

INSTRUCTION MANUAL

Type B Earth Leakage Relay

FANOX

ELR-3B



Description

- Earth leakage relay type B
- True RMS
- Modular DIN-rail housing, 3 modules
- Green power LED indicator (ON)
- External residual current transformer CTB-1 series
- Fail safe function (settable)
- Visualization of the differential current
- Backlighting LCD display
- On the front panel, TEST and RESET button
- Two independent programmable outputs (trip and prealarm)

WARNING!

- Carefully read the manual before the installation or use.
- This device is to be installed by qualified personnel, complying to current standards, to avoid damages.
- Before any maintenance operation on the device, remove supply inputs.
- The manufacturer cannot be held responsible for electrical safety in case of improper use of the equipment.
- Products illustrated herein are subject to alteration and changes without prior notice.

Display and LED functions

Thanks to LCD display, the user can view very quickly the measurements, the alarms and can access to all settings

- Green: detected current lower than threshold
- Yellow: detected current higher than ALARM threshold but lower than TRIP threshold
- Red:
 - detected current higher than ALARM threshold and relay activation
 - open residual current transformer circuit (or not connected)
 - current leakage reading off scale
 - TEST, causes tripping of the relay

Front keyboard

RESET key – To reset the relay after tripping

TEST key – Causes tripping of the relay

t_d key – Used to select the tripping delay time

I_d key – Used to select the fault current to earth

Std/+ key at least 2 seconds – Positive safety activated or deactivated on TRIP and ALARM relays

PROG key – Used to enter into prealarm relay menu setting (on the display will appears ALARM)

Δ AUTO key (only ALARM menu setting) – Used to set the reset for prealarm relay (manual or automatic)

Id key at least 2 seconds (only ALARM menu setting) – Used to set the prealarm's threshold

td key at least 2 seconds (only ALARM menu setting) – Used to set the prealarm delay time

Order codes

Code	Type	Tripping set-point (IΔ)	Tripping time (t)	Auxiliary supply
41032	ELR-3B	0,03-0,1-0,3-0,5-1-3 (A)	0,1-0,2-0,3-0,4-0,5-0,75-1-5-10 (s)	230VAC ±20% 50-60 Hz

Display indications

Cause of the trip	Display message
Test	TEST
Remote signal ON/OFF	EXT
Current leakage	ALARM

Others display messages	
Save setting values	SAVE
Current leakage over scale	OVR
Poor toroidal connection	ERRt

Reclosing the equipment

- By ALARM. A manual RESET, or remote ON is required to return to the equipment's initial status.
When the trip is caused by the remote OFF signal, it can only be re-armed by the remote ON signal.
- By PREALARM. A manual RESET has to be performed if it is in non-automatic mode to cancel this status.

TRIP relay parameters table

For each parameter are indicated the possible setting range, the factory default, as well as a description of the function of the parameter.

FAULT CURRENT	Unit of measure	Def.	Range
I _{Δn}	A	0,03	0,03-0,1-0,3-0,5-1-3 (ELR-3B)

Trip threshold adjustment for fault current to earth. Press the **I_{Δn}** button for 2 seconds to access the settings. You can change the value by repeatedly pressing the same button. When the key is released, the device validates the value and showing the **SAVE** message.

TRIPPING DELAY TIME	Unit of measure	Default	Range
Time	s		0,1...10

Select the prealarm delay time. Press **t_Δ** at least 2 seconds to enter settings menu. You can change the value by repeatedly pressing the same key. When the key is released, the device validates the value and showing the **SAVE** message.

ALARM relay parameters table

A short press on PROG enters the prealarm channel, activating the **Alarm** message on the display.

ALARM RELAY	Unit of measure	Default	Range
Fail-safe	-	Std	Std- +

If set to **+**, positive safety activated on TRIP relay, in this condition the ALARM relay is normally energized. It's possible to change the value pressing the **Std/+** key at least 2 seconds.

Note: If the prealarm relay is OFF, the first setting that must be made to enable it, is the prealarm threshold.

TRIP RELAY	Unit of measure	Default	Range
Fail-safe	-	Std	Std- +

If set to **+**, positive safety activated on TRIP relay, in this condition the TRIP relay is normally energized; therefore in the event of the lack of auxiliary voltage the output contacts move to the trip condition (TRIP). It's possible to change the value pressing the **Std/+** key at least 2 seconds.

