

# Type: M1PRF & M1PRF-4W

## Phase Failure, Phase Sequence and Under Voltage

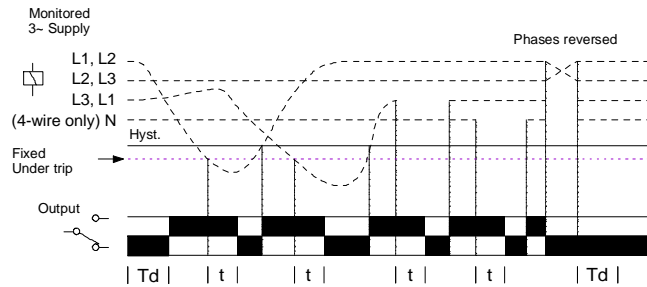
- 17.5mm DIN rail housing
- Microprocessor controlled with internal monitoring (self-checking)
- Monitors own supply and detects an Under voltage condition on one or more phases
- M1PRF measures phase to phase voltage and M1PRF-4W measures phase to neutral voltage
- Detects incorrect phase sequence, phase loss and neutral loss (4-wire only)
- Fixed Under voltage trip level
- Fixed time delay
- 1 x SPDT relay output 8A
- Intelligent LED indication for supply and relay status



Dims:  
to DIN 43880  
W. 17.5mm

Terminal Protection to IP20

### FUNCTION DIAGRAM



### INSTALLATION AND SETTING



Installation work must be carried out by qualified personnel.

- BEFORE INSTALLATION, ISOLATE THE SUPPLY.
- Connect the unit as required. The diagram below shows a typical installation, whereby the supply to the load is being monitored by the relay. If a fault should occur (i.e. fuse blowing), the contactor is de-energised removing the 3-phase supply to the load. The contactor only re-energises after the fault has cleared.

#### Applying power.

- Apply power and the green "supply on" and red "relay" LED's will illuminate, the relay will energise and contacts 15 and 18 will close. Refer to the troubleshooting table if the unit fails to operate correctly.

#### Note:

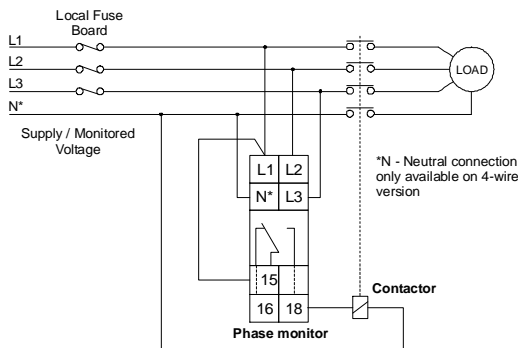
This device is not suitable for applications where there could be a percentage of re-regenerative voltage present during a fault condition, i.e. fuse failure. During these conditions a monitor that includes an adjustable under voltage trip level is necessary which allows this type of fault to be detected. It is therefore recommended that the M1prt or M1prt-4w phase monitors be considered.

#### Troubleshooting.

The table below shows the status of the unit during a fault condition.

Supply fault	Green LED	Red LED	Relay
Phase or Neutral (4-wire only) missing	Off	Off	De-energised
Phases reversed	Flashing	Off	De-energised
Phase below 70% of Un (fixed under trip level)	On	Off	De-energised
Phase below 50% of Un	Off	Off	De-energised

### CONNECTION DIAGRAM



### TECHNICAL SPECIFICATION

Supply / monitoring voltage U*:	M1PRF (L1, L2, L3) 77 - 143V AC 161 - 300V AC 280 - 520V AC	M1PRF-4W (L1, L2, L3, N) 44.5 - 82.5V AC 93 - 173V AC 161 - 300V AC
Frequency range:	48 - 63Hz	
Isolation:	Over voltage cat. III	
Rated impulse withstand voltage:	4kV (1.2 / 50µs) IEC 60664	
Power consumption: (max.)	L1: 20VA (3-wire), 13VA (4-wire) L2: 0.2VA (3-wire), 0.1VA (4-wire) L3: 20VA (3-wire), 0.1VA (4-wire)	

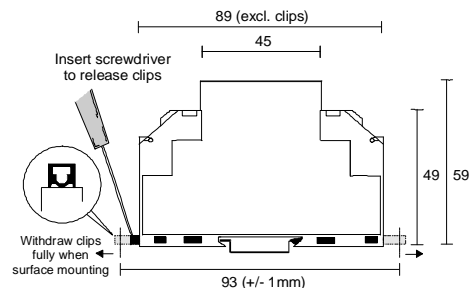
\*Please state Supply / monitoring voltage when ordering

Trip level:	Under trip level fixed at (±2%):
Voltage range:	77 - 143V AC (3-wire) 77V 161 - 300V AC (3-wire) 161V 280 - 520V AC (3-wire) 280V 44.5 - 82.5V AC (4-wire) 44.5V 93 - 173V AC (4-wire) 93V 161 - 300V AC (4-wire) 161V
Hysteresis:	≈ 2% of trip level (factory set)
Time delay (t):	≈ 100 ms (worst case = t x 2)
Power on delay (Td):	≈ 1sec. (worst case = Td x 2)
Ambient temp:	-20 to +60°C
Relative humidity:	+ 95%
Output (15, 16, 18):	SPDT relay
Output rating:	AC1 250V 8A (2000VA) AC15 250V 5A (no), 3A (nc) DC1 25V 8A (200W)
Electrical life:	≥ 150,000 ops at rated load
Dielectric voltage:	2kV AC (rms) IEC 60947-1
Rated impulse withstand voltage:	4kV (1.2 / 50µs) IEC 60664
Housing:	Orange flame retardant UL94 VO
Weight:	≈ 70g
Mounting option:	On to 35mm symmetric DIN rail to BS5584:1978 (EN50 002, DIN 46277-3) Or direct surface mounting via 2 x M3.5 or 4BA screws using the black clips provided on the rear of the unit.
Terminal conductor size:	≤ 2 x 2.5mm <sup>2</sup> solid or stranded
Approvals:	Conforms to IEC, CE and Compliant.

#### Options:

1. For other supply/monitoring voltages, please consult the sales office.
2. For alternative time delays or trip levels, please consult the sales office.
3. The unit is also available with a double-pole relay output. Refer to separate data sheet for M3prf/2 and M3prf/2-4w.

### MOUNTING DETAILS



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M1PRF-3-A

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