

YDS60-80 Smart Power Sensor





Hazards and warnings

Before installing, operating, or maintaining this equipment, read this manual carefully, or familiarize the equipment. This document is not an operating manual for untrained persons, and it is not responsible for problems arising outside of its normal use.



Danger of electric shock, combustion, or explosion

- This equipment part has a power danger, please operate strictly in accordance with the specifications.
- The equipment must be powered off and grounded before maintenance and maintenance.
- All mechanical parts, doors, etc shall be restored in place before equipment.
- Equipment maintenance and installation shall only be carried out by qualified personnel.

Failure attention to these precautions can cause serious injury.

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Chapter 1: Product Introduction

1.1 Overview

Smart Power Sensor is used to realize power grid power rationing and energy storage charge and discharge control. It is the core component of household energy management. RS485 wired communication can complete power measurement and power metering functions, and respond to real-time data query of the upper host.

1.2 Function introduction

Table 1 Basic Functions

real-time measurement	
Quick acquisition of channel data refresh time was 75ms	
active power	Three-phase active power and three-phase total active power
reactive power	Three-phase reactive power, three-phase total reactive power
power factor	Three-phase power factor, system power factor
The refresh period of ordinary sampling channel data is 200ms	
current	Three-phase current, total current
phase voltage	Three-phase voltage, average-phase voltage
line voltage	Three-phase line voltage, average line voltage
apparent output	Three-phase in power, three-phase total vision in power
frequency	system frequency
Electric energy measurement	
electric energy	Forward active, reverse active, four-quadrant reactive, Phase active active electric energy and phase reactive electric energy
report an emergency	
PT breakage	The alarm occurs when the positive voltage is less than 8 volts or the negative positive voltage is more than 8 volts and the duration is more than 5s
CT breakage	The alarm occurs when the maximum phase current is greater than 0.2In and the maximum phase current is greater than 4 times of either phase current and the duration is greater than 5s
show	
real-time data	Three-phase voltage, current, power, frequency and other electrical parameters display active power display
plant parameter	Relevant set parameters (communication parameters such as address, wave rate, calibration mode and product information)
Pulse indicating	Active pulse indicator light
display mode	Segment code display
communication	
RS485	One-way RS485 interface, which supports the MODBUS protocol
Baud rate	The Porter rate supports 4800bps, 9600bps, 19200bps, 115200bps with default to 9600bps
check bit	Support no check, parity, odd check, 1 bit stop bit, 2 stop bit, the default is no check 1 bit stop bit

Chapter 2: Installation

2.1 Installation, prevention and preparation

Read it before starting the operation

This chapter contains important safety prevention information that must be followed before installation, service, or maintenance of electrical equipment. Read carefully and follow the following safety precautions instructions.



Electric shock, the danger of burning or explosion, so only qualified operators can install the equipment. This work should be carried out after reading all the guidance. All power connections shall be disconnected before installation, inspection, testing, or maintenance. Please follow the wiring instructions in the instructions, and carefully check whether the wiring is correct after receiving. Aware of the potential danger, the staff should wear the protective equipment and carefully check the correct working wiring and installation. When installing or removing the instrument, please confirm whether the power supply, signal source to be tested and related power supply are disconnected.

2.2 Installation information

2.2.1 Installation environment and location

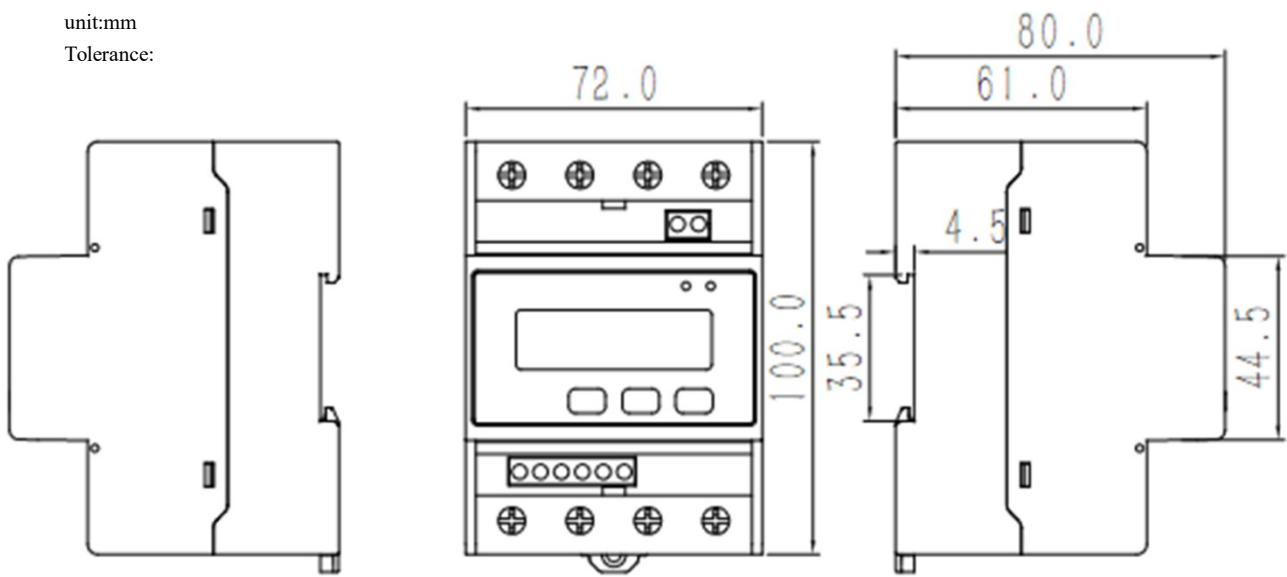
The device shall be installed dry, clean, away from heat and strong electromagnetic fields to avoid direct sunlight. The position is usually installed in the switchgear to protect the device from oil, dirt, dust, corrosive gases, or other harmful substances. Installation should pay attention to convenient maintenance, there is enough space to place the relevant line, terminal row, short contact board and other necessary equipment.

