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Earth Fault Relay – EFSPL-1A/5A

IEEE DEVICES CODE-50N

Features

- Static Device
- Compact, Reliable with Aesthetic Value
- Rugged, Robust and Tropicalised design
- Consistent repeat accuracy
- Wide Current Operating range
- LED Indication for Healthy & Fault Status
- Manual Reset & Low Burden on CT Secondary

Applications

- Earth Fault Protection for Generators / Alternators
- Earth Fault Protection for Transformers & Feeders

Specifications

SPECIFICATIONS	***DEFINITE TIME / INSTANTANEOUS STATIC EARTH FAULT RELAY(EFR), EFSPL-1A/5A***
Auxiliary Voltage	110V/230V/415V/550V,AC 50Hz 48/110/220 VDC.
Frequency	50Hz
Neutral or Summation CT Rated Current-In	1A or 5A (Factory Set)
Burden on CT	<0.2VA
Sensitivity Settings Plug Setting Range(PS)	PS Range : (10%-80%) of In. in steps OF 10%
Definite Time Settings in Sec	0.15 to 3.0 Sec (6 Steps) Steps : 0.15, 0.25, 0.50, 1.00, 2.00 and 3.00 Sec.
IDMT Curves	NOT APPLICABLE
Time Setting Multiplier (TMS)	NOT APPLICABLE

High Set Enable/Disable Option	NOT APPLICABLE
High Set	NOT APPLICABLE
Time for High Set Operation	NOT APPLICABLE
CBCT / ZCT size for EFR	Circular: 40mm,65mm,100mm,150mm,200mm,250mm & 300mm with Secondary 1A only
Contact Capacity (A)	8A@250V AC 8A@30V DC
Contact type	NC-C-NO One change over (optional - Two change over)
Operating Temperature (°C)	-5°C --- +55°C
Standard	IEC - 60255 & IEC 755
Relay Setting Mode	Setting through DIP switch. • PS • Definite time
Display/Indication	LED for indicating the status • Green LED-Healthy • Red LED-Trip
Relay Test Facility	Available through push button
Mounting Type	Flush Din/Surface
Dimensions in mm	Flush : 96 x 96 x 75 Din : 79 x 93 x 73 (W x H x D)
Panel cut out in mm (Flush type)	90 x 90 +/-1 mm

Description

Prok dv's make Definite Time / Instantaneous Static Earth Fault Relay (EFR) is a current sensing device which is tropicalised, professionally designed and tested for protection of Generators, Transformers and Feeders. Prok dv's make Static Definite Time & Instantaneous Earth Fault Relay (EFR) can be employed with various earth fault protective schemes, which are explained in brief with figures. The magnitude of the earth fault current depends on the fault impedance and invariably the fault impedance for earth fault is higher than that for phase faults, hence the earth fault current is low compared to the phase fault currents. The fault impedance depends on the system parameter and also on type of earthing. The neutral may be solidly grounded, grounded through resistance or reactance.

Figure A Shows how an earth fault relay (EFR) can be energized by a residual current, in this method the secondary 3 CT currents, by summation technique **Ir, Iy & Ib** of three different phases are connected in parallel. The vectorial sum of three current i.e, (**Ir+ Iy + Ib**) is zero under normal condition. During the occurrence of earth fault the residual current is non-zero and when it exceeds the pick-up value (externally selectable by Dip switch on front fascia),the Earth Fault Relay (EFR) trips. Theoretically during balanced load conditions the Earth Fault Relay (EFR) carries no current hence its current, setting may be any value greater than zero, but in practice such ideal system do not exist.

Figure B Shows schemes for Definite Time / Instantaneous Static Earth Fault Relay (EFR) used for protection of Transformer and Generator. On occurrence of earth fault, zero sequence current flows through the neutral, in-turn actuating the Earth Fault Relay (EFR).

Figure C shows a scheme with Definite time / Instantaneous Static Earth Fault Relay (EFR) which utilized a special type of C.T., called core balance current transformer (CBCT / ZCT) which is toroidal in nature, under normal condition of 3 phase to phase faults the current in the

toroidal secondary is zero. During earth fault the reflected zero sequence unbalance current flows in the (CBCT / ZCT) secondary energizing the earth fault relay (EFR).

