



YME96H

Three phase multi-function smart meter



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機電

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1. Product Features

- n Fast installation
 - Product size is standard 96 panel type
 - Installation method is a snap on type, without screws
- n Support multiple current transformer connections
 - The YME96HN series supports a new type of current transformer – rogowski coil direct connection, without the need for an external integrator
 - The YME96HN series supports voltage output type current transformer connection simultaneously
 - The YME96HC series supports direct current connection, with a maximum connection current of 7A
- n Support multiple power grid systems
 - Supports three-phase four wire, three-phase three wire, one phase three phase, and single-phase systems
- n Multiple power supply options available
 - Available in 220VAC, 24VDC and 12VDC power supplies
- n Support voltage and current harmonic measurement
 - Supports voltage, current, fractional harmonics, up to 50 measurements
 - Support voltage and current harmonic distortion and harmonic value measurement
 - Support voltage and current total harmonic distortion measurement
- n More features
 - Support 6 rate tariff energy, support RTC switching or manual switching
 - Support demand measurement
 - Support alarm setting
 - Support current transformer orientation modification
 - Support current channel modification

2. Product operation process

- 1) Determine the type of grid system to be measured and wire it according to the corresponding wiring diagram, see 6.2
 - 2) Confirm the type and scope of power supply of the product, and power up the product
 - 3) Modify the meter wiring method parameter to the type of grid system to be measured, see 8.10.2.1
 - 4) Modify the meter nominal frequency parameter to the nominal frequency of the grid to be measured, see 8.10.2.2
 - 5) Modify the PT ratio of the meter according to whether a voltage transformer is used, see 8.10.2.4
 - 6) Modify the meter current conversion coefficient, according to whether the current conversion coefficient needs to be configured, see 8.10.2.5
 - 7) Modify the meter current transformer type parameters, depending on the type of current sensor used, see 8.10.3.1
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- 8) Modify the current transformer ratio parameters corresponding to the meter, according to the current transformer ratio used, see 8.10.3.2
- 9) Modify the nominal current parameters corresponding to the meter, according to the maximum current to be measured, see 8.10.3.3
- 10) Modify the zero-drift suppression parameters according to the minimum voltage and current to be measured, see 8.10.4
- 11) Verify whether the voltage, current, and power are correct (if not, there is a problem with the wiring or configuration)

3. Product Description

3.1 Dimensions



figure 3-1 Meter dimension

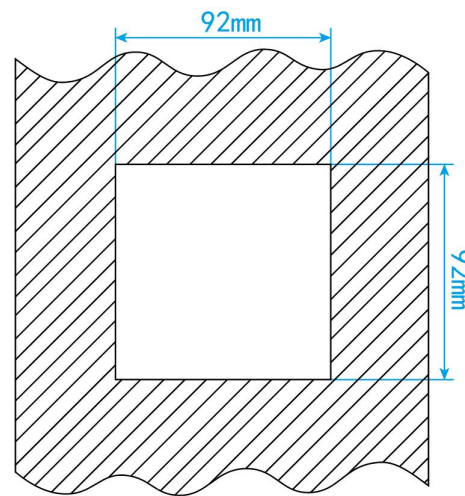


figure 3-2 Installation

3.2 Model Naming Conventions

YME9 6H	-	N	-	D	-	2
					Power supply	2 :220V AC auxiliary power supply (95-265VAC) 3 :24V DC auxiliary power supply (18-36VDC) 4 :12V DC auxiliary power supply (9-18VDC)
					Current transformer port	D :Terminal type R :RJ45 (only for N series, not for C series)
					Current transformer type	C :Direct connection of 5A current N :Rogowski coil and voltage output type CT

3.3 Feature Overview

YME96H panel type three-phase multi-function power meter, external open Rogowski coil or voltage type CT, realize the test without removing the wire, simplify the test steps, and save construction costs. YME96H supports three-phase four-wire, three-phase three-wire, one-phase three-wire and

single-phase systems; It can measure multiple electrical parameters such as voltage, current, power factor, harmonics, power, and energy of A, B and C phases.

