

PZ 系列智能直流电能表

PZ Series Intelligent DC Energy Meter

安装使用说明书 V1.8

Installation Instructions V1.8

安科瑞电气股份有限公司

SHANGHAI ACREL CO.,Ltd

申 明

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1. 概述 General

PZ系列智能直流电能表是针对直流屏、太阳能供电、电信基站、充电桩等应用场合而设计的，该系列仪表可测量直流系统中的电压、电流、功率、正向与反向电能。既可用于本地显示，又能与工控设备、计算机连接，组成测控系统。同时它具有多种外围接口功能可供用户选择：带有RS-485通讯接口，采用Modbus-RTU协议；可带继电器报警输出、开关量输入/输出。根据不同要求，通过仪表面板按键，对变比、通讯进行设置与控制。

PZ series intelligent DC energy meter is designed for applications such as DC panels, solar power, telecommunications base stations, and charging posts. This series of instruments can measure voltage, current, power, forward and reverse power in DC system. It can be used for local display, and connected with industrial control equipment, computers, form a measurement and control system. And it has a variety of external excuse functions for the user to choose: RS485 communication interface, Modbus-RTU protocol, relay alarm output, digital input/output. According to different requirements, through the instrument panel keys, you can set the ratio, communication parameters.

产品符合 Q/GDW1825-2013《直流电能表技术规范》、GB/T29318-2012《电动汽车非车载充电电能计量》、Q/GDW364-2009《单相智能电能表技术规范》等标准的相关技术要求。

The product meets the relevant technical requirements of the standard Q/GDW1825-2013 DC power meter specification, GB/T29318-2012 Non-vehicle charging electric energy metering for electric vehicles, Q/GDW364-2009 Single-phase energy meter specification.

2. 产品型号及功能 Type and Function

表 1 产品型号及功能

仪表型号 Type	显示 Display	外形 shape	基本功能 Basic Function	可选功能 Optional Function
PZ72L-DE	LCD 液晶显示 LCD display	72 方形	DC: voltage、 current、 power、 energy	1、一路 RS485 通讯 RS485 (C)
PZ72-DE	LED 数码管 显示 LED display	72 Square		2、12V 电源输出 12V power output① (V)
PZ96L-DE	LCD 液晶显示 LCD display	96 方形		3、RS485 通讯+开关量 2DO RS485 + 2DO (KC)
PZ96-DE	LED 数码管 显示 LED display	96 Square		4、RS485 通讯+开关量 2DI2DO RS485 + 2DI2DO (KC)
				5、RS485 通讯+开关量 4DI2DO RS485 + 4DI2DO② (KC)
				6、RS485 通讯+开关量 2DO +12V 电源输出 (KVC) RS485 + 2DO + 12V power output
				7、RS485 通讯+12V 电源输出 (VC) RS485 + 12V power output
				以上功能可同时带有以下两个可选功能： The above functions can have the following two optional functions at the same time:
				8、辅助电源 20-60V Auxiliary power 20-60V (ZD)
				9、复费率 Multiple rate (F)

注：①开关量输入功能与 12V 电源功能二选一；

②开关量 4DI2DO 仅仪表 PZ96 (L) -DE 有该功能。

Note: ①The function of 12V power output and DI can't be selected at the same time;

②Only PZ96 (L) -DE has 4DI2DO function.

