# Digital EFR, Panel Mount




Operating Instruction

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96 x 96mm

## Salient features

- Earth fault current monitoring in 1 systems
- True RMS value measurement (AC)
- User selectable power ON delay, Trip delay and Recovery delay
- 6 selectable IDMT characteristic curves
- Adjustable time multiplier
- Low set /High set earth fault current value selection with Definite, Indefinite & Instant time setting
- Adjustable Hysteresis
- Feasible to work with normal CT
- Pre-alarm indication selectable
- Test and Reset via Front / Remote
- Trip relay with NO or NC operation selectable

## Ordering information

| Product code | Supply voltage | Certification |
|---|---|---|
| EFR-341-2-CE | 90-270V 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

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

| Technical specifications | |
|---|---|
| HMI | 4 digits, 7 segment display |
| Electrical connection | 1Ø-2 wire, 3Ø-4 wire, 3Ø-3 wire |
| Auxiliary supply | 90-270V AC/DC |
| Frequency range | 50/60Hz |
| VA rating | <4VA max |
| CT Primary range | 1A to 999A |
| CT Secondary range | 1A & 5A selectable |
| Time setting | Power ON delay: 0.5 - 99.9sec<br>Trip time delay: 0.5 - 999.9sec<br>Recovery time: 0.0 - 99.9sec |
| Hysteresis | 5 5 to 40% of set value {For eg., If set HYS is 10% & SV is 100mA, will allow untrip at 90mA} |
| Resolution | Depends on trip setting as per range resolution will be,<br>< <100mA = i.e. 0.001A<br>< <10A= 0.01<br>< <10A= 1A |
| Accuracy | Current: ±5% of set value<br>Time: ±5% of setting ±100ms |
| Output specifications | Relay: 2 X 2C/O (SPDT) |
| Relay rating | NO (5A, 250V AC / 28V DC)<br>NC (5A, 250V AC / 28V DC) |
| LED indication | LED1 (red): R1 trip indication)<br>LED2 (red) R2 (for Alarm / Trip indication)<br>LED3 (red): 10x (for high trip indication) |
| Reset conditions | - Power ON reset<br>- Terminal reset (Y1 & Y2 short)<br>- Press RST key for 3 sec.<br>- Auto reset (as per setting) |
| Test / Reset function | Test / Reset function is used to check proper functioning of product. It includes<br>- Relay contact switching<br>- LED check |
| Test mode | - Press TST key for 3 sec.<br>- Test through terminal (Y1 & Y2 short) |
| Reset mode | - Press RST key for 3 sec.<br>- Reset through terminal (Y1 & Y2 short) |
| Environmental specifications | - Indoor use<br>- Altitude of up to 2000 meters<br>- Pollution degree II |
| temperature | Operating: 0 to 60 °C<br>Storage: -20 to 70 °C |
| Humidity | Up to 95% RH, non-condensing |

| | |
|---|---|
| Mechanical specifications | No. of push buttons: 3<br>Size: 96 x 96 mm<br>Mounting: Panel mount<br>Wire size (max): 4 sq.mm<br>Screw tightening torque: 0.5 N-M |
| Weight | 290 gm approx |
| CE certification | IEC60947-2 (for EMI-EMC)<br>IEC 60255-151 (for IDMT) |

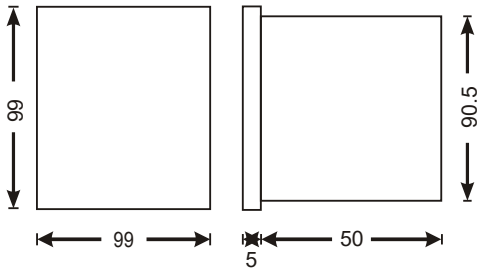
## LED indication chart

| Various conditions | 'R1' LED | 'R2' LED | '10X' LED |
|---|---|---|---|
| Healthy | OFF | OFF | OFF |
| Alarm | OFF | Blink | OFF |
| Trip | ON | Blink*/ON | OFF |
| 10x current | ON | Blink*/ON | ON |

