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AEW100 无线计量仪表

AEW100 wireless measurement meter

安装使用说明书 V1.7

Instruction V1.7

安科瑞电气股份有限公司

Acrel Co.,LTD.

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目录

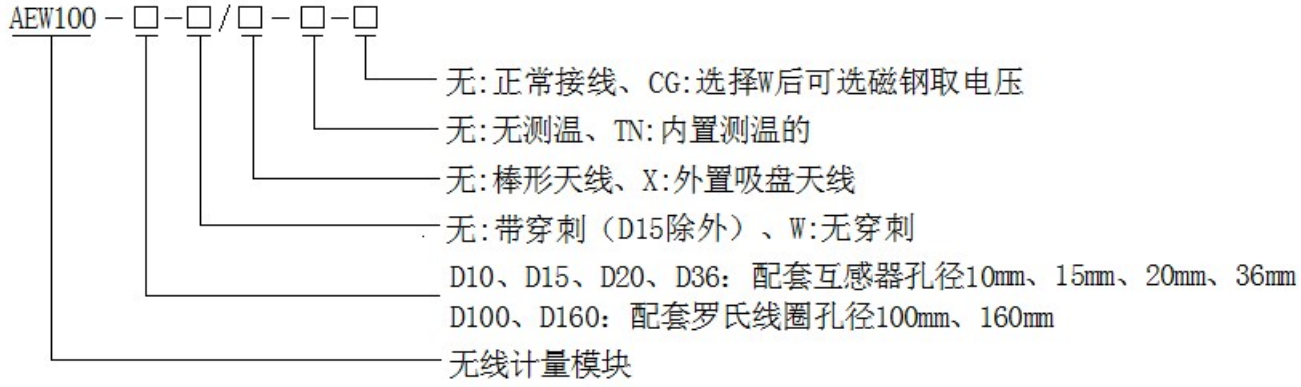
1 概述 Overview

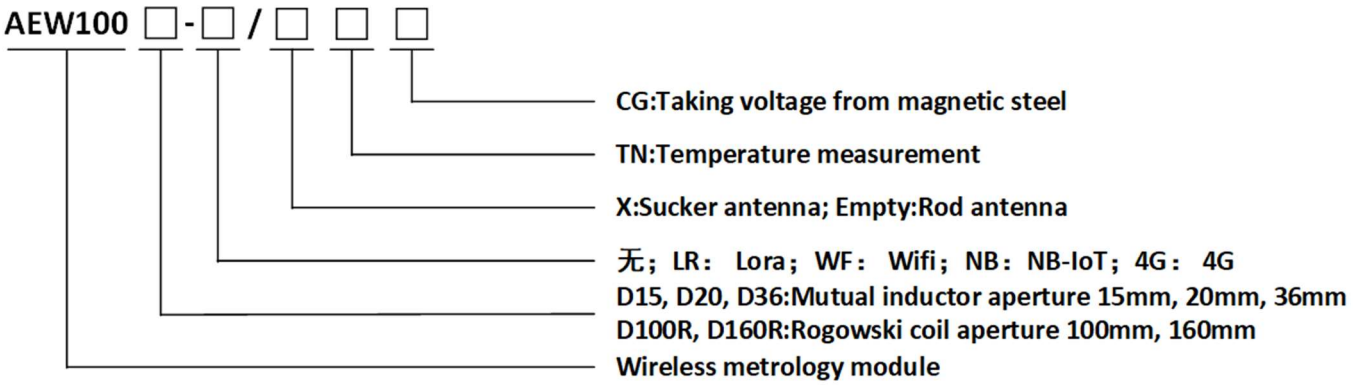
AEW100 无线计量模块主要用于计量低压网络的三相有功电能，具有 RS485 通讯和 470MHz 无线通讯功能，方便用户进行用电监测、集抄和管理。可灵活安装于配电箱内，实现对不同区域和不同负荷的分项电能计量，统计和分析。

AEW 100 wireless measurement module is mainly used for metering three phase active energy on low voltage network. There are functions like RS485 communication and wireless communication on 470MHz in order to help customers check, get and manage the value of energy consumption. This kind of production can be installed in distribution box flexibly, achieving the different demand of measurement and statistics of distribution on different areas and different loadings.

2 产品型号规格 Product specification

2.1 AEW100 主体模块命名规则 Naming rule of main part





注：

1. 选择 W 后才能选择 CG；

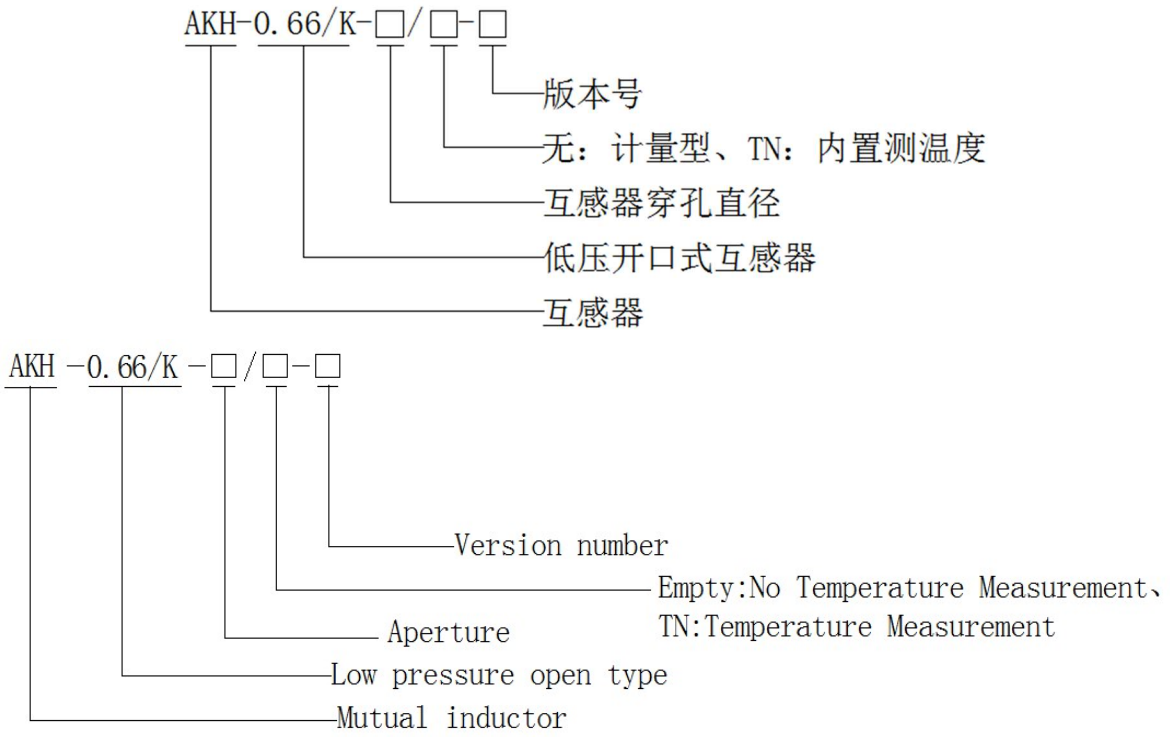
2. 2.可选择外置吸盘天线，标配线长 2 米。

Note:

1. Choose W before choosing CG;

2. There is a mobile antenna lay outside can be chosen, and the length of wire is 2 meters.

2.2 配套互感器命名规则 Naming rule of mutual inductor



2.3 规格型号 Model and specification

表 1 AEW100 配套互感器规格型号

Chart 1 Mutual inductor specification

电压规格 Voltage	电流规格 Current	配套计量互感器 Mutual inductor	配套内部测温互感器 Inside mutual inductor of temperature measurement
3×220/380V 3×380V 3×57.7/100V 3×100V	3×1.5(6)A	HCT16K-FJ	
	3×20(100)A	HCT16K-FJ	
	3×20(100)A	AKH-0.66/K-20 （穿刺 puncture）	AKH-0.66/K-20/TN
	3×20(100)A	HCT20K-TN	HCT20K-TN
	3×40(200)A	AKH-0.66/K-20 （穿刺 puncture）	AKH-0.66/K-20/TN

	3×40(200)A	HCT20K-TN	HCT20K-TN
	3×80(400)A	AKH-0.66/K-20 （穿刺 puncture）	AKH-0.66/K-20/TN
	3×80(400)A	HCT20K-TN	HCT20K-TN
	3×80(400)A	AKH-0.66/K-36 （穿刺 puncture）	AKH-0.66/K-36/TN
	3×80(400)A	HCT36K-TN	HCT36K-TN
	3×120(600)A	AKH-0.66/K-36 （穿刺 puncture）	AKH-0.66/K-36/TN
	3×120(600)A	HCT36K-TN	HCT36K-TN
	3×200(1000)A	D100R	
	3×400(2000)A	D100R	
	3×200(1000)A	D160R	
	3×400(2000)A	D160R	