Ac meter voltage input circuit must be connected with appropriate safety or circuit breaker. If it is straight-through, the circuit breaker should be installed before input. The circuit breaker should be the product with rated working voltage AC400V and rated current 125A.

External current transformers should meet the requirements of IEC61010-2-032 CAT-III 230V or better.

2.2.2 Installation dimensions

unit:mm
Tolerance:

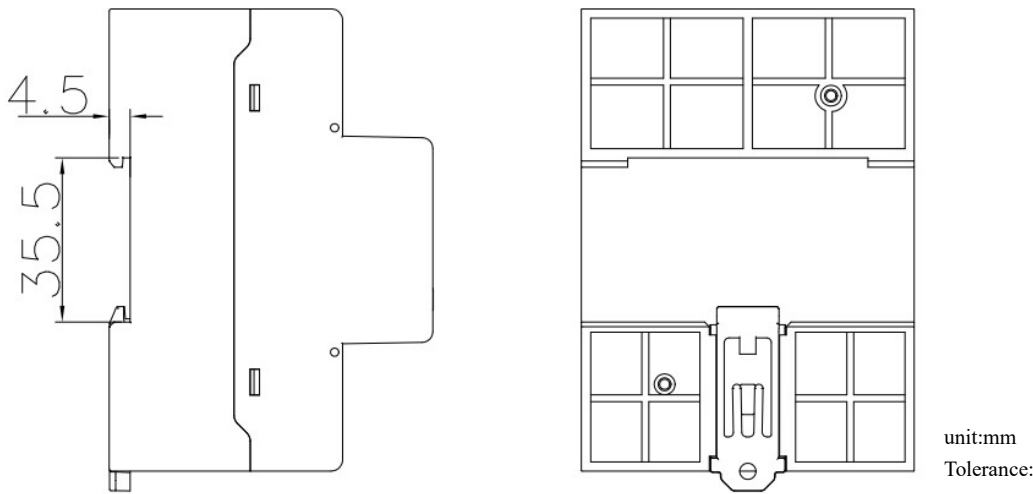


Overall dimension: length, width and height of $100 \pm 0.5\text{mm} \times 72 \pm 0.5\text{mm} \times 80 \pm 0.5\text{mm}$ do not include wiring terminals; guide rail card slot width is 35mm.5

Weight: approximately 0.35kg

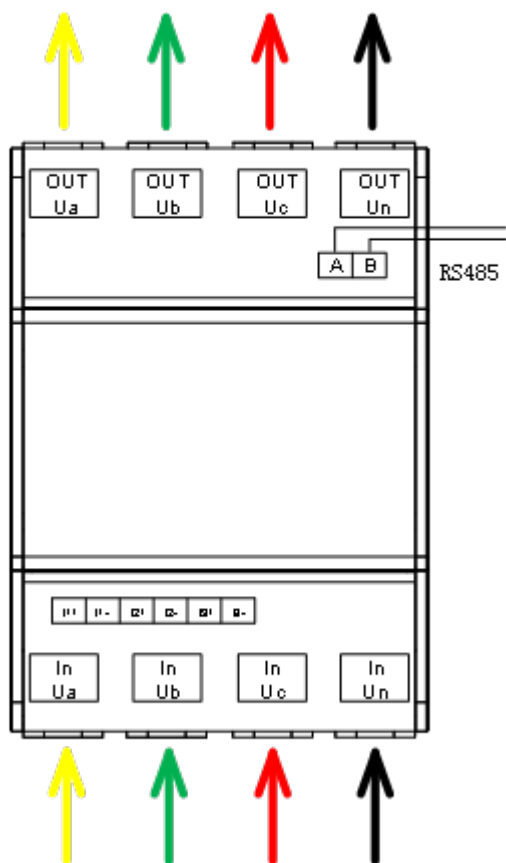
2.2.3 Installation method

Installation of 35mm standard DIN guide rail;

