PECTECH SRL
Via A. Brustolon, 2A, 35031
Abano Terme (PD)

PEC-EM3-96-5A

Three-phase multifunction energy meter



User Guide V1.3

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Safety Information - Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER
DANGER indicates an imminently hazardous situation which,if not avoided, will result in death or serious injury.

WARNING
WARNING indicates a potentially hazardous situation which, if not avoided, can result in death or serious injury.

CAUTION
CAUTION indicates a potentially hazardous situation which, if not avoided, can result in minor or moderate injury.

NOTICE
NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this signal word.

Please Note

Electrical equipment should be installed, operated,serviced, and maintained only by qualified personnel. No responsibility is asumed by Pectech for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recongnize and avoid the hazards involved.

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Chapter 1. Overview

1.1. Introduction

PEC-EM3-96-5A product is a multi-function power measurement for collection and analysis of electric parameters, used not only in the electricity transmission and power distribution system, but also in the power consumption measurement and in high voltage intelligent power grid. This product can support a variety of electric parameter measurement, such as voltage, current, the four quadrant power, PF, total harmonic distortion, individual harmonic distortion, unbalance factor, crest factor, etc.

This product also provide a variety of electrical energy parameters measurement, such as two-way active energy, reactive energy, four-quadrant energy, monthly and daily energy consumption statistics.

PEC-EM3-96-5A can support in the 1P2W, 2P3W, 3P3W and 3P4W grid environment, and at the same time providing multi-channel digital input/output interface, and SOE function, is suitable for real time power monitoring and control system, the energy consumption management system, industrial monitoring site, high stability and long life characteristics.

PEC-EM3-96-5A can support external voltage transformer (PT) and current transformer (CT) access, the maximum current up to 9999A, the maximum voltage up to 600kV. This product with RS485 communication interface, supporting Modbus RTU protocol with maximum baud rate to 38400bps. It can easily realize the function of remote data read, and it's fit with a large-screen LCD and touch-sensitive buttons, for local view and set operation of various parameters. The product has the function of password protection, to assures the security.

1.2. **Characteristics**

- Multi-function parameter measurement, providing voltage, current, active power, reactive power, apparent power, power factor, phase Angle, etc.
- Provides a variety of analytical parameters, such as total harmonic distortion (THD) and Individual harmonic distortion (IHD) of voltage/current, voltage/current unbalance factor, voltage crest factor, current K factor, etc. The Sub-harmonic component is maximum supported to the 63rd.
- Provide a variety of statistical data and local storage functions, such as two-way power, four-quadrant power, demand, maximum/minimum value and other statistical data. Provide monthly electricity consumption statistics for the last 12 months and daily electricity consumption statistics for the last 31 days.
- External current transformers of output types 5A
- Support external voltage transformer access (minimum input 30V).
- Embedded installation, product panel size is 96*96mm.
- Plug and pull type connection mode, convenient construction connection.
- Liquid crystal display with backlit, backlight lighting time adjustable.
- LCD refresh time is 1 second, support manual or automatic scroll display (configurable).
- Support multi - channel digital input and output interface.
- Two pulse optocoupler output interfaces are pulse 1 and pulse 2 respectively. The output parameter can be set for pulse 1, while the fixed pulse 2 represents the total active energy of the secondary side, which cannot be set.
- Support RS485 Modbus RTU communication protocol, baud rate up to 38400bps.

1.3. Parameters

1. The Unit can measure and display	
Instantaneous RMS Values	
Current	Per phase, neutral
Voltage	L-L, L-N
Frequency	45 to 65Hz
Active power	Total and per phase
Reactive power	Total and per phase
Apparent power	Total and per phase
Power factor	Total and per phase
Phase sequence	Voltage phase sequence, Current phase sequence
Energy Values (include: import, export, import + export)	
Active energy	0 to $1.0*10^{14}$ Wh
Reactive energy	0 to $1.0*10^{14}$ varh
Multi-Tariff active energy (T1 - T4)	0 to $1.0*10^{14}$ Wh
Maximum Demand Values	
Max.Demand of current	Per phase, neutral
Max.Demand of active power	Total
Max.Demand of reactive power	Total
Max.Demand of apparent power	Total
Harmonic Distortion Values	
Total harmonic distortion (THD)	Current and voltage (L-L and L-N)
Individual harmonic distortion (IHD)	Current and voltage (L-L and L-N), 2~63rd
Maximum and Minimum Values	
Max./Min.Value of voltage	L-L, L-N
Max./Min.Value of current	Per phase, neutral
Max./Min.Value of active power	Total and per phase
Max./Min.Value of reactive power	Total and per phase
Max./Min.Value of apparent power	Total and per phase

2. The Unit can measure and communication read	
Power Quality Values	
Voltage unbalance factor	Negative-sequence, Zero-sequence
Current unbalance factor	Negative-sequence, Zero-sequence
Voltage crest factor	Per phase
Current K factor	Per phase
Nature of load	System total load, Per phase load
Displacement power factor	Total and per phase
Maximum Demand Values	
Max.Demand of active power	Import active power, Export active power
The occur time of max. demand	Voltage, Current, Active power, Reactive power, Apparent power
Maximum and Minimum Values	
Max./Min.Value of current	Total current
Max./Min.Value of power factor	Total and per phase
Voltage THD	L-L, L-N
Current THD	Per phase
The occur Time max./min.Value	Voltage, Current, Active power, Reactive power, Apparent power, Power factor, Voltage/Current THD
Energy Values	
Apparent Energy (total)	0 to $1.0*10^{14}$ VAh
Per phase energy	Active energy and reactive energy, include: import, export, import+export Range: 0 to $1.0*10^{14}$ Wh/varh
Net energy	Active energy and reactive energy. (net = import - export) Range: 0 to $1.0*10^{14}$ Wh/varh
Multi-Tariff active energy (T1 - T4)	Per phase active energy and reactive energy, include: import, export, import+export

	Range: 0 to $1.0*10^{14}$ Wh/varh
Four quadrant reactive energy	0 to $1.0*10^{14}$ varh
Monthly electricity consumption for the last 12 months	Active energy and reactive energy, include: import, export, import+export Range: 0 to $1.0*10^{14}$ Wh/varh
Daily energy consumption for the last 31 days	Active energy, include: import, export, import+export Range: 0 to $1.0*10^{14}$ Wh

3. The Unit can settable	
Communication class	Modbus address, baud rate, parity bit, stop bit
Current transformer (CT) class	CT1 (Primary), range from 1 to 9999 CT2 (Secondary) = 5
Voltage transformer (PT) class	PT1 (Primary), range from 30 to 600000 PT2 (Secondary), range is 30 to 600
Power system type	1P2W, 2P3W, 3P3P, 3P4W
System configuration class	Current direction correction, User password (HMI)
Demand class	Demand interval period, Slide time, Demand calculation method
Pulse output class	Pulse output type, Pulse output width, Pulse output rate
Time class	Automatic scroll display time, Backlit time, System time (RTC), Tariff time
Reset	Energy, Demand, Max./Min.Value, DI count, SOE info
Digital input (DI) class	DI filter time, DI count
Digital output (DO) class	Output mode, Pulse width time of output, Manual control
Alarm (AL) class	Alarm monitoring object, Delay time of alarm action, Alarm threshold value, Alarm status

Chapter 2. Technical parameters specification

2.1. Specification

Electrical Characteristics		
Type of measurement		RMS including harmonics on AC system 128 samples per cycle
Measurement accuracy	Voltage, Current	Class 0.5, according IEC 61557-12
	Active power	Class 0.5, according IEC 61557-12
	Reactive power	Class 2, according IEC 61557-12
	Apparent power	Class 1, according IEC 61557-12
	Active energy	Class 0.5S, according IEC 62053-22 Class 0.5, according IEC 61557-12
	Reactive energy	Class 2, according IEC 62053-23 Class 2, according IEC 61557-12
	Power factor	Class 1, according IEC 61557-12
	Frequency	Class 0.05, according IEC 61557-12
	Harmonic distortion	Class 2, according IEC 61557-12
Data update rate		1 second. Optional 100 ms
Input-Voltage	Rate voltage (Un)	230 Vac (L-N) / 400 Vac (L-L)
	Measured range (Direct connection)	30 to 350 Vac (L-N), 30 to 660 Vac (L-L)
	PT primary	30 to 600000
	Impedance	1MΩ
	Frequency range	45 to 65 Hz
	Overload capacity	2*Un for 1 second
Input-Current	CT2 (Secondary)	5A
	CT1 (Primary)	1 to 9999 A
	Measured range	0.003 to 6 A, basic current (Ib) is 5A
	Impedance	<0.01 ohm
	Overload capacity	120A for 0.5 second
	Burden	<0.06VA at 6A
Auxiliary power supply	Operating range	80 ~ 300 Vac / 100 ~ 420 Vdc
	Frequency	45 ~ 65 Hz
	Power consumption	< 4VA/0.5W
Digital input (DI)	Number	4
	Type	Support dry contact input (built-in power supply: 20 ~ 24VDC)
	Input Resistance	10kΩ
	Maximum frequency	250Hz
	Response time	2 milliseconds
	Isolation	2.5 kVrms
Digital output (DO)	Number/Type	2 - electromagnetic relay
	Output frequency	10Hz maximum
	Switching current	250 Vac at 3.0 Amps, 100k cycles
	Isolation	2.5 kVrms
Pulse output	Interface type	Open collector optocoupler
	Pulse constant	Per pulse equal 0.001/0.01/0.1/1/10/100/1000 kWh/kvarh (Configurable)
	Pulse width	60/100/200 milliseconds (Configurable), default is 100milliseconds
	Pulse output type	Import/export/total active energy, Import/export/total reactive energy (Configurable)
	Class	Class A, according IEC 62053-31
	Input voltage	5 ~ 27 Vdc
Pulse indicator light on the panel		Pulse constant is 5000imp/kWh, Represents the total active energy of the secondary side
Real-time clock accuracy		1.0 s/d

Mechanical Characteristics	
IP Degree of Protection (IEC 60529)	Designed to IP51 front display, IP30 meter body
Dimensions (W x H x D)	88 x 88 x 70 mm (depth of meter from housing mounting flange) 96 x 96 x 14 mm (protrusion of meter from housing mounting flange)
Weight	390g.
Mounting Position	Vertical
Panel thickness	1 ~ 5 mm
Material of meter case	UL 94 V-0

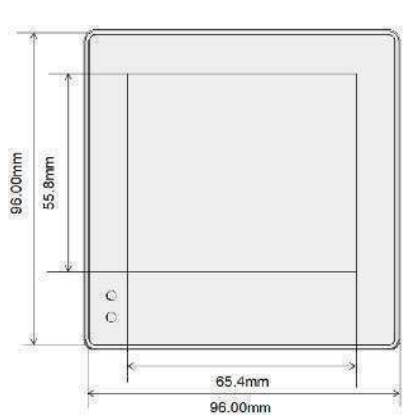
Environmental Characteristics	
Operating Temperature	-25 to +70℃
Storage Temperature	-40 to +80℃
Humidity	< 90%, non-condensing
Pollution Degree	2
Altitude	Up to 2000m
Vibration	10 Hz to 150Hz, IEC 60068-2-6

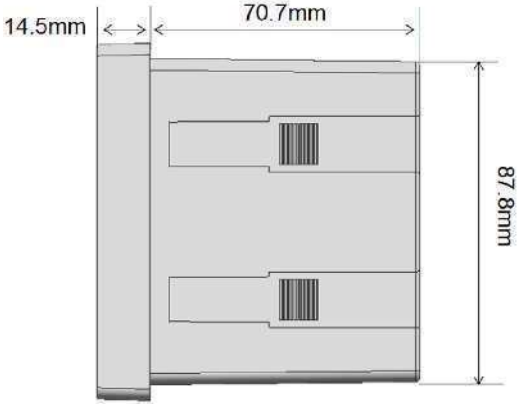
Electromagnetic Characteristics	
Electrostatic Discharge	Level 4, according IEC 61000-4-2(1)
Immunity to Radiated Fields	Level 3, according IEC 61000-4-3(1)
Immunity to Electrical Fast Transients	Level 4, according IEC 61000-4-4(1)
Immunity to Surges	Level 4, according IEC 61000-4-5(1)
Immunity to Conducted Disturbances	Level 3, according IEC 61000-4-6(1)
Immunity to Magnetic Fields	IEC 61000-4-8(1)
Immunity to Voltage Dips	IEC 61000-4-11(1)
Radiated Emissions	Class B, according EN55011
Conducted Emissions	Class B, according EN55011
Harmonics	IEC 61000-3-2(1)
(1): The experimental test is carried out according to the grade requirements of industrial grade products in IEC61326-1	

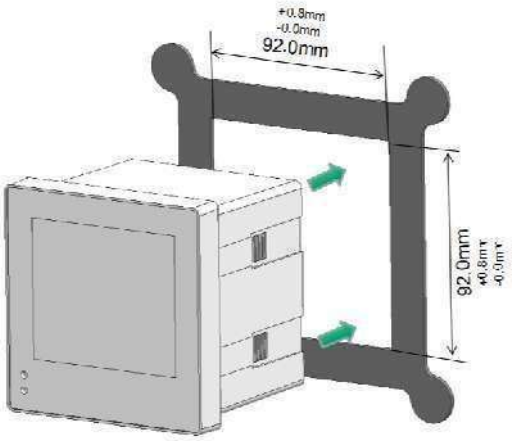
Safety	
Measurement Category	CAT III, according IEC 61010-1
Current Input	Require external Current Transformer for Insulation
Overvoltage Category	CAT III, according IEC 61010-1
Insulation	AC Voltage Test: 4kV for 1 minute
	Impulse Voltage Test: 6kV - 1.2/50μS waveform
Protective Class	II, according IEC61010-1

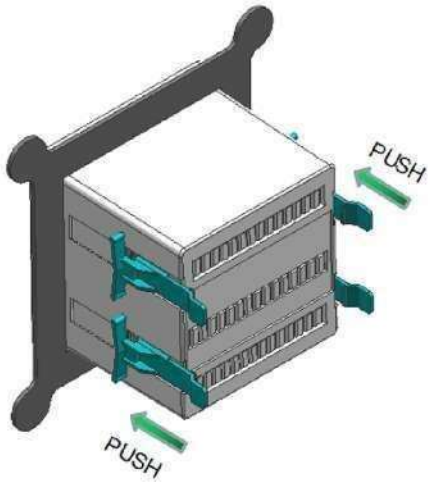
Communications	
Interfaces standard and protocols	2-wire RS485, Modbus RTU
Baud rate	1200 to 38400 bps, default is 9600 bps
Parity bit	None, Even, Odd, default is None
Stop bit	1 or 2, default is 1
Response time	<100ms
Transmission mode	half-duplex
Transmission distance	Up to 1000m
Max. Bus loading	64 pcs
Firmware Update	Support communication port to update firmware

2.2. **Installation dimensions**



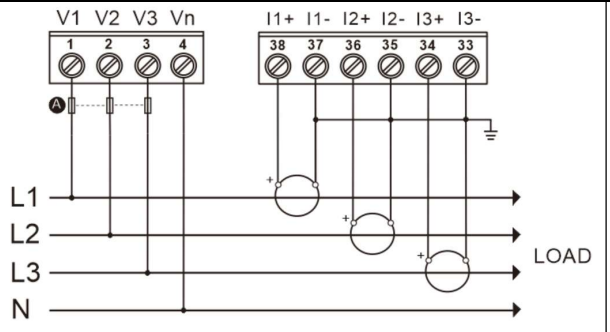
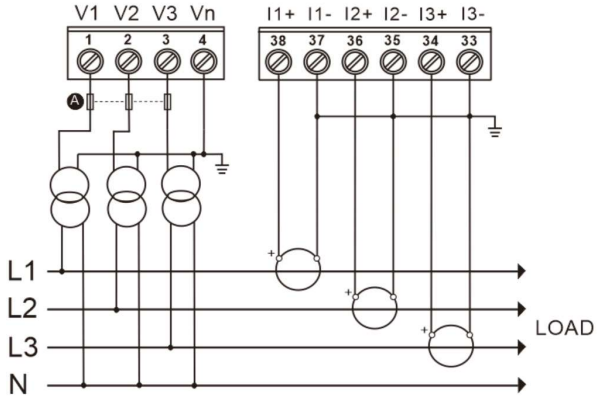
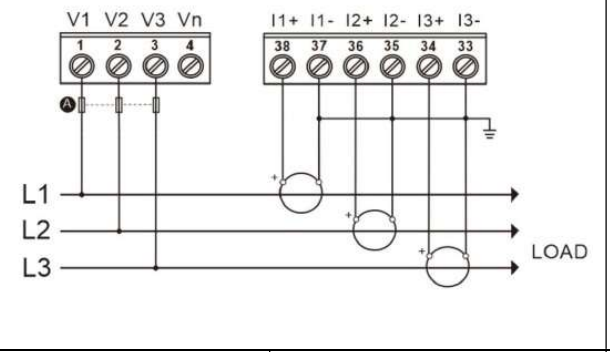
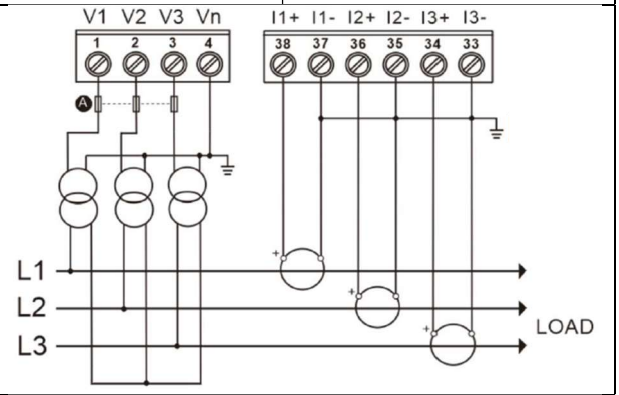
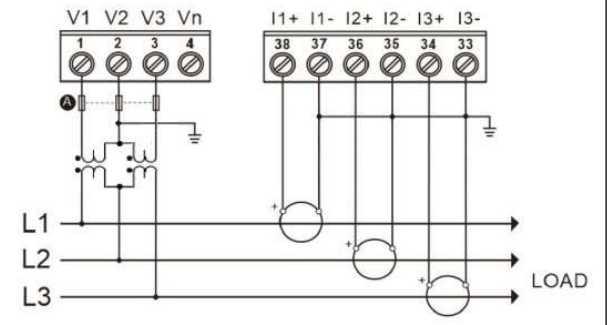
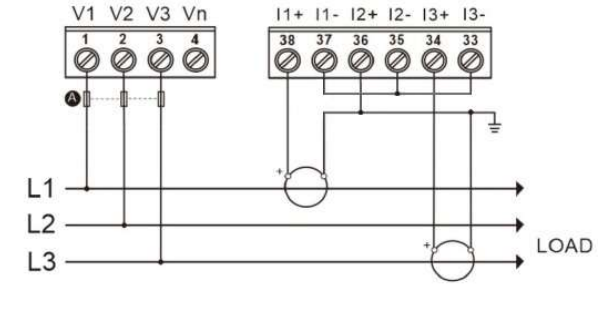
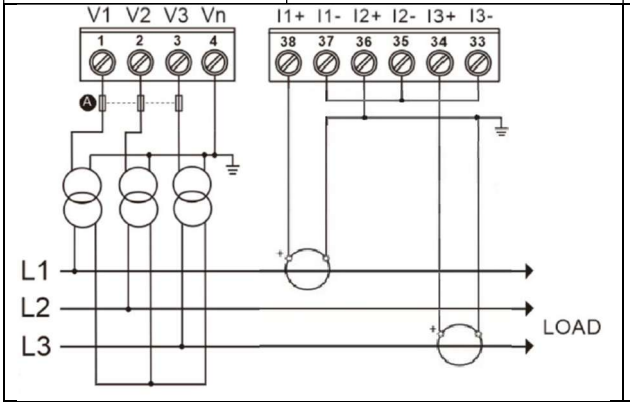
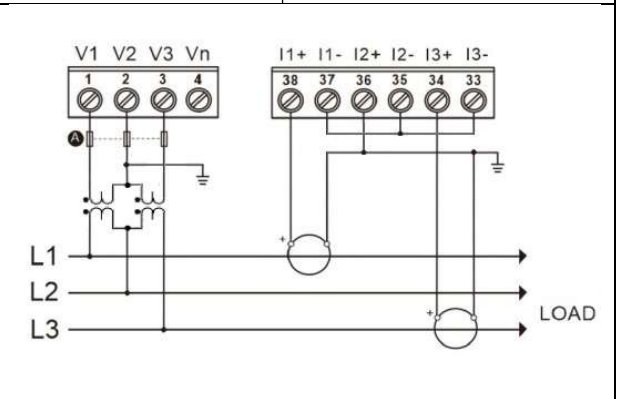




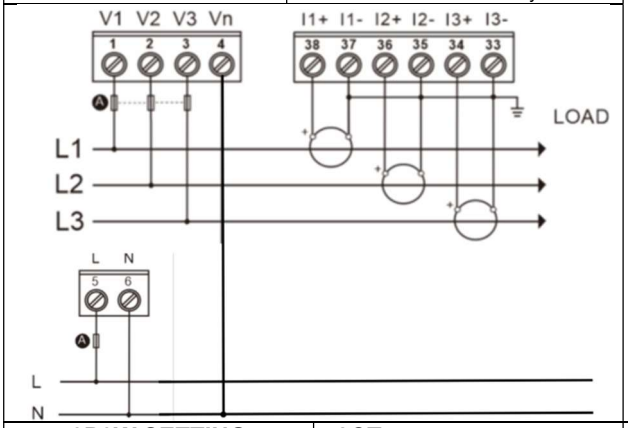


2.3. **Wiring Diagrams**

Measurement input wiring

3P4W SETTING	3CT DIAGRAM	**3P4W SETTING**	3PT+3CT DIAGRAM
			
3P4W SETTING	3CT DIAGRAM without neutral	**3P4W SETTING**	3PT+3CT DIAGRAM without neutral
			
3P4W SETTING	2PT+3CT DIAGRAM without neutral	**3P4W SETTING**	2CT DIAGRAM without neutral
			
3P4W SETTING	3PT+2CT DIAGRAM without neutral	**3P4W SETTING**	2PT+2CT DIAGRAM without neutral
			

