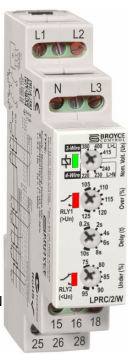


Terminal Protection to IP20



Dims: to DIN
43880
W. 17.5mm

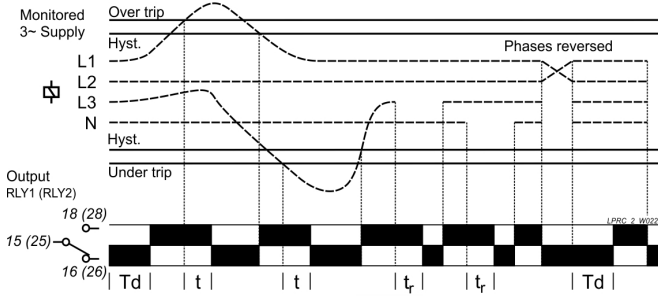
- True R.M.S. monitoring measuring phase to phase (3-wire) or phase to neutral (4-wire) voltages
- Selectable nominal voltages to suit most popular 3-wire or 4-wire supply voltages
- Monitors own supply and detects if one or more phases exceed the set Under or Over voltage trip levels
- Detects phase loss and neutral loss¹
- Operates irrespective of phase sequence
- Adjustments for Under and Over voltage trip levels
- Adjustment for Time delay
- DPDT relay output 5A
- Green LED indication for supply status
- Red LED indication for both relay and timing status
- Compact 17.5mm DIN rail housing
- Microprocessor based



¹ Only when 4-wire monitoring selected

FUNCTION DIAGRAM

Under and Over Voltage Monitoring



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.
- Only connect the Neutral if available and 4-wire monitoring is required.

Applying power.

- Set the "Nominal (Un)" **6** voltage selector to match that of the voltage being monitored.
- Set the Over % **4** adjustment to maximum and the "Under %" **6** adjustment to minimum. Set the "Delay (t)" **5** to minimum.
- Apply power and the green "Power supply" **1** LED will illuminate. The red **2** LED will illuminate, and relay will energise after the short Power on delay (Td).
- Refer to the Troubleshooting table if the unit fails to operate correctly.

Setting the unit (with power applied).

- Set the "Over %" and the "Under %" adjustments to give the required monitoring range.
- If large supply variations are anticipated, the adjustments should be set further from the nominal voltage.
- Set the "Delay (t)" adjustment as required. (Note that the delay is only effective should the supply increase above or drop below the set trip levels. However, if during an under voltage condition the supply drops below the 2nd under voltage trip level, any set time delay is automatically cancelled and both relays de-energise immediately).

Troubleshooting.

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

| Supply fault | Green LED 1 | Red LED 2 | Relay |
|---|-----------------------|-----------------------|-------------------------|
| Phase or neutral ² missing | Flashing ¹ | Flashing ¹ | De-energised |
| Phases reversed | On | On | Energised |
| Under voltage condition (during timing) | On | Flashing | Energised for delay (t) |
| Under voltage condition (after timing) | On | Off | De-energised |
| Over voltage condition (during timing) | On | Flashing | Energised for delay (t) |
| Over voltage condition (after timing) | On | Off | De-energised |
| Phases < fixed under trip level [2] | On | Off | De-energised |