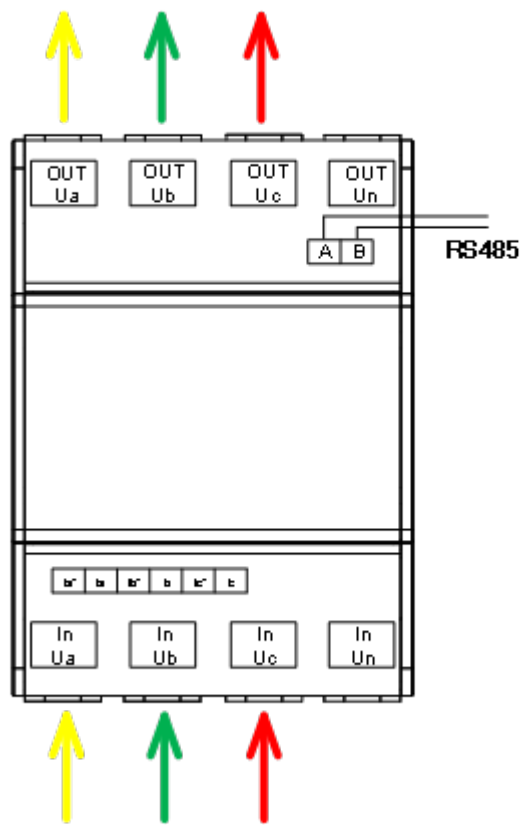


2.2.4 Wiring drawing

- 1) Current and Voltage Direct Connection (Current $\leq 80\text{ A}$ and Line Voltage $\leq 500\text{ V}$)