Note: PROKDV'S- EFR (EFSPL- 1A) Shall be Provided along with CBCT Secondary current 1 A on clients Request

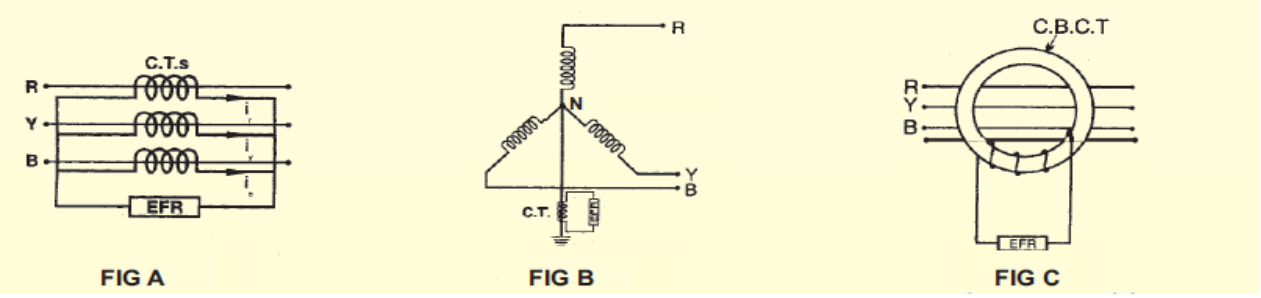
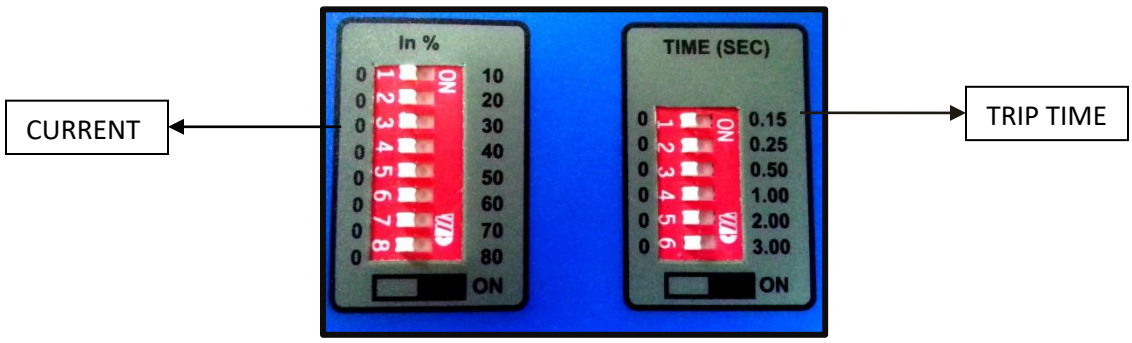


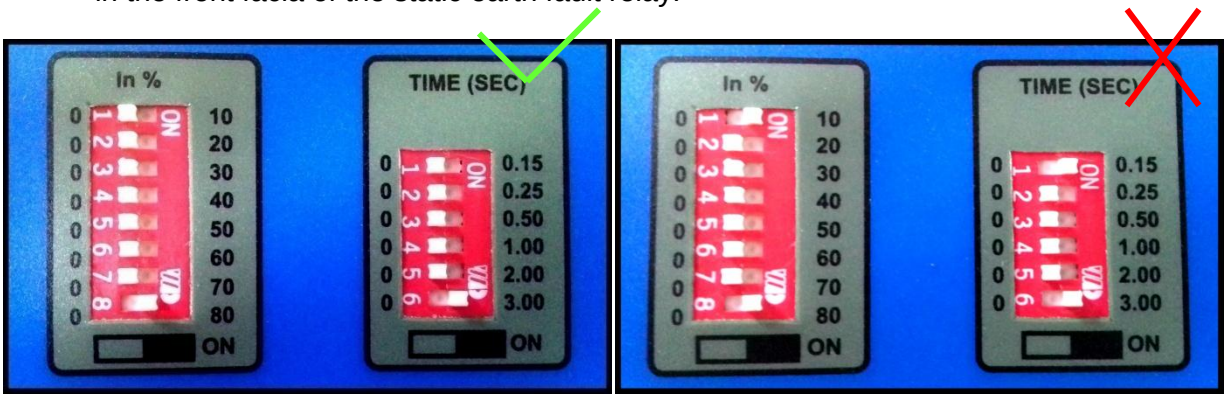
FIG A FIG B FIG C

Setting Procedure

1. The Earth Fault Relay has two settings current setting and trip time setting.



2. The same can be set by selecting any one dipswitch in on position at a time as shown in the front facia of the static earth fault relay.

