Type: LPRC/2-NFC

Fully Programmable Three Phase Voltage Monitoring Relay (with NFC)

Terminal Protection to IP20



Dims: to DIN 43880
W. 17.5mm

- **Flexibility – 1 product covers all the needs for monitoring and protecting equipment/loads**
- **Built-in NFC (Near Field Communication) allows user to access and change settings via compatible Smartphone/Device with installed app^**
- **Configurable trip and time delay settings using app**
- **High accuracy due to digital settings**
- **Easy to clone settings on further units**
- **Monitors own supply (3-wire or 4-wire)**
- **True R.M.S. monitoring**
- **Multi-voltage supply options to suit key global supplies**
- **Switch mode power supply design for low power operation**
- **2 x SPDT independent relay outputs 5A - User configurable and assignable to various functions**
- **Compact dimensions – 17.5mm wide**
- **No external adjustments to tamper with**

NFC

^ App available from:

GET IT ON Google Play

QMS ISO 9001 REGISTERED

ISO 9001:2015
Cert. No. 14125771

OVERVIEW

The LPRC/2-NFC is a multi-function, 3-Phase voltage monitoring relay designed for both 3-wire and 4-wire supplies and is ideal where several parameters need to be monitored. It can monitor for under voltage, over voltage, phase loss, neutral loss (when set for 4-wire monitoring), phase reversal and phase asymmetry. The parameters which need to be monitored are configured and set using the app.

Within the app (and the initial setting up process), the user can choose from either 3-wire (Delta) or 4-wire (Y/Star) monitoring and select the voltage to be monitored from the nominal supply voltage options provided. From here, settings for the trip levels, time delays and relay operation are made. There are adjustments provided also for the setting of the Hysteresis which sets the threshold at which the unit returns from a no-fault condition.

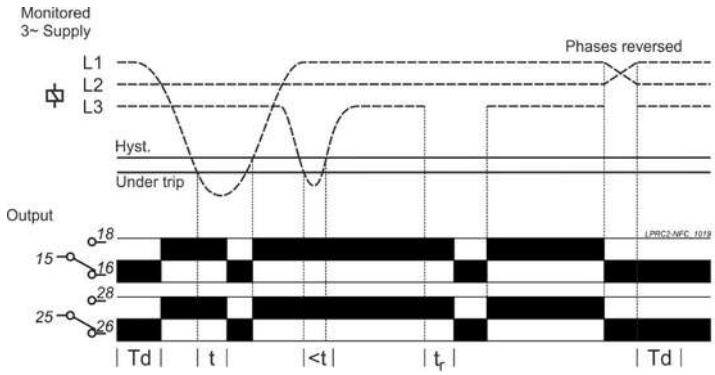
As the relays are independent, they can be assigned to operate against a particular parameter (i.e. Relay 1 assigned to operate only on phase reversal, Relay 2 assigned to operate only on under or over voltage) so making this product truly universal. The relays can be configured to operate simultaneously if required i.e. operating as a DPDT relay.

Utilising NFC technology also adds the benefit of unit configuration taking place without the need for the unit to be powered. This feature is useful where a panel needs to be shut down and power removed (for safety reasons) before any work or alterations can be made.

The unit also benefits from using a switch mode power supply which is not affected by applications that maybe prone to noise (i.e. generated from inverters). This increases the products resilience to any additional heat dissipation which otherwise would be generated in non-switch mode based products.

FUNCTION DIAGRAM

Factory default operation shown
Under Voltage Monitoring (3-wire supply), DPDT



APP

To utilise the full features, the app must be downloaded and installed on a compatible Android smartphone. This app can be obtained as follows:

- Visit https://play.google.com/store/apps and search for LPRC/2-NFC
- Scan the QR code below. This will take you directly to the app on Google Play

Instructions on using the app to set the additional features can be found in the Help menu (within the app)

SETTING UP

The unit is supplied with pre-defined parameters and settings based on the most popular requirements for this type of relay. However, using the app, the user has the choice to alter and re-configure the functionality, trip level(s), time delay(s) and relay(s) to suit.