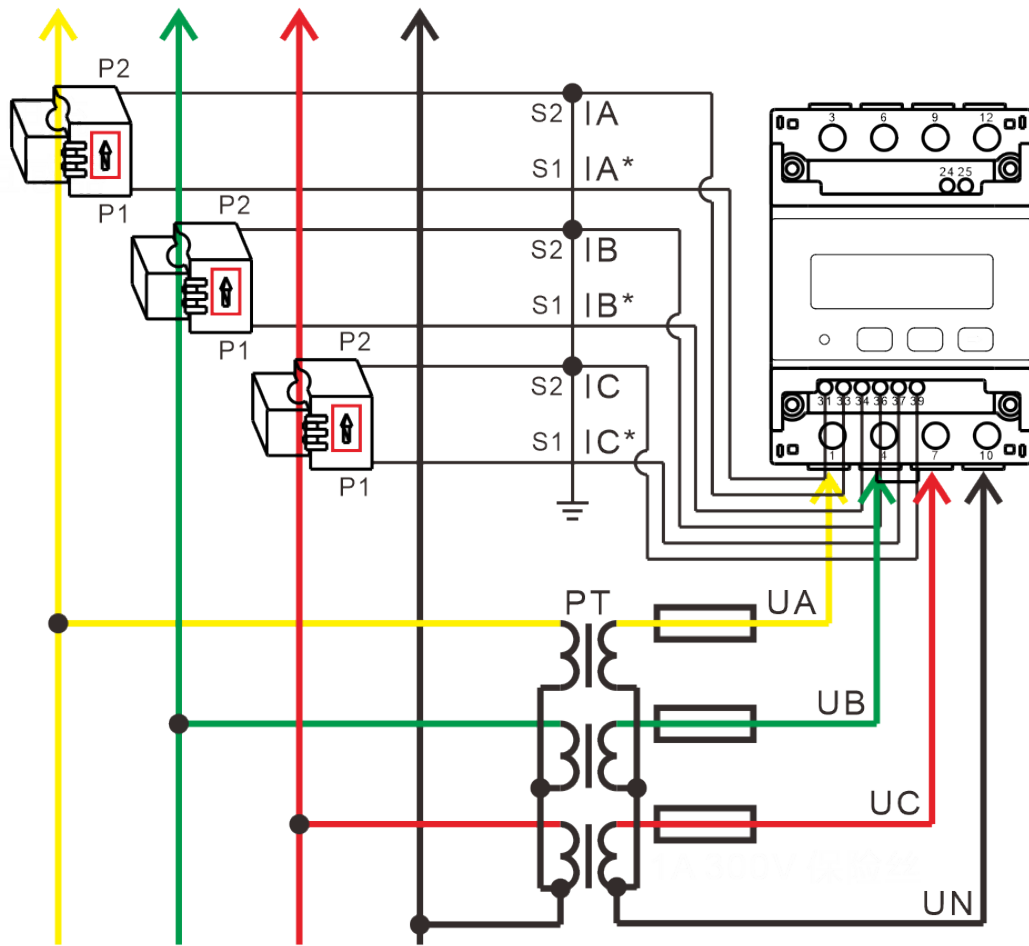


Three-phase four-wire connection

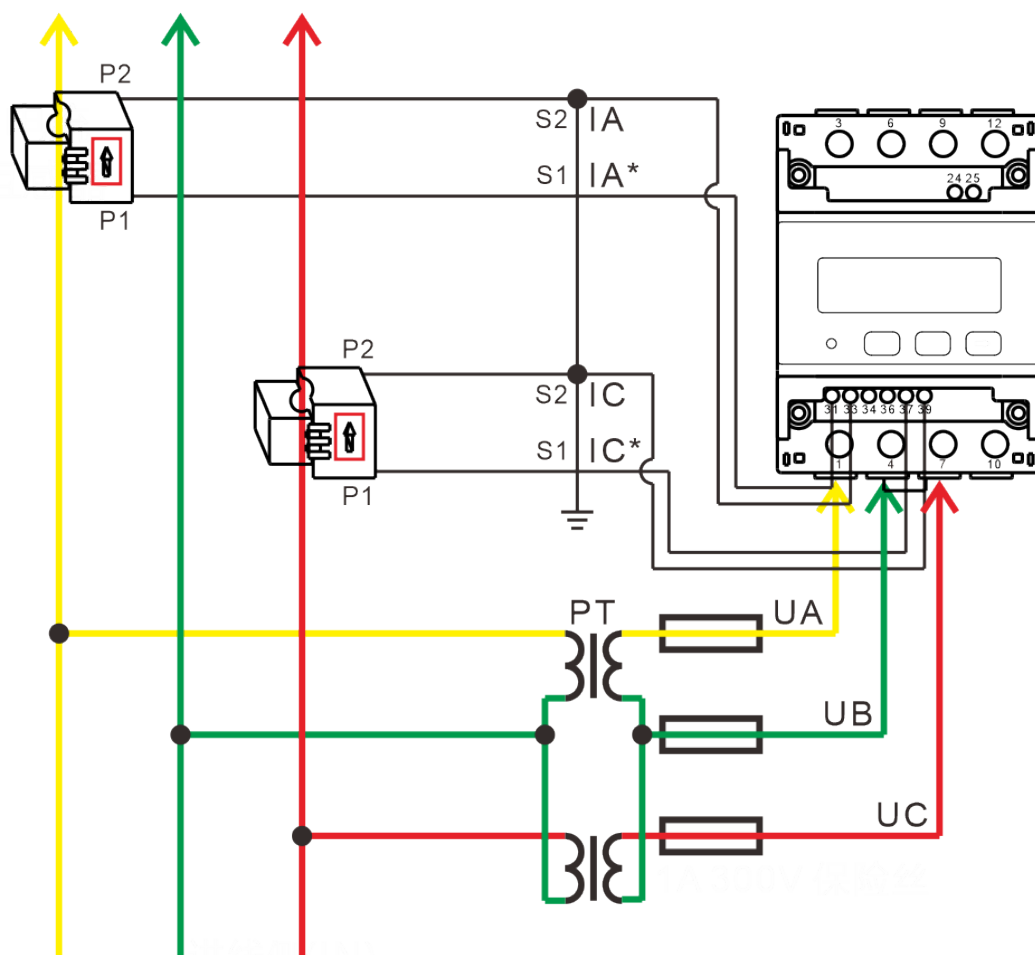


Three-phase three-wire connection

- 2) Connection Through Current Transformer and Potential Transformer (Current ≥ 0 A, Line Voltage > 500 V)



Three-phase four-wire connection



Three-phase three-wire connection

2.2.5 Terminal Definition

joggle	explain
I n U a	Phase A voltage incoming interface
I n U b	Phase B voltage incoming interface
I n U c	Phase C voltage incoming interface
I n U n	N phase voltage incoming interface
O UTU a	Phase A voltage outlet interface
O UTU b	Phase B voltage outlet interface
O UTU b	Phase C voltage outlet interface
O UTU n	The N-phase voltage outlet interface
A	485 Communication + port
B	485 Communication-Port
Ia *	Phase A current transformer + terminal
Ia	Phase A current transformer-end
Ib *	Phase B current transformer + terminal
Ib	Phase B current transformer-end
Ic *	Phase C current transformer + terminal
Ic	C-phase current transformer-terminal
NOTE:	
1、 Input voltage: When the line voltage is less than or equal to 500 V, connect the meter directly. When the line voltage is	

greater than 500 V, connect the meter through potential transformers.