YME96H is equipped with RS485 communication interface, through the standard Modbus-RTU protocol, can be compatible with various configuration systems, the front-end collected electrical parameters real-time transmission to the system data center.

overview			
Type	Panel type		
Model	YME96H		
Current sensor type	YME96HN	YME96HC	
	Rogowski coil, voltage output type CT	Current type transformer	
Characteristic	Support direct access to Rogowski coils	Direct current connection	
Advantage	Suitable for wide current range, without disassembling wires for measurement		
Wire system	3P4W 4CT,3P4W 3CT,3P3W 3CT,3P3W 2CT,1P3W,1P2W		
Application	Power analysis, energy measurement		
Display screen	LCD display		
Weight	259g		
Size	L*W*D:96*96 *45mm		
Color	White and black		
Current measurement			
Channel input range	YME96HN	YME96HC	
	0-900mVAC peak,636mV RMS		0-7A AC
Measuring range	Rogowski coils	Voltage output type CT	0-7A AC
	50mV/kA@50Hz(0-12000A),@60Hz(0-10000A) 85mV/kA@50Hz(0-7000A),@60Hz(0-6000A) 100mV/kA@50Hz(0-6000A),@60Hz(0-5000A)...	Varies with instrument transformer parameters	
Voltage measurement			
Measuring range	0~600VAC Phase voltage		
Maximum measurement	720VAC Phase voltage		
Digital signal			
Relay output	1 electromagnetic relay output, contact capacity: 3A 30V DC, 3A 250V AC		
Digital input	2 dry contact inputs, optocoupler isolated (5kVrms)		
Communication			
RS485	One RS485 communication interface, interface type: two-wire half-duplex Communication rate: 2400bps~115200bps Specification: Modbus-RTU		
Power supply			
Power	YME96HXX2	YME96HXX3	YME96HXX4
	95~265VAC/110~370VDC,45~60Hz	18-36VDC	9-18VDC
Maximum power consumption	3.5VA		

4. Data display

Instantaneous value	
Phase voltage	U1,U2,U3,AVG
Line voltage	U12,U23,U31,AVG
Current	I1,I2,I3,AVG,In
Grid frequency	F1,F2,F3,Σ (Total)
Power factor PF	PF1,PF2,PF3,Σ(Total)
Displacement Power factor DPF	DPF1,DPF2,DPF3,Σ(Total)
Active power	P1,P2,P3,Σ(Total)
Reactive power	Q1,Q2,Q3,Σ(Total)
Apparent power	S1,S2,S3,Σ(Total)
Energy	
Active Energy Import	EP1,EP2,EP3,Σ(Total) When the total Energy reaches 1.0 x 10 ⁹ kWh, the energy of each phase will automatically clear to zero
Active Energy Export	EP1,EP2,EP3,Σ(Total) When the total Energy reaches 1.0 x 10 ⁹ kWh, the energy of each phase will automatically clear to zero
Reactive Energy Import	EQ1,EQ2,EQ3,Σ(Total) When the total Energy reaches 1.0 x 10 ⁹ kVARh, the energy of each phase will automatically clear to zero
Reactive Energy Export	EQ1,EQ2,EQ3,Σ(Total) When the total Energy reaches 1.0 x 10 ⁹ kVARh, the energy of each phase will automatically clear to zero
Apparent Energy	ES1,ES2,ES3,Σ(Total) When the total Energy reaches 1.0 x 10 ⁹ kVAh, the energy of each phase will automatically clear to zero
Tariff Energy	ET1,ET2, ET3,ET4, ET5,ET6 When Energy reaches 1.0 x 10 ⁹ kWh, Energy automatically clears to zero
Harmonics	
Voltage harmonic percentage	Total harmonics (U1, U2, U3), odd total harmonics (U1, U2, U3), even total harmonics (U1, U2, U3) Fractional harmonics of order 1-50 (U1, U2, U3)
Current harmonic percentage	Total harmonics (I1, I2, I3), odd total harmonics (I1, I2, I3), even total harmonics (I1, I2, I3), K factor (I1, I2, I3) Fractional harmonics of order 1-50 (I1, I2, I3)
Voltage harmonic value	Total harmonics (U1, U2, U3) Fractional harmonics of order 1-50 (U1, U2, U3)
Current harmonic value	Total harmonics (U1, U2, U3) Fractional harmonics of order 1-50 (U1, U2, U3)
Phase diagram	
Phase sequence	Voltage, current
Voltage angle	U1,U2,U3