3 技术参数 Technical parameter

3.1 无线计量模块 Wireless measurement module

表 2 AEW100 主要功能

Chart 2 Main function

功能 Function	功能说明 Function description
电能计量 Energy metering	有功电能计量（正、反向） Active kWh (positive and negative)
电量测量 Electrical measurement	U、I、 P、Q、S、PF、F
脉冲输出 Pulse output	有功脉冲输出 Active pulse output
LED 指示 LED display	（L1、L2、L3）取电显示、脉冲、通讯、无线状态指示 (L1、L2、L3)powered display, pulse, communication, wireless status
通讯 Communication	470MHz 无线传输 Wireless transmission on 470MHz
	红外通讯 Infrared communication
	RS485 接口 Communication interface: RS485

3.2 电气特性 Electrical performance

表 3 AEW100 电气特性

Chart 3 Electrical performance

电压输入 Voltage input	额定电压 Rated voltage	3×220/380V，3×380V，3×57.7/100V，3×100V
	参比频率 Reference frequency	50Hz
	功耗 Consumption	<2VA（每相）(Each phase)
电流输入 Current input	输入电流 Input current	3×1.5(6)A、3×20(100)A、 3×40(200)A、3×80(400)A、3×120(600)A、3×200(1000)A、3×400(2000)A
	起动电流 Start current	4‰Ib（1 级 1 Class）
	功耗 Consumption	<2VA
测量性能 Measurement performance	符合标准 Standard	GB/T17215.321-2008
	有功电能精度 Active energy accuracy	1 级 1 Class
	温度精度 Temperature accuracy	±2℃
脉冲 Pulse	脉冲宽度 Width of pulse	80±20ms
	脉冲常数 Pulse constant	6400imp/kWh 、400imp/kWh、200imp/kWh、100imp/kWh、60imp/kWh
通信 Communication	无线 Wireless	470MHz 无线传输，空旷时最远传输距离：1km Transmission on 470MHz and maximum distance in open space is 1km
	红外通讯 Infrared communication	波特率固定为 1200 The constant baud rate is 1200
	接口 Interface	RS485(A+、B-)
	介质 Connection mode	屏蔽双绞线 Shielded twisted pair conductors
	协议 Protocol	MODBUS-RTU

3.3 环境条件 Work environment

表 4 AEW100 环境条件

Chart 4 Work environment

温度范围 Temperature range	工作温度 Operating temperature	-20℃~55℃
	存储温度 Storage temperature	-40℃~70℃
湿度 Humidity		≤95%（无凝露）(No condensation)
海拔 Altitude		<2000m

4 外形尺寸及安装说明（单位：mm） Dimension and installing description (Unit: mm)

4.1 外形尺寸(单位：mm) Dimension drawings (Unit: mm)

表 5 AEW100 及配套互感器外形尺寸

Chart 5 Dimension of mutual inductor

计量模块 Metering module	长×宽×高 L×W×H	88mm×54mm×50mm	
AKH-0.66/K-20 互感器 AKH-0.66/K-20 Mutual inductor		90mm×57mm×35mm	二次测线长 500mm Secondary terminal wire length 500mm
AKH-0.66/K-36 互感器 AKH-0.66/K-36 Mutual inductor		109mm×71mm×35 mm	二次测线长 500mm Secondary terminal wire length 500mm
HCT16K-FJ 互感器 HCT16K-FJ Mutual inductor		29.5mm×44mm×43 mm	二次测线长 2000mm Secondary terminal wire length 2000mm
HCT20K-TN 互感器 HCT20K-TN Mutual inductor		70.5mm×57mm×35 mm	二次测线长 2000mm Secondary terminal wire length 2000mm
HCT36K-TN 互感器 HCT36K-TN Mutual inductor		85mm×71mm×35m m	二次测线长 2000mm Secondary terminal wire length 2000mm

