

We touch your **electricity** everyday!

ELR 1.0

• Earth Leakage Relay



Catalog

PMD Division

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1) Introduction

ELR1.0 is a compact design based on latest digital technology. It monitors earth current with core balance current transformer (CBCT). By monitoring it detects and protects power systems from Earth leakage faults. In the events of a earth leakage ELR will trip the contactor etc. to isolate the load. LED's are provided on Top of the unit to indicate earth leakage fault and alarm indication.

2) Features & Protections

- ◆ Monitors, Detects & Protects Power systems from Earth Leakage Fault
- ◆ Wide range of selectable Earth Leakage Current setting
- ◆ Consistent operation without chattering
- ◆ Immune to transient and surge
- ◆ Instantaneous Trip
- ◆ Configurable Earth Leakage Trip time: 0 - 30 s
- ◆ Test feature to check complete product functionality
- ◆ CBCT measures the leakage current to the highest accuracy
- ◆ Continuous detection of CBCT open with Enable/Disable option
- ◆ Flush Mounting Version with Digital Seven Segment Display
- ◆ LED Indication for Earth Leakage Fault & Alarm indication
- ◆ 1 Change over (Trip contact)
- ◆ Last Fault record
- ◆ Wide Auxiliary Supply Range

3) Application

C&S Earth leakage relay is a electronic device based on state of the art technology to protect electrical machines and equipments from insulation breakdown and earth leakage currents.

The electrical cable feeding the power to the equipments is passed through CBCT and relay is operated in case the leakage current exceeds the set value.

One potential free change over contact of the relay are provided for customer usage at the terminals for external connections. LEDs are provided on the top of the unit to indicate Earth leakage fault and alarm status.

- ◆ Leakage protection for Feeders, Motors, Generators, Transformers and mobile operating equipments
- ◆ Leakage protection for LT control panels & switch boards
- ◆ Protections for mining and control engineering
- ◆ Protections for expensive equipments in hazardous sensitive environment like Oil refineries, cement plants, chemical plants, steel plants, pulp industries and general electrical distribution unit

4) Technical Data

Parameters	Description
Supply Voltage (Range)	85 - 280V AC / 95 - 280V DC
Leakage Current Range	30mA to 750mA / 30mA to 3A / 300mA to 12A / OR OTHER RANGE *
Trip Time (sec)	0 to 30 sec (in step of 100msec)
Frequency	50/60Hz
Type Class	'A' True RMS measurement
Measurement Accuracy	± 5%
Trip Accuracy	± 5% of Set Delay or ± 50 msec (whichever is higher)
Reset Mode	Auto / Manual
Reset Enable	Below 50% of Set current in presence of CBCT
Test / Reset	Local
DO Contact Rating	1 C/O contact, 5A / 250V AC or 24V DC
Mounting	Panel / Flush Mountable
Operating Temperature	0 Deg C to +60 Deg C
Storage Temperature	- 20 Deg C to +80 Deg C
Degree of Protection	IP 20 for Terminals, IP 40 for Enclosure
Dimension	(W x H x D) (in mm) See dimensional details
Weight (unpacked)	Approx. 0.3 kg

* Model Dependent

5) Standards

EMI / EMC	
Harmonic Current Emissions	IEC 61000-3-2
ESD	IEC 61000-4-2
Radiated Susceptibility	IEC 61000-4-3
Electrical Fast Transients	IEC 61000-4-4
Surges	IEC 61000-4-5
Conducted Susceptibility	IEC 61000-4-6
Voltage Dips & Interruptions (AC)	IEC 61000-4-11
Conducted Emission	CISPR 11
Radiated Emission	CISPR 11
ENVIRONMENTAL	
Cold Heat	IEC 60068-2-1
Dry Heat	IEC 60068-2-2
Vibration	IEC 60068-2-6
Shock	IEC 60068-2-27

6) Setting Parameters

Basic Setting Parameters

Parameter	Display	Setting Range		Step Size	Unit	Default Setting
		Min.	Max.			
Earth Leakage set current *	I E-L	0.03	0.75	0.01	Amp	0.75
		0.03	3.0	0.01	Amp	3.0
		0.300	12.0	0.100	Amp	12.0
Earth Leakage trip time	tE-L	0	30.0	0.1	Sec	0.5

