

DIFFERENTIAL RELAYS

ELR20/30 type A relays

ELR21/31 type B relays



The differential relays ELR are relays for the limitation of the earth leakage current of the type A for the ELR20/30 and type B for the ELR21/31. Associated with a measure earth leakage transformer and a circuit breaker they allow to perform on low voltage networks of the type TT, IT, TNS the following functions:

- protection from direct contacts,
- complementary protection from indirect contacts,
- limitation of the leak current,
- protection from fires.

Their reinforced immunity as well as their TRMS measurement technique can guarantee a maximum safety and a continuity of the electrical operation, avoiding ill-timed cuts.

They include in addition a pre-alarm output, allowing the anticipation of insulation defaults without causing a trip.

The ELR 30 and 31 offer an automatic reclosing function allowing to maintain the necessary service continuity in some installations which may be sensitive or isolated.

Option N: digital data link RS485, protocole Modbus/Jbus



conform with IEC60755

Functions

- LCD display allowing:
 - The permanent display of the instant leak current as well as the value of the tripping current.
 - The visualisation of the status of the alarms.
 - The configuration of the instrument (protected by a programming code).
- Sensitiveness programmable: 30mA to 3A (8 calibers) ($I_{\Delta n}$)

- 2 relay outputs:

Relay 1:

Main alarm

- Tripping setpoint programmable (50 to 80% of $I_{\Delta n}$)
- Safety programmable (positive or negative)
- 3 time delay modes: general (instant), selective or programmable lapse from 20ms to 10s.

Relay 2:

End of reclosing cycle contact or pre-alarm

- Tripping setpoint programmable (30 to 80% of $I_{\Delta n}$)
- Safety programmable (positive or negative)
- Hysteresis programmable (from 0 to 20%)
- Time lapse programmable from 20ms to 10s.
- Recording function.

- Test and reset of the alarms by keyboard keys or external control.
- Test of the connection with the earth leakage transformer.
- Function self-reclosing (ELR30 and 31) with:

Programming of the number of reclosings (20 max.)

Programming of the time between each reclosing (from 1 to 9999 sec.)

Programming of the cycle reinitialisation time (from 1 to 9999 sec.)



Features

Power supply: Universal: from 20 to 270Vac and 20 to 300Vdc / Power draw: 3W max or 5VA

Insulation: 2kV-50Hz-1min (between supply and outputs)

Setting of the sensitiveness ($I_{\Delta n}$): 0.030 - 0.1 - 0.2 - 0.3 - 0.5 - 1 - 2 - 3A

Setting of the measure frequency: 50 or 60 Hz or DC (ELR 21/31 only)

Alarm outputs: 1 NO-NC contact per alarm, 8A/250Vac on resistive load

Setting of the triggering:

Main alarm: 50% - 60% - 70% - 80% of $I_{\Delta n}$

Pre-alarm: 30% - 50% - 60% - 70% - 80% of $I_{\Delta n}$

Setting of the time delay:

Main alarm: General mode (instant) - Selective mode

Or fixed lapse: 0.02 - 0.1 - 0.2 - 0.3 - 0.4 - 0.5 - 0.75 - 1 - 2 - 5 - 10 sec.

Pre-alarm: Lapse: 0.02 - 0.1 - 0.2 - 0.3 - 0.4 - 0.5 - 0.75 - 1 - 2 - 5 - 10 sec.

Setting of the hysteresis: Pre-alarm: 0% - 5% - 10% - 15% - 20% de $I_{\Delta n}$

External control (Reset or test): potential free contact

Operating temperature: -5 to +55°C

Storage temperature: -20 to +70°C

Dimensions: 26.5x80x130 mm

Mounting: on DIN rail

Connection: plug-in connector for screwed connections (2.5mm² flexible or rigid)

Protection indice: IP20

Standards: IEC 610008-1 / IEC 60755

Reference	Differential relays type	Specificities	Associated earth leakage transformers
ELR 20	A 	1 alarm relay + 1 pre-alarm relay	Series TCA
ELR 30	A 	1 alarm relay + 1 pre-alarm relay Function self-retriggering	Series TCA
ELR 21	B 	1 alarm relay + 1 pre-alarm relay	Series TCB
ELR 31	B 	1 alarm relay + 1 pre-alarm relay Function self-retriggering	Series TCB

