PSM Series

True RMS 3-Phase Voltage Monitoring Relay

Description

PSM series is a 3-phase mains monitoring relay. It operates on 3P systems, monitoring phase loss, phase sequence and undervoltage. Power supply provided by the monitored mains. For mounting on DIN-rail.

Main Features & Benefits

- **Wide Voltage Range:** Working in systems from 208 to 480 VAC.
- **Adjustable Undervoltage Level:** To allow a correct response to real alarm conditions with easy-to-use front dial
- **Output and Status LED Indication:** For quick troubleshooting.
- **Regenerated Voltage Detection:** To detect phase loss even while the motor is running.
- **High Compactness:** 17.5 mm DIN-rail housing.
- **Monitoring:** 3-phase mains with 3 wires (3P).
- **Detection:** Identify the correct phase sequence and phase loss.
- **Changeover Relay Output:** Single-Pole Double-Throw

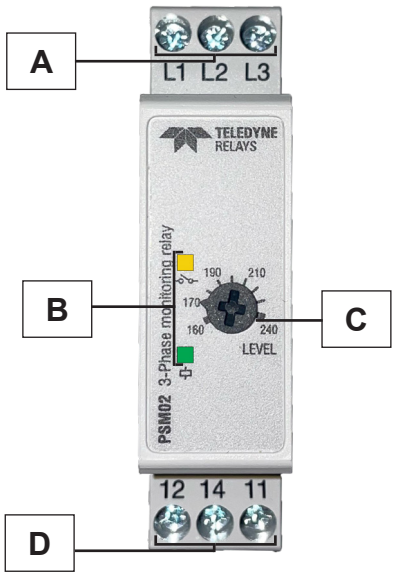
Part Numbering System

Code	Option	Description
PSM		Product Series
-	02	DIN Rail Mount
-	A	SPDT Configuration, 17.5 mm Package
-	208	Power Supply: 208 to 240 VAC
	380	Power Supply: 380 to 480 VAC

Example: PSM 02 A 208

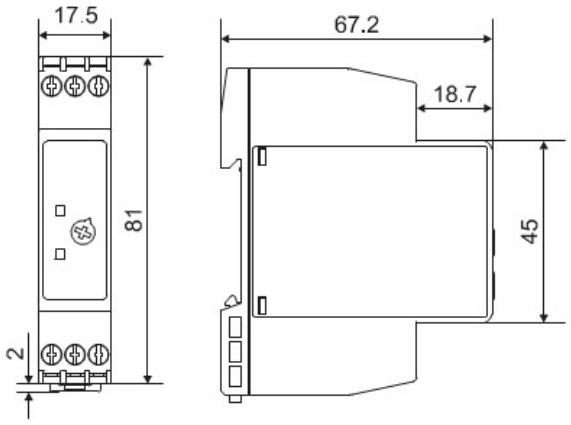
Series	DIN-Rail Mount	Configuration	Power Supply

Structure



Element	Component	Function
A	Input Terminals	Connection of the line voltages
B	Information LEDs	Yellow for relay output status Green for device ON
C	Voltage setpoint dial	Undervoltage setpoint adjustment
D	Output Terminals	SPDT relay output

Outline



Dimensions in mm

Power Supply

Power Supply		Supplied by measured phases (L1, L3)
Overvoltage Category		III (IEC 60664)
Voltage Range	**PSM02A208**	208 to 240 V_{L-L} AC ± 15% (177 to 276 V)
	PSM02A380	380 to 480 V_{L-L} AC ± 15% (323 to 552 V)
Frequency Range		50 to 60 Hz ±10% sinusoidal waveform
Consumption	**PSM02A208**	< 7 VA
	PSM02A380	< 13 VA

Inputs

Terminals	L1, L2, L3
Measured Variables	Phase Sequence Phase Loss 3P: Voltages V_{L12}, V_{L23}, V_{L31}

Outputs

Terminals	11, 12, 14
Number of Outputs	1
Type	SPDT electromechanical relay with changeover contacts
Logic	Output de-energized
Contact Rating	**Ith:** 5 A @ 250 VAC **AC15:** 2.5 A @ 250 VAC **DC12:** 5 A @ 24 VDC **DC13:** 2.5 A @ 24 VDC
Electrical Lifetime	≥ 50 x 103 operations (at 5 A, 250 V, cos φ= 1)
Mechanical Lifetime	> 30 x 106 operations
Assignment	Associated to all alarm types

