Technical Specifications:

Ordering Part Number		EL500-00-10
Supply Characteristics:		
Supply Voltage (⏦)		110 - 240 Vac / Vdc, 50 / 60 Hz
Supply Variation		± 20%
Fuse		Use external 250 mA time-delay fuse
Power Consumption (Max.)		5 VA
LED Indication	Power On	ON (Green Led)
	EL / CT	ON (Red Led) Relay Trip / Blinking (CT OPEN)
	Leakage Current / TST	By Bar graph 30%(Green), 45%(Green), 60%(Yellow), and 75%(Red), Blink Test / reset switch is pressed
Threshold I n (A)		0.03, 0.1, 0.3, 0.5, 1, 3, 5, 10, 20, 30
Relay O/P Characteristics:		
Contact Rating		1 C/O + 1 NO; 5 A (Resistive) at 240 Vac / 30 Vdc
Contact Arrangement		1 C/O SPDT and 1 NO SPST
Utilization Category (AC-15)		3.0 A at 120 V and 1.5 A at 240 V
Utilization Category (DC-13)		0.22 A at 125 V and 0.10 A at 250 V
Mechanical Life Expectancy		$1X10^7$ operations
Electrical Life Expectancy		$1X10^5$ operations
Contact Material		Ag Alloy
Feature Characteristics:		
Reset		Manual Reset
Test / Reset		Local and Remote (Non Potential Free Contacts) (Up to 10 m)
∆t settings (s)		0.00, 0.06, 0.15, 0.25, 0.5, 0.8, 1, 2.5, 5, 10
Reset Enable		Below 50% of set IΔn in presence of CBCT
Reset Time		<1 s
Type Class		'A' True RMS measurement upto I∆1A (as per IEC 60947-2 Annex M)[1]
		'AC' True RMS measurement 30 mA to 30 A (as per IEC 60947-2 Annex M)
Setting Accuracy		+0, -20 % (including CBCT accuracy)
Repeat Accuracy		± 2%
Ambient Conditions:		
Storage Temperature		-20°C to + 80°C
Operating Temperature		-15°C to + 60°C
Relative Humidity		5 to 95% Rh (without condensation)
Max. Operating Altitude		2000 m
Degree of Protection		IP20 for Terminals, IP40 for Enclosure
Operating Position		Any
Pollution Degree		II
Others:		
Mounting		Base / Din Rail
Dimensions in mm (W X H X D)		90 X 36 X 66.2
Weight Approx. (Un-packed)		150 g
Enclosure Colour		Black
Knob Colour		Green

CBCT for Type A & AC Current

Part Number	Size (W X H X D) mm	Inner Diameter	IΔn setting range for Type AC current	IΔn setting range if there are pulsating DC current (Type A)
ELCT500-38	37x91x71	38 mm	30 mA to 30 A	30 mA to 1 A
ELCT500-57	37x117x97	57 mm	30 mA to 30 A	30 mA to 3 A
ELCT500-70	37x133x109.3	70 mm	30 mA to 30 A	30 mA to 3 A
ELCT500-92	37x155x132	92 mm	30 mA to 30 A	30 mA to 3 A
ELCT500-120	37x176x153	120 mm	30 mA to 30 A	30 mA to 3 A
ELCT500-210	37x282x250	210 mm	30 mA to 30 A	30 mA to 3 A

Turns Ratio: 1500:1 (Common for all CBCTs (Core Balance Current Transformers))

Internal Burden: 74 Ω, 2 W, to give 1 V output at 30 A

Trip Characteristics:

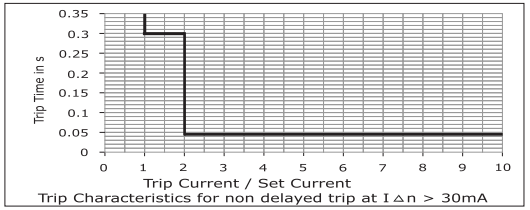
Standard IEC 60947-2 annex M indicates the operating characteristic for a non-time-delay type in table B.1 in B.4.2.4.1 in standard IEC 60947-2 annex M.

CBRs having IΔn = 30 mA shall be of the non-time-delay type. If the trip time is set at '0' s, then for 5 IΔn & 10 IΔn, the tripping time will be < 40 ms for all current ranges.

