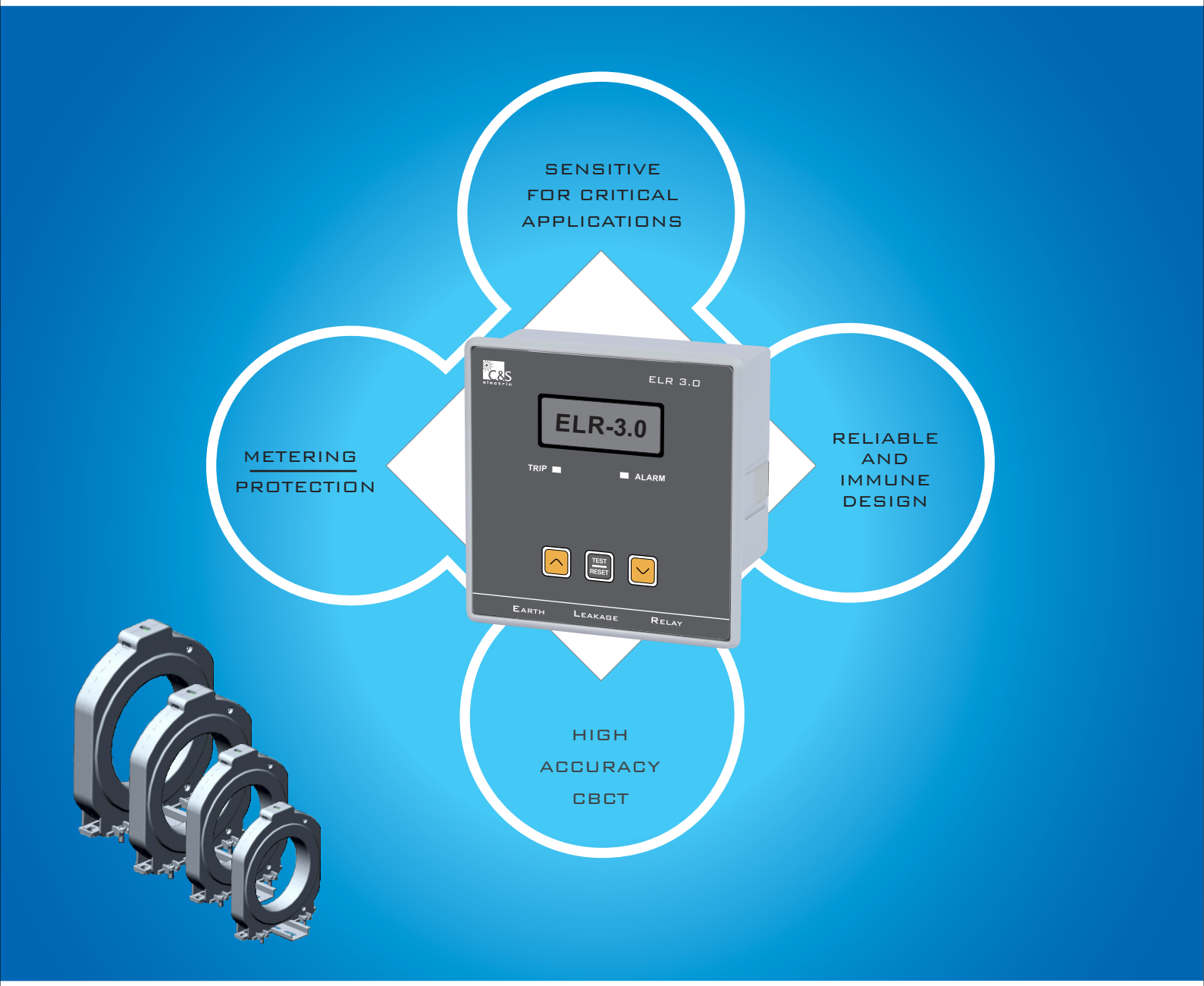
We touch your electricity everyday!