3. 技术参数 Technical Parameters

表 2 产品主要技术参数

技术参数 Technical Parameters		指标 Indicators	
输入 Input	直流电压 DC voltage	输入范围 Input range	直接接入 Direct access: 0~100V,0~500V,0~1000V
		输入阻抗 Input resistance	≥6kΩ/V
	直流电流 DC current	输入范围 Input range	间接接入: 0~2500A(外置分流器或霍尔元件, 量程可编程设定) Indirect access: 0-2500A(External Shunt or Hall Current Sensor, the range can be set)
		分流器 Shunt	75mV
		霍尔元件 Hall Current Sensor	0~20mA、0~5V
	功耗 Power consumption	≤1mW	
过载 Overload	1.2 倍可持续正常工作, 2 倍持续 1 秒 It can work at normal status at 1.2 times of full load, and can continued work 1 second at 2 times of full load.		
精度等级 Accuracy class		0.5 级 0.5class	
脉冲常数 Pulse constant		电压电流规格: 750V、300A, 默认脉冲常数: 100imp/kWh Voltage and current specifications: 750V、300A, Default pulse constant: 100imp/kWh	
		电压电流规格: 1000V、300A, 默认脉冲常数: 100imp/kWh Voltage and current specifications: 1000V、300A, Default pulse constant: 100imp/kWh	
功能 Function	测量功能 Measuring	能测量直流电压 U、电流 I、功率 P。 Voltage、Current、Power	
	计量功能 Calculate	能计量当前组合电能, 正向电能, 反向电能。 Current total electricity、Current positive energy、Current reverse power	
	分时功能 Multiple rate	两套时段表, 一年可以分为 4 个时区, 每套时段表可设 12 个日时段, 4 个费率(F1、F2、F3、F4 即尖峰平谷), 时段最小间隔为 15 分钟, 时段可跨零点设置。(仅 LCD 液晶表具有) Four time zones、two time table、fourteen time points、four multiple rates. (PZ72L-DE support only)	
	历史数据统计功能 Historical data statistics	能统计上 12 月的历史电能(各费率电能)。(仅 LCD 液晶表具有) Last 12 months of historical electricity(multiple rate electricity).(PZ72L-DE support only)	
开关量输入输出功能 DI、DO	PZ72 有二路开关量输出, 二路开关量输入, PZ96 有二路开关量输出, 四路开关量输入, 开关量输出为继电器输出, 可以实现“遥控”和报警输出。开关量输入不仅能够采集和显示本地的开关状态信息, 同时可以通过仪表的 RS485 实现远程传输功能, 即“遥信”功能。 PZ72 has two digital outputs and two digital inputs, PZ96 has two digital outputs and four digital inputs. DI(Collect and display local switch status information、Realize remote transmission by RS485)、DO(Relay output, can achieve "remote		

		control" and alarm output)
	显示 Display	LCD（背光延时时间可调）或 LED LCD(the backlight delay time can be adjusted) or LED
	通讯 Communication	RS485 接口，半双工、光电隔离，Modbus-RTU 或 DL/T645-2007 协议，波特率 1200、2400、4800、9600、19200、38400 可选，调制红外固定为 1200bps。 RS485、Half duplex、Photoelectric isolation、Modbus-RTU / DL/T645-07、Band:1200/2400/4800/9600、Infrared: 1200
	开关量 DI、DO	输入 DI 干接点输入，仪表内置电源，光电隔离 Dry contact input, Meter built-in power supply, photoelectric isolation
		输出 DO 2 路继电器输出，常开触点，容量 2A/30VDC 或 2A/250VAC Two relay outputs, Normally open contact, capacity:2A/30VDC or 2A/250VAC
工作电源 Working power	电压范围 Voltage range	85~265VAC/DC、50/60Hz；20~60VDC（订货时说明）
	功耗 Power consumption	≤2W
绝缘电阻 Insulation resistance		≥100MΩ
工频耐压 Power frequency withstand voltage		电源端子组与信号输入、输出端子组之间 3kV/1min（RMS） 3kV/1min（RMS）(between the power supply binding post and the signal binding post)
环境 Environment	温度 Temperature	工作温度：-25℃~+60℃；贮存温度：-20℃~+70℃
	湿度 Humidity	≤93%RH，不结露，不含腐蚀性气体No condensation, no corrosive gases
	海拔 Altitude	≤2500m

4. 安装指南 The installation guide

4.1 外形及安装开孔尺寸 Shape and hole size

表 3 PZ 系列直流表外形及开孔尺寸

仪表外形 Shape	面框尺寸 panel		壳体尺寸 shell			开孔尺寸 aperture	
	宽 Wide	高 High	宽 Wide	高 High	深 Deep	宽 Wide	高 High
72 方形 72 square	75±0.2	75±0.2	66±0.2	66±0.2	98+2	67+0.5	67+0.5
96 方形 96 square	96±0.2	96±0.2	86±0.2	86±0.2	92±1	88±0.2	88±0.2