2、 Input current: When the input current is 0 A to 80 A, connect the meter directly (channel 1). When the input current is greater than or equal to 80 A, connect the meter through current transformers (channel 2).

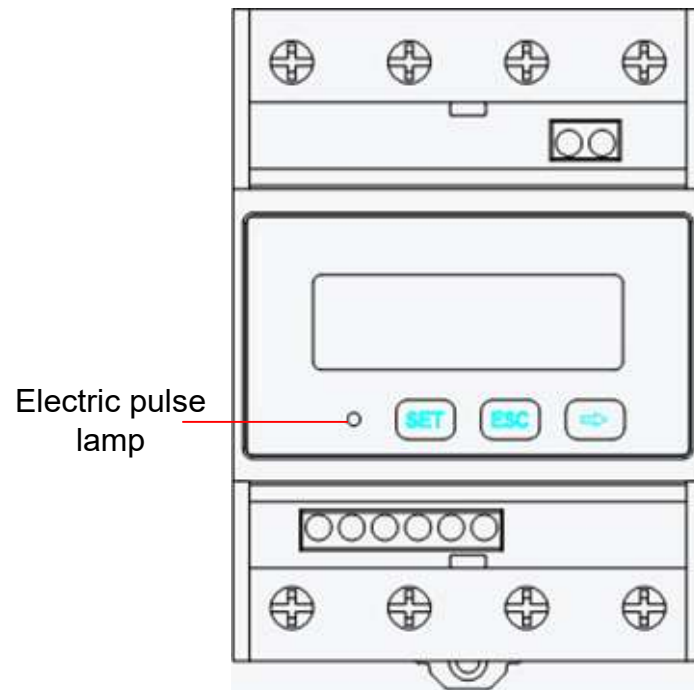
2.2.6 Preparing Cables

Cable	Port	Type	Conductor Cross-s ectional Area Range	Outer Diameter	Source	Electric characters
Channel 1 voltage cable	UA-1 and 3	Single-core outdoor copper cable	25 mm ²	10 mm	Prepared by the customer	105℃、600V
	UB-4 and 6					
	UC-7 and 9					
	UN-10 and 12					
Channel 2 voltage cable	UA-1	Single-core outdoor copper cable	4-25 mm ²	5-10 mm	Prepared by the customer	105℃、600V
	UB-4					
	UC-7					
	UN-10					
Channel 2 Current Transformer cable	IA*-31	Single-core outdoor copper cable	2-4 mm ²	3-5 mm	Prepared by the customer or supplied with current transformers	105℃、600V
	IA-33					
	IB*-34					
	IB-36					
	IC*-37					
	IC-39					
Communications cable	RS485A-24	Two-core outdoor shielded twisted pair copper cable	0.25-1.5 mm ²	4-11 mm	Supplied by the manufacturer	80℃、300V
	RS485B-25					

Chapter 3: Use and Operation

3.1 indicator light

Pulse indicator light: under the condition of load, the meter will measure the electric energy. During the measurement, the indicator light will blink at different frequencies according to the load consumption.



3.2 Display

The button → is used to switch the displays. Set parameter disp to enable the rotation display function.

No.	Display	Description	No.	Display	Description
1		Positive active energy = 10000.00kWh	2		Negative active energy = 2345.67kWh
3		None parity, 8 data bits, and 1 stop bit; baud rate = 9600 bps (default)	4		011 represents address (default)
5		Phase A voltage = 220.0V	6		Phase B voltage = 220.1V
7		Phase C voltage = 220.2V	8		Phase A current = 5.000A
9		Phase B current = 5.001A	10		Phase C current = 5.002A
11		Total phase active power = 3.291 kW	12		Phase A active power = 1.090 kW
13		Phase B active power = 1.101 kW	14		Phase C active power = 1.100kW
15		Total phase power factor PFt = 0.500	16		Phase A power factor PFa = 1.000
17		Phase B power factor PFb = 0.500	18		Phase C power factor PFc = -0.500

