

# Type: M3PRT/2 & M3PRT/2-4W

## Phase Failure, Phase Sequence and Under Voltage plus Time Delay

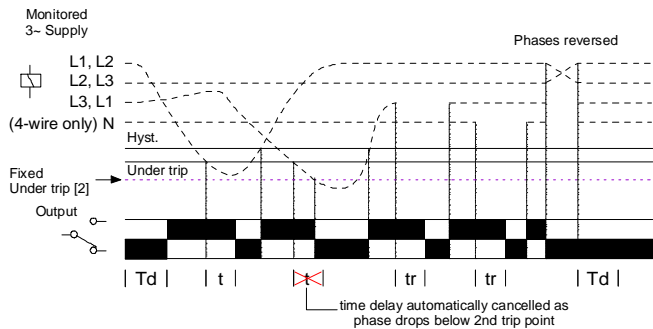
- 35mm DIN rail housing
- Microprocessor controlled with internal monitoring (self-checking)
- Monitors own supply and detects an Under voltage condition on one or more phases
- M3PRT/2 measures phase to phase voltage and M3PRT/2-4W measures phase to neutral voltage
- Detects incorrect phase sequence, phase loss and neutral loss (4-wire only)
- Adjustment for under voltage trip level
- Adjustment for time delay (from an under voltage condition)
- 1 x DPDT relay output 8A
- Intelligent LED indication for supply and relay status



Dims:  
to DIN 43880  
W. 35mm

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, 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.

- Set the "trip level" and the "time delay" to minimum.
- Apply power and the green "supply on" and red "relay" LED's will illuminate, the relay will energise and contacts 15 and 18 / 25 and 28 will close. Refer to troubleshooting table if the unit fails to operate correctly.

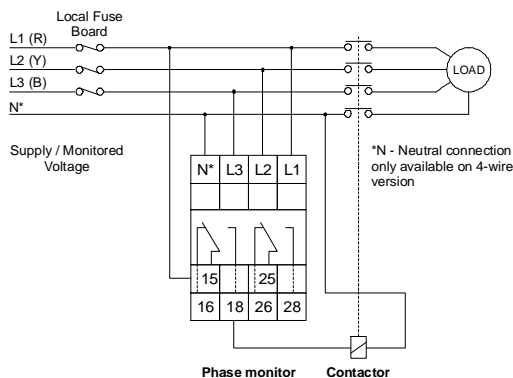
#### Setting the unit.

- Accurate setting can be achieved by adjusting the "trip level" until the unit trips (relay de-energises) then by decreasing the "trip level" setting until the relay re-energises. By close setting of the "trip level", the unit will also detect a phase loss even with a large percentage of re-generative voltage.
- In order to set the unit as previously described but without causing disruption to the equipment being controlled/monitored, set the "time delay" to maximum. It will now be possible to establish the trip point when the red "relay" LED starts to flash. Decrease the trip level setting to stop the LED flashing. (Note: If the time delay is allowed to expire, the output relay will de-energise).
- If large supply variations are anticipated, the "trip level" should be set further from the nominal voltage.
- Set the "time delay" as required. (Note that the delay is only effective should the supply drop below the set "trip level". However, if during an under voltage condition the supply drops below the 2<sup>nd</sup> under voltage trip level, any set time delay is automatically cancelled and the relay de-energises).

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 (no delay)                         | Flashing  | Off      | De-energised                |
| Under Voltage condition (during timing)            | On        | Flashing | Energised for set delay (t) |
| Under Voltage condition (after timing)             | On        | Off      | De-energised                |
| Phase below 70% of Un (fixed under trip level [2]) | On        | Off      | De-energised                |
| Phase below 50% of Un                              | Off       | Off      | De-energised                |

### CONNECTION DIAGRAM



### TECHNICAL SPECIFICATION

| Supply / monitoring voltage U*:  | M3PRT/2 (L1, L2, L3)       | M3PRT/2-4W (L1, L2, L3, N) |
|----------------------------------|----------------------------|----------------------------|
| Frequency range:                 | 77 - 143V AC               | 44.5 - 82.5V AC            |
| Isolation:                       | 161 - 300V AC              | 93 - 173V AC               |
| Rated impulse withstand voltage: | 280 - 520V AC              | 161 - 300V AC              |
| Power consumption: (max.)        | 48 - 63Hz                  |                            |
|                                  | Over voltage cat. III      |                            |
|                                  | 4kV (1.2 / 50µs) IEC 60664 |                            |

\*Please state Supply / monitoring voltage when ordering

| Trip levels:     | Under [2] fixed ±2%:                                      | Under (adjustable): |
|------------------|---|---------------------|
| 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                |
| Repeat accuracy: | ± 0.5% @ constant conditions                              |                     |
| Hysteresis:      | ≈ 2% of trip level (factory set)                          |                     |
| Response time:   | ≈ 50 ms   |                     |
| Time delay (t):  | 0.2 - 10 sec (± 5%)                                       |                     |
|                  | Note: actual delay (t) = adjustable delay + response time |                     |

|                                     |                                |
|-------------------------------------|--------------------------------|
| Delay from phase/neutral loss (tr): | ≈ 100 ms (worst case = tr x 2) |
| Power on delay (Td):                | ≈ 1sec. (worst case = Td x 2)  |

|                    |               |
|--------------------|---------------|
| Ambient temp:      | -20 to + 60°C |
| Relative humidity: | + 95%         |

|                |                                      |
|----------------|--------------------------------------|
| Output:        | DPDT relay (15, 16, 18 / 25, 26, 28) |
| Output rating: | AC1 250V 8A (2000VA)                 |
|                | AC15 250V 3A                         |
|                | 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:          | ≈ 100g   |
| 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. |

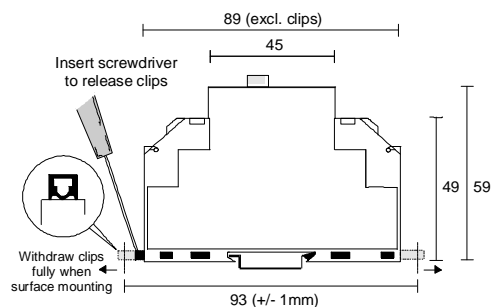
|                          |  |
|--------------------------|--|
| Terminal conductor size: | ≤ 2 x 2.5mm <sup>2</sup> solid or stranded |
|--------------------------|--|

|            |                                     |
|------------|-------------------------------------|
| 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.

### MOUNTING DETAILS



Available from: Power Drive Systems, 48A Ainsdale Street, Chermside West, Queensland 4032

M3PRT-2-A

Telephone: (07) 3350 4594 Facsimile: (07) 3350 1654 Email: info@powersystems.com.au Web: http://www.powersystems.com.au

The information provided in this literature is believed to be accurate (subject to change without prior notice); however, use of such information shall be entirely at the user's own risk.