ELR 3.0

Earth Leakage Relay



Catalog

C&S electric

PMD Division

CONTENTS

1) Introduction

ELR3.0 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
- Continuous monitoring of Set leakage current and measured leakage current
- Trip Circuit Failure indication
- 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
- Continuos detection of CBCT open with Enable/Disable option
- Flush Mounting Version with LCD Display
- LED Indication for Earth Leakage Fault
- 1 C/O contact and 1 N/O contact
- Last 10 Fault records with date & time stamp
- External Test / Reset Facility
- MODBUS RS-485 communication
- Wide Auxiliary Supply Range

3) Application

- 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
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 or External
DO Contact Rating	1 C/O contact, 5A / 250V AC or 24V DC, 1 N/O contact 5A / 250V AC or 24V DC
Communication	MODBUS RS-485 communication
Mounting	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
Reference Standard	IEC 60255

*** 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

* Model Dependent

6) Setting Parameters

Basic Setting Parameters

Parameter	Display	Setting Range		Step Size	Unit	Default Setting
		Min.	Max.			
Earth Leakage set current *	IE-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 *	IEL	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	tEL	0	30.0	0.1	Sec	0.5
Trip characteristics (1)	Char	DEFT	AUTO	---	---	DEFT
Trip Circuit Fail Detection Time	tTCFail	1	40	1	Sec	OFF
DO-1 Relay Reset	DO1Rst	MAN	AUTO	---	---	MAN
No. of Auto Reset (2)	NoOfARst	1	10	—	—	5
Auto Reset Window Time (3)	tAutoRst	1	30	---	Min	15
DO-2 Relay Type (4)	DO2Rely	ALRM / TRIP / OFF		---	---	OFF
DO-2 Relay Setting (5)	DO2Sett	60	95	5	% IEL	90
DO-2 Relay Reset (6)	DO2Rst	MAN	AUTO	---	---	AUTO
DI Function (7)	DIFunc	ENBL	DSBL	---	---	DSBL

Note: (1) This menu will be active when Earth Leakage Trip Time is selected to '0' sec (instantaneous trip).
When Trip characteristics is selected to "DEFT", then Earth leakage trip time will be ≤ 40msec
When Trip characteristics is selected to "AUTO", then Earth leakage trip time will follow the graph as shown on page 6

(2) & (3) This menu will be active when DO-1 Relay Reset is selected to AUTO

(4) When DO-2 relay type is selected to TRIP then DO-2 relay will follow DO-1 relay functionality

(5) & (6) This menu will be active when DO-2 Relay Type is selected to ALRM

(7) Digital Input (DI) will be active when DI Function is selected to ENBL

RTC Setting Parameter

Date and Time can be set by editing HOUR, MIN, SEC, DATE, MONTH & YEAR parameters.

Communication Setting Parameter

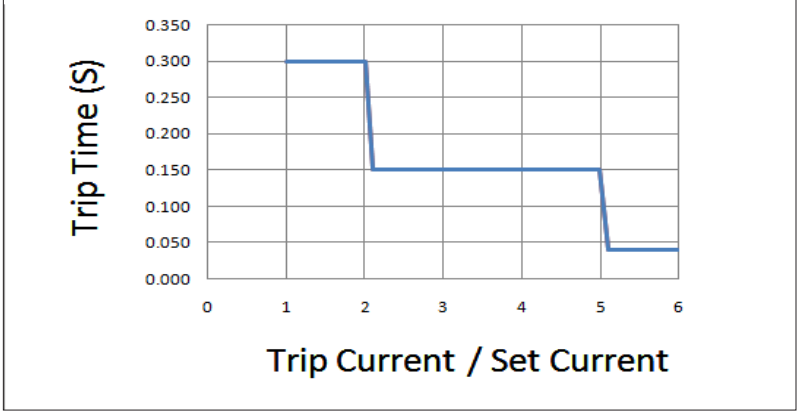
Parameter	Display	Setting Range		Step Size	Unit	Default Setting
		Min.	Max.			
Slave Address	SlaveAdd	1	247	1	-	1
Baud Rate	Baudrt	9600 or 19200 or 38400		-	bps	19200
Parity	Parity	NONE or ODD or EVEN		-	-	NONE