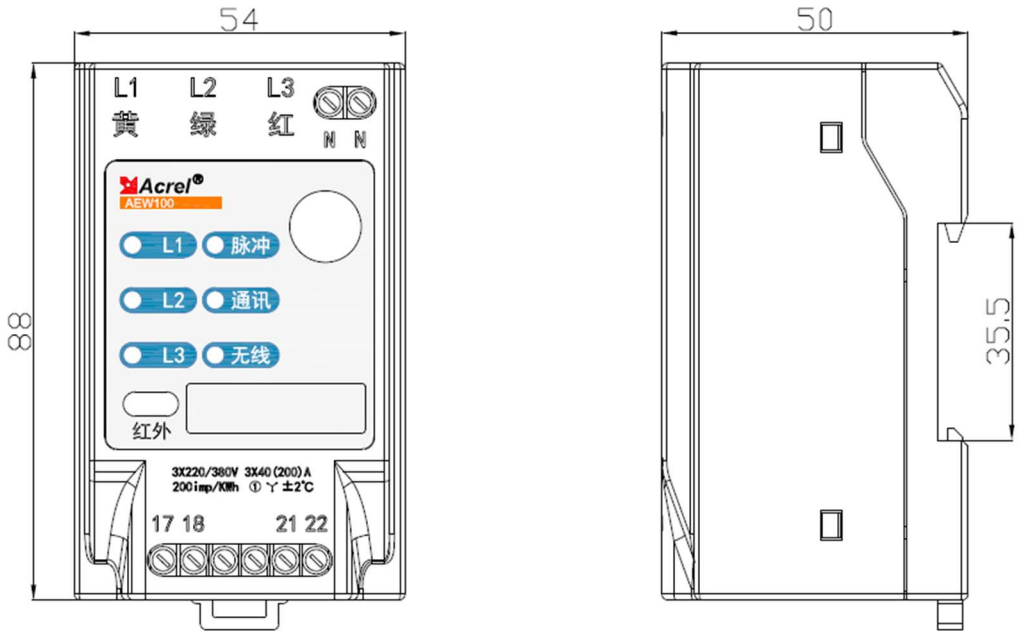


图 1 AEW100 尺寸图

Fig 1 Dimension of AEW100

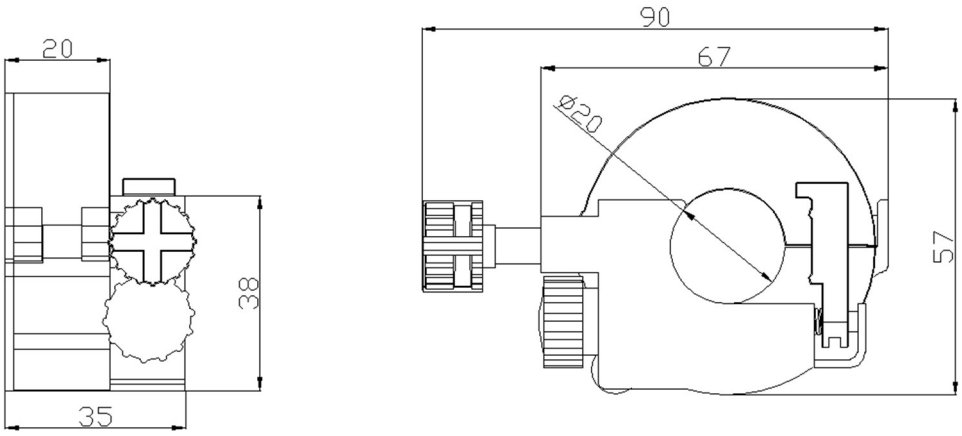


图 2 配套互感器 AKH-0.66/K-20 尺寸图

Fig 2 Dimension of mutual inductor AKH-0.66/K-20

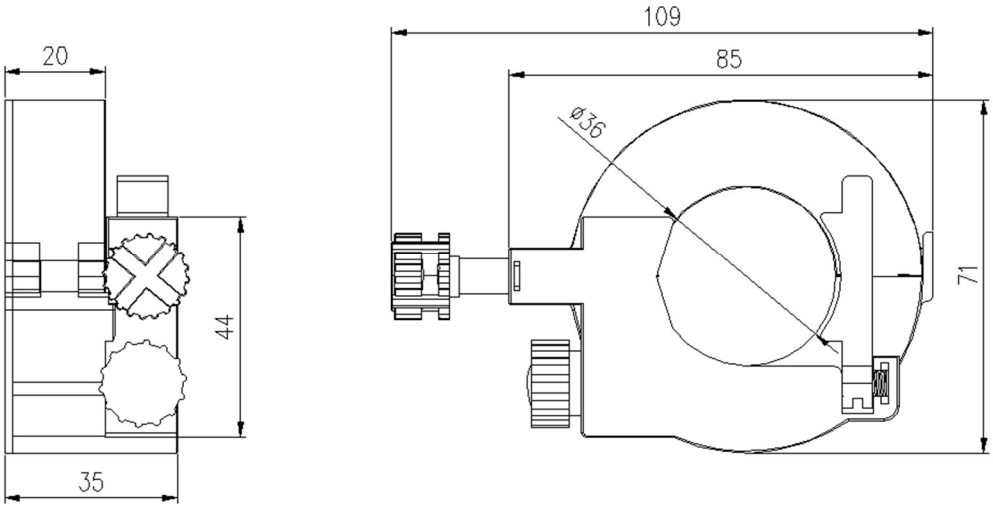


图 3 配套互感器 AKH-0.66/K-36 尺寸图

Fig 3 Dimension of mutual inductor AKH-0.66/K-36

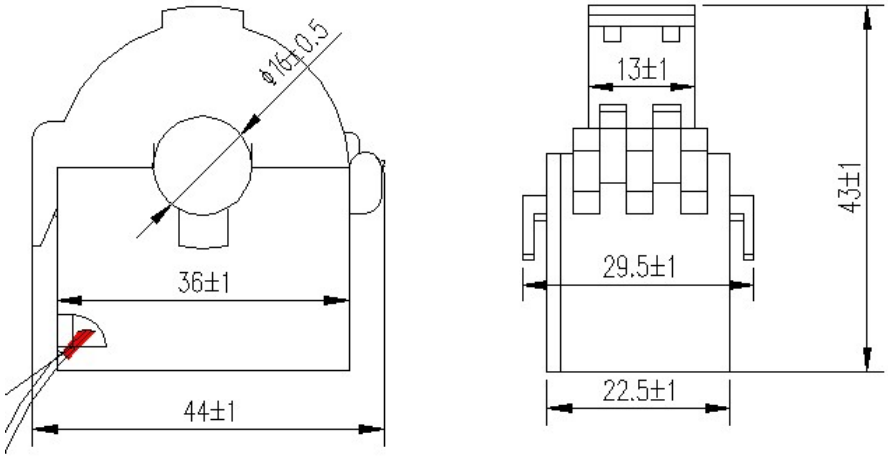


图 4 配套互感器 HCT16K-FJ 尺寸图

Fig 4 Dimension of mutual inductor HCT16K-FJ

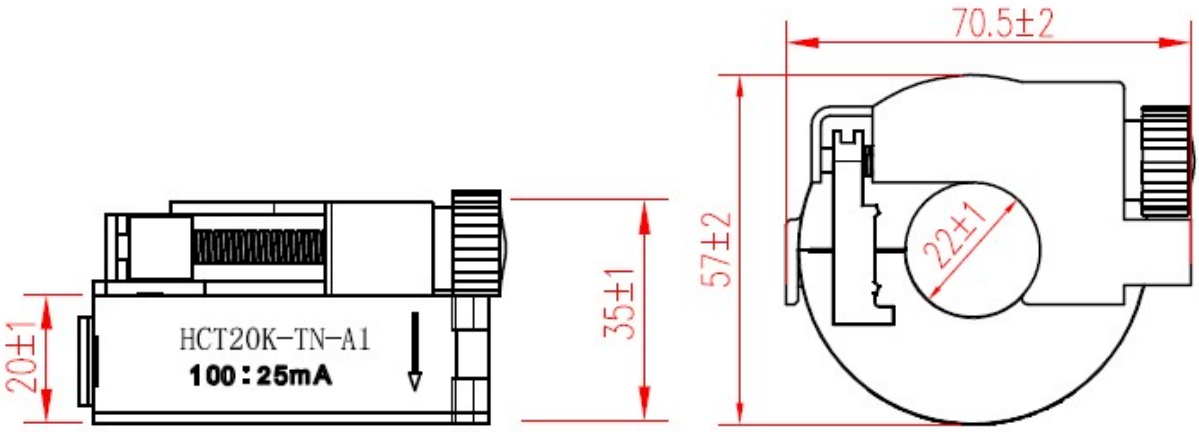


图 5 配套互感器 HCT20K-TN 尺寸图

Fig 5 Dimension of mutual inductor HCT20K-TN

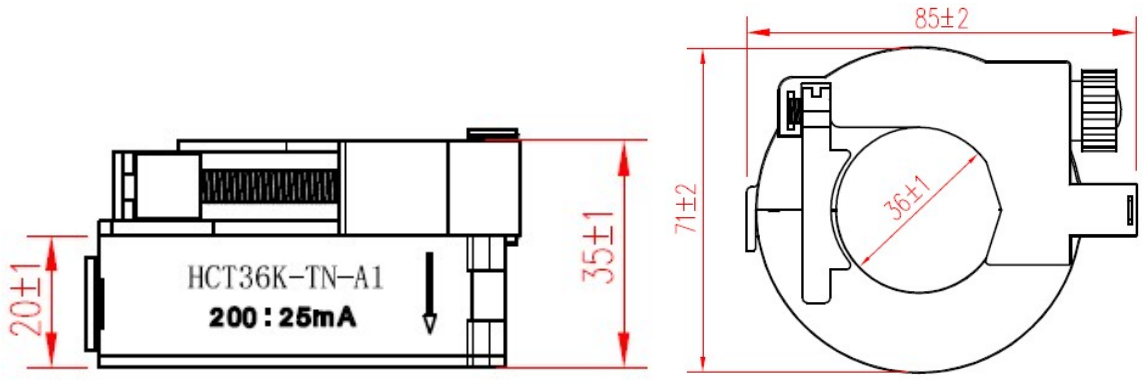


图 6 配套互感器 HCT36K-TN 尺寸图

Fig 6 Dimension of mutual inductor HCT36K-TN

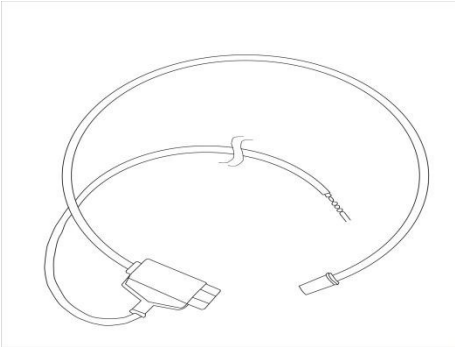


图 7 配套罗氏线圈

Fig 7 Rogowski coil

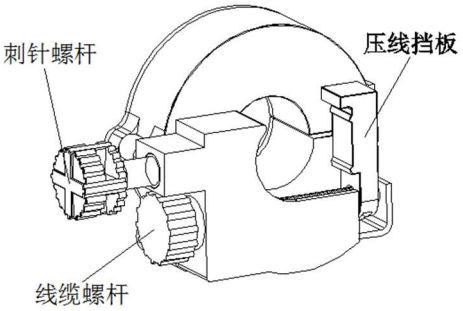
4.2 安装接线说明 Installing and Wiring description

有功电能脉冲　　通讯接口

4.2.1 正常型号带穿刺安装说明 Installing description of normal type with puncture

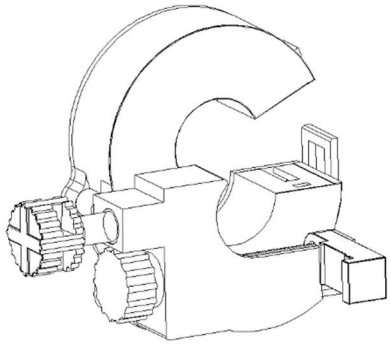
L1、L2、L3 开口式传感器分别通过穿刺接入 A 相、B 相、C 相线缆，**其中 A 相传感器通过穿刺线缆及 N 线端子取电为计量模块供电，**同时 A 相、B 相、C 相传感器分别将电压、电流信号通过信号连接线传输给计量模块，计量模块通过无线或者 RS485 方式将测试数据传输至后台终端。

L1, L2, L3 prick in to A, B, C phase respectively, and especially the A phase and N terminal powered for the AEW100. And A, B, C phase transmits the voltage and current to AEW100 by mutual inductor, and then the AEW100 transmits the single to PC via RS485.



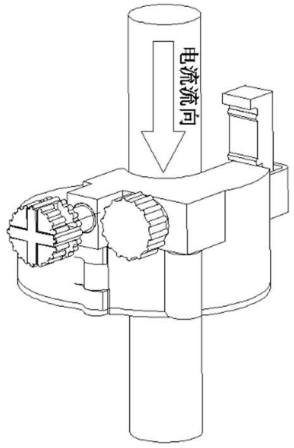
第一步：将刺针螺杆松到底，旋转线缆螺杆将压线挡板松到顶部（如上图）。

First step: Loosing the needle screw and loosing the wire bezel to the top (show as above).



