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RESTRICTED EARTH FAULT RELAY

RESTRICTED EARTH FAULT RELAY - µP BASED 5A

MPREFR

ON

FAULT

Prok Dvs
REF-5A

SET | ▲ INC | ▼ DEC/TEST | RESET

★ To go to programming mode, Press INC & DEC / TEST keys together & release
★ Use ▲ & ▼ Keys for selecting the desired value
★ Press SET Key to store the values
★ Press DEC / TEST key to test the relay
★ Press RESET key to reset the relay

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DIGITAL MICROPROCESSOR BASED RESTRICTED EARTH FAULT RELAY (REFR) IEEE Device Code: 87N

Features

- •Microprocessor Based Design
- •Wide Setting Ranges
- •Universal Auxiliary supply 85-275V AC/DC
- •Rugged and Compact Design
- •8 Character Back-lit LCD
- •Display of Fault current

Applications

The DIGITAL MICROPROCESSOR BASED RESTRICTED EARTH FAULT RELAY (REFR), is a universal protection device for high, medium and low voltage networks. It is aimed primarily at high impedance differential schemes such as restricted earth fault and generator differential protection.

In this type of protection scheme, based on circulating current measurement, heavy through fault currents during a fault condition can cause current transformers to approach or exceed their saturation level and allow sufficient unbalance current to operate the relay. This is due to the asymmetrical current of extreme magnitude which has dissimilar effects on seemingly identical CT's.

In order to ensure stability under these circumstances, it is usual practice to employ a high impedance differential scheme, the stability of which is achieved through careful selection of CT's, stabilizing resistors, settings and non-linear resistors.

Introduction

The application of powerful microprocessors DIGITAL MICROPROCESSOR BASED RESTRICTED EARTH FAULT RELAY (REFR) opens a new chapter for power system protective relaying. The digital processing of measured values and the ability to perform complex arithmetic and logic operations, give digital protection relays significant performance and flexibility improvements over their traditional analogue counterparts. Additional advantages - very small power consumption, adaptability, self-supervision, smaller physical construction and selectable relay characteristics - all combine to allow the implementation of accurate and highly reliable protection schemes at a significantly reduced financial burden.

The development of microprocessor based DIGITAL MICROPROCESSOR BASED RESTRICTED EARTH FAULT RELAY (REFR) protective relays and their introduction into the market has been stimulated by the recent trend to replace analogue with digital equipment. The superiority of digital protective relaying over traditional analogue devices, as embodied by the DIGITAL MICROPROCESSOR BASED RESTRICTED EARTH FAULT RELAY (REFR)

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Principles of Operation

Restricted Earth Fault (REF) protection is a sensitive way to protect a zone between two measuring points against earth faults. When there is a fault outside the protected zone the CT secondaries will cancel each other's currents. This is partly true even if both or only one of the CT saturates, because the impedance of a saturated CT secondary will collapse to near zero. The non-zero wiring impedance and CT impedance will however cause a voltage VS, but the stabilizing resistor RS will prevent the relay from tripping. During an inside fault the secondary currents of the two CT's have no other way to go than through the relay. The relay will trip when the current I = VS/RS exceeds the setting IS of the relay. The voltage dependent resistor (VDR) is used to protect the CT's and wiring by limiting the voltage VS during heavy inside faults.

Specification

Rated Current	: 5 Amps
Plug setting Range	: 5% – 80% in steps of 1%
Operating Time	: Instantaneous(<40ms)
Burden	: <0.2 VA
Frequency	: 50 Hz
Auxiliary supply	: 85-275V AC/DC
Output Relay	: 2 C/O,250V,8A AC
	30V,8A DC
Operating Temperature	: -5ºC to +55 ºC
Panel cut out	: 90 x 90+0.1mm
Enclosure Dimensions	: 96 x 96 x 70 mm

Setting Procedure

Step1:   Power up the DIGITAL MICROPROCESSOR BASED RESTRICTED EARTH FAULT RELAY (REFR)

Connect the suitable Aux. supply to the P & N terminals of the MPREFR. i.e. (85-275V AC 50Hz) The display shows

Prok Dvs
REF – 1A

or

Prok Dvs
REF – 5A

(Factory set)

Note: In-5A or In-1A shows the relay rated current.

Step 2: Push the Increment key, hold it and then push the Decrement key
Now the display shows

Ib=0010%
[5-80]%

Push the Increment key or the Decrement key to select the value. Range is from 5% to 80%.

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DIGITAL MICROPROCESSOR BASED RESTRICTED EARTH FAULT RELAY (REFR) IEEE Device Code: 87N

Step 3: Relay Test

Push the Decrement key to Test the Output Contacts of the Relay and the LEDs. Then
Display shows

> Rel Test
> >YES <NO

Press   the Increment key to Trip the Relay. The Relay Trips and the LEDs glow.
Push the Decrement or the Set Key to move out of it.

