

INSTALLATION INSTRUCTION FOR F3 EFR1

INTRODUCTION

It's the company's pleasure to enlist you as one of our esteemed user customer. Thank you for selecting & purchasing 'MINILEC' make EARTH FAULT RELAY F3 EFR1.

The following installation instruction would guide you in installation F3 EFR1 and making best use of it.

F3 EFR1 operates on current sensing principle and is used in electrical circuits & systems where EARTH FAULT protection is required. F3 EFR1 relay is more accurate, easy to set, compact and easy to install at panel facia .This relay offers (1CO/2CO) relay contact of 5Amps at 240VAC rating.

MOUNTING

Your F3 EFR1 can be panel mounted & is flush fitting panel mounting type.(See fig.2 — for panel mounting & panel cutout dimensions)

CAUTION

Ensure that your F3 EFR1 is-

- Not installed near any heat sources like Burner, Sunlight ,electric arc etc.
- Not subjected to abnormal vibration.
- Not subjected to direct rains, stormy wind & dust.
- Installed as near to the starter as possible.

ELECTRICAL CONNECTION OF F3 EFR1

See fig 3 & 4 for electrical connection details of F3 EFR1.

FUNCTION

The unit is provided with settable EARTH FAULT current trip setting, Trip time delay & with provision of relay energizing on fault condition logic. Select external CT to be installed in the system after considering EARTH FAULT current levels expected in systems circuit. External CT should have secondary current rating of 5A or 1A. Rated current input of 5A or 1A can be selected through CT I/P (C & 5A) or (C & 1A) indicated on back terminal (see fig.3 & 4)

When the power is applied to the unit relay remains in de - energized condition. The relay energized immediately , when input current exceeds Earth fault set level for selected trip time delay.

The unit operates in manul reset mode hence for resetting it is necessary to press RESET push button provided on front side of unit. F3 EFR1 also be resetted by using external no type remote reset push button.

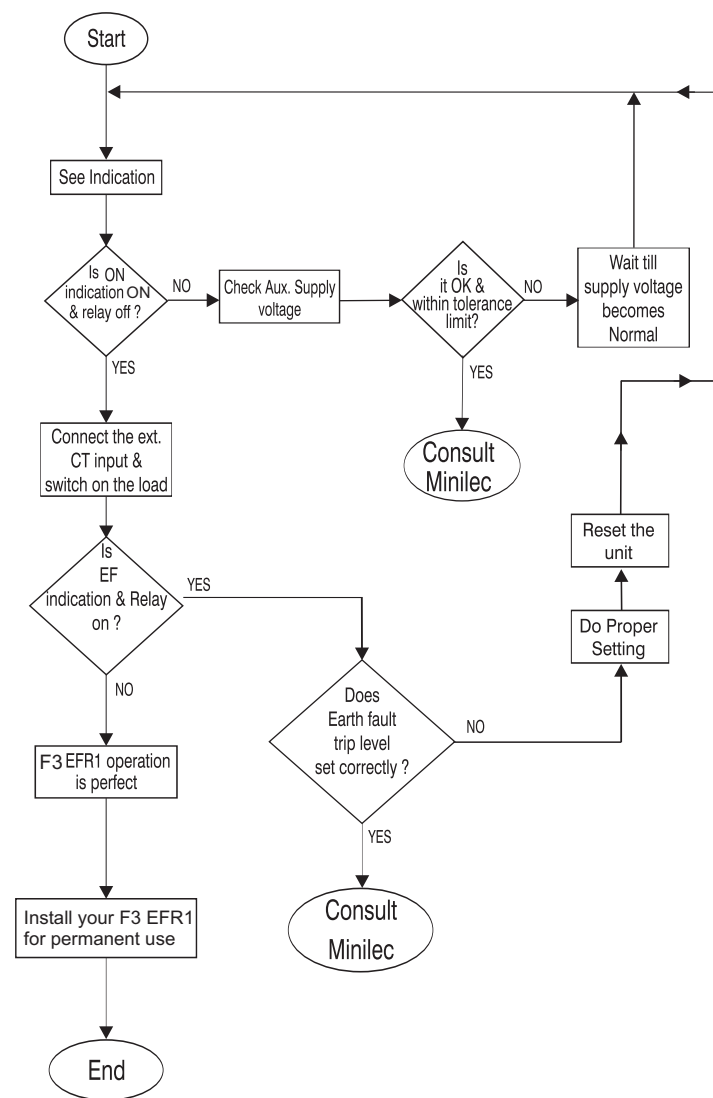
TRIP TIME DELAY SELECTION

On occurrence of earth fault condition,F3 EFR1 will trip as per the trip sec selected on front plate.

