



NO:

YDS60-2P Three-Phase Intelligent Power Acquisition Device

Instruction Manual

Guangdong Yada Electronics Co.,Ltd



Danger and warning

Before installing, operating or maintaining the equipment, please read this manual carefully, get it and gradually get familiar with the equipment. This document is not an operating manual for non-trainees, and our company are not responsible for any problems arising out of its normal use.



Risk of electric shock, fire or explosion

- There is a power hazard in some parts of this equipment. Please operate in strict accordance with the specifications.
- Before maintenance and overhaul, the equipment must be powered off and grounded.
- All mechanical parts, doors and covers should be returned to their original position before the equipment is energized.
- Equipment maintenance and installation work can only be performed by qualified personnel.

If you do not pay attention to these precautions, it may cause serious injury.

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Chapter I Product Introduction

1.1 Overview

The Three-Phase Intelligent Power Acquisition Device is a new type of intelligent power acquisition device specially designed for distributed photovoltaic systems. Integrating measurement and communication functions, it is mainly used for measuring electrical parameters such as voltage, current, power, frequency, power factor, and active energy in electrical circuits. It can form a network with external devices through the RS485 communication interface, and support on-site debugging via Bluetooth and WIFI. Adopting standard DIN35mm rail-mounted installation and modular structural design, it features small size, easy installation, and convenient networking.

The acquisition device converts voltage and current signals into signals recognizable by the MCU through the sampling circuit. The MCU calculates and converts these signals into electrical quantities such as energy, power, and power factor, transmits them to users through communication, and stores the data in the storage circuit simultaneously.

1.2 Model Description

Model	Function
YDS60-2P	Real-time measurement of three-phase AC voltage, current, power, power factor, frequency and energy metering. Suitable for power supply systems with phase voltage 176VAC~288VAC (three-phase four-wire, rated 220VAC\230VAC\240VAC).

1.3 Function Introduction

1.3.1 Metering Function

Accurately measure forward and reverse active energy as well as combined active energy;

Combined active energy = Forward active energy - Reverse active energy.

1.3.2 Electrical Parameter Measurement Function

Accurately measure electrical parameters including voltage, current, frequency, power factor, power, etc.

1.3.3 Communication Function

One RS485 communication interface, which is electrically isolated from the internal circuit of the meter. The RS485 communication baud rate supports 4800bps, 9600bps, 19200bps, 115200bps (configurable), with a default of 9600bps;

One Bluetooth communication interface (low-power BLE 5.0) and one WIFI communication interface (2.4G frequency band); only one can be used at a time.

1.3.4 Refresh Cycle

Fast sampling channel: Refresh cycle of active power, reactive power, and power factor $\leq 75\text{ms}$;

Normal sampling channel: Refresh cycle of all parameters in the normal sampling channel $\leq 200\text{ms}$.

1.3.5 Indicator Lights

Operation Indicator (Run): Flashes when the product is working normally;

Wireless Communication Indicator (Net): Flashes slowly in normal operation; flashes rapidly when entering the network configuration mode via key press; remains on when network configuration is successful;

RS485 Communication Indicator (Comm): Flashes during data interaction;

Key: Used for WIFI network configuration.

1.3.6 Power Supply

The product is self-powered, and the power supply is taken from Phase A voltage;

Power supply range: 176V~288V.

Chapter II Installation

2.1 Installation, prevention and preparation

Before installing and operating this device, please read the following information carefully and follow the safety precautions below.



Danger

Risk of Electric Shock, Explosion, or Arc Flash

- Disconnect all power connections before installation, inspection, testing, or maintenance.
 - There are no user-serviceable parts inside; arrange for qualified personnel to perform maintenance.
 - Do not work alone or under hazardous conditions.
 - High current passing through conductive materials can cause severe burns.
 - This meter is suitable for measurements in building facilities, such as on distribution boards, circuit breakers, wiring (including cables, busbars), junction boxes, switches, fixed facility outlet sockets, industrial equipment, and other devices (e.g., stationary motors permanently connected to fixed facilities).
 - If the device is not used in the manner specified by the manufacturer, the protection provided by the device may be impaired.
 - The voltage input circuit of this meter must be connected to appropriate safety devices or circuit breakers.
 - Primary current wires shall use double-insulated cables;
 - Strong and weak current circuits shall not use the same cable, and the wire cores shall be bundled separately. The current wires of the transformer are weak current and shall not be bundled with strong current.
- Otherwise, death or serious injury may occur!

2.2 Installation information

2.2.1 Installation Notes

The meter should be installed in a dry, clean place away from heat sources and strong electromagnetic fields.