Current angle	I1,I2,I3
Voltage and current angle	UI1,UI2,UI3
Demand	
Demand	Total Active power, Total Reactive power, Total Apparent power
Total Active power demand max	Maximum demand and time
Total Reactive power demand max	Maximum demand and time
Total Apparent power demand max	Maximum demand and time
Unbalance	
Voltage unbalance	Negative order, zero order
Current unbalance	Negative order, zero order
Max.&Min.	
Phase voltage	Phases and averages
Line voltage	Phases and averages
Current	Phases and averages
Active power	Phases and averages
Reactive power	Phases and averages
Apparent power	Phases and averages

5. Accuracy and certification

Measuring accuracy	
current measurement accuracy	0.1%+Accuracy of current sensor
Voltage measurement accuracy	$\pm 0.2\%$ (60V~600V AC)
Grid frequency	$\pm 0.01\%$ (45~65Hz)
Power factor	± 0.005
Active and apparent power	IEC62053-22 level 0.5S
Reactive power	IEC62053-21 level 1S
Active energy	IEC62053-22 level 0.5S
Reactive energy	IEC62053-21 level 1S
Environment condition	
Operating temperature	-20℃~+70℃
Storage temperature	-40℃~+85℃
Humidity range	5~95% RH, 50℃(non-condensing)
Class of pollution	2

Over voltage capability	CAT III 1000V, It is suitable for distribution system below 277 / 480VAC
Insulation strength	IEC61010-1
Altitude	3000m Max
Antipollution level	IP20(Meet the standard of IEC 60629)
Quality guarantee period	12 months
EMC(electromagnetic compatibility)	
Electrostatic discharge	Level IV(IEC61000-4-2)
Radiated immunity	Level III (IEC61000-4-3)
EFT Electrical fast burst immunity	Level IV (IEC61000-4-4)
Surge immunity	Level IV (IEC61000-4-5)
Conducted disturbance immunity	Level III (IEC61000-4-6)
Power frequency magnetic field immunity	0.5mT (IEC61000-4-8)
Conduction and radiation	Class B (EN55022)
Measurement standard	
EN 62052-11, EN61557-12, EN 62053-21, EN 62053-22, EN 62053-23, EN 50470-1, EN 50470-3, EN 61010-1, EN 61010-2, EN 61010-031	

6. Wiring

The meter is equipped with a wide range of interfaces to realize different functions.

