Earth Fault Relay



Operating Instruction

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DIN 35mm

Salient features

- **Earth fault current monitoring in 1Ø and 3Ø systems**
- **True RMS value measurement (AC)**
- **User selectable Trip time delay, Recovery time delay, Power ON delay**
- **Adjustable hysteresis**
- **Alarm relays with NO & NC operation selectable**
- **Test and Reset via Front / Remote**

Ordering information

Product code	Supply voltage	Certification
900EFR-BL-U-CE	85 to 270V AC/DC	CE

All safety related modifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument.
If the equipment is not used in a manner specified by the manufacturer it might impair the protection provided by the equipment. If there is physical damage to the unit then do not use it.
Read complete instructions prior to installation and operation of the unit.

Warning guidelines

1. To prevent the risk of electric shock power supply to the equipment must be kept OFF while doing the wiring arrangement
2. Wiring shall be done strictly according to the terminal layout with shortest connections. Confirm that all connections are correct

Caution

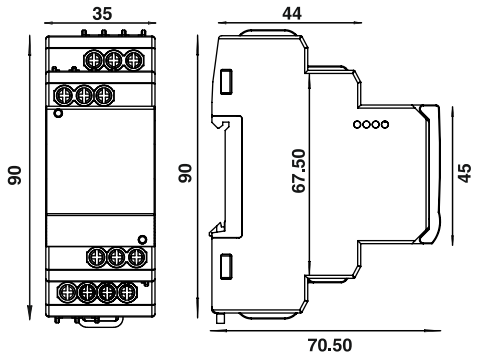
- To ensure the safe operation of unit, check the wiring and connections.

Note for connection

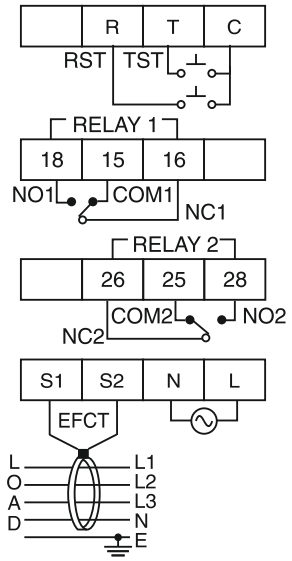
- For single phase and three phase applications
- For single phase system pass L & N through EFCT
- For 3P4W system pass L1, L2, L3 and N through EFCT
- For 3P3W system pass L1, L2, L3 through EFCT
- The earth must not pass through the EFCT
- The distance between relay & EFCT should be kept as short as possible
- Use screen, shielded cable or twisted pair cable between the unit and EFCT for long distance (greater than 1m)

Technical specifications	
Display	3 Digits, Liquid crystal display with backlight
Electrical connection	1Ø-2 wire, 3Ø-3 wire, 3Ø-4 wire
Auxiliary supply	85 - 270V AC/DC
Frequency range	50/60 Hz
VA rating	4VA max
Trip settings	10% to 80% of selected MCCB frame rating
Time setting	Response time: < 100ms Trip time delay: 0 - 99.9sec Recovery time: 0 - 99.9sec Power ON delay: 0.5 - 99.9sec
Hysteresis	1 - 10% of fault current setting
Resolution	0.1A when fault current is less than or equal to 99.9A 1A when fault current is greater than 100A
Accuracy	Current: ±5% of setting ± 2 digits Time: ±5% of setting ±100ms
Output specifications	Relay1: 1C/O (SPDT) Relay2: 1C/O (SPDT)
Relay rating	5A @250V AC (NO) 3A @250V AC (NC)
LED indication	LED1 (red): Alarm (continuously ON after trip) LED2 (red): Pre - Alarm (continuously ON during pre alarm condition)
Environmental specifications	- Indoor use - Altitude of up to 2000 meters - Pollution degree II
Temperature	Operating: 0 °C to 50 °C Storage: -20 °C to 70 °C
Humidity	Up to 95% RH, non-condensing
Mechanical specifications	No. of push buttons: 3 Size: 35mm width Mounting: 35mm din rail mount Wire size (max): 4 sq.mm Screw tightening torque: 0.5 N-M
Weight	150 gm