Advance Setting Parameters

Parameter	Display	Setting Range		Step Size	Unit	Default Setting
		Min.	Max.			
Earth Leakage set current *	I E-L	0.03	0.75	0.01	Amp	0.75
		0.03	3.0	0.01	Amp	3.0
		0.300	12.0	0.100	Amp	12.0
Earth Leakage trip time	tE-L	0	30.0	0.1	Sec	0.5
Instantaneous characteristics ^{(1) (2)}	CHAR	dEft	Auto	---	---	dEft
CBCT Open Detection ⁽³⁾	Ctdt	OFF/trIP/ALrī		---	---	OFF
CB Fail Detection Time	tCbF	1	40	1	Sec	OFF
DO Reset	rESt	īAn	Auto	---	---	īAn
No. of Auto Reset ⁽⁴⁾	nrSt	1	10			5
Auto Reset Window Time ⁽⁵⁾	trSt	1	30	---	Min	15

Note: (1) This menu will be active when Earth leakage trip time is selected to '0' sec (Instantaneous trip).

When Instantaneous characteristics is selected "dEft", then Earth Leakage trip time will be $\leq 40\text{msec}$

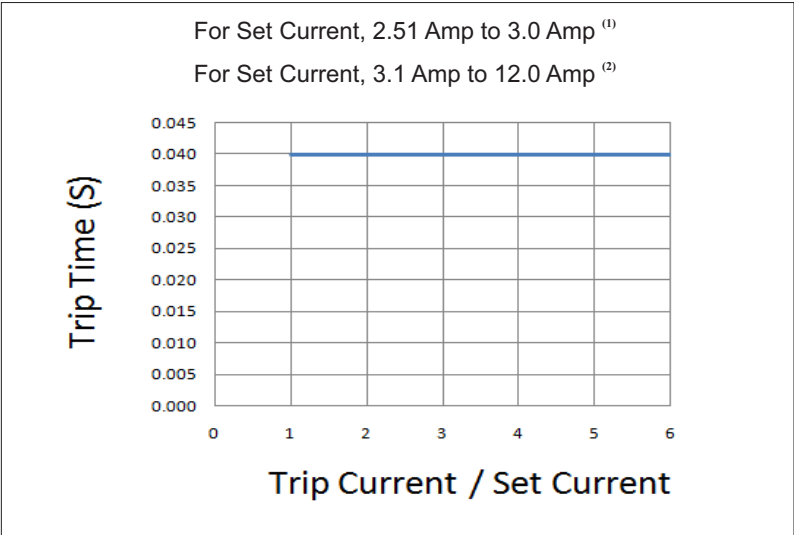
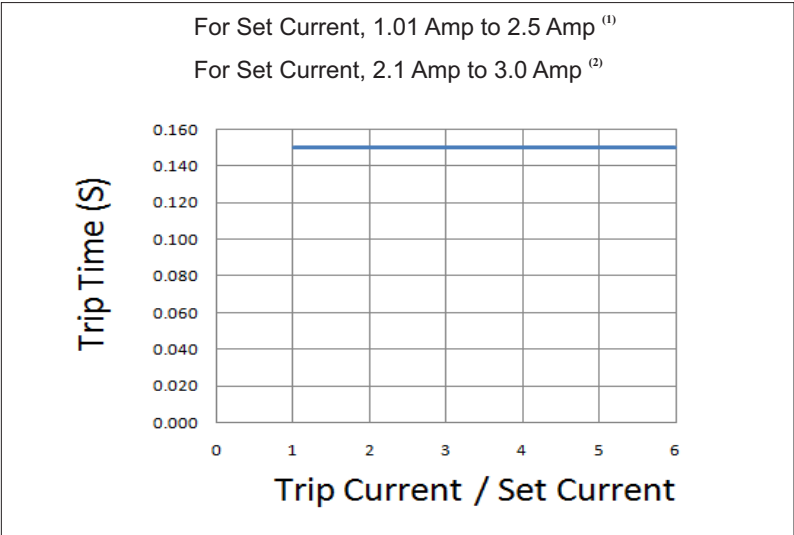
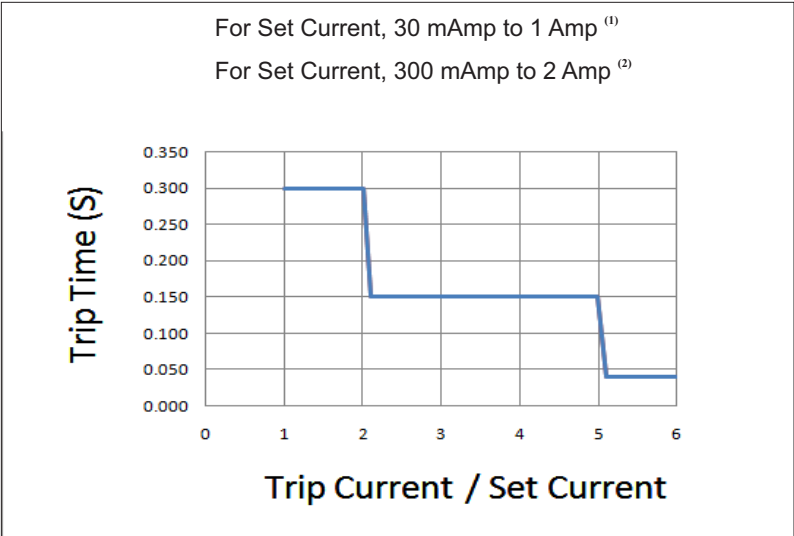
(2) When Instantaneous characteristics is selected "Auto", then Earth Leakage trip time will follow graph as shown on page 6