Alarm range according to leakage current

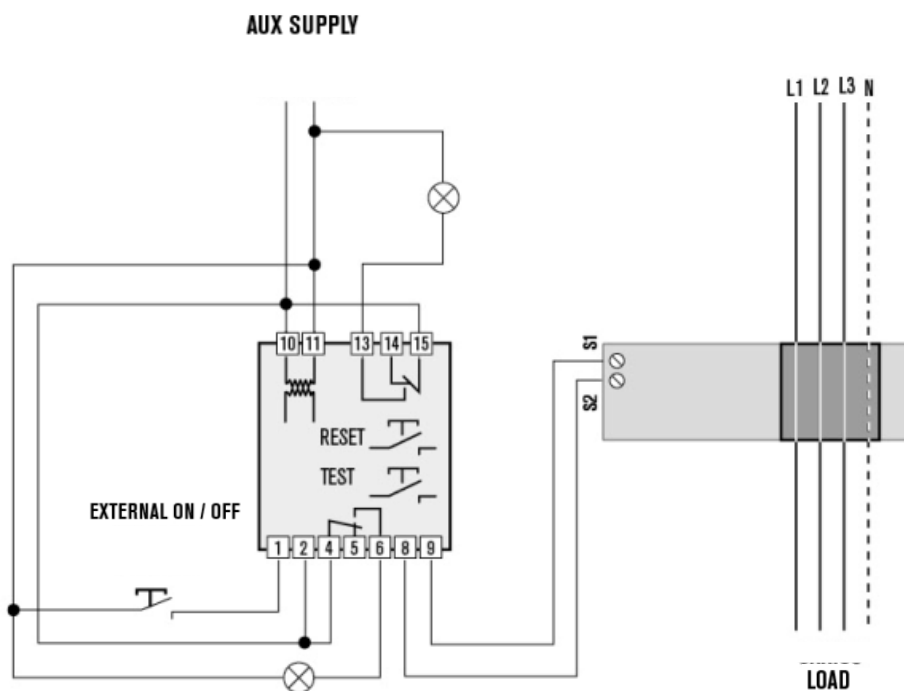
Current		Lower limit	Upper limit
Type AC (sine)		$0,8 \times I_{dN}$	$1 \times I_{dN}$
Type A	Sine half wave	$0,8 \times I_{dN}$	$1,4 \times I_{dN}$
	Sine half wave phase controlled (90° - 135°)	$0,8 \times I_{dN}$	$1,4 \times I_{dN}$
Type B	Smooth DC current	$0,8 \times I_{dN}$	$1,7 \times I_{dN}$
	Sine current at 150Hz	$0,8 \times I_{dN}$	$1 \times I_{dN}$
	Sine current at 400Hz	$0,8 \times I_{dN}$	$1 \times I_{dN}$
	Sine current at 1000Hz	$1 \times I_{dN}$	$1,3 \times I_{dN}$

Toroidal current transformer type according to current

Current	Trasformer
30mA	CTB-1/22, CTB-1/35
$\geq 300\text{mA}$	CTB-1/60, CTB-1/80, CTB-1/110
$\geq 500\text{mA}$	CTB-1/160, CTB-1/210, CTB-1/300

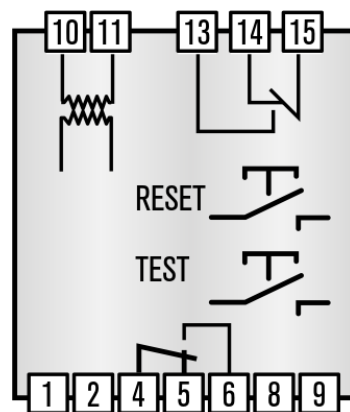
Type	Code	Useful section
CTB-1/22	41093	$\varnothing 22 \text{ mm}$
CTB-1/35	41094	$\varnothing 35 \text{ mm}$
CTB-1/60	41095	$\varnothing 60 \text{ mm}$
CTB-1/80	41096	$\varnothing 80 \text{ mm}$
CTB-1/110	41097	$\varnothing 110 \text{ mm}$
CTB-1/160	41098	$\varnothing 160 \text{ mm}$
CTB-1/210	41099	$\varnothing 210 \text{ mm}$
CTB-1/300	41091	$\varnothing 300 \text{ mm}$

