MOTOR PROTECTION RELAY

FEATURES

- State of Art Microcontroller Based Design
- 4 Line 3 Digit ultra bright LED display
- Site selectable CT ratio
- True RMS measurement
- Password Protection
- Universal Aux. Supply
- Bargraph Indiaction of Load current

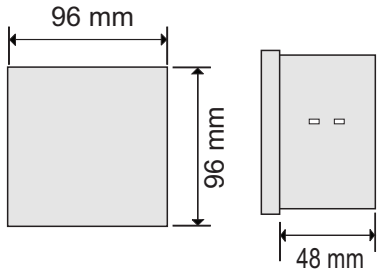
ALARM / TRIPS

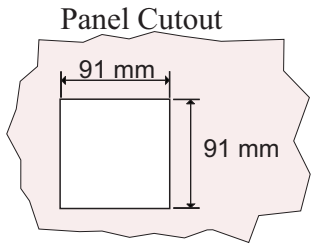
- ✓ Under Voltage
- ✓ Over Voltage
- ✓ Voltage Assymetry / Unbalance
- ✓ Phase Loss
- ✓ Phase Reversal
- ✓ Under Current
- ✓ Over Current
- ✓ Current Phase Loss
- ✓ Current Imbalance
- ✓ Under Frequency
- ✓ Over Frequency
- ✓ Locked Rotor
- ✓ Rotor Earth Fault

PARAMETERS

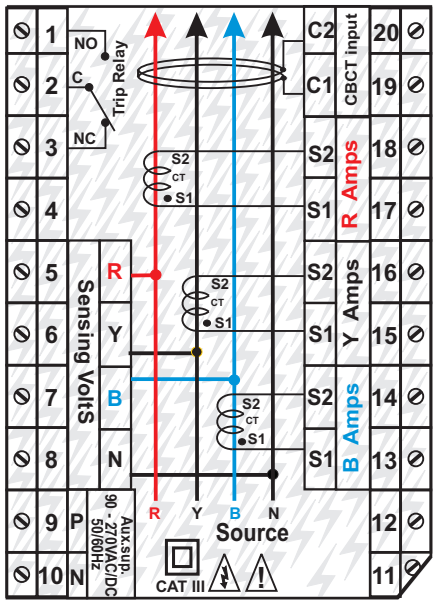
- ✓ Volts : R Y (Phase - Phase)
  - YB (Phase - Phase)
  - BR (Phase - Phase)
  - Average (Phase - Phase)
  - RN (Phase - Neutral)
  - YN (Phase - Neutral)
  - BN (Phase - Neutral)
  - Average (Phase - Neutral)
- ✓ Amps : R Phase
  - Y Phase
  - B Phase
  - Average
- ✓ Frequency
- ✓ Run Hour
- ✓ Earth Fault current

MECHANICAL DIMENTION

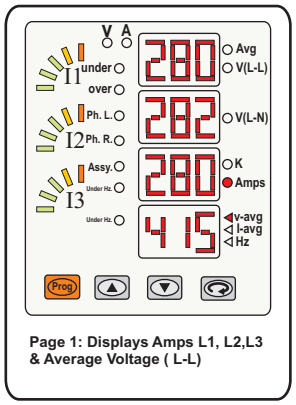




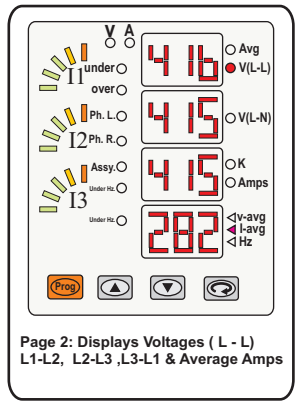
Electrical Wiring / Connection Diagram



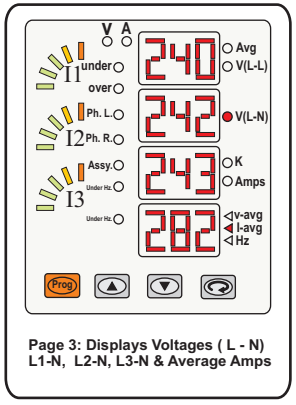
DISPLAY PAGES



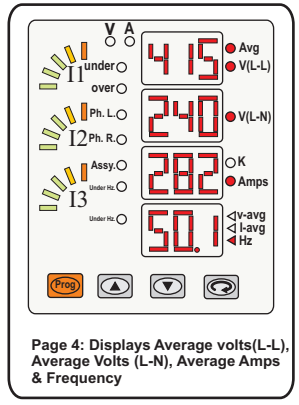
Page 1: Displays Amps L1, L2,L3 & Average Voltage (L-L)



