Type: ELR01PN/30PN

Earth Leakage Relay – Type A (with NFC Technology)

Terminal Protection to IP20



Dims: to DIN 43880
W. 44mm

- **Programmable user settings/adjustments**
- **Built-in NFC (Near Field Communication) allows user to access and change settings via compatible Smartphone/Device with installed app^ as well as retrieve historical data**
- **Two models available 6mA – 1A (ELR01PN) and 30mA – 30A (ELR30PN) – True R.M.S. measurements**
- **Option to select alternative toroid ratio, tripping method (latch or auto-reclosure modes), Output relay logic (pre-alarm, energise or de-energise on trip) and filter cut-off points**
- **Connection facility for remote "Test" and "Reset" push buttons or N.O. contacts**
- **Toroid open and short-circuit detection forces unit to trip (Red LED flashes during this condition)**
- **2 Relay outputs – Relay 1 (SPDT) and Relay 2 (SPNO) - User configurable**
- **Wide auxiliary operating supply voltage - 24 – 230V AC/DC**
- **Compliant with IEC 60947-2 / Annex M**

NFC

^ App available from:

GET IT ON Google Play

QMS ISO 9001 REGISTERED

ISO 9001:2015
Cert. No. 14125771

OVERVIEW

The ELR…PN is a fully featured, Earth Leakage Relay that can either be easily configured using the built-in pre-defined "Profiles" or tailored specifically to suit the application. The app^ allows the user to define how the unit should operate (see Function diagrams below) as well as configure and set parameters such as the toroid ratio, relay logic (i.e. energise or de-energise on trip) and define how the Auto-Reclosure mode should operate. Additionally, the option to set a filter cut-off point can also be defined therefore allowing the unit to ignore signals above a certain frequency.

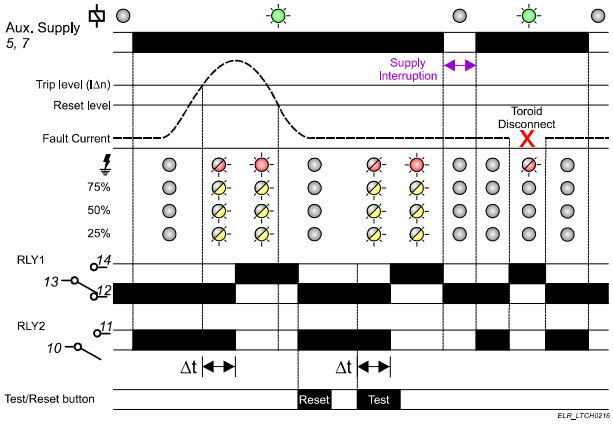
Utilising NFC technology allows the unit to be used in a "Passive" mode whereby settings can be made in the app and written to the unit without the need for the unit to be powered. This feature is useful where a panel needs to be shut down and power removed (for safety reasons) before any work or alterations need to be made. The user also has the ability to read back the configuration of a unit using the app in order to establish/check the settings. Additionally, it is possible to measure (and display) the actual leakage current present in the system.

An option to recall previous tripping information (accessed via the Logs option in the app) provides the user with historical data allowing the user to establish a pattern in the tripping occurrence's and hence make any necessary adjustments.

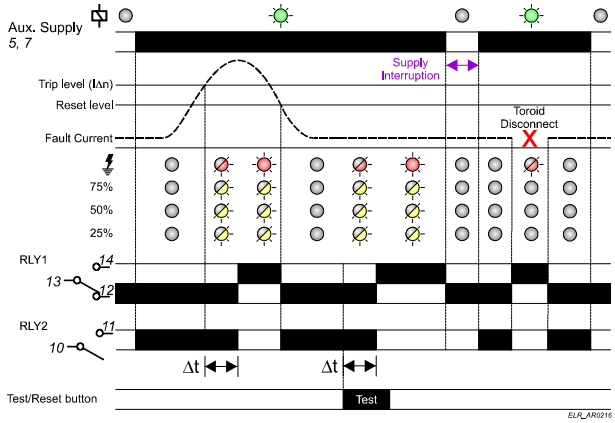
FUNCTION DIAGRAMS

The following operational modes are either enabled using the app or by adding external links

Latching mode (factory default)



Auto-reset mode (enabled via app)



