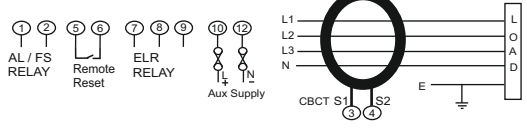


# ELPR Operating Manual and Installation guide

ELPR is earth leakage detection and a protection device used in electrical installations to measure leakage current occurs due to punctured or weak insulations or contact to live parts. Earth leakage current is measured through CBCT. 1CO Relay is provided to disconnect breaker and additional 1NO configurable relay for alarm / fail safe purpose is provided, CBCT open detection feature ensures that no false measurement is made. LED indicates Leakage current ( bargraph ), relay state, CBCT connections. Two models Smart, Smart+ models are available.



## Connection diagram:



## Technical Specifications:

**Input :**  
 Leakage current (In) 30mA to 30A (Type A)  
 ELR Tripping range 80% - 100 % of In  
 Alarm Tripping range > 50 % of In  
 Resetting value Below 15% of Trip value

**Auxiliary Supply:**  
 Auxiliary supply option 1 60V - 300V AC/DC  
 Auxiliary supply option 2 20 - 60V DC (20-40 VAC)  
 Auxiliary supply frequency 45 to 66 Hz range

**Accuracy:**  
 Leakage current ± 5% of full scale  
 Trip Delay ± 5% of set trip time or 50ms (whichever is greater)  
 (Including Setting Accuracy )  
 Instantaneous Trip < 25 millisecond for leakage current greater than 5 x In, with exception of 30A setting

## Reference Conditions for Accuracy:

Reference temperature 23°C +/- 2°C  
 Input Waveform Sinusoidal (distortion factor 0.005)  
 Input frequency 50/60 Hz ± 2%  
 Auxiliary supply voltage 230 ± 1%  
 Auxiliary supply frequency 50 or 60 Hz ± 2%

**VA Burden :**  
 Auxiliary supply burden < 4 VA approx

**Applicable Standards:**  
 EMC IEC 61326-1:2012 Table 2  
 Terms, definitions & Test method IEC 60688  
 Immunity IEC 61000-4-3 10 V/m Min - Level 3  
 Safety IEC 61010-1:2001, Permanently connected use  
 IP for water & dust IEC60529  
 Pollution degree 2  
 Installation category III 300 V  
 High Voltage Test 2.2 kV AC, 50Hz for 1 minute between all electrical circuits

## Environmental:

Operating temperature -20 to +65°C  
 Storage temperature -40 to +75°C  
 Relative humidity 0...90% (non condensing)  
 Shock Half sine 30gn duration 18 ms (IEC 60068-2-27)  
 Vibration 10...150...10 Hz, 0.15mm amplitude  
 Enclosure IP40 - Front face Only , IP20 - Terminals

**Relay Contacts:**  
 Relay 1 ( ELR ) Output 1 CO ( 1NC + 1NO )  
 Relay 2 ( Alarm / Fail safe Output ) 1 NO ( Optional )  
 Contact rating 5A / 250 VAC or 30VDC  
 Mechanical endurance 1 x 10<sup>7</sup> OPS  
 Electrical endurance 5 x 10<sup>4</sup> OPS

## Setting interface:

**Key operations :** Separate Trip and Reset keys are provided

1. Trip key - Pressing of test key ( > 3 second ) and holding till release of key triggers fault condition of relay contacts.
2. Reset key - Pressing key ( > 3 second ) reset / clear the fault relay condition if fault current is within normal current range. This key has memory function till power fail of instrument.

**Potentiometers operations :** Potentiometers are provided for

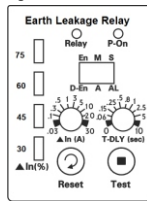
1. Leakage current (In) - To set Leakage current in Ampere
2. Trip time setting (T-DLY) - Set Leakage sustain time in seconds before relay driven to fault state.