*** Model Dependent**

7) Trip Time at Trip Characteristics (Auto)

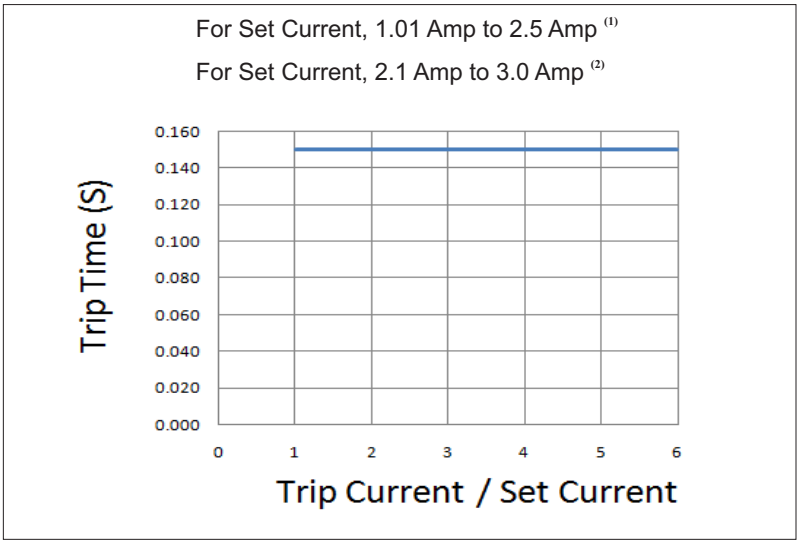
For Set Current, 30 mAmp to 1 Amp [1]

For Set Current, 300 mAmp to 2 Amp [2]



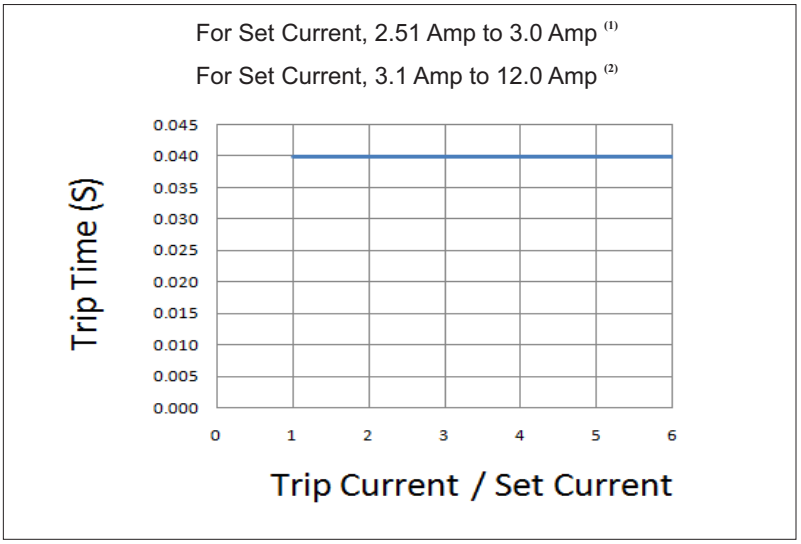
For Set Current, 1.01 Amp to 2.5 Amp [1]

For Set Current, 2.1 Amp to 3.0 Amp [2]



