PROTECTION
AND CONTROL

ELR-4C

TYPE A residual
current monitoring
and protection relay
WITH 4 CHANNELS

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ITALIAN DESIGN

Why use type A residual current protection?

Residual current devices (RCD)

Residual current monitors (RCM) monitor residual current in electrical installations and issue a signal when the residual current exceeds a set value. RCMs are used primarily in plants where a fault should result in a signal, but not in disconnection. This enables plant operators to detect faults and eliminate their causes before the protective devices disconnect the installation, which increases plant and operating safety and cuts costs.

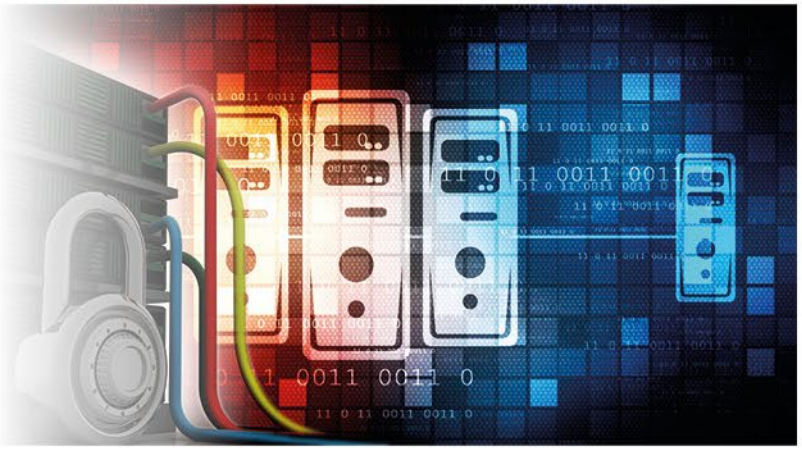
Modular residual current devices (MRCD)

Modular residual current devices (**MRCD**) monitor residual currents in electrical systems and trip the molded case circuit breaker via a shunt trip or an undervoltage release after an adjustable advance warning if the residual current exceeds a defined value. This makes it possible for you to offer molded case circuit breakers (**MCCBs**) with personal and fire protection in compliance with **EN 60947-2** (Annex M) (also as a retrofit).

Versatility

LThe wide range of sensitivities, from **30 mA** to **3 A**, and adjustable delays up to 10 s, allows using the ELR-4C at any point in the installation, whether at a specific location in a distribution board or even in the header.

- **Versatility for all types of installations**
- **Preventive maintenance by means of alarms**
- **Real-time display and monitoring**
- **Filtering in the presence of high harmonic content leakage currents**
- **RS-485 communications (Modbus RTU)**

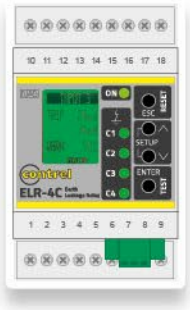


Field of use

The **ELR-4C** earth leakage relay is used for the control and monitoring of leakage currents in plants or parts of the plant, causing the power supply to be interrupted in the event that these currents exceed values that are dangerous to people or things.

It can be installed in single-phase and three-phase 3 and 4-wire 230/400 VAC networks.

ELR-4C multipoint earth leakage system for measurement and signalling with external transformer of the **CT-1 series**



Type A protection
Pulsating sinusoidal current
Pulsating alternating current

Benefits

Higher plant availability and operating safety through permanent monitoring of residual currents

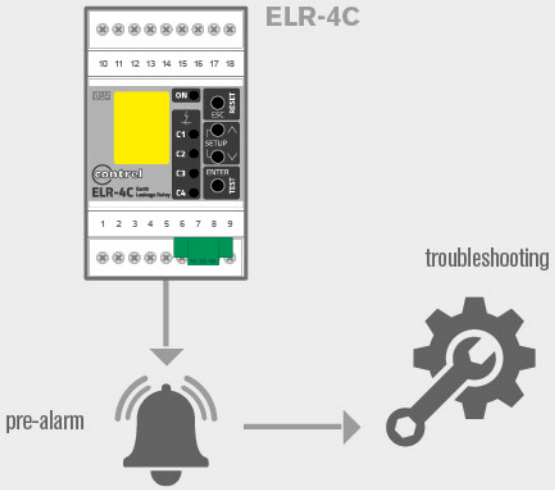
Adjustable limit values for residual current and response time enable timely detection and signaling – plant shutdowns are often avoidable

