

OPERATING MANUAL EARTH LEAKAGE RELAYS



The NIPPEN ELR (Earth Leakage Relay) is a high performance micro controller based with 3 digit, 7 segments bright LED display. It protects the electrical system from fire and other electrical hazards.

The unit ELR consists essentially of two parts.

- Basic Relay
- Core Balance Current transformer (cbct).

FEATURES

Digital display in both DIN RAIL and Panel Models.

Monitors true RMS earth fault currents

Bar Graph to indicate leakage current as a percentage.

Test and Reset function

CBCT open circuit detection

USER SETTABLE PARAMETERS

Range – $I_{\Delta n}(A)$: This is a rotary switch use to set the current range.

It has a wide range of 30mA to 30A.

Delay – $\Delta t(s)$: This rotary switch enables the user to set the time delay after which the unit trips.

NORMAL CONDITION

- When ELR is connected it will directly display the leakage current on the screen
- The LED bargraphs In different colour will will also glow. It will showthe %age of leakage current with respect to set value.

OVERLOAD CONDITION

- If leakage current exceeds the set current value it will trip the contactor thus providing protection to the unit.
- In such condition “Ovr” i.e. Overload will be displayed and all LED in
- If the leakage current is too high it may also display “Cb.f” Bargraph will glow.

TECHNICAL SPECIFICATIONS

Aux supply: 230V / 110V (On Request)

AC 50Hz (-20% +15%)

Frequency: 50/60Hz.

VA Burden: 3VA max.

Current: CBCT Secondary.

Overload: x2 continuously, x 10 for 3 secs as per BS6253.

Alarm relay output: 50% of set value.

Trip relay: 80-90% of set value.

Status: Normally Energised.

Built-in Relay Contact: 5Amp/250V

User settable wide Time delay range (0, 0.06, 0.15, 0.25, 0.5, 0.8, 1, 2.5, 5, 10 sec) user adjustable.

Leakage current range: 0.03,0.1,0.3,0.5,1.0,3.0,5.0,10,20, 30A

with CT Ratio on 1000:1

Fail Safe Relay (Optional)

ENVIRONMENT

Relative humidity: <90% Non condensing

Operating temperature:-10°C to 55°C.

CBCT SPECIFICATIONS

System voltage: 720Vmax.

Insulation Voltage: 3KV for 1minute.

System frequency: 50Hz / 60Hz.

Max permissible: 1KA continuous, 5KA for 1.5 seconds.

Terminal conductor: $\leq 2.5\text{mm}^2$.

Current ratio: 1 /1000 (any other ratio on request)

Distance between Toroid and relay: <50 metres.

Enclosure: Flame retardant ABS.

Compliant with: IEC 44-1 and IEC185.

Mounting: Four Fixing Slots.

CBCT sizes (I.D): 35mm or 70mm or 120mm (210mm optional)

OPERATING SWITCHES

Test: This switch checks all the LEDs are operative even in absence of leakage current.

Reset: This switch is used to Reset the unit after tripping due to exceed leakage current with respect to set value.

RELAYS Trip Relay: In overload condition the Trip relay de-energises and trips the unit.

Pre Alarm Relay: If the leakage current exceeds the set value above 50%,the relay de-energises and give signal.

LED BARGRAPH

Leakage current	LED Glows
> = 5%	5% glows
> = 30%	5%, 30% both glows
> = 45%	5%, 30% & 45% glows
> = 60%	5%, 30%, 45% & 60% glows
> = 75%	All LEDs glows

ACTION TO BE TAKEN IN OVERLOAD CONDITION

- Increase the current set value and manually press the RESET switch.
- Increase the set value until the meter is in normal condition.

CBCT FAULT

If CBCT is not connected to the meter it will dispaly “Cb.f” i.e. CBCT failure

TEST CERTIFICATE

S.No.	TEST	TEST CONDITION	STATUS																																
1	Insulation	a)Voltage Circuit and Earth b)Current Circuit and Earth	Complied																																
2	H V Test	2KV for 1min a)Voltage Circuit and Earth b)Current Circuit and Earth	Complied																																
3	Accuracy Test	<table border="1"> <thead> <tr> <th>Parameter</th><th>100%</th><th>50%</th><th>5%</th></tr> </thead> <tbody> <tr> <td>PF</td><td>Less than 1stelect.</td><td></td><td>Complied</td></tr> <tr> <td>kW</td><td>Within 0.5%</td><td></td><td>Complied</td></tr> <tr> <td>kVA</td><td>Within 0.5%</td><td></td><td>Complied</td></tr> <tr> <td>V</td><td>Within 0.5%</td><td></td><td>Complied</td></tr> <tr> <td>A</td><td>Within 0.5%</td><td></td><td>Complied</td></tr> <tr> <td>F</td><td>Less than 0.1Hz</td><td></td><td>Complied</td></tr> <tr> <td>kWh</td><td>Within 0.5%</td><td></td><td>Complied</td></tr> </tbody> </table>	Parameter	100%	50%	5%	PF	Less than 1 st elect.		Complied	kW	Within 0.5%		Complied	kVA	Within 0.5%		Complied	V	Within 0.5%		Complied	A	Within 0.5%		Complied	F	Less than 0.1Hz		Complied	kWh	Within 0.5%		Complied	
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Ref Calibration standards

1. MTE SWS 1.3 class0.1

S.No.39822 ☒



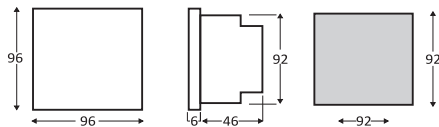
12 months WARRANTY

Tested by :.....

Approved by :.....

Date.....

MECHANICAL SPECIFICATIONS



Dimension: 96 x 96 mm

Panel cutout: 92 x 92 mm

Dimension: 47x90 x 75 mm

WEIGHT

Size	Gross weight
96 x 96mm Panel	295 gm (approx)
DIN RAIL	225gm(aapprox)

WORKING

The ELR employs a cbct to sense the leakage currents.

In case of leakages either due to insulation failure or direct phase to

ground fault, the vector sum of the current is not zero

and therefore generates resultant flux, inducing a

voltage in the secondary of the cbct, which is fed to

the relay. This signal is compared with internal

references and the instant the pre set reference level

of current is crossed the relay trips, causing the no

volt coil of the main breaker to open simultaneously.

Thus the load circuit is isolated making the installation

safe against leakages/earth faults.

CONNECTION DIAGRAM