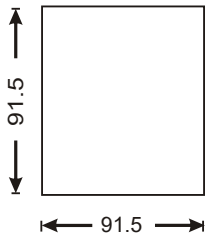
*= Blink only when RLY2 used as Pre Alarm

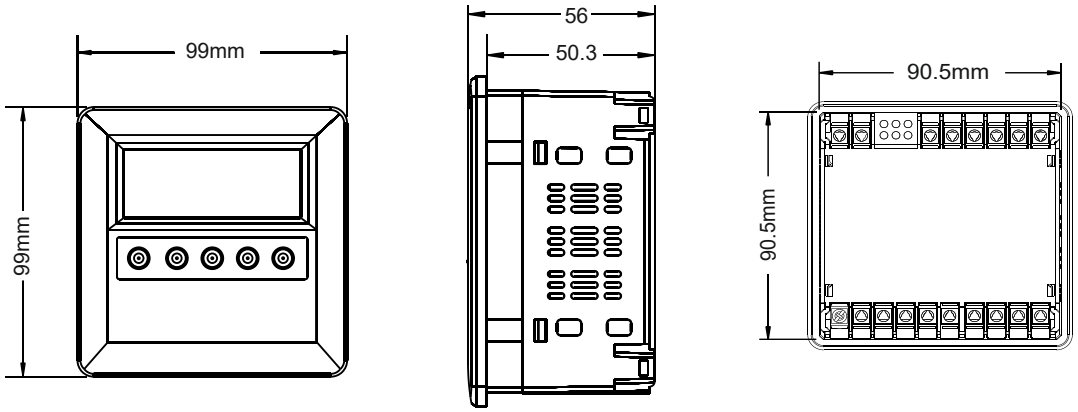
## Dimensions (all dimensions in mm)

**Outline**

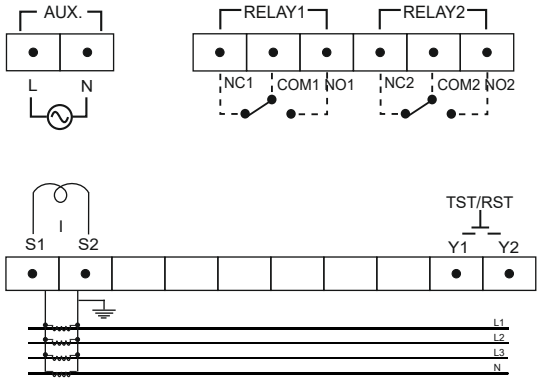



**Panel cutout**




## Terminal connections



**Press ▲ + ▼ for 5sec. to enter or exit configuration menu.**

| | | | | | |
|---|---|---|---|---|---|
| | | | Press ● to save value | | |
| Press ▲ or ▼ to scroll through menu | | Press ● + ▲ or ● + ▼ to change parameter value | | | |
| **Display (for 1sec)** | **Description** | **Default value** | **Range / Type** | **Step size** | **Condition** |
| P.ON.d | Power ON delay | 5.0 | 0.5 to 99.9sec | 0.1sec | |
| Ct-P | CT Primary | 1 | 1A to 999A | 1A | |
| Ct-S | CT Secondary | 1 | 1A or 5A | NA | |
| IdMt | Curve selection | EI.2 | 1.NI.1: Normal inverse 3/10<br>2.NI.2: Normal inverse 1.3/10<br>3.LTI: Long time inverse<br>4.VI: Very inverse<br>5.EI.1: Extremely inverse<br>6.EI.2: Extremely inverse 0.65 | NA | This function can be disable. |
| TMUL | Time multiplier | 1.00 | 0.05 to 1.00 | 0.01 | |
| EFVL | Earth fault low value | 10 | 10% to 100% Primary current | 1% | |
| EFVH | Earth fault high value (10x) | 100 | 1A: 10% to 1000%<br>5A: 10% to 300% | 1% | EFVH should always greater than EFVL |
| EFtL | Earth fault low trip time | 2.0 | 0.5 Sec to 999.9 Sec | 0.1 Sec | |
| EFtH | Earth fault high trip time | 0.5 | 0.5 Sec to 2.5 Sec | 0.1 Sec | |
| rL 1.r | Recovery time Relay 1 | 0.5 | 0.0 Sec to 99.9 Sec | 0.1 Sec | |