Devices for every application

Additional fire protection can be implemented using the monitoring system

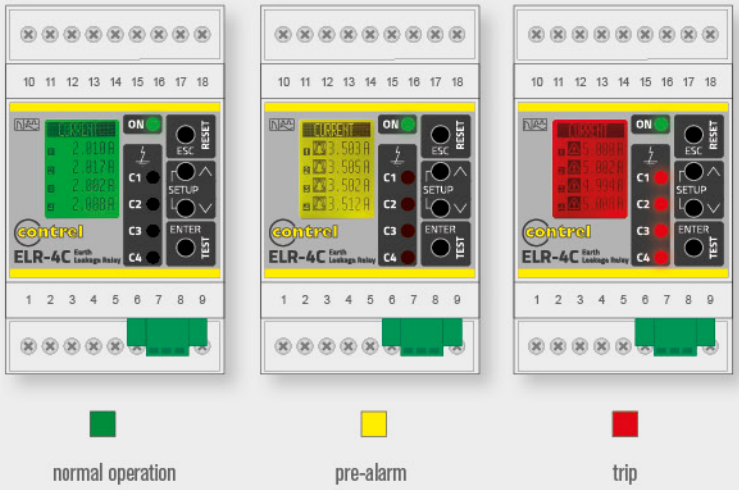
Current transformers are available in various sizes, the RCMs/MRCDs can be used optionally for signaling and/or switching

PREVENTIVE MAINTENANCE



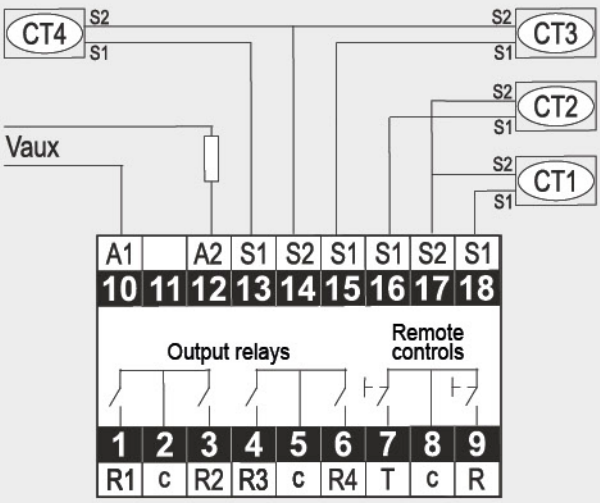
The **ELR-4C** has a display using as pre-alarms. Before an event is triggered, the device allows preventive maintenance to be scheduled when the installation is taken offline. It also offers an event log that can be analysed to aid in troubleshooting.

REAL-TIME DISPLAY AND EARTH LEAKAGE MONITORING



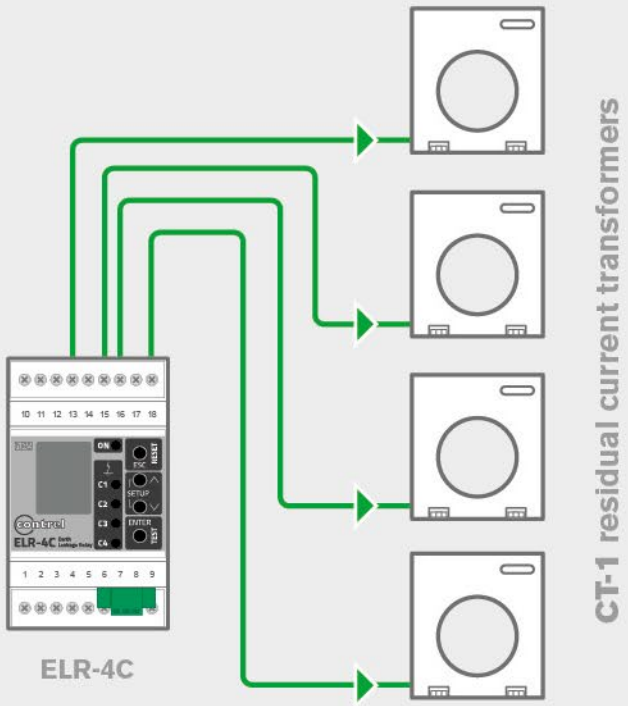
Its high-contrast display, together with its **RS-485** communications (**Modbus RTU**), allows leakage to be monitored in real time. The display changes to red when it triggers, saving the value of the trip current, facilitating the problem's detection and source.