3P4W SETTING | 3CT DIAGRAM + auxiliary neutral

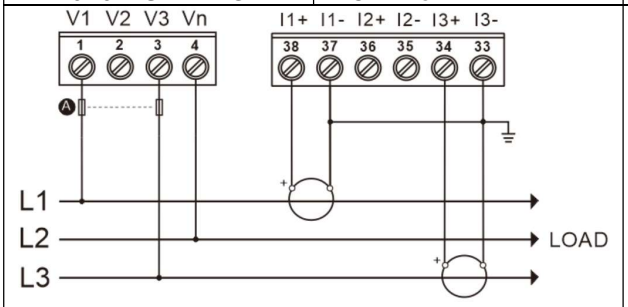


<u>3P3W</u> INSERTION (WITHOUT NEUTRAL)

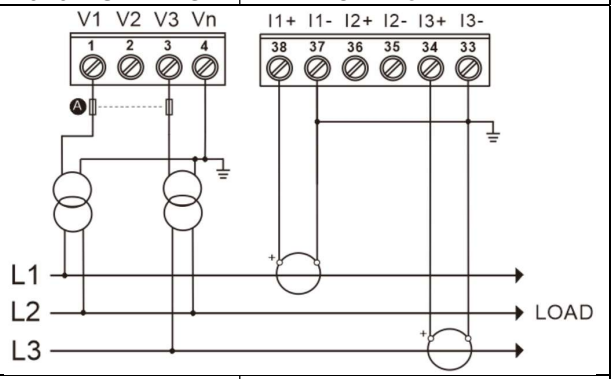
Device works in triangular mode, aren't available lines measures as V_{L-N} , $P_{1,2,3}$, $Q_{1,2,3}$, $S_{1,2,3}$, $PF_{1,2,3}$

Measures available V_{L-L} , $I_{1,2,3}$, P_{TOT} , Q_{TOT} , S_{TOT} , PF_{TOT}

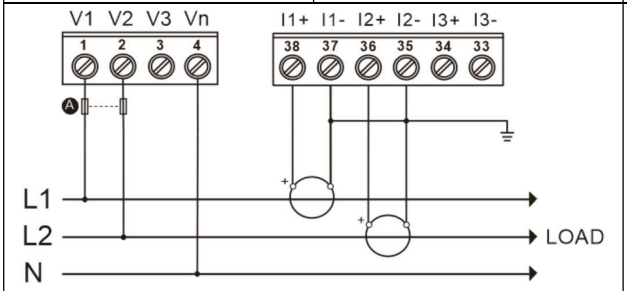
3P3W SETTING | 2CT DIAGRAM without neutral



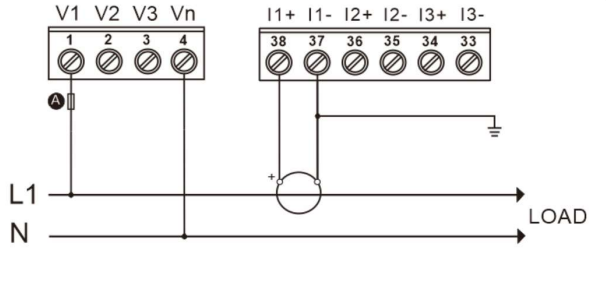
3P3W SETTING | 2PT+2CT DIAGRAM without neutral



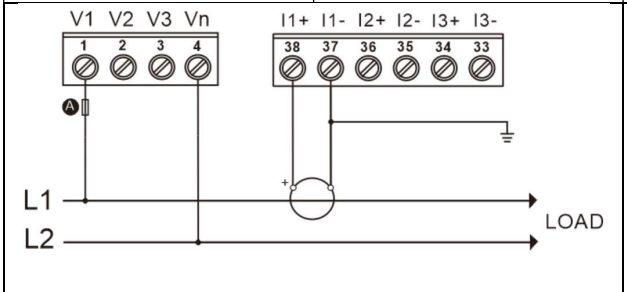
2P3W SETTING | L+L+N, 2CT DIAGRAM



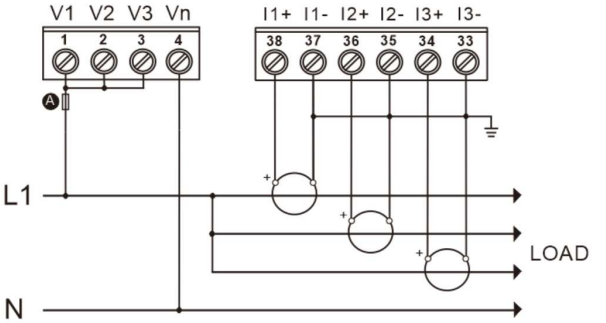
1P2W SETTING | L+N，1CT DIAGRAM



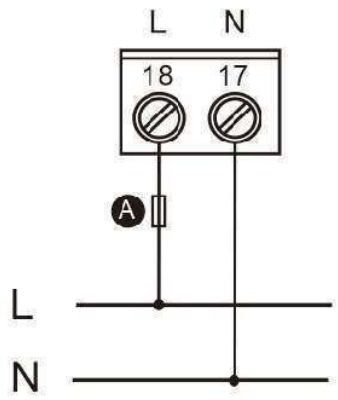
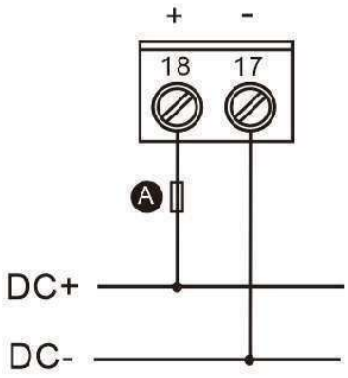
1P2W SETTING | L+L，1CT DIAGRAM



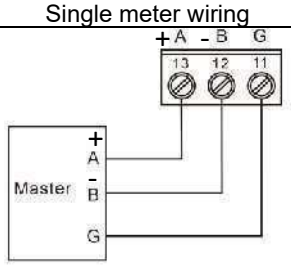
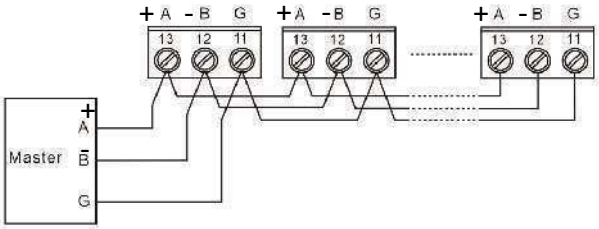
1P2W SETTING | L+N，3CT DIAGRAM



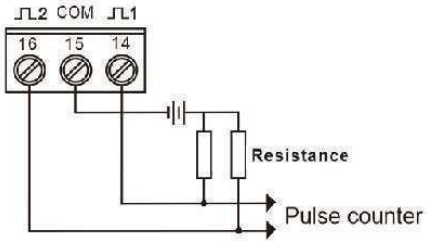
Auxiliary power wiring

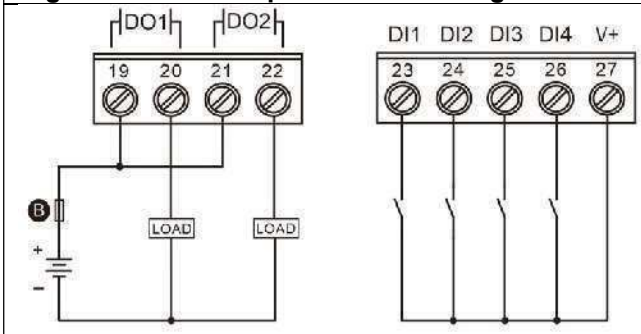
AC Power	DC Power
	

Communication terminal wiring

Single meter wiring	Multiple meters wiring
	

Pulse output terminal wiring



Digital inout and ouput terminal wiring

A : 500 mA fast fuse.
B : Fast fuse. In use, the user needs to select the fast fuse according to the load specification parameters.

Terminal specification parameters	
Voltage measurement input terminal	Wire size: 0.82 ~ 3.31 mm^2 (18 ~ 12 AWG) Torque: 0.5 ~ 0.6 N.m
Current measurement input terminal	Wire size: 1.318 ~ 3.31 mm^2 (16 ~ 12 AWG) Torque: 0.5 ~ 0.6 N.m
Auxiliary power terminal	Wire size: 0.82 ~ 3.31 mm^2 (18 ~ 12 AWG) Torque: 0.5 ~ 0.6 N.m
Communication terminal	Wire size: 0.82 ~ 3.31 mm^2 (18 ~ 12 AWG) Torque: 0.5 ~ 0.6 N.m
Pulse output terminal	Wire size: 0.82 ~ 3.31 mm^2 (18 ~ 12 AWG) Torque: 0.5 ~ 0.6 N.m
Digital inout and ouput terminal	Wire size: 0.82 ~ 3.31 mm^2 (18 ~ 12 AWG) Torque: 0.5 ~ 0.6 N.m

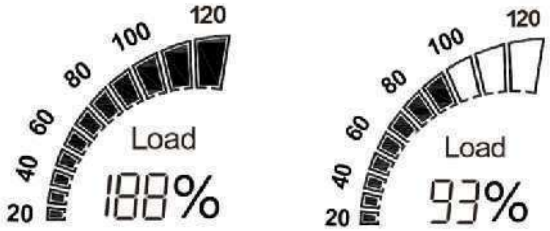
Chapter 3. General function description

3.1. Display icon description

3.1.1. Bar graph for power

The bar graph for power is used to indicate the percentage of the actual measured value of the total apparent power value of the power meter to the rated value. The rated value of total apparent power is equal to the effective phase number * rated voltage value * rated current value.

Figure 3-1: Bar graph for power



Example:

Assuming a three-phase 3-wire system, voltage at primary L-N = 230Vac , CT = 50/5, the maximum rated apparent power of the system is Sn = 230 x 50 x 3 = 34500VA

If we refer to figure 3-1, assuming we are in the conditions above, 93% means that the system apparent power is 32085VA

Note:

1) Under the measurement type conditions of three-phase four-wire 3CT, three-phase three-wire 3CT and single-phase two-wire 3CT, the effective phase number is equal to 3. Under the measurement type condition of three phase three-wire 2CT and two phase three-wire 2CT, the effective phase number is equal to 2.

2), The rated voltage is equal to the rated voltage of the secondary side * the rate of the voltage transformer.

3), The rated current is equal to the rated current of the secondary side * the rate of the current transformer.

4), Rated voltage of the secondary side defaults to 230V and rated current of the secondary side defaults to 5A. Voltage values can be set by communication commands. For specific register information, please refer to the relevant communication protocol documents of the product.

3.1.2. **Digital I/O indicating icon**

The digital I/O indicator icon is used to indicate the status of the digital I/O interface of the current power meter.

Figure 3-2: Digital I/O indicator icon



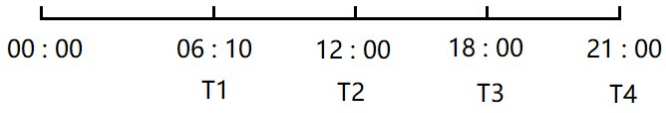
If the icon only shows the circle without the dot inside, it means the current state is OFF. If both circle and dot show, it means the current state is ON. As shown in Figure 3-2, DI-1 and DI-2 are ON states, DI-3 and DI-4 are OFF states, DO-1 is OFF states and DO-2 is ON states.

3.2. **Multi-tariffs function**

The multi-tariffs function refers to the function that the meter realizes time-sharing measurement of electric quantity. The power meter divides the 24 hours of a day into several time periods, and then specifies the rate number for each time period. Then the power meter sortes the amount of electricity in time division according to the pre-divided time period, and stores it to the position of the rate number corresponding to each time period, so as to realize the function of time-division measurement of electricity.

The meter used the method of the tariff number correlation to the starting time point to realize the tariff segment division. The power meter support up to 8 starting time points and up to 4 tariff segments (T1, T2, T3 and T4).

Figure 3-1: The starting time points of the tariff segment



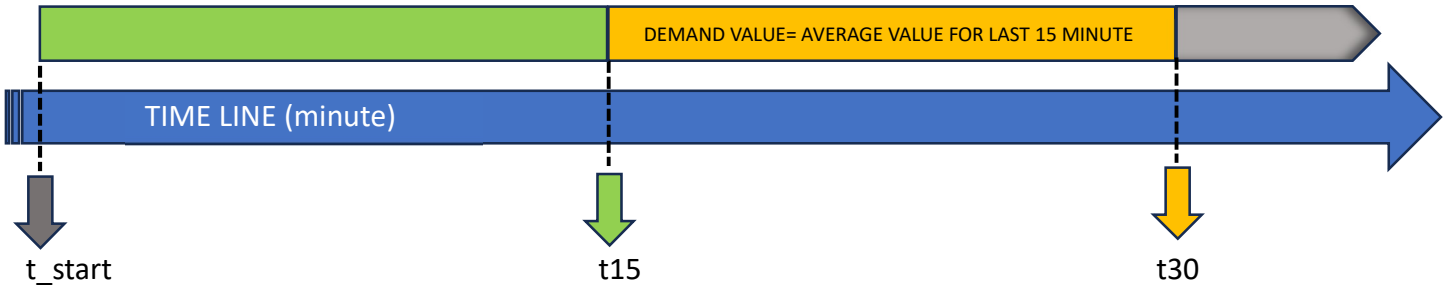
As shown in Figure 3-1, 06:10 marks the start time of tariff 1 (T1), 12:00 the tariff 2 (T2), 18:00 tariff 3 (T3) and 21:00 designated as the tariff 4 (T4). That means tariff 1 range is 06:10 to 12:00, tariff 2 range is 12:00 to 18:00, tariff 3 range is 18:00 to 21:00, tariff 4 range is 21:00 to next 06:10 when start again the T1.

3.3. **Demand calculation method**

3.3.1. **Fixed block interval**

The block intervals are consecutive, the power meter calculates and updates the demand at the end of each interval.

Figure 3-4: Diagram of fixed block interval calculation method

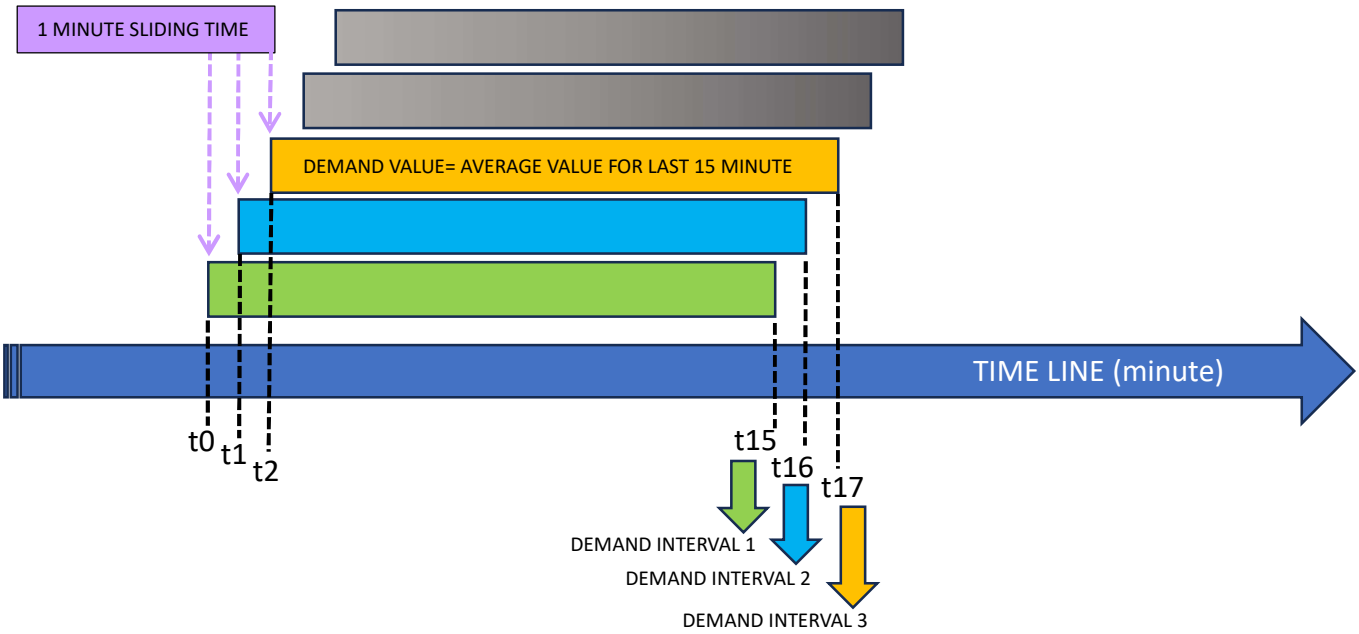


As shown in Figure 3-4, the first demand calculation is made at the 15th minute, and the demand calculation data is between the starting point and the 15th minute. At the 30th minute, do the second demand calculation, demand calculation data is between the 15th and the 30th minute, and so on.

3.3.2. **Sliding block interval**

The block intervals are sliding, the power meter calculates and update the demand at the sliding speed.

Figure 3-5: Diagram of sliding block interval calculation method



As shown in Figure 3-2, the first demand calculation is shown after 15 minute from turn on (demand calculation between the 0th and the 15th minute) then at16th minute do the second demand calculation (demand calculation between the 1th and the 16th minute).
Once again at the 17th minute the third (demand calculation between the 2th and the 17th minute) and so on.

3.4. **System current direction correction function**

This function is to set the wiring direction of the CT of the current channel through internal processing of the power meter, without rewiring the CT in this process. If the current transformer is installed in the opposite direction or connected to the power meter in the opposite direction, the user can setting this function to retrieve right current direction.

Note: This function can be set by pressing the button (Refer to step 3 in 4.5.4), also can be set by communication commands (Please refer to the relevant communication protocol document for the register address).

3.5. **Description of energy display format**

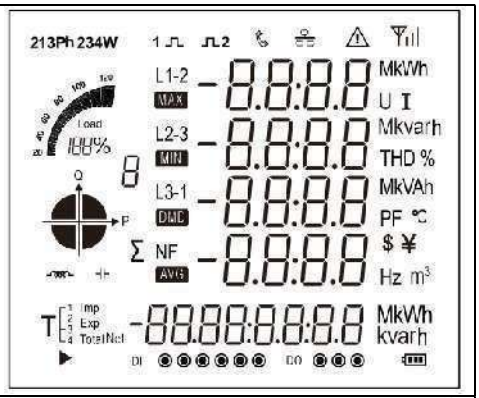
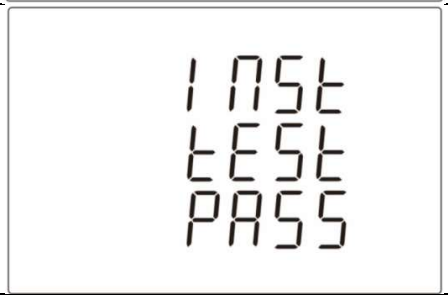
The energy display format of power meter is to automatically adjust the display effective digit according to the energy value. The change process of effective digit of energy display is shown as follows:

0.00 kWh/kvarh -> 999999.99 kWh/kvarh -> 1000000.0 kWh/kvarh -> 9999999.9 kWh/kvarh -> 10000000 kWh/kvarh -> 99999999 kWh/kvarh -> 100000.00 MWh/Mvarh -> 999999.99 MWh/Mvarh -> 1000000.0 MWh/Mvarh -> 9999999.9 MWh/Mvarh -> 10000000 MWh/Mvarh -> 99999999 MWh/Mvarh -> 0.00 kWh/kvarh.

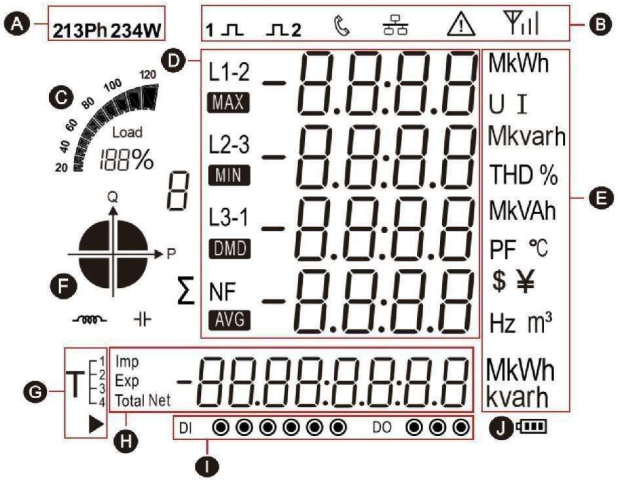
Chapter 4. Operation

4.1. Meter startup instructions

Each time PEC-EM3-96-5A turned on start self-test process, display the sequence as follow:

First screen display	Display full screen characters	
Second screen display	Displays the software version number of the power meter	
Three screen display	Display the results of the self-test	

4.2. **LCD display area description**



A: The power grid type icon represents the current measurement type of the power meter.

B: The status indicator icon for the power meter.

C: Bar graph for power indication.

D: Measured values.

E: Icon of a unit of measurement data.

F: Icon indicating the quadrant of the current load.

G: Icon indicating the tariff segment to which the current energy. ▶ represents the tariff number displayed as the running tariff segment.



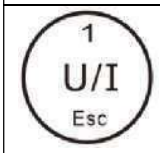
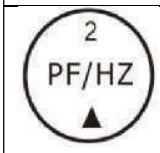
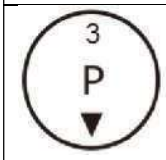
For example: ▶ The figure on the left represents that the tariff 2 (T2) segment is running, and the accumulated energy will be counted into the corresponding energy area of tariff 2 (T2).

H: Energy data display area of the power meter.

I: An icon of digital I/O status for the power meter.

J: The battery status icon of the power meter indicates the state of the battery.