**DIP switch :** DIP switch is provided in Smart + model only

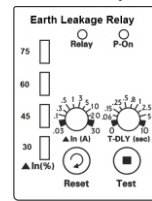
ELR relay configuration - En / D-En,

Relay 2 configuration - Alarm or fail safe

Leakage Fault reset mode - Automatic with 3 retry or Manual reset



Smart+ Model



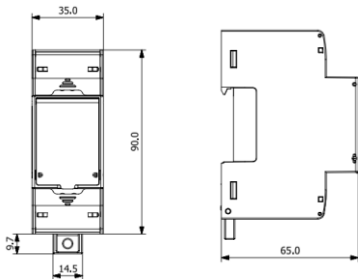
Smart Model

## Installation:

Installation to be carried out by qualified person along with life protecting equipment to prevent hazardous shock Isolate incoming supply before connection Do not expose device to Rain, Dust environment. Keep at least 10-15 mm distance on both sides of device. Do not install near Vibrating environment. Do not install near Heat source. Install Fuses of 2 Amp in series with supply. Use Sealing provision to protect from unintentional adjustment.

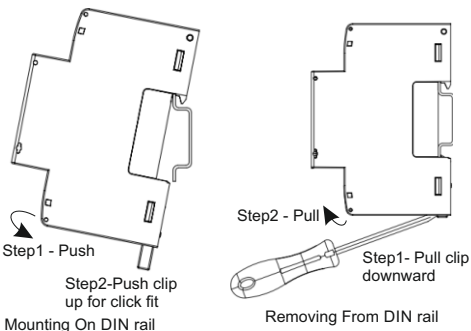


## Dimensions : 90 x 65 x 35 mm As Per DIN 43880



## Mounting:

To mount the device it should be fastened to a standard 35mm DIN rail (DIN50022). Key hole is provided for wall mount . follow steps to mount and unmount the instrument

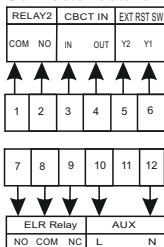


Mounting On DIN rail

Removing From DIN rail

## Connector details:

Use proper screw driver so that sufficient but not excess force is applied. Wire of 2 sq.mm with lug is recommended for all connections. Rated switchgear to be used for inputs if applicable. connect supply voltage with 2 Amp fuses Remote Reset contacts are electrically isolated from other input / output but are not potential free



Terminals are marked as 1- 6 and 7-12  
 Terminal 1-2 - Relay2 COM-NO ( AL/FS)  
 Terminal 3-4 - CBCT S1, S2 connection  
 Terminal 5-6 - Remote Reset connection  
 Terminal 7-8-9 - Relay1 NO-COM-NC (ELR)  
 Terminal 10-12 - Auxillary supply

**Indications:**

LED indication	Continuous on	Blinking LED
P-ON ( Green )	Power on	At 0.7 Seconds CBCT Oper
Relay	EL Relay in operated	Alarm ( Relay ) activated
Bargraph	Proportional ON to set IN value ( In percent )	---

**Parameter settings:**

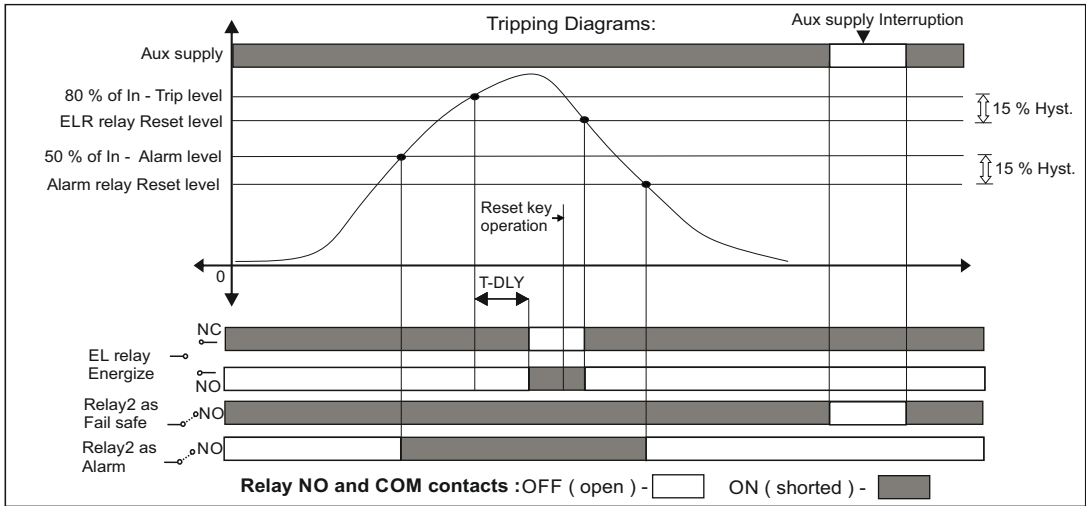
1. PON delay - 1 Second
2. Reset Delay -  
Manual mode -1 second after reset key long press release  
Auto mode - 10 Seconds fixed between attempts of auto reclose  
Reclosing attempts - 3 ( Fixed ) before final trip
3. Trip Delay -  
- As per front potentiometer setting in seconds  
- ( Trip delay = 0 ) Instantaneous trip for current 5 x In
4. Trip Hysteresis - 15% of trip value
5. Relay1 Reset option : Auto-recloser / Manual
- 6 Relay1 configuration mode : Energize / De-energize