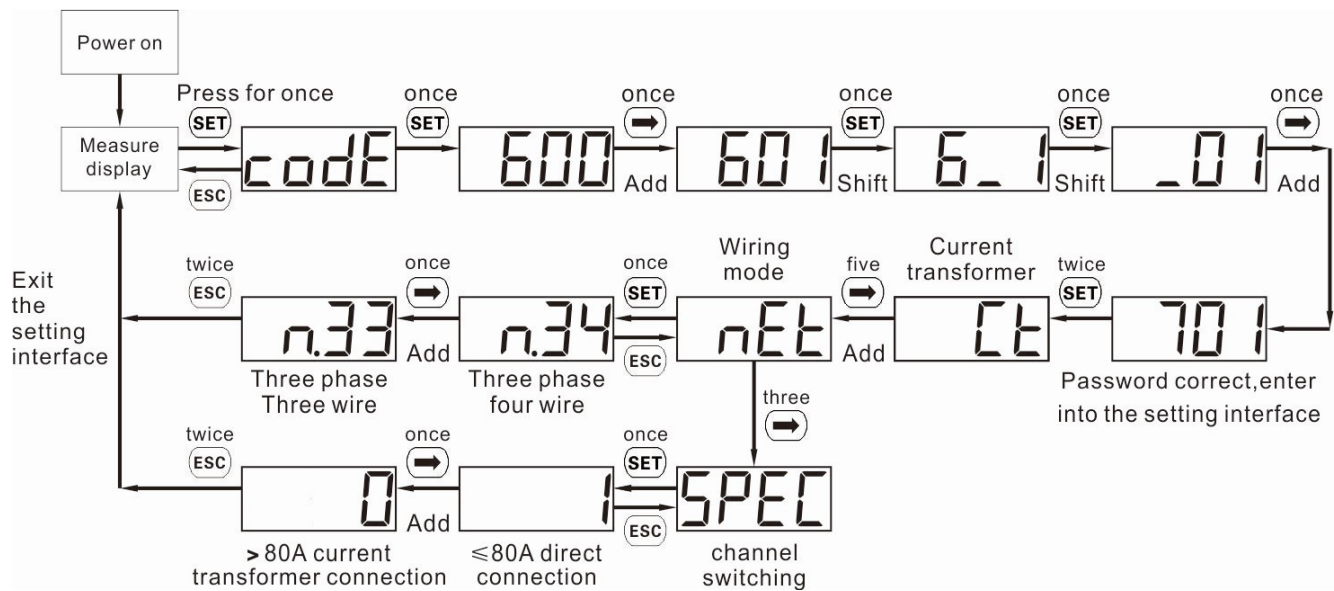
3.3 Parameter Settings

No.	Parameter	Value Range	Description
1		1~6553	Current transformer ratio
2		0.1~999.9	Potential transformer ratio
3		1: 645 2: n.2 3: n.1 4: E.1 5: 0.1	Communication protocol switchover: 1: Factory mode 2: None parity, 2 stop bits, n.2 3: None parity, 1 stop bit, n.1 4: Even parity, 1 stop bit, E.1 5: Odd parity, 1 stop bit, 0.1
4		1~247	Modbus communication address
5		0: 1.200 1: 2.400 2: 4.800 3: 9.600 4: 19.20 5: 115.2	Communication baud rate: 0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps 5: 115200bps
6		0: n.34 1: n.33	Wiring mode: 0: n.34, three-phase four-wire 1: n.33, three-phase three-wire
7		0~30	Rotation display time (s): 0: Fixed display 1~30: Time interval of rotation display
8		0~30	Backlight illumination time control (minutes): 0: Steady on 1~30: Time of backlight illumination without key operation
9		0: ct 1: dc	Channel switchover: 0: Transformer connection 1: Direct connection

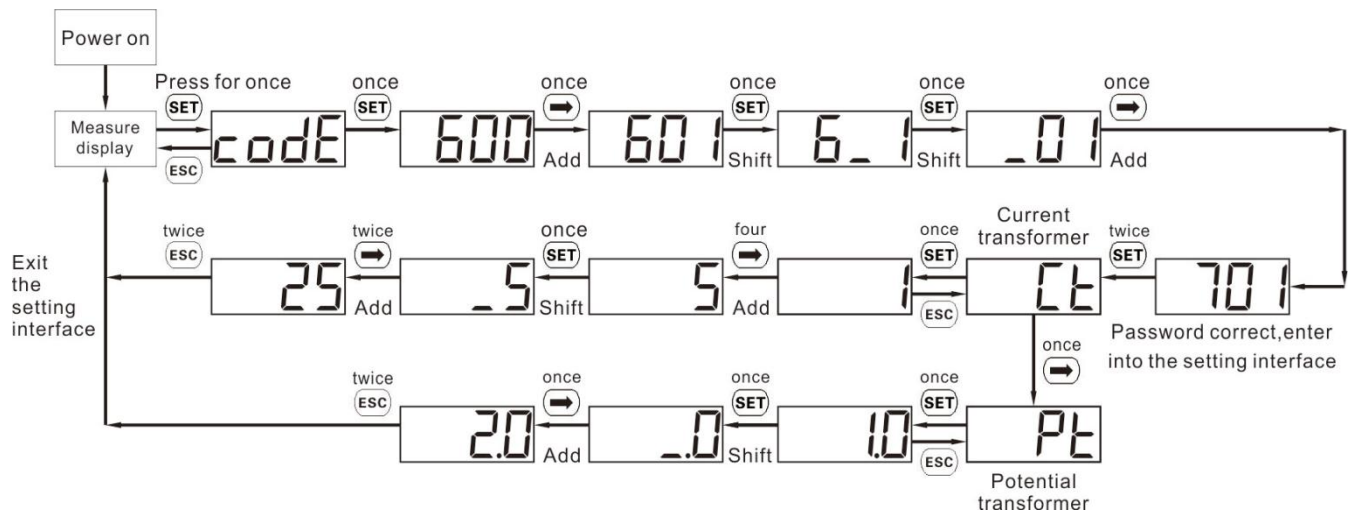
3.4 Parameter Setting Operations

Button description: SET means "confirm" or "cursor move" (when inputting numbers or parameters), ESC means "exit", and → means "add". The default user password is 701.