4.3. **Button definition description**

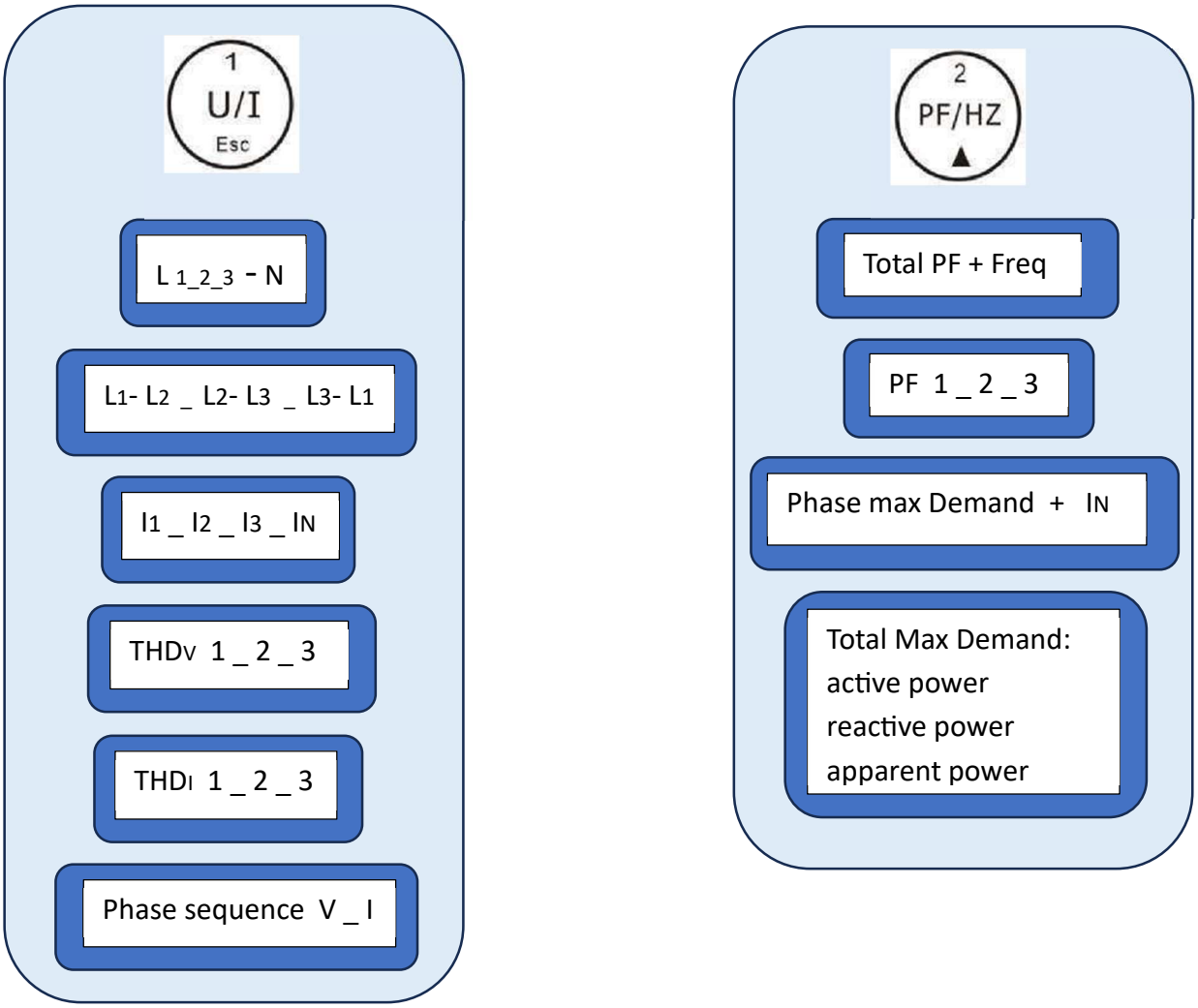
Button	Definition	Click	Press 3 second
	Button 1: Escape key (Esc)	1. In the setting screen or auxiliary screen: exit or return to the previous screen. 2. In the main display screen: page turning for parameters such as voltage and current.	Under the main display screen: enter the auxiliary display screen.
	Button 2: Up key (Up)	1. In the main display screen: view the power factor, maximum demand. 2. In the setting screen or auxiliary screen: scroll up to display the page or the increasing number.	Null
	Button 3: Down key (Dn)	1. In the main display screen: view the power information. 2. In the setting screen or auxiliary screen: scroll down to display the page or the decreasing number.	Null
	Button 4: Enter key (Et)	1. In the main display screen: view energy data and system time. 2. In the setting screen: right move the setting cursor.	1. In the main display screen: enter the setting mode. 2. In the auxiliary display screen: confirm the auxiliary information to be viewed and enter the specific display screen. 3. In the setting screen: enter the setting state or carry out confirmation operation.

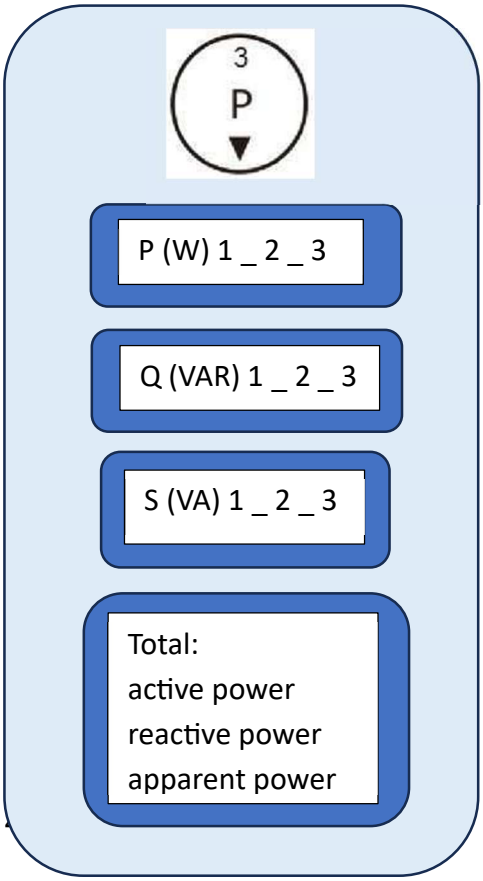
4.4. **Description of display screen**

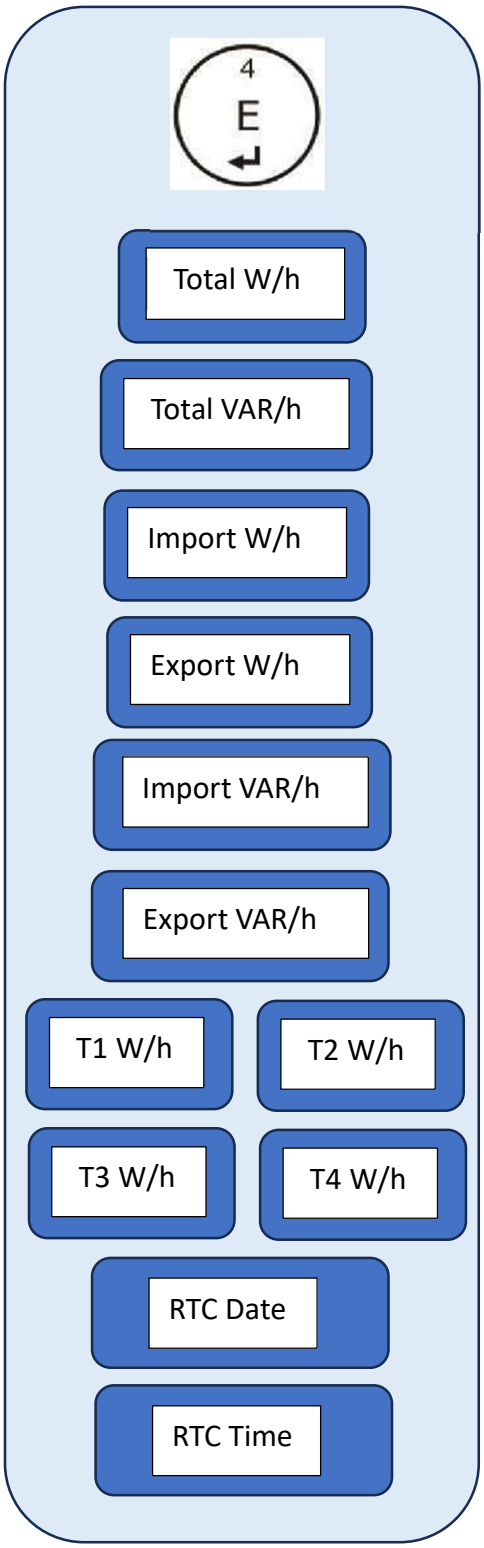
4.4.1. **Main display screen**

After the power meter is powered on and passes the self-test process, it will enter the main display screen. This screen is used to display the main measurement parameters and energy data of the power meter. Users can click the button to turn the page for viewing. Under the main display screen, the power meter will assign different parameter display for each button according to the different system types currently set.

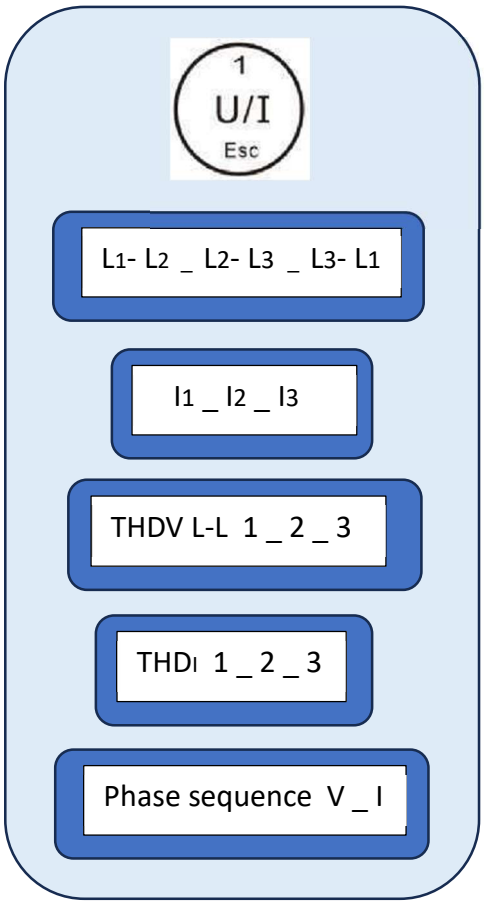
Three-phase four-wire (3P4W)

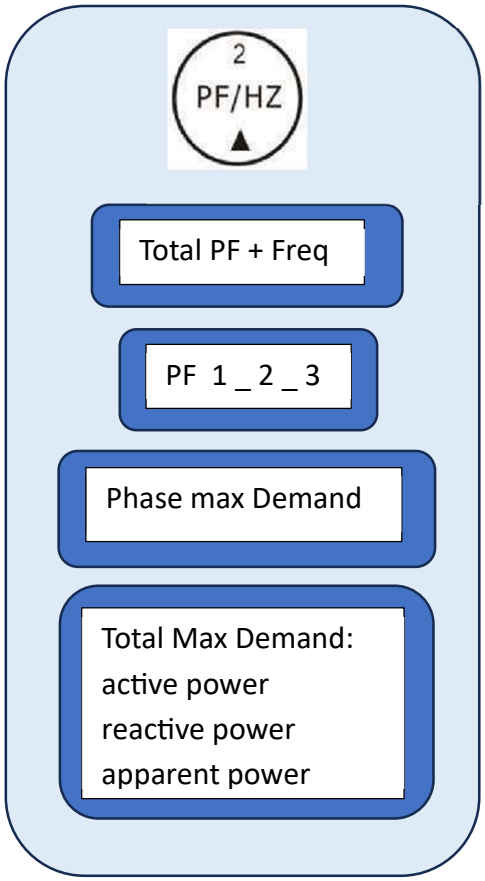


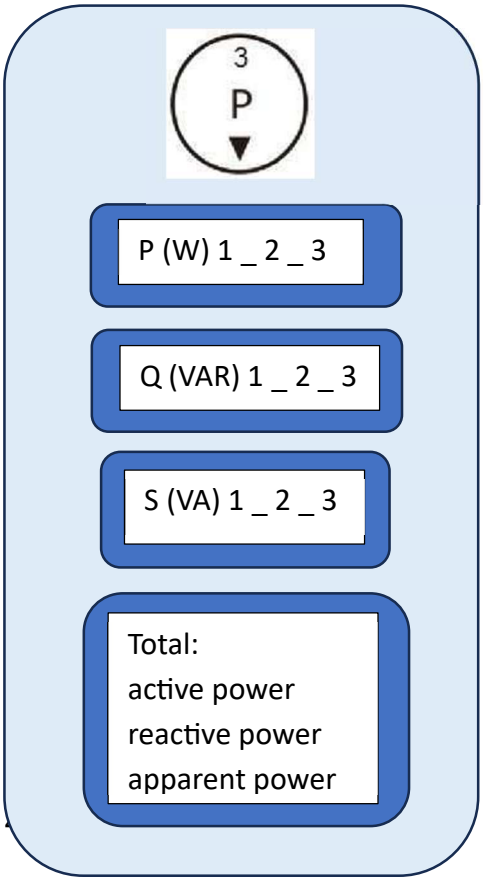

3
P
P (W) 1 _ 2 _ 3
Q (VAR) 1 _ 2 _ 3
S (VA) 1 _ 2 _ 3
Total:
active power
reactive power
apparent power

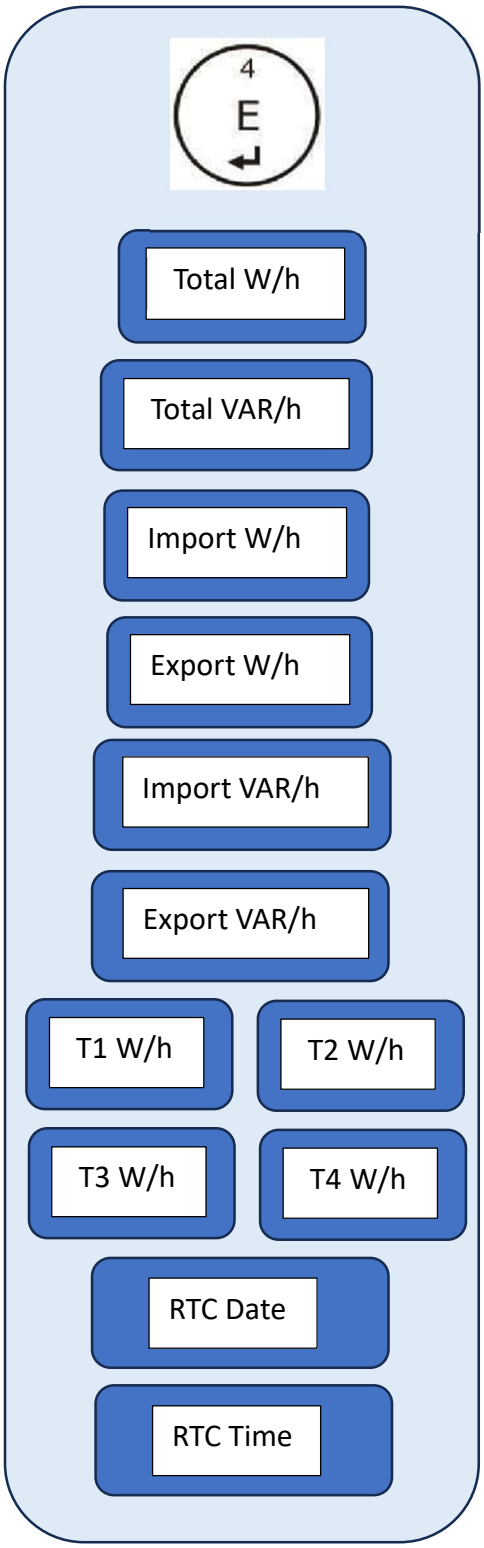

4
E
Total W/h
Total VAR/h
Import W/h
Export W/h
Import VAR/h
Export VAR/h
T1 W/h
T2 W/h
T3 W/h
T4 W/h
RTC Date
RTC Time

Three-phase three-wire 2CT (3P3W 2CT)

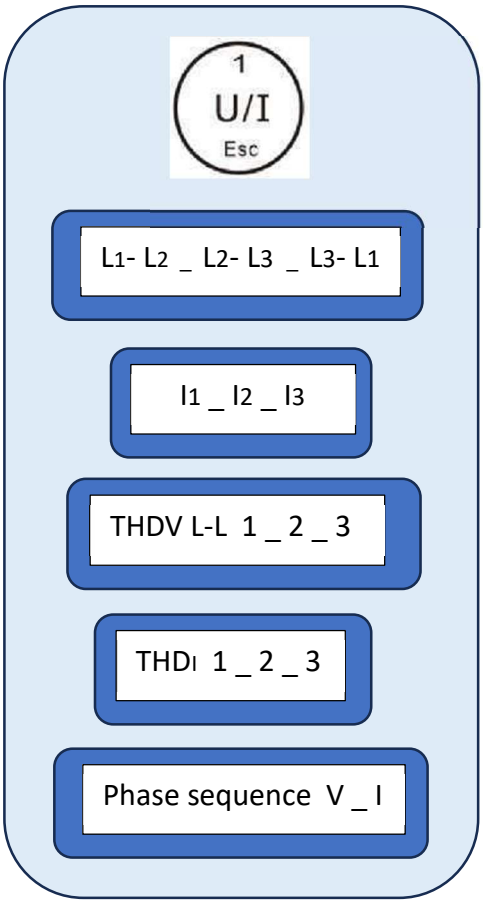


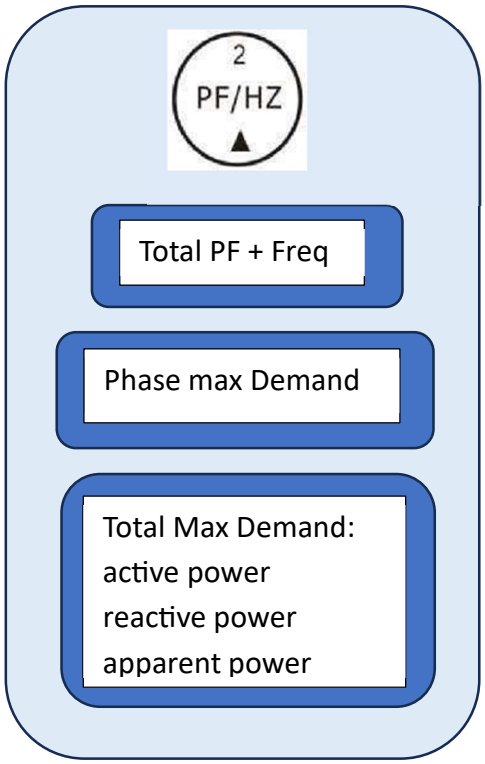


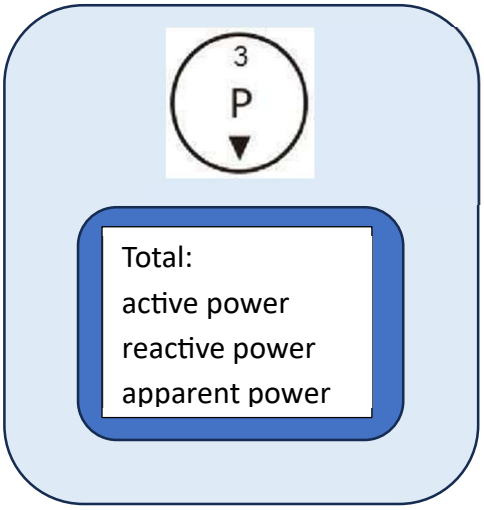

3
P
P (W) 1 _ 2 _ 3
Q (VAR) 1 _ 2 _ 3
S (VA) 1 _ 2 _ 3
Total:
active power
reactive power
apparent power

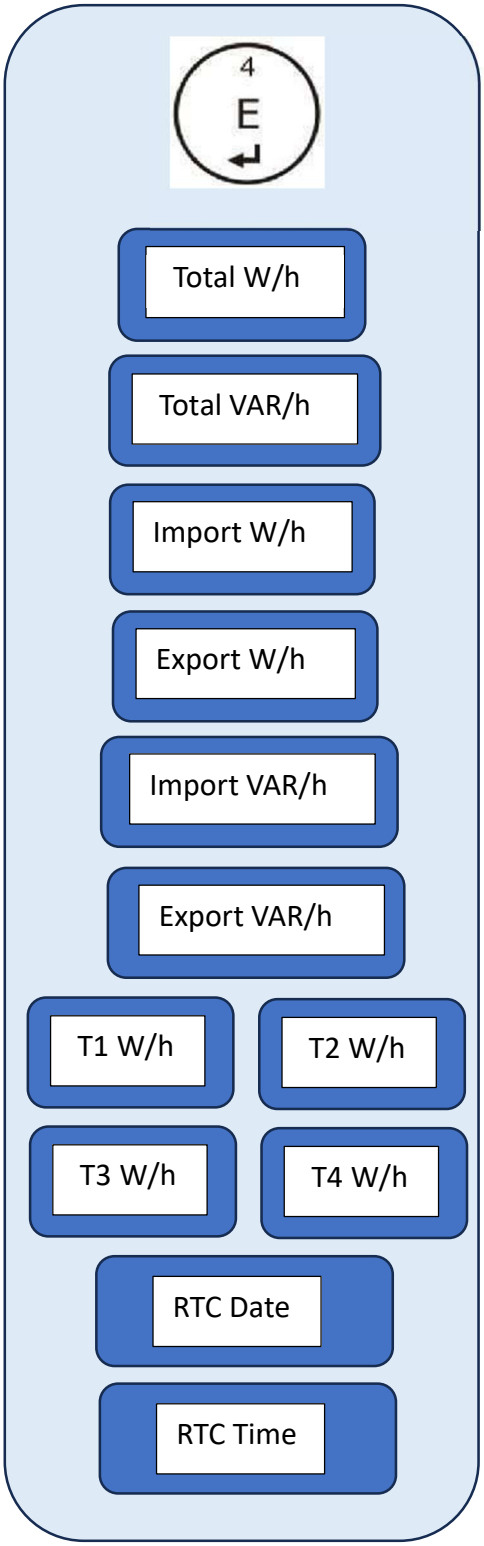

4
E
Total W/h
Total VAR/h
Import W/h
Export W/h
Import VAR/h
Export VAR/h
T1 W/h
T2 W/h
T3 W/h
T4 W/h
RTC Date
RTC Time

Three-phase three-wire 3CT (3P3W 3CT)