The meter is usually installed in a switchgear cabinet to protect the device from oil, dirt, dust, corrosive gases, or other harmful substances.

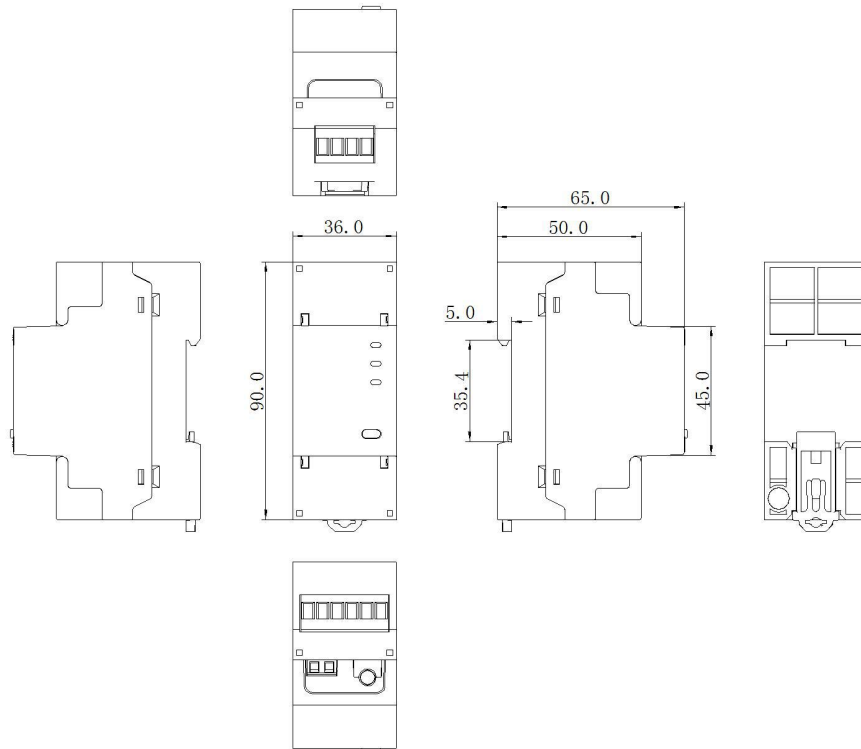
A suitable fuse must be connected to the voltage input circuit of the meter.

2.2.2 Installation Dimensions

(1) Main Unit (Unit: mm, Tolerance: ± 0.5)

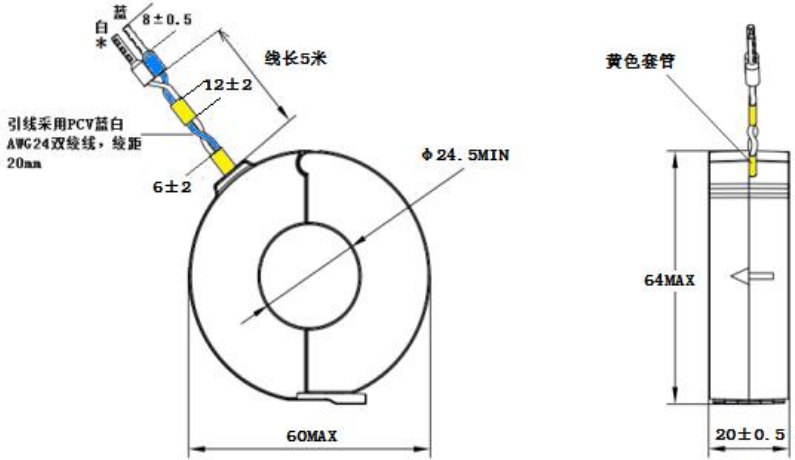
Overall dimensions: 90mm×36mm×65mm; DIN rail installation dimension: 35mm;

For overall dimensions and installation dimensions, refer to the figure below:



Weight: Approximately 124g

(2) Supporting Current Transformers

Transformer Model	Product Image
SCT24L-5k-250	
	Dimensions (Unit: mm)
	 Note: The above dimensions are for reference only; for more detailed and specific information, refer to our transformer specification sheet. Each unit is equipped with 3 transformers, and the leads are distinguished by yellow, green, and red sleeves, corresponding to Phase A, Phase B, and Phase C respectively.