**ELR Smart+ model:**

Onsite setting below parameter possible

Manual / Auto reset option

1. Manual reset - using RESET key
- Auto reset - If fault condition occurs attempts are made forcefully to clear fault condition and fault current assessed to decide further action. if fault continues after 3 attempt relay is tripped permanently if fault recovered then reset condition is generated.
2. Energize / De-Energize of EL 1NO+1NC (1CO) relay -  
Defines Relay NO and pole contact state in fault condition  
Energize - In fault condition relay contacts are shorted ie relay is Energized ( on )  
De-Energize - In fault condition relay contacts are open ie relay is D-Energized ( off )
3. Relay2 ( 1 NO ) configuration - Alarm Relay / Fail safe Relay  
Alarm Relay - if leakage current exceeds 50 % of set value alarm relay is activated so to trigger suitable indications connected.  
Fail Safe Relay - Relay is permanently energized once powered on and stay on until powering off of the instrument.  
Alarm relay configuration setting can be altered using key operation



**On site setting of relay Energize (En) / De-Energize (D-En) :**

Smart Model has two settings - 1. Main Relay ( Relay1 ) state En / D-En 2. Additional Relay ( Relay2 ) state En / D-En  
Smart+ Model has only one setting - 1. Relay2 state En / D-En ( As main relay state is configurable through DIP switch )  
Combination of bargraph LED ( 30 % , 45 % , 60 % , 75 % ) used to indicate present and new set value  
For setting the parameter, Press both keys simultaneously for more than 3 seconds.

**Setting1 : For Main (ELR) Relay ( Relay1 ) -**

Setting is activated is indicated by blinking of Bargraph 75 % LED and 30% LED - blink at rate of 0.5 second  
If 45 % LED ON and 60 % LED is OFF then relay is configured as En state setting  
If 45 % LED OFF and 60 % LED is ON then relay is configured as D-En state setting  
- Press Test button to toggle / change state setting.

- To confirm state setting parameter and to Smart+ second setting press both key for Long duration ( more than 3 Seconds )

**Setting2 : For Additional Relay ( Relay2 - Alarm relay function ( Smart model ) / Fail safe or Alarm ( Smart+ ELR model )**

Setting is activated is indicated by blinking of Bargraph 75% LED and 30% LED - blink at rate of 0.25 second ( Twice Fast than First setting )

If 45 % LED ON and 60 % LED is OFF then relay is configured as En state setting  
If 45 % LED OFF and 60 % LED is ON then relay is configured as D-En state setting  
Press Test button to toggle / change state setting.

To confirm state setting parameter and to exit settings press both key for Long duration ( more than 3 Seconds )

**Test Certificate:**

Model	: Earth Leakage Relay	<input type="checkbox"/> Smart+	<input type="checkbox"/> Smart
Accuracy Test	: Pass	Relay Test	: Pass
Tripping Test	: Pass	Adjustment Test	: Pass

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