ELR-91 EARTH LEAKAGE RELAY

GENERALITY

The device type ELR-91 is an amperometric relay of maximum homopolar differential current to use to control the insulation towards earth of networks of energy supplier, of electric machines, etc.
The device must be joined at a suitable toroidal current transformer of the CT-1/… line in the way to point out the earth leakage current of the system to control and to protect.
The toroidal current transformer point out the vectorial sum of the currents present on the active conductor of single-phase line, three-phase with or without neutral (inside the toroidal current transformer will pass all phase conductor and if present the neutral, but none protection conductor must pass), in the way to point up the leakage current towards earth, depend of the insulation level line under control.
When the current read exceed the threshold value set the two exchanging contacts, available in output, will commute in the way to protect the line under control using opportune opening coils switch or contactor or to signal at distance the low insulation condition of the line or equipment under control.

INTRODUCTION

The ELR-91 has standard dimensions DIN 72x72mm with depth very limited, in the way to use it in application where the space available is limited.
A wide range of current and time of delay calibration, allows to use it in a lot of application, both like signalling of low insulation and like protection line according with the norms (CEI 64.8), to realize adequate vertical and horizontal selectivity, etc.
The device has the following principal features: on input circuits of the measure circuit has opportune filters doing it exempt by external noises, permanent control function of efficiency of internal circuit, permanent control of connection between relay and toroidal current transformer and coil continuity. The functioning is insured also with sinusoidal current and unidirectional button (type A according to norms IEC 755).
On the front it's possible to program the tripping current (25mA ÷ 25 A), the tripping delay (0,02 ÷ 5 sec.) and the type of functioning of the reset (automatic or manual). The device has a contact in exchange in output (both for the application with a closed contact and opened contact), an apposite transparent cover of frontal protection and rear extractible screw terminals.

MODELS:

In basis of power supply there are two models:

- ELR-91 110-230V:	100÷125V ca/cc - 220÷240Vca	cod. 3EL71W
- ELR-91 24-48V:	24V ca/cc - 48V ca/cc	cod. 3EL71N