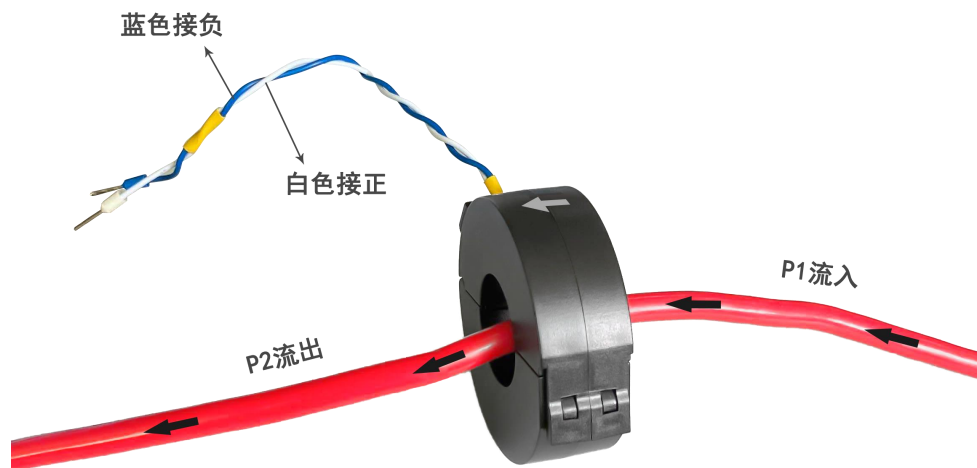
CTF16L-3k-120	Product Image Dimensions (Unit: mm) Note: The above dimensions are for reference only; for more detailed and specific information, refer to our transformer specification sheet. Each unit is equipped with 3 transformers, and the leads are distinguished by yellow, green, and red sleeves, corresponding to Phase A, Phase B, and Phase C respectively.
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2.2.3 Installation Procedures

- (1) Install the intelligent power acquisition device on a standard DIN35mm rail.
- (2) Mount the intelligent power acquisition device onto the standard rail from top to bottom, then push the acquisition device into the rail from the bottom to the front.
- (3) For disassembly, use a screwdriver to firmly hold the flexible latch, then pull out the acquisition device.
- (4) Installation of SCT24L Transformer (see the figure below):

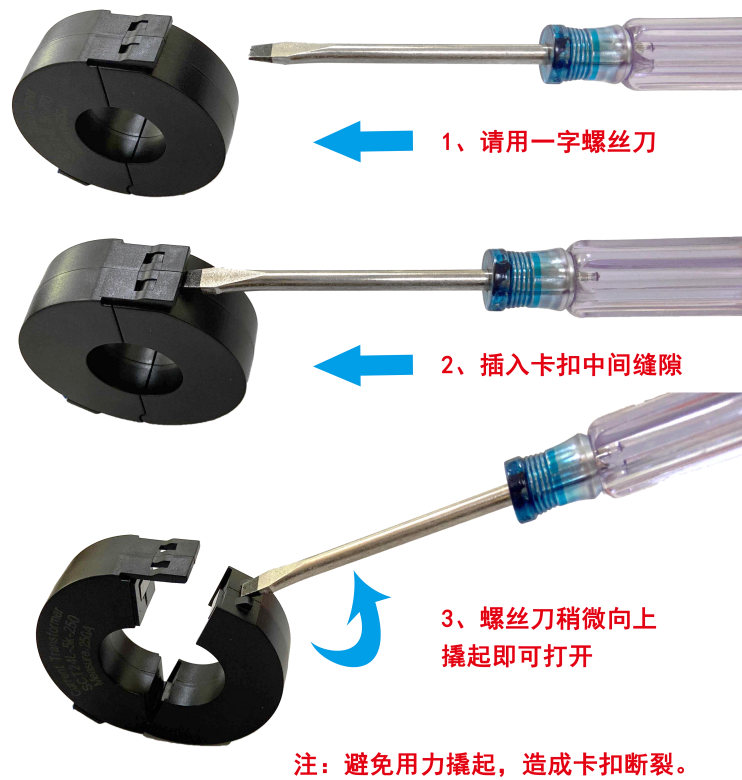
Mount the transformer directly on the primary current wire and fix it with a cable tie. Connect the white wire with the yellow sleeve from the secondary side of the transformer to Ia* of the main unit, the blue wire to Ia; connect the white wire with the green sleeve to Ib* of the main unit, the blue wire to Ib; connect the white wire with the red sleeve to Ic* of the main unit, the blue wire to Ic.