Note that phase and neutral loss detection are always enabled and cannot be altered

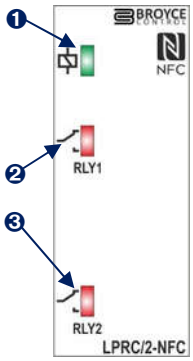
A typical setting up procedure is carried out as follows:

1. Apply power to the unit
2. With the app running on the smartphone, hold against the front of the unit and tap "Read"
   Information about the configuration is displayed on the smartphone
3. The user can now carry out a change to the parameters/settings as required
4. Once the changes are confirmed, these can be downloaded back to the unit[1]
5. If required, further units can also be configured (cloned) with the same settings

[1] The unit will need to be power cycled for the changes to take effect

FRONT LED INDICATION

1. Power supply status (Green) LED
2. Relay 1 status (Red) LED
3. Relay 2 status (Red) LED



In addition to the default functionality of the LED's as described above, the LED's are also used to indicate a particular state or condition that the unit may be measuring or following a trip event. Refer to next page for further information.

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Type: LPRC/2-NFC

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INSTALLATION

Installation work must be carried out by qualified personnel.

- BEFORE INSTALLATION, ISOLATE THE SUPPLY.
- Connect the unit as required. The Connection Diagram further down shows a typical installation whereby the supply to a load is being monitored by the Phase monitoring relay.
- Typically, the relay(s) will be used to control/switch an external contactor but depending on how the product is configured to operate will determine how and when the contactor operates.
- Only connect the Neutral if available and 4-wire monitoring is required.

Applying power

(Product operation based on factory default settings (see yellow coloured panel on the right))

- Apply power and the green "Power supply" ❶ LED will illuminate.
- With the supply voltage matching the nominal voltage selected, both output relays will energise i.e.
  - "RLY1" Red LED ❷ will illuminate and contacts 15 and 18 will close
  - "RLY2" Red LED ❸ will illuminate and contacts 25 and 28 will close
- Refer to the Troubleshooting table below if the unit fails to operate correctly.

Troubleshooting

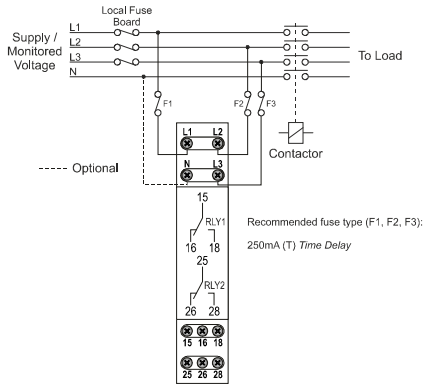
If the unit fails to operate correctly or as described, check the wiring is correct, phases are in the correct sequence, supply voltage matches the selected nominal and is within the operating limits specified.

The table below indicates the status of the relay(s) and LED's during a particular fault condition. *Note that the information below refers to all conditions in which the product can monitor and when enabled. For clarity, the examples shown are based on both relays operating simultaneously i.e. DPDT*

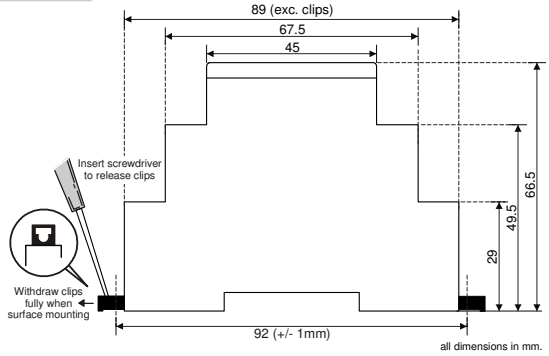
Supply fault	Green LED ❶	Red LED (RLY1) ❷	Red LED (RLY2) ❸	RLY1/RLY2
Phase (neutral) missing	Flashing[2]	Off	Flashing[2]	De-energised
Phases reversed (no delay)	Flashing	Off	Off	De-energised[3]
Under voltage condition (during timing)	On	Flashing simultaneously		En for delay (t) [3]
Under voltage condition (after timing)	2 flashes	Off	Off	De-energised[3]
Over voltage condition (during timing)	On	Flashing simultaneously		En for delay (t) [3]
Over voltage condition (after timing)	3 flashes	Off	Off	De-energised[3]
Simultaneous Under/Over voltage (during timing)	On	Flashing simultaneously		En for delay (t) [3]
Simultaneous Under/Over voltage (after timing)	1 flash	Off	Off	De-energised[3]
Phase Asymmetry (during timing)	On	Flashing simultaneously		En for delay (t) [3]
Phase Asymmetry (after timing)	4 flashes	Off	Off	De-energised[3]