4.2 仪表及开孔示意图 Opening schematic diagram

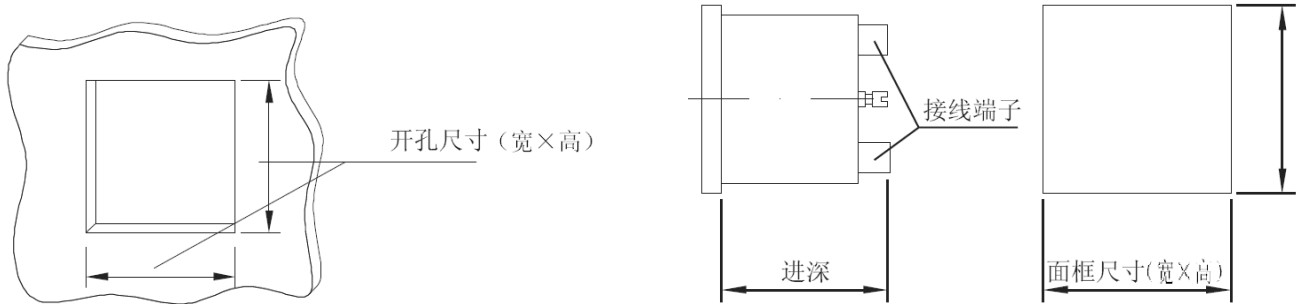


图 1 PZ 系列直流表开孔示意图

4.3 安装示意图 Installation diagram

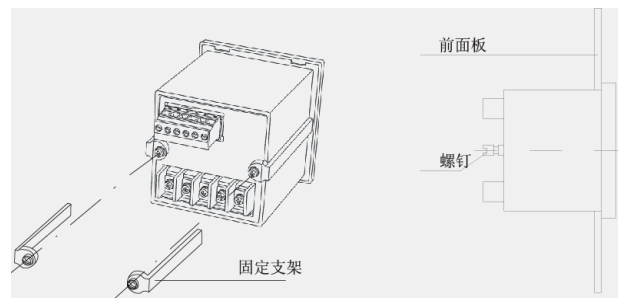


图 2 PZ 系列直流表安装示意图

4.4 安装说明 Installation instructions

安装时，将仪表嵌入安装孔内，装上固定支架，拧紧螺钉，使仪表安装牢固，不松动即可。

Insert the instrument into the mounting hole , install the fixing bracket and tighten the screw, make instrumentation firm and not loose.

4.5 端子及接线 Terminal and wiring

4.5.1 仪表辅助电源端子 Instrument auxiliary power terminal

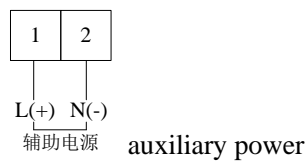


图 3 仪表辅助电源端子

Fig 3 Instrument auxiliary power terminal

4.5.2 信号输入端子 Signal input terminal

电流信号采样线须使用屏蔽双绞线。

The current signal sampling line must use shielded twisted pair.

(一) 使用分流器采样电流时，分流器与仪表之间的接线如图 4 所示：

Sampling current with shunt, connection between shunt and instrument as shown in figure 4:

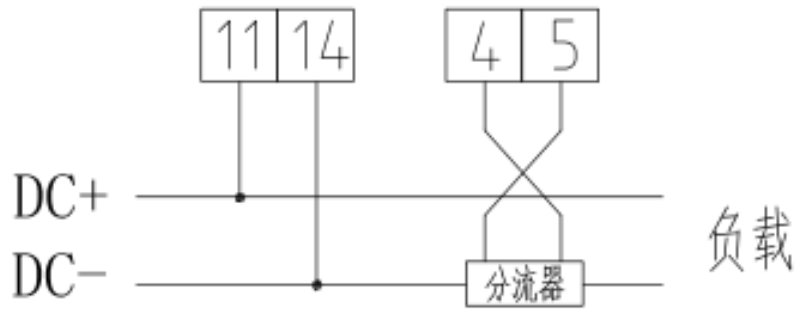


图 4 外置分流器接线示意图

Figure 4 outside shunt wiring diagram

注：若分流器安装于 DC+ 时，订货前订单备注共正接法。

Note: If the shunt is installed in DC+, you need to note the common positive connection method in the order before ordering