开合式互感器工作原理



Split Core Transformer Working Principle (Blue for Negative, White for Positive, P1 Inlet, P2 Outlet)

Precautions for Disassembling and Assembling Split Core Transformers



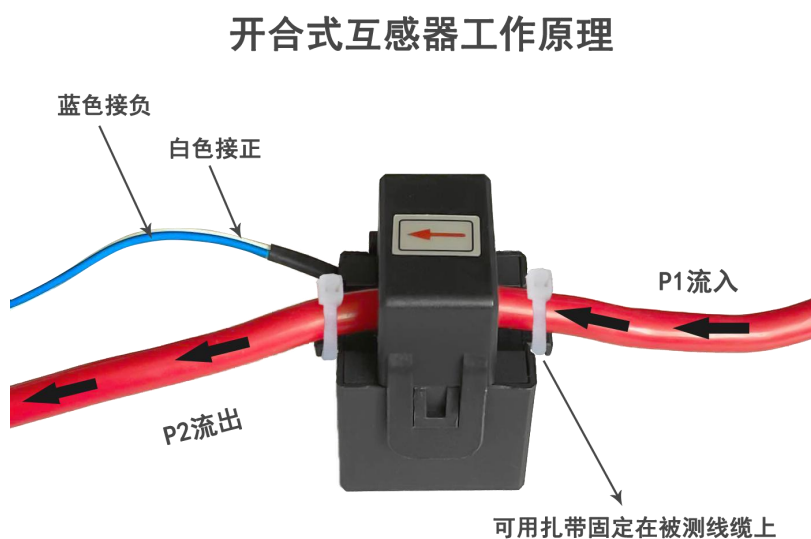
Disassembly Steps:

1. Use a flat-blade screwdriver;
2. Insert it into the gap in the middle of the buckle;
3. Pry the screwdriver slightly upward to open;

Note: Avoid prying too hard to prevent buckle breakage.

(5) Installation of CTF16 Transformer / CTF10 Transformer (see the figure below):

Mount the transformer directly on the primary current wire and fix it with a cable tie. Connect the white wire from the secondary side of the transformer to I* of the main unit, and the blue wire to I.



Split Core Transformer Working Principle (Blue for Negative, White for Positive, P1 Inlet, P2 Outlet; Can be Fixed on the Measured Cable with a Cable Tie)

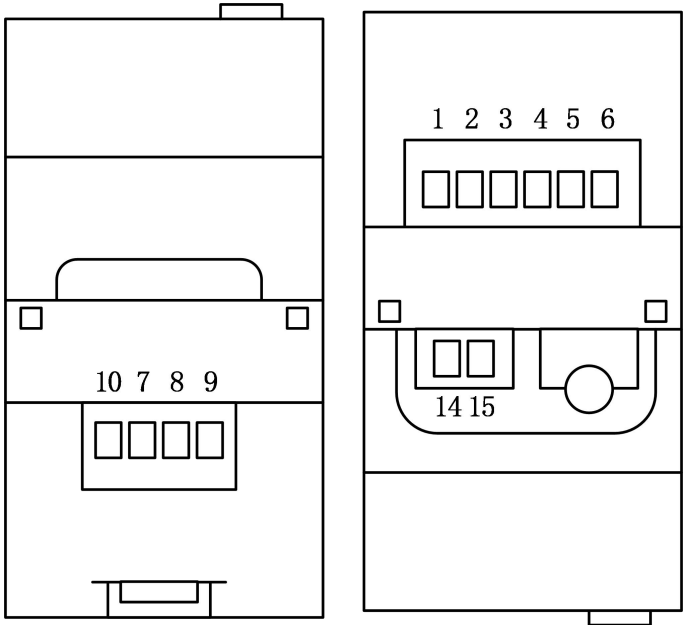
2.2.4 Cable Requirements

Cable Type	Identification	Cable Type	Conductor Cross-Sectional Area	Outer Diameter	Electrical Performance (Minimum)	Source
AC Voltage Cable	Ua	Single-core outdoor copper cable	1.5mm ² ~4mm ²	3~8mm	105°C、600V	Prepared by User
	Ub					
	Uc					
	Un					
CT Cable	Ia*	Blue-white wire with European terminal	24AWG	/	/	Provided with Transformer
	Ia					
	Ib*	Blue-white wire with European terminal	24AWG	/	/	Provided with Transformer
	Ib					
	Ic*	Blue-white wire with European terminal	24AWG	/	/	Provided with Transformer
	Ic					
Communication Cable	RS485A	Two-core outdoor shielded twisted pair	0.25mm ² ~1.5mm ²	4~11mm	80°C、300V	Prepared by User
	RS485B					

Notes: 1. The selection of the minimum wire diameter of the cable shall comply with local cable standards. 2. Factors affecting cable selection include: rated current, cable type, laying method, ambient temperature, and maximum expected line loss.

