

## SAFETY PRECAUTIONS

1. The device must be installed by a qualified person,
2. Disconnect all power before working on the device. Don't touch any terminal when the power is ON.
3. Verify correct terminal connection when wiring.
4. Don't dismantle or repair the device whether it operates normally, otherwise no responsibility is assumed by producer and seller.
5. Never use the device at the site which can be invaded by corrode gas, strong sunshine light and rain.
6. Clean the device with a dry cloth.
7. Fail to follow these instructions will result in serious injury or death.

## FEATURES

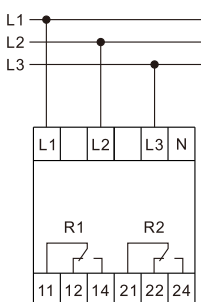
- Supply voltage measurement (True RMS)
- 3-wire or 4-wire connection (with or without neutral).
- Possibility of automatic or manual transition from fault state.
- Stores last five fault history.
- Digital backlight display for real time monitoring.
- Password protection.
- Each output relay can be set individually.

## TECHNICAL PARAMETERS

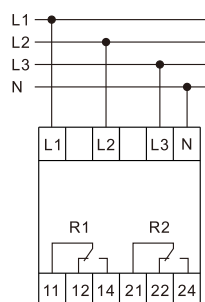
Wiring method	3 Phase 3 wire	3 Phase 4 Wire
Supply terminals	L1,L2,L3	L1,L2,L3-N
Supply and monitored voltage	AC 85-530V	AC 50-300V
OV and UV setting voltage	AC 150-520V	AC 85-300V
OV and UV limit voltage	AC 550V/AC 120V	AC 320V/AC 70V
OF and UF setting frequency	45-65Hz	
Asymmetry setting	Percentage: 2%~30%; absolute: 5-99V	
OV and UV hysteresis	2~20V	
OF and UF hysteresis	0.2-2Hz	
Asymmetry hysteresis	Percentage: 1%~15%; absolute: 2-50V	
Power ON delay	0.5-300s	
Off delay	0.1~300s(OV,UV,OF,UF and asymmetry) 200ms(phase sequence and failure)	
On delay	0.1~300s	
Asymmetry hysteresis	2%	
Voltage measurement error	≤1%	
Frequency measurement error	≤0.3Hz	
Delay error	±5%+0.1s	
Output contact	1C/O+1C/O	
Current rating	3A/250V AC1	
Mechanical life	10 <sup>5</sup>	
Electrical life	10 <sup>5</sup>	
Protection degree	IP20	
Pollution degree	3	
Altitude	≤2000m	
Operating temperature	-20°C~55°C	
Permissible relative humidity	≤50% at 40°C(without condensation)	
Storage temperature	-30°C~70°C	
Wire size	0.5mm <sup>2</sup> ~2.5mm <sup>2</sup>	
Torque	0.5Nm	
Mounting	Th35 Rail(EN60715)	

## WIRING DIAGRAMS

### ● 3-wire connection



### ● 4-wire connection

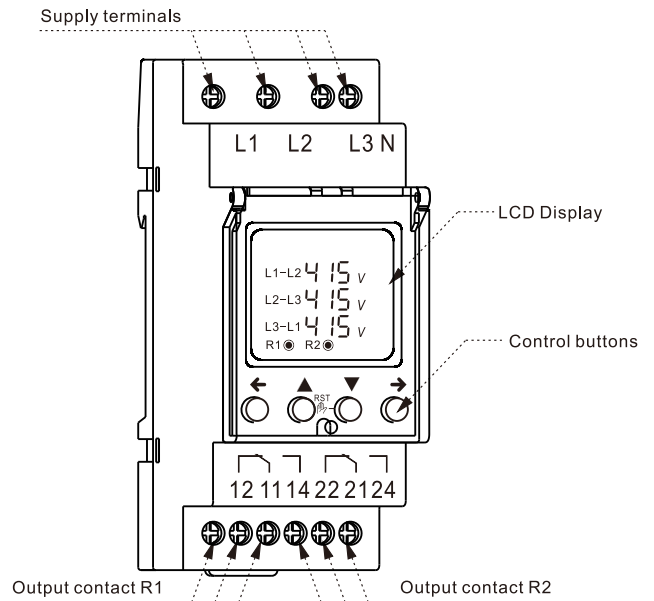


## 53990

## DIGITAL VOLTAGE MONITORING RELAY

Please read complete instructions prior to installation and operation of the device.

