



## FEATURES

- Over voltage, Under voltage, Over frequency, Under frequency, Phase Asymmetry, Phase failure, Neutral Loss, Phase sequence monitoring system etc.
- True RMS measurement
- Trip Time delay, Recovery Time delay, Power ON delay
- Adjustable switching Hysteresis
- Two separate alarm relays operation

## SPECIFICATIONS

### DISPLAY

3 Digits, LCD with Backlight

### ELECTRICAL CONNECTION

3Ø-3 wire, 3Ø-4 wire

### AUXILIARY SUPPLY

85 – 270V AC/DC

50 / 60Hz

### OPERATING RANGE

50 – 288V AC (L-N)

85 – 500V AC (L-L)

### FREQUENCY RANGE

45 – 65Hz

### VA RATING

4VA max.

### TRIP SETTINGS

Under Voltage : 50 to 288V AC (L-N)  
[for 3Ø-4 wire]  
85 to 500V AC (L-L)  
[for 3Ø-3 wire]

Over Voltage : 50 to 288V AC (L-N)  
[for 3Ø-4 wire]  
85 to 500V AC (L-L)  
[for 3Ø-3 wire]

Under Frequency : 45 – 65Hz

Over Frequency : 45 – 65Hz

Phase Asymmetry : 5 – 30%

## TIME SETTINGS

Power ON Delay : 0.5–300sec.

Trip Time Delay : 0–300sec.

Recovery Time : 0–300sec.

Response Time

Under Voltage : < 120ms

Over Voltage : < 120ms

Phase Asymmetry : < 120ms

Phase loss : < 200ms

Phase sequence : < 250ms

## HYSTERESIS

Voltage : 1–40V

Frequency : 0.2–2.0Hz

Asymmetry : 2–20.0%

## RESOLUTION

Voltage : 1V

Frequency : 0.1Hz

## ACCURACY

Voltage :  $\pm 1\% \pm 2$  digits

Frequency :  $\pm 0.5\% \pm 1$  digit

Time :  $\pm 5\%$  of setting  $\pm 120$ ms

(Trip Time Delay, Power ON Delay, Recovery Time Delay)

## OUTPUT SPECIFICATIONS

2 Relays : Relay1 : 1C/O (SPDT)

Relay2 : 1C/O (SPDT)

## RELAY RATING

NO (5A, 250V AC)

NC (3A, 250V AC)

## LED INDICATION

LED1 : Continuously ON after trip

LED2 : Continuously ON after trip

## ENVIRONMENTAL SPECIFICATIONS

- Indoor use

- Altitude of up to 2000 meters

- Pollution degree II

Temperature : Operating :  $-25^{\circ}\text{C}$  to  $+55^{\circ}\text{C}$

Storage :  $-25^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$

Humidity : Up to 95% RH, non-condensing

## MECHANICAL SPECIFICATIONS

No. of Push Buttons : 3

Size : 35mm width

Mounting : 35mm Din Rail Mount

Wire Size (max) : 4 sq.mm

Screw tightening torque : 0.5 N-M

## WEIGHT

150 gms.

## SAFETY PRECAUTIONS

All safety related codifications, 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.

## WIRING GUIDELINES

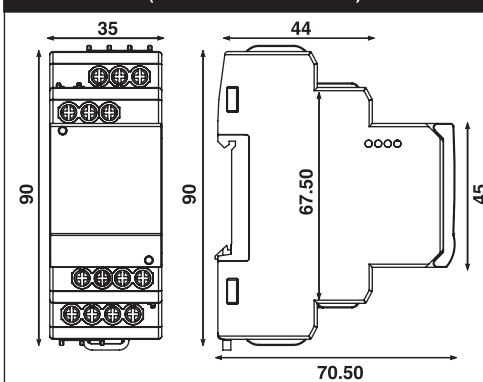
### WARNING

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

1. To ensure the safe operation of unit, check the wiring and connections.

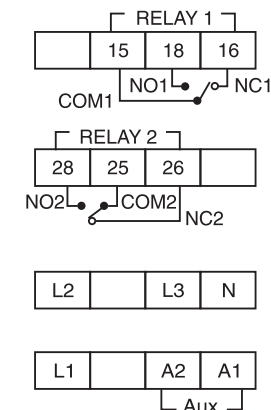
## DIMENSIONS ( All dimensions in mm )