(3) When CT Open is detected then Relay will trip only when CBCT open detection is selected to "TRIP"

(4) This menu will be active when DO Reset is selected to "Auto".

(5) This menu will be active when DO Reset is selected to "Auto".

7) Trip Time at Trip Characteristics (Auto)

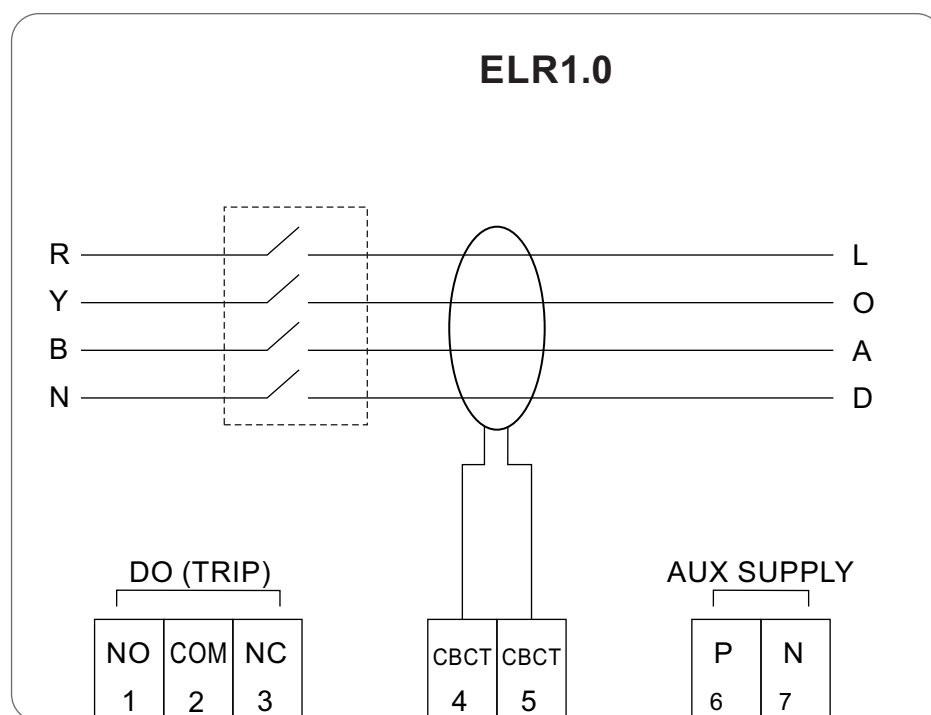
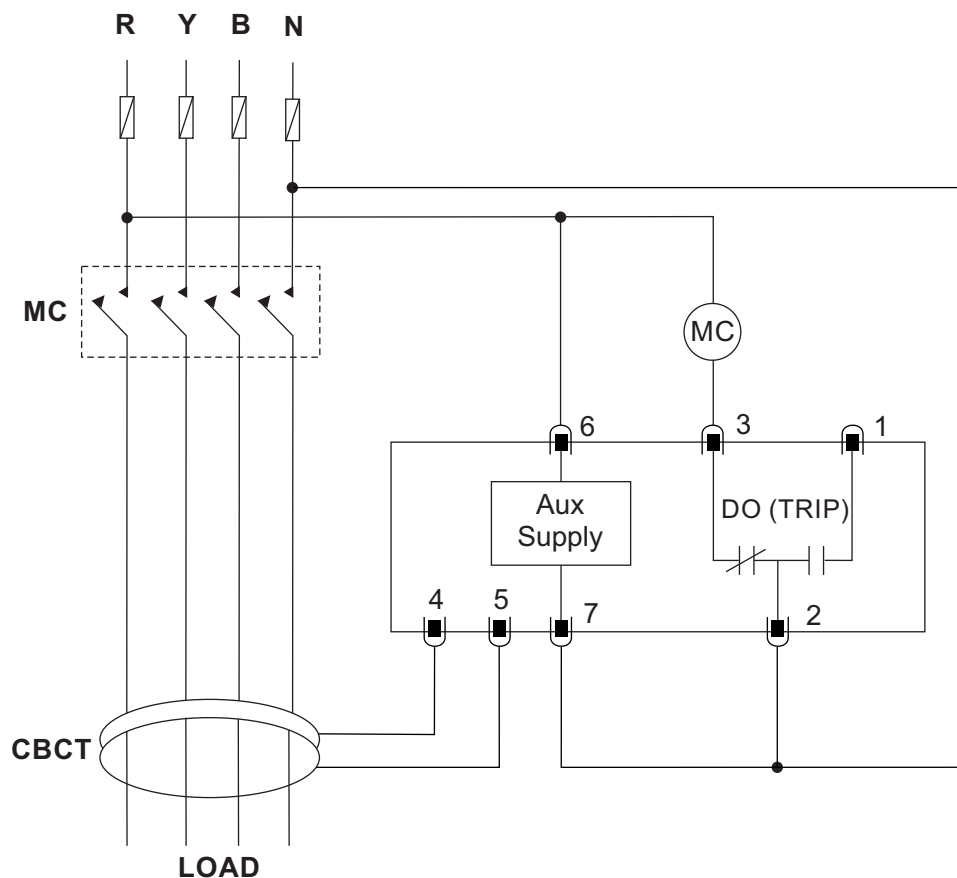