Residual current	IΔn	2IΔn	5IΔn[1]	10IΔn[2]
Maximum break time s	0.3	0.15	0.04	0.04

1) For CBRs having IΔn ⩽ 30 mA, 0.25 A may be used as an alternative to 5IΔn

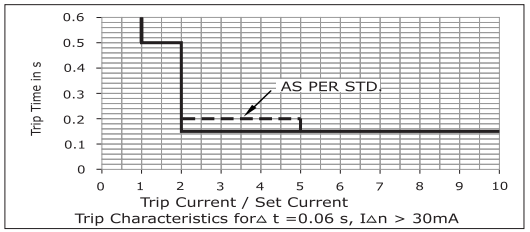
2) 0.5 A if 0.25 A is used according to note 1).



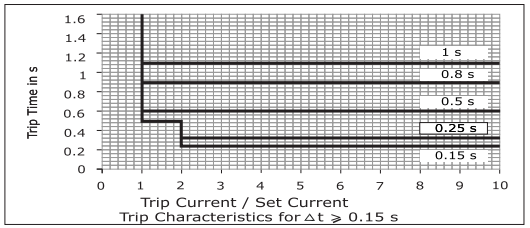
Trip Characteristics for non delayed trip at I∆n > 30mA

For CBRs having limiting non-actuating time of 0.06 s the operating characteristic is given in table B.2. in B.4.2.4.1 in standard IEC 60947-2 annex M.

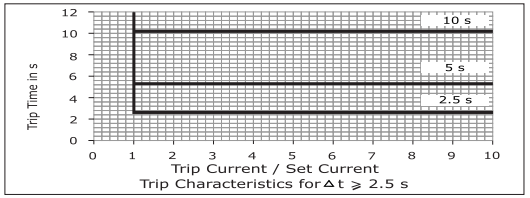
Residual current	IΔn	2IΔn	5IΔn	10IΔn
Maximum break time s	0.5	0.2	0.15	0.15



Trip Characteristics for∆ t =0.06 s, IΔn > 30mA



Trip Characteristics for∆t ⩾ 0.15 s



Trip Characteristics for∆t ⩾ 2.5 s

Trip Characteristics for ∆t ⩾ 0.15 s

EN 60947-2:2003

B.4.2.4.2.2 Operating characteristic for CBRs having a limiting non-actuating time higher than 0.6 s are declared. The maximum break time at IΔn, 2 IΔn, 5 IΔn, and 10 IΔn.

Residual current Trip setting	Maximum Break Time s			
	IΔn	2IΔn	5IΔn	10IΔn
0.15 s	0.5	0.25	0.25	0.25
0.25 s	0.5	0.35	0.35	0.35
0.5 s	0.6	0.6	0.6	0.6
0.8 s	0.9	0.9	0.9	0.9
1 s	1.1	1.1	1.1	1.1
2.5 s	2.6	2.6	2.6	2.6
5 s	5.1	5.1	5.1	5.1
10 s	10.1	10.1	10.1	10.1

EARTH LEAKAGE RELAY SERIES: EL500

Ordering Product Information

EL500-00-10

Features:

1. Wide range of earth leakage current adjustment.
2. Adjustable earth leakage trip time.
3. Instantaneous trip (for details refer trip characteristics).
4. Test feature to check complete product functionality.
5. Manual reset feature through reset switch on product.
6. 1C/O + 1NO relay output.
7. LED indications for all failure conditions.
8. Wide auxiliary supply voltage range.
9. Base or DIN rail mounting.
10. Easy to install.
11. Compact size.

Recommendations:

It is recommended to use CBCTs as mentioned in the table, to ensure the trip current accuracy.

⚠ Caution:

1. Always follow instructions stated in this product leaflet.
2. Before installation, ensure that specifications agree with intended application.
3. Installation to be done by skilled electrician.
4. Suitable dampers should be provided in the event of excess vibration during installation.
5. Automation and control devices must be installed so that they are protected against any risk of involuntary actuation.
6. Disconnect power before working on equipment.
7. Use slow blow 250 mA fuse in series with supply.

Terminal Details :

Ø3.5 mm	0.54 N.m (4.7lb.in) Terminal screw - M2.6
	1 x 0.2...3.3 mm^2 Solid Wire
AWG	1 x 24 to 12

Use Cu Wire of 60/75°C only.

Notes From Manufacturer:

1. Product innovation being a continuous process, we reserve right to alter any specifications without prior notice.
2. The unit is factory set to 30mA trip and instantaneous delay. Adjustment of these settings can be made if necessary to suit the requirements of the installation. A tamper-resistant plastic window is included. This helps prevent any unnecessary adjustment of the settings.
3. To satisfy regulations, it is recommended that the device be tested periodically to ensure correct operation.
4. The I∆n level may need to be set at a higher level for applications with higher leakage current due to lower impedance caused by cable capacitance.

