# Appendix C - Connection Diagrams

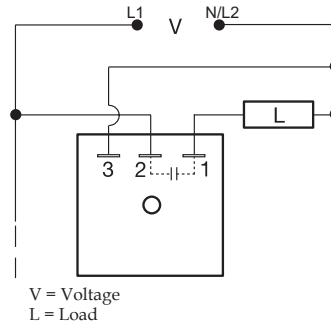
**FIGURE 1 - FSU1000 Series**



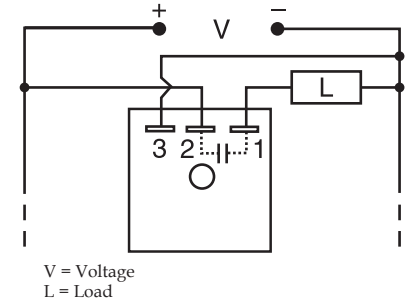
**FIGURE 2 - FS100 Series**



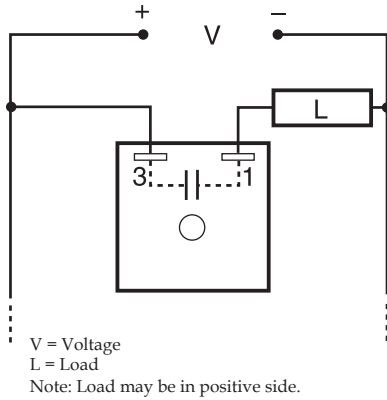
**FIGURE 3 - FS100 Series**



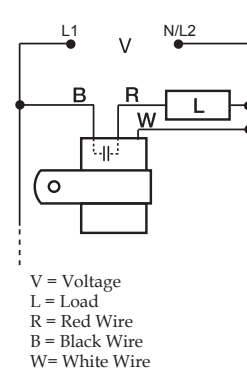
**FIGURE 4 - FS200 Series**



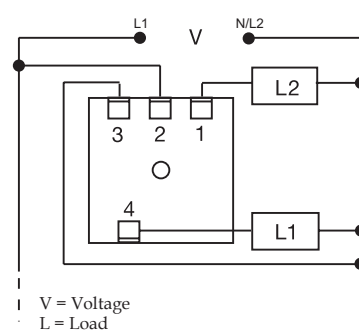
**FIGURE 5 - FS300 Series**



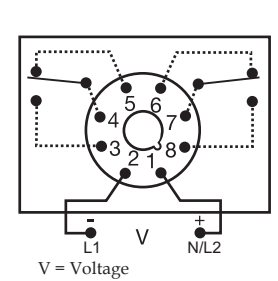
**FIGURE 6 - FS400 Series**



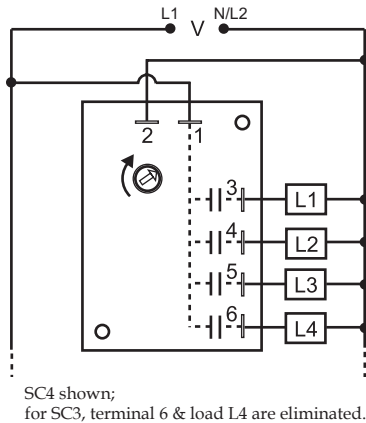
**FIGURE 7 - AF Series**



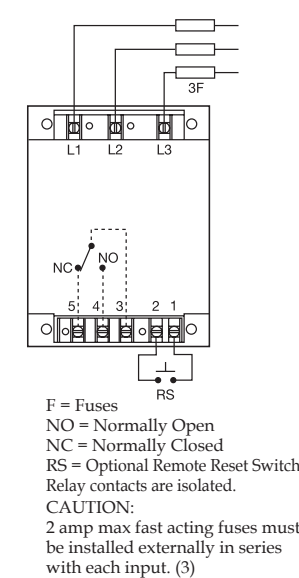
**FIGURE 8 - FS500 Series**



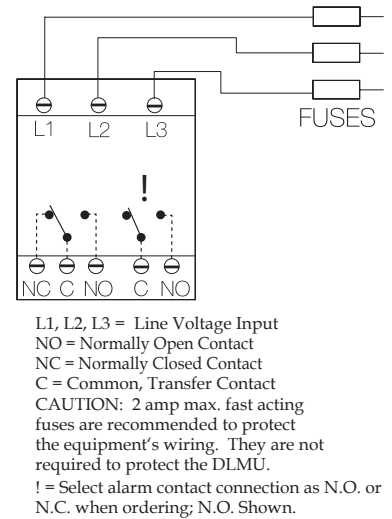
**FIGURE 9 - SC3/SC4 Series**



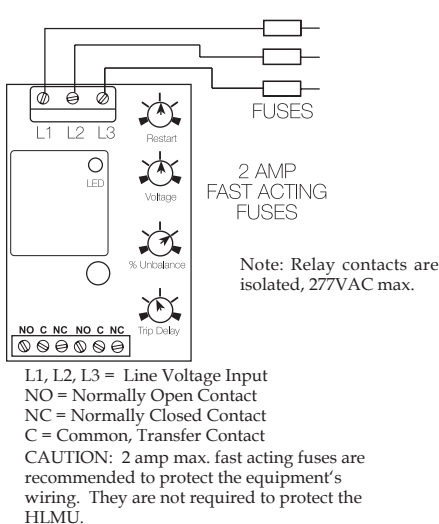
**FIGURE 10 - WVM Series**



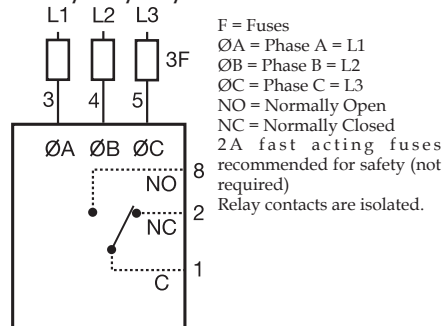
**FIGURE 11 - DLMU Series**



**FIGURE 12 - HLMU Series**



**FIGURE 13 - PLMU/PLM/PLR/PLS Series**



**FIGURE 14 - TVM/TVW Series**

