



**FEATURES**

- Under voltage, over voltage, under frequency, over frequency, asymmetry, phase failure and phase sequence monitoring in 3Ø system
- RMS measurement
- Power ON delay, Trip time delay and Delay on release
- Adjustable switching hysteresis
- Two separate alarm relays operation

**SPECIFICATIONS**

**DISPLAY**

3 Digits, Liquid Crystal Display

**ELECTRICAL CONNECTION**

3Ø-3 wire, 3Ø-4 wire

**AUXILIARY SUPPLY**

Self powered

**OPERATING RANGE**

280 – 520V AC (L-L)

160 – 300V AC (L-N)

**FREQUENCY RANGE**

45 - 65Hz

**VA RATING**

30VA max

**TRIP SETTINGS**

Under Voltage : 280 to 520V AC (L-L)

[for 3Ø-3 wire]

160 to 300V AC (L-N)

[for 3Ø-4 wire]

Over Voltage : 280 to 520V AC (L-L)

[for 3Ø-3 wire]

160 to 300V AC (L-N)

[for 3Ø-4 wire]

Under Frequency : 45 – 65Hz

Over Frequency : 45 – 65Hz

Phase Asymmetry : 5.0 – 99.9%

**TIME SETTINGS**

Power ON Delay : 2.0 - 99.9sec

Response Delay : 0 - 99.9sec

(Trip time delay)

Delay ON Release : 0 - 99.9sec

Response Time : <200ms

**HYSTERESIS**

Voltage : 1.0 – 99.9V

Frequency : 0.2 – 2Hz

Asymmetry : 2.0 – 20.0%

**RESOLUTION**

Voltage : 1V

Frequency : 0.1Hz

**ACCURACY**

Voltage : ±1% of set value

Frequency : ±0.3Hz

Time : ±5% of setting + 200ms

(Recovery Time, Trip Delay, Power ON Delay)

**OUTPUT SPECIFICATIONS**

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

Relay2 : 1C/O (SPDT)

**RELAY RATING**

NO (5A, 250V AC / 30V DC)

NC (3A, 250V AC / 30V DC)

**LED INDICATION**

LED1 (Green) : Power ON

LED2 (Red) : Relay1

(Continuously ON after trip)

LED3 (Red) : Relay2

(Continuously ON after trip)

**ENVIRONMENTAL SPECIFICATIONS**

- Indoor use

- Altitude of up to 2000 meters

- Pollution degree II

Temperature : Operating : 0 to 55°C

Storage : -20 to 70°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**

135 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**

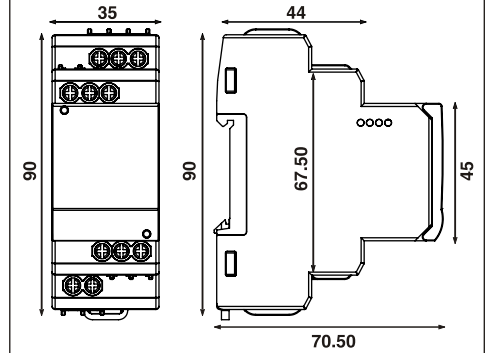
**WARNING**

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.

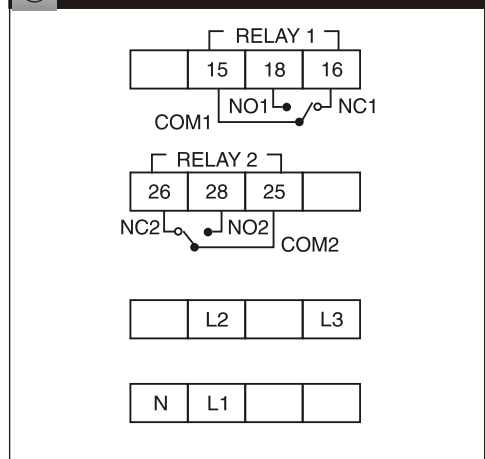
**DIMENSIONS ( All dimensions in mm )**



**LED INDICATION CHART**

Various Conditions	Power LED	'R1' LED	'R2' LED
No fault	ON	OFF	OFF
Trip (Relay 1)	ON	ON	OFF
Trip (Relay 2)	ON	OFF	ON
Trip (If programmed for both relays)	ON	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

OV    SOV    UV    SUV    OF    SOF    UF

Set under frequency    Asymmetry    Phase Asymmetry Setting    Phase sequence    Phase failure    Latch

SUF    AS    PAS    P59    PFL    LCH

Trip time delay    Recovery time    Power ON delay

TRP    REC    PON

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

RLY    OV    SOV    UV    SUV    OF    SOF

Under frequency    Set under frequency    Asymmetry    Phase Asymmetry Setting    Phase sequence    Phase failure    Latch

UF    SUF    AS    PAS    P59    PFL    LCH

Trip time delay    Recovery time

TRP    REC

Voltage    Frequency    Asymmetry

VLT    FR9    ASY

Password Enable / Disble    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	288	280 - 520V(Default : 498) [For 3P3W system] 160 - 300V(Default : 288) [For 3P4W system]	This option will be prompted only when OV option is made ON
UV	Under voltage	OFF	ON / OFF	
SUV	Set under voltage	192	280 - 520V(Default : 332) [For 3P3W system] 160 - 300V(Default : 192) [For 3P4W system]	This option will be prompted only when UV option is made ON
OF	Over frequency	OFF	ON / OFF	
SOF	Set over frequency	55	45.0 - 65.0Hz	This option will be prompted only when OF option is made ON
UF	Under frequency	OFF	ON / OFF	
SUF	Set under frequency	45	45.0 - 65.0Hz	This option will be prompted only when UF option is made ON
AS	Asymmetry	ON	ON / OFF	
PAS	Phase Asymmetry Setting	100	5.0 - 99.9%	This option will be prompted only when AS option is made ON