## DESCRIPTION



### Symbol legend

R1● — R1 relay ON	R2● — R2 relay ON
R1○ — R1 relay OFF	R2○ — R2 relay OFF
⊙ — Indication of a running delay	L1-L2 — Voltage in L1-L2(3P 3W)
V — Voltage	L2-L3 — Voltage in L2-L3(3P 3W)
s — Delay in seconds	L3-L1 — Voltage in L3-L1(3P 3W)
% — Asymmetry in percentage	L1 — Voltage in L1(3P 4W)
Hz — Frequency in Hz	L2 — Voltage in L2(3P 4W)
	L3 — Voltage in L3(3P 4W)

### Display Legend

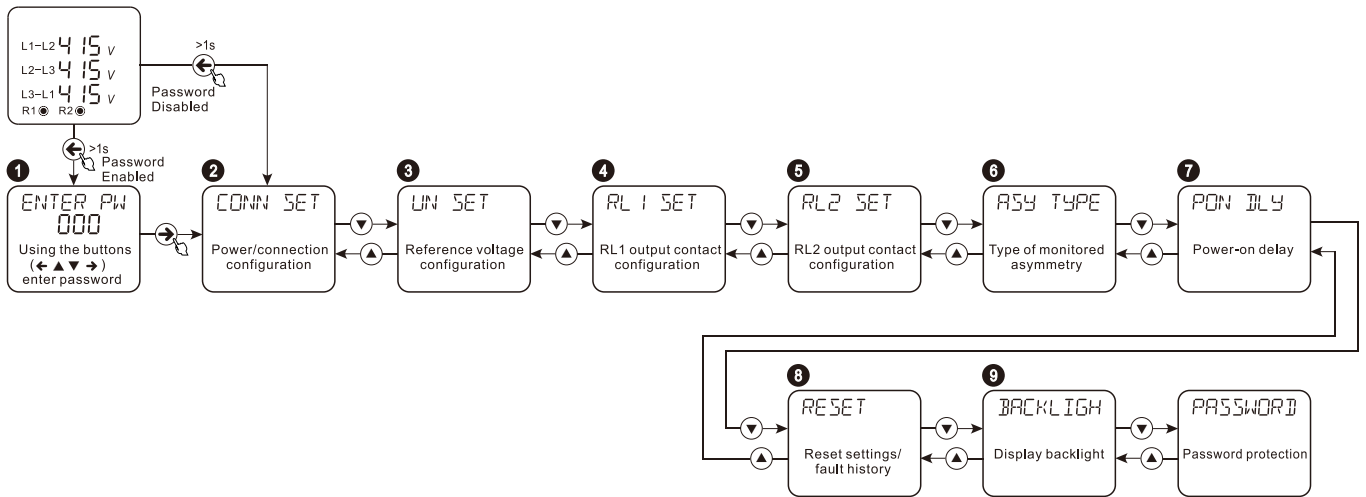
FAULT--NF	Neutral fail
FAULT--LC	Lower threshold voltage
FAULT--HC	Upper threshold voltage
RL1--FAIL	RL1 phase failure
RL1--SEQ	RL1 phase sequence
RL1--ASY	RL1 asymmetry
RL1--OV	RL1 over-voltage
RL1--UV	RL1 under-voltage
RL1--OF	RL1 over-frequency
RL1--UF	RL1 under-frequency
RL2--FAIL	RL2 phase failure
RL2--SEQ	RL2 phase sequence
RL2--ASY	RL2 asymmetry
RL2--OV	RL2 over-voltage
RL2--UV	RL2 under-voltage
RL2--OF	RL2 over-frequency
RL2--UF	RL2 under-frequency

Relay mode	OK state	Fault state
Fail Safe	R1● 11-14 R2● 21-24	R1○ 11-12 R2○ 21-22
Non Fail Safe	R1○ 11-12 R2○ 21-22	R1● 11-14 R2● 21-24