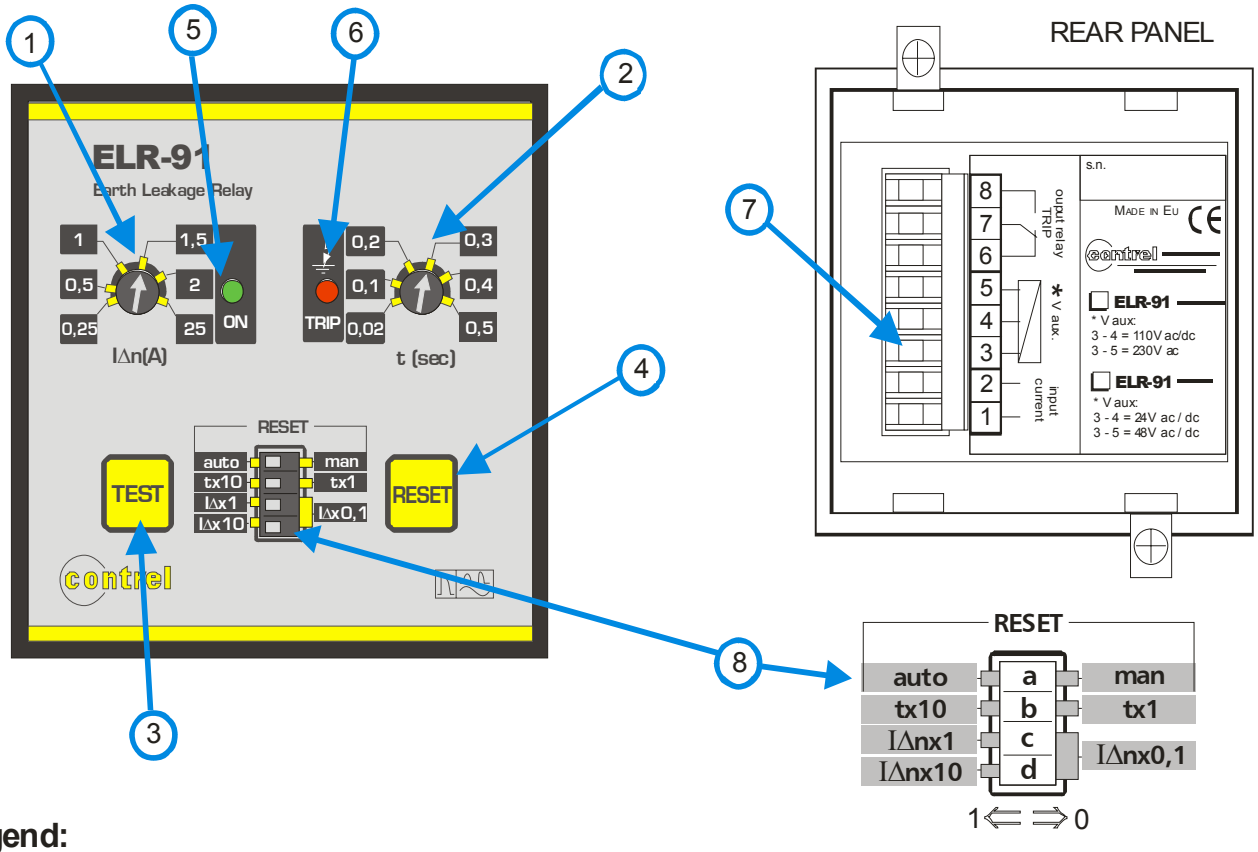
ACCESSORIES AND OPTIONS

The ELR-91 is supplied of a transparent cover of frontal protection.
Option: IP65.

INSTALLATION

Only a qualified technician can do the installation. The instrument installation must be done in total absence of voltage. The instrument must be intact and it haven't damages caused of transport. The power supply must be compatible with the tool range.
To fix the device at the panel, insert the two bracket into apposite button-holes in the side of the enclosure and to shut the screw. The transparent cover is fixed at the upper part at joint. To remove the cover it's necessary to act on the two hooks in a side of the frontal part of the instrument with a screwdriver.
The wire of connection between the relay and the toroidal current transformer must be twisted or shielded in presence of strong electromagnetic noises or considerable length. It's better to use a cable with a section of 1 mm^2 and a length lower than 30 meters. The terminals 1-2 (coil of measure) of the toroidal current transformer must be connected to the terminals 1-2 of the ELR-91, the terminals 3-4 (coil of test) must not be connected. The relay trip if the connection is interrupted (function of permanent control of the efficiency of the connection circuit). To test the device it's possible to use the bottom of TEST that caused the intervention of relay after the delay set.

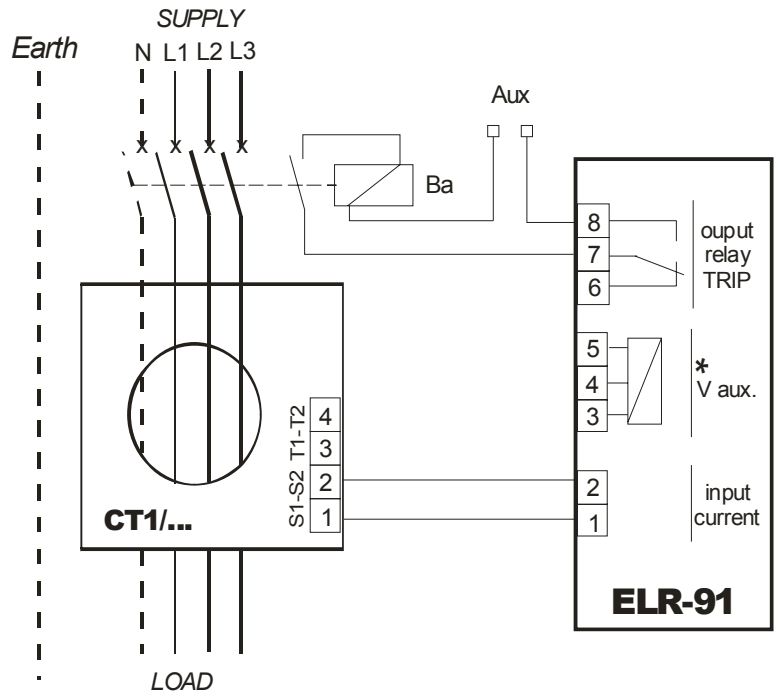
DESCRIPTION – PROGRAMMING



Legend:

1) current tripping setting potentiometer
2) tripping time setting potentiometer
3) push button for test
4) push button for manual reset
5) signalling green LED for auxiliary supply presence
6) signalling red LED for relay tripped
7) terminal at screw for the connection
8) microswitches for programming:
   - **a**. selection type of reset
     in position 1 automatic reset
     in position 0 manual reset
   - **b**. selection of the multiplying constant of tripping time
     in position 1 K=10
     in position 0 K=1
   - **c,d** selection of the multiplying constant of tripping current
     with c,d in position 0 K=0,1
     with c in position 1, d in position 0 K=1
     with c,d in position 1 K=10

WIRING DIAGRAMS



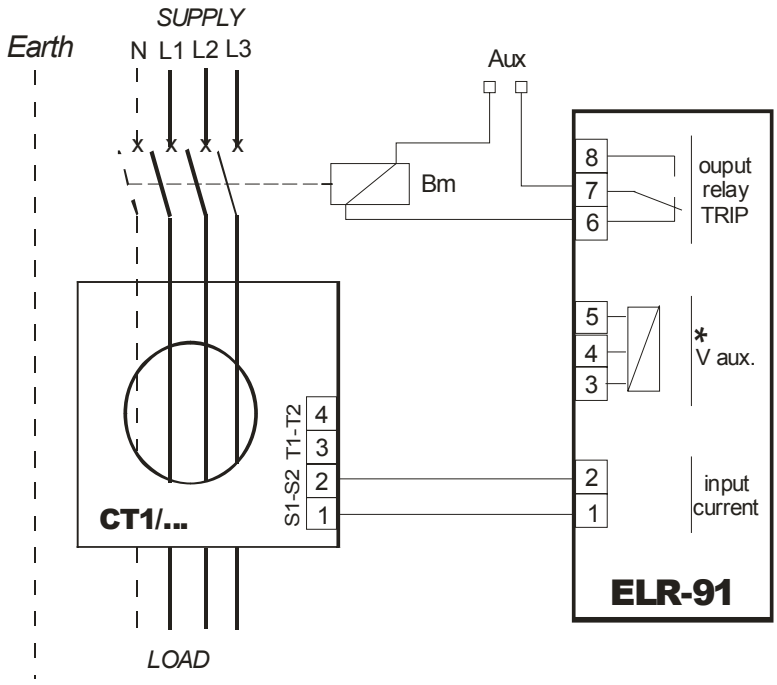
Wiring diagram with switch with opening coil.

The output contact can be used to signal at distance the relay tripped, it isn't connected at opening coils.

* power supply Uaux

ELR-91 110-230V
- terminals 3 - 5 = 220-240V ac
- terminals 3 - 4 = 110-125V ac / dc

ELR-91 24-48V
- terminals *3* - 5 = 48 V ac/dc
- terminals *3* - 4 = 24 V ac/dc



Wiring diagram with switch with under voltage opening coil.

The output contact can be used to signal at distance the relay tripped, it isn't connected at opening coils.

* power supply Uaux

ELR-91 110-230V
- terminals 3 - 5 = 220-240V ac
- terminals 3 - 4 = 110-125V ac / dc