Note : ⁽¹⁾ For 3A model

⁽²⁾ For 12A model

* Model Dependent

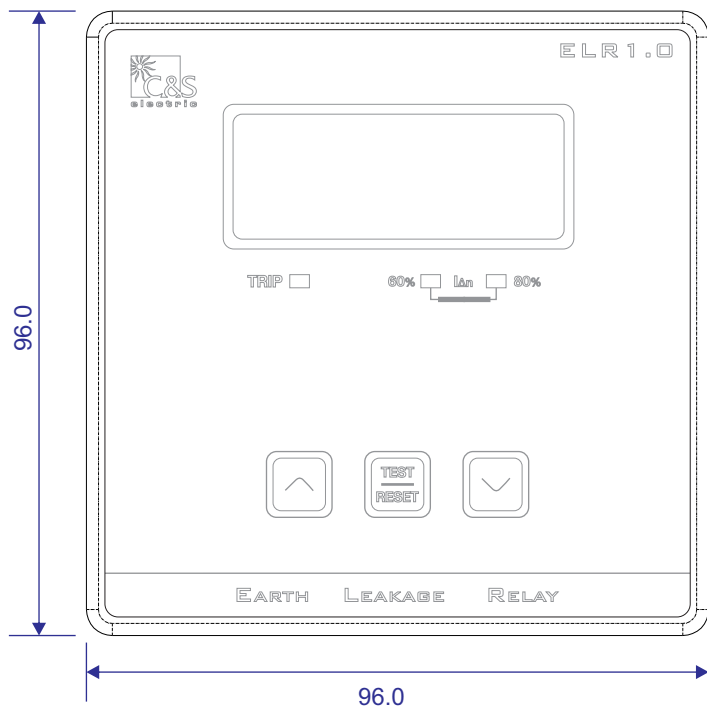
8) Connection Diagram



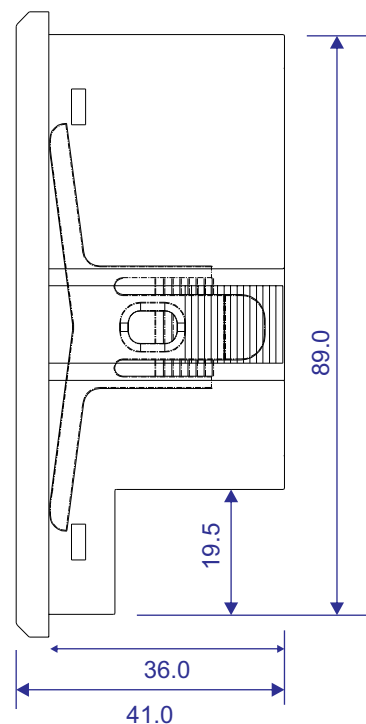
9) Dimensional Details

All the dim. are in mm (Gen. Tol. : ± 1.0 mm) Panel cut out : 90 x 90 mm (W x H x D : 96 x 96 x 41) / Weight ~ 300 gm