### Control buttons

← ○ Enter the setting menu	→ ○ Confirm edition
⊙ ○ Return to previous menu	⊙ ○ Next menu
▲ ○ Menu selection	▼ ○ Menu selection
⊙ ○ Increase the value of a parameter	⊙ ○ Decrease the value of a parameter
○ View values of frequency and asymmetry	○ View history of fault states
▲ RST ⊙ ○ Manual reset	

## MAIN MENU

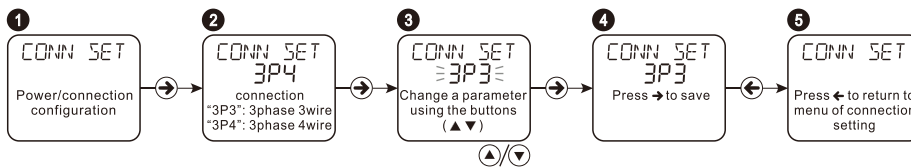


1	ENTER PW	Enter password
2	CONN SET	Power/Connection setting
3	UN SET	Reference voltage setting
4	RL1 SET	RI1 parameters setting
5	RL2 SET	RI2 parameters setting

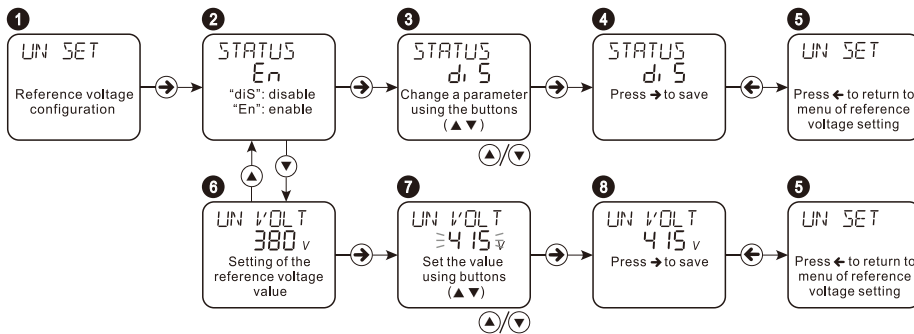
6	ASY TYPE	Setting of asymmetry type
7	PON DLY	Power-on delay setting
8	RESET	Reset setting
9	BACKLIGH	Display backlight setting
10	PASSWORD	Password protection setting