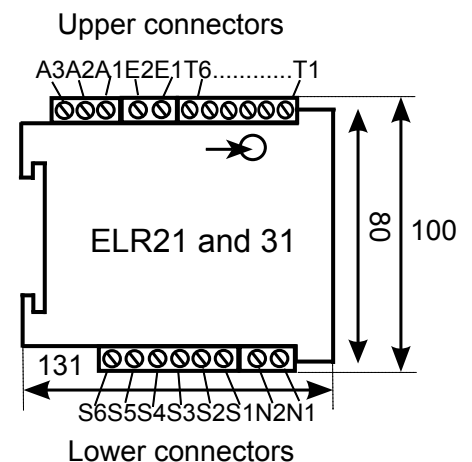
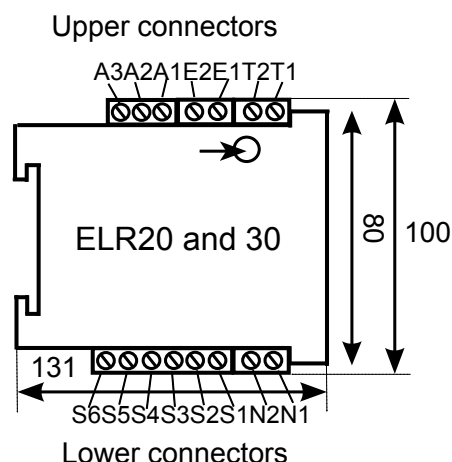
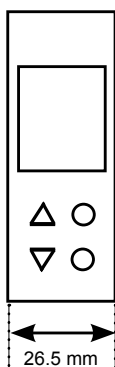
Dimensions: 26.5 x 80 x 131 mm

Housing: self-extinguishing case of black UL 94VO ABS

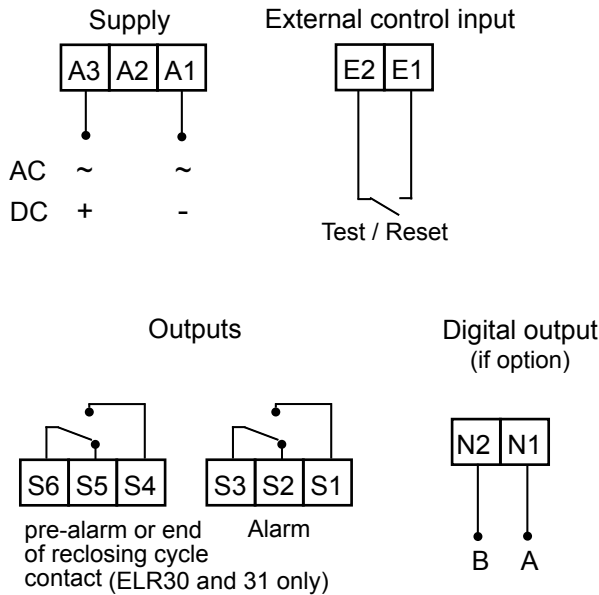
Mounting in switchbox: latching on symmetrical DIN rail.