(二) 使用霍尔电流传感器采样电流时，霍尔电流传感器(单独供电)与仪表之间的接线如图 5 所示：

Sampling current with Hall Current Sensor, connection between Hall current sensor(Powered separately) and instrument as shown in figure 5:

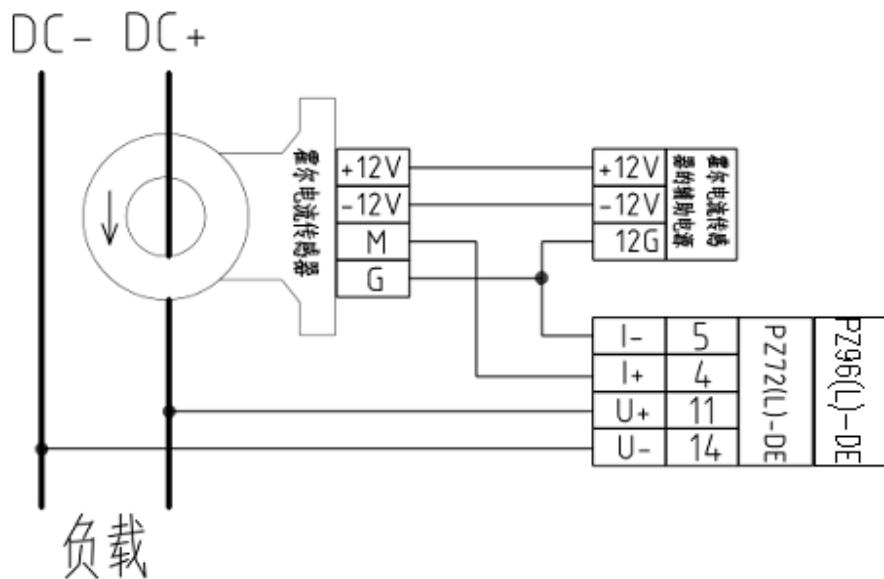


图 5 使用霍尔电流传感器典型接线示意图

Fig 5 Typical wiring diagram of using Hall current sensor

注：图 5 为使用霍尔电流传感器的典型接线示意图，仅做参考，如与实际需要使用的霍尔电流传感器接线图不符，请以实际需要使用的霍尔电流传感器的说明书中所示的接线图为准。

Notes: Figure 5 is typical wiring diagram using hall current sensor, figure is only for reference ,if not accordance with the actual wiring diagram of Hall current sensor, please refer to the wiring diagram shown in the instructions of Hall current transducers that are actually needed.

(三) 使用霍尔电流传感器采样电流时，霍尔电流传感器(由仪表的选配功能：12V 电源输出供电)与仪表之间的接线如图 6 所示：

Sampling current with Hall current sensor, connection with Hall current sensor (selection function of instrument : 12V power supply output power supply) and instrument as shown in figure 6:

图 6 中所示的接线方式仅适用于供电电源范围包含±12V 的霍尔电流传感器。

The wiring shown in the figure is only applicable to Hall current sensors with a power supply range of $\pm 12V$.