Insulation

Terminals	Basic Insulation
Inputs: L1, L2, L3 to Output: 11, 12, 14	2.5 kVrms, 4 kV impulse 1.2/50 µs

General

Material	Polyamide (Nylon) (PA66/6) or Phenylene ether + Polystyrene (PPE-PS) Flammability rating: HB according to UL 94
Colour	RAL7035 (Light Grey)
Dimensions (W x H x D)	17.5 x 81 x 67.2 mm (0.68 x 3.19 x 2.65 in)
Weight	75 g (2.65 oz)
Terminals	Cable size from 0.05 to 2.5 mm^2 (AWG30 to AWG13), stranded or solid
Tightening Torque	Max. 0.5 Nm (4.425 lbin)
Terminal Type	Screw terminals

Environmental

Operating Temperature	50 Hz: -20 to 60°C (-4 to 140°F) 60 Hz: -20 to 50°C (-4 to 122°F)
Storage Temperature	-30 to 80°C (-22 to 176°F)
Relative Humidity	5 - 95% Non-condensing
Protection Degree	IP20
Pollution Degree	2
Operating Max Altitude	2000 m amsl (6560 ft)
Salinity	Non saline environment
UV Resistance	No

Test Condition	Test	Level
Tests with Unpacked Device	Vibration response (IEC60255-21-1)	Class 1
	Vibration endurance (IEC 60255-21-1)	Class 1
	Shock (IEC 60255-21-2)	Class 1
	Bump (IEC 60255-21-2)	Class 1

Test Condition	Test	Level
Tests with packed Device	Vibration random (IEC60068-2-64)	Class 1
	Shock (IEC 60255-21-2)	Class 1
	Bump (IEC 60255-21-2)	Class 1

Class 1: monitoring devices for normal use in power plants, substations and industrial plants and for normal transportation conditions.

The packaging type is designed and implemented in such manner that the severity class parameters will not be exceeded during transportation.

Compatibility and Conformity

Marking	CE UKCA
Directives	2014/35/EU (LVD - Low voltage) 2014/30/EU (EMC - Electromagnetic compatibility)
Standards	Insulation coordination: EN 60664-1 Immunity: EN61000-6-2 Emission: EN61000-6-3
Approvals	c UL us LISTED (UL508) CSA

Operating Description

Device configuration

The relay operates when all the phases are present, the phase sequence is correct and the phase-phase voltage levels are above the adjusted setpoint.

Undervoltage Adjustment Dial		
Typology	**PSM02A208**	Linear selection from 160 to 240 V
	PSM02A380	Linear selection from 320 to 480 V
Resolution	**PSM02A208**	10 V increase per notch
	PSM02A380	20 V increase per notch
Function		Undervoltage setpoint

Phase Loss Alarm		
Input Variables		L1-L2, L2-L3 and L3-L1
Alarm Setpoint		One phase ≤ 85% of the rated value (regenerated voltage detection)
Restore Setpoint		All phases > 85% of the rated value + Hysteresis
Reaction Time		Alarm ON : < 100 ms Alarm OFF : < 300 ms
Hysteresis	**PSM02A208**	3% on full scale
	PSM02A380	4% on full scale
Delay ON		None
Delay OFF		None

Phase Sequence Alarm	
Input Variables	Connection L1, L2, L3
Reaction Time	Alarm ON : < 100 ms Alarm OFF : < 300 ms
Delay ON	None
Delay OFF	None

Undervoltage Alarm		
Input Variables		3P: voltages V_{L12}, V_{L23}, V_{L31}
Reaction Time		Alarm ON : < 100 ms Alarm OFF : < 300 ms
Undervoltage Setting Range	**PSM02A208**	From 160 to 240 VAC
	PSM02A380	From 320 to 480 VAC
Repeatability		0.5% on full scale
Hysteresis	**PSM02A208**	3% on full scale
	PSM02A380	4% on full scale
Delay ON		None
Delay OFF		None

Information LEDs

Color	Status		Description
Green (⊟)	Power Supply	ON	Power Supply ON
		OFF	Power Supply OFF
Yellow (⊸)	Relay Output	ON	Energized
		OFF	De-energized

