

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.



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.

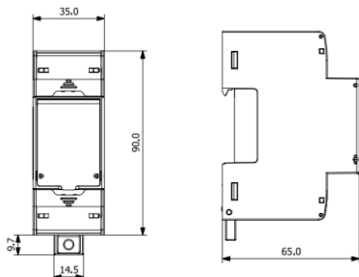
Do not install near Heat source.

Install Fuses of 2 Amp in series with supply.

Use Sealing provision to protect from unintentional adjustment.

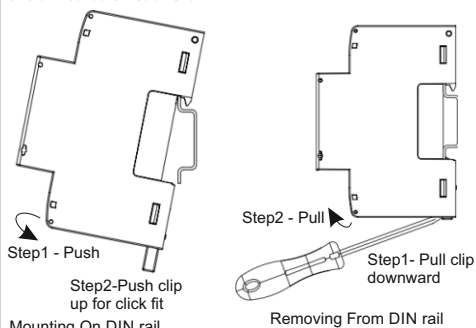


Dimensions : 90 x 65 x 35 mm As Per DIN 43880



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



Connector details:

Terminal Block Details:

RELAY2		CBCT IN		EXT RST SW	
COM	NO	IN	OUT	Y2	Y1
↑	↑	↑	↑	↑	↑
1	2	3	4	5	6

7	8	9	10	11	12
↓	↓	↓	↓	↓	↓

ELR Relay			AUX	
NO	COM	NC	L	N

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)

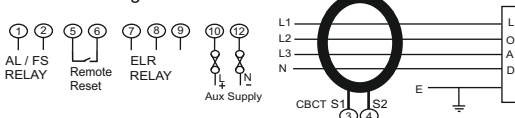
Terminal 3-4 - CBCT S1, S2 connection

Terminal 5-6 - Remote Reset connection

Terminal 7-8-9 - Relay1 NO-COM-NC (ELR)

Terminal 10-12 - Auxiliary supply

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 option1	60V - 300V AC/DC
Auxiliary supply option2	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
(Including Setting Accuracy)	(whichever is greater)
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 Table2
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	II
Installation category	1
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 ⁷ OPS
Electrical endurance	5 x 10 ⁴ 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

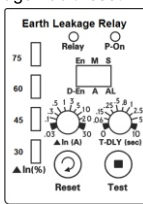
1. Leakage current (In) - To set Leakage current in Ampere
2. Trip time setting (T-DLY) - Fault sustain time in seconds before relay driven to fault state.

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

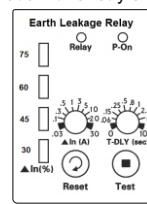
ELR relay configuration - En / D-En.

Relay 2 configuration - Alarm or fail safe

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



Smart+ Model



Smart Model

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 I_n
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)

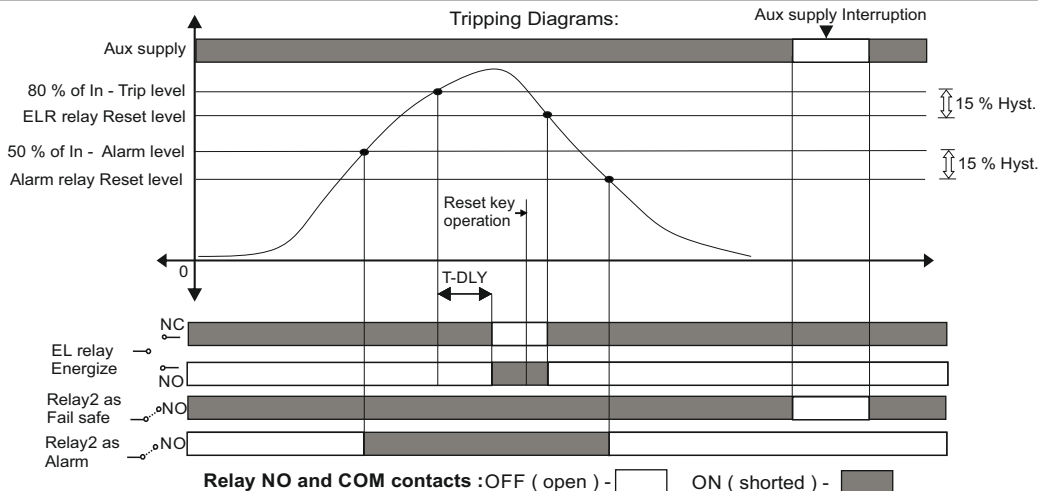
3. Relay2 (1 NO) configuration - Alarm Relay / Fail safe Relay

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

Tripping Diagrams:



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	☐ Smart+	☐ Smart
Accuracy Test	: Pass	Relay Test	: Pass
Tripping Test	: Pass	Adjustment Test	: Pass