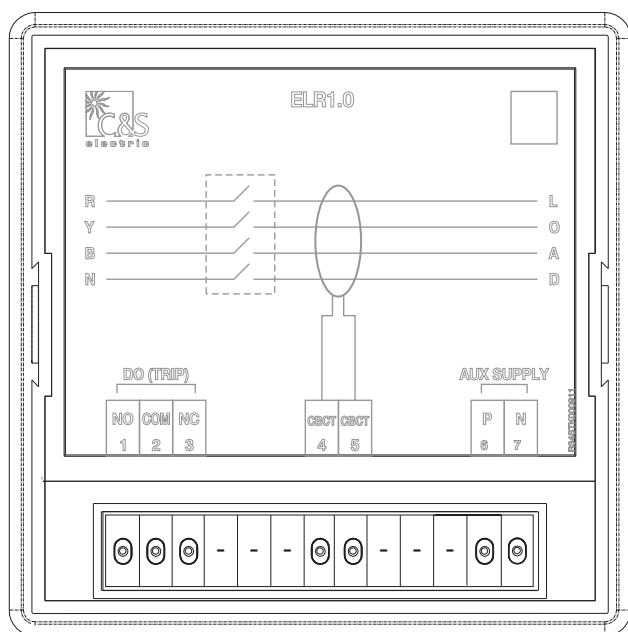
Front View



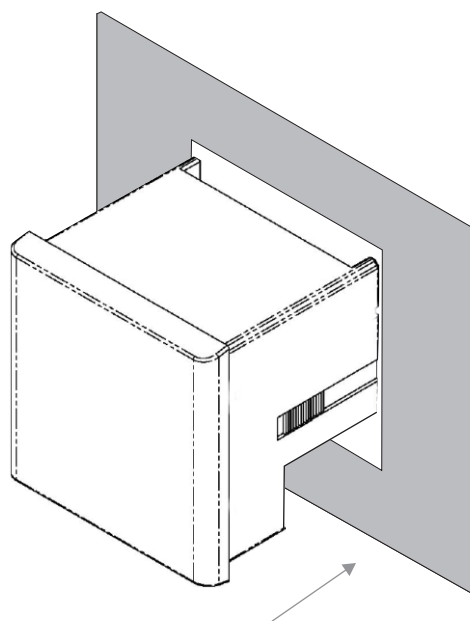
Side View



Back View



Panel Cut out 90 x 90 mm



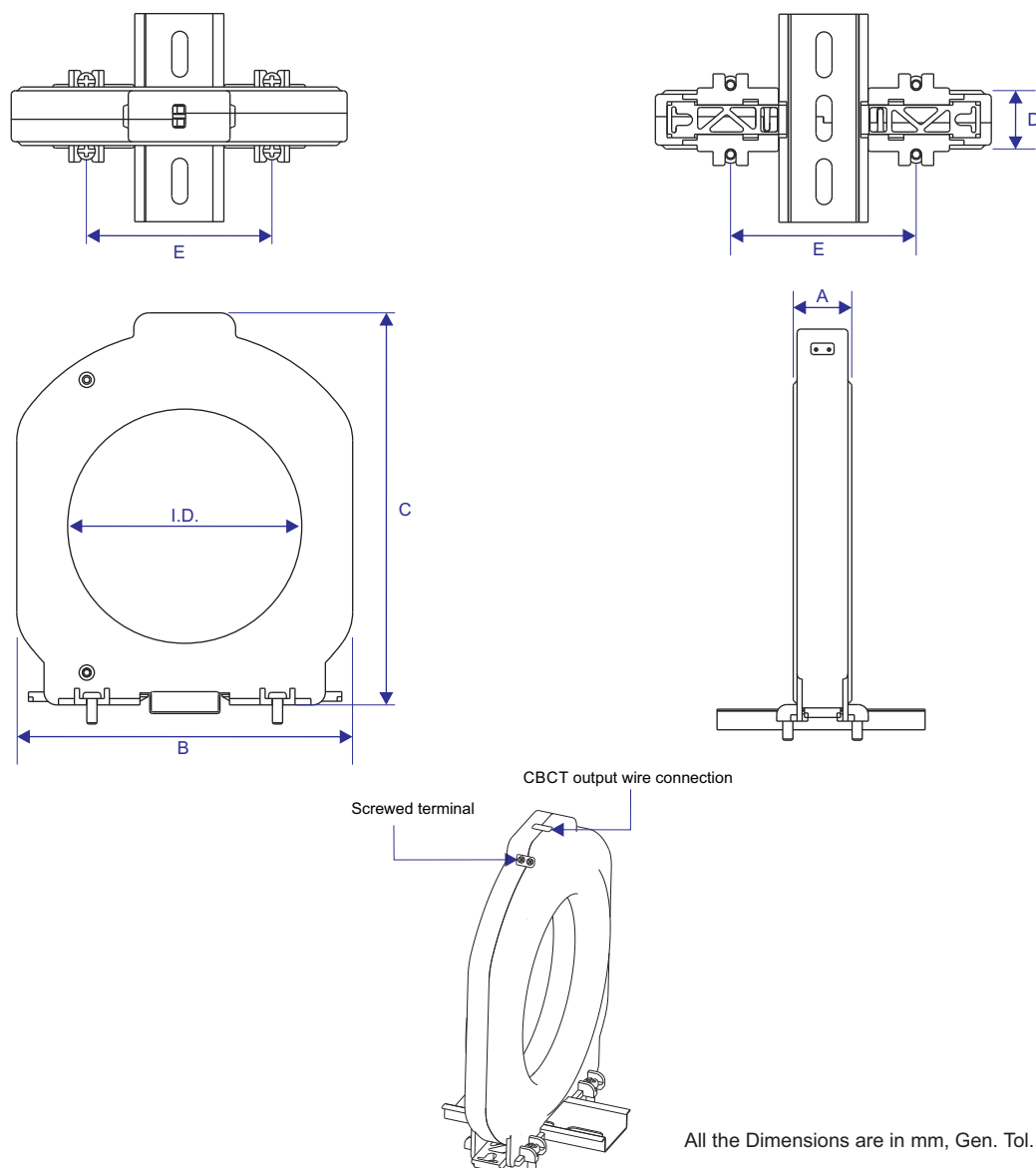
10) CBCT Details

CBCT Specification Details for CBCT 55/70/90/120

CBCT Type	:	Round, In Moulded Casing
Molded Case	:	Poly carbonate
Input Current Range	:	30mA to 3A (Standard) ; (Optional : 300mA to 12A, 30mA to 30A)
Turns Ratio	:	1 / 1500
Output Terminal	:	For Conductor ≤ 2.5 sq. mm
System Voltage	:	720V maximum
System Frequency	:	50 / 60 Hz
Insulation Voltage	:	3kV for 1 minute
Degree of Protection	:	IP-20 for Terminals, IP-40 for Enclosure
Mounting	:	DIN Rail / Panel Mount
Distance between CBCT & Relay	:	The distance between CBCT & ELR needs to be kept as short as possible. Use Screen, shielded cable or twisted pair cable between CBCT and ELR for distance > 1 meter

Note: - Recommended to use twisted pair shielded cable (It should not be run parallel to power cables).

Dimension Details (for CBCT 55/70/90/120)



All the Dimensions are in mm, Gen. Tol. : ± 1.0 mm

CT Type	I.D	A	B	C	D	E
CBCT55	57	20	97	117	22	55
CBCT70	70	20	109	133	22	59
CBCT90	92	20	132	155	22	73
CBCT120	120	20	153	176	22	73