TECHNICAL SPECIFICATION OF F3 EFR1

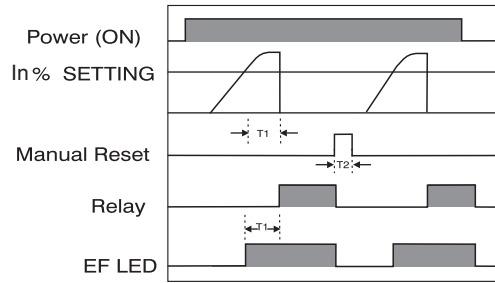
- 1 . **Auxilliary supply** : 24-30VDC \pm 10%
110/220/230/240VAC/DC \pm 20%
380/415/440VAC \pm 20%, 50Hz
- 2 . **Rated current input** : 5A/1A (selection via terminals)
- 3 . **Frequency** : 50 / 60Hz , \pm 3%
- 4 . **Power consumption** : 3VA max.
- 5 . **Output relay contact** : 1CO / (2CO)
- 6 . **Out put contact rating**: 5A,240VAC (resistive)
- 7 . **Life expectancy** : 0.5x10⁸ operations at 100% rating
- 8 . **EF trip setting** : 10% to 100% of rated current input (variable)
- 9 . **Set accuracy** : For current - \pm 5% w.r.t. Current input of 100% (full scale)
For trip delay - \pm 10% w.r.t. Trip time delay (full scale)
10. **Trip time delay** : 0.1 sec. to 1sec or
1sec to 10sec (optional)
11. **Reset** : manual / remote reset
12. **Indication** : ON (green) - Power ON
EF (red) - Earth Fault Trip
13. **Current sensor** : neutral CT / CBCT / summation CT with secondary current rating of 1A or 5A (Protection class)
14. **operating conditions** : temperature - -5^oc to 60^oc
humidity - upto 95% R/H.
15. **Enclosure** : F3 ENCLOSURE (ABS)
16. **Dimension (mm)** : overall - 96 X 96 X 80mm
cut out - 92 X 92 mm
17. **Weight (approx)** : 500gms.

Testing procedure



OPERATIONAL DIAGRAM

FIG. 1



T1 : Trip Delay

T2 : Unit is resetted by pressing MANUAL / REMOTE reset push button switch.

SETTING OF EARTH FAULT RELAY

Typical Earthfault Relay Setting for electrical low voltage system of 415 V AC , 3 phase , 50 Hz, maximum demand of 150 KW at lagging power factor of 0.85 are shown below.

$$\text{Power} = \sqrt{3} \times V \times I \times \cos \phi$$

$$\text{Load Current} = \frac{150 \times 1000}{1.732 \times 415 \times 0.85}$$

$$\text{Load Current} = 245.50 \text{ Amps.}$$

Current Transformer Selected = 300/5A, 15 VA , Class 5P10

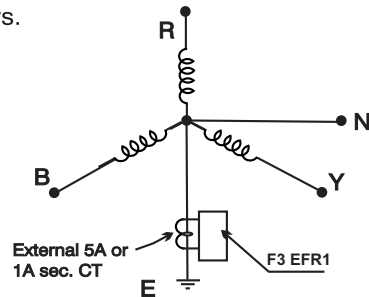
Minilec make F3 EFR 1 is Provided with Earthfault current setting between 10% - 100%

Hence Earthfault at 10% setting = $10\% \times 300A = 30 \text{ Amps}$

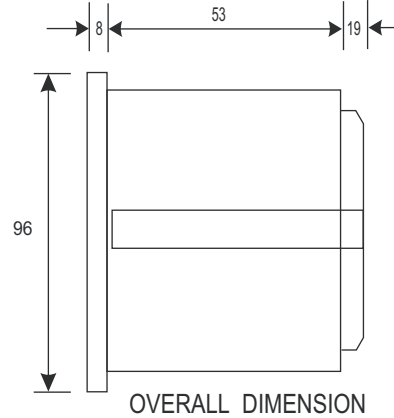
Similarly Earthfault at 30% setting = $30\% \times 300A = 90 \text{ Amps}$

These are typical earthfault current calculations and settings shown as an example. Individual user can make the earthfault settings as per their requirement.

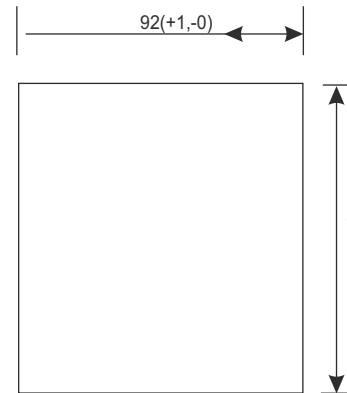
For Generator and Transformer application, with 3P-4W system, connection of CT can be made as follows.