ELR-91 24-48V
- terminals *3* - 5 = 48 V ac/dc
- terminals *3* - 4 = 24 V ac/dc

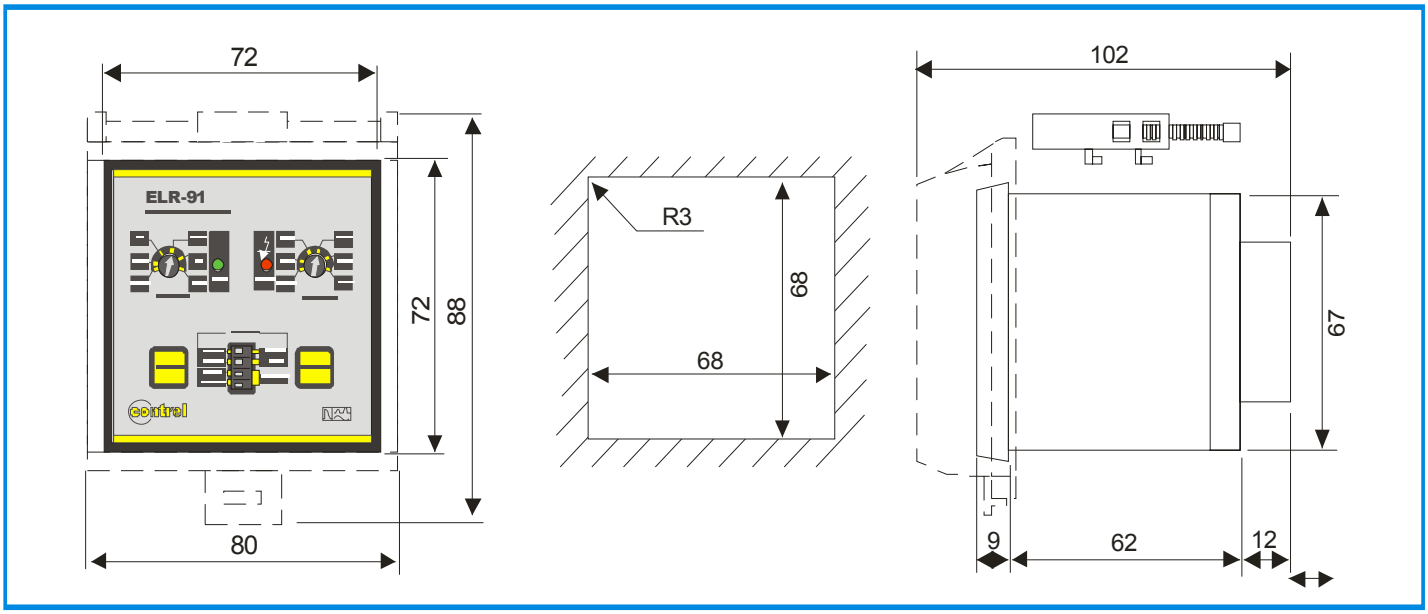
FUNCTIONALITY

When the device is installed and correctly supplied, its green LED will be on. The eventual trip of relay can depend by an interruption of the toroid–relay circuit or by a presence of earth leakage current higher than the value set.
The automatic reset can be enabled with its respective micro-switch, in the way that if the current measured descend under the level of the threshold set, the relay will rearm automatically. If after the trip the power supply disappears, the relay will rearm automatically. If it's impossible to rearm the relay depends by a current measured upper than the threshold or the connection between relay and toroidal current transformer is interrupted.

TECHNICAL FEATURES

Auxiliary power supply	**ELR-91 110-230V**:100÷125Vcc/dc 50-60Hz 220÷240V 50-60Hz ±10% **ELR-91 24-48V**:24–48V cc/dc 50-60Hz ±20%
Maximum consumption	3 VA
Current tripping adjustment range IΔn	0,025 ÷ 0,25 A for K = 0,1 0,25 ÷ 2,5 A for K = 1 2,5 ÷ 25 A for K = 10
Tripping time adjustment range t	0,02 ÷ 0,5 sec. for K =1 0,2 ÷ 5 sec. for K =10
Signalling	led ON, led TRIP
External toroidal current transformer and accessories	CT-1/…serie
Output relay: voltage free contacts	1 changeover contact NO-C-NC 5 A 250V resistive load
Functions programmable	Manual or automatic reset
Working temperature	-10 ÷ 60°C
Storing temperature	-20 ÷ 70°C
Relative humidity	≤ 90 %
Insulation test	2,5 kV 60 sec.
Position of mounting	Indifferent
Type of connection	Extractible terminal with screws, section wires max 2,5 mm^2
Protection degree	IP 52 front with cover (IP40 without cover) - IP 20 enclosure
Mounting DIN 43700	Flush mounting DIN 72x72mm, depth 76mm
Standards	CEI 41-1 IEC 255 VDE 0664 IEC755 CEI 64.8 EN 61008-1 (1999-11); EN 62020 (1999-09); EN 61543 (1996-09); EN61326-1 (1998-04);EN 61326/A1 (1999-05)
Electromagnetic compatibility	CEI-EN 50081-1 CEI-EN 50082-2

DIMENSIONS



Contact the technical assistance or refer at specific document for application don't described in this manual.

NOTE
At reason of the evolution of standards and products, the company reserves to modify in every time the features of the product described in this document, that it's necessary to verify preventively.
The liability of the producer for damage caused by defect of the product "can be reduced or deleted (…) when the damage is caused joint by a defect of product or for blame of the damaged or a person of which the damaged is responsible" (Article 8, 85/374/CEE).

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