## SUBMENU SETTING

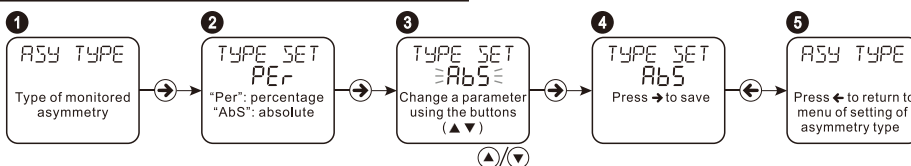
### ● Power/Connection setting



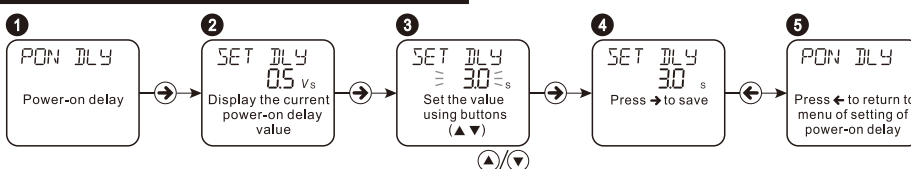
### ● Reference voltage setting



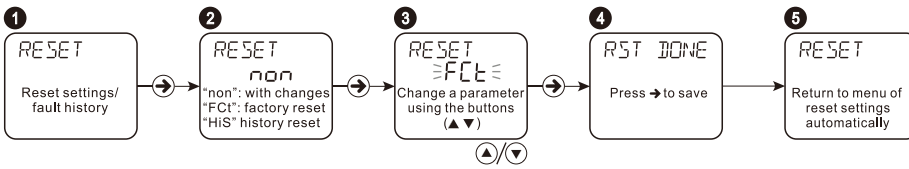
### ● Type of monitored asymmetry



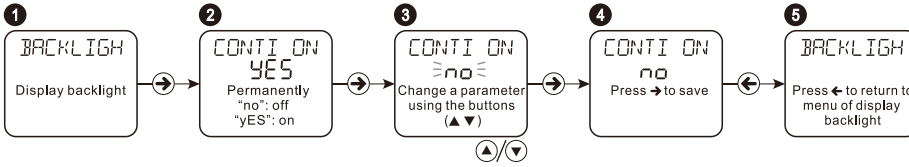
### ● Power-on delay



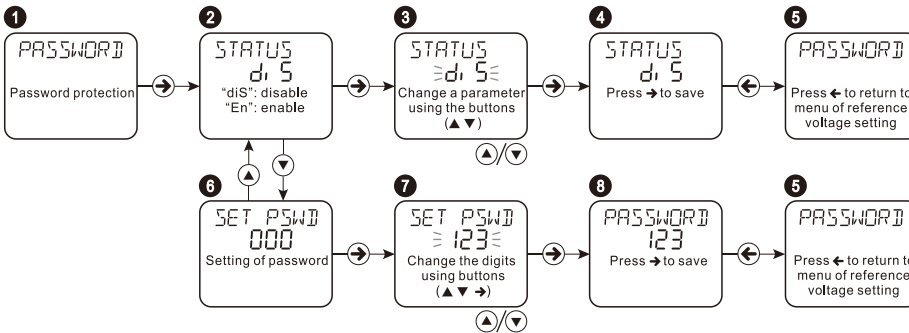
## ● Reset settings



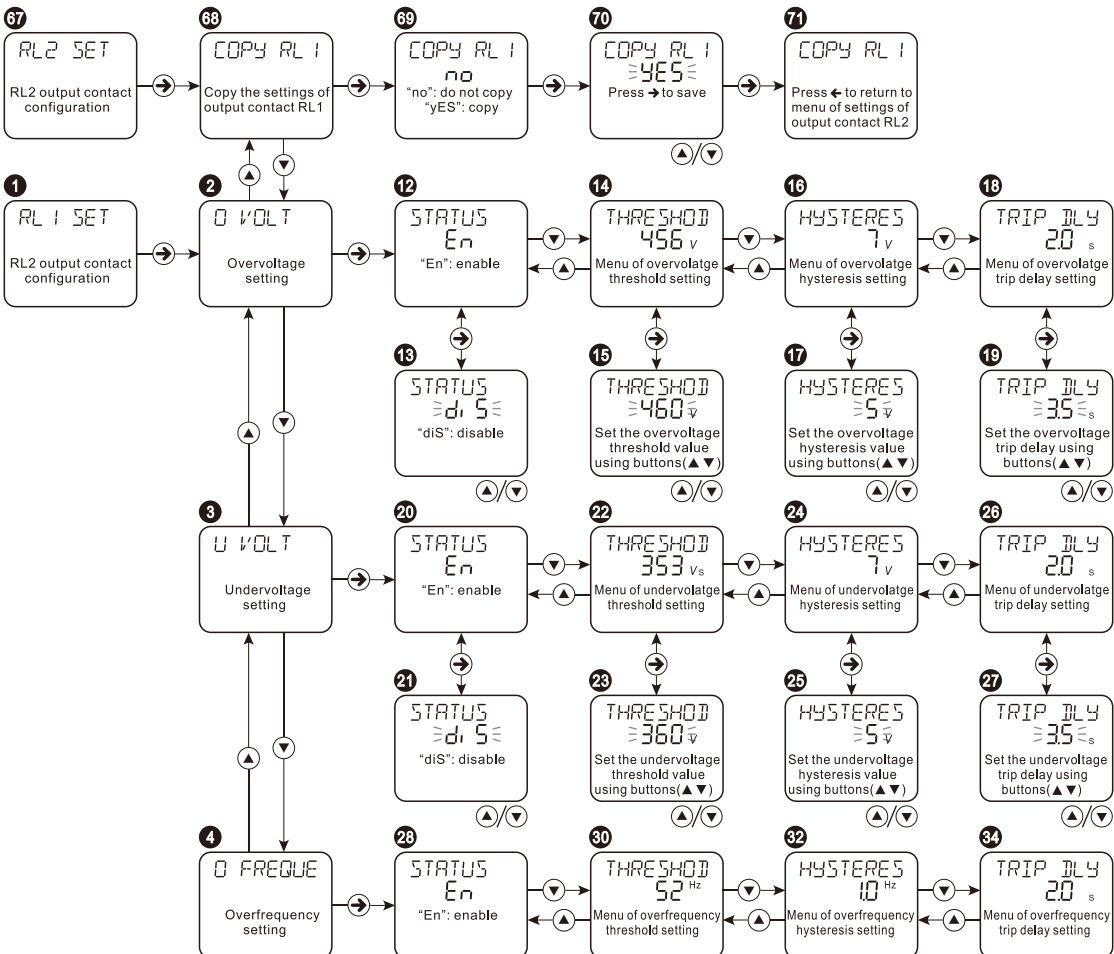
## ● Display backlight

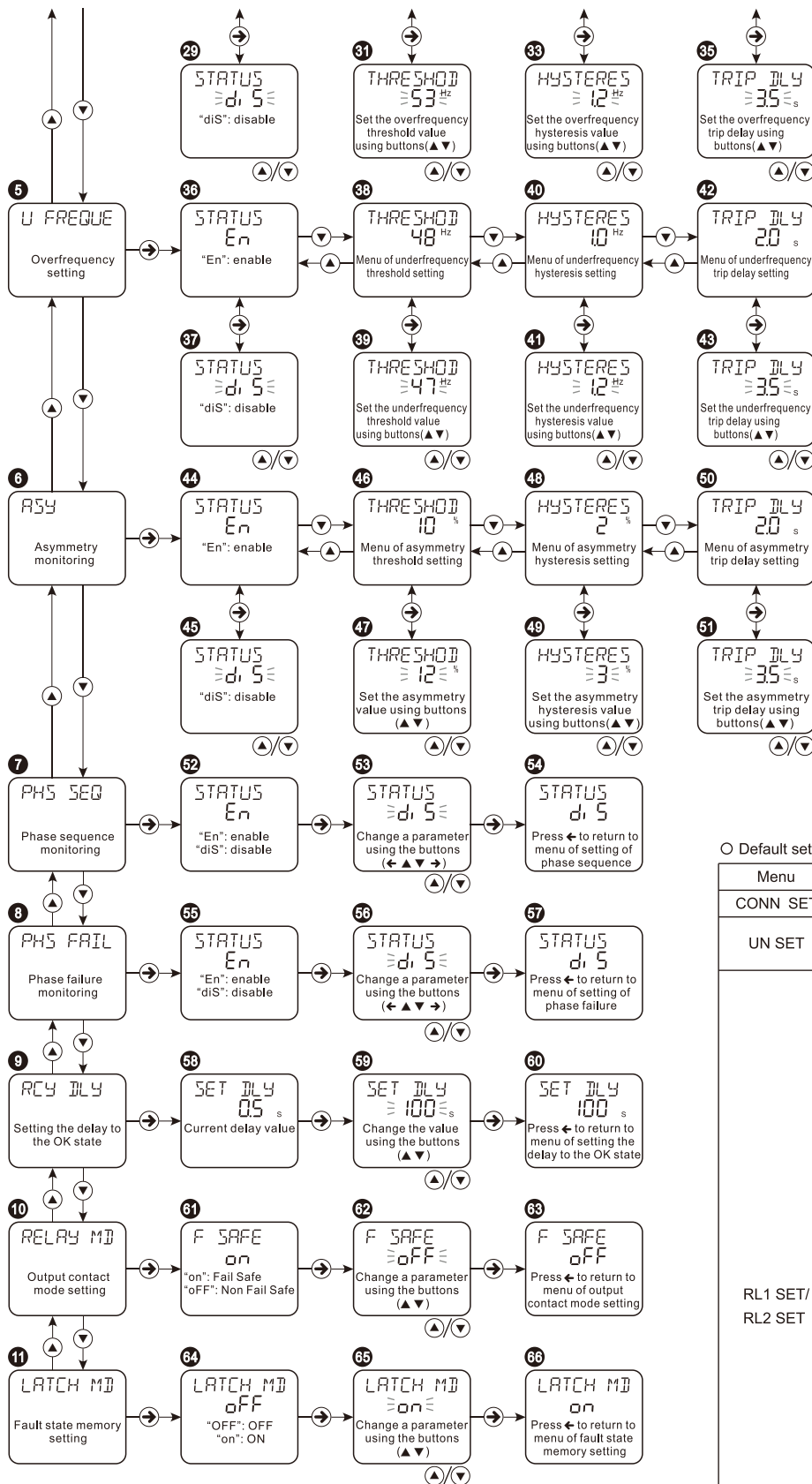


## ● Password protection



## ● RL1/RL2 setting



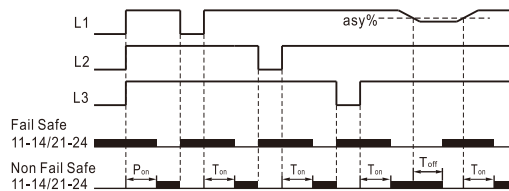


○ Default setting values

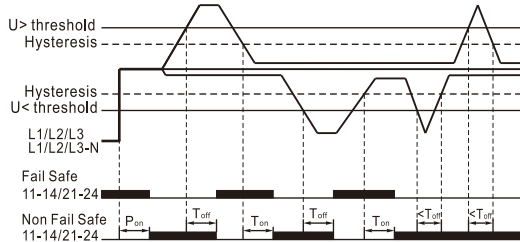
Menu	Submenu 1	Submenu 2	Pre-value
CONN SET			3P4