OR OTHER RANGE *

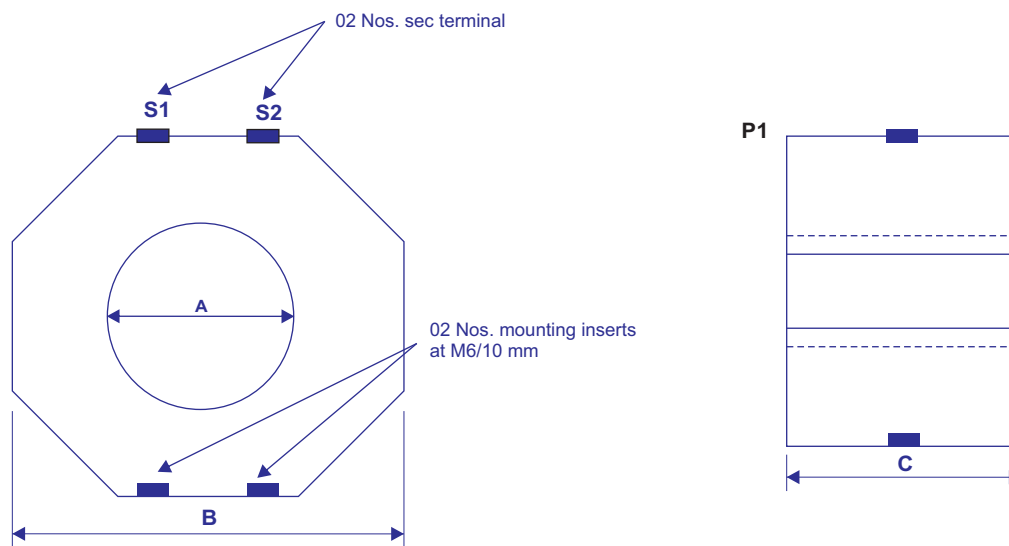
CBCT Details

CBCT Specification Details for CBCT 150 / 200 / 300

CBCT Type	:	Resin Cast Ring Type / Rectangular Type
Moulded Case	:	Unsaturated Polyester Resin
Input Current Range	:	30mA to 3A (Standard); (Optional : 300mA to 12A, 30mA to 30A)
Turns Ratio	:	1 / 1500
Output Terminal	:	Terminal provided for secondary connection
System Voltage	:	720V maximum
System Frequency	:	50 / 60 Hz
Insulation Voltage	:	3kV for 1 minute
Degree of Protection	:	IP-20 for Terminals
Distance between CBCT & Relay	:	The distance between CBCT & ELR needs to be kept as short as possible. Use Screen, shielded cable or twisted pair cable between CBCT and ELR for distance > 1 meter

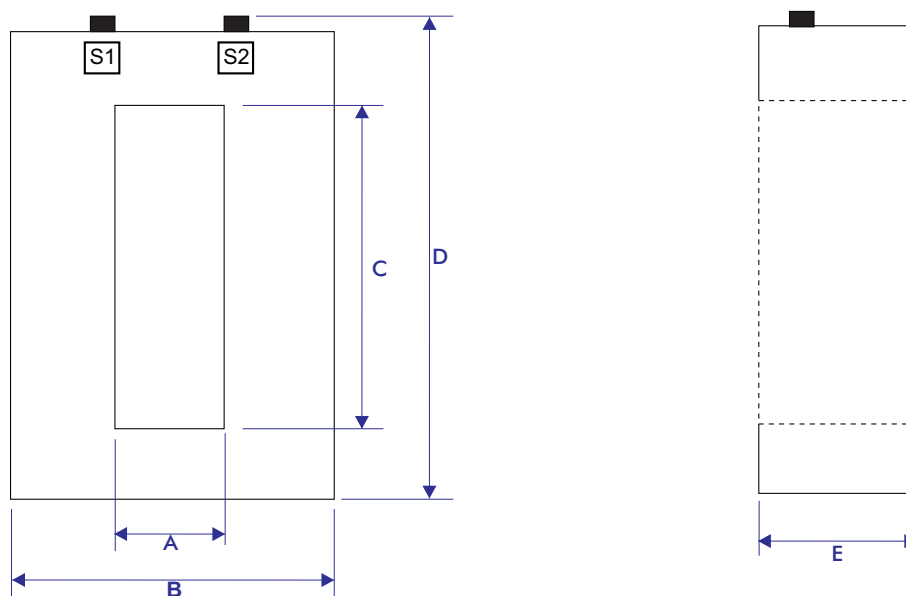
Note: - Recommended to use twisted pair shielded cable (It should not be run parallel to power cables).

Dimension Details (for CBCT 150 / 200)