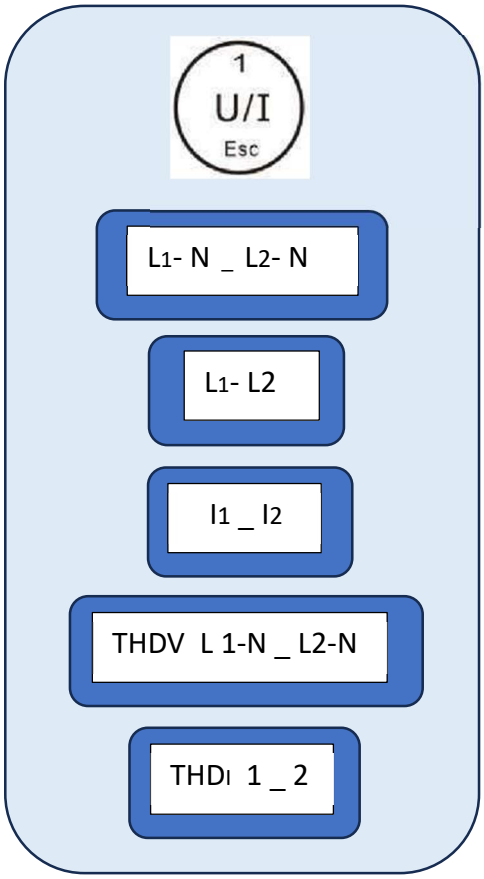


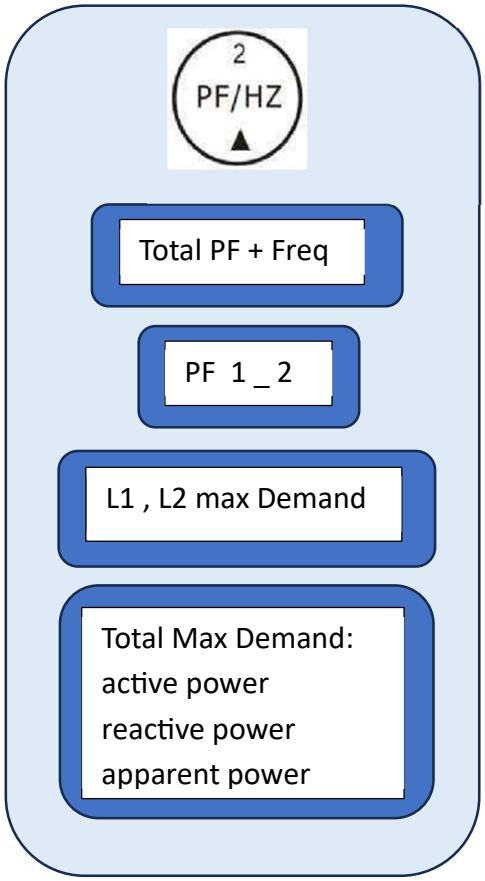


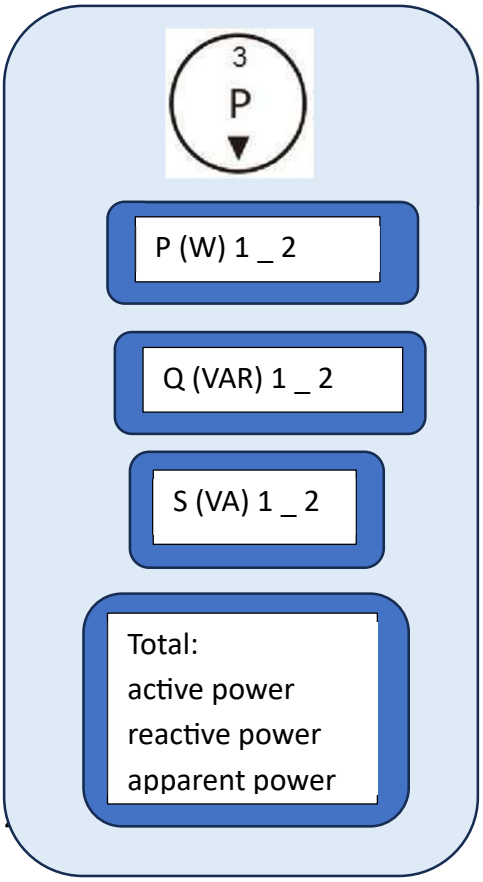


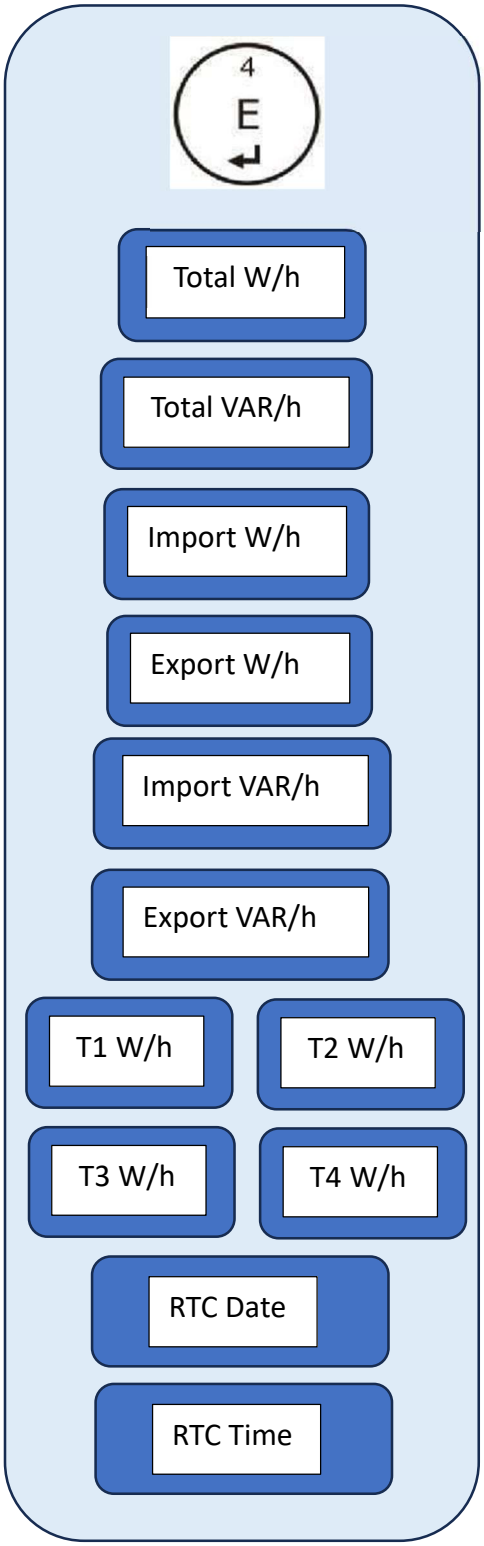

4
E
Total W/h
Total VAR/h
Import W/h
Export W/h
Import VAR/h
Export VAR/h
T1 W/h
T2 W/h
T3 W/h
T4 W/h
RTC Date
RTC Time

Two-phase three-wire (2P3W)

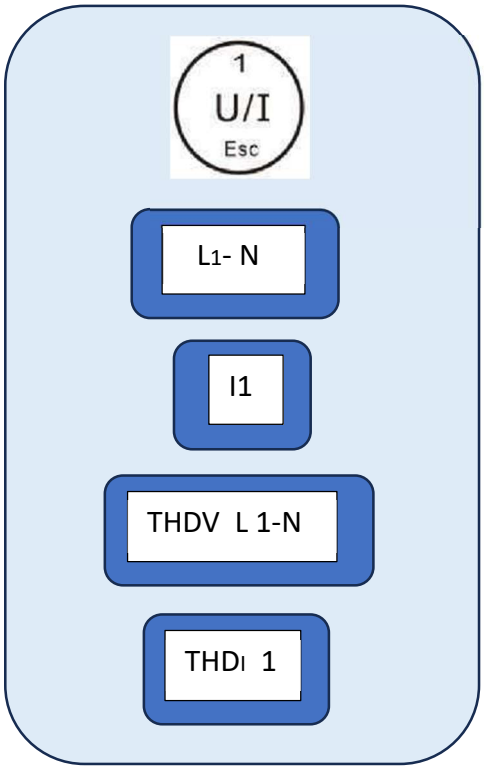


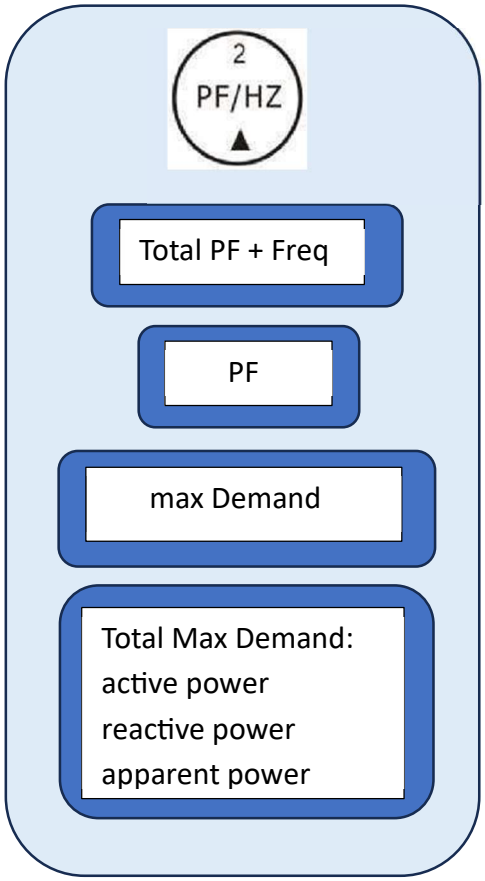


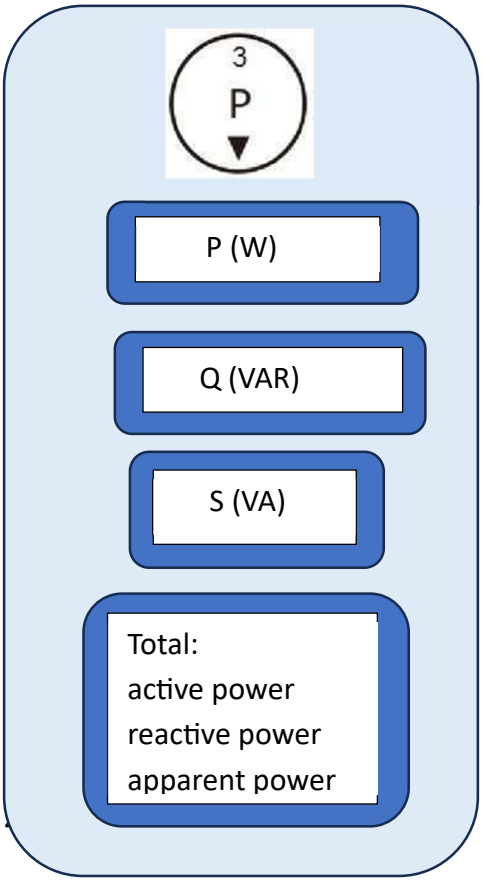

3
P
P (W) 1 _ 2
Q (VAR) 1 _ 2
S (VA) 1 _ 2
Total:
active power
reactive power
apparent power

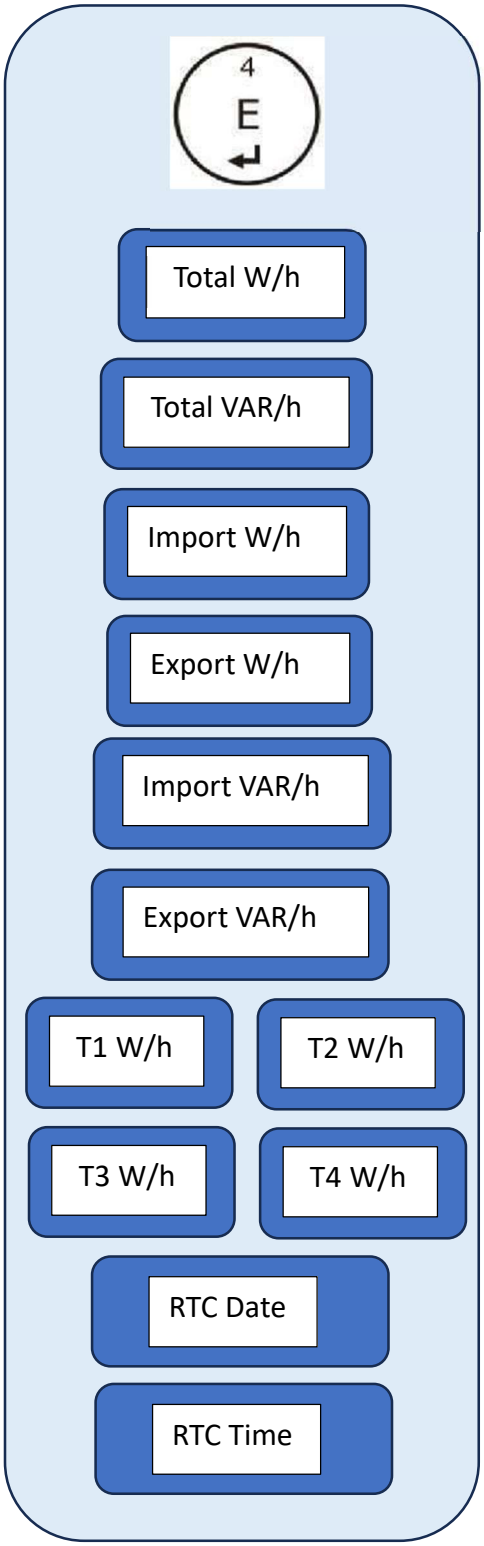

4
E
Total W/h
Total VAR/h
Import W/h
Export W/h
Import VAR/h
Export VAR/h
T1 W/h
T2 W/h
T3 W/h
T4 W/h
RTC Date
RTC Time

Two-phase three-wire (2P3W)






3
P
P (W)
Q (VAR)
S (VA)
Total:
active power
reactive power
apparent power


4
E
Total W/h
Total VAR/h
Import W/h
Export W/h
Import VAR/h
Export VAR/h
T1 W/h
T2 W/h
T3 W/h
T4 W/h
RTC Date
RTC Time

4.4.2. **Auxiliary display screen**

Under the main display screen, press button 1 for 3 second to enter the selection screen of auxiliary display. At this point, click button 2 or button 3 can be used to select the option of auxiliary information that needs to be viewed. Then press button 4 for 3 second to enter the specific data display screen of the selected auxiliary information option. After entering the specific auxiliary information display screen, you can turn the page by click the button 2 or button 3, and click the button 1 to return to the previous menu. Please refer to Appendix C for the detailed screen diagram of auxiliary information display.

Note: The auxiliary display screen supports two exit modes, namely, timed exit and manual exit. The register with the address [56 0B] can be set with the RS485 communication function to switch between these two modes.

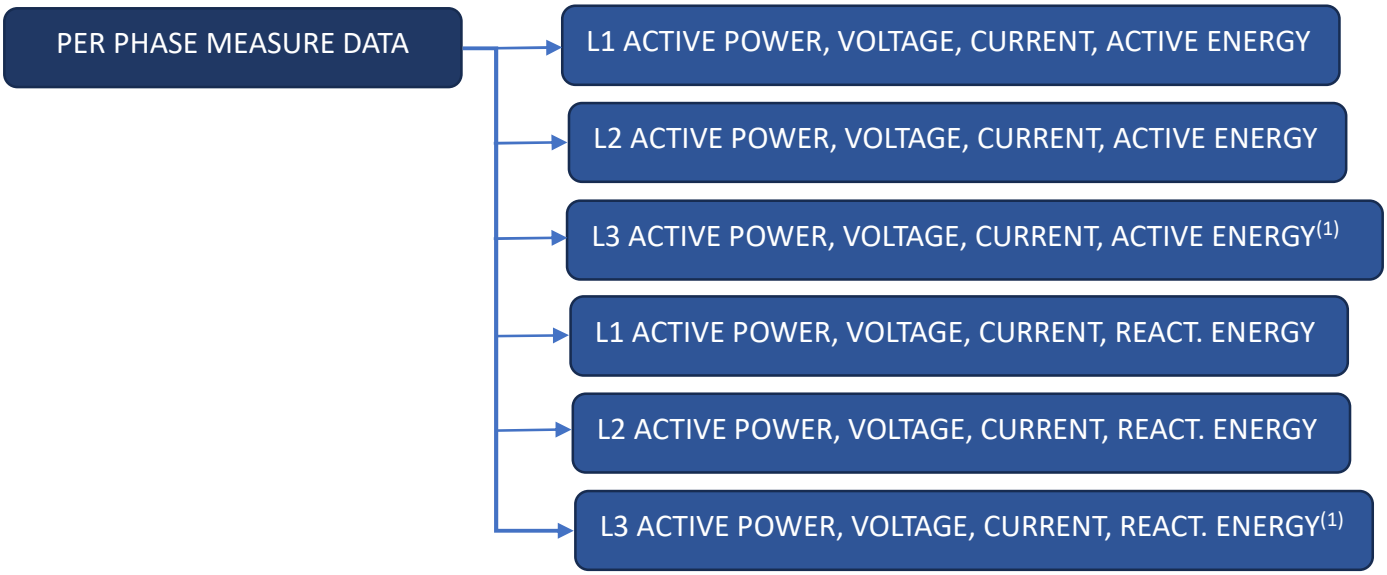
1. Manual exit mode: the exit function can only be achieved by pressing the button 1. If you do not exit manually, you will always stay in the auxiliary display screen.

2. Timed exit mode: on the auxiliary display screen, if there is no keystroke operation within the set time, it will automatically exit and return to the main display screen. The set time is equal to the value set in the register with the address [56 0B]. The effective range is 0 to 255 seconds, 0 represents manual exit mode.

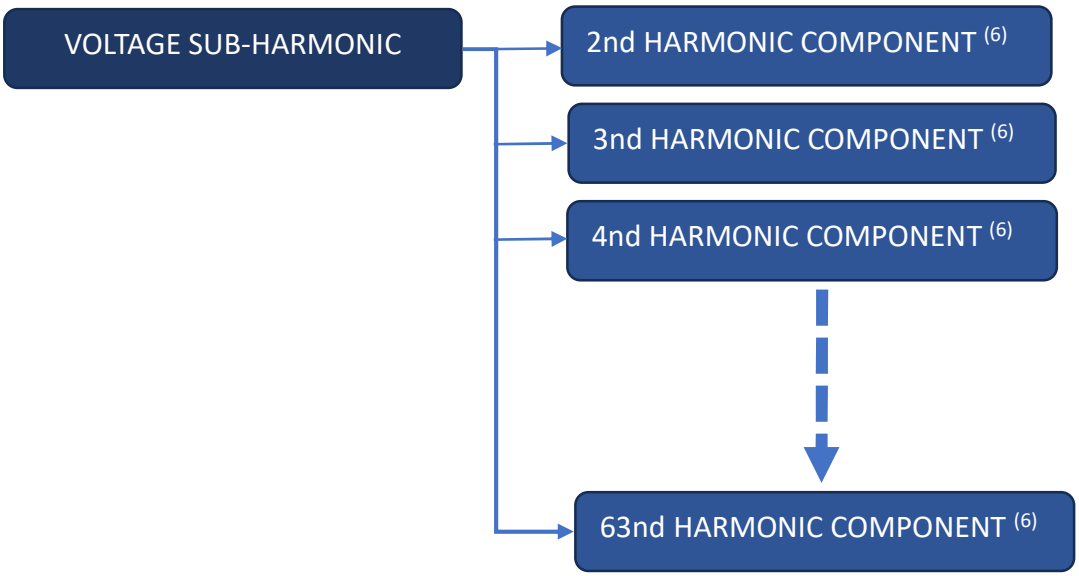
The display categories of the auxiliary display screen respectively include:

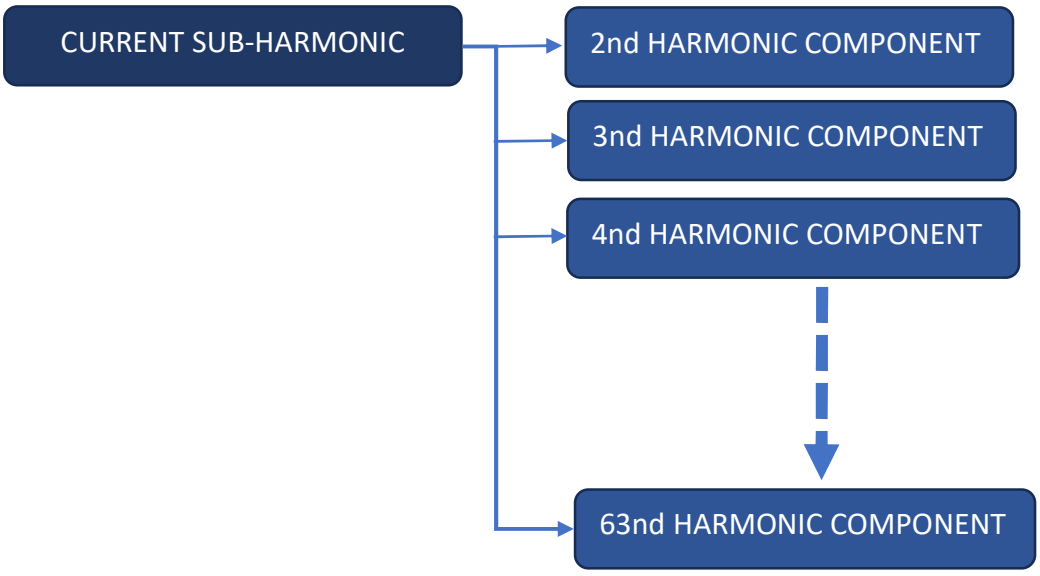
1). Per phase measurement data. (Not displayed under type 3P3W)
2). Maximum and minimum value data.
3). Individual harmonic distortion of voltage
4). Individual harmonic distortion of current
5). Extended information

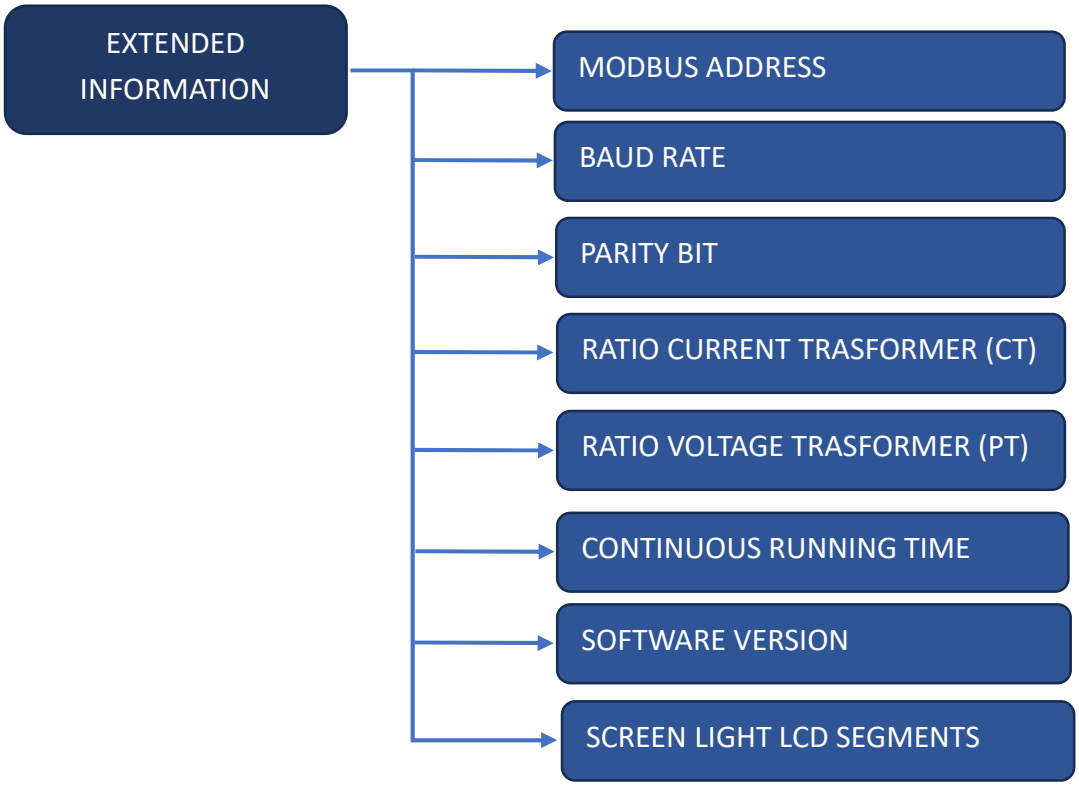
The display logic diagram of the auxiliary display screen is shown below:




MAX. / MIN. VALUE
MAX. VALUE PER PHASE L-N VOLTAGE (2)
MAX. VALUE PER PHASE L-L VOLTAGE (3)
MAX. VALUE PER PHASE AND NEUTRAL CURRENT (4)
MAX. VALUE PER PHASE ACTIVE POWER (5)
MAX. VALUE PER PHASE REACTIVE POWER (5)
MAX. VALUE PER PHASE APPARENT POWER (5)
MAX. VALUE TOTAL ACTIVE/REACTIVE/APPARENT POW
MIN. VALUE PER PHASE L-N VOLTAGE (2)
MIN. VALUE PER PHASE L-L VOLTAGE (3)
MIN. VALUE PER PHASE AND NEUTRAL CURRENT (4)
MIN. VALUE PER PHASE ACTIVE POWER (5)
MIN. VALUE PER PHASE REACTIVE POWER (5)
MIN. VALUE PER PHASE APPARENT POWER (5)
MIN. VALUE TOTAL ACTIVE/REACTIVE/APPARENT POW


VOLTAGE SUB-HARMONIC
2nd HARMONIC COMPONENT (6)
3nd HARMONIC COMPONENT (6)
4nd HARMONIC COMPONENT (6)
63nd HARMONIC COMPONENT (6)

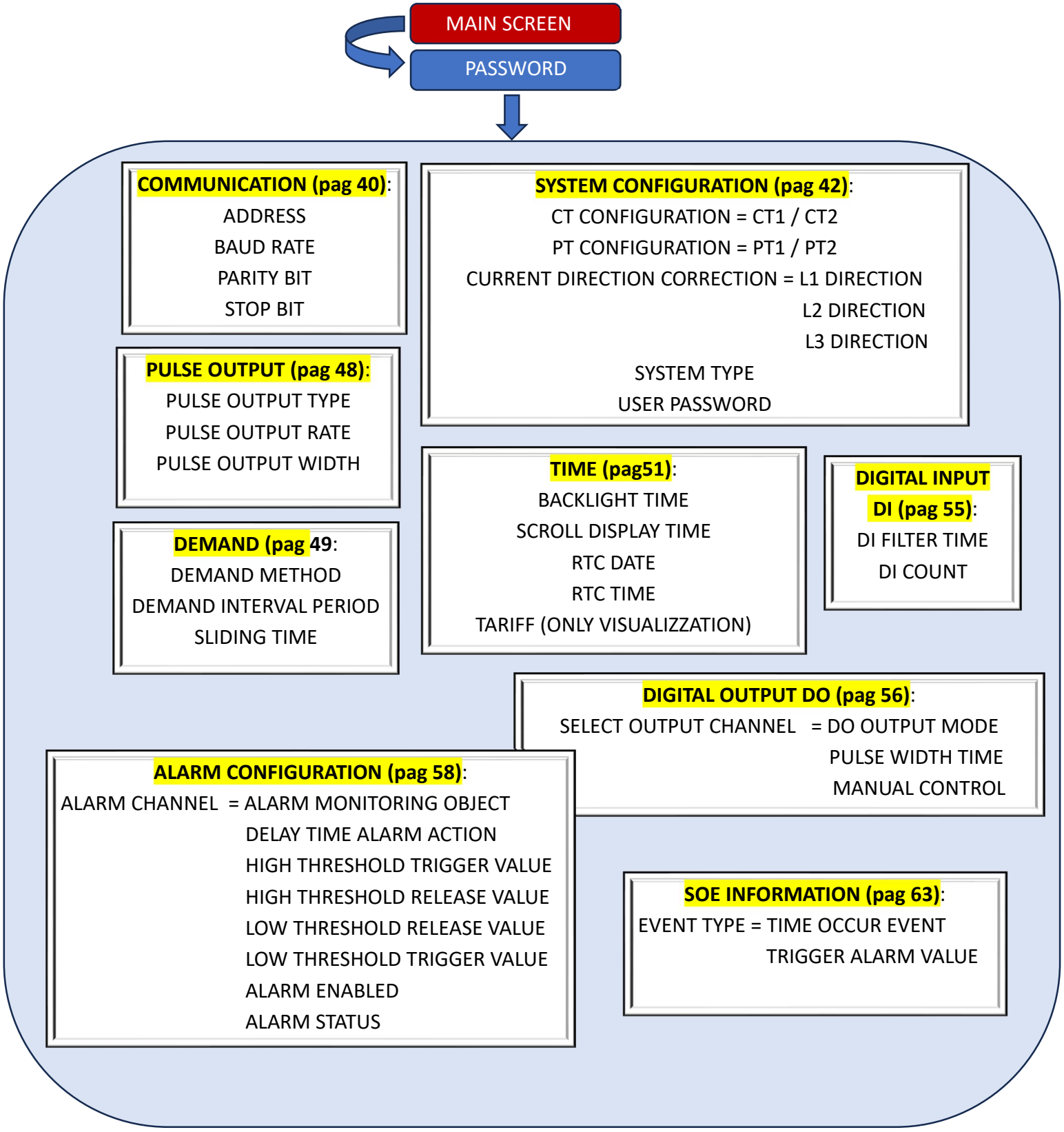

CURRENT SUB-HARMONIC
2nd HARMONIC COMPONENT
3nd HARMONIC COMPONENT
4nd HARMONIC COMPONENT
63nd HARMONIC COMPONENT



Note:
(1). It is not displayed in two-phase three-wire mode.
(2). It is not displayed in three-phase three-wire mode.
(3). It is not displayed in single-phase three-wire mode.
(3). Neutral current is not displayed in three-phase three-wire mode
(5). It is not displayed in three-phase three-wire 3CT mode.
(6). In the three-phase three-wire mode, the L-L voltage harmonics are displayed, while in other modes, the L-N voltage harmonics are displayed.

4.5. **Setting-up**

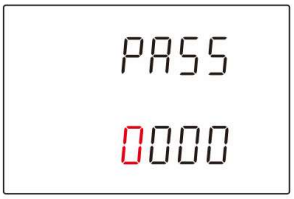
The logical diagram of the parameter setting menu is as follows:



How to enter the "Parameter setting Menu" screen:

Step 1: In the main display screen, press button 4 for 3 second to enter the user password input mode.

Note: The user password input screen is shown in the figure on the right.



Step 2: Enter the correct user password (*) and press button 4 for 3 second to confirm.

(*) How to enter a password:

A: Click button 2 or 3 to increase or decrease the number of flashing bits.

B: Click button 4 to move the flashing position to the right.

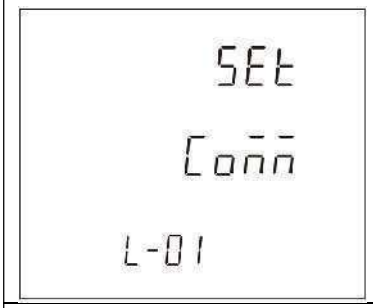
C: After entering the correct password, press button 4 for confirmation. If the password is verified correctly, the power meter will enter the screen of "Parameter Setting menu".

Note: Under the user password input screen, can click button 1 to return to the main display screen. If there is no button operation in more than 1 minute under this screen, the power meter will automatically return to the main display screen.

4.5.1. Set communication class parameters

Communication parameters include: Modbus address, baud rate, parity bit, stop bit.

1. After entering the "Parameter Setting Menu" screen, select the L-01 setting screen (as shown in the figure below), and then press button 4 for 3 second to enter the communication parameter setting screen.



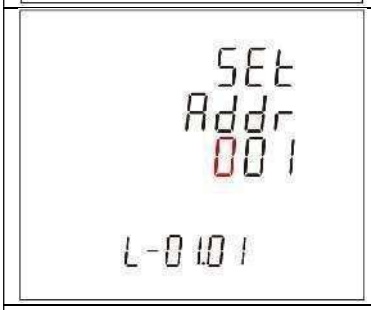
2. Setting modbus address (L-01.01 setting screen)



Modbus address setting range: 001 to 247, default is 001.

Press button 4 for 3 second to enter the setting state, and the digit of the setting becomes the flashing state.

Click button 1 to return to the previous level setup menu.



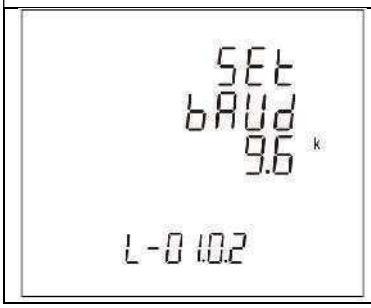
Click button 2 or 3 to increase or decrease the number of set bits.

Click button 4 can be moved the set bits to the right.

Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state.

Click button 1 to exit the setting state without saving the setting parameters.

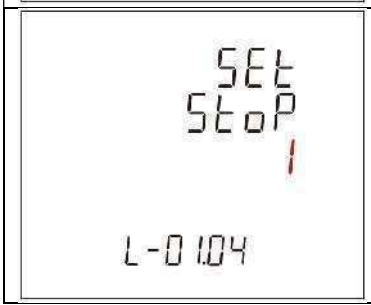
3. Setting baud rate (L-01.02 setting screen)



Baud rate can be set: 1200, 2400, 4800, 9600, 19200, 38400 bps, default is 9600bps.

Press button 4 for 3 second to enter the setting state, and the digit of the setting becomes the flashing state.

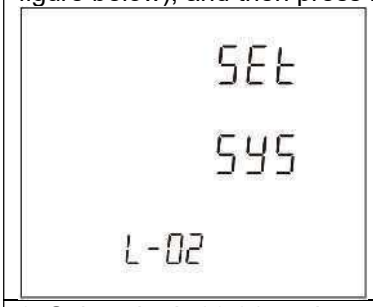
Click button 1 to return to the previous level setup menu.

	Click button 2 or 3 to select the baud rate. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters.
4. Setting parity bit (L-01.03 setting screen)	
	Parity bit can be set: None, Even, Odd, default is None. Press button 4 for 3 second to enter the setting state, and the character of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu.
	Click button 2 or 3 to select the parity bit. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters.
5. Setting stop bit (L-01.04 setting screen)	
	Stop bit can be set: 1 or 2, default is 1. Press button 4 for 3 second to enter the setting state, and the digit of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu. **Note:** The stop bit can only be set to 2 if the check bit is equal to None.
	Click button 2 or 3 to select the stop bit. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters.

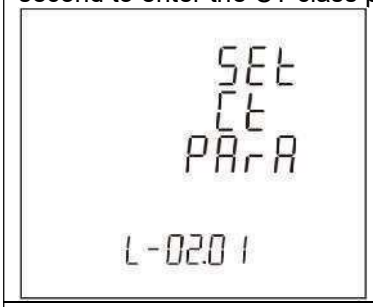
4.5.2. **Set CT class parameters**

CT parameters include: primary side value (CT1) and secondary side value (CT2) of the current transformer.

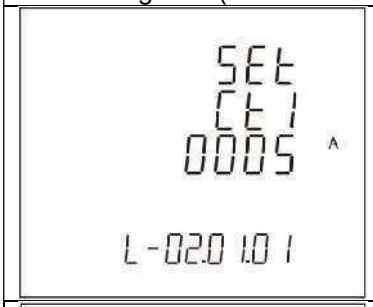
1. After entering the "Parameter Setting Menu" screen, select the L-02 setting screen (as shown in the figure below), and then press button 4 for 3 second to enter the CT parameter setting screen.



2. Select the L-02.01 setting screen (as shown in the figure below), and then press button 4 for 3 second to enter the CT class parameters setting screen.



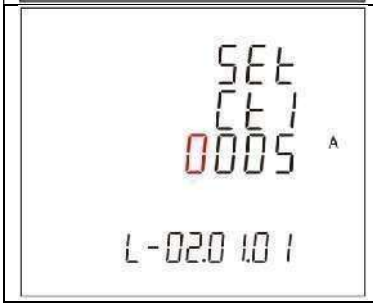
2.1. Setting CT1 (L-02.01.01 setting screen)



CT1 setting range: 1 to 9999A, default is 5A.

Press button 4 for 3 second to enter the setting state, and the digit of the setting becomes the flashing state.

Click button 1 to return to the previous level setup menu.



Click button 2 or 3 to increase or decrease the number of set bits.

Click button 4 can be moved the set bits to the right.

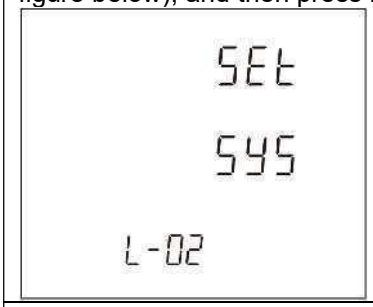
Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state.

Click button 1 to exit the setting state without saving the setting parameters.

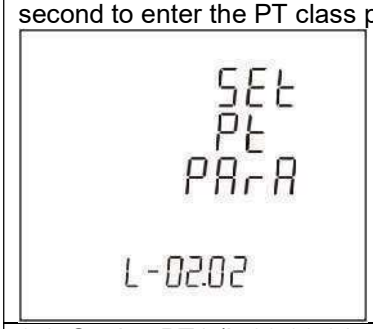
4.5.3. **Set PT class parameters**

PT parameters include: primary side value (PT1) and secondary side value (PT2) of the voltage transformer.

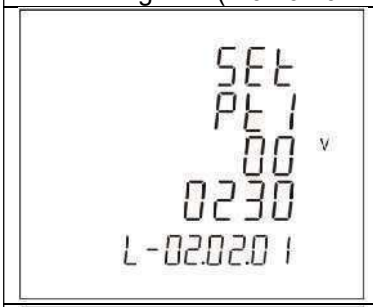
1. After entering the "Parameter Setting Menu" screen, select the L-02 setting screen (as shown in the figure below), and then press button 4 for 3 second to enter the PT parameter setting screen.



2. Select the L-02.02 setting screen (as shown in the figure below), and then press button 4 for 3 second to enter the PT class parameters setting screen.



2.1. Setting PT1 (L-02.02.01 setting screen)



PT1 setting range: 30 to 600000V, default is 230V.

Press button 4 for 3 second to enter the setting state, and the digit of the setting becomes the flashing state.

Click button 1 to return to the previous level setup menu.



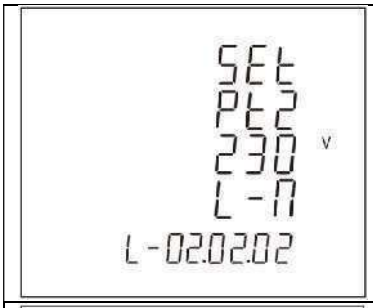
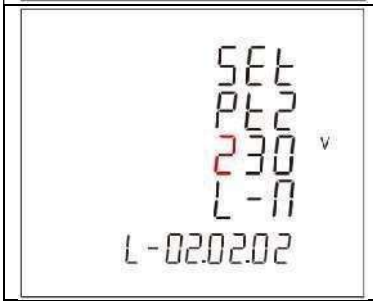
Click button 2 or 3 to increase or decrease the number of set bits.

Click button 4 can be moved the set bits to the right.

Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state.

Click button 1 to exit the setting state without saving the setting parameters.

2.2. Setting PT2 (L-02.02.02 setting screen)

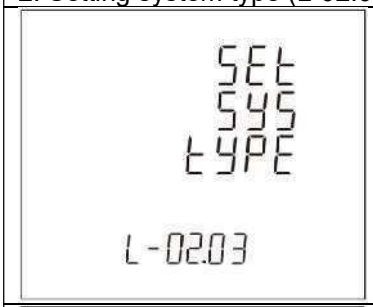
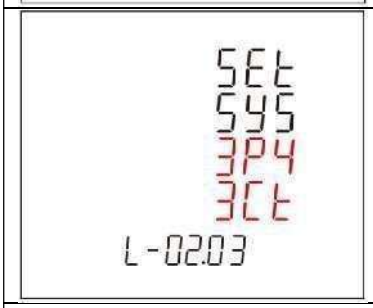
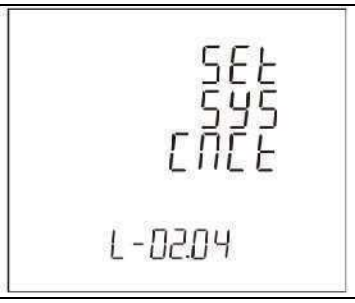
	PT2 setting range: 30 to 600V, default is 230V. Press button 4 for 3 second to enter the setting state, and the digit of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu.
	Click button 2 or 3 to increase or decrease the number of set bits. Click button 4 can be moved the set bits to the right. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters.

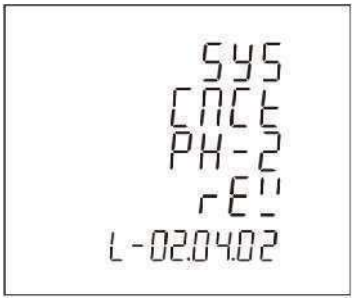
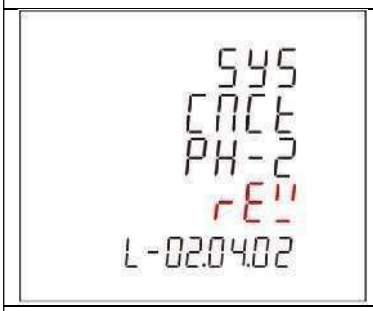
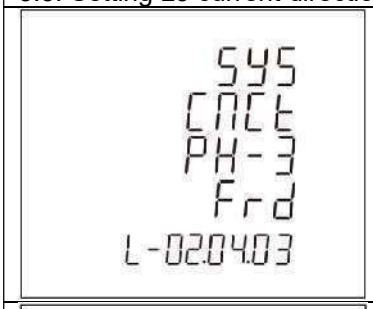
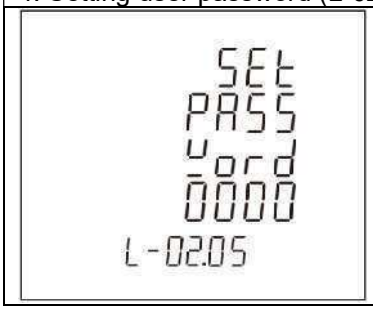
4.5.4. **Set system class parameters**

System class parameters include: system type, system current direction correction, user password.

1. After entering the "Parameter Setting Menu" screen, select the L-02 setting screen (as shown in the figure below), and then press button 4 for 3 second to enter the system class parameter setting screen.



2. Setting system type (L-02.03 setting screen)	
	The system type supported by the power meter includes the five types: 1P2W 3CT, 2P3W 2CT, 3P3W 2CT, 3P4W 3CT, 3P3W 3CT. Press button 4 for 3 second to enter the setting state, and the character of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu.
	The corresponding relationship between the character of the setting option and the actual measurement wire type is shown in Table 1 below. Note: To set the character of the option and the corresponding relationship of the system type, please refer to Table 4-1.
3. Setting system current direction correction (L-02.04 setting screen)	
	Press button 4 for 3 second to enter the next level setting menu. Click button 1 to return to the previous level setup menu.
3.1. Set L1 current direction correction (L-02.04.01 setting screen)	
	L1 current direction correction can be set: forward or reverse, default is forward. Click button 3 to scroll down to the Settings screen of L2. Press button 4 for 3 second to enter the setting state, and the character of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu.
	Click button 2 or 3 to select the current direction. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters. **Note:** Frd represents forward, rEU represents reverse.
3.2. Setting L2 current direction correction (L-02.04.02 setting screen)	

	L2 current direction correction can be set: forward or reverse, default is forward. Click button 2 to scroll up to the Settings screen of L1. Click button 3 to scroll down to the Settings screen of L3. Press button 4 for 3 second to enter the setting state, and the character of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu.
	Click button 2 or 3 to select the current direction. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters. **Note:** Frd represents forward, rEV represents reverse.
3.3. Setting L3 current direction correction (L-02.04.03 setting screen)	
	L3 current direction correction can be set: forward or reverse, default is forward. Click button 2 to scroll up to the Settings screen of L2. Press button 4 for 3 second to enter the setting state, and the character of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu.
	Click button 2 or 3 to select the current direction. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters. **Note:** Frd represents forward, rEV represents reverse.
4. Setting user password (L-02.05 setting screen)	
	User password setting range:0000 to 9999, default is 0000. Press button 4 for 3 second to enter the setting state, and the digit of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu.

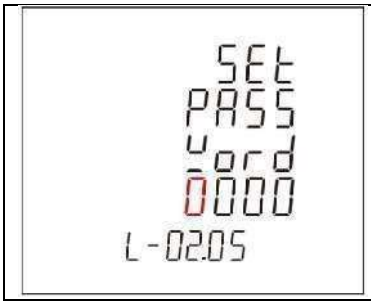
	Click button 2 or 3 to increase or decrease the number of set bits. Click button 4 can be moved the set bits to the right. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters.

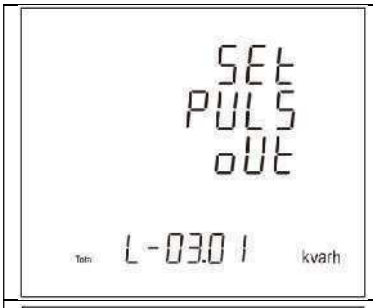
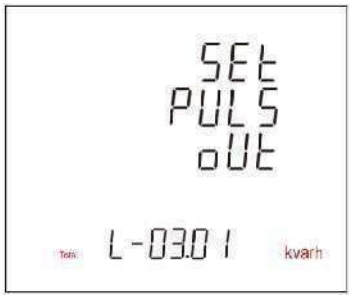
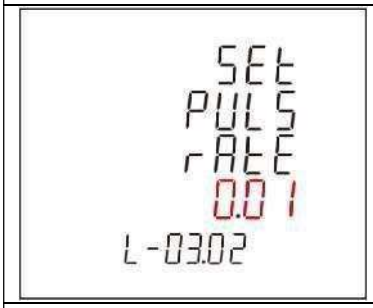
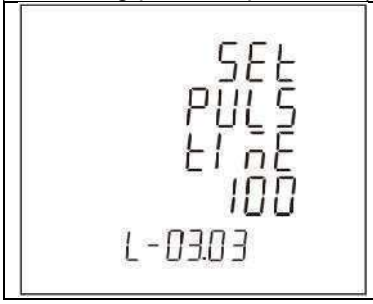
Table 4-1: List of system type

Character	System type	Character	System type
	1P2W 3CT		2P2W 2CT
	3P4W 3CT		3P3W 3CT
	3P3W 2CT		

4.5.5. **Set pulse output class parameters**

Pulse output class parameters include: pulse output type, pulse output rate and pulse output width.