WIRING CONNECTION



TERMINAL	DESCRIPTION
1	Trip output relay R1
2	Trip output relay R1,R2 (COMMON)
3	Trip output relay R2
4	Trip output relay R3
5	Trip output relay R3,R4 (COMMON)
6	Trip output relay R4
7	External TEST (DI1)
8	Digital input (COMMON)
9	External RESET (DI2)
10	Auxiliary supply (neutral or phase)
11	Not used
12	Auxiliary supply (neutral or phase)
13	Input toroidal current transformer 4-S1
14	Input toroidal current transformer 3,4-S2
15	Input toroidal current transformer 3-S1
16	Input toroidal current transformer 2-S1
17	Input toroidal current transformer 1,2-S2
18	Input toroidal current transformer 1-S1

4 FULLY INDEPENDENT CHANNELS



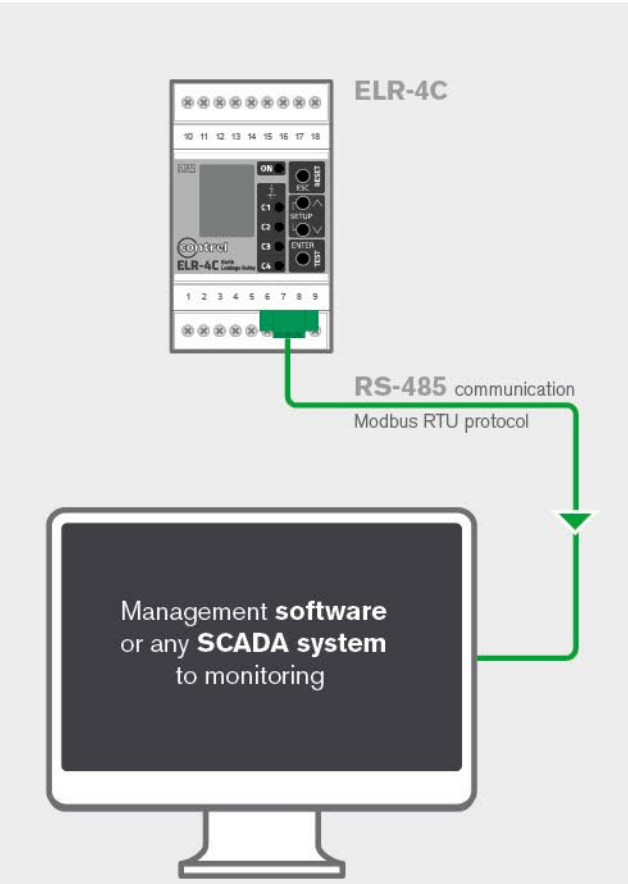
Controlling the switches of the input channels

Instantaneous bar graph of the current measurement for each channel

Current trip event log

Adjustable frequency filtering

This function makes the relay more robust in the presence of leakage currents with a high harmonic content which typically are not attributable to a fault in the circuit.
This situation is usually found in the use of inverters to control motors.



Communication

RS-485 communication (Modbus protocol) for integration into management software or any SCADA system, which makes all the monitoring, event logging and remote control features offered by the relay much easier to use.

Remote Reset and Test

The output contacts of the ELR-4C relay can be reset from the outside, using external buttons.