## LED INDICATION CHART

Various Conditions	'R1' LED	'R2' LED
No fault	OFF	OFF
R1 Trip	ON	OFF
R2 Trip	OFF	ON
Both the Relay Trip (If Programed for Both Relay)	ON	ON

## TERMINAL CONNECTIONS



# CONFIGURATION MENU

Press ▲ + ▼ for 3sec. to enter or exit configuration menu.

## MAIN MENU

Network selection

NWK

Relay 1 settings

RL1

Time Setting for Relay 1

EM1

Relay 2 setting

RL2

Time Setting for Relay 2

EM2

Hysteresis

HYS

Password

PW

Factory set

RSt

## SUB MENU

Press ▲ Key to go to Relay 1 setting (RL1) from network selection (NWK)  
Press ▼ Key to go to network selection (NWK) from Relay 1 setting (RL1)

Over Voltage    Set Over Voltage    Under Voltage    Set under Voltage    Over frequency    Set over frequency    Under frequency    Set under frequency

OV    SOV    UV    SUV    OF    SOF    UF    SUF

Phase Asymmetry    Phase sequence    Phase failure    Power ON Delay Mode    MOD    Latch

AS    PAS    PS9    PFL    PDM    MOD    LCH

Trip time delay    Recovery time delay    Power ON delay

TRP    REC    PON

Over voltage    Set Over voltage    Under voltage    Set under voltage    Over frequency    Set over frequency    Under frequency

RLY    OV    SOV    UV    SUV    OF    SOF    UF

Set under frequency    Phase Asymmetry    Phase sequence    Phase failure    Power ON Delay Mode    MOD    Latch

SUF    AS    PAS    PS9    PFL    PDM    MOD    LCH

Trip time delay    Recovery time delay

TRP    REC

Voltage    Frequency    Asymmetry

VLT    FR9    ASY

Password Enable / Disable    Set password

PW    SPW

Factory set Yes / No

RSt

## SUB MENU

### Network Selection (NWK)

Press ▲ to enter sub menu from main menu

Press ▲ or ▼ to scroll through sub menu

Press ● + ▲ or ● + ▼ to change parameter value

DISPLAY (For 1sec)	DESCRIPTION	DEFAULT VALUE	RANGE	CONDITION
NWK	Network selection	3P4	3P3 / 3P4	

### Relay 1 (RL1) settings

Press ▲ to enter sub menu from main menu

Press ▲ or ▼ to scroll through sub menu

Press ● + ▲ or ● + ▼ to change parameter value

DISPLAY (For 1sec)	DESCRIPTION	DEFAULT VALUE	RANGE	CONDITION
OV	Over voltage	ON	ON / OFF	
SOV	Set Over Voltage	264	85 - 500V (Default : 498) [For 3P3W system] 50 - 288V (Default : 264) [For 3P4W system]	This option will be prompted only when OV protection ON
UV	Under voltage	OFF	ON / OFF	
SUV	Set under voltage	184	85 - 500V (Default : 332) [For 3P3W system] 50 - 288V (Default : 184) [For 3P4W system]	This option will be prompted only when UV protection ON
OF	Over frequency	ON	ON / OFF	
SOF	Set over frequency	55	45.0 - 65.0Hz	This option will be prompted only when OF protection ON
UF	Under frequency	OFF	ON / OFF	
SUF	Set under frequency	45	45.0 - 65.0Hz	This option will be prompted only when UF protection ON
AS	Asymmetry	ON	ON / OFF	
PAS	Phase Asymmetry Setting	100	5.0 - 30.0%	This option will be prompted only when AS protection ON
PS9	Phase sequence	ON	ON / OFF	
PFL	Phase failure	ON	ON / OFF	

TO SCROLL THROUGH MAIN MENU PRESS ● + ▲ OR ● + ▼ KEYS

Note : Appearance of shaded menus dependant on selection of other parameters.