1. After entering the "Parameter Setting Menu" screen, select the L-03 setting screen (as shown in the figure below), and then press button 4 for 3 second to enter the pulse output class parameter setting screen. 
2. Setting pulse output type (L-03.01 setting screen)

	The type of energy represented by the pulse output. Options that can be set: total active energy, import active energy, export active energy, total reactive energy, import reactive energy, export reactive energy, default is total reactive energy. Press button 4 for 3 second to enter the setting state, and the character of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu.
	Click button 2 or 3 to select the pulse output type. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters. Note: To set the character of the option and the corresponding relationship of the pulse output type, please refer to Table 4-2.
3. Setting pulse output rate (L-03.02 setting screen)	
	Pulse output rate can be set: 0.001, 0.01, 0.1, 1, 10, 100, 1000, default is 0.01. Press button 4 for 3 second to enter the setting state, and the character of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu. **Note:** Digital representation of pulse output rate: how much kWh/ kVARh is each pulse. Example: Setting the pulse output rate to 0.1 means that each output pulse is equal to 0.1kwh /kvarh.
	Click button 2 or 3 to select the pulse output rate. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters.
4. Setting pulse output width (L-03.03 setting screen)	
	The pulse output width represents the effective duration of the pulse output. Options that can be set: 60, 100, 200, unit is ms, default is 100ms. Press button 4 for 3 second to enter the setting state, and the digit of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu.

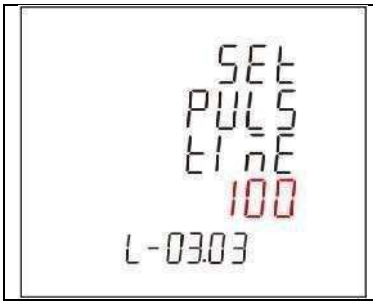
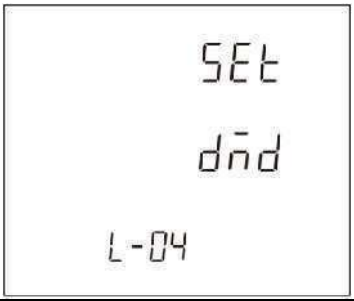
	Click button 2 or 3 to select the pulse output width. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters.

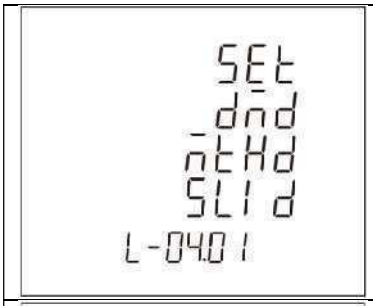
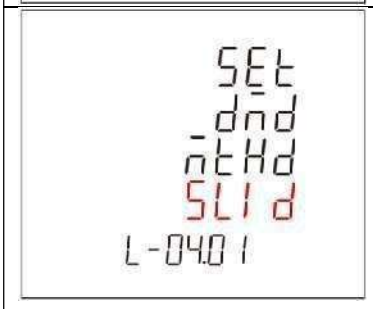
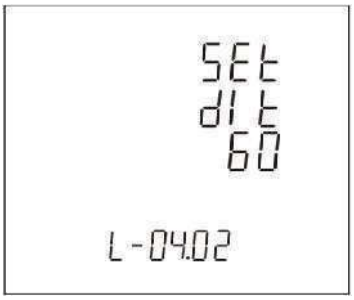
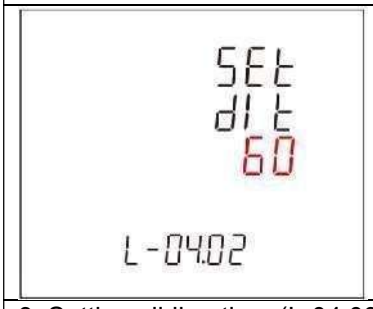
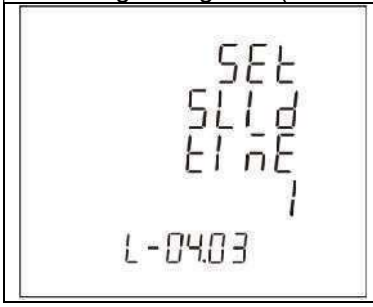
Table 4-1: List of pulse output type

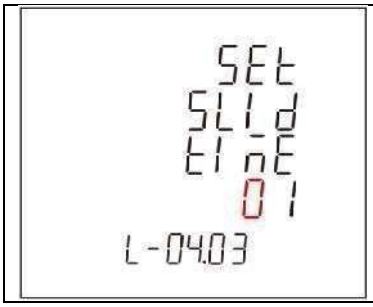
Character	Pulse output type
Total kWh	Total active energy
Total kvarh	Total reactive energy
IMP kWh	Import active energy
IMP kvarh	Import reactive energy
EXP kWh	Export active energy
EXP kvarh	Export reactive energy

4.5.6. **Set demand class parameters**

Demand class parameters include: demand calculation method, demand interval period and sliding time.

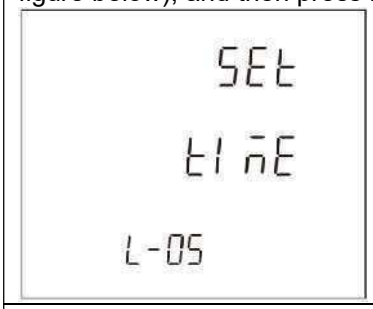
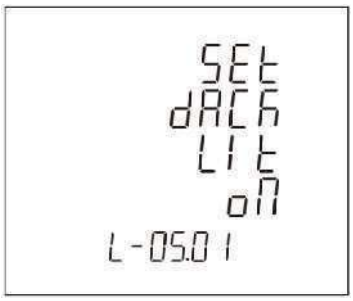
1. After entering the "Parameter Setting Menu" screen, select the L-04 setting screen (as shown in the figure below), and then press button 4 for 3 second to enter the demand class parameter setting screen. 
2. Setting demand calculation method (L-04.01 setting screen)

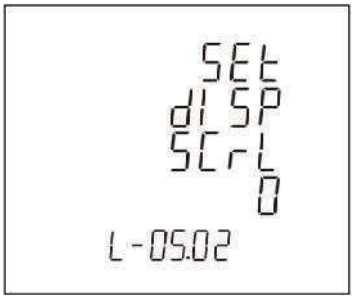
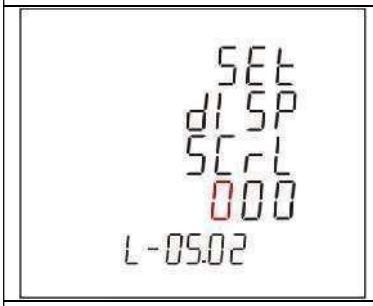
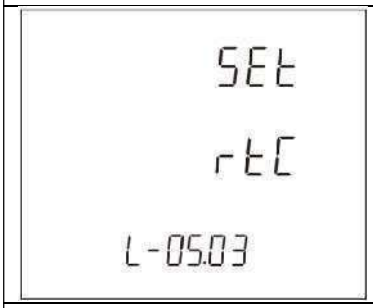
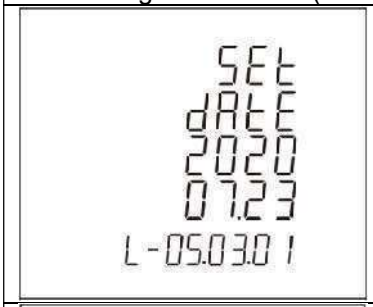
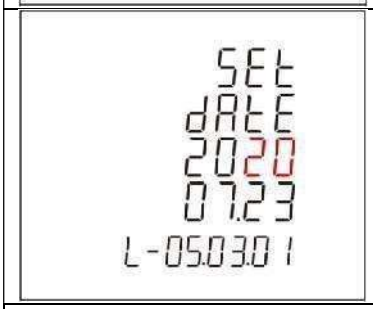
	Demand calculation method can be set: fix block interval and sliding block interval, default is sliding block interval. Press button 4 for 3 second to enter the setting state, and the character of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu.
	Click button 2 or 3 to select the demand calculation method. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters. **Note:** FIX represents fix block interval, SLId represents sliding block interval.
3. Setting demand interval period (L-04.02 setting screen)	
	Demand interval period can be set: 0, 5, 8, 10, 15, 30, 60, unit is minute, default is 60 minutes. Press button 4 for 3 second to enter the setting state, and the digit of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu. Note: 1. If the demand interval period is set to 0 minutes, then the demand is updated every second. 2. If you need to set other values between 0 and 60 minutes, use the communication command to do so.
	Click button 2 or 3 to select the demand interval period. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters.
3. Setting sliding time (L-04.03 setting screen)	
	Sliding time setting range: 1 to (demand interval period), unit is minutes, default is 1 minute. Press button 4 for 3 second to enter the setting state, and the digit of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu. **Note:** This setting menu will only be displayed if the demand calculation method is set to sliding block interval.

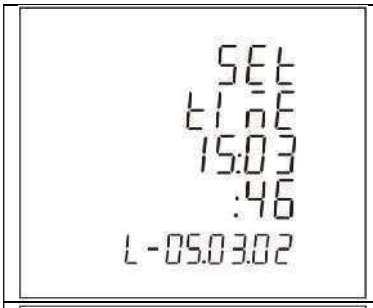
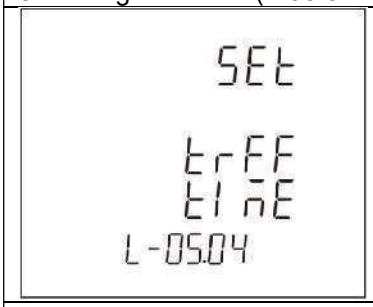
	Click button 2 or 3 to increase or decrease the number of set bits. Click button 4 can be moved the set bits to the right. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters.

4.5.7. **Set time class parameters**

Time class parameters include: backlight time, automatic scroll display time, System time (RTC) and Tariff time.

1. After entering the "Parameter Setting Menu" screen, select the L-05 setting screen (as shown in the figure below), and then press button 4 for 3 second to enter the time class parameter setting screen. 	
2. Setting backlight time (L-05.01 setting screen)	
	Backlight time can be set: on, off, 5, 10, 30, 60, 120, unit is minute, default is 60 minutes. Press button 4 for 3 second to enter the setting state, and the character of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu. Note: 1. On means the backlight is always on, and off means the backlight is always off. 2. If you need to set other values within 120 minutes, use the communication command to do so.
	Click button 2 or 3 to select the backlight time. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters. **Note:** on That means is on. oFF That means is off.
3. Setting automatic scroll display time (L-05.02 setting screen)	

	Automatic scroll display time set range: 0 to 255, unit is second, default is 0 second. Press button 4 for 3 second to enter the setting state, and the digit of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu. **Note:** 1. Automatic scroll display time refers to the time interval of automatic page turning display on the main display screen. 2. Automatic scroll display time is 0, means no automatic wheel display
	Click button 2 or 3 to increase or decrease the number of set bits. Click button 4 can be moved the set bits to the right. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters.
4. Setting system time (RTC) (L-05.03 setting screen)	
	Press button 4 for 3 second to enter the next level setting menu. Click button 1 to return to the previous level setup menu.
4.1. Setting date of RTC (L-05.03.01 setting screen)	
	Click button 3 to scroll down to the time setting screen. Press button 4 for 3 second to enter the setting state, and the character of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu.
	Click button 2 or 3 to increase or decrease the number of set bits. Click button 4 can be moved the set bits to the right. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters.
4.2. Setting time of RTC (L-05.03.02 setting screen)	

	Click button 2 to scroll up to the date setting screen. Press button 4 for 3 second to enter the setting state, and the character of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu.
	Click button 2 or 3 to increase or decrease the number of set bits. Click button 4 can be moved the set bits to the right. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters.
5. Setting tariff time (L-05.04 setting screen)	
	Press button 4 for 3 second to enter the next level setting menu. Click button 1 to return to the previous level setup menu.
5.1. Setting the start time of the tariff segment (L-05.04.01 to L-05.04.08 setting screen)	
	Click button 2 or 3 to select the time starting point that needs to be set. Press button 4 for 3 second to enter the setting state, and the character of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu. **Note:** 1. The number displayed in the second line of the screen represents the sequence number of the selected starting time point. The meter supports 8 starting time points and 4 tariff segments. 2. The character displayed in the third line of the screen represents the starting time of the tariff segment (format is hours: minutes). 3. The power meter supports 4 tariff segments. FEE1 That means tariff segment is tariff 1 (T1). FEE2 That means tariff segment is tariff 2 (T2). FEE3 That means tariff segment is tariff 3 (T3). FEE4 That means tariff segment is tariff 4 (T4).

	Click button 2 or 3 to increase or decrease the number of set bits. Click button 4 can be moved the set bits to the right. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters. **Note:** If the time point is not needed (no link tariff segment), the tariff number needs to be set to 0.

4.5.8. **Reset**

The power meter supports button reset operations for the data types is: energy data, Max. Demand, DI count, Max./Min. value, SOE information.

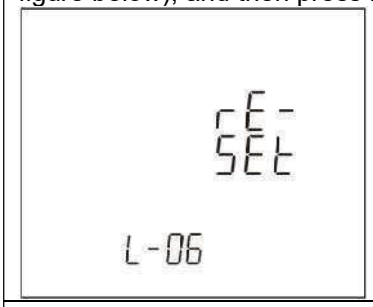
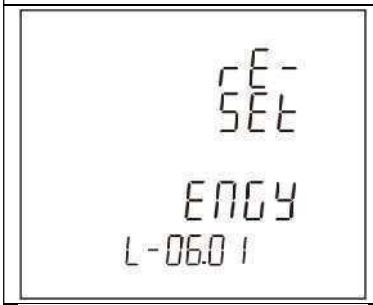
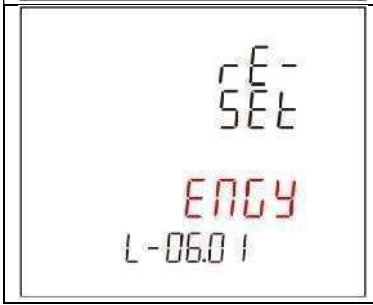
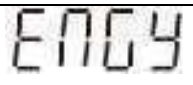
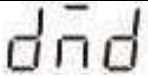
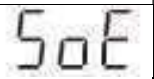
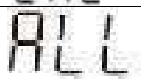
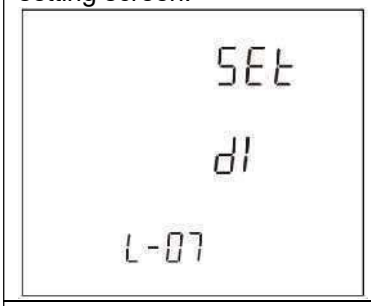
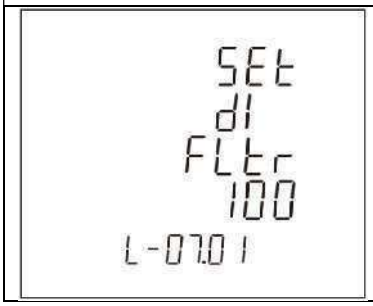
1. After entering the "Parameter Setting Menu" screen, select the L-06 setting screen (as shown in the figure below), and then press button 4 for 3 second to enter the reset parameter setting screen. 	
2. Select the data type that need to be reset (L-06.01 to L-06.06 setting screen)	
	Click button 2 or 3 to select the data type that needs to be reset. Press button 4 for 3 second to enter the reset state, and the character of the reset data becomes the flashing state. Click button 1 to return to the previous level setup menu. **Note:** To reset the character of the option and the corresponding relationship of the reset data, please refer to Table 4-3.
	Press button 4 for 3 second to confirm the operation, and the power meter will reset the selected type of data. Click button 1 to exit the reset state, and do not reset the selected reset option.

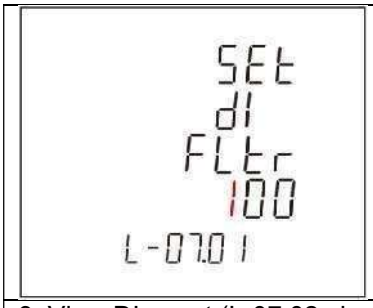
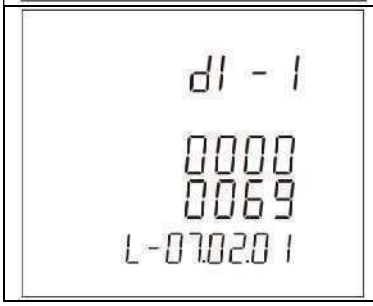
Table 4-3: List of reset data type

Character	Reset data type	Character	Reset data type	Character	Reset data type
	All energy data		Max. Demand		DI count
	Max./Min. value		SOE information		All resettable data

4.5.9. **Set digital input (DI) class parameters**

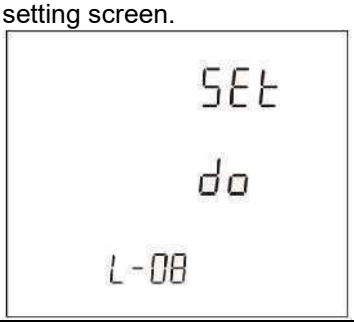
Digital input (DI) class parameters include: DI filter time and DI count.

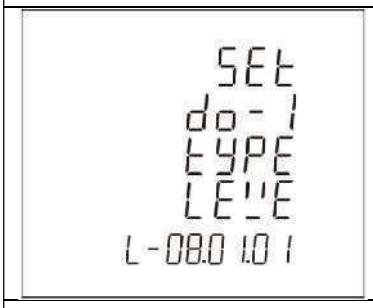
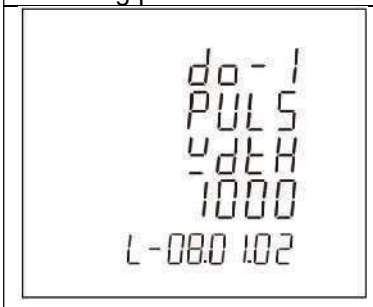
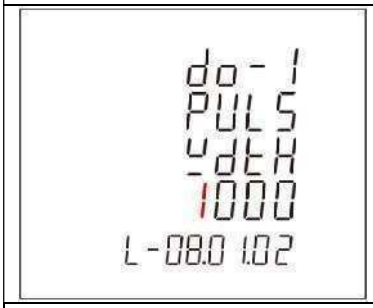
1. After entering the "Parameter Setting Menu" screen, select the L-07 setting screen (as shown in the figure below), and then press button 4 for 3 second to enter the digital input (DI) class parameter setting screen. 
2. Setting DI filter time (L-07.01 setting screen)
 DI filter time set range: 0 to 255, unit is ms, default is 100ms. Press button 4 for 3 second to enter the setting state, and the character of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu.

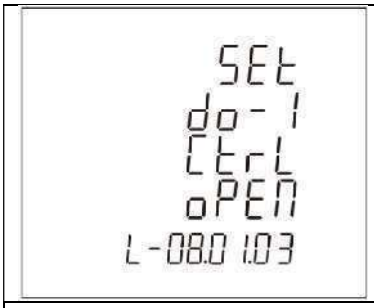
	Click button 2 or 3 to increase or decrease the number of set bits. Click button 4 can be moved the set bits to the right. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters.
3. View DI count (L-07.02 view screen)	
	Press button 4 for 3 second to enter the DI count value view screen. Click button 1 to return to the previous level setup menu.
	Click button 2 or 3 to select the DI channel. Click button 1 to return to the previous level setup menu. **Note:** The power meter provides four digital input channels (DI-1, DI-2, DI-3 and DI-4).

4.5.10. **Set digital output (DO) class parameters**

Digital output (DO) class parameters include: output mode, pulse width time of output and manual control.

1. After entering the "Parameter Setting Menu" screen, select the L-08 setting screen (as shown in the figure below), and then press button 4 for 3 second to enter the digital output (DO) class parameter setting screen. 
2. Select DO output channel (L-08.01 to L-08.02 setting screen)

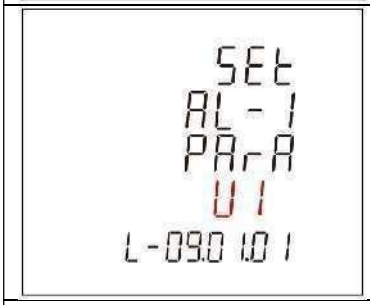
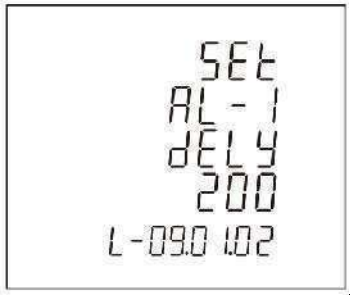
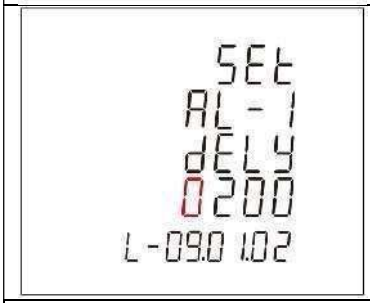
	Click button 2 or 3 select the digital output channel. Press button 4 for 3 second to enter the parameter setting menu of the digital output channel. Press the No. 1 button to return to the previous level menu.
3. Setting DO output mode (L-08.0*.01 setting screen)	
	DO output mode can be set: level output mode and pulse output mode, default is level mode. Press button 4 for 3 second to enter the setting state, and the character of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu.
	Click button 2 or 3 to select the DO output mode. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters. **Note:** LEVE That means level output mode. PULS That means pulse output mode.
4. Setting pulse width time of DO output (L-08.0*.02 setting screen)	
	pulse width time of DO output set range: 50 to 3000, unit is ms, default is 1000ms. Press button 4 for 3 second to enter the setting state, and the digit of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu. **Note:** Only when the digital output (DO) is set to pulse output mode, this Settings screen will appear.
	Click button 2 or 3 to increase or decrease the number of set bits. Click button 4 can be moved the set bits to the right. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters.
5. Setting manual control of DO (L-08.0*.03 setting screen)	

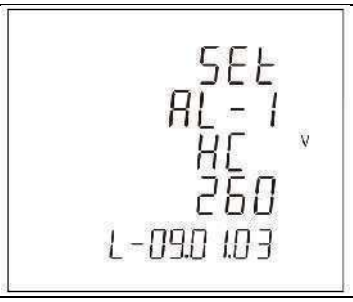
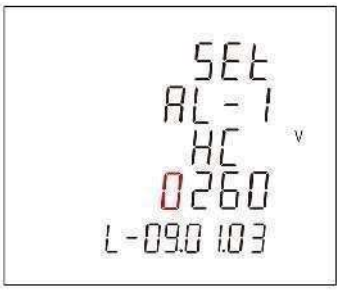
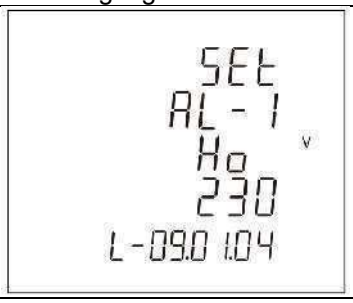
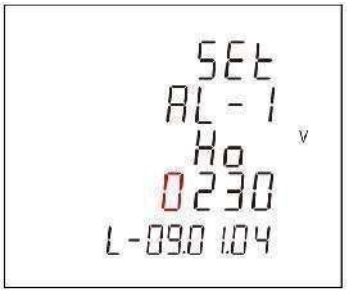
	The manual control operation screen of digital output (DO) can control the switch of relay to ON or OFF state. Press 3Sbutton 4 to enter the manual control state, and the character of the control option becomes the flashing state. Click button 1 to return to the previous level setup menu. **Note:** ON means relay is closed, OFF means relay is open.
	Click button 2 or 3 keys to select the state of the relay. Press button 4 for 3 second for confirmation, and the meter will control the relay according to the selected relay state. Click button 1 to exit the manual control state without any operation on the relay. **Note:** oPEN That means open, relay is OFF status. CLoS That means close, relay is ON status.