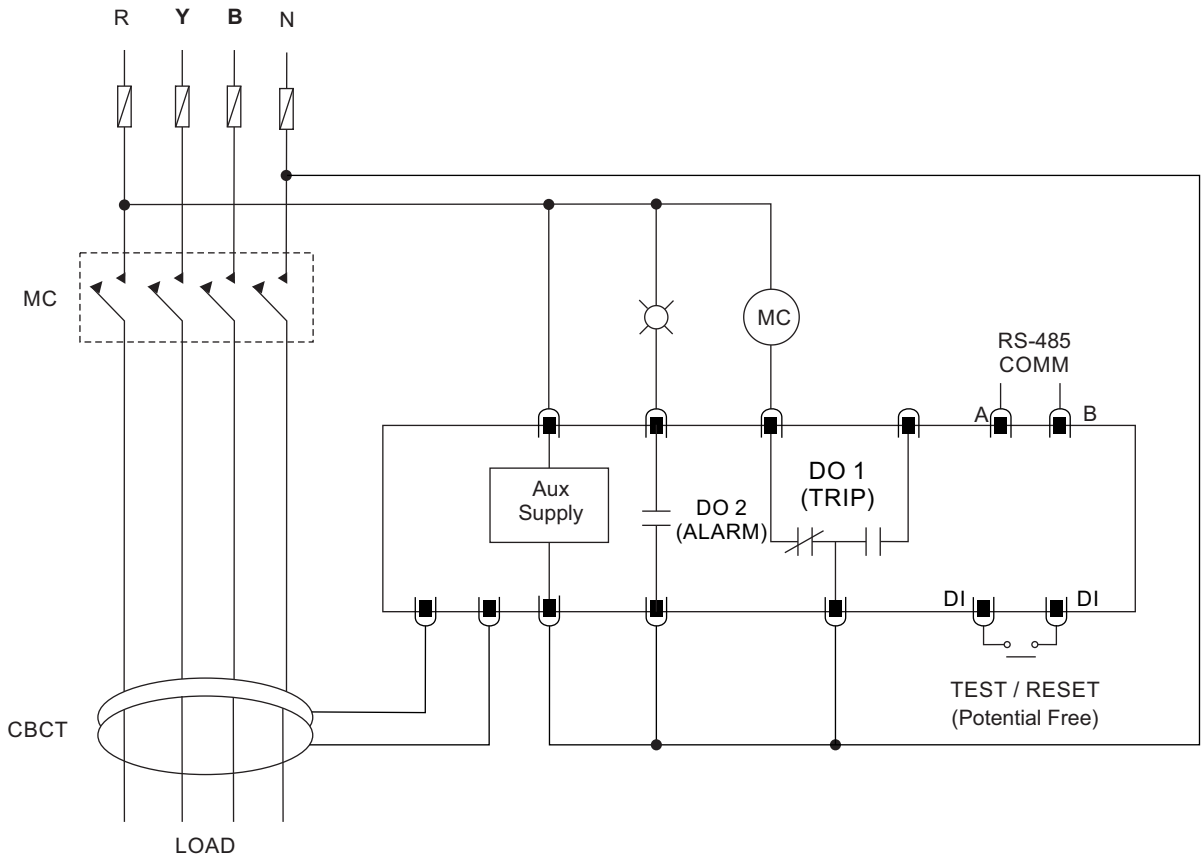
For Set Current, 2.51 Amp to 3.0 Amp [1]

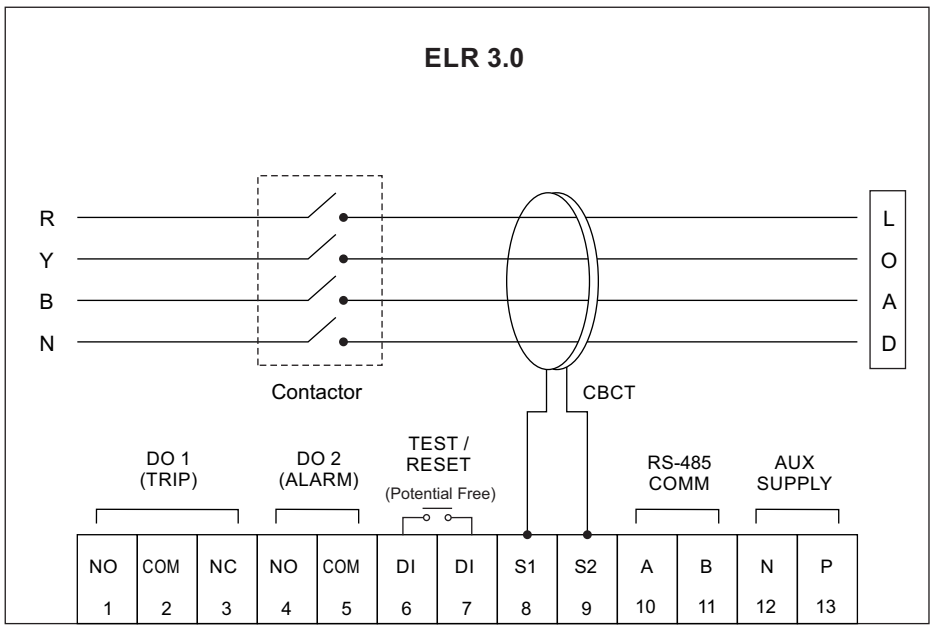
For Set Current, 3.1 Amp to 12.0 Amp [2]