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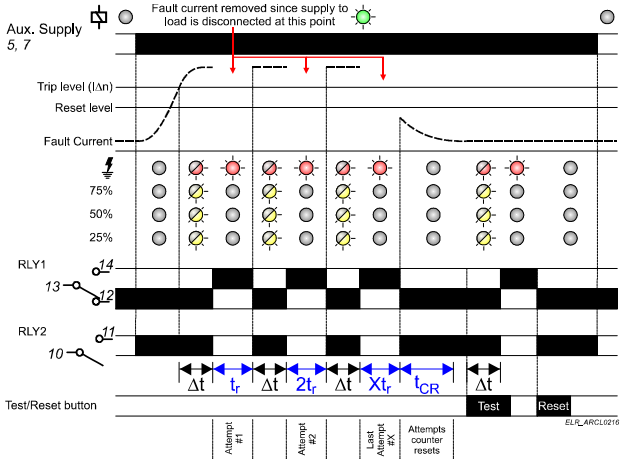
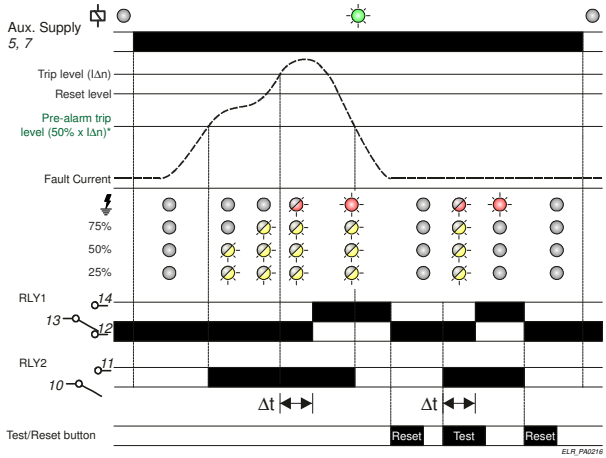
Auto-reclosure mode (enabled via app)



Pre-Alarm mode (enabled via app)



Note: relays are shown operating in their factory default states i.e. RLY1 = Standard Output and RLY2 = Positive Safety Output (Pre-Alarm default states are RLY1 and RLY2 = Standard Output)

LED legend
Off On Flashing

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INSTALLATION

Installation work must be carried out by qualified personnel.

- BEFORE INSTALLATION, ISOLATE THE SUPPLY.
- Connect the unit as shown in the diagram below on the next page (N.B. certain features may not be required and therefore do not need to be connected).
- Ensure the Auxiliary supply voltage to be connected to terminals 5 and 7 matches the rating of the product.
- A suitably rated fuse should be installed in series with connection to terminal 5 (A1) in order to protect the unit. See Technical specification for further information.
- Refer to separate data sheet for installation advice regarding the externally connected toroid.

APP

To utilise the full features, the app must be downloaded and installed on to the device that will be used to communicate with the unit. This app can be obtained as follows:

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

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

Note
The unit will need to be power cycled if a new profile is uploaded to the unit.

SETTING

- The unit should be set according to the requirements of the application and the features required.

Applying Power.

- Apply power and the green "supply on" LED ❸ will illuminate.
- Assuming the relays are in their factory default state will operate as follows: The "positive safety output" (RLY2) relay will energise.
- The positive safety output relay will de-energise if:
  a, the fault current level exceeds the set trip level (IΔn) **
  b, there is a failure of the connection between the relay and the toroid ** (Note the red "tripped" LED ❹ will flash during this condition)
  c, the supply to the unit is removed

  ** causes the "standard output" relay (RLY1) to energise in response to the fault condition.
- Prior to the unit tripping, the LED bargraph ❺ will indicate the % of IΔn being detected (the display is scaled between 25, 50, and 75% of the actual trip level). After all 3 LED's have illuminated and the unit trips due to an excessive fault current, the red "tripped" LED ❹ will illuminate.
- After the fault has cleared, the unit will then continue to operate as follows depending on how initially setup:
  a, remain in the latched state
  b, automatically reset (if the fault current has cleared and terminals 1 and 2 are linked externally)
  c, carry out the auto-reclosing function (if enabled)

Fault simulation (Test mode).

- The unit can be placed into a fault condition by pressing the "Test/Reset" button ❻ on the front of the unit (or by pressing the remote "Test" button - if fitted). The output relays operate accordingly. *Note, if the time delay (Δt) is set, the "Test" button must be held for this duration before tripping occurs.*
- Press the same "Test/Reset" button on the front of the unit (or remote "Reset" button - if fitted) to reset the unit. The output relays revert back to their "non-tripped" state.
- The unit can also be reset by interrupting the power supply.
- To satisfy regulations, it is recommended that the device be tested periodically to ensure correct operation.

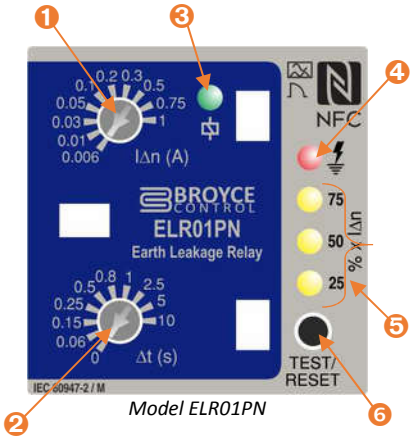
Troubleshooting.