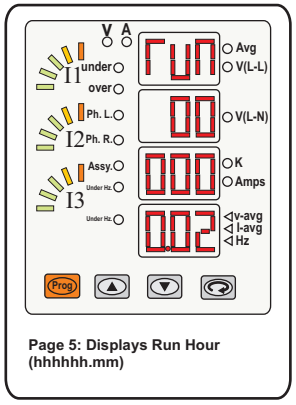
Page 2: Displays Voltages (L - L) L1-L2, L2-L3 ,L3-L1 & Average Amps



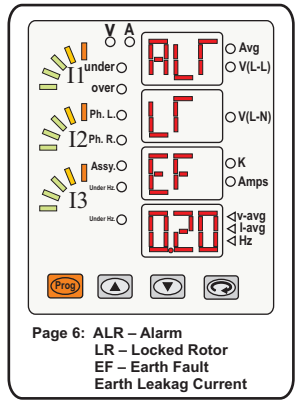
Page 3: Displays Voltages (L - N) L1-N, L2-N, L3-N & Average Amps



Page 4: Displays Average volts(L-L), Average Volts (L-N), Average Amps & Frequency



Page 5: Displays Run Hour (hhhhhh.mm)



Page 6: ALR – Alarm
LR – Locked Rotor
EF – Earth Fault
Earth Leakag Current

SPECIFICATIONS

Input	: 3 phase 4 wire
Volts	: Range 10 - 500VAC L-L
Amps	: 0.10 - 6.0 Amps
Freq	: Through R phase (Internally)
Burden	: 0.2 VA max. per input for Voltage & Current Signals 3 VA max. on Aux. Supply
Aux.Supply	: 90 - 270 VAC / DC,50/60Hz
Display	: 4 Line x 3 Digit {0.39 Inches 7 Segment LED Display}
Accuracy	:Class 1.0 for Volt / Ammeter For Hz : 0.1 % of full scale
Resolution	: 0.01 for Frequency Meter Amps: 0.1<100A 1.0<1000A 0.1KA>1000A
Relay	: Normally Energised
Computation	: True RMS
Frequency	: 45 Hz - 65 Hz.
Ambient	: -10℃ to 55℃
Humidity	: < 95 % Non-condensing
Weight	: 350gms
Dimensions	: 96 X 96 X 48 mm (L x W x D)
Panel Cutout	: (90^{+1}_{-0})mm X (90^{+1}_{-0}) mm
Mounting	:Flush Mounting with side clamps.

TEST?CERTIFICATE

Type : Motor Protection Relay

Accuracy : Class 1.0 for V & A ;
0.1% of FS for Hz

Accuracy TEST:

VOLTAGE		CURRENT		FREQUENCY
10%	100%	10%	100%	100%
+/- 1.0%	+/- 1.0%	+/- 1.0%	+/- 1.0%	+/- 0.10%
OK	OK	OK	OK	OK

Note:
A) For Digital Readouts the erroe is computed in counts.

– Class 1.0 = ±1% of Full Scale + 1 count
– Class 0.5 = ± 0.5% of Full Scale + 1 count

Tested By.: Prathmesh
Date :

PROGRAMMING

1) Press (Prog) key to enter Program Mode.

2) The Meter Shows Password Entry Page {ENT PASS 0000}.
Enter the Password using ▲ / ▼ Keys & (Prog) Key to move to the next digit. After entering password press ↻ key, if pass word is correct, unit will enter program mode.

3) Following Programming menus are available which can be accessed using ▲ / ▼ Keys.

Menu	Symbol	Description
1	Ct rAt	To program CT Primary
2	ALr SEt	To set various Alarm Parameters
3	ALr rSt	Alarm Reset Mode Auto / Manual
4	PON dLY	To set the Power ON Delay in Secs.
5	Ld dLY	Starting Delay for Motors to by-pass the starting surge current; setting in secs.
6	AUr dLY	Auto Reset Delay time in secs
7	PAS COd	To set new Password

Select the Menu to be edited using ▲ ▼ Keys and press ↻ Key to enter the respective menu.