DISPLAY (For 1sec)	DESCRIPTION	DEFAULT VALUE	RANGE	CONDITION
	Power 'ON' Delay Mode		ON / OFF	ON : NO OFF : NC
	MOD		ON / OFF	ON : NC (During Trip) OFF : NO (During Trip)
	Latch		ON / OFF	If Latch is ON, user has to reset the unit manually when fault is removed

Time Setting for Relay 1 (TM1) <span style="float: right;">Press ▲ to enter sub menu from main menu</span>				
Press ▲ or ▼ to scroll through sub menu		Press ● + ▲ or ● + ▼ to change parameter value		
DISPLAY (For 1sec)	DESCRIPTION	DEFAULT VALUE	RANGE	CONDITION
	Trip time delay		0.0 - 300s	
	Recovery time		0.0 - 300s	
	Power ON delay		0.5 - 300s	Applicable for Relay 1 and Relay 2

Relay 2 (RL2) <span style="float: right;">Press ▲ to enter sub menu from main menu</span>				
Press ▲ or ▼ to scroll through sub menu		Press ● + ▲ or ● + ▼ to change parameter value		
DISPLAY (For 1sec)	DESCRIPTION	DEFAULT VALUE	RANGE	CONDITION
	Relay		RL1 / RL2	If RL1 is selected, all the settings done for RL1 & TM1 will be automatically set for RL2 and no other parameter of RL2 & TM2 will be prompted.
	Over voltage		ON / OFF	
	Set Over voltage		85 - 500V(Default : 498) [For 3P3W system] 50 - 288V(Default : 264) [For 3P4W system]	This option will be prompted only when OV protection ON
	Under voltage		ON / OFF	
	Set under voltage		85 - 500V(Default : 332) [For 3P3W system] 50 - 288V(Default : 184) [For 3P4W system]	This option will be prompted only when UV protection ON

DISPLAY (For 1sec)	DESCRIPTION	DEFAULT VALUE	RANGE	CONDITION
	Over frequency		ON / OFF	
	Set over frequency		45.0 - 65.0Hz	This option will be prompted only when OF protection ON
	Under frequency		ON / OFF	
	Set under frequency		45.0 - 65.0Hz	This option will be prompted only when UF protection ON
	Asymmetry		ON / OFF	
	Phase Asymmetry Setting		5.0 - 30.0%	This option will be prompted only when AS protection ON
	Phase sequence		ON / OFF	
	Phase failure		ON / OFF	
	Power 'ON' Delay Mode		ON / OFF	ON : NO OFF : NC
	MOD		ON / OFF	ON : NC (During Trip) OFF : NO (During Trip)
	Latch		ON / OFF	If Latch is ON, user has to reset the unit manually when fault is removed

Time Setting for Relay 2 (TM2) <span style="float: right;">Press ▲ to enter sub menu from main menu</span>				
Press ▲ or ▼ to scroll through sub menu		Press ● + ▲ or ● + ▼ to change parameter value		
DISPLAY (For 1sec)	DESCRIPTION	DEFAULT VALUE	RANGE	CONDITION
	Trip time delay		0.0 - 300s	
	Recovery time		0.0 - 300s	

Note : Relay (RL2 ) submenus are not visible when its is selected as Relay 1 (RL1).