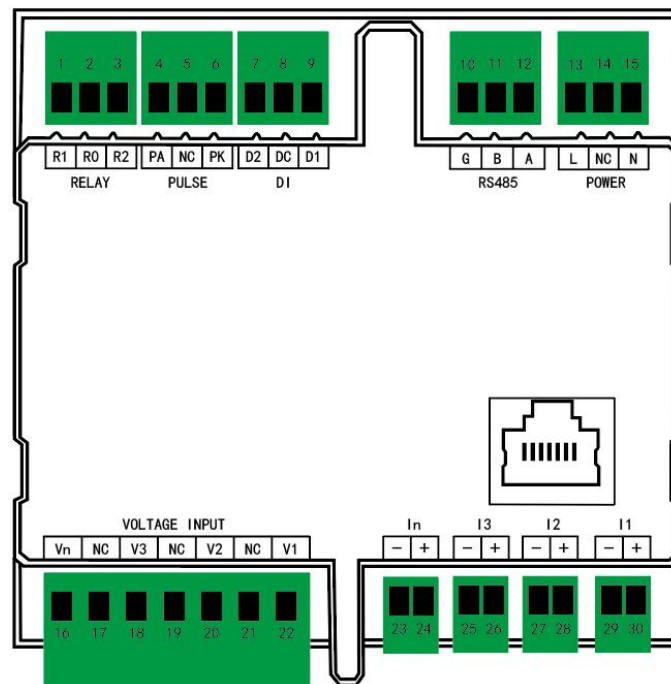


figure 6-1 Interface

No.	Name	Definition	Type	Remarks
1	R1	Relay normally open contacts	Relay output	It is a relay output with normally open and normally closed contacts
2	R0	Relay common contacts		
3	R2	Relay normally closed contacts		
4	PA	Pulse output positive terminal	Pulse output	Active Energy pulse output
5	NC	Empty terminal		
6	PK	Pulse output negative terminal		
7	D2	Digital input channel 2	Digital input	The two channels are dry contact inputs
8	DC	Digital channel common end		
9	D1	Digital input channel 1		
10	G	RS485 GND	RS485	RS485 Communication
11	B	RS485 B		
12	A	RS485 A		
13	L	Power supply (+)	Power supply	Power supply
14	NC	Empty terminal		
15	N	Power supply (-)		
16	Vn	N-phase voltage input	Voltage input	Voltage input channel
17	NC	Empty terminal		
18	V3	C-phase voltage input		
19	NC	Empty terminal		
20	V2	B-phase voltage input		
21	NC	Empty terminal		
22	V1	A-phase voltage input		
23	In-	N-phase current input negative	Current input	YME96HXD series current channel
24	In+	N-phase current input positive		
25	I3-	C-phase current input negative		
26	I3+	C-phase current input positive		
27	I2-	B-phase current input negative		
28	I2+	B-phase current input positive		
29	I1-	A-phase current input negative		
30	I1+	A-phase current input		

		positive		
31	RJ45	ABC three-phase current input	Current input	YME96HXR series current channel

6.1 Power supply

The meter adopts external power supply mode, and there is no internal direct power supply.

- Ø **Do not connect the meter while the cable is live**
- Ø **Before connecting the power supply, it is necessary to confirm whether the power supply voltage is within the required range, otherwise the meter cannot work properly**

6.2 Wiring type

Meter support wiring type, three-phase four-wire 4CT (3P4W_4CT), three-phase four-wire 3CT (3P4W_3CT), three-phase three-wire 3CT (3P3W_3CT), three-phase three-wire 2CT (3P3W_2CT), one-phase three-wire (1P3W), one-phase two-wire (1P2W)

- Ø **The actual wiring type of the meter must be consistent with the wiring method of the internal configuration of the meter**
- Ø **Three-phase four-wire 4CT (3P4W_4CT) requires 4 current sensors, and the N-phase current is measured through the sensor**
- Ø **Three-phase four-wire 3CT (3P4W_3CT) requires 3 current sensors, and the N-phase current is calculated by calculation**
- Ø **Three-phase three-wire 3CT (3P3W_3CT) requires 3 current sensors, and the B-phase current is measured through the sensor**
- Ø **Three-phase three-wire 2CT (3P3W_2CT) requires 2 current sensors, and the B phase current is calculated by calculation**
- Ø **The phase sequence of voltage and current must be in accordance with the phase sequence of ABC, otherwise the meter will show that the voltage and current phase sequence is wrong**
- Ø **When using a current sensor, pay attention to the current arrow pointing on the sensor must be consistent with the actual current flow direction, that is, the sensor current arrow points to the load end**

The voltage and current wiring type is as follows:

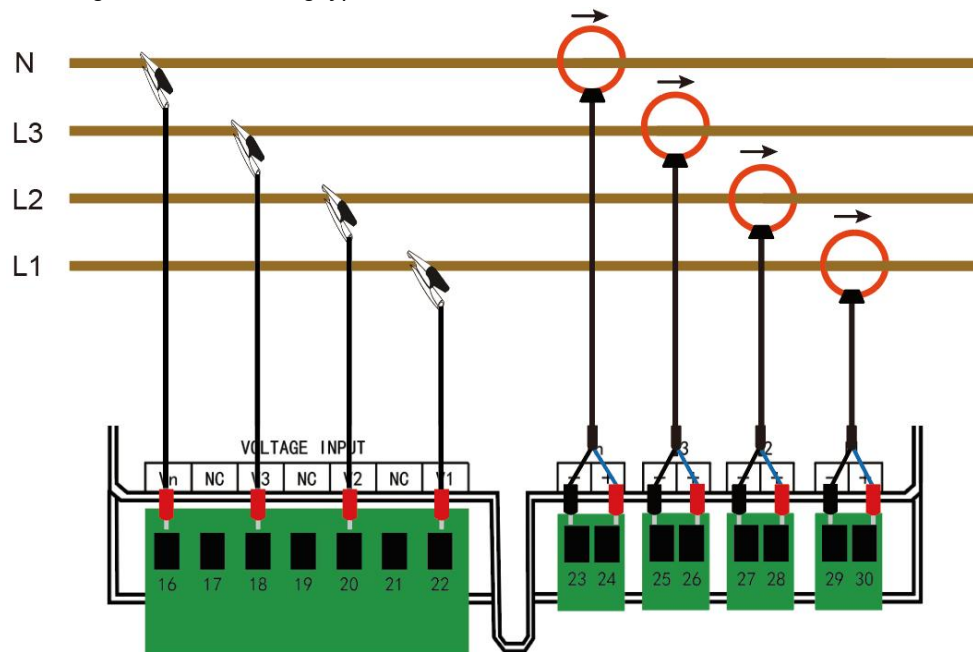


figure 6-2 Three-phase four-wire 4CT

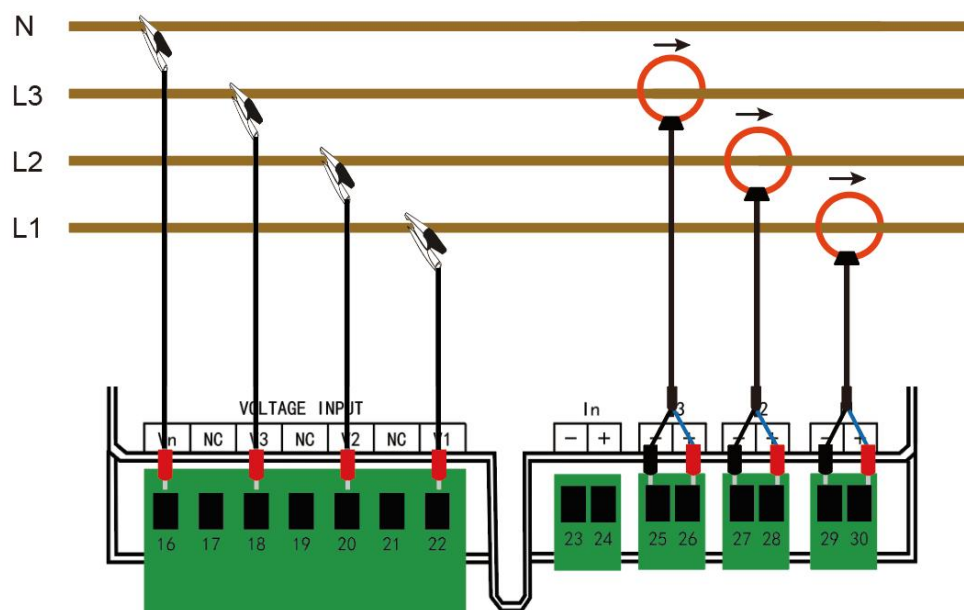


figure 6-3 Three-phase four-wire 3CT

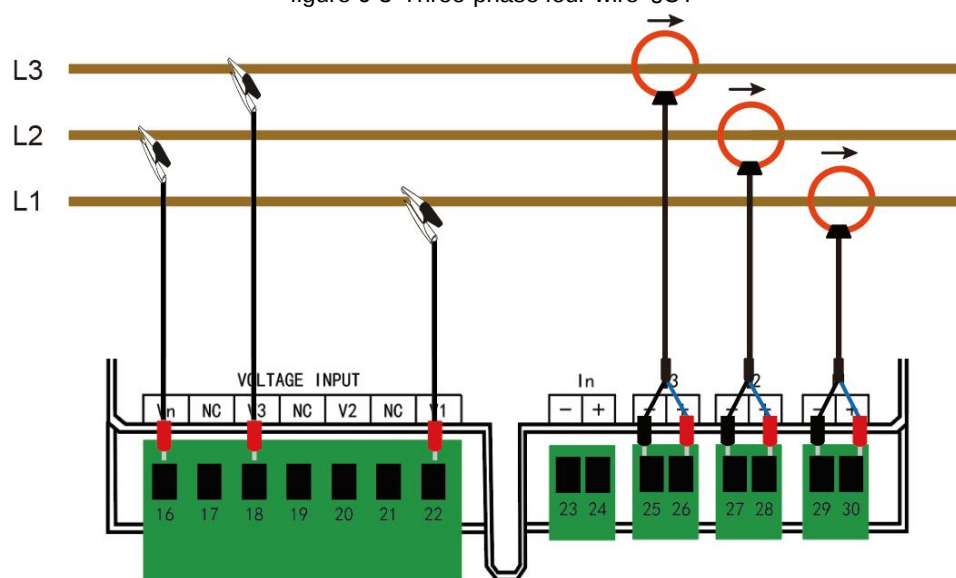


figure 6-4 Three-phase three-wire 3CT

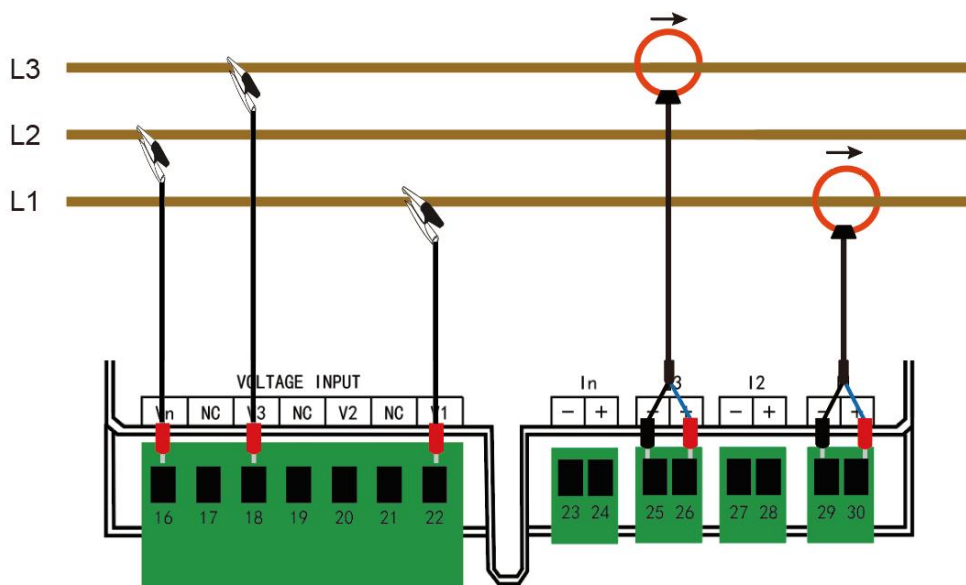


figure 6-5 Three-phase three-wire 2CT

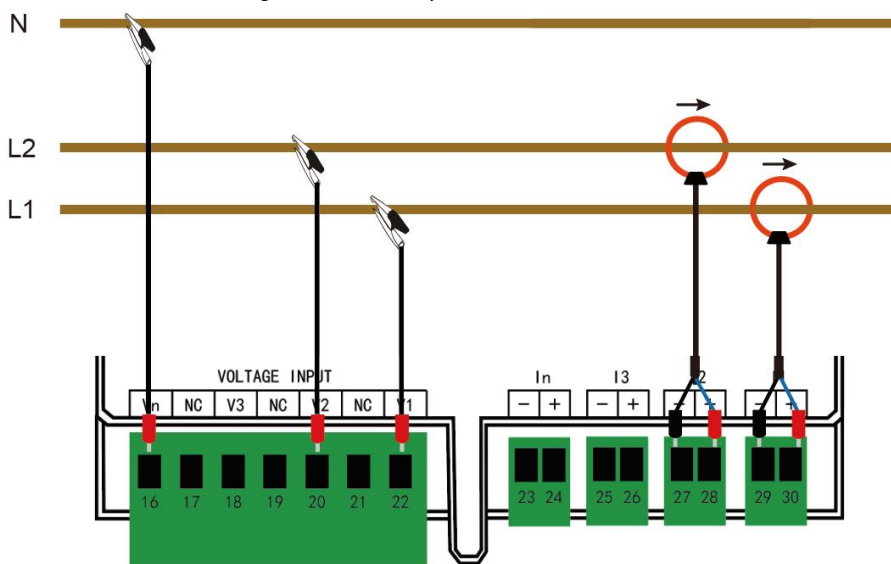


figure 6-6 Single-phase three-wire

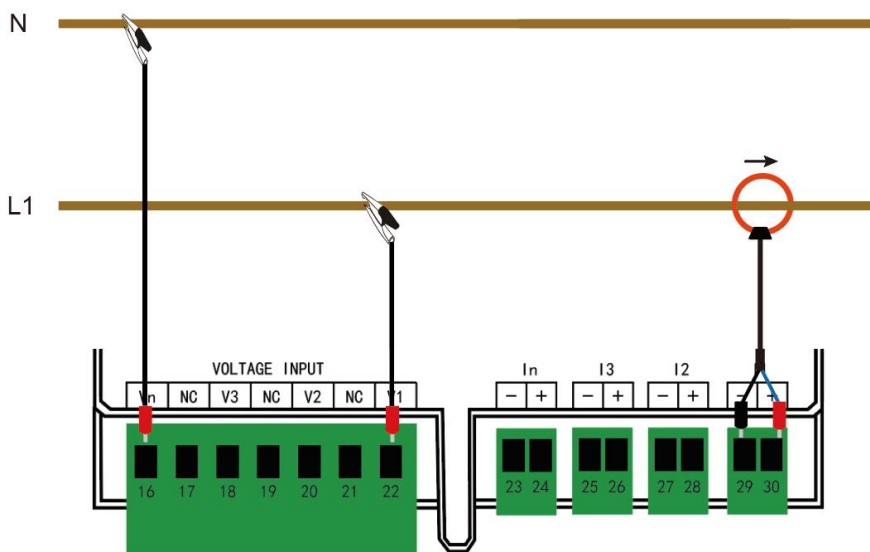
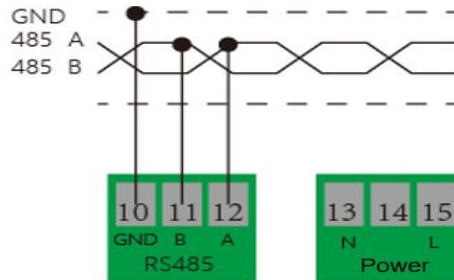


figure 6-7 Single-phase two-wire

6.3 RS485

The electricity meter is equipped with an RS485 communication interface that supports the ModBus RTU protocol. The RS485 communication interface requires the use of shielded twisted pair connections, which are connected in the form of a daisy chain. In long-distance high-speed situations, a 120 Ω resistor needs to be connected in parallel at both ends of the daisy chain.