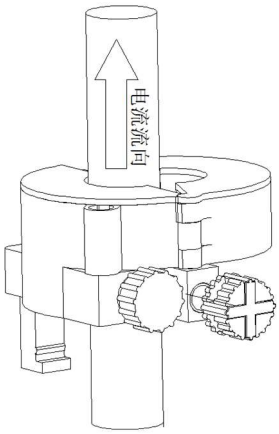
第二步：打开开口式互感器，并把压线挡板向上旋转 90 度（如上图）。

Second step: Open the mutual inductor and rotate the wire bezel to vertical (show as above).



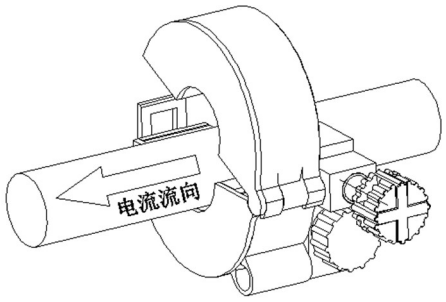
第三步：根据应用现场实际电流流向，正确安装互感器（如上图电流流向自上而下）。

Third step: Installing the mutual inductor correctly refers to the current flow (The current flow towards downward as above).



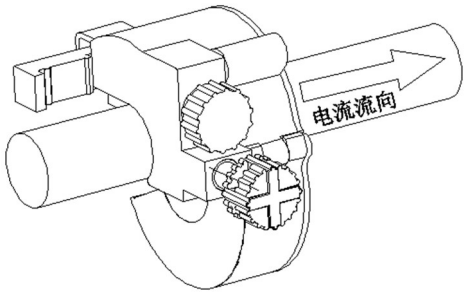
（如上图电流流向自下而上）

(The current flow towards upward shown as above)



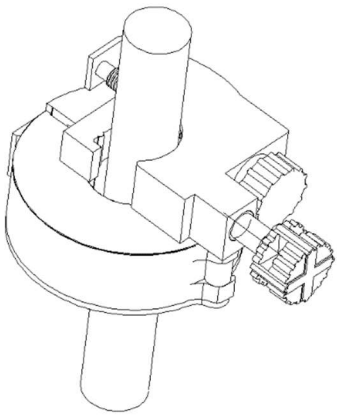
（如上图电流流向自右而左）

(The current flow towards the left shown as above)



（如上图电流流向自左而右）

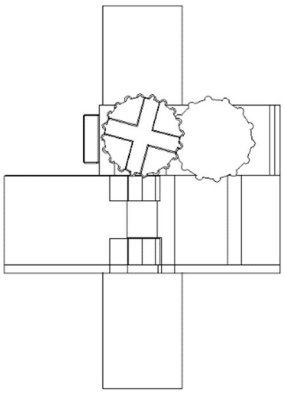
(The current flow towards the right shown as above)



第四步：闭合互感器放下压线挡板，将线缆紧靠刺针

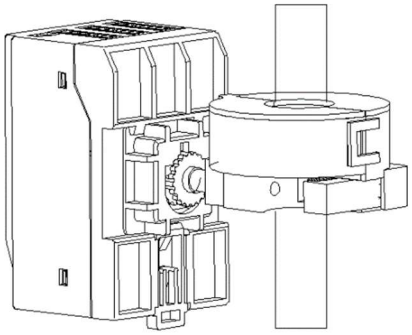
孔处，旋转螺杆收紧线缆（如上图）

Fourth step: Close the mutual inductor and put down the wire bezel, and make the wire beside the pricking needle hole, then rotate tightly the screw arbor (show as above)



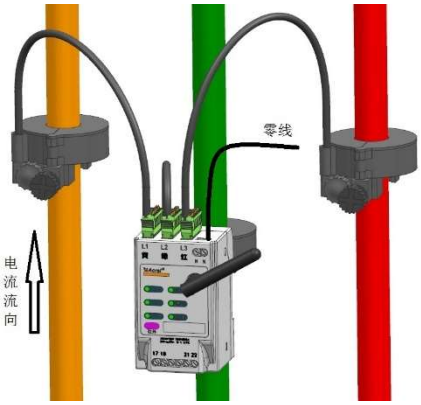
第五步：旋转刺针螺杆，拧紧后将螺杆调整 90°＜十字印＜150°（如上图）

Fifth step: Rotating the pricking needle screw arbor, and then tight the screw arbor, making cross symbol's angle between 90 degree to 150 degree.



第六步：把互感器上端子按照线上色标对应插在 AEW100 端口处，之后把 AEW100 安装在互感器上（如上图）。

Sixth step: Match the color with mutual inductor and AEW100 terminal, the locate the AEW100 on the mutual inductor (show as above)



第七步：最终安装效果图

Seventh step: The effect picture of the final installation.

安装注意事项：

1. 安装过程中应避免用力掰动线缆，防止线缆接点松动导致接触电阻增大，发热，造成安全隐患；
2. 安装完成后，让设备侧满载运行超过一小时，测量安装点线缆的温度，应不超过 80℃；
3. 本产品配套互感器的工作温度≤90℃，应在 90℃及以下的温度环境下工作。

Installation Notes:

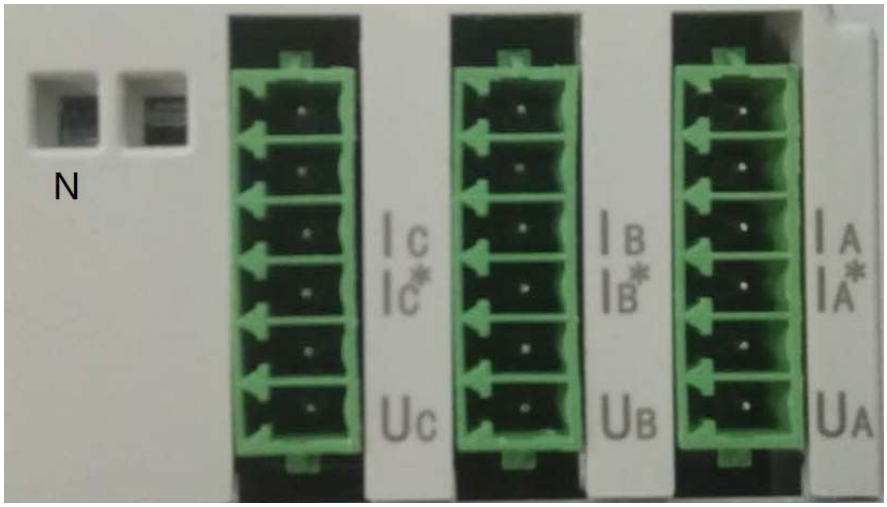
1. Loosening cable should be avoided during installation
2. Measure the temperature of the installation position after full-loading operation of equipment side for more than 1 hour,. The temperature should not exceed 80 ℃.
3. The working temperature of the matching transformer of this product is less than 90 ℃

4.2.2 带 W 无穿刺（或罗氏线圈）安装说明 Installing description of W type(Or rogowski coil) without puncture

L1、L2、L3 开口式传感器分别卡住 A 相、B 相、C 相线缆，A、B、C 三相的电压信号线分别接到 **UA、UB、UC** 端子；N 线接到 **N** 端子。同时 A 相、B 相、C 相传感器分别将电压、电流信号通过信号连接线传输给计量模块，计量模块通过无线或者 RS485 方式将测试数据传输至后台终端。

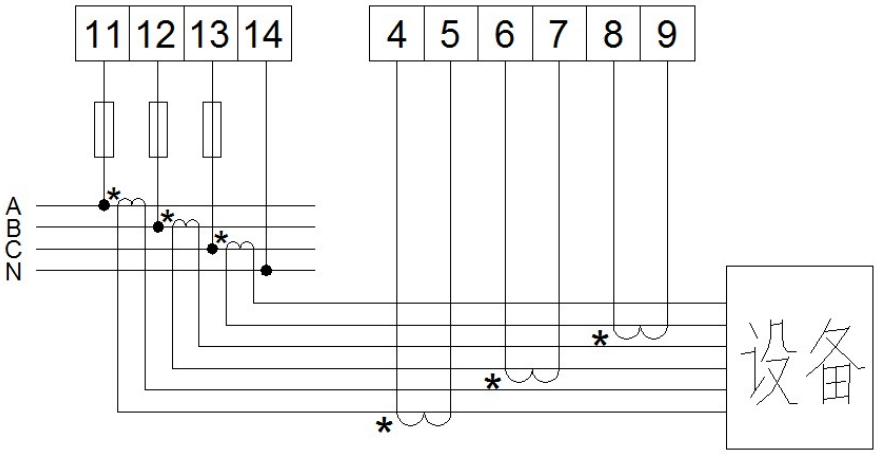
L1, L2, L3 place on A, B, C phase respectively. A、B、C three-phase voltage signal lines are connected to UA, UB, UC terminals respectively, neutral line is connected to the N terminal. And

especially the A phase and N terminal powered for the AEW100. And A, B, C phase transmits the voltage and current to AEW100 by mutual inductor, and then the AEW100 transmits the single to PC via RS485.



