

Terminal Protection to IP20



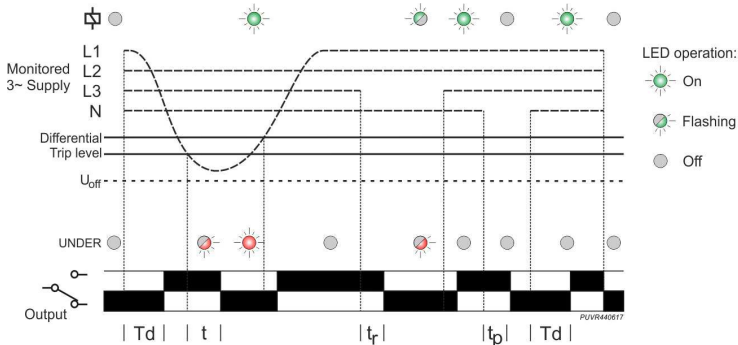
Dims: to DIN 43880  
W. 44mm

- Designed to withstand overloads up to 125% (cont.), 150% (10s)
- Microprocessor based
- True R.M.S. monitoring
- Selectable nominal voltages (220, 230, 240, 254, 265, 277V (L>N))
- Monitors own supply and detects an Under voltage condition on one or more phases
- Adjustment for Differential and Under voltage trip level
- Adjustment for Time delay
- DPDT relay output 8A
- Green LED indication for supply status
- Red LED indication for fault/timing status
- Can be tested on single phase when 3-phase not available i.e. during commissioning



ISO 9001:2015  
Cert. No. 14125771

### FUNCTION DIAGRAM



### TECHNICAL SPECIFICATION

Supply/monitoring voltage Un (1, 3, 5, 7):	220 - 277V AC (L>N)
Frequency range:	45 - 65Hz
Supply variation:	132 - 346V AC (L>N)
Maximum overload (L>N):	416V for 10s
Overvoltage category:	III (IEC 60664)
Rated impulse withstand voltage:	4kV (1.2/50μs) IEC 60664
Power consumption (max.):	3VA/1.7W
Monitoring mode:	Under voltage
Trip levels:	
Supply threshold (U <sub>set</sub> ):	140V ± 2% (fixed)
Under:	70 - 100% of Un
Measuring ranges:	
Nominal (Un)	Under
220V	154 - 220V
230V	161 - 230V
240V	168 - 240V
254V	178 - 254V
265V	185 - 265V
277V	194 - 277V
Differential:	1 - 15% of Un
Setting accuracy:	± 3%
Repeat accuracy:	± 0.5% at constant conditions
Immunity from micro power cuts:	<50ms
Delay from Phase loss (t <sub>p</sub> ):	<300ms (150ms typical)
Delay from Neutral loss (t <sub>n</sub> ):	<300ms (150ms typical)
Delay to relay re-energising:	<500ms (after fault clearing)
Time delay (t <sub>d</sub> ):	0.5 - 10s (± 5%)
Power on delay (Td):	≈ 0.5s (worst case = Td x 2)
Reset time:	50 - 100ms
Power on indication:	Green LED
Fault/timing status indication:	Red LED
Ambient temperature:	-20 to +60°C
Relative humidity:	+95% max.
Output (8, 9, 10 / 12, 13, 14):	DPDT relay
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:	Grey flame retardant Lexan UL94 V0
Weight:	100g
Mounting option:	On to 35mm symmetric DIN rail to BS EN 60715
Terminal conductor size	≤ 2 x 2.5mm <sup>2</sup> solid or stranded
Approvals:	Conforms to IEC, CE, EMC and RoHS Compliant. EMC: Immunity: EN 61000-6-2 Emissions: EN 61000-6-4

### INSTALLATION AND SETTING



Installation work must be carried out by qualified personnel.

- BEFORE INSTALLATION, ISOLATE THE SUPPLY.
- Connect the unit as required. The Connection Diagram below shows a typical installation, whereby the supply to a load is being monitored by the Phase monitoring relay. If a fault should occur (i.e. fuse blowing), the relay will de-energise and assuming control of the external Contactor, de-energise the Contactor as well.

#### Setting the unit and applying power.

- Set the "Nominal Voltage (Un)" voltage adjustment to match that of the supply voltage being monitored.
- Set the "Trip Level" and "Differential" adjustments to minimum. Set the "Time Delay" to minimum.
- Apply power and the green "Power supply" LED will illuminate and relay will energise after the short Power on delay (Td). The red "UNDER" LED will remain extinguished.
- Refer to the troubleshooting table if the unit fails to operate correctly.

#### Setting the unit (with power applied).

- Accurate setting can be achieved by adjusting the "Trip Level" until the unit trips (relay de-energises/red LED lit) then by decreasing the "Trip Level" until the relay re-energises again (red LED extinguished). Close setting of the trip level ensures the unit will 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 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 "Delay (t)" 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 fixed "U<sub>off</sub>" trip level any set time delay is automatically cancelled and the relay de-energises).

#### Testing on single phase

- For the purpose of testing/checking the unit where 3-phase is not available, wire the unit as shown in the diagram on the right. The procedure further up (Setting the unit and applying power) still applies.

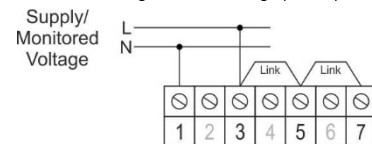
#### Troubleshooting.

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

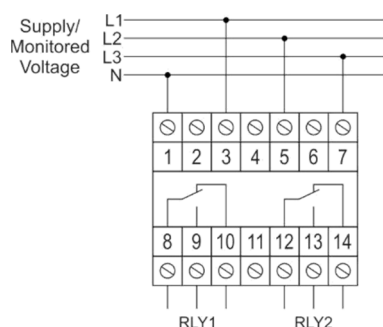
Supply fault	Green LED ①	Red LED ②	Relay
Under voltage condition (during timing)	On	Flashing	Energised for delay (t)
Under voltage condition (after timing)	On	On	De-energised
Phase missing/below supply threshold (U <sub>set</sub> )	LED's flash alternately		De-energised
Neutral missing	Off	Off	De-energised

### CONNECTION FOR TESTING ON SINGLE PHASE

Link the terminals as shown in the diagram below for single phase operation/testing purposes.



### CONNECTION DIAGRAM (3-PHASE)



### SETTING DETAILS

- Power supply status (Green) LED
- Fault / Timing status (Red) LED
- "Nominal Voltage (Un)" selector
- "Time Delay (s)" adjustment
- "Trip Level (% x Un)" adjustment\*
- "Differential (% x Un)" adjustment\*

\*scaled as % of the selected "Nominal Voltage"



### DIMENSIONS