Note : [1] For 3A model **[2] For 12A model** *** Model Dependent**

8) Connection Diagram



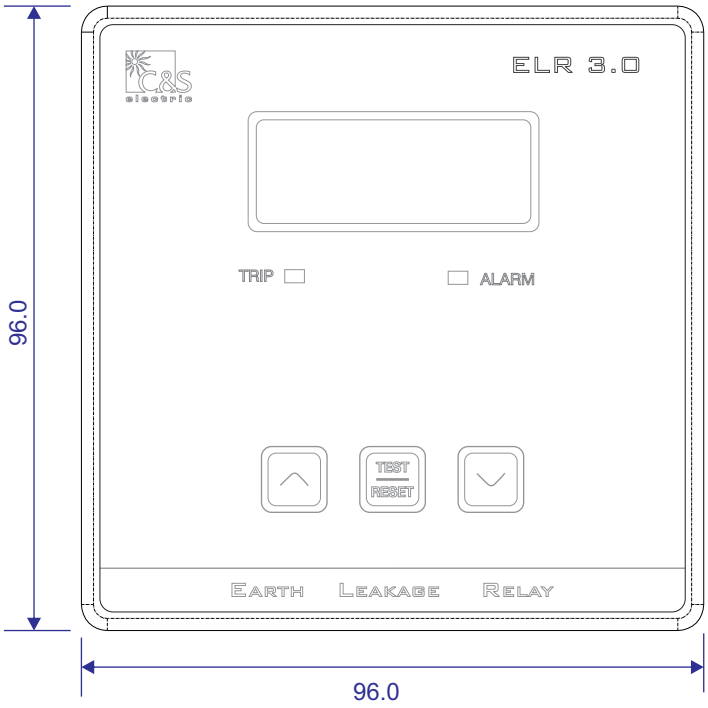


9) Dimension Details

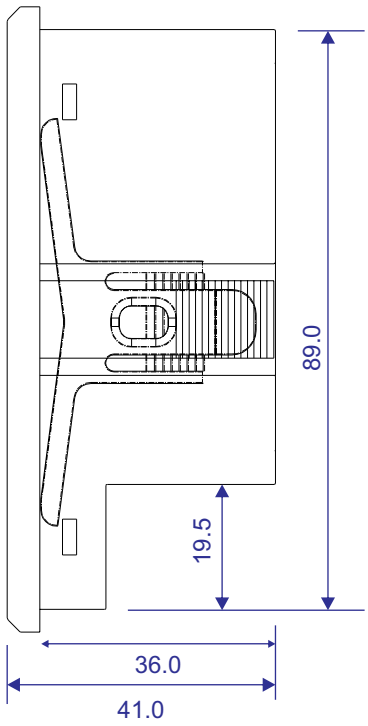
All the dim. are in mm (Gen. Tol. : ± 1.0 mm)