[2] Green and Red LED's alternate in this fault condition
[3] Assuming relay has been assigned to monitor for this condition

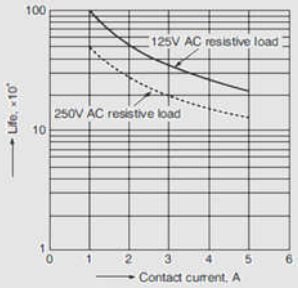
CONNECTION DIAGRAM



DIMENSIONS



TECHNICAL SPECIFICATION

Supply/monitoring voltage Un (L1, L2, L3 (N)):	3-wire monitoring 380, 400, 415V AC	4-wire monitoring 220, 230, 240V AC
Frequency range:	48 – 63Hz	
Supply variation:	243 – 540V AC (L>L)	
Overvoltage category:	III (IEC 60664)	
Rated impulse withstand voltage:	4kV (1.2/50µS) IEC 60664	
Power consumption (max.):	2.5VA	
Monitored parameters: (configured via app)	3-wire monitoring, 4-wire monitoring, Under voltage, Over voltage Phase asymmetry and Phase Reversal	
Default configuration when shipped from factory:	• **3-wire monitoring, 400VAC L>L** • Under voltage detection enabled – pre-set to **85%** • Hysteresis adjustment pre-set to **3%** • Phase Reversal detection **enabled** • RLY1 and RLY2 operating as **DPDT relay**	
User adjustments (applicable when enabled via app):		
Nominal voltage options: (see supply/monitoring voltages above)	6	*Factory default 3-wire, 400V AC*
Adjustment ranges:		
Under voltage trip:	75 – 95% of Un	*Factory default 85%*
Over voltage trip:	105 – 125% of Un	*Factory default 115%*
Phase asymmetry:	5 – 22%	*Factory default 10%*
Hysteresis adjustment:		
Under/over voltage monitoring:	2 – 10% of actual trip setting	*Factory default 3%*
Phase asymmetry monitoring:	2 – 5% of actual trip setting	*Factory default 2%*
Setting accuracy:	In steps of 1%	
Time delay (t):	0.2 – 10s	*Factory default 0.2s*
Restart/Power on delay (Td)[4]:	0s – 5m	*Factory default 0s*
Setting accuracy:	In steps of 0.1s (delay t), 1s (delay Td)	
[4] Worst case delay could be Td + 1s		
Repeat accuracy:	± 0.5% at constant conditions	
Immunity from micro power cuts:	<50ms	
Response time (t_r):	≈ 50ms	
Reset time:	50 – 100ms	
Relay operation (RLY1/RLY2)		
Method of operation:	Normally energised with no fault present App allows relays to be configured independently	
LED indication		
(see Troubleshooting section for further information about LED operation during a supply fault condition)		
Power on indication:	Green x1	
Relay status:	Red x 2	
NFC status:	NFC Configuration error: *Green LED remains off, Red LED's flash alternately (Unit must be power cycled and when power returned, unit will revert to default settings)*	
Temperature rating		
Operating:	-20 to +60°C	
Storage:	-30 to +70°C	
Relative humidity:	+95% max.	
Output		
RLY1 **(15, 16, 18):**	SPDT relay	
RLY2 **(25, 26, 28):**	SPDT relay	
Output rating (all relays):	AC1	250V 5A (1250VA)
	AC15	250V 2A
	DC1	30V 5A (150W)
Electrical life:		
Dielectric voltage:	2kV AC (rms) IEC 60947-1	
Rated impulse withstand voltage:	4kV (1.2/50µS) IEC 60664	
Housing		
Material:	Orange flame retardant Lexan UL94	
Weight:	100g	
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 the black clips provided on the rear of the unit.	
Terminals		
Terminal conductor size:	≤ 2.5mm² solid or stranded	
Terminal screw:	M2.5	
Tightening torque:	0.4Nm (3.5Lb-In) Max.	
Standards		
Product:	Conforms to: CE and RoHS Compliant. C-tick UL LISTED IND. CONT. EQ. E111187	
EMC:	Immunity: EN 61000-6-2 Emissions: EN 61000-6-3	

Broyce Control Ltd., Pool Street, Wolverhampton, West Midlands WV2 4HN. England
Tel: +44 (0) 1902 773746 Fax: +44 (0) 1902 420639 Email: sales@broycecontrol.com Web: www.broycecontrol.com

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