- If the unit fails to operate correctly check that all wiring and connections are good. Also check that the externally connected toroid meets the requirements of the product.

Note:
The operating function of this unit is classed as a **Type A** for which tripping is ensured for residual sinusoidal alternating currents and residual pulsating direct currents, whether applied suddenly or slowly rising. Additionally, this unit is protected against nuisance tripping ⎍. This unit will also satisfy the requirements for **Type AC** devices which only need to detect residual alternating currents.

DESCRIPTION

1. IΔn Trip level selector
2. Δt Time delay selector
3. Power on LED indication (Green)
4. "Tripped" LED indication (Red)
5. Bargraph LED indication (Yellow)
6. Combined "Test/Reset" button



Model ELR01PN



Model ELR30PN

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Type: ELR01PN/30PN

Earth Leakage Relay – Type A (with NFC Technology)

TECHNICAL SPECIFICATION

Auxiliary Power Supply (5, 7)		
Voltage range (Us):	24 – 230V AC/DC	
1.25A (T) rated fuse should be installed in line with terminal 5 (A1)		
Frequency range (AC supply):	50/60Hz	
Supply variation:	85 – 115% of Us	
Auxiliary supply is galvanically isolated from the Toroid and Remote Test/Reset connections		
Overvoltage category:	III (IEC 60664)	
Rated impulse withstand voltage:	4kV (1.2/50µS) IEC 60664	
Power consumption (max.):	AC: 6VA, DC: 5W	
Monitored input (via external Toroid connected to terminals 8 and 9)		
Unit classification:	Type A	
Measurement principle:	True R.M.S.	
Input DSP filter cut-off	150, 300 or 450Hz *(factory default = 150Hz)*	
External Toroid ratio:	Selectable between 600:1 and 1000:1 in 100:1 steps *(factory default = 1000:1)*	
Monitored leakage current range:	**ELR01PN**	**ELR30PN**
	1.5mA – 1A	7.5mA – 30A
User adjustments		
	ELR01PN	**ELR30PN**
Trip level settings (IΔn):	6mA, 10mA, 30mA, 50mA, 100mA, 200mA, 300mA, 500mA, 750mA, 1A	30mA, 100mA, 300mA, 500mA, 1A, 3A, 5A, 10A, 20A, 30A
Actual trip level:	85% of IΔn (+/- 5%)	
Rated residual non-operating current (IΔno):	<80% of IΔn	
Reset level:	≈ 85% tripped level	
Time delay (Non-operate) settings (Δt):	0[1], 60ms, 150ms, 250ms, 500ms, 800ms, 1s, 2.5s, 5s, 10s	
	[1] *actual delay when set to 0 (instantaneous) is <25ms @ 5 x IΔn*	

Note:

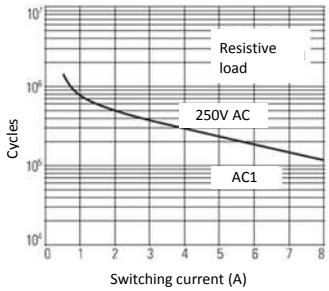
1. For IΔn of 30mA or less (model dependant) the Time delay is fixed to 0 (instantaneous) and is not adjustable (i.e. any other delay cannot be set)
2. The unit is factory set to 30mA (or 6mA) (and instantaneous delay). Adjustment of these settings can be made if necessary to suit the requirements of the installation. To prevent tampering of the settings, the clear window can be secured in place using a 2mm or 2.5mm wide cable tie (not supplied).