UN SET	STATUS		En(enable)
	UN VOLT		240V
RL1 SET/ RL2 SET	O VOLT	STAUTS	En(enable)
		THRESHOD	264V
		HYSTERES	5V
		TRIP DLY	2.0s
	U VOLT	STAUTS	En(enable)
		THRESHOD	192V
		HYSTERES	5V
		TRIP DLY	2.0s
	O FREQUE	STAUTS	En(enable)
		THRESHOD	52Hz
		HYSTERES	1.0Hz
		TRIP DLY	2.0s
U FREQUE	STAUTS	En(enable)	
	THRESHOD	48Hz	
	HYSTERES	1.0Hz	
	TRIP DLY	2.0s	
ASY	STAUTS	En(enable)	
	THRESHOD	10%	
	HYSTERES	2%	
	TRIP DLY	2.0s	
PHS SEQ	STATUS		En(enable)
PHS FAIL	STATUS		En(enable)
RCY DLY	SET DLY		0.5s
RELAY MD	F SAFE		ON
LATCH MD	LATCH MD		OFF
ASY TYPE	TYPE SET		Per
PON DLY	SET DLY		0.5s
RESET	RESET		non
BACKLIGH	CONTI ON		YES
PASSWORD	STATUS		dIS
	SET PSWD		000

## FUNCTION DIAGRAMS(AUTO-RESET)

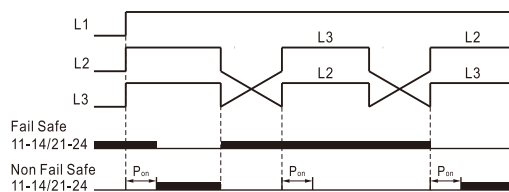
### ● Phase failure and asymmetry



### ● Overvoltage and undervoltage

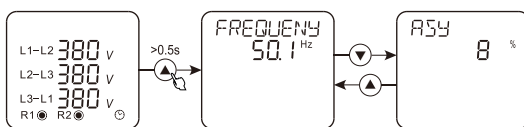


### ● Phase sequence

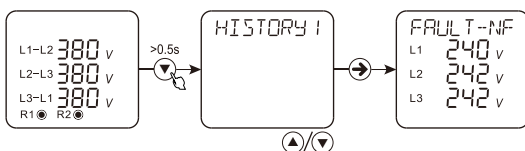


P<sub>on</sub>: Power-on delay(delay after power supply connection)  
 T<sub>on</sub>: ON delay(delay to OK state)  
 T<sub>off</sub>: OFF delay(delay to fault state)

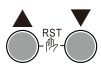
## VIEW OF OPERATION FREQUENCY AND ASYMMETRY



## VIEW OF HISTROY OF LAST FAULT STATES



## MANUAL RESET



When "LTACH MD" setting is ON, the relay will remain fault state after the output relay tripped. press "▲" and "▼" keys simultaneously to eliminate the fault state.

## DIMENSION