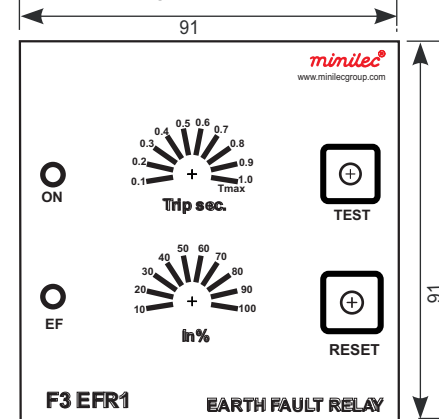
MOUNTING DIMENSION



PANEL CUTOUT

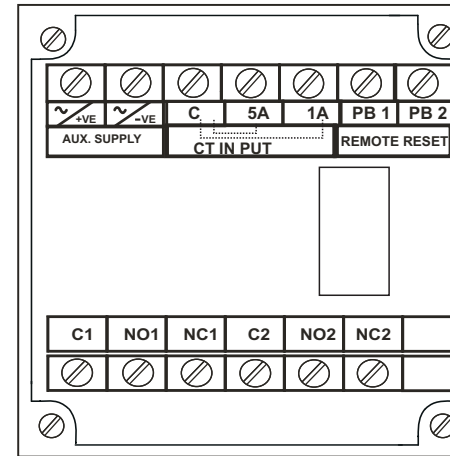


FRONT VIEW



ALL DIMENSIONS ARE IN mm (FIG.2)

TERMINAL DETAILS



TERMINAL DETAILS (FIG.3)

- ~/+VE , ~/-VE : AUX SUPPLY
- C1 - NO1 - NC1 : OUTPUT RELAY CONTACT.
- C2 - NO2 - NC2 : OUTPUT RELAY CONTACT.(2CO)
- C -5A : CT INPUT 5A SECONDARY
- C -1A : CT INPUT 1A SECONDARY
- PB 1, PB 2 : REMOTE RESET

INDICATION

- ON (GREEN) : POWER ON.
- EF (RED) : EARTH FAULT TRIP.



WARRANTY
AGAINST
ALL MANUFACTURING DEFECTS
FOR 18 MONTHS
FROM DATE OF SUPPLY
OR 12 MONTHS FROM
INSTALLATION
WHICHEVER IS EARLIER

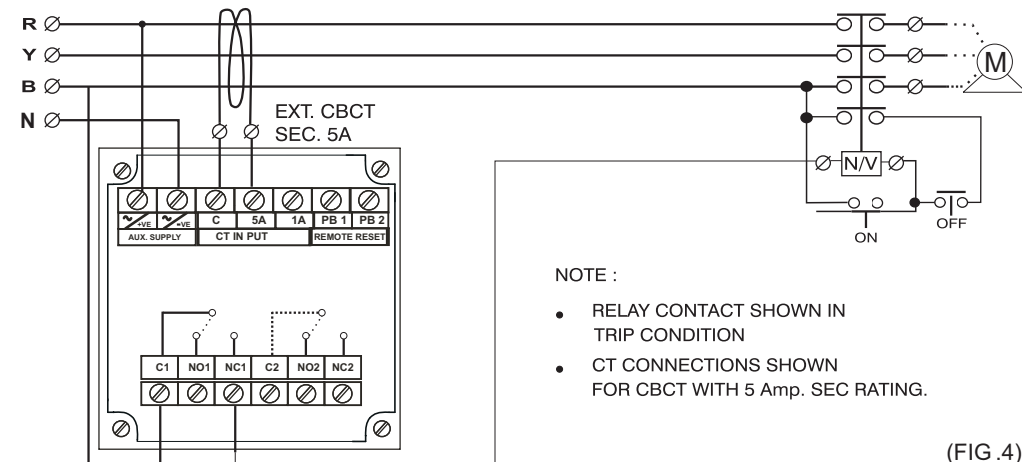
Manufactured by :

minilec[®]
www.minilecgroup.com

1073/1-2-3 AT POST : PIRANGOOT,
TAL. : MULSHI, DIST. : PUNE, (INDIA)
PIN : 412 111

VERSION- 01
(09 / 06 / 2012)

ELECTRICAL CONNECTIONS IN POWER AND CONTROL WIRING (CBCT TYPE)



NOTE :

- RELAY CONTACT SHOWN IN TRIP CONDITION
- CT CONNECTIONS SHOWN FOR CBCT WITH 5 Amp. SEC RATING.

(FIG.4)