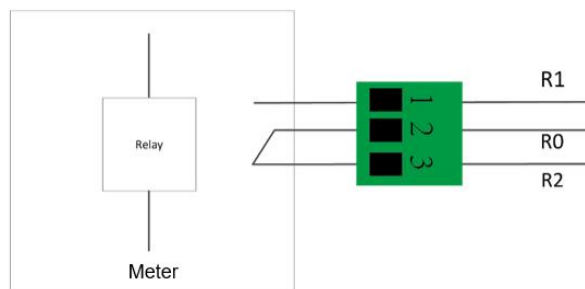
6.4 Relay output

The meter is equipped with a relay output that is a normally open contact. The terminal markings are R1 and R0, where R0 is the common contact and R1 is the normally open contact. The maximum load capacity of the relay is 3A 30V DC and 3A 250V AC

The closed state of the normally open contact of the relay is displayed on the meter display interface

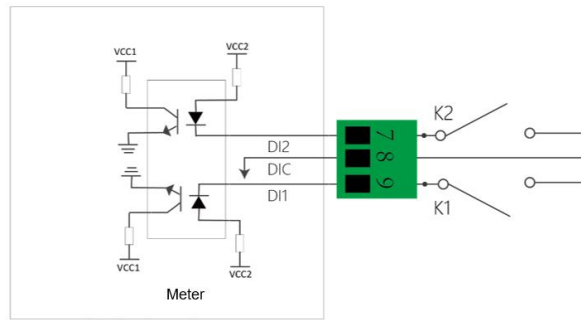
There are two types of relay output control modes, which can be modified through the meter operation interface or Modbus

Relay output control mode	Description
Manual	The relay output is controlled via the meter operator interface or Modbus
Alarm	The relay output is controlled by setting alarm parameters



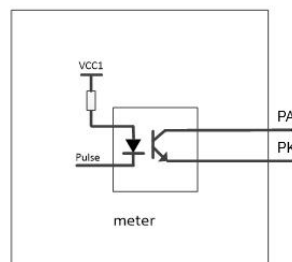
6.5 Digital input

The meter is equipped with two digital switching inputs, which are connected by passive dry contact. The terminal blocks are identified as: DI1, DI2, DIC, where DIC is the common contact. The status of two digital switching inputs can be read through RS485/ModBus protocol, and the status of digital switching input is displayed on the meter display interface.



6.6 Energy pulse output

The meter is equipped with an active power pulse output, and the electric energy pulse constant EC can be viewed through the meter information interface. The internal optocoupler of the meter is isolated, the maximum allowable passing current is 80mA DC, and the working voltage range is 5V ~ 80V DC



Energy pulse output connection diagram