Pug-in connectors for screwed connections

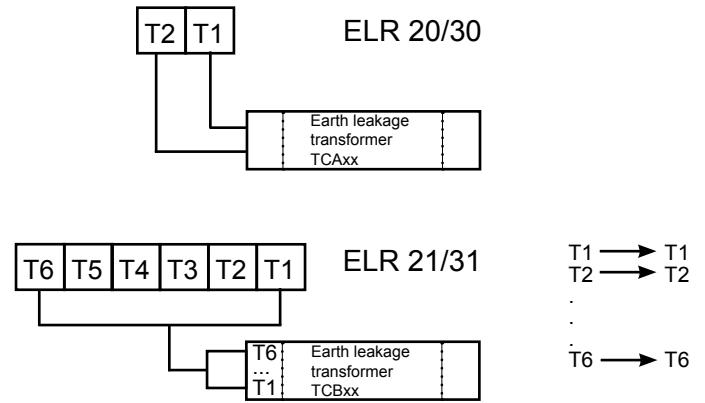
Protection: housing/terminals: IP 20



Wiring



Earth leakage transformer

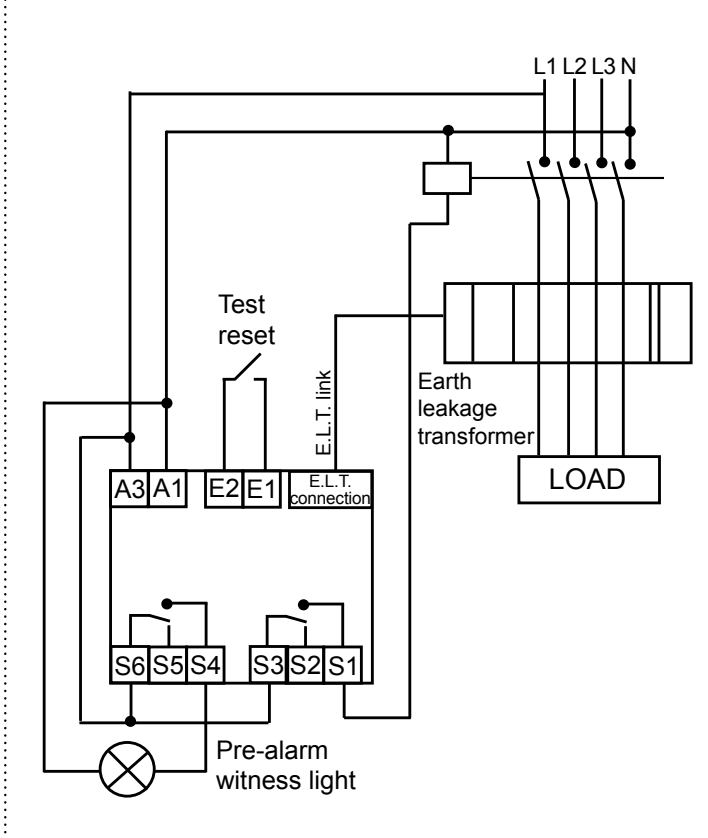


Use preferably a connection cable reference CBBxx.

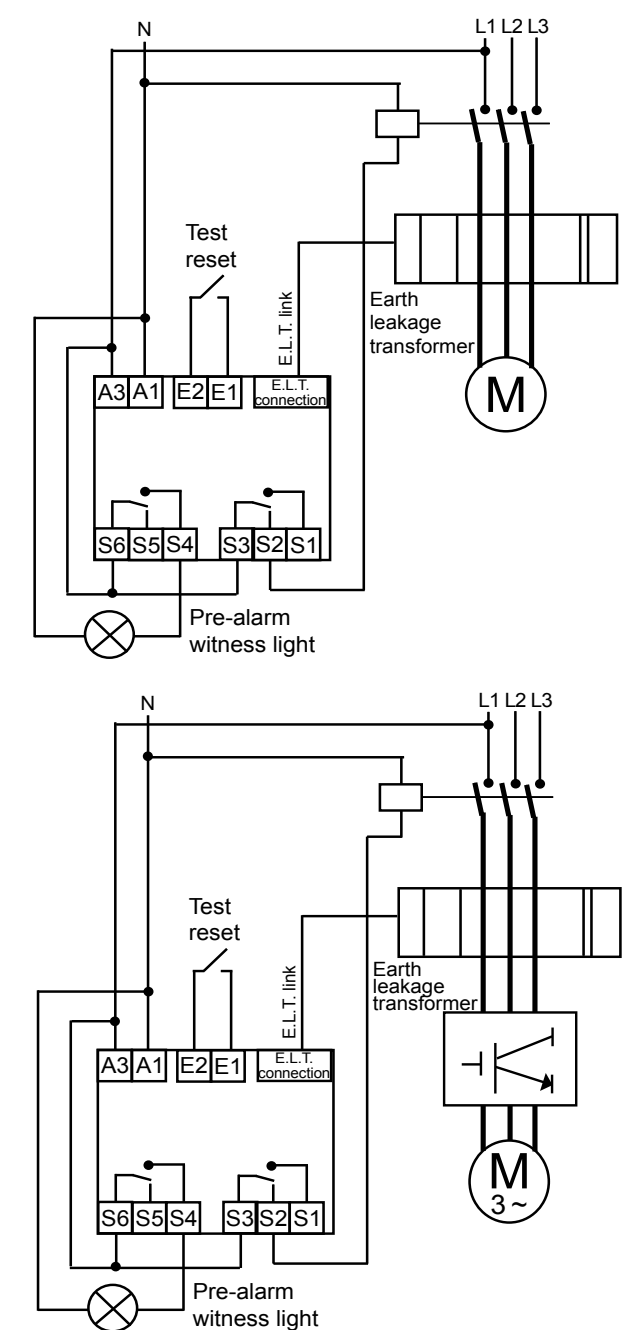
Recommendations for the wiring of the earth leakage transformer: Take care to make the shortest possible connection between the relay and the earth leakage transformer. Use preferably twisted cables, or even shielded cables for very disturbed environments with the shielding connected on both sides on the terminals T2 for the ELR20 or 30 and on the terminals T5 on the ELR21 or 31.