Wiring connection

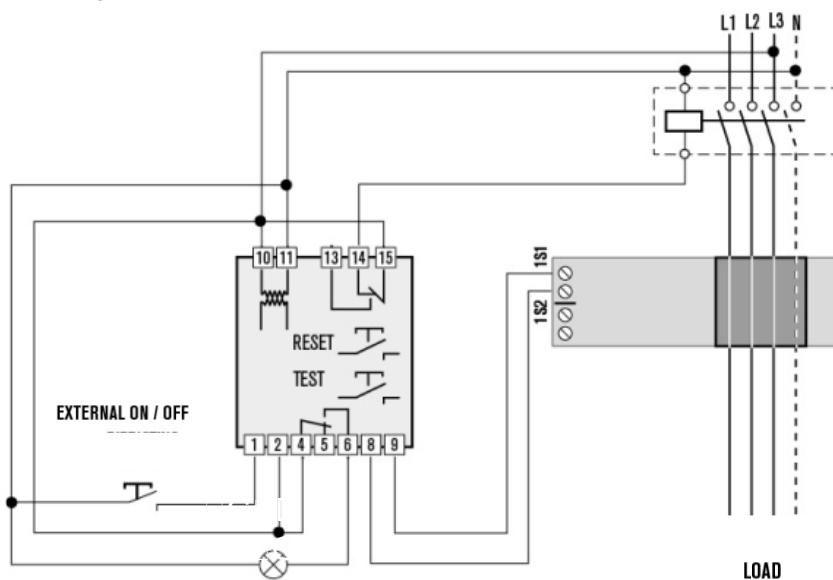


Terminal connection

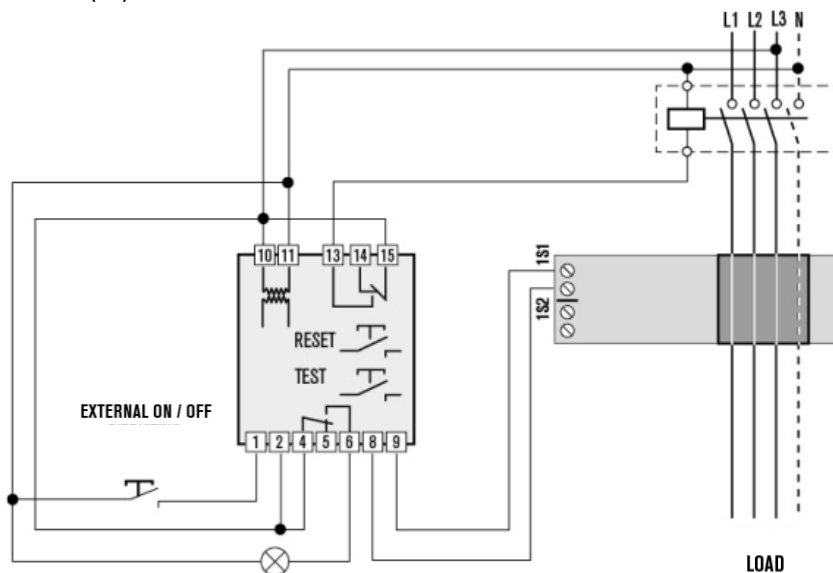
N°	Description
1 - 2	External Input Trip / Reclose
3	Not used
4	Pre-alarm output relay - COMMON
5	Pre-alarm output relay - NC
6	Pre-alarm output relay - NO
7	Not used
8	Input toroidal current transformer S2
9	Input toroidal current transformer S1
10	Auxiliary supply (phase or neutral)
11	Auxiliary supply (neutral or phase)
12	Not used
13	Tripping output relay - NO
14	Tripping output relay - NC
15	Tripping output relay - COMMON



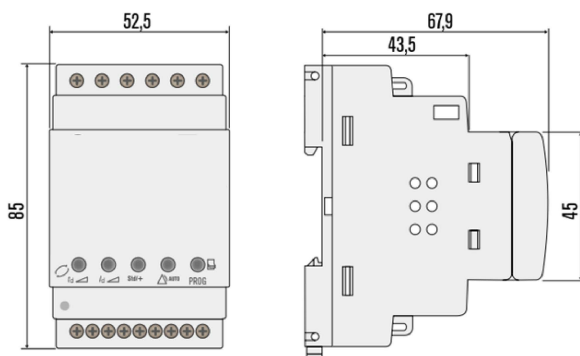
Undervoltage coil (BM)



Shunt coil (BL)



Mechanical dimensions (mm)



Technical characteristics

Control circuit	
Toroidal transformer	External, CTB-1 series
Tripping type	Type B
Tripping set-point (I Δ)	0,03-0,1-0,3-0,5-1-3
Alarm set-point	OFF / 50÷80%
Tripping time (t)	0,1÷10s
Resetting	Automatic or manual by pushbutton on front or remote
Auxiliary supply	
Auxiliary voltage	230VAC $\pm$ 20%
Rated frequency	50/60Hz
Max power consumption	6VA
Output relay	
State	Configurable normally de-energised or energised
Contact arrangement	2 changeovers (1 trip, 1 alarm)
Rated contact capacity	10A – 250VAC
Display	
Type	LCD
Connections	
Type of terminal	Screw (fixed)
Number of terminals	15
Conductor cross section	0,127 - 2,082 mm ²
Tightening torque	0.5 - 0.6 Nm
Length of cable to strip	7mm
Ambient operating conditions	
Operating temperature	-10÷50°C
Storage temperature	-20÷80°C
Relative humidity	5÷95%
Altitude	2000m
Housing	
Version	3 module DIN
Degree of protection	IP20 terminals IP41 on front
Weight	168g
Certifications and compliance	
Reference standards	EN 62020 EN 60755 EN 60947-2 annex M



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