2.3 Interface Definition

2.3.1 Panel Description and Interface Definition



Terminal No.	Identification	Function	Description
1	IA*	Phase A AC Current CT Positive Input	Connect to the white terminal of the supporting current transformer
2	IA	Phase A AC Current CT Negative Input	Connect to the blue terminal of the supporting current transformer
3	IB*	Phase B AC Current CT Positive Input	Connect to the white terminal of the supporting current transformer
4	IB	Phase B AC Current CT Negative Input	Connect to the blue terminal of the supporting current transformer
5	IC*	Phase C AC Current CT Positive Input	Connect to the white terminal of the supporting current transformer
6	IC	Phase C AC Current CT Negative Input	Connect to the blue terminal of the supporting current transformer
7	Ua	Phase A AC Voltage Input	Connect to the Phase A voltage wire of the three-phase AC power supply
8	Ub	Phase B AC Voltage Input	Connect to the Phase B voltage wire of the three-phase AC power supply
9	Uc	Phase C AC Voltage Input	Connect to the Phase C voltage wire of the three-phase AC power supply
10	Un	Neutral Wire (N) Input	Connect to the neutral wire (N) of the three-phase AC power supply
11	A	RS485 Communication +	RS485 communication output positive pole
12	B	RS485 Communication -	RS485 communication output negative pole

2.3.2 Indicator Light and Key Definition



Indicator Lights

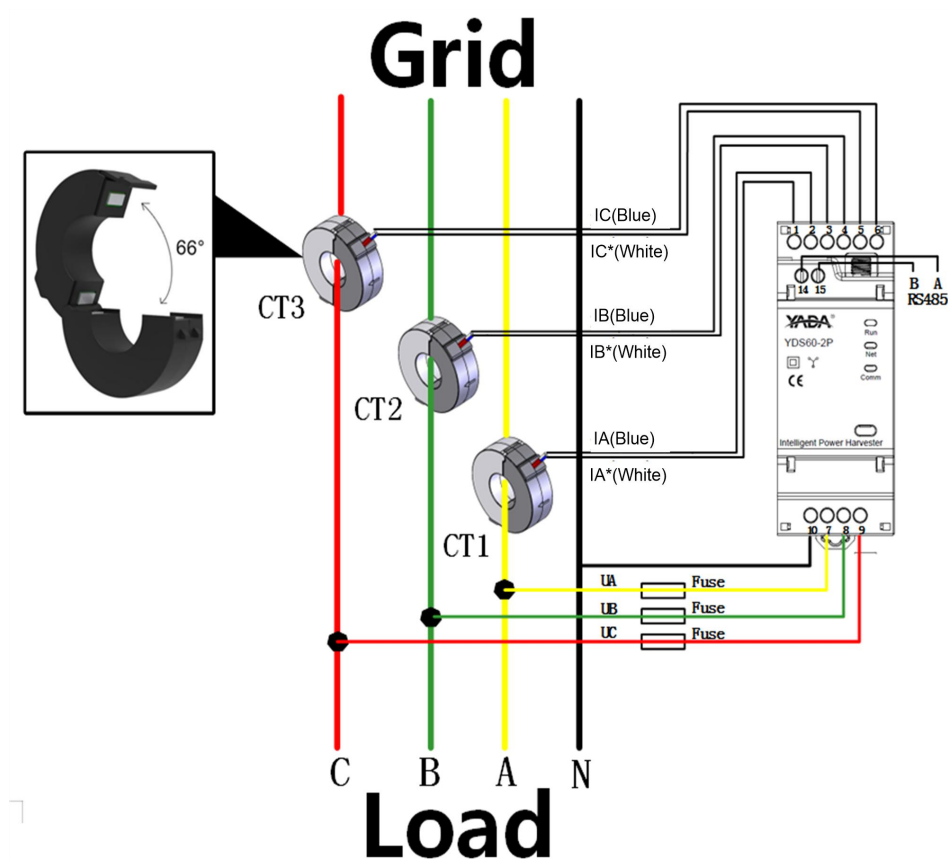
Type	Definition	Description
Run	Operation Indicator	Flashes when the product is working normally.
Net	Wireless Network Indicator	Flashes slowly in normal operation; flashes rapidly when waiting for network configuration; remains on when network configuration is successful.
Comm	Communication Indicator	Flashes during communication data interaction.