Mechanical Dimension DIGITAL MICROPROCESSOR BASED RESTRICTED EARTH FAULT RELAY (REFR)

FRONT VIEW

SIDE VIEW

TOP VIEW
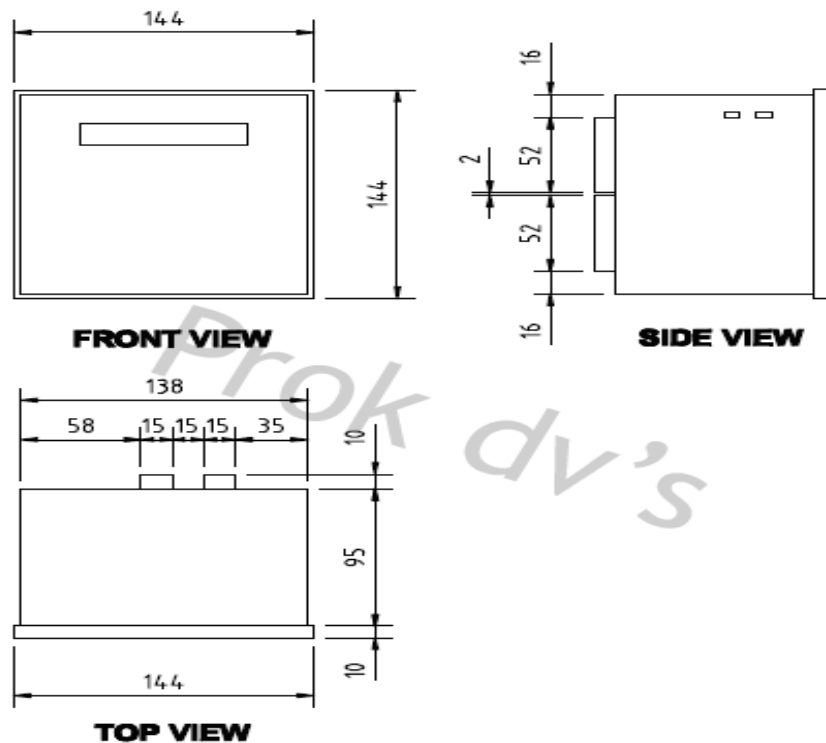
NOTE: ALL DIMENSIONS ARE IN MM
       TOLERANCE:- ± 1MM

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DIGITAL MICROPROCESSOR BASED RESTRICTED EARTH FAULT RELAY (REFR) IEEE Device Code: 87N

Wiring Diagram DIGITAL MICROPROCESSOR BASED RESTRICTED EARTH FAULT RELAY (REFR)
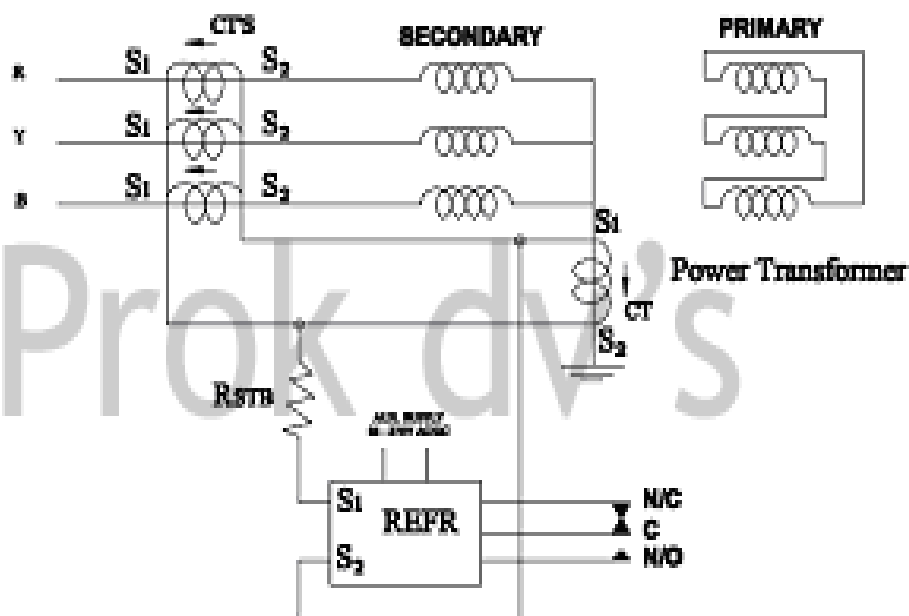
NOTE: FOR SHUNT RELEASE CONNECT "C" & "N/O" CONTACTS
FOR UV RELEASE OR CONTACTOR COIL CONNECT "C" & "N/C"
CONTACTS SHOWING IN HEALTHY CONDITION

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