Dimensions (all dimensions in mm)



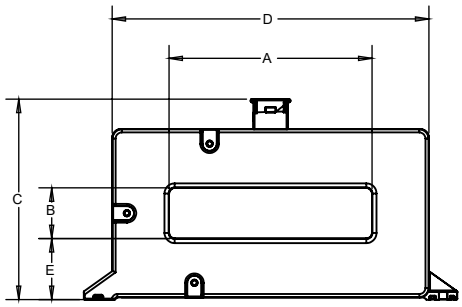
Terminal connections



LED indication chart		
Various conditions	**'R1' LED**	**'R2' LED**
No fault (healthy)	OFF	OFF
Pre-Alarm	OFF	ON
Trip	ON	ON

Core balanced current transformer

EFCT

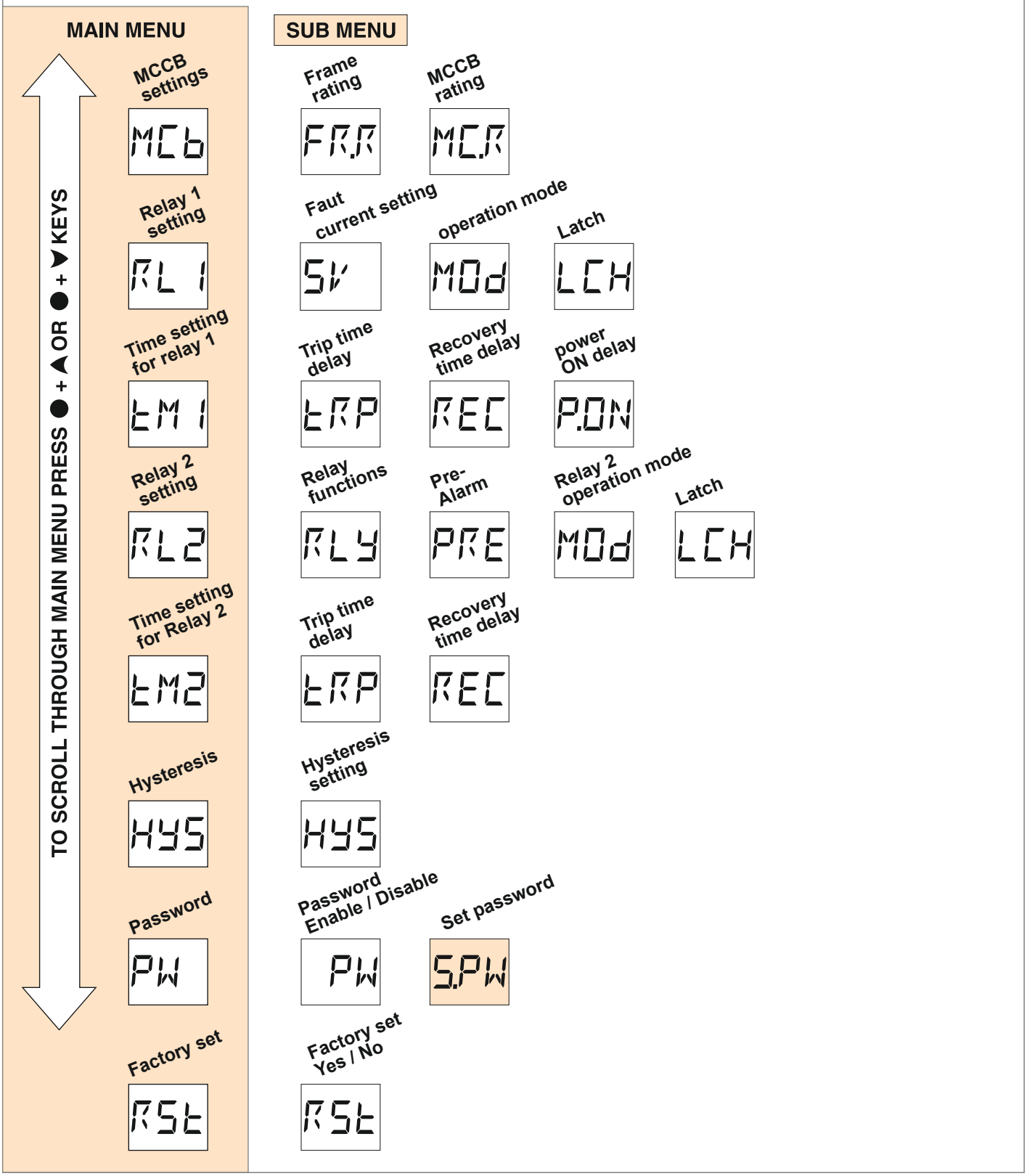


EFCT TYPE	Dimensions (mm)				
	A	B	C	D	E
EFCT 100X25	100	25	100	156	30
EFCT 140X35	140	35	114	201	32
EFCT 180X35	180	35	109	236	30
EFCT 220X50	220	50	128	276	32

Ordering information

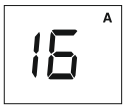
Product code	Dimenssion in mm	Current transformer ratio
EFCT 100/25 160/1A VAL CL1	100 x 25	160/1A
EFCT 140/35 160/1A VAL CL1	140 x 35	160/1A
EFCT 140/35 250/1A VAL CL1	140 x 35	250/1A
EFCT 180/35 250/1A VAL CL1	180 x 35	250/1A
EFCT 180/35 630/1A VAL CL1	180 x 35	630/1A
EFCT 220/50 630/1A VAL CL1	220 x 50	630/1A

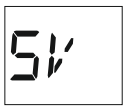
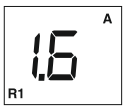
Press ▲ + ▼ for 3sec. to enter or exit configuration menu.

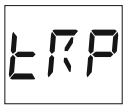
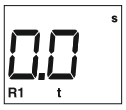


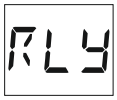
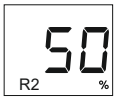
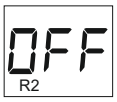
Note: Appearance of shaded menus dependant on selection of other parameters

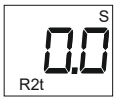
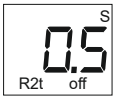
SUB MENU

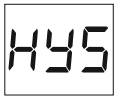
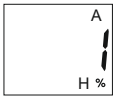
Relay 1 (Rl1) settings		Press ▲ to enter sub menu from main menu		
Press ▲ or ▼ to scroll through sub menu		Press ● + ▲ or ● + ▼ to change parameter value & then press ▲ to set value		
Display (for 1sec)	**Description**	**Default**	**Range**	**Condition**
	Frame rating		160, 250, 630	
	MCCB rating		For different Frame rating the MCCB ratings are 160: 16, 20, 25, 32, 40, 50, 63, 80, 100, 125, 160 250: 40, 50, 63, 80, 100, 125, 160, 200, 250 630: 250, 315, 400, 500, 630	For selected frame rating, the default value will be minimum MCCB rating of that particular frame.