Key

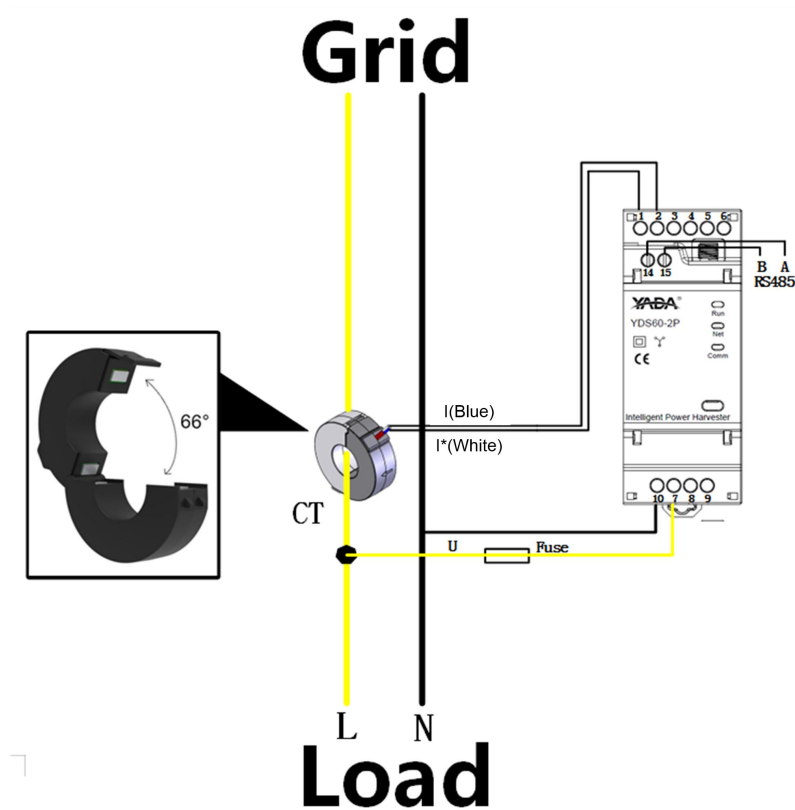
Single Key	In normal operation or successful network configuration state: Press and hold for 10s-20s to enter WIFI network configuration mode; in network configuration state: Press and hold for 10s-20s to exit network configuration mode.
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2.4 Wiring drawings

2.4.1 Voltage and Current Input Wiring Diagram



Three-Phase Four-Wire Wiring Method



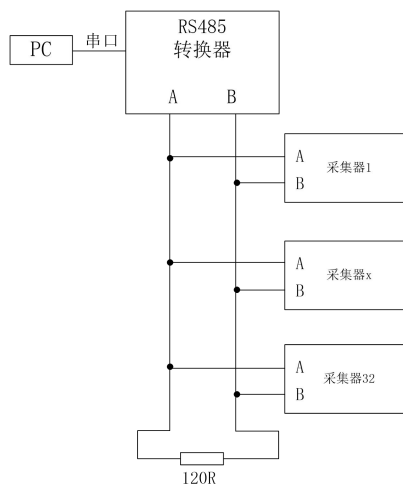
Single-Phase Two-Wire Wiring Method

According to different design requirements, it is recommended to add a fuse to the voltage input terminal to meet the safety requirements of relevant electrical specifications. The recommended fuse FU for the wiring diagram is 2A.

Note: During on-site installation, the meter must be used in one-to-one correspondence with the supporting split core transformer; otherwise, the measurement accuracy will be affected. At the same time, ensure reliable connection between the two.