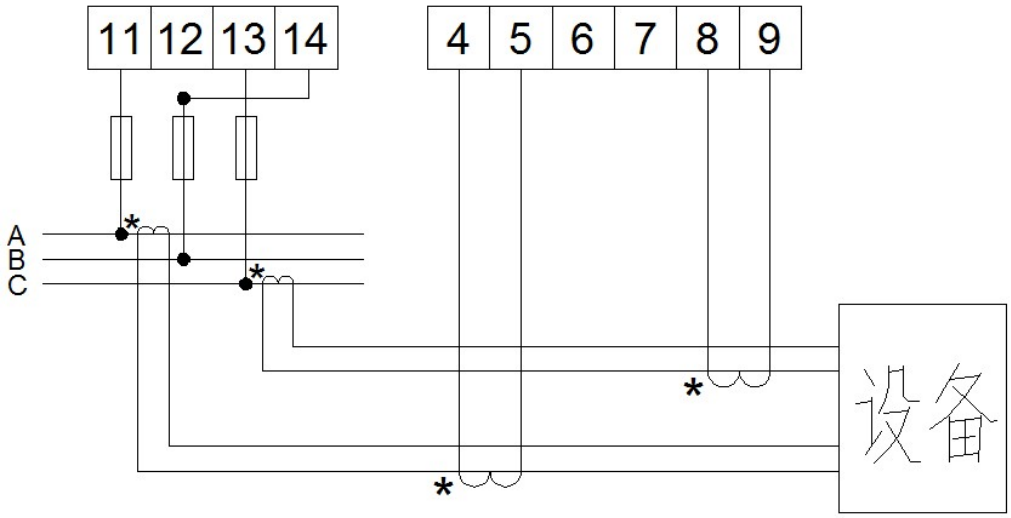
AEW100-D15、AEW100-D15W、AEW100-D20W、AEW100-D36W 端子图

Terminals of AEW100-D15、AEW100-D15W、AEW100-D20W、AEW100-D36W



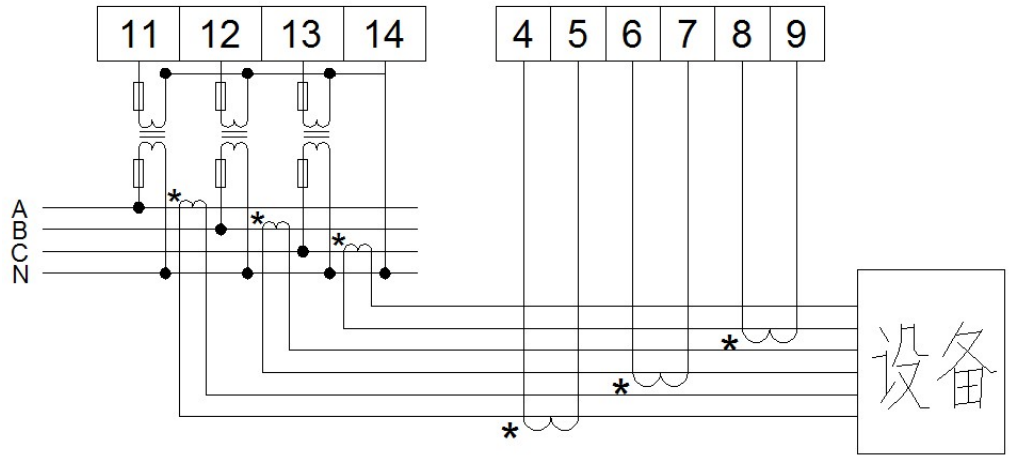
三相四线(电流经互感器接入)

3-phase 4-wire (current connected via CT)



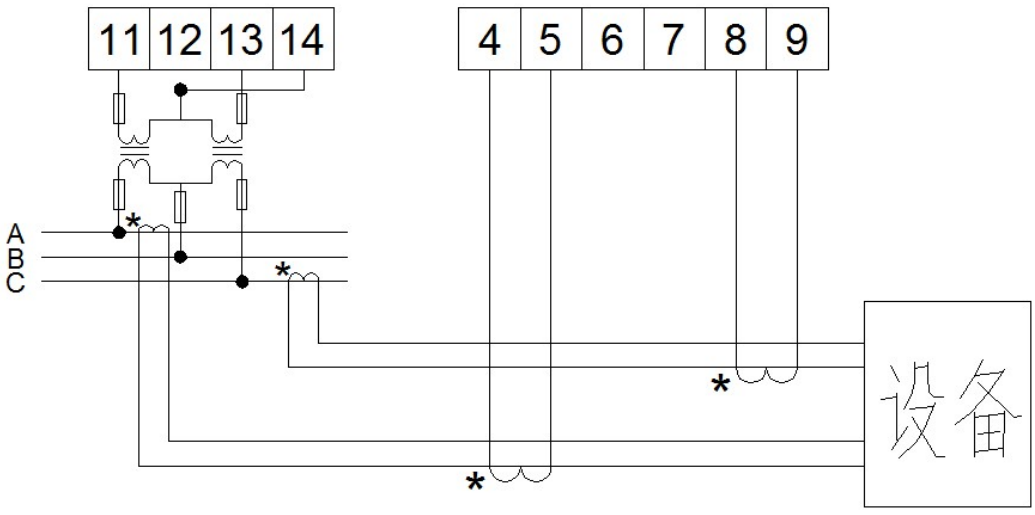
三相三线(电流经互感器接入)

3-phase 3-wire (current connected via CT)



三相四线(电压、电流经互感器接入)

3-phase 4-wire (voltage and current connected via CT)

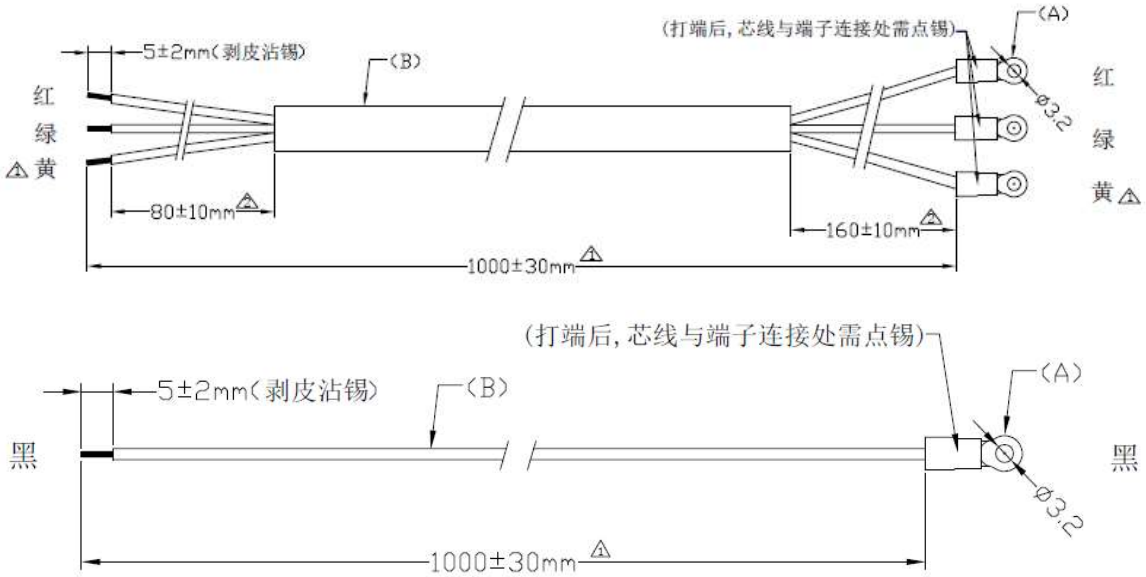


三相三线(电压、电流经互感器接入)

3-phase 3-wire (voltage and current connected via CT)

注：选择 W 后可选 CG，即磁钢取电压

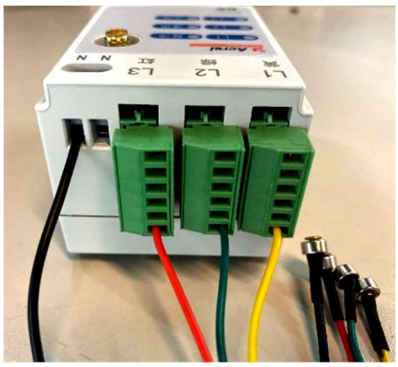
Note: CG is optional after selecting W, which means taking voltage from magnetic steel.