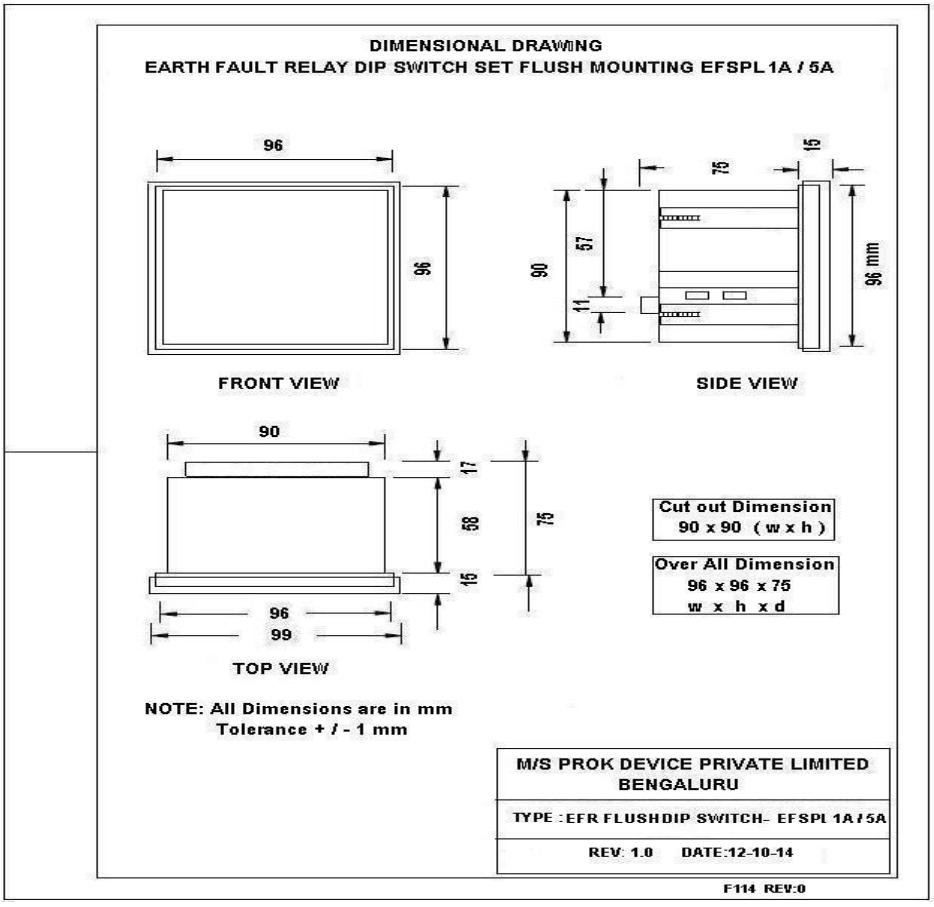


INDICATIONS AND KEYS

- The relay has two indications: Healthy and Fault
- In order to check the connection of the relay, the Test button has been provided.
- In case the relay trips/fault indication is on, the reset button to reset the relay

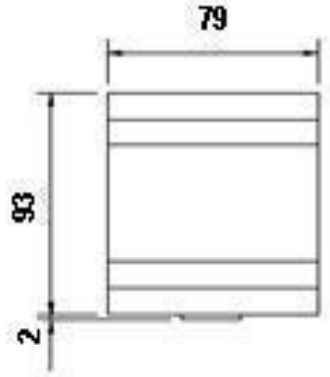
FRONT FASCIA

DIMENSIONAL DRAWING

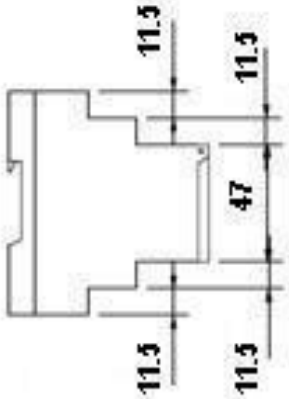


DIMENSIONAL DRAWING

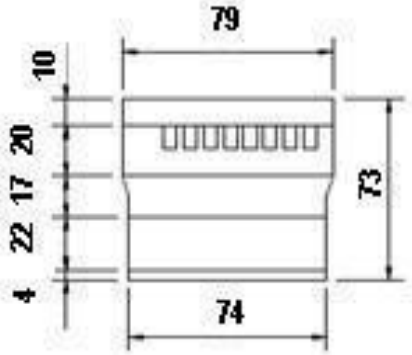
EARTH FAULT RELAY (EFR) DIN RAIL MOUNT DEFSPL 1A / 5A



FRONT VIEW



SIDE VIEW



TOP VIEW

Over all Dimension
79 x 93 x73
(w x h x d)