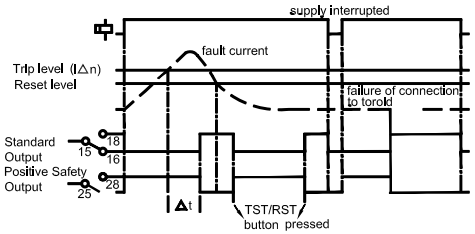
Functional Description: Earth Leakage Protection :

The EL500 is a micro controller-based device meant to measure leakage current and isolate the faulty circuit from the system. Leakage current is sensed through a core balance current transformer. A trip occurs when earth leakage current exceeds the set value of trip current, for the trip time which is adjustable by means of a front mounted potentiometer. For details refer to trip characteristics. The red LED "EL" indicates the presence of earth leakage.

CBCT Connections :

All main primary conductors shall pass through the window of CBCT. Use shielded wires for secondary terminal connections to B1 & B2. Connect the shield to the Y2 terminal of device, which is circuit ground of device. The CT wires should be placed adequately away from high current carrying conductors or source of strong magnetic field to avoid noise pickup. The earth leakage relay also verifies CT connection. If CT winding is open, red LED "EL" blinks.

FUNCTIONAL DIAGRAM :



Test/Reset :

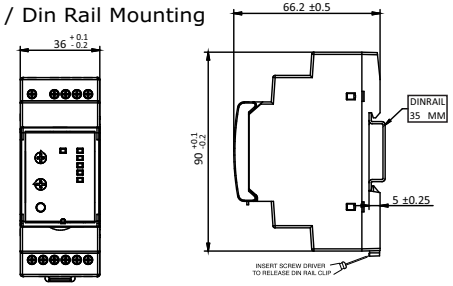
Press and hold TST/RST switch for a minimum of 1 s. The EL500 will change its state from healthy to tripped (Test) or from tripped to healthy (Reset).

Remote Test/Reset :

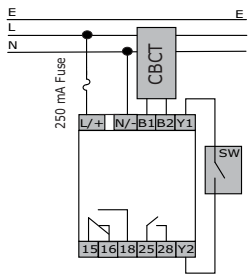
For Remote test Reset, connect an external push button switch between Y1and Y2. For test sequence, press and hold the external push button switch for a minimum of 1 s.

Overall Dimensions and Mounting Details:

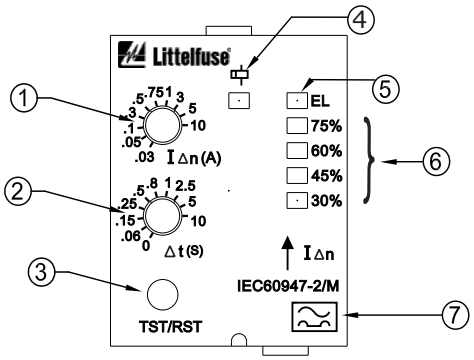
Base / Din Rail Mounting



SINGLE PHASE APPLICATION



Front Facia :

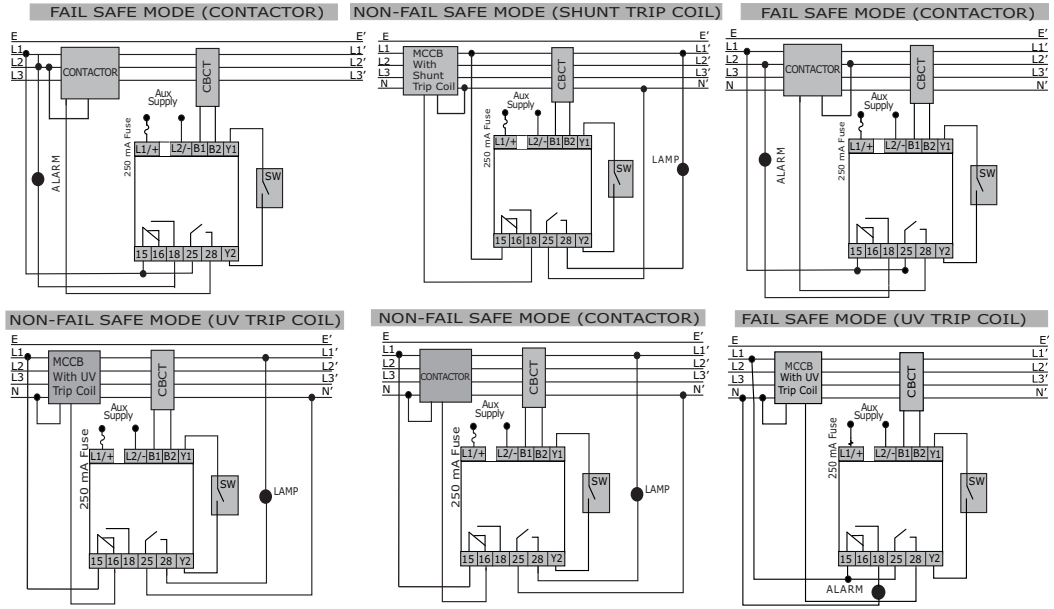


1. Potentiometer for earth leakage current setting.
2. Potentiometer for trip time set setting.
3. Test / Reset function push button
4. Power ON LED Indication.
5. Earth leakage fault LED indication / CT open.
6. Bar graph for earth Fault indication / TEST / RESET switch short.
7. Type A indication.