EXAMPLES OF WIRING DIAGRAMS

For triggering by emission of voltage



For triggering by lack of voltage

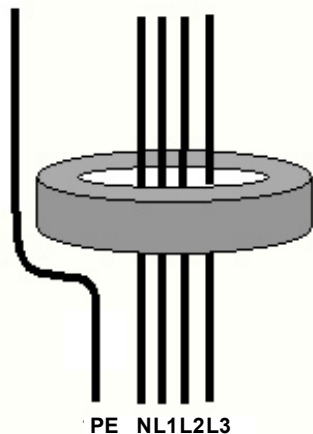
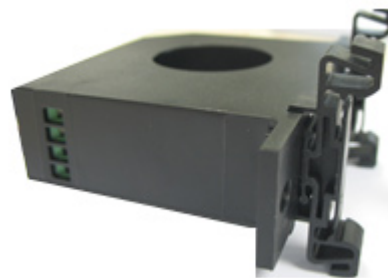


- Note:
- The earth leakage transformer must be crossed in the same direction by all the active cables of the line, including the neutral (if it is present).
 - All the cables must be at the center of the earth leakage transformer.
 - The earth cable should not go through the earth leakage transformer.

Differential earth leakage transformers

They perform the algebraic sum of the currents inside the active leads (phase and neutral), thus allowing the detection of any leak current even in the case of a very low value.

They are foreseen for wall mounting, but can also be mounted on DIN rail thanks to specific provided fastenings.



Recommendations for use:

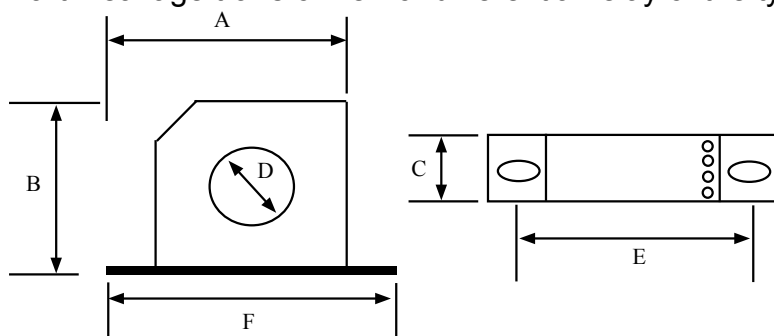
The earth leakage transformer must be crossed in the same direction by all the active cables of the line, including the neutral (if present).

Do not let the earth cable go through the earth leakage transformer.

Maintain the cables at the center of the earth leakage transformer.

Series TCA

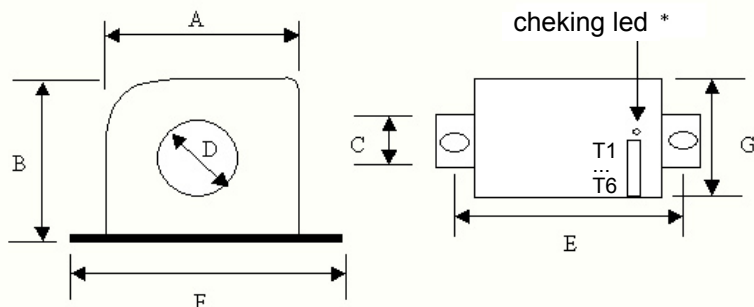
Earth leakage transformer for differential relay of the type A: ELR20 or ELR30



Reference	A	B	C	D	E	F
TCA35	81	71	26	35	96	111
TCA70	120	110	26	70	134	150
TCA110	170	160	26	110	184	200

Series TCB

Earth leakage transformer for differential relay of the type B: ELR21 or ELR31



Reference	A	B	C	D	E	F	G
TCB35	95	91	24	35	111	125	49
TCB70	127	110	24	70	144	157	49
TCB110	162	145	24	110	179	192	49

Accessories (for TCBxx only):

1m long connection cable: reference CBB01

2m long connection cable: reference CBB02

5m long connection cable: reference CBB05



RCS Lyon 444-429-476 - Printed in France.

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