Relay 1 Settings (RL1)		Press ▲ to enter sub menu from main menu		
Press ▲ or ▼ to scroll through sub menu		Press ● + ▲ or ● + ▼ to change parameter value		
Display (for 1sec)	**Description**	**Default**	**Range**	**Condition**
	Set trip value for fault current		10% to 80% of selected MCCB rating steps of 0.1A from 0 to 99.9A and steps of 1A beyond 100A	Eg. for MCCB rating of 160A set value will be from 16.0A to 128A
	Relay operation mode		ON/OFF	ON : NC(during trip) OFF: NO(during trip)
	Latch		ON/OFF	If latch is ON, user has to reset the unit manually when the fault is removed

Time Setting for Relay 1 (TM1)		Press ▲ to enter sub menu from main menu		
Press ▲ or ▼ to scroll through sub menu		Press ● + ▲ or ● + ▼ to change parameter value		
Display (for 1sec)	**Description**	**Default**	**Range**	**Condition**
	Trip time delay		0.0 – 99.9 sec	
	Recovery time delay		0.0 – 99.9 sec	
	Power ON delay		0.0 – 99.9 sec	Applicable for Relay 1 and Relay 2

Relay 2 (RL2)				Press ▲ to enter sub menu from main menu
Press ▲ or ▼ to scroll through sub menu		Press ● + ▲ or ● + ▼ to change parameter value & then press ▲ to set value		
Display (for 1sec)	**Description**	**Default**	**Range**	**Condition**
	Relay 2 functions		RL1 / PRE	If RL1 is selected, all the settings done for RL1 & TM1 will be automatically set for RL2 and no other parameter of RL2 & TM2 will be prompted.
	Pre-Alarm		50% – 100%	Will prompt only if PRE is selected for Relay 2
	Relay operation mode		ON / OFF	ON : NC (During trip) OFF: NO (During trip)
	Latch		ON / OFF	If Latch is ON, user has to reset the unit manually when fault is removed

Time setting for relay 2 (TM2)				Press ▲ to enter sub menu from main menu
Press ▲ or ▼ to scroll through sub menu		Press ● + ▲ or ● + ▼ to change parameter value & then press ▲ to set value		
Display (for 1sec)	**Description**	**Default**	**Range**	**Condition**
	Trip time delay		0.0 - 99.9 Sec.	
	Recovery time delay		0.0 - 99.9 Sec.	

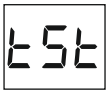
Hysteresis (HYS)				Press ▲ to enter sub menu from main menu
Press ▲ or ▼ to scroll through sub menu		Press ● + ▲ or ● + ▼ to change parameter value & then press ▲ to set value		
Display (for 1sec)	**Description**	**Default**	**Range**	**Condition**
	Hysteresis		1% to 10% of trip current setting (SV)	Fault condition is removed when fault is H% less than the set value

Password (PW)		Press ▲ to enter sub menu from main menu		
Press ▲ or ▼ to scroll through sub menu		Press ● + ▲ or ● + ▼ to change parameter value & then press ▲ to set value		
Display (for 1sec)	**Description**	**Default**	**Range**	**Condition**
PW	Password	dI S	ENB / DIS	Enable / Disable password protection option
S.PW	Set password	0	0-999	Will be prompted only when password option is enabled
PW	Main menu password		**NOTE:** PW option will be asked when the user enter the config. menu if PW option is enabled in the config menu and the user has to enter the password which he has set in the S.PW (set password) option.	

Factory set (RST)		Press ▲ to enter sub menu from main menu		
Press ▲ or ▼ to scroll through sub menu		Press ● + ▲ or ● + ▼ to change parameter value & then press ▲ to set value		
Display (for 1sec)	**Description**	**Default**	**Range**	**Condition**
RSt	Reset (factory set)	NO	YES / NO	

TEST & RESET FUNCTION

● LED ON ○ LED OFF

Key	Description	Display (for 1sec.)	LED's	Condition
For test	Press TST key for >2 Sec.		○ R1 ○ R2	Test is in process
Test passed			● R1 ● R2	If test key is passed, OK will be displayed till reset button is pressed.
Test failed			○ R1 ○ R2	----
RST	Press RST key for >2 sec.	Actual value	○ R1 ○ R2	----

TRIP Indication	Trip Indication on press of ▲ key: Trip value will be displayed till the key is pressed
RESET	Press ● key for 3sec. to reset manually

Master password: 753

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