¹ Green and Red LED's alternate in this fault condition

² Refer to Technical Specification for neutral loss/shift threshold voltage

TECHNICAL SPECIFICATION

| Supply/monitoring voltage Un (L1, L2, L3, (N)): | 3-wire monitoring 3-Wire | 4-wire monitoring 4-Wire | | |
|---|--|---------------------------------|------------|------------|
| Frequency range: | 380, 400, 415V AC | 220, 230, 240V AC | | |
| Supply variation: | 48 – 63Hz | | | |
| Overvoltage category: | 243– 540V AC (L>L) | | | |
| Rated impulse withstand voltage: | III (IEC 60664) | | | |
| Power consumption (max.): | 4kV (1.2/50µs) IEC 60664 | 2.5VA | | |
| Monitoring mode: | Under and Over voltage | | | |
| Trip levels: | | | | |
| Under [2]: | Fixed ± 2% see below | | | |
| Under: | 75 – 95% of Un | | | |
| Over: | 105 – 125% of Un | | | |
| Neutral loss/shift detection threshold: | ≈ 45V rms (assuming balanced load across phases). Applies if unit set to: 220, 230 or 240V L-N | | | |
| Measuring ranges: | Nominal (Un) | Under [2] | Under | Over |
| 3-wire (L>L) | 380V | 243V | 285 – 361V | 399 – 475V |
| | 400V | 256V | 300 – 380V | 420 – 500V |
| | 415V | 265V | 311 – 394V | 436 – 519V |
| 4-wire (L>N) | 220V | 140V | 165 – 209V | 231 – 275V |
| | 230V | 147V | 173 – 219V | 242 – 288V |
| | 240V | 153V | 180 – 228V | 252 – 300V |

| | |
|----------------------------------|---|
| Hysteresis: | ≈ 2% of trip level (factory set) |
| Setting accuracy: | ± 3% |
| Repeat accuracy: | ± 0.5% at constant conditions |
| Immunity from micro power cuts: | <50ms |
| Response time (t _r): | ≈ 50ms |
| Time delay (t _d): | 0.2 – 10s (± 5%) <i>Note: actual delay (t) = adjustable delay + response time</i> |
| Power on delay (Td): | ≈ 1s (worst case = Td x 2) |
| Reset time: | 50 – 100ms |
| Power on indication: | Green LED |
| Relay status indication: | Red LED x2 |
| Ambient temperature: | -20 to +60°C |
| Relative humidity: | +95% max. |

| | |
|-----------------------------------|--|
| Output (15, 16, 18 / 25, 26, 28): | DPDT relay |
| Output rating: | AC1 250V 5A (1250VA) AC15 250V 2A DC1 25V 5A (125W) |
| 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 UL94 |
| Weight: | 90g |
| Mounting option: | On to 35mm symmetric DIN rail to BS EN 60715 or direct surface mounting via 2 x M3.5 or 4BA screws using black clips provided on the rear of the unit. |
| Terminal conductor size: | ≤ 2.5mm ² solid or stranded |
| Terminal screw: | M2.5 |
| Tightening torque: | 0.4Nm (3.5Lb-In) Max. |

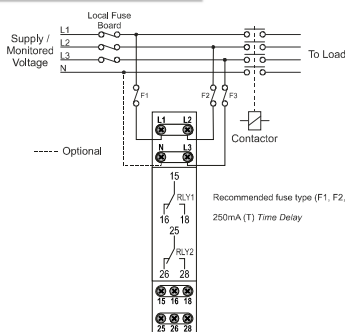
Approvals: Conforms to IEC, CE, UKCA, and RoHS Compliant.
EMC: Immunity: EN 61000-6-2 Emissions: EN 61000-6-4



IND. CONT. EQ.
E111187

Note: "L>L" has the same meaning as "phase to phase" and "L>N", the same as "phase to neutral"

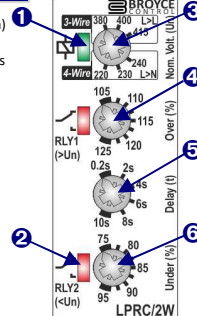
CONNECTION DIAGRAM



SETTING DETAILS

1. Power supply status (Green) LED
2. Relay output / Timing status
3. "Nominal (Un)" voltage selector
4. "Over %" trip level adjustment^A
5. "Delay (t)" adjustment
6. "Under %" trip level adjustment^A

^Ascaled as % of the selected nominal voltage "Un"



DIMENSIONS