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
P.S9	Phase sequence	ON <sub>R1</sub>	ON / OFF	
P.FL	Phase failure	ON <sub>R1</sub>	ON / OFF	
LCH	Latch	OFF <sub>R1</sub>	ON / OFF	If Latch is ON, user has to reset the unit manually when fault is removed
<b>Time Setting for Relay 1 (TM1)</b> 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
TRP	Trip time delay	3.0 <sub>R1 t</sub>	0.0 - 99.9s	
REC	Recovery time	0.5 <sub>R1 t off</sub>	0.0 - 99.9s	
P.ON	Power ON delay	5.0 <sub>R1 ton</sub>	2.0 - 99.9s	Applicable for Relay 1 & Relay 2
<b>Relay 2 (RL2)</b> 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
RLY	Relay	RL1 <sub>R2</sub>	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.
OV	Over voltage	ON <sub>R2</sub>	ON / OFF	
SOV	Set Over voltage	288 <sub>R2</sub>	280 - 520V(Default : 498) [For 3P3W system] 160 - 300V(Default : 288) [For 3P4W system]	This option will be prompted only when OV option is made ON
UV	Under voltage	OFF <sub>R2</sub>	ON / OFF	
SUV	Set under voltage	192 <sub>R2</sub>	280 - 520V(Default : 332) [For 3P3W system] 160 - 300V(Default : 192) [For 3P4W system]	This option will be prompted only when UV option is made ON

DISPLAY (For 1sec)	DESCRIPTION	DEFAULT VALUE	RANGE	CONDITION
OF	Over frequency	OFF <sub>R2 Hz</sub>	ON / OFF	
SOF	Set over frequency	55 <sub>R2 Hz</sub>	45.0 - 65.0Hz	
UF	Under frequency	OFF <sub>R2 Hz</sub>	ON / OFF	
SUF	Set under frequency	45 <sub>R2 Hz</sub>	45.0 - 65.0Hz	This option will be prompted only when UF option is made ON
AS	Asymmetry	ON <sub>R2 As</sub>	ON / OFF	
PAS	Phase Asymmetry Setting	100 <sub>R2 %</sub>	5.0 - 99.9%	This option will be prompted only when AS option is made ON
P.S9	Phase sequence	ON <sub>R2</sub>	ON / OFF	
P.FL	Phase failure	ON <sub>R2</sub>	ON / OFF	
LCH	Latch	OFF <sub>R2</sub>	ON / OFF	If Latch is ON, user has to reset the unit manually when fault is removed

<b>Time Setting for Relay 2 (TM2)</b> 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
TRP	Trip time delay	3.0 <sub>R2 t</sub>	0.0 - 99.9s	
REC	Recovery time	0.5 <sub>R2 t off</sub>	0.0 - 99.9s	

**Note :** Relay 2 (RL2) Default values shown are applicable when Relay 2 (RL2) 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
VLL	Hysteresis for voltage	10 <sup>V</sup>	1.0 - 99.9V	
FR9	Hysteresis for frequency	0.2 <sup>H</sup>	0.2 - 2Hz	
AS4	Hysteresis for Asymmetry	20 <sup>As</sup>	2 - 20%	

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	d15	ENB / DIS	Enable / Disable password protection option
SPW	Set password	000	000-999	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 <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.

Press ▲ or ▼ to scroll through main menu		Press ● + ▲ or ● + ▼ to change parameter value		
DISPLAY (For 1sec)	DESCRIPTION	DEFAULT VALUE	RANGE	CONDITION
5.0V <sup>R1</sup>	Set over voltage for Relay 1	288 <sup>&gt;V</sup>	280 - 520V(Default : 498) [For 3P3W system] 160 - 300V(Default : 288) [For 3P4W system]	
5.0V <sup>R1</sup>	Set under voltage for Relay 1	192 <sup>&lt;V</sup>	280 - 520V(Default : 332) [For 3P3W system] 160 - 300V(Default : 192) [For 3P4W system]	
5.0V <sup>R2</sup>	Set over voltage for Relay 2	288 <sup>&gt;V</sup>	280 - 520V(Default : 498) [For 3P3W system] 160 - 300V(Default : 288) [For 3P4W system]	
5.0V <sup>R2</sup>	Set under voltage for Relay 2	192 <sup>&lt;V</sup>	280 - 520V(Default : 332) [For 3P3W system] 160 - 300V(Default : 192) [For 3P4W system]	
TRP	Trip time delay for Relay1	30 <sup>s</sup>	0.0 - 99.9s	
TRP	Trip time delay for Relay2	30 <sup>s</sup>	0.0 - 99.9s	
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 TR2 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.

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 %

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

\* **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.

<b>TRIP INDICATION</b>	Trip Indication on press of ▲ key : Trip value will be displayed till the key is pressed.
<b>RESET</b>	Press ● key for 3sec. to reset manually
<b>Master Password : 753</b>	

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

( Specifications are subject to change, since development is a continuous process )

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