Menu 1:**(CT Primary)**
when (Prog) Key is pressed the display shows {CT Rat 0005}.
The Ct Primary can be programmed using ▲ ▼ Keys and (Prog) as shift key. After entering desired value press ↻ key to save value.

Menu 2:**(To set the Various Alarms)**
when ↻ Key is pressed the Following options are available.

Alarm	Symbol	Description
1	UNd UOL	**Under Voltage Alarm**
2	OVr UOL	**Over Voltage Alarm**
3	ASy UOL	**Asymmetry Voltage Alarm**
4	PHS rEV	**Phase Sequence Alarm** {can be enabled / disabled; delay is ?xed 500mSec.}
5	PHF UOL	**Phase Failure Alarm (voltage)** {set to 10% of L-N Voltage; delay is ?xed 500mSec.}
6	UNd CUr	**Under Current Alarm**
7	OVr CUr	**Over Current Alarm**
8	ASy CUr	**Asymmetry Current Alarm**
9	PHF CUr	**Phase Failure Alarm (current)** {The Trip Value is 150% of OL Value; Delay is ?xed 500mSec.}
10	UNd FrE	**Under Frequency Alarm**
11	OVr FrE	**Over Frequency Alarm**
12	rOt LOC	**Lock Rotor Alarm** {only trip value can be set 2.0 to 5.0 times of set OL value}
13	ELr FLt	**Earth Fault Alarm** {Earth Fault current of 0.50 - 10.0 Amps can be set}

Note for Alarm 6 & 7 :
For Under current the Set Value is calculated as below.
e.g. : CT Ratio 200/5
Under load setting required is 60 Amps.
set value = 60X(5/200) = 1.50

For Over current the Set Value is calculated as below.
e.g. : CT Ratio 200/5
Overload setting required is 175 Amps.
set value = 175X(5/200) = 4.37

ALARM 1,2,3,6,7,8,10,11 can be edited by Pressing ↻ Key. Once you enter the particular Alarm the following Parameters can be set using the ▲ ▼ Keys.

1	USE OFF	To Enable / Disable the alarm using ▲ ▼ Key & Press ↻ Key to store and Proceed further.
2	trP VAL	The desired Tripvalue can be set by using ▲ ▼ Key & Press ↻ Key to store and Proceed further.Value is displayed on 4th Line
3	trP HYS	The desired Hystersisvalue can be set by using ▼ ▲ Key in % of the Set Point .
4	dLY 0 050	The desired Delay value can be set by using ▼ ▲ Key & Press ↻ Key to store and Proceed further.

Menu 3: **(To set the Alarm RESET Mode)**
To set the Alarm Reset Mode Press ↻ Key the display shows AUT / MAN mode.
Using ▲ ▼ key Auto / Manual RESET mode can be set.

For Manual Reset mode ↻ Key acts as Reset button. Pressing the ↻ Key when all Faults have cleared with reset fault LEDs and Output Relay will turn ON {normally energised in healthy conditions}

Menu 4: **(To set Power ON Delay)**
To set the Power ON Delay Press ↻ Key the display shows PON DLY / 005.
Using ▲ ▼ (Prog) key the Desired value can be edited (time in Secs.)

At power ON the output relay will energise after the delay time set has lapsed.
The output relay is in Normally energised condition in Healthy status (when no faults are present).

Menu 5: **(To set Starting Delay)**
To set Starting time for the motors in secs Press ↻ Key the display shows Ld DLY / 005.
Using ▲ ▼ (Prog) key the Desired value can be edited .

When the current increases from 0 - 50% full scale to bypass the motor starting surge current, the delay time can be set. All faults will be by passed for the time period set.

Menu 6: **(To set Auto Rest Time Delay)**
To set the Auto Reset time Delay in secs Press ↻ Key the display shows AUR DLY/005. Using ▲ ▼ (Prog) key the Desired value can be edited .

In case of Auto reset mode - Auto Reset delay can be programmed. when all the faults are cleared the output relay will energise after Auto Reset time has expired. This delay can be set for Auto mode only.

Menu 7: **(To set PASSWORD)**
To set the PASSWORD Press ↻ Key the display shows PAS COD-0000

The new password can be set using ▲ ▼ (Prog) key . Press ↻ Key to store the password.