2.4.2 Communication

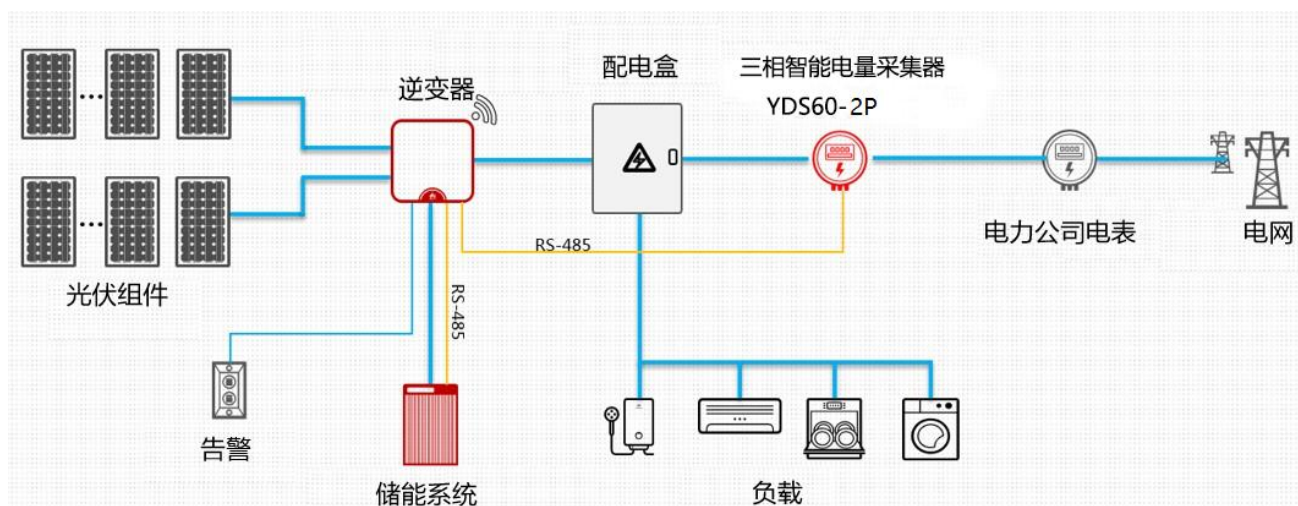
The RS-485 communication method allows a maximum of 32 meters to be connected to one bus, which is connected to the upper computer through an RS-485 converter. The communication cable can use ordinary shielded twisted pair, with a total length not exceeding 1200 meters. The positive and negative polarities of the RS-485 ports of each device must be connected correctly. If the shielded twisted pair is long, it is recommended to connect a resistor of approximately 120Ω at its end to improve communication reliability.



2.5 Application Scenarios

This meter is used to realize grid power control and energy storage charging/discharging control in residential inverter solutions, and is a core component of residential energy management. Adopting RS485 communication, it can realize power measurement and energy metering functions, and respond to real-time data queries from the host.

The meter is mainly used for grid connection point power control. The measured power generation and power consumption can only be used for reference and shall not be used as the basis for electricity fee measurement. Electricity fee measurement shall be based on the metering meter of the power grid company.



Application Scenario Diagram (Distribution Box, Three-Phase Intelligent Power Acquisition Device YDS60-2P, Inverter, Power Grid Company Meter, Power Grid, PV Modules, RS-485, Alarm, Load, Energy Storage System)

ChapterIII Operation and Usage

3.1 Keys definition

There is 1 key used for WIFI network configuration. Press and hold the key until the wireless indicator flashes rapidly to enter the network configuration mode; to exit the network configuration mode, press and hold the key until the wireless indicator changes from rapid flashing to slow flashing.

Chapter IV Technical Specifications

4.1 Ratings

Item	Specification 1	Specification 2
Reference Voltage (Un)	3×220/380V	3×220/380V
Reference Current (Maximum Current) Ib(Imax)	3×250(300)A	3×120(150)A
Minimum Current - Threshold Current (Maximum Current) Imin-Ist (Imax)	0.5~25(300)A	2.4~12(150)A
Note: The above parameters are subject to the nameplate marking.		

4.2 Accuracy

Item	Index	Measurement Range
Current	±0.5%	$I_{st} \leq I \leq I_{max}$
	±1%	$I_{min} \leq I < I_{st}$
Phase Voltage	±0.5%	176V~288V
Line Voltage	±0.5%	304V~500V
Power	±1%	/
Frequency	±0.01Hz	45Hz~65Hz
Power Factor	±0.01	-1~1
Active Energy	Class B	GBT 17215.321
Reactive Energy	Class 2	GBT 17215-323

4.3 Operating Environment

4.3.1 Electrical Parameters

Item	Index	Item	Index
Operating Voltage Range	176V~288V (taken from Phase A signal)	Measurement Category	CAT-III-220
Overvoltage Category	III	Power Consumption	≤1.5W
Operating Frequency	45Hz~65Hz		

4.3.2 Operating Environmental Conditions

Item	Index	Item	Index
Operating Temperature Range	-25°C~60°C	Extreme Operating Temperature Range	-35°C~70°C
Storage and Transportation Temperature Range	-40°C~85°C	Operating Relative Humidity	5%~95% (no condensation)
Pollution Degree	2	Altitude	≤2000m
Atmospheric Pressure	86kPa~106kPa		

4.4 Communication Parameters

Item	Parameter	Item	Parameter
RS485 Communication Port	RS-485 (two-wire), isolated communication	RS485 Communication Interval	Interval between two command transmissions >400mS
RS485 Communication Address	1~247 (default 1 at factory)	RS485 Parity Bit	None/Odd/Even (configurable), default None at factory
RS485 Baud Rate	4800/9600/19200/115200 (default 9600 at factory)	RS485 Data Bit	8bits
RS485 Communication Protocol	ModBus-RTU, enterprise-customized content	RS485 Stop Bit	1bit or 2bits
RS485 Data Upload	Data communication according to standard ModBus protocol	RS485 Response Time	≤500mS
Bluetooth Version	BLE 5.0	Bluetooth Communication Protocol	ModBus-RTU, enterprise-customized content
WIFI	2.4G frequency band, supports IEEE 802.11 b/g/n	WIFI Communication Protocol	ModBus-RTU, enterprise-customized content