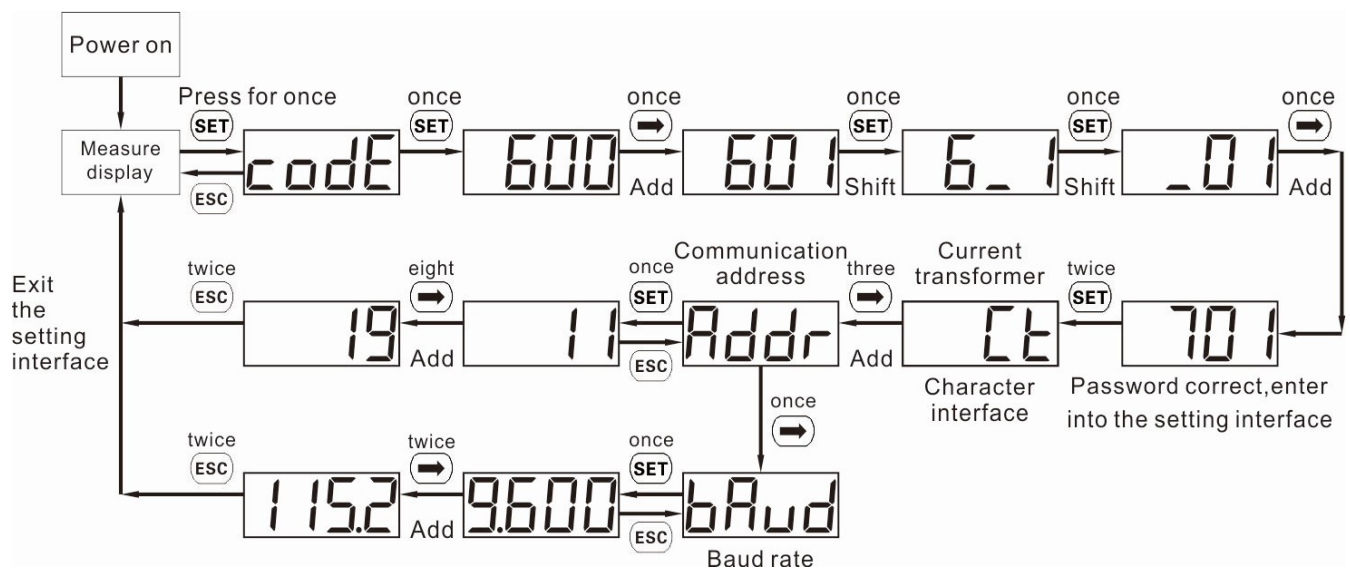
(1) Set wiring mode (three-phase four-wire or three-phase three-wire) and channel switchover (direct connection or current transformer connection):



(2) Set the current transformation ratio or potential transformation ratio:



(3) Set communication address or baud rate:



(4) Modify user password:

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graph LR
    Power[Power on] --> Measure[Measure display]
    Measure -- "Press for once (SET)" --> code1[code]
    code1 -- "once (SET)" --> 600[600]
    600 -- "six (Add)" --> 606[606]
    606 -- "once (Shift)" --> 6_6[6_6]
    6_6 -- "six (Add)" --> 666[666]
    666 -- "twice (Shift)" --> 702[702]
    702 -- "twice (ESC)" --> Exit[Exit the setting interface]
    702 -- "once (Add)" --> 701[701]
    701 -- "once (SET)" --> code2[code]
    code2 -- "once (ESC)" --> code2
    code2 -- "once (SET)" --> 6666[6666]
    6666 -- "six (Add)" --> _666[_666]
    _666 -- "once (Add)" --> Range[Range: 1-999]
    Range -- "once (Add)" --> Password[Password correct, enter into the setting interface]
  
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dissipation		
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4.3 Voltage and current input

Voltage input	
Overvoltage category	III
Rated voltage: 3×230/400 3~	Loss per phase: <0.5VA
Frequency	50/60Hz
MAINS supply voltage fluctuations	±10%
Measuring range: AC30V~265V	Overload: 1.4 times rated voltage, continuous operation; 2 times rated voltage, allowed 1s
Measurent category	CAT-III-230
CAT-III	MEASUREMENT CATEGORY III is applicable to test and measuring circuits connected to the distribution part of the buiddings low-voltage MAINS installation.
current input	
Rated current: 31.5 (6) A	Loss per phase line: <0.2VA
Measurement range: AC0.05A~6A	Overload: 1.2 times rated current, continuous operation; 20 times rated current, measurable, allowed for 1s;

Note: The voltage / current value beyond the rated range of the product will cause instrument damage. Long, full-range applications can also cause damage to your device. Our company for excess Changes in accuracy caused by procedures are not responsible.