Reset time:	<1s (from supply interruption)	
LED indication		
Power Supply ⏚	Green x1	*LED is usually permanently lit but will flash if no valid profile has been selected or there was a communication error with the smartphone*
Tripped ⚡	Red x 1	*LED flashes during a time out (i.e. before tripping) or if the external toroid is disconnected. LED will also flash prior to unit reclosing if "auto-reclosure" mode enabled.*
Bargraph (25, 50, 75%)	Yellow x3	
Test and Reset		
	Front push button	**Remote N.O. push button(s)**
"Test" method *(assuming unit is in the non-tripped state)*	Press once to trip the unit	Press "Test" button to trip the unit (connected to terminals 2 and 3)
"Reset" method *(assuming unit is in the tripped state and fault current cleared)*	Press once to reset the unit	Press "Reset" button to reset the unit (connected to terminals 1 and 2)
Minimum trigger time:	>Δt	>80ms + Δt setting (only applicable to remote "Test")
Auto-reset		
To enable:	Via app (or place wire link between terminals 1 and 2)	
Auto-reclosure		
To enable and adjust parameters:	Via app only	
Reclosure attempts:	Selectable between 1 and 10 *(factory default = 6)*	
Time between reclosure attempts (t_r):	t_r after first attempt which doubles after each attempt i.e. 2t_r, 4 t_r, 8 t_r, etc. Options are: 1, 2.5, 5, 7.5 and 10s *(factory default = 7.5s)*	
Timeout:	Selectable between 1 and 20mins *(factory default = 15mins)*	
Relay operational modes		
To change modes:	Via app only	
	RLY1	**RLY2**
Key (assuming non-tripped state):	S.O. *(factory default)*	P.S.O. *(factory default)*
S.O. = Standard Output (relay normally de-energised)	S.O.	Pre-alarm*
	P.S.O.	P.S.O.
P.S.O = Positive Safety Output (relay normally energised)	S.O.	S.O.
	* Relay energises when Pre-alarm threshold exceeded *(factory default = 50% of IΔn). Threshold can be changed via app*	

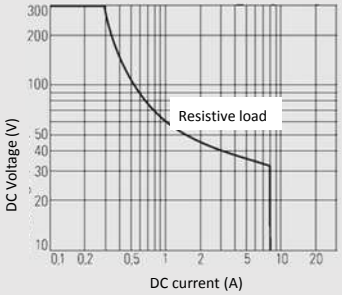
TECHNICAL SPECIFICATION (continued)

Temperature rating			
Operating:	-20 to +60°C		
Storage:	-30 to +70°C		
Relative humidity:	+95% max.		
Output			
		RLY1	RLY2
Terminals:		**12, 13, 14**	**10, 11**
Contact arrangement:		1 x SPDT	1 x SPNO
	AC1 (250V)	8A (2000VA)	8A (2000VA)
	AC15 (250V)	2.5A	2.5A
	DC1 (25V)	8A (200W)	8A (200W)

Electrical life:



DC load capacity:



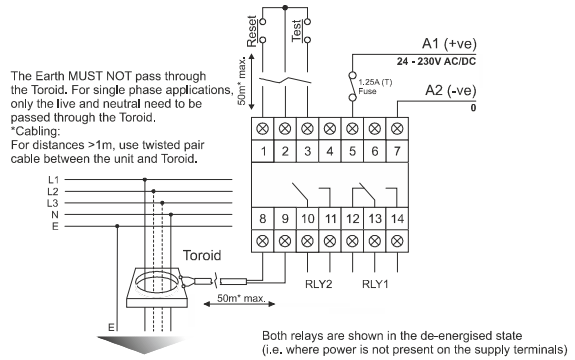
Dielectric voltage:	2kV AC (rms) IEC 60947-1
Rated impulse withstand voltage:	4kV (1.2/50µS) IEC 60664
Housing	
Material:	Grey flame retardant Lexan UL94 V0
Weight:	120g
Mounting option:	On to 35mm symmetric DIN rail to BS EN 60715

Terminal conductor size			
Cable type:			
Nominal cross section:	0.2 – 4mm²	0.2 – 2.5mm²	0.2 – 2.5mm²
	30 – 12AWG	30 – 12AWG	30 – 12AWG
Stripping length:	6mm		

Standards	
Product:	IEC 60947-2 / Annex M, IEC 60755, IEC 62020
EMC:	IEC 61543, IEC 61000-4 Series, CISPR 22
	CE and RoHS Compliant. C-tick

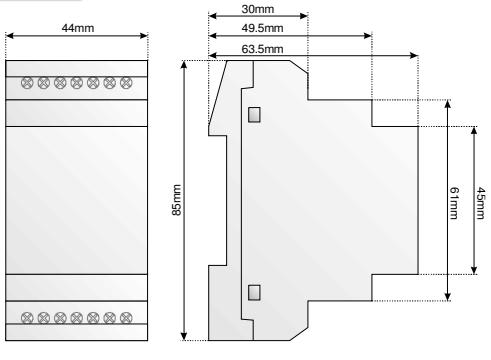
Toroid options			
Part number:	Aperture	Internal diameter/size:	IΔn (min.) A
BZCT035	○	35mm ∅	0.006
BZCT050	○	50mm ∅	0.006
BZCT070	○	70mm ∅	0.03
BZCT120	○	120mm ∅	0.1
BZCT160	○	160mm ∅	0.1
BZCT210	○	210mm ∅	0.3
BZCTR305	□	115 x 305mm	0.3
BZCTR350	□	150 x 350mm	0.3
BZCTR470	□	160 x 470mm	0.3

CONNECTION DIAGRAM



Both relays are shown in the de-energised state (i.e. where power is not present on the supply terminals)

DIMENSIONS



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