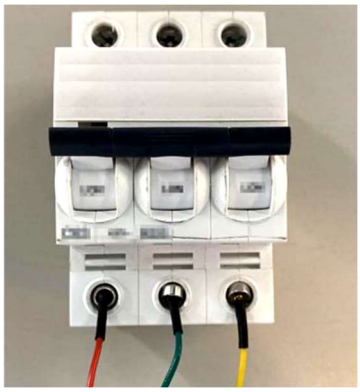
磁钢尺寸与规格

Dimension of magnet steel

4.2.3 磁钢接线说明 Magnetic steel wiring instructions



第一步：分别把黑色、红色、绿色、黄色磁钢线接入电表的 N、UC、UB 、UA 端子接口。建议磁钢线接入电表前串联保险丝以提高线路安全性。



第二步：把磁钢按照相序吸附到监测线路中，先接 N 相。建议在磁钢吸合处贴封条固定以防止意外损坏，并用扎带把磁钢线和负载线路固定在一起。

Step 1: Put the black, red, green, respectively Yellow magnetic steel wire connected to the electricity meter N, UC, UB, UA Terminal interface。It is suggested that the magnetic steel wire be connected to the front string of the electricity meter Joint fuse to improve line safety.

Step 2: adsorb the magnetic steel to the monitoring according to the phase sequence In the line, connect the N phase first. Suggested in the magnetic steel suction joint Attach the seal to prevent accidental damage, and tie the tape Attach the magnetic steel lines and the load lines together.

注：磁钢工作温度为 -40℃ ～70℃

Note: The working temperature of the magnetic steel is-40℃ ～70℃

5 操作与显示 Operating and display

在面板的左上方有六个 LED 指示灯，分别为：“L1”、“L2”、“L3”、“脉冲”、“通讯”、“无线”。

“L1”：亮起时说明 L1 相取电成功；

“L2”：亮起时说明 L2 相取电成功；

“L3”：亮起时说明 L3 相取电成功；

“脉冲”：每亮起一次，表示仪表输出一个电能脉冲；

“通讯”：当仪表通过 RS485 进行通讯时会闪烁；

“无线”：当仪表通过无线模块进行通讯时会闪烁。

There are 6 LED lights on the surface of the meter represent for L1, L2, L3, pulse, communication, wireless respectively.

L1 light on means L1 phase powered;

L2 light on means L2 phase powered;

L3 light on means L3 phase powered;

Pulse light on each time means one electric pulse output;

Communication light will flash while communicating via RS485;

Wireless light will flash while communicating via wireless module.

6 通信说明 Communication description

6.1 通信协议 Protocol

本仪表采用 MODBUS-RTU 协议或 DL/T645 规约。具体协议格式请参照相关协议标准，此处不再赘述。

The meters adapt Modbus and DL/T645 protocol. Please refer to the relevant standards for more information.

6.2 MODBUS 通讯

使用 Modbus 协议进行通讯时，读数据命令功能码为 03H，写数据命令功能码为 10H。具体寄存器地址表如下：

MODBUS-RTU protocol has 03H and 10H command to read and write registers respectively. The following chart is registers' address list:

数据地址 Address	数据名称 Variable	长度 Length	读/写 R/W	备注 Notes
0000H	通信地址 Address	2	R/W	1～247
0001H	波特率 Baud rate	2	R/W	1：1200bps 2：3400bps 3：4800bps 4：9600bps
0002H	扩频因数	2	R/W	6~12

	Spreading factor			
0003H	频道设置 Frequency channel setting	2	R/W	0-10(与频道相同的主站才能通讯)(Communication with the same frequency host)
0004H	高位：校验方式，低位：停止位 High byte: parity mode, low byte: stop bit	2	R/W	高位：0-无校验、1-偶校验、2-奇校验， 低位：0-1 停止位、1-2 停止位 High byte: 0-none, 1-even, 2-odd; low byte: 0- 1 stop bit, 1- 2 stop bit
0005H	保留 Reserved			
0006H	脉冲常数 Pulse constant			
0007H	需量周期 Demand cycle			
0008H	密码 Code			
0009H~000CH	保留 Reserved			
000DH	电流规格 Current specification			
000EH	罗氏线圈标志位 Rogowski coil EN			
000FH~0010H	保留 Reserved			
0011H~0013H	时间日期（秒、分、时、日、月、年） Time, date (second, minute, hour, day, month, year)			
0014H	A 相电压 Voltage of A phase	2	R	整型 保留 1 位小数 （所得数据除以 10 即为实际数据。以下数据小数位均以此处理） Int Keep 1 decimal places (The real value is the showed value divide 10.The following data all in this rule.)
0015H	B 相电压 Voltage of B phase	2	R	
0016H	C 相电压 Voltage of C phase	2	R	
0017H	A-B 线电压 Voltage between A-B	2	R	
0018H	C-B 线电压 Voltage between C-B	2	R	
0019H	A-C 线电压 Voltage between A-C	2	R	
001AH	A 相电流 Electricity of A phase	2	R	整型 保留 2 位小数（若使用罗氏线圈则保留 1 位小数） Int Keep 2 decimal places(keep 1 decimal when use Rogowski coil)
001BH	B 相电流 Electricity of B phase	2	R	
001CH	C 相电流 Electricity of C phase	2	R	
001DH	三相电流矢量和 Vector sum of 3-phase current	2	R	
001EH	A 相有功功率 Active power of A phase	4	R	整型 保留 3 位小数 Int Keep 3 decimal places
0020H	B 相有功功率 Active power of B phase	4	R	
0022H	C 相有功功率 Active power of C phase	4	R	
0024H	总有功功率 Total active power	4	R	
0026H	A 相无功功率 Reactive power of A phase	4	R	
0028H	B 相无功功率 Reactive power of B phase	4	R	

002AH	C 相无功功率 Reactive power of C phase	4	R	
002CH	总无功功率 Total reactive power	4	R	
002EH	A 相视在功率 Apparent power of A phase	4	R	
0030H	B 相视在功率 Apparent power of b phase	4	R	
0032H	C 相视在功率 Apparent power of c phase	4	R	
0034H	总视在功率 Total apparent power	4	R	
0036H	A 相功率因数 Power factor of A phase	2	R	整型 保留 3 位小数 Int Keep 3 decimal places
0037H	B 相功率因数 Power factor of B phase	2	R	
0038H	C 相功率因数 Power factor of C phase	2	R	
0039H	总功率因数 Total power factor	2	R	
003AH	保留 Reserved			
003BH	电源频率 Frequency of power	2	R	整型 2 位小数 Int,Keep 2 decimal places
003CH	总用电量 Total energy consumption	4	R	整型 保留 2 位小数 Int Keep 2 decimal places
003EH	正向有功用电量 Forward active energy consumption	4	R	
0040H	反向有功用电量 Reversing active energy consumption	4	R	
0042H	正向无功用电量 Forward reactive energy consumption	4	R	
0044H	反向无功用电量 Reversing reactive energy consumption	4	R	
0046H	A 相总用电量 Total energy consumption on A phase	4	R	
0048H	A 相正向有功用电量 Forward active energy consumption on A phase	4	R	
004AH	A 相反向有功用电量 Reversing active energy consumption on A phase	4	R	
004CH	A 相正向无功用电量 Forward reactive energy consumption on A phase	4	R	
004EH	A 相反向无功用电量 Reversing reactive energy consumption on A phase	4	R	
0050H	B 相总用电量 Total energy consumption on B phase	4	R	
0052H	B 相正向有功用电量 Forward active energy consumption on B phase	4	R	
0054H	B 相反向有功用电量 Reversing active energy consumption on B phase	4	R	
0056H	B 相正向无功用电量 Forward reactive energy consumption on B phase	4	R	
0058H	B 相反向无功用电量 Reversing reactive energy consumption on B phase	4	R	