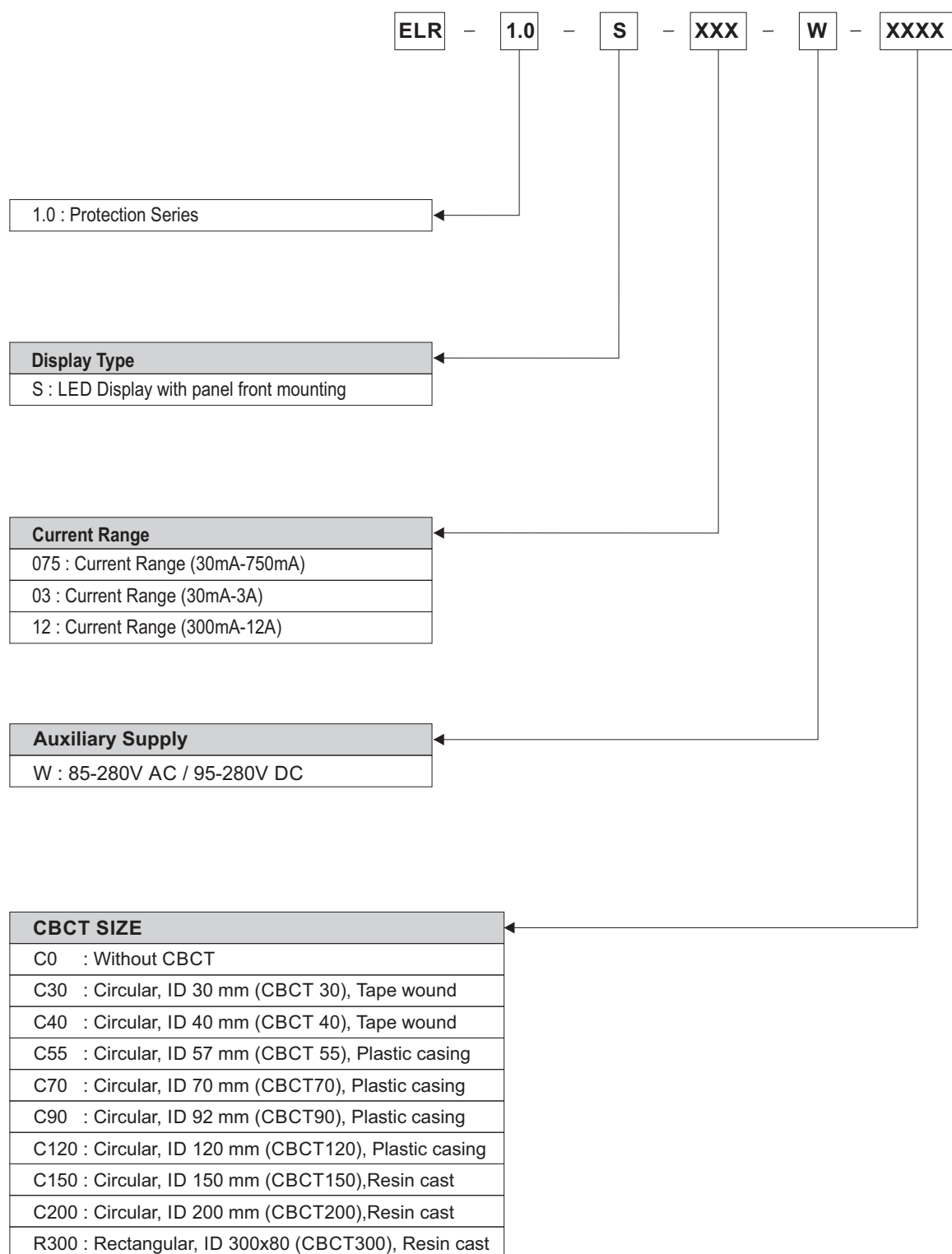
CT Type	A	B	C
CBCT150	150	195	35
CBCT200	200	250	35

Dimension Details (for CBCT 300)



CT Type	A	B	C	D	E
CBCT300	80	130	300	365	30

11) Ordering Information



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Branch	Phone	Fax	E-mail
Ahmedabad:	+91-79-615651 22/23/24	+91-79-61565130	ahmedabad@cselectric.co.in
Bangalore:	+91-80-305703 72/73, 30570347	+91 2558 4839	bangalore@cselectric.co.in
Bhubaneswar:	+91-674-2507265	+91 674 2507265	bhubaneswar@cselectric.co.in
Chennai:	+91-44-33534501,33534521-23	----	chennai@cselectric.co.in
Cochin:	+91-484-3071717	+91 0484 3071716	cochin@cselectric.co.in
Delhi:	+91-11-338490 00/10/11	+91 11 30838826	sales.pmd@cselectric.co.in
Hyderabad:	+91-40-485340 80/82	----	hyderabad@cselectric.co.in
Kolkata:	+91-33-392121 19-21	----	----
Mumbai:	+91-22-241147 27/28	----	cspc.mumbai@cselectric.co.in
Pune:	+91-20-242505 18/19	+91 20 30283244	pune@cselectric.co.in

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