4.4 Communication

The MODBUS communication protocol	
Communication port: RS485,2-line half-duplex	Communication wave rate: 4800bps, 9600bps, 19200bps, 115200bps optional, default 9600bps
Stop bit: 1 / 2 bit is optional	Default 1 bit
Check bit: no / odd / even optional	Default no check

4.5 Electrical characteristics

electrical character	
insulation resistance	100MΩ/500V
Medium strength (power frequency withstand voltage)	3kv (r.m.For s), 50Hz, 1min (voltage, current to communication)

4.6 Electromagnetic compatibility

electromagnetic compatibility	
RE (Radiation emission)	CLASS B (-6dB) @30MHz ~6GHz
RS (Radiation disturbance resistance)	Power supply: 10V / m, 80%AM (1KHz), 80~6000MHz; criterion A No power input: 30V / m, 80%AM (1KHz), 80~6000MHz; criterion A
CE (conduction emission)	CLASS B (-6dB) @150kHz ~30MHz (direct grid equipment)
CS (conduction harassment resistance)	10V, 80%AM (1kHz), 0.15~80MHz; criterion A Note: For an EFT \ CS application longer than 3m, the EFT \ CS shorter than 3m is

	not tested.
SURGE (surge resistance), impact current	RS485 communication port protection level: surge differential mode 4KV (internal resistance 42Ω , $1.2 / 50\mu s$); RS485 communication port surge to AC power supply port 6KV; (485 signal line connected together to AC input line and verified together) Power outlet: 6KV;
EFT (disturbance resistance of electric fast transient pulse group)	$\pm 4kV$, $5 / 50ns$, 5kHz; Inductive B
AC-DIP (temporary voltage temporary drop, short-time interruption, voltage change resistance)	Drop to 0%UT for 10ms, to 0%UT at 20ms, to 70%UT at 500ms; to 0%UT at 5000ms; criteria B, B, B, C
Fluctuations and Flicker (Voltage fluctuation and flicker)	The Pst value is not greater than 1;
	The Plt value is not greater than 0.65;
	The relative voltage change of dc does not exceed 3.3%;
	The maximum relative voltage change of dmax does not exceed 4%;
	During the voltage change, the d (t) value exceeding 3.3% is not more than 500ms.
Harmonic (power supply port current harmonic)	50-2000Hz, Class A product requirements
ESD (electrostatic discharge disturbance resistance)	Contact discharge of 6 / 8KV, judgment of B / R;
PMS specification (power frequency magnetic field resistance)	The PMS index of the unit shell port meets the requirements of IEC61000-4-8 standard, and the specific requirements are the system index-steady state: 30A / m, 1 minute test;

General criteria:

A: Establish the connection of the equipment during testing.

B: During the test process, the equipment can be reduced within the scope required by the product specification, the equipment can return to normal, and any manual intervention is not allowed.

Chapter 5: Maintenance and Troubleshooting

5.1 Troubleshooting

Possible problem	Possible cause	Possible solutions
The indicator light is not on after the power is on	Power supply was not added to the device	Check if the correct operating voltage is added on the equipment terminal
The measurement data is inaccurate after adding the signal	Incorrect voltage measurement	Check whether the voltage signal is correctly connected to the device Check whether the voltage measurement signal is within the equipment measurement range Check that the PT variable ratio parameter is set correctly
	Current measurement is not accurate	Check whether the current signal is correctly connected to the device Check that the current measurement signal is within the equipment measurement range Check that the CT variable ratio parameter is set correctly
	Power measurement is not accurate	Check that the measurement mode is set correctly Check whether the voltage and current corresponding phase sequence is correct Check that the current direction is correct Check the core direction
The background system cannot communicate with the device	Communication wiring error	Check that the wiring terminals are reliably connected Check whether the AB terminal of the communication line inlet instrument port is reversed
	Incorrect communication parameter	Check that the mailing address is correct Check that the communication port rate is correct Check that the communication check bit is correct
	Communication links are affected	Check for devices with the same parameters on the same communication link Check the communication shield layer for good grounding Check that the communication cable is disconnected

Note: If there are some unsolved problems, please contact our after-sales service department timely.



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