005AH	C 相总用电量 Total energy consumption on C phase	4	R	
005CH	C 相正向有功用电量 Forward active energy consumption on C phase	4	R	
005EH	C 相反向有功用电量 Reversing active energy consumption on C phase	4	R	
0060H	C 相正向无功用电量 Forward reactive energy consumption on C phase	4	R	
0062H	C 相反向无功用电量 Reversing reactive energy consumption on C phase	4	R	
0064H	当月正向有功最大需量 Maximum forward active demand in current month	4	R	整型，保留 3 位小数 Int Keep 3 decimal places
0066H~0067H	发生时间 Occur time	4	R	分、时、日、月 Minute, hour, day, month
0068H	当月反向有功最大需量 Maximum reversing active demand in current month	4	R	整型，保留 3 位小数 Int Keep 3 decimal places
006AH~006BH	发生时间 Occur time	4	R	分、时、日、月 Minute, hour, day, month
006CH	当月正向无功最大需量 Maximum forward reactive demand in current month	4	R	整型，保留 3 位小数 Int Keep 3 decimal places
006EH~006FH	发生时间 Occur time	4	R	分、时、日、月 Minute, hour, day, month
0070H	当月反向无功最大需量 Maximum reversing reactive demand in current month	4	R	整型，保留 3 位小数 Int Keep 3 decimal places
0072H~0073H	发生时间 Occur time	4	R	分、时、日、月 Minute, hour, day, month
0074H	THDUa	2	R	分相电压电流总畸变率 整型，保留 2 位小数(%) Total distortion rate of voltage and current on each phase Int,Keep 2 decimal places
0075H	THDUb	2	R	
0076H	THDUc	2	R	
0077H	THDIa	2	R	
0078H	THDIb	2	R	
0079H	THDIc	2	R	
007AH	THUa(2-31 次谐波) Harmonic on 2^{nd}-31^{st}	2×30	R	电压分相 2~31 次谐波含量 整形 保留 2 位小数(%) Harmonic voltage on 2^{nd}-31^{st} Int Keep 2 decimal places
0098H	THUb(2-31 次谐波) Harmonic on 2^{nd}-31^{st}	2×30	R	
00B6H	THUc(2-31 次谐波) Harmonic on 2^{nd}-31^{st}	2×30	R	
00D4H	THIa(2-31 次谐波) Harmonic on 2^{nd}-31^{st}	2×30	R	电流分相 2~31 次谐波含量 整形 保留 2 位小数(%)
00F2H	THIb(2-31 次谐波)	2×30	R	

	Harmonic on 2nd-31st			Harmonic current on 2nd-31st
0110H	THIc(2-31 次谐波) Harmonic on 2nd-31st	2×30	R	Int Keep 2 decimal places
012EH	A 相基波电压 Fundamental voltage on A phase	2	R	整型 保留 2 位小数 Int Keep 2 decimal places
012FH	B 相基波电压 Fundamental voltage on B phase	2	R	
0130H	C 相基波电压 Fundamental voltage on C phase	2	R	
0131H	A 相谐波电压 Harmonic voltage on A phase	2	R	
0132H	B 相谐波电压 Harmonic voltage on B phase	2	R	
0133H	C 相谐波电压 Harmonic voltage on C phase	2	R	
0134H	A 相基波电流 Fundamental current on A phase	2	R	
0135H	B 相基波电流 Fundamental current on B phase	2	R	
0136H	C 相基波电流 Fundamental current on C phase	2	R	
0137H	A 相谐波电流 Harmonic current on A phase	2	R	
0138H	B 相谐波电流 Harmonic current on B phase	2	R	
0139H	C 相谐波电流 Harmonic current on C phase	2	R	
013AH	A 相基波有功功率 Fundamental active power on A phase	4	R	整型 保留 3 位小数 Int Keep 3 decimal places
013CH	B 相基波有功功率 Fundamental active power on B phase	4	R	
013EH	C 相基波有功功率 Fundamental active power on C phase	4	R	
0140H	总基波有功功率 Fundamental active power	4	R	
0142H	A 相基波无功功率 Fundamental reactive power on A phase	4	R	
0144H	B 相基波无功功率 Fundamental reactive power on B phase	4	R	
0146H	C 相基波无功功率 Fundamental reactive power on C phase	4	R	
0148H	总基波无功功率 Fundamental reactive power	4	R	
014AH	A 相谐波有功功率 Harmonic active power on A phase	4	R	

014CH	B 相谐波有功功率 Harmonic active power on B phase	4	R	
014EH	C 相谐波有功功率 Harmonic active power on C phase	4	R	
0150H	总谐波有功功率 Harmonic active power	4	R	
0152H	A 相谐波无功功率 Harmonic reactive power on A phase	4	R	
0154H	B 相谐波无功功率 Harmonic reactive power on B phase	4	R	
0156H	C 相谐波无功功率 Harmonic reactive power on C phase	4	R	
0158H	总谐波无功功率 Harmonic reactive power	4	R	
015AH	当前正向有功需量 Current forward active demand	4	R	
015CH	当前反向有功需量 Current reversing active demand	4	R	
015EH	当前正向无功需量 Current forward reactive demand	4	R	
0160H	当前反向无功需量 Current reversing reactive demand	4	R	
0162H	电压不平衡度 Voltage imbalance	2	R	整形 单位 0.01% Int, unit 0.01%
0163H	电流不平衡度 Current imbalance	2	R	
0164H	A 相温度 Temperature on A phase	2	R	整形 单位 0.1℃ Int, unit 0.1℃
0165H	B 相温度 Temperature on B phase	2	R	
0166H	C 相温度 Temperature on C phase	2	R	
0167H	时区时段表号/时区日期：日 Time zone number/Time zone date: day	2	R/W	
0168H	时区日期：月/时区时段表号 Time zone date: month/Time zone number	2	R/W	
0169H	时区日期：日/时区日期：月 Time zone date: day/ Time zone date: month	2	R/W	
016AH	时区时段表号/时区日期：日 Time zone number/Time zone date: day	2	R/W	
016BH	时区日期：月/时区时段表号 Time zone date: month/Time zone number	2	R/W	
016CH	时区日期：日/时区日期：月	2	R/W	

	Time zone date: day/ Time zone date: month			
016DH … 0181H	1-14 时段参数设置信息 1-14 period of time Parameters setting information	2	R/W	1#时段表 1# time list
0182H … 0196H	1-14 时段参数设置信息 1-14 period of time Parameters setting information	2	R/W	2#时段表 2# time list
0197H	当前总有功尖电能 Current total spike active energy	4	R	
0199H	当前总有功峰电能 Current total peak active energy	4	R	
019BH	当前总有功平电能 Current total flat active energy	4	R	
019DH	当前总有功谷电能 Current total valley active energy	4	R	
019FH	当前正向有功尖电能 Current total spike forward active energy	4	R	
01A1H	当前正向有功峰电能 Current total peak forward active energy	4	R	
01A3H	当前正向有功平电能 Current total flat forward active energy	4	R	
01A5H	当前正向有功谷电能 Current total valley forward active energy	4	R	
01A7H	当前反向有功尖电能 Current total spike reversing active energy	4	R	
01A9H	当前反向有功峰电能 Current total peak reversing active energy	4	R	
01ABH	当前反向有功平电能 Current total flat reversing active energy	4	R	
01ADH	当前反向有功谷电能 Current total valley reversing active energy	4	R	
01AFH	当前正向无功尖电能	4	R	

	Current total spike forward reactive energy			
01B1H	当前正向无功峰电能 Current total peak forward reactive energy	4	R	
01B3H	当前正向无功平电能 Current total flat forward reactive energy	4	R	
01B5H	当前正向无功谷电能 Current total valley forward reactive energy	4	R	
01B7H	当前反向无功尖电能 Current total spike reversing reactive energy	4	R	
01B9H	当前反向无功峰电能 Current total peak reversing reactive energy	4	R	
01BBH	当前反向无功平电能 Current total flat reversing reactive energy	4	R	
01BDH	当前反向无功谷电能 Current total valley reversing reactive energy	4	R	

6.3 历史数据存储

上十二月电能读取方式如下表：

区间首地址（高字节） Start address(high byte)	历史数据类型 Data type
48-53H	上 1 月-上 12 月 Last 1 month-last 12 months

区间首地址（低字节） Start address(low byte)	数据类型 Data type
00H	记录日期时间 Record date and time
03H	历史组合有功总电能 History total active energy
05H	历史正向有功总电能 History total forward active energy
07H	历史反向有功总电能 History total reversing active energy
09H	历史正向无功总电能 History total forward reactive energy
0BH	历史反向无功总电能 History total reversing reactive energy

0DH	A 相组合有功总电能 Total active energy on A phase
0FH	A 相正向有功总电能 Total forward active energy on A phase
11H	A 相反向有功总电能 Total reversing active energy on A phase
13H	A 相正向无功总电能 Total forward reactive energy on A phase
15H	A 相反向无功总电能 Total reversing reactive energy on A phase
17H	B 相组合有功总电能 Total active energy on B phase
19H	B 相正向有功总电能 Total forward active energy on B phase
1BH	B 相反向有功总电能 Total reversing active energy on B phase
1DH	B 相正向无功总电能 Total forward reactive energy on B phase
1FH	B 相反向无功总电能 Total reversing reactive energy on B phase
21H	C 相组合有功总电能 Total active energy on C phase
23H	C 相正向有功总电能 Total forward active energy on C phase
25H	C 相反向有功总电能 Total reversing active energy on C phase
27H	C 相正向无功总电能 Total forward reactive energy on C phase
29H	C 相反向无功总电能 Total reversing reactive energy on C phase
2BH	当前总有功尖电能 Current spike electric energy
2DH	当前总有功峰电能 Current peak electric energy
2FH	当前总有功平电能 Current flat electric energy
31H	当前总有功谷电能 Current valley electric energy
33H	当前正向有功尖电能 Current forward active spike electric energy
35H	当前正向有功峰电能