Hysteresis (HYS) <span style="float:right">Press ▲ to enter sub menu from main menu</span>				
Press ▲ or ▼ to scroll through sub menu		Press ● + ▲ or ● + ▼ to change parameter value		
DISPLAY (For 1sec)	DESCRIPTION	DEFAULT VALUE	RANGE	CONDITION
VLT	Hysteresis for voltage	10	1.0 - 40.0V	
FRQ	Hysteresis for frequency	0.2	0.2 - 2.0Hz	
ASY	Hysteresis for Asymmetry	20	2.0 - 20.0%	

Password (PW) <span style="float:right">Press ▲ to enter sub menu from main menu</span>				
Press ▲ or ▼ to scroll through sub menu		Press ● + ▲ or ● + ▼ to change parameter value		
DISPLAY (For 1sec)	DESCRIPTION	DEFAULT VALUE	RANGE	CONDITION
PW	Password	dis	ENB / DIS	Enable / Disable password protection option
SPW	Set password	0	0-999	Will be prompted only when Password option is enabled

**NOTE :** PW option will be asked when the user enter the config. menu if PW option is enabled in the config menu and the user has to enter the password which he has set in the S.PW (set password) option.

Factory set (RST) <span style="float:right">Press ▲ to enter sub menu from main menu</span>				
Press ▲ or ▼ to scroll through sub menu		Press ● + ▲ or ● + ▼ to change parameter value		
DISPLAY (For 1sec)	DESCRIPTION	DEFAULT VALUE	RANGE	CONDITION
RST	Reset (Factory set)	NO	YES / NO	

TRIP VALUE SETTING (Online) <span style="float:right">Press ▲ key for 3 sec. to enter or exit Trip Value Setting menu :</span>				
Press ▲ or ▼ to scroll through main menu		Press ● + ▲ or ● + ▼ to change parameter value		
DISPLAY (For 1sec)	DESCRIPTION	DEFAULT VALUE	RANGE	CONDITION
LCK	LOCK	YES	YES / NO	This option will prompted first when the user enters the trip setting menu. User has to set NO after which he can access the trip setting menu.
5.0V	Set over voltage for Relay 1	264	85 - 500V(Default : 498) [For 3P3W system] 50 - 288V(Default : 264) [For 3P4W system]	
5.0V	Set under voltage for Relay 1	184	85 - 500V(Default : 332) [For 3P3W system] 50 - 288V(Default : 184) [For 3P4W system]	

Press ▲ or ▼ to scroll through main menu		Press ● + ▲ or ● + ▼ to change parameter value		
DISPLAY (For 1sec)	DESCRIPTION	DEFAULT VALUE	RANGE	CONDITION
5.0V	Set over voltage for Relay 2	264	85 - 500V(Default : 498) [For 3P3W system] 50 - 288V(Default : 264) [For 3P4W system]	
5.0V	Set under voltage for Relay 2	184	85 - 500V(Default : 332) [For 3P3W system] 50 - 288V(Default : 184) [For 3P4W system]	
TRP	Trip time delay for Relay1	30	0.0 - 300s	
TRP	Trip time delay for Relay2	30	0.0 - 300s	
LCK	LOCK	NO	YES / NO (In this option if YES is selected by the user, then whenever the user enters the Trip Value Setting, initially LOCK option will be prompted. The user will have to set NO after which he can access the trip setting menu. If the user wants to disable LOCK option, he can set NO when LOCK option is prompted after TRP option.)	

**NOTE :** If Values are changed, the same setting in config menu will also changed and vice versa, also if RL1 is selected for RL2 in config menu no parameter of Relay 2 will be prompted in the above trip value setting.

**ONLINE KEYS** Individual parameters can be viewed with every press of ▼ keys.

PARAMETER	SYMBOL
*Average Voltage	L1 L2 L3
Voltage (L1-phase)	L1
Voltage (L2-phase)	L2
Voltage (L3-phase)	L3
Voltage (L1-L2 phase)	L1 L2
Voltage (L2-L3 phase)	L2 L3
Voltage (L1-L3 phase)	L1 L3
Frequency	Hz
Phase Asymmetry	As %

\* **Default Page :** This page is displayed after 3 sec. from other online page.  
For 3P4W system average of L-N voltages is shown.  
For 3P3W system average of L-L voltages is shown.

**TRIP INDICATION** Trip Indication on press of ▲ key : Trip value will be displayed till the key is pressed.

**RESET** Press ● key for 3sec. to reset manually (Applicable only if Latch is ON)

**Master Password : 753**

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

(Specifications subject to change as development is a continuous process.)

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