Note: All Dimensions are in mm
+/- 1 mm Tolerance

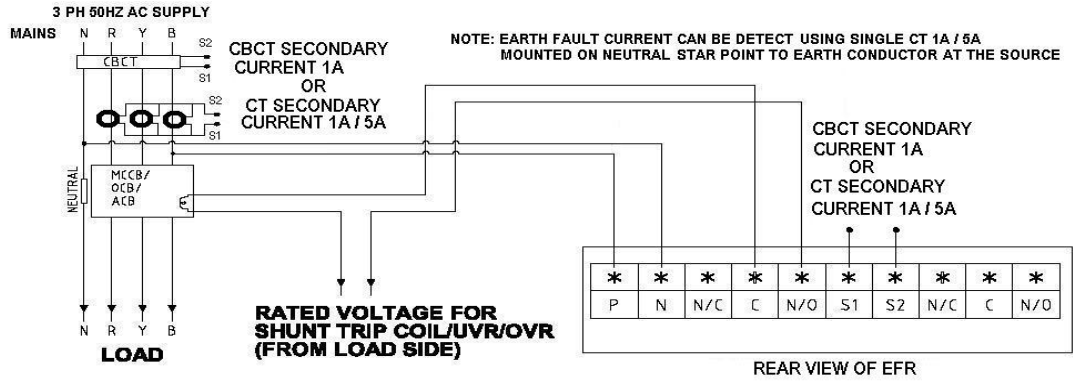
PROK DEVICES PRIVATE LIMITED
TYPE: EFR DIN MOUNT DEFSPL 1A / 5A
REV:1.0 DATE: 15-10-2014

F114 REV:0

WIRING DIAGRAMS

PROK DEVICES PRIVATE LIMIED

WIRING DIAGRAM: FLUSH MOUNTING EFR - EFSPL 1A / 5A (FOR SET OF 2 CHANGE OVER RELAY CONTACTS)

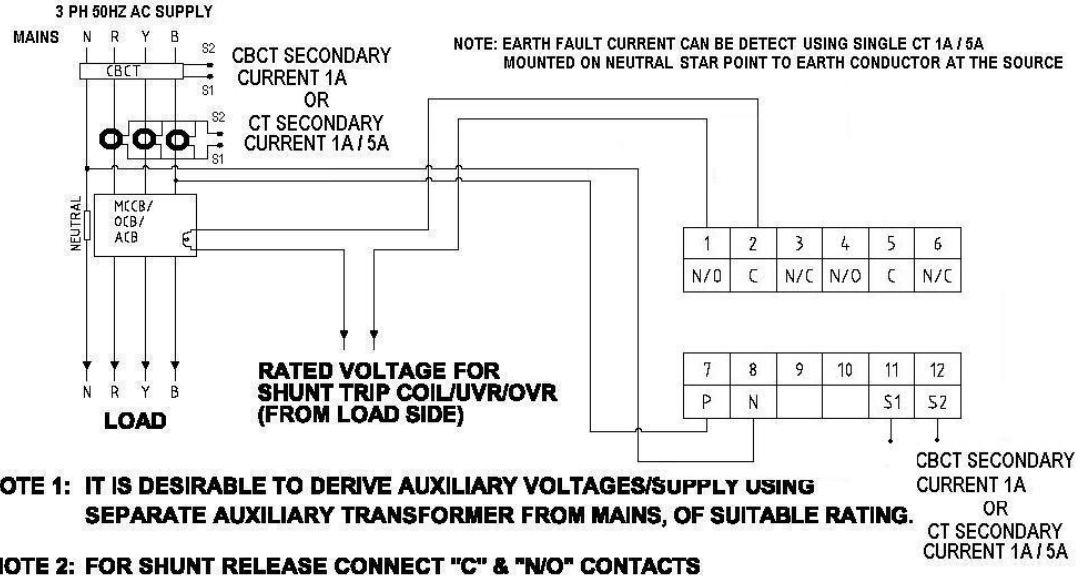


NOTE 1: IT IS DESIRABLE TO DERIVE AUXILIARY VOLTAGES/SUPPLY USING SEPARATE AUXILIARY TRANSFORMER FROM MAINS, OF SUITABLE RATING.

NOTE 2: FOR SHUNT RELEASE CONNECT "C" & "N/O" CONTACTS FOR UV RELEASE OR CONTACTOR COIL CONNECT "C" & "N/C" CONTACTS SHOWING IN HEALTHY CONDITION

PROK DEVICES PRIVATE LIMIED

WIRING DIAGRAM: DIN MOUNTING EARTH FAULT RELAY (EFR) - DEFSPL-1A / 5A



NOTE 1: IT IS DESIRABLE TO DERIVE AUXILIARY VOLTAGES/SUPPLY USING SEPARATE AUXILIARY TRANSFORMER FROM MAINS, OF SUITABLE RATING.

NOTE 2: FOR SHUNT RELEASE CONNECT "C" & "N/O" CONTACTS FOR UV RELEASE OR CONTACTOR COIL CONNECT "C" & "N/C" CONTACTS SHOWING IN HEALTHY CONDITION