Note:

1. For CT connections use shielded wire and connect shield to terminal Y2.
2. For single phase applications, only Line and Neutral need to be passed through CBCT.
3. Do not pass earth conductor through CBCT connected to earth leakage relay.
4. All conductors to be protected must pass through CBCT.
5. Do not apply supply voltage at CT and switch terminal.
6. Connect the wires between CBCT and ELR with respect to B1 and B2. Wire gauge should be as mentioned under "Terminal Details".
7. This unit satisfies the requirements for Type A devices which only need to detect residual alternating currents.

Connection Diagram:



Conformity to Standards EMC:

Generally meet standard	IEC 60947-2, IEC 62020 and IEC 61008-1	
Harmonic Current Emission	IEC 61000-3-2	Class A
Voltage Flicker and Fluctuations	IEC 61000-3-3	Class A
ESD	IEC 61000-4-2	Level II
Radiated Susceptibility	IEC 61000-4-3	Level III "Criteria B"
Electrical Fast Transients	IEC 61000-4-4	Level IV
Surge	IEC 61000-4-5	Level IV for AC & Level I for DC Products
Conducted Susceptibility	IEC 61000-4-6	Level III
Voltage Dips and Interruptions (AC)	IEC 61000-4-11	Level I, II, III, IV, V, VI, & VII
Voltage Dips and Interruptions (DC)	50% for 50 ms at Nominal Voltage 15V DC	
Conducted Emission	CISPR 11	Class A
Radiated Emission	CISPR 11	Class A

Safety:

Test Voltage Between I/P & O/P	IEC 60947-5-1 / UL 508	2 kV
Test Voltage Between all Terminals & Enclosure	IEC 60947-5-1 / UL 508	2.5 kV
Over Voltage Category	IEC 60947-1	IV
Impulse Voltage Between I/P & O/P	IEC 60947-5-1	Level 4 kV
Single Fault	IEC 61010-1	
Insulation Resistance	UL 508	>50 kΩ
Leakage Current	UL 508	<3.5 mA

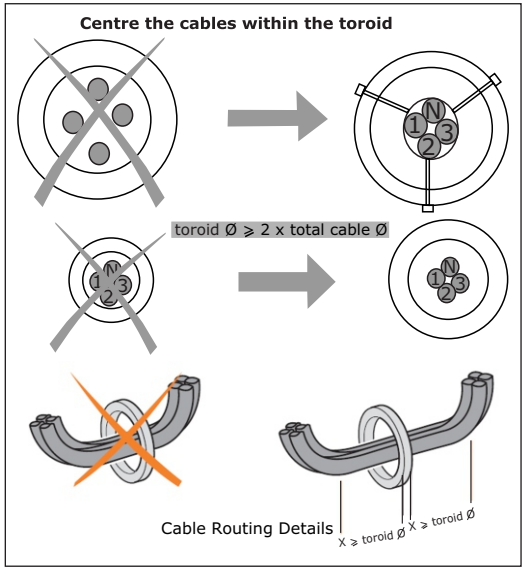
Environmental:

Cold Heat	IEC 60068-2-1	
Dry Heat	IEC 60068-2-2	
Vibration	IEC 60068-2-6	5g (10 - 50 Hz)
Repetitive Shock	IEC 60068-2-27	40 g, 6 ms
Non-repetitive Shock	IEC 60068-2-27	30 g, 15 ms

Note: As per IEC60947-2 (B.4.2.2) the minimum value of rated residual non operating current is 0.5 IΔn.

ELR Operating condition	Contact Positions	
	1 NO (PSO/Fail safe)	1 C/O (SO/Non fail safe)
No Auxiliary Supply	25 28	15 16 18
Healthy / Reset State	25 28	15 16 18
Trip state	25 28	15 16 18

PSO - Positive safety output SO - Standard Output



E-Waste Regulatory Notice:

Kindly treat, recycle or dispose of this equipment in an environmentally sound manner after end of life, as per WEEE (Waste Electrical and Electronic Equipment) regulations; or as per local norms; or hand it over to Littelfuse, Inc. through website www.littelfuse.com