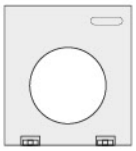
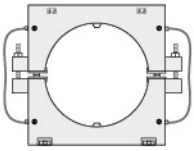
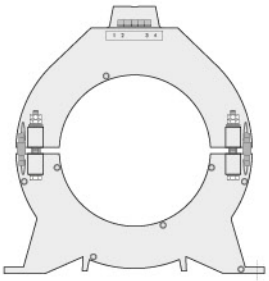
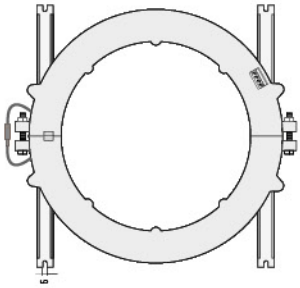
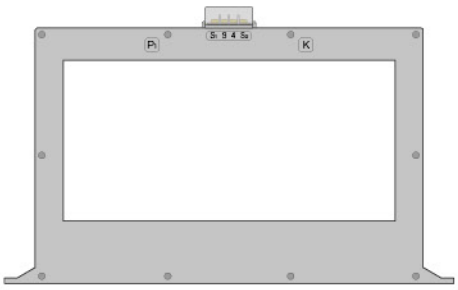
Autoreset

At the end of the trip situation, the relay contacts will switch automatically, without the need to press the reset key locally or remotely.

TECHNICAL CHARACTERISTICS

CONTROL CIRCUIT	
Toroidal transformer	External, CT-1 series
Tripping type	Type A
Number of channels	4
Tripping set-point (IΔ)	0,03÷30A
Prealarm set-point	50÷90%
Tripping time (t)	0,02÷10s
Resetting	Automatic or manual by pushbutton on front or remote
AUXILIARY SUPPLY	
Auxiliary voltage	230 VAC 115 VAC (optional) 24-48 VAC/DC (optional)
Rated frequency	50/60Hz
Max power consumption	6VA
OUTPUT RELAY	
Number of outputs	4
State	Configurable normally de-energised or energised
Rated operating voltage	250 VAC
Rated current	5A
Mechanical life	$10 \cdot 10^6$ cycles
DIGITAL INPUTS	
Number of inputs	2
Rated voltage	Self powered
DISPLAY	
Type	LCD
RS485 SERIAL INTERFACE (optional)	
Protocol	Modbus-RTU
Baud-rate	Programmable 4800 – 115200 bps
CONNECTIONS	
Type of terminal	Screw (fixed)
Number of terminals	18
Conductor cross section	0,127 - 2,082 mm2
Tightening torque	0.5 - 0.6 Nm
Length of cable to strip	7 mm
AMBIENT OPERATING CONDITIONS	
Operating temperature	-10÷60°C
Storage temperature	-20÷80°C
Relative humidity	5÷95%
HOUSING	
Version	3 module DIN
Degree of protection	IP20 terminals IP40 on front
Weight	200 g
CONFORMITÀ	
Reference standards	EN 61010, EN 61000-6-2, EN 61000-6-3, IEC/TR 60755 EN 60947-2 Annex M

CT-1 residual current transformers

TYPE		Ø (mm)	OPENABLE	MIN MEASURED CURRENT	TRANSFORMATION RATIO
	**CTD-1/28**	**28**	NO	25 mA	500/1
	**CT-1/22**	**22**	NO	25 mA	500/1
	**CT-1/35**	**35**	NO	25 mA	500/1
	CT-1/60	**60**	NO	25 mA	
	CT-1/80	**80**	NO	100 mA	
	CT-1/110	**110**	NO	250 mA	
	CT-1/160	**160**	NO	500 mA	
	**CTA-1/110**	**110**	YES	25 mA	500/1
	**CTA-1/160**	**160**	SI	500 mA	500/1
	**CT-1/210**	**210**	NO	250 mA	500/1
	CT-1/300	**300**	NO	250 mA	
	CTA-1/210	**210**	SI	500 mA	
	CTA-1/300	**300**	SI	1 A	
	**CT-1/280R**	**280x150**	NO	500 mA	500/1
	CT-1/350R	**350x170**	NO	500 mA	
	**CT-1/415R**	**400x150**	NO	250 mA	500/1

ISO 9001

Studio Massimo Covati

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