(W x H x D : 96 x 96 x 41) / Weight ~ 300 gm

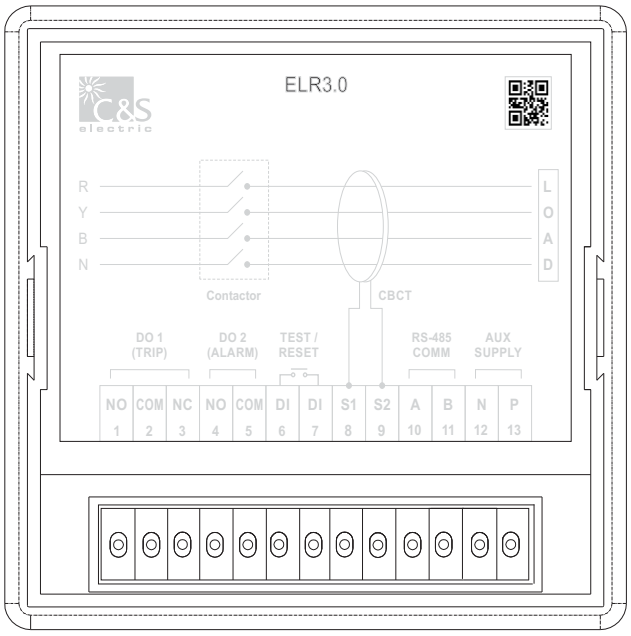
Front View



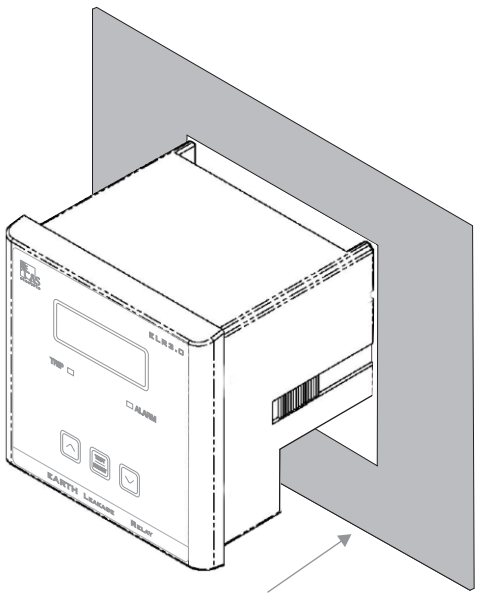
Side View



Back View



Panel Cut out 90 x 90 mm



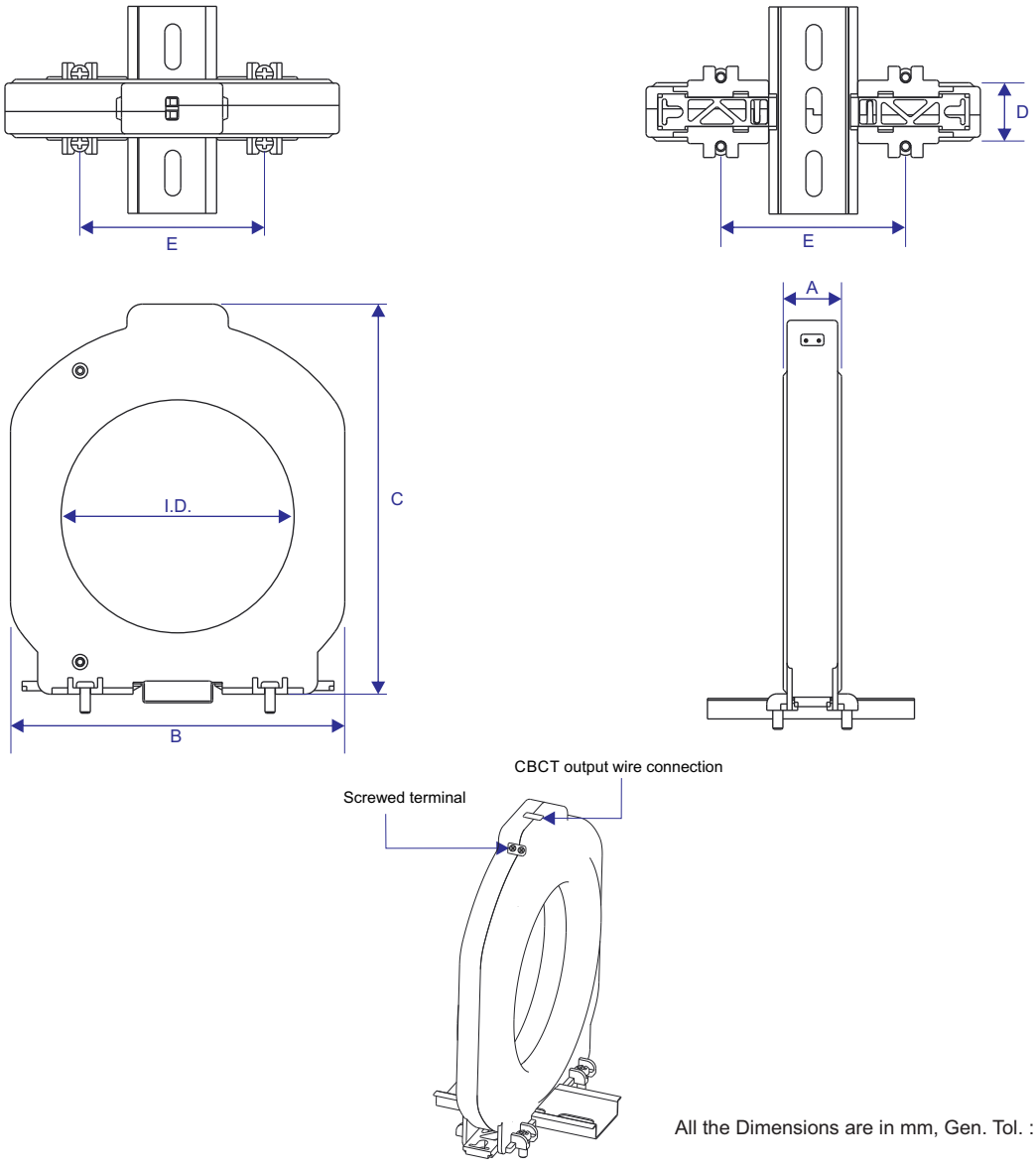
10) CBCT Details

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 *

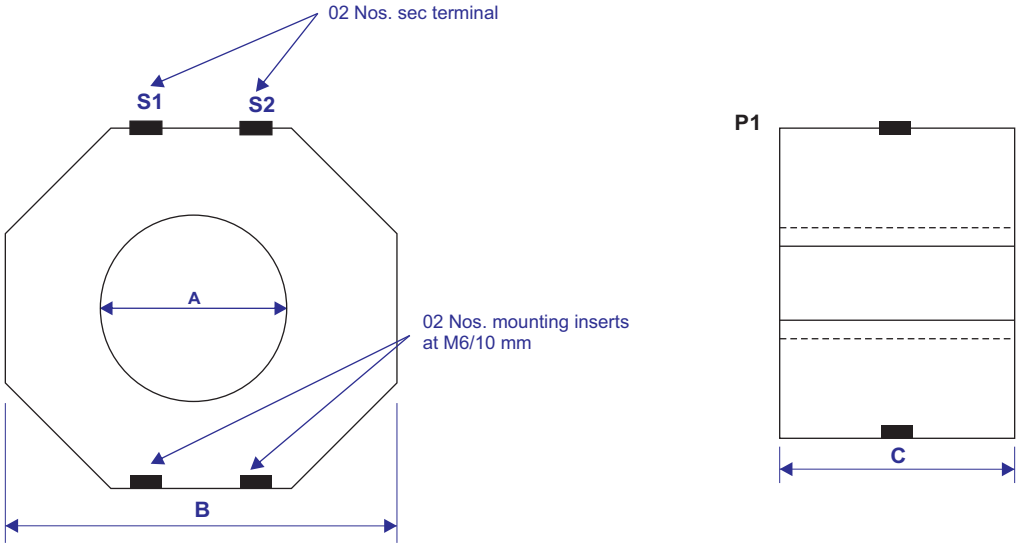
CBCT Details

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

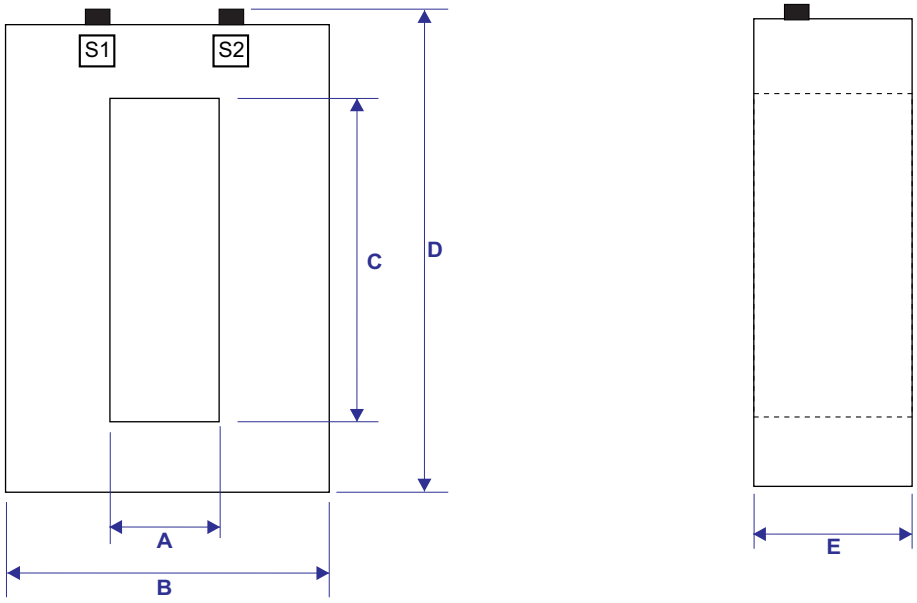
Note: - Recommended to use twisted pair shielded cable (It should not be run parallel to power cables).

Dimension Details (for CBCT 150 / 200)



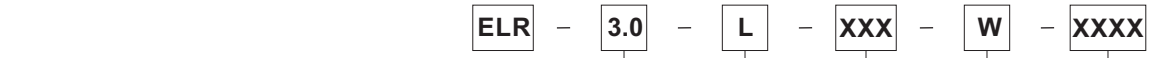
CT Type	A	B	C
CBCT150	150	195	35
CBCT200	200	250	35

Dimension Details (for CBCT 300)



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

11) Ordering Information