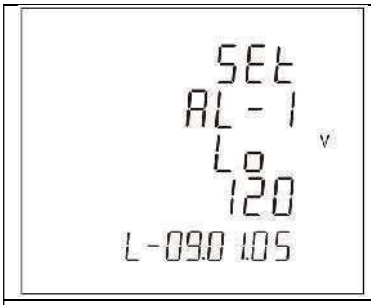
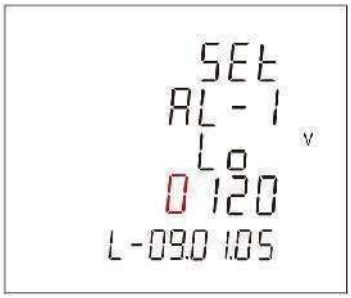
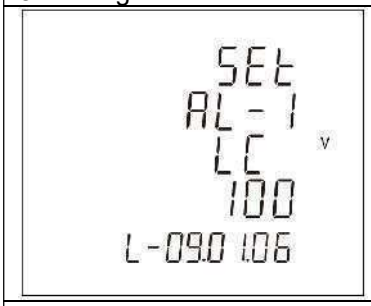
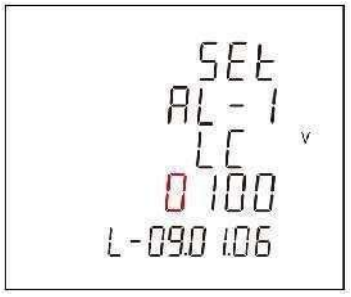
4.5.11. **Set alarm (AL) class parameters**

Alarm (AL) class parameters include: alarm monitoring object, delay time of alarm action, high-threshold alarm trigger value (HC), high-threshold alarm release value (HO), low threshold alarm release value (LO), low threshold alarm trigger value (LC), alarm enabled and alarm status.

1. After entering the "Parameter Setting Menu" screen, select the L-09 setting screen (as shown in the figure below), and then press button 4 for 3 second to enter the alarm (AL) class parameter setting screen. 
2. Select Alarm (AL) channel (L-09.01 to L-09.02 setting screen)

	Click button 2 or 3 select the alarm channel. Press button 4 for 3 second to enter the parameter setting menu of the alarm channel. Press the No. 1 button to return to the previous level menu. **Note:** AL-1 link to DO-1, AL-2 link to DO-2.
3. Setting alarm monitoring object (L-09.0*.01 setting screen)	
	The power meter has 37 alarm monitoring objects, the optional types of alarm monitoring objects are shown in Table 4-4 below. Press button 4 for 3 second to enter the setting state, and the character of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu.
	Click button 2 or 3 to select the alarm monitoring objects. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters.
4. Setting delay time of alarm action (L-09.0*.02 setting screen)	
	Delay time of alarm action set range: 0 to 9999, unit is ms, default is 200ms. If the delay time is set to 0, when an alarm occurs, the alarm action will be executed immediately without delay. Press button 4 for 3 second to enter the setting state, and the digit of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu.
	Click button 2 or 3 to increase or decrease the number of set bits. Click button 4 can be moved the set bits to the right. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters.
5. Setting high-threshold alarm trigger value (HC) (L-09.0*.03 setting screen)	

	Press button 4 for 3 second to enter the setting state, and the digit of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu. **Note:** High-threshold alarm trigger values support signed values.
	Click button 2 or 3 to increase or decrease the number of set bits. Click button 4 can be moved the set bits to the right. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters. **Note:** 1. When the first number is equal to 0 and in the setting state, click button 3 to switch the number to a negative number, click button 2 to switch the number to a positive number. 2. Click button 4 to move the setting bit. When it moves to the fourth digit, click button 4 again, and the setting bit will switch to the setting of units, which can be set at this time.
6. Setting high-threshold alarm release value (HO) (L-09.0*.04 setting screen)	
	Press button 4 for 3 second to enter the setting state, and the digit of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu. **Note:** High-threshold alarm release values support signed values.
	Click button 2 or 3 to increase or decrease the number of set bits. Click button 4 can be moved the set bits to the right. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters. **Note:** 1. When the first number is equal to 0 and in the setting state, click button 3 to switch the number to a negative number, click button 2 to switch the number to a positive number. 2. Click button 4 to move the setting bit. When it moves to the fourth digit, click button 4 again, and the setting bit will switch to the setting of units, which can be set at this time.
7. Setting low-threshold alarm release value (LO) (L-09.0*.05 setting screen)	

	Press button 4 for 3 second to enter the setting state, and the digit of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu. **Note:** Low-threshold alarm release values support signed values.
	Click button 2 or 3 to increase or decrease the number of set bits. Click button 4 can be moved the set bits to the right. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters. **Note:** 1. When the first number is equal to 0 and in the setting state, click button 3 to switch the number to a negative number, click button 2 to switch the number to a positive number. 2. Click button 4 to move the setting bit. When it moves to the fourth digit, click button 4 again, and the setting bit will switch to the setting of units, which can be set at this time.
8. Setting low-threshold alarm trigger value (LC) (L-09.0*.06 setting screen)	
	Press button 4 for 3 second to enter the setting state, and the digit of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu. **Note:** Low-threshold alarm trigger values support signed values.
	Click button 2 or 3 to increase or decrease the number of set bits. Click button 4 can be moved the set bits to the right. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters. **Note:** 1. When the first number is equal to 0 and in the setting state, click button 3 to switch the number to a negative number, click button 2 to switch the number to a positive number. 2. Click button 4 to move the setting bit. When it moves to the fourth digit, click button 4 again, and the setting bit will switch to the setting of units, which can be set at this time.
9. Setting alarm enabled (L-09.0*.07 setting screen)	

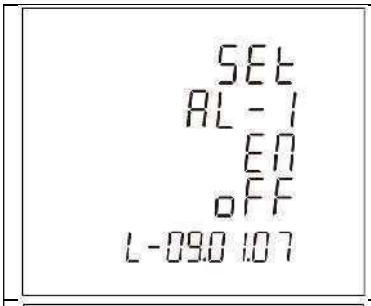
	Alarm enables can be set: ON and OFF. ON means turn on alarm function, OFF means turn off alarm function. Press button 4 for 3 second to enter the setting state, and the character of the setting becomes the flashing state. Click button 1 to return to the previous level setup menu.
	Click button 2 or 3 to select the alarm enable value. Press button 4 for 3 second to confirm the setting. The power meter will save the setting value and exit the setting state. Click button 1 to exit the setting state without saving the setting parameters.
10. View alarm status (L-09.0*.08 view screen)	
	View the alarm status of the current alarm channel. Click button 1 to return to the previous level setup menu. rLS That means the alarm status is release, there is no alarm. AL HI That means the alarm status is high-threshold alarm. AL Lo That means the alarm status is low-threshold alarm. AL HI.Lo That means both high-threshold and low-threshold alarms occur in the monitoring object. It may occur only when the monitoring object is per phase parameter. **Note:** This screen can only be viewed.

Table 4-4: List of alarm monitoring objects

Character	Alarm monitoring objects	Character	Alarm monitoring objects	Character	Alarm monitoring objects
U1	Phase 1 line to neutral volts.	P1	L1 active power	PF2	Phase 2 power factor.
U2	Phase 2 line to neutral volts.	P2	L2 active power	PF3	Phase 3 power factor .
U3	Phase 3 line to neutral volts.	P3	L3 active power	Total PF	Total system power factor.
UNAV	Average line to neutral volts.	Total P	Total active power	F	Frequency of supply voltages.
U12	Line 1 to Line 2 volts.	Q1	L1 reactive power	UNPH	Line to neutral voltage of per phase

U23	Line 2 to Line 3 volts.	92	L2 reactive power	UUPH	Line to line voltage of per phase
U31	Line 3 to Line 1 volts.	93	L3 reactive power	I-PH	Current of per phase
UUAV	Average line to line volts.	Total 9	Total reactive power	P-PH	Active power of per phase
I1	Phase 1 current.	S1	L1 apparent power	Q-PH	Reactive power of per phase
I2	Phase 2 current.	S2	L2 apparent power	S-PH	Apparent power of per phase
I3	Phase 3 current.	S3	L3 apparent power	PFPH	Power factor of per phase
IAV	Average line current.	Total S	Total apparent power	NULL	Null alarm objects (no use alarm)
IN	Neutral current.	PF1	L1 power factor		

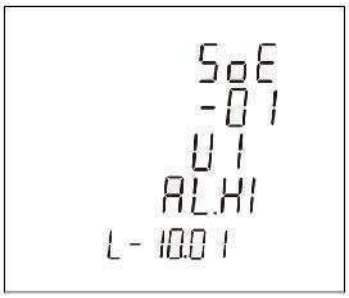
4.5.12. **View SOE log information**

SOE log information include: evetn type, time of occur event. If it is an alarm event, it also has the alarm value that triggers the alarm.

1. After entering the "Parameter Setting Menu" screen, select the L-10 view screen (as shown in the figure below), and then press button 4 for 3 second to enter the SOE log information view screen.



2. Select the SOE information sequence number that you want to view (L-10.01 to L-10.30 view screen)



Click button 2 or 3 to select the record sequence number for SOE information.

Press button 4 for 3 second to enter the next level menu, and view the information the occurrence time of the event and the alarm value that triggers the alarm.

Note:
1. The characters shown in the third and fourth lines of the screen represent event types. The type of SOE supported by the power meter is shown in Table 4-5.
2. If the event belongs to the alarm event, then the characters displayed in the third line represent the alarm object that triggers the alarm event. The character of display and the corresponding relationship of alarm monitoring object, please refer to Table 4-4 above.

3. The occurrence time of the event (L-10.**.01 view screen)

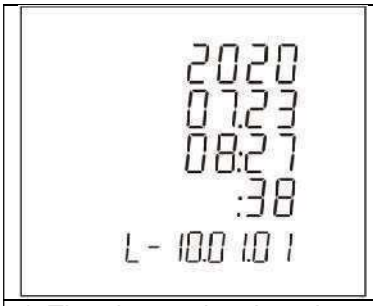
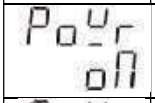
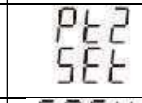
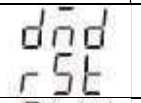
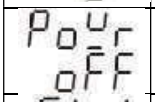
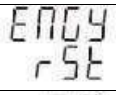
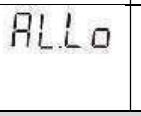
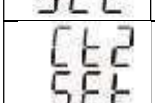
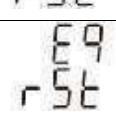
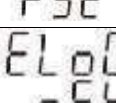
	Click button 3 to turn the page, you can view the alarm value that triggers the alarm. Click button 1 to return to the previous level setup menu. **Note:** Only when SOE information belongs to alarm event, can the alarm value when the alarm is triggered be view, otherwise there is no view screen of alarm value.
4. The alarm value that triggers the alarm (L-10.**.02 view screen)	
	Click button 2 to turn the page, you can view the occurrence time of the event. Click button 1 to return to the previous level setup menu.

Table 4-5: List of SOE type

Character	SOE type	Character	SOE type	Character	SOE type
	Power on event		Setting PT2 event		Reset max.demand event
	Power off event		Reset all energy data event		High-threshold alarm event
	Setting CT1 event		Reset active energy data event		Low-threshold alarm event
	Setting CT2 event		Reset reactive energy data event		
	Setting PT1 event		Reset monthly and daily energy consumption data events		

Chapter 5. Digital input (DI) interface

5.1. Function declaration

The power meter can support 4 channels of digital input (DI1, DI2, DI3 and DI4). The digital input interface circuit has built-in power supply in the power meter, which can support dry contact input, such as contact mechanical switch, dry reed pipe, open collector pulse output interface and so on.

Digital input interface can detect the input of switch state (ON or OFF), can also be to count Off-to-On transitions for each input. The count value can be through the relevant interface to enter the Settings menu to view (Refer to step 3 in 4.5.9), also can use communication command to read specify the register to get the count value (Please refer to the relevant communication protocol document for the register address).

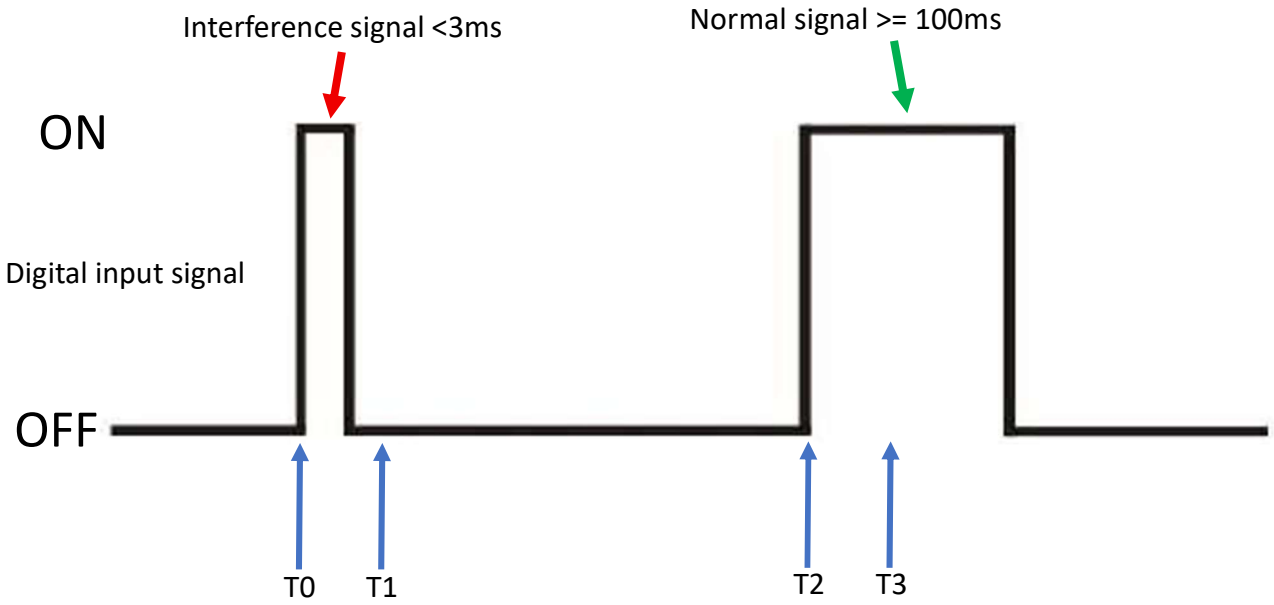
Digital input interface can be used to detect the switch state of circuit breaker, water meter output pulse count and other scenarios.

5.2. Description of filter function for input detection

Digital input interface supports filter detection function to detect input signals, which can prevent errors in detection results due to interference signals in the detection process. When using the filtering function, it is necessary to ensure that the filtering time set is less than the effective time of the input signal ON, otherwise the detection will be wrong.

Filter detection principle: when the digital input interface first detects that the input signal has changed to an ON state, will start the filtering timing, after the timing time is equal to the filtering time, the digital input interface will detect the state of the input signal again, if it is still in the state of ON, the digital input interface determines that the input signal is in the state of ON; otherwise, it determines that the input signal is in the state of OFF.

Figure 5-1: Diagram of digital input signal detection process



T0 and T2 are the points at which the timer is started

T1 and T4 are the points at which the timer is ended

As shown in Figure 5-1: assuming the filtering time is set to 10ms, the time difference between T0 and T1, T2 and T3 is all 10ms (filtering timing time). At the time point T1, the digital input signal is OFF. This time, the input signal is judged to be OFF, so the interference signal will be filtered out. At time point T3, the digital input signal is in the state of ON, and this time the input signal is judged to be ON, so the normal input signal will be detected normally.

The detected filtering time can be set by pressing the button (Refer to steps 2 in 4.5.9) or by communication command (Please refer to the relevant communication protocol document for the register address). If the filtering time is set to 0, filtering is not enabled.

Note: ON represents the input digital signal is closed state; OFF represents the input digital signal is disconnected state.

Chapter 6. Digital output (DO) interface

The power meter can support 2 channels of digital output (DO1 and DO2). Digital output has two working modes: manual control and alarm control.

Manual control mode: Users can switch the digital output interface by pressing the button (Refer to steps 5 in 4.5.10) or use communication commands for remote control.

Alarm control mode: By associating the alarm monitoring object, the product can automatically switch the digital output interface according to the value of the monitored object (refer to the introduction of alarm function in Chapter 7).

The digital output interface has two output modes: level output mode and pulse output mode.

Level output mode: after the digital output is set to ON state, it will always remain ON state and will not switch to OFF state until it is set to OFF state.

Pulse output mode: After the digital output is set to ON state, the timing will start. When the timing time is equal to the width of DO pulse, the digital output will automatically switch back to OFF state.

The output mode and DO pulse width time of digital output can be set from the Settings menu (refer to the operation steps in 4.5.10) or by using the communication command.

Note: ON represents the relay is closed state; OFF represents the relay is disconnected state.

Chapter 7. Alarm

The power meter can support 2 channels of alarm functiont (AL1 and AL2), alarm action is related to the digital output interface, according to the real-time measurement data of the monitoring object automatically control the digital output interface to switch to the corresponding state (ON or OFF). The alarm function is to bind a monitoring object on the alarm channel and compare the measured data of the monitoring object with the alarm threshold value every second to determine whether the alarm threshold value is exceeded or trigger the alarm action.

Note: If the measurement wire type, CT, PT and other parameters of the power meter are modified, all alarm functions will be disabled to prevent unnecessary alarm events. It is necessary to confirm whether the alarm parameters are correct and then restart the alarm function.

7.1. **Alarm parameter description**

1. Alarm monitoring object: Alarm related measurement parameter. The power meter compares the data of this measurement parameter every second to determine whether the alarm threshold is exceeded, so as to decide whether to trigger the alarm. Alarm monitoring objects support 37 kinds of measurement parameters, the specific measurement parameters are shown in Table 7-1 below.

2. Alarm action delay time: When an alarm event occurs, the alarm action will be performed only after the delay time. If the delay time is set to 0, the alarm action will be executed immediately.

3. High-threshold alarm trigger value (HC): When the measured data of the monitored object is greater than the trigger value, high-threshold alarm event will be triggered.

4. High-threshold alarm release value (HO): When a high-threshold alarm event is triggered, the alarm state will exit only if the measured data of the monitored object is less than the release value.

5. Low threshold alarm release value (LO): When the low threshold alarm event is triggered, the alarm state will exit only if the measured data of the monitored object is greater than the release value.

6. Low threshold alarm trigger value (LC): When the measured data of the monitored object is less than the trigger value, low threshold alarm event will be triggered.

7. Alarm enabled: The function used to control the alarm is turned on or off. Only when the alarm enabling control value is set to the state of being turned on, can the power meter normally operate the alarm workflow.

Table 7-1: Alarm monitoring object

Number	Alarm parameter	Number	Alarm parameter	Number	Alarm parameter
0	Phase 1 line to neutral volts.	13	Phase 1 active power.	26	Phase 2 power factor.
1	Phase 2 line to neutral volts.	14	Phase 2 active power.	27	Phase 3 power factor .
2	Phase 3 line to neutral volts.	15	Phase 3 active power.	28	Total system power factor.
3	Average line to neutral volts.	16	Total system active power.	29	Frequency of supply voltages.
4	Line 1 to Line 2 volts.	17	Phase 1 reactive power.	30	Line to neutral voltage of per phase
5	Line 2 to Line 3 volts.	18	Phase 2 reactive power.	31	Line to line voltage of per phase
6	Line 3 to Line 1 volts.	19	Phase 3 reactive power.	32	Current of per phase
7	Average line to line volts.	20	Total system reactive power.	33	Active power of per phase
8	Phase 1 current.	21	Phase 1 apparent power.	34	Reactive power of per phase
9	Phase 2 current.	22	Phase 2 apparent power.	35	Apparent power of per phase
10	Phase 3 current.	23	Phase 3 apparent power.	36	Power factor of per phase
11	Average line current.	24	Total system apparent power.		
12	Neutral current.	25	Phase 1 power factor.		

Note: Per phase L-N voltage and L-L voltage, per phase current, per phase active/reactive/apparent power, per phase power factor belonging to the split phase parameters (containing the L1, L2, L3 parameters). When the monitoring object of the product binding is the split phase parameter, as long as any phase parameter exceeds the alarm threshold, the alarm event will be triggered; only when the parameters of all three phases are in the state of no alarm, the alarm state of the alarm channel will be lifted.

7.2. **Alarm parameter setting process**

Step1: Select the alarm channel.

Step2: Bind the alarm monitoring object.

Step3: Set the alarm action delay time.