Operating Diagram

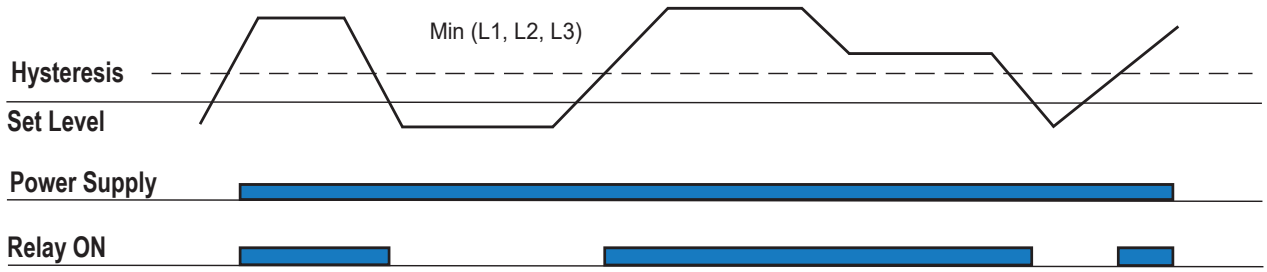


Fig. 1 Undervoltage Monitoring

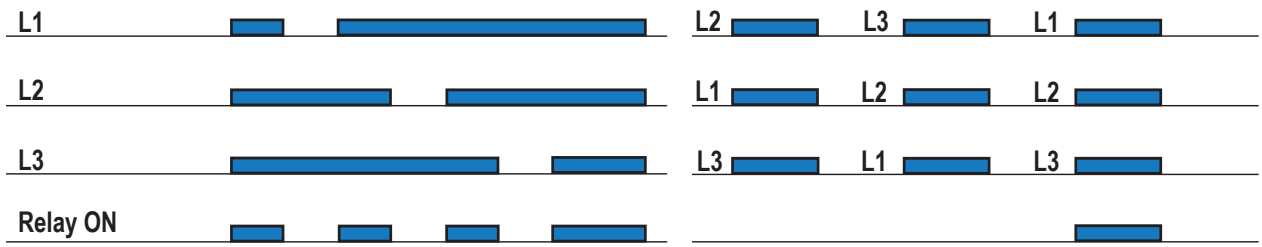
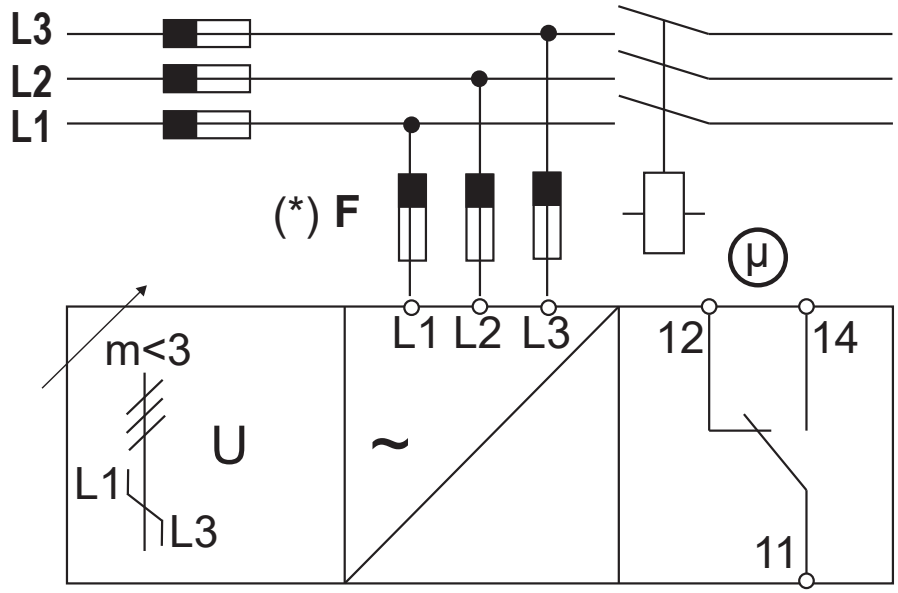


Fig 2. Total Phase Loss, Phase Sequence

Connection Diagram



(*) NOTE: fuses F of 315 mA delayed, if required by local law.

Questions? Call us at (914) 592-7726. www.alltechelectronics.com