	Current forward active peak electric energy
37H	当前正向有功平电能 Current forward active flat electric energy
39H	当前正向有功谷电能 Current forward active valley electric energy
3BH	当前反向有功尖电能 Current reversing active spike electric energy
3DH	当前反向有功峰电能 Current reversing Active peak electric energy
3FH	当前反向有功平电能 Current reversing active flat electric energy
41H	当前反向有功谷电能 Current reversing Active valley electric energy
43H	当前正向无功尖电能 Current forward reactive spike electric energy
45H	当前正向无功峰电能 Current forward reactive spike electric energy
47H	当前正向无功平电能 Current forward reactive flat electric energy
49H	当前正向无功谷电能 Current forward reactive valley electric energy
4BH	当前反向无功尖电能 Current reversing reactive spike electric energy
4DH	当前反向无功峰电能 Current reversing reactive peak electric energy
4FH	当前反向无功平电能 Current reversing reactive flat electric energy

51H	当前反向无功谷电能 Current reversing reactive valley electric energy

6.4 极值数据存储 Extreme value data storage

极大值记录：Maximum value record:

区间首地址（高字节） Start address (high byte)	历史数据类型 Data type
04	当月极值及发生时间记录 Monthly extreme value and occurrence time record
05	上一月极值及发生时间记录 Last month extreme value and occurrence time record
06	上二月极值及发生时间记录 Extreme value and occurrence time record of the last February
07	上三月极值及发生时间记录 Extreme value and occurrence time record of the last March month

各区间偏移地址（低字节） Each val offset address (low bytes)	数据类型 Data type
00	A 相电压极大值及发生时间记录 Phase A voltage maximum and occurrence time are recorded
03	B 相电压极大值及发生时间记录 Phase B voltage maximum and occurrence time are recorded
06	C 相电压极大值及发生时间记录 C phase voltage maximum and occurrence time record
09	AB 线电压极大值及发生时间记录 AB line voltage maximum value and occurrence time record
0C	BC 线电压极大值及发生时间记录 BC line voltage maximum value and occurrence time record
0F	CA 线电压极大值及发生时间记录 CA line voltage maximum and occurrence time record
12	A 相电流极大值及发生时间记录 Phase A current maximum and occurrence time are recorded
15	B 相电流极大值及发生时间记录 Phase B current maximum and occurrence time are recorded
18	C 相电流极大值及发生时间记录 C phase current maximum and occurrence time record
1B	三相电流矢量和极大值及发生时间记录 Three-phase current vector and maximum and occurrence time are recorded
1E	A 相有功功率极大值及发生时间记录

	Record of phase A active power maximum and time of occurrence
22	B 相有功功率极大值及发生时间记录 Record of phase B active power maximum and occurrence time
26	C 相有功功率极大值及发生时间记录 Phase C Record of the active power maximum and occurrence time
2A	总有功功率极大值及发生时间记录 Total active power maximum value and occurrence time record
2E	A 相无功功率极大值及发生时间记录 Phase A reactive power maximum value and occurrence time are recorded
32	B 相无功功率极大值及发生时间记录 B phase reactive power maximum and occurrence time record
36	C 相无功功率极大值及发生时间记录 C phase reactive power maximum and occurrence time record
3A	总无功功率极大值及发生时间记录 Total reactive power maximum and occurrence time record
3E	A 相视在功率极大值及发生时间记录 A Record the power maximum and occurrence time
42	B 相视在功率极大值及发生时间记录 B Record the power maximum and occurrence time
46	C 相视在功率极大值及发生时间记录 C Record the power maximum and occurrence time
4A	总视在功率极大值及发生时间记录 Total apparent power maximum and occurrence time record

极小值记录：Minimum record:

区间首地址（高字节） Start address (high byte)	历史数据类型 Data type
04	当月极值及发生时间记录

各区间偏移地址（低字节） Each val offset address (low bytes)	数据类型 Data type
4E	A 相电压极小值及发生时间记录

	Monthly extreme value and occurrence time record
05	上一月极值及发生时间记录 Last month extreme value and occurrence time record
06	上二月极值及发生时间记录 Extreme value and occurrence time record of the last February
07	上三月极值及发生时间记录 Extreme value and occurrence time record of the last March month

	Phase A voltage minimum and occurrence time are recorded
51	B 相电压极小值及发生时间记录 Phase B voltage minimum and occurrence time are recorded
54	C 相电压极小值及发生时间记录 C phase voltage minimum and occurrence time record
57	AB 线电压极小值及发生时间记录 AB line voltage minimum value and occurrence time record
5A	BC 线电压极小值及发生时间记录 Record the voltage minimum value and occurrence time of BC line
5D	CA 线电压极小值及发生时间记录 CA line voltage minimum value and time of occurrence record
60	A 相电流极小值及发生时间记录 Phase A current minimum and occurrence time are recorded
63	B 相电流极小值及发生时间记录 Phase B current minimum and occurrence time are recorded
66	C 相电流极小值及发生时间记录 C Phase current minimum and occurrence time are recorded
69	三相电流矢量和极小值及发生时间记录 Three-phase current vector and minimum value and occurrence time were recorded
6C	A 相有功功率极小值及发生时间记录 Record the active power minimum and the time of occurrence of phase A
70	B 相有功功率极小值及发生时间记录 Record the phase B active power minimum and occurrence time
74	C 相有功功率极小值及发生时间记录 C phase active power minimum and occurrence time record
78	总有功功率极小值及发生时间记录 Total active power minimum value and occurrence time record
7C	A 相无功功率极小值及发生时间记录 Phase A reactive power minimum and occurrence time record

80	B 相无功功率极小值及发生时间记录 B phase reactive power minimum and occurrence time record
84	C 相无功功率极小值及发生时间记录 C phase reactive power minimum and occurrence time record
88	总无功功率极小值及发生时间记录 Total reactive power minimum value and occurrence time record
8C	A 相视在功率极小值及发生时间记录 A Record the power minimum and occurrence time
90	B 相视在功率极小值及发生时间记录 B Record the power minimum and occurrence time
94	C 相视在功率极小值及发生时间记录 C Record the power minimum and occurrence time
98	总视在功率极小值及发生时间记录 Total apparent power minimum and occurrence time record

备注：每条极值及发生时间记录长度为 3 个字，具体数据排布均参照下表：

Note: The length of each extreme value and occurrence time is 3 words. refer to the following table for the specific data arrangement:

寄存器地址 Register address	事件名称 Event name	数据类型 data type	备注 remarks
0400H	A 相电压极大值及发生时间记录 Phase A voltage maximum and occurrence time are recorded	极值具体数据 Extreme value specific data	具体数据类型及小数位参考 6.2 地址表 Refer to the 6.2 address table for specific data types and decimal places
0401H		发生时间的分、时 The time point and time of occurrence	高字节为分 High bytes are divided
0402H		发生时间的日、月 The day and month of the time of occurrence	高字节为日 High bytes for the day

7 常见故障排查 Common errors check and solve

7.1 仪表安装后不亮，或者某一路电压指示灯不亮。

排查建议：请再旋转刺针螺杆以确保仪表刺针已刺破线缆且与线缆内部导体接触。
7.1 The meter do not light after powered, or one path of voltage indicator do not light.
Suggestion: Please turn the screw to ensure that the meter needle has been punctured and contacted with the cable inner conductor cable.

7.2 仪表无线通讯故障。

排查建议：请先使用 USB 转 485 串口线与仪表 RS485 接口相连，通过通讯读取表内参数，确认表内参数与上端主站无线配置是否相同（频道与扩频因数），若不同，请修改仪表无线参数与主站一致后再重新测试；若相同，则有可能是仪表与主站相距太远或现场干扰严重，此时可尝试使用外置吸盘天线，或者考虑就近新增无线主站，再行测试。
7.2 Meter’s wireless communication failure
Suggestion: Please connect RS485 interface on the meter and USB convert to 485 serial port to read the parameters, and confirm whether the parameters are the same as the upper terminal wireless configuration (channel and spread spectrum factor). If different, please modify the meter’s wireless parameters and retest the master terminal after the same, and if the same, it may be the meter and master terminal are in a relative long distance. It is too far to communicate or the scene is seriously disturbed. We can try to use the external antenna at the same time, or consider the newly added wireless master terminals, and then test it.

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