Step4: Set high threshold alarm trigger value and high threshold alarm release value.

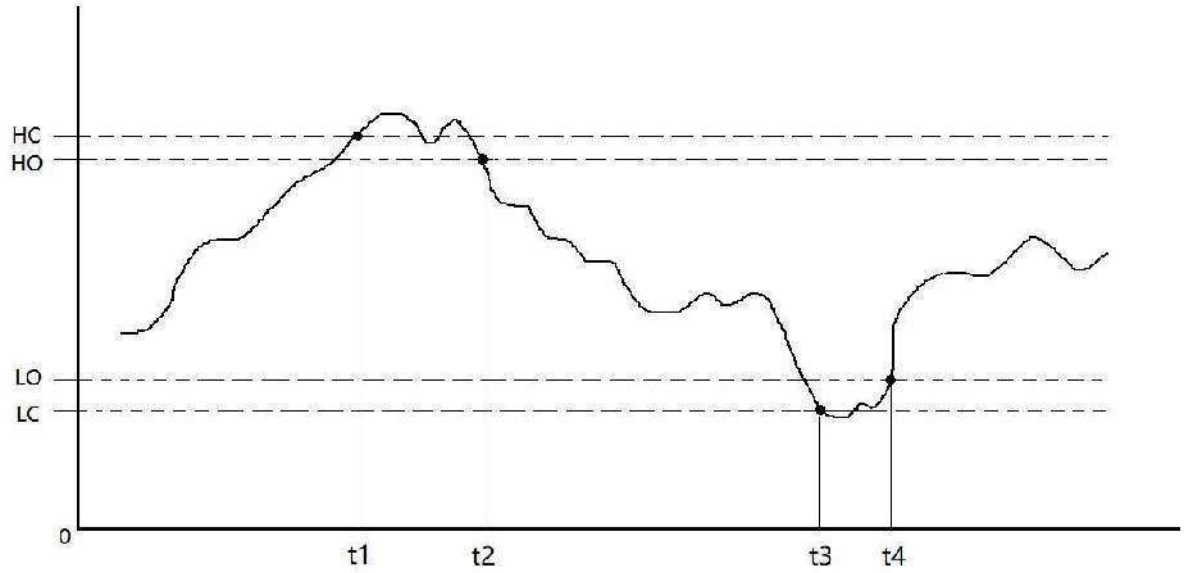
Step5: Set low threshold alarm release value and low threshold alarm trigger value.

Step6: Turn on the alarm function.

Note:
1, The alarm parameters can be set from the Settings menu (refer to the operation steps in 4.5.11) or by using the communication command.
2, When readjusting the alarm threshold value, please turn off the alarm function first to prevent the alarm event from being triggered by mistake during the numerical adjustment.
3, After each reset of the alarm monitoring object, the alarm function will be automatically turned off in order to prevent the wrong triggering of the alarm, and the setting of the alarm monitoring object is required. When the alarm monitoring object reset is complete, need to reopen the alarm function.
4, The setting process of alarm threshold shall ensure that: high threshold alarm trigger value > high threshold alarm relief value > low threshold alarm relief value > Low threshold alarm trigger value, otherwise an error will occur during the execution of the alarm function.

7.3. **Rules for alarm monitoring**

Figure 7-1: Diagram of alarm monitoring process



Note: HC represents High-threshold alarm trigger value.
HO represents High-threshold alarm release value.
LO represents Low threshold alarm release value.
LC represents Low threshold alarm trigger value.

As shown in Figure 7-1:

1. At time T1, when the power meter detects that the value of the monitored object is greater than the trigger value of the high-threshold alarm, the high-threshold alarm event of the power meter is triggered.

2. During the time period from T1 to T2, although the value of the monitoring object appears less than the high-threshold alarm trigger value, it is still greater than the high-threshold alarm release value, so the power meter is still in the high-threshold alarm state.

3. At time point T2, if the power meter detects that the value of the monitored object is less than the high-threshold alarm release value, then the power meter will exit the high-alarm state.

4. At time point T3, the power meter detects that the value of the monitored object is less than the low-threshold trigger alarm, and then the low-threshold alarm event of the power meter is triggered.

5. During the period of T3 ~ T4, although the value of the monitored object appears greater than the low threshold alarm trigger value, it is still smaller than the low threshold alarm release value, so the power meter is still in the state of low threshold alarm.

6. At the time point T4, when the power meter detects that the value of the monitored object is greater than the low-threshold alarm release value, the power meter will exit the low-alarm state.

7.4. **Alarm action process**

When the alarm event is triggered, first judge whether the "delay time of alarm action" is equal to 0. If it is equal to 0, immediately execute the following alarm action; if it is not equal to 0, start the delay first, and execute the following alarm action after the delay time reaches the set time.

Alarm action of the power meter:

1. The relay at the digital output interface of the corresponding channel will become ON state (AL1 corresponds to DO1, AL2 corresponds to DO2).

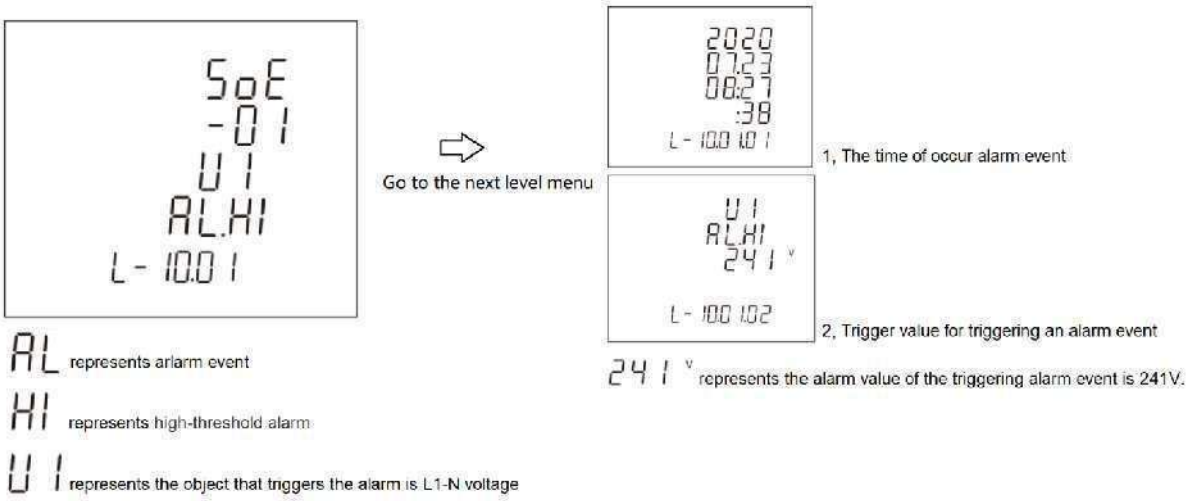
2. ⚠ The icon will be flashing.

3. An SOE event is generated and recorded to storage.

7.5. **View the alarm event record**

Refer to the operation steps in 4.5.12, enter the display of SOE event, and the record information of the alarm event can be found by turning the page. After entering the query menu of the next level, the occurrence time, alarm type and object, trigger value of the alarm event and other information can be inquired, as shown in the figure 7-2 below. In addition, you can also use the communication command to read the specified register to obtain relevant information (please refer to the relevant communication protocol documentation for the register address).

Figure 7-2: Display diagram of record information query of alarm event



As shown in figure 7-2, the specific meaning of the display information of the alarm event is described.

Appendix

Appendix A – LCD character definition table

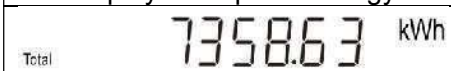
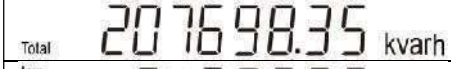
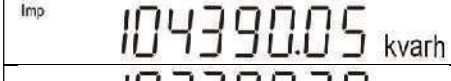
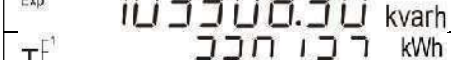
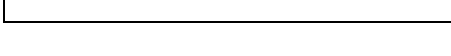
									
0	1	2	3	4	5	6	7	8	9
									
A	B	C	D	E	F	G	H	I	J
									
K	L	M	N	O	P	Q	R	S	T
									
U	V	W	X	Y	Z				

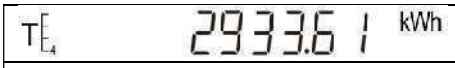
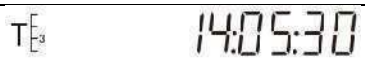
Appendix B – Introduction to the main display screen

1. Display example of measurement data	
	A display screen for three-phase L-N voltage. Example: L1-N voltage = 230.0V L2-N voltage = 230.0V L3-N voltage = 230.0V
	A display screen for three-phase L-L voltage. Example: L1-2 voltage = 400.0V L2-3 voltage = 400.0V L3-1 voltage = 400.0V
	A display screen for three-phase current and neutral current. Example: L1 current = 5.001A L2 current = 5.002A L3 current = 5.000A Neutral current = 0.001A
	A display screen for three-phase L-N voltage THD. Example: L1 voltage THD = 4.06% L2 voltage THD = 3.98% L3 voltage THD = 4.12%

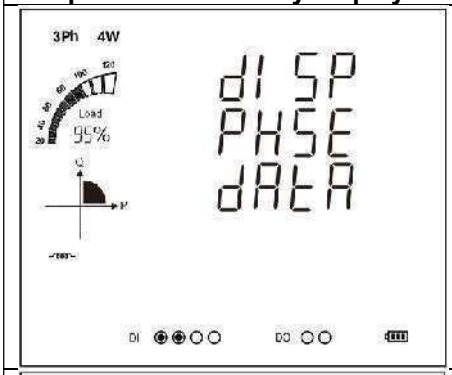
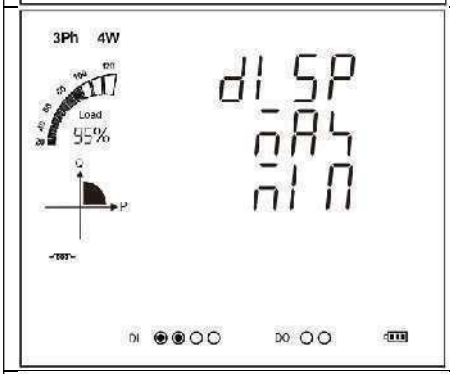
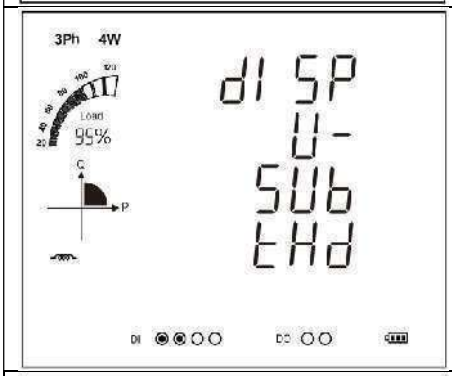
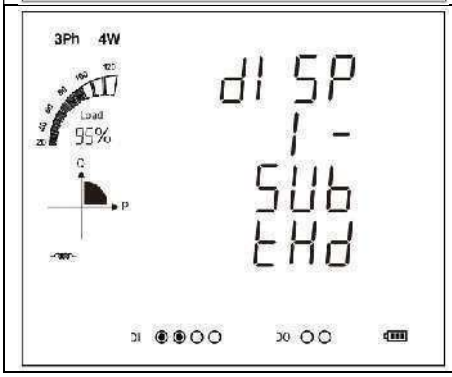
	A display screen for three-phase L-L voltage THD. Example: L1-2 voltage THD = 4.06% L2-3 voltage THD = 3.98% L3-1 voltage THD = 0.00%
	A display screen for three-phase current THD. Example: L1 current THD = 4.06% L2 current THD = 4.05% L3 current THD = 4.04%
	Voltage and current phase sequence display screen **Note:** 1. U 123 represents the phase sequence of the voltage. 123 represents forward sequence, 321 represents reverse sequence. 2. I 321 represents the phase sequence of the current. 123 represents forward sequence, 321 represents reverse sequence.
	Total power factor and frequency display screen Example: Total power factor = 0.503 Frequency = 50.02Hz

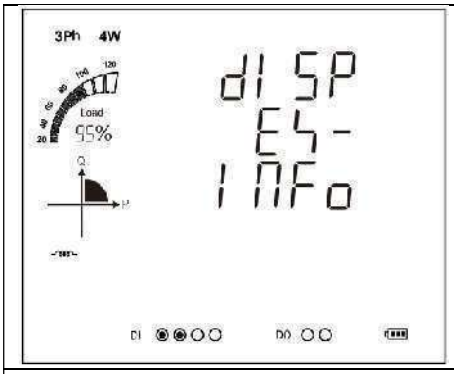
	Three - phase power factor display screen Example: L1 power factor = 0.506 L2 power factor = 0.502 L3 power factor = 0.501
	Max.demand of three-phase and neutral current display screen Example: Max.Demand of L1 current = 5.002A Max.Demand of L2 current = 5.003A Max.Demand of L3 current = 5.000A Max.Demand of neutral current = 0.002A
	Max.demand of total active/reactive/apparent power display screen Example: Max.Demand of total active power = 1.560 kW Max.Demand of total reactive power = 2.867 kvar Max.Demand of total apparent power = 3.197 kVA
	Per phase active power display screen Example: L1 active power = 0.551 kW L2 active power = 0.548 kW L3 active power = 0.550 kW

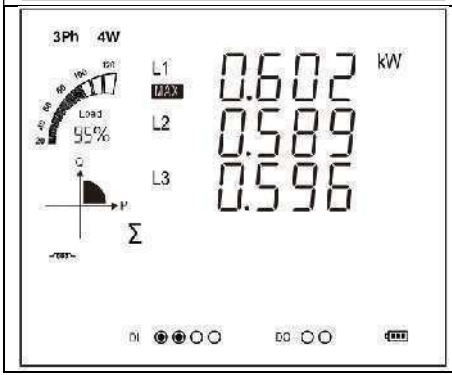
	Per phase reactive power display screen Example: L1 reactive power = 0.952 kvar L2 reactive power = 0.944 kvar L3 reactive power = 0.948 kvar
	Per phase apparent power display screen Example: L1 apparent power = 1.100 kVA L2 apparent power = 1.096 kVA L3 apparent power = 1.082 kVA
	Total active/reactive/apparent power display screen Example: Total active power = 1.649 kW Total reactive power = 2.844 kvar Total apparent power = 3.278 kVA
2. Display example of energy data	
	Total active energy
	Import active energy
	Export active energy
	Total reactive energy
	Import reactive energy
	Export reactive energy
	Tariff 1 active energy
	Tariff 2 active energy
	Tariff 3 active energy Note: ▶ represents that the current rate number is a running tariff segment, i.e., the tariff 3 (T3) is valid.

	Tariff 4 active energy
3. Display example of real-time clock data of the system (RTC)	
	Example of displaying the current date of the system real-time clock.
	Example of displaying the current time of the system real-time clock. Note: The figure on the left represents the tariff segment to which the current time belongs tariff 3 (T3).

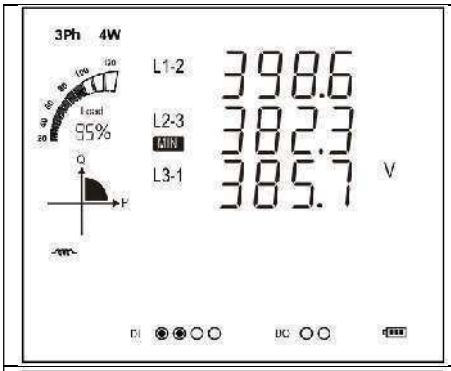
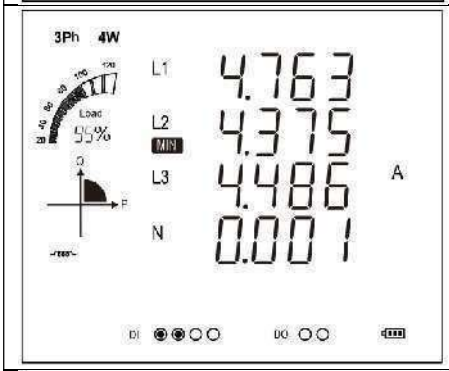
Appendix C – Introduction to auxiliary information display screen

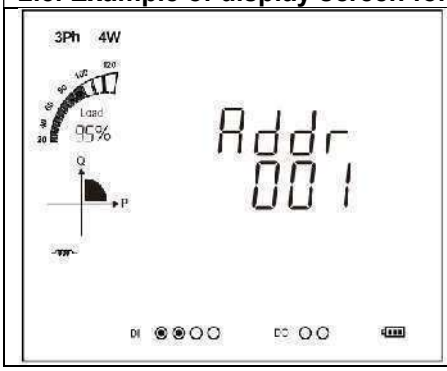
1. Options for auxiliary display screen	
	Per phase measurement class display option
	Max./Min.value class display option
	Sub-harmonic component of voltage display option
	Sub-harmonic component of current display option

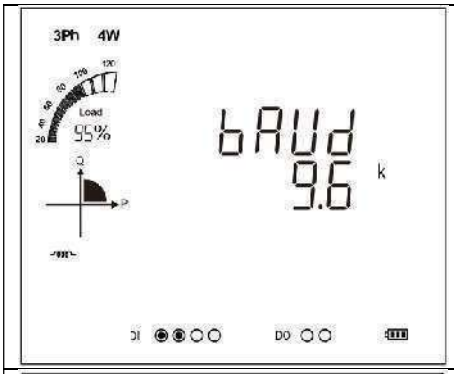
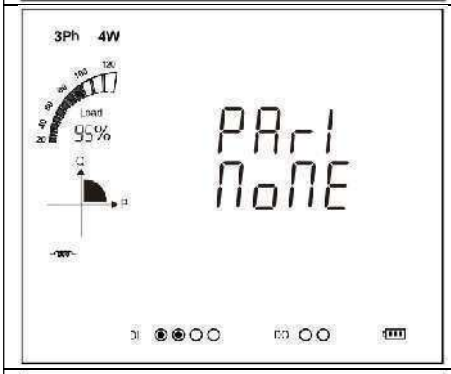
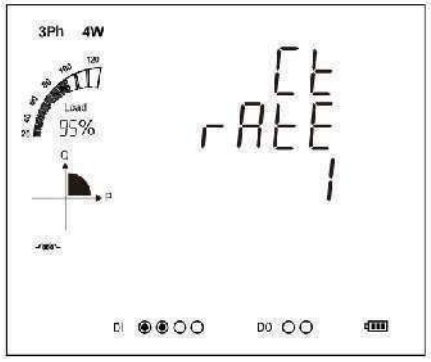
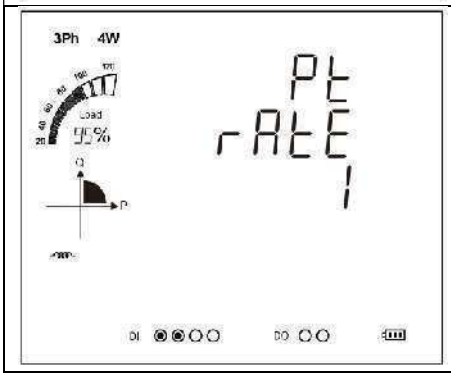
	Extended information class display option
2. Display example of auxiliary display screen	
2.1. Example of display screen for per phase measurement class	
	L1 active power, L1-N voltage, L1 current and L1 active energy display screen
	L2 active power, L2-N voltage, L2 current and L2 active energy display screen
	L3 active power, L3-N voltage, L3 current and L3 active energy display screen
2.2. Example of display screen for Max./Min. value class	

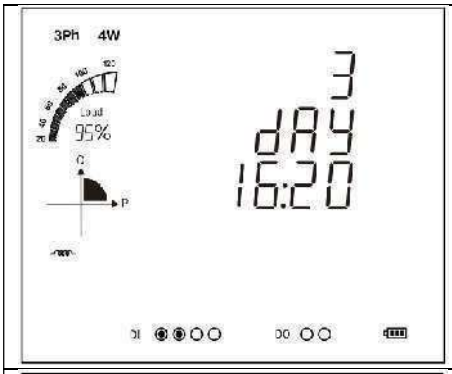
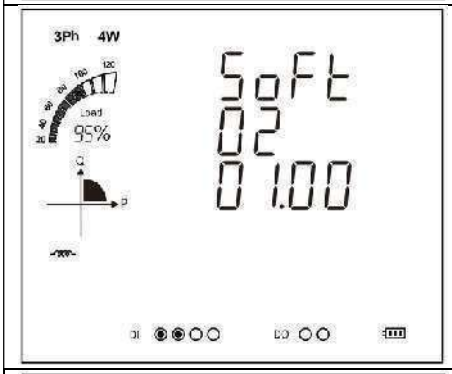
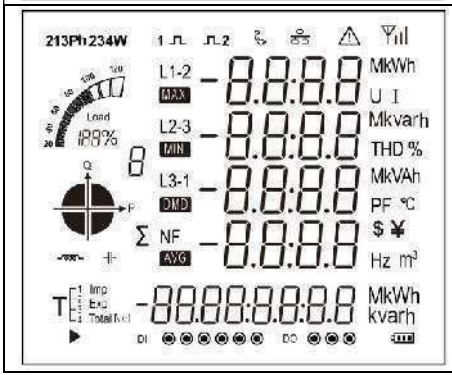
	Max.value of per phase L-N voltage
	Max.value of per phase L-L voltage
	Max.value of per phase and neutral current
	Max.value of per phase active power

	Max.value of per phase reactive power
	Max.value of per phase apparent power
	Max.value of per total active/reactive/apparent power
	Min.value of per phase L-N voltage

	Min.value of per phase L-L voltage
	Min.value of per phase and neutral current
	Min.value of per phase active power
	Min.value of per phase reactive power

	Min.value of per total active/reactive/apparent power
2.3. Example of display screen for individual harmonic distortion of voltage	
	Individual harmonic distortion of voltage Note: tH.02 represents the current displayed voltage harmonics component is the second harmonics.
2.4. Example of display screen for individual harmonic distortion of current	
	Individual harmonic distortion of current Note: tH.02 represents the current displayed current harmonics component is the second harmonics.
2.5. Example of display screen for extended information	
	Modbus address

	Baud rate
	Parity bit
	Ratio of current transformer (CT)
	Ratio of voltage transformer (PT)

	Continuous running time of the power meter **Note:** As shown in the left figure, the figures in the first row represent the days of continuous operation of the power meter, the figures in the third row represent the hours and minutes of continuous operation of the power meter, and the example the power meter in the left figure has been continuously running for 3 days, 16 hours and 20 minutes.
	Software version number
	The screen lights all LCD segments and can be used as a display LCD check.