3.0 : Protection Series

Display Type
L : LCD Display

Current Range
075 : Current Range (30mA-750mA)
03 : Current Range (30mA-3A)
12 : Current Range (300mA-12A)

Auxiliary Supply
W : 85-280V AC / 95-280V DC

CBCT SIZE
C0 : Without CBCT
C30 : Circular, ID 30 mm (CBCT 30), Tape wound
C40 : Circular, ID 40 mm (CBCT 40), Tape wound
C55 : Circular, ID 57 mm (CBCT 55), Plastic casing
C70 : Circular, ID 70 mm (CBCT70), Plastic casing
C90 : Circular, ID 92 mm (CBCT90), Plastic casing
C120 : Circular, ID 120 mm (CBCT120), Plastic casing
C150 : Circular, ID 150 mm (CBCT150), Resin cast
C200 : Circular, ID 200 mm (CBCT200), Resin cast
R300 : Rectangular, ID 300 x 80 (CBCT300), Resin cast

Revision History

S.No.	Rev.No.	Details	Date
01	01	CBCT details included	27.07.20
02	02	One More Option of Current Range included in Order Information, Change in setting parameters data etc	16.09.20
02	02	Revised Graph of Trip Time at Trip characteristics on page 6	29.10.20

NOTE

The content in this document are not binding and is for general information.
C&S reserves the right to change the design, content or specification contained in this document without prior notice.

For further information, please contact:

C&S Electric Ltd.
(Protection & Measurement Devices)

C-60, Wing-A, Phase-II, Noida-201 305,
Dist: Gautam Budh Nagar (U.P) INDIA
Phone : +91-120-38748 00 / 01

Technical Question or After-sales Service

Customer Center Quick Response Service, Excellent Technical Support

1800 572 2012

Branch office

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	delhi@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

Issue Date: 12.03.20, Rev. No: 03, Rev. Date: 29.10.20