4.5 Electromagnetic Compatibility (EMC)

Item	Index	Compliance Criterion
Radiated Emission (RE)	CLASS B (-6dB) @30MHz~6GHz	——
Radiated Susceptibility (RS)	Powered on: 10V/m, 80%AM(1KHz), 80~6000MHz	Criterion A
	No power input: 30V/m, 80%AM(1KHz), 80~6000MHz	Criterion A
Conducted Emission (CE)	CLASS B (-6dB) @150kHz~30MHz	——
Conducted Susceptibility (CS)	10V、80%AM(1kHz)、0.15~80MHz	Criterion A
Surge Immunity (SURGE), Inrush Current	RS485 communication port protection level: Surge differential mode 2KV (internal resistance 42Ω, 1.2/50us)	——
	Surge between RS485 communication port and AC power port: 4KV; (Verification by connecting 485 signal lines together and AC input lines together)	——
	Power port: Surge differential mode 4KV	——
Electrical Fast Transient/Burst Immunity (EFT)	±4kV、5/50ns、5kHz	Criterion B
Voltage Dips, Short Interruptions, and Voltage Variations Immunity (AC-DIP)	Drop to 0%UT, duration 10ms	Criterion B
	Drop to 0%UT, duration 20ms	Criterion B
	Drop to 70%UT, duration 500ms	Criterion B

Item	Index	Compliance Criterion
	Drop to 0% UT, duration 5000ms	Criterion C
Fluctuations and Flicker	Pst value ≤ 1	
	Plt value ≤ 0.65	
	Relative voltage change dc $\leq 3.3\%$	
	Maximum relative voltage change dmax $\leq 4\%$	
	Duration of d(t) value exceeding 3.3% during voltage change $\leq 500\text{ms}$	
Harmonics (Power Port Current Harmonics)	50~2000Hz, Class A product requirements	——
Electrostatic Discharge (ESD) Immunity	Contact discharge 6KV; Air discharge 8KV	Criterion B
Power Frequency Magnetic Field Immunity (PMS Specification)	PMS index of unit housing port meets IEC61000-4-8 standard requirements: Steady state: 30A/m, 1-minute test	Criterion B
General Criteria: A: The device can maintain the established connection during the test. B: The device may experience performance degradation within the range required by the product specification during the test; after the interference is eliminated, the device can return to normal without reset or any manual intervention. C: Temporary loss or degradation of function or performance, which requires manual intervention to recover.		

4.6 Power Frequency Withstand Voltage

Item	Index
Power Frequency Withstand Voltage	Voltage input to RS485 communication: 2.0kV·min·mA

Chapter V Maintenance and Troubleshooting

5.1 Troubleshooting

Fault Phenomenon	Cause Analysis	Handling Method
No display after power-on	1. Incorrect wiring method.	1. If the wiring method is incorrect, rewire according to the correct wiring diagram (see Wiring Diagrams).
	2. Abnormal power supply voltage.	2. If the power supply voltage is abnormal, provide voltage according to the acquisition device specification sheet.
RS485 Communication Abnormality	1. RS485 communication line is not connected, short-circuited, or reversed.	1. If there is a problem with the communication cable, replace the cable.
Inaccurate Energy Metering	1. Incorrect wiring; check whether the phase sequence corresponding to voltage and current is correct.	If the wiring method is incorrect, rewire according to the correct wiring diagram (see Wiring Diagrams).
	2. Check whether the high and low ends of the incoming line of the current transformer are reversed.	

Note: If you encounter any unsolvable problems, please contact our company's after-sales service department in a timely manner.

Chapter VI Quality Assurance

6.1 Quality Guarantee

For all new meters sold to users, we provide a free quality guarantee for 12 months after power-on operation or 18 months after delivery for faults caused by design, materials, and craftsmanship. If the product is confirmed to meet the above warranty conditions, our company will be responsible for free repair.

6.2 Quality Limitations

The following device issues are not free warranty:

- Damage caused by incorrect installation, use, or storage.
- Operation and application conditions beyond the product's specified limits.
- Meters repaired by unauthorized institutions or personnel.
- Meters beyond the free warranty period.

Note: The above images are for reference only; the product shall be subject to the actual item.



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