| Display (for 1sec) | Description | Default value | Range / Type | Step size | Condition |
|---|---|---|---|---|---|
| rL 1.n | Mode- Relay 1 | ON | ON/OFF | NA | ON: NC (during trip)<br>OFF: NO (during trip) |
| LCH.1 | Latch- Relay 1 | OFF | ON/OFF | NA | If Latch is ON, User has to reset the unit manually when fault is removed |
| rL2.F | Setting of operation | PrE | PRE/RLY1/Disable | NA | If RLY1 is chosen, entire setting of RLY1 will be applicable to Relay2. RLY2 setting options will be not displayed |
| ALEn | Alarm | 90 | 50% to 100% of primary | 1% | |
| rL2.t | Trip time relay 2 | 2.0 | 0.5Sec to 999.9Sec | 0.1Sec | |
| rL2.r | Recovery time relay 2 | 0.5 | 0.0Sec to 99.9Sec | 0.1Sec | |
| rL2.n | Mode - Relay 2 | ON | ON/OFF | NA | ON: NC (During trip)<br>OFF: NO (During trip) |
| LCH.2 | Latch - Relay 2 | OFF | ON/OFF | NA | If Latch is ON, User has to reset the unit manually when fault is removed |
| HYS | Hysteresis | 10 | 5% to 40% of primary current | 1% | Fault condition is removed when fault is H% less than the set value |
| S.PY | Set password | dIS | 0 to 999 / Disable | NA | Master password: 753 This function can be disable |
| rSt | Reset | NO | YES/NO | NA | |

● LED ON ○ LED OFF

| Key | Description | Display (for 1 sec.) | LED's | Condition |
|---|---|---|---|---|
| For TEST | Press TST key for 3 sec. | tSt | ○ ○ ○ R1 R2 10x | Test function is applicable only when unit is in healthy condition |
| Test passed | | OK | ● ● ● R1 R2 10X | If test is passed, OK will be displayed till reset button is pressed |
| Test failed | | nOK | ○ ○ ○ R1 R2 10X | ---- |
| RST | Press RST key for 3 sec. | Actual value | ○ ○ ○ R1 R2 10X | ---- |

| | |
|---|---|
| **RESET** | Press ▼ key for 3sec. to reset manually |
| **TRIP VALUE** | On ▲ key press: Trip value will be displayed till the key is pressed |

In configuration menu, if no key pressed for 30 sec. then unit resumes online mode

# WARRANTY / LIMITATIONS OF LIABILITY

Selec warrants the products to be free from defects in the materials and workmanship for a period of one year (or other period specified, if any) from the date of sale by Selec.

The warranty does not apply to defects resulting from any action of the buyer, including but not limited to improper handling, operating the product outside the specification limits or unauthorized disassembling / altering of the product. The warranty shall be VOID if the product shows evidence of having been tampered or being damaged due to usage in corrosive environment; or current, heat, moisture or vibration; improper specification; wrong usage in an application; misuse or other operating conditions outside of Selec's control.

Selec shall not be responsible for special, indirect or consequential damages, loss of profits or commercial loss in any way connected with the products, whether such claim is based on contract, warranty, negligence or strict liability.

In no event shall the responsibility of Selec for any act exceed the individual price of the product on which liability is asserted.

In no event shall Selec be responsible for warranty or other claims regarding the products unless Selec's analysis confirms that the products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification or repair.

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