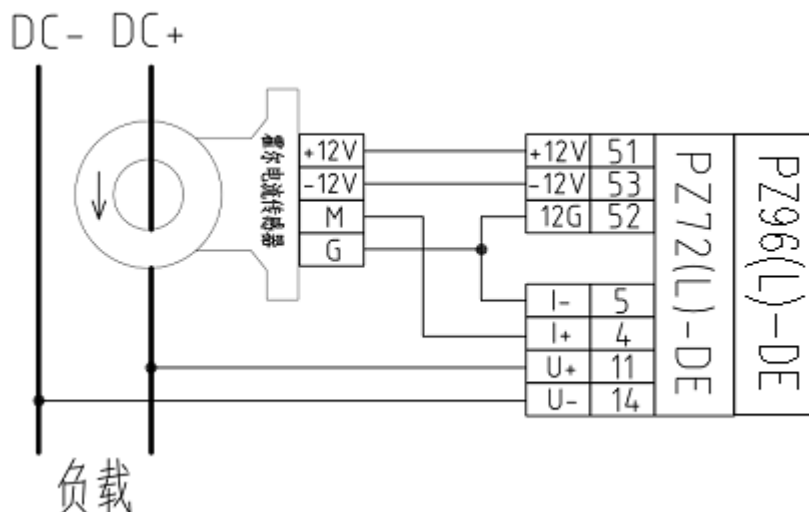


图 6 使用霍尔电流传感器(由仪表的选配功能 12V 电源输出供电)典型接线示意图

Figure 6 Typical wiring diagram of using Hall current sensor

(Powered by the optional function “12V power output” of the meter)

注：1、因电压信号端口与电流信号端口仪表内部未采取隔离措施。接线时，请注意电压信号负端与电流信号负端之间电压差不得大于 5V。

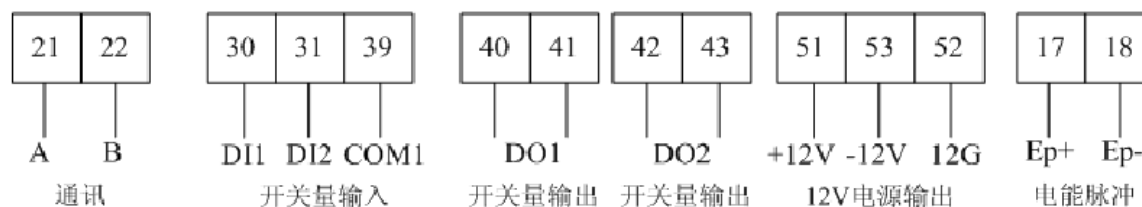
Because there is no isolation between the voltage signal port and the current model port in the instrument. when wiring , please note that the voltage between the negative end of the voltage signal and negative end of the current signal should not be greater than 5V.

2、在实际使用过程中，当电压与电流信号全为正或负值时，功率将表示为正，电能用 kWh 表示；当电压与电流一正一负时，功率将表示为负，电能用 kWh 表示。电能采用正负分开计量的方式，之间互不影响。

In actual use, when the voltage and current signals are all positive or negative, the power will be expressed as positive, and the electric energy will be expressed as kWh; when the voltage and current are positive and negative, the power will be expressed as negative, and the electric energy will be expressed as kWh. The electric energy is measured by positive and negative separately, and does not affect each other.

4.5.3 附加功能端子 Additional functional terminals

PZ72 (L) -DE



PZ96 (L) -DE

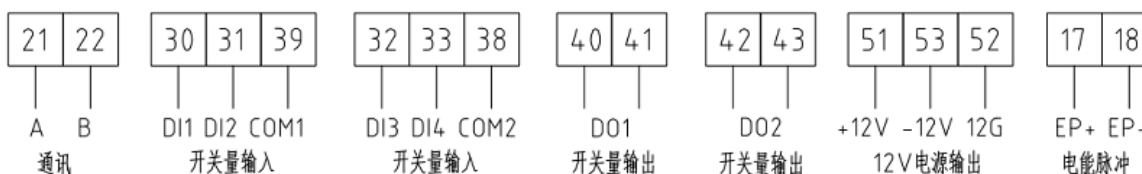


图 8 附加功能端子

Figure 8 additional functional terminals

注：该接线仅供参考，具体以仪表上接线图为准；

This wiring is only for reference , the specific wiring shall be based on the wiring diagram on the instrument;

开关量输入功能与 12V 电源功能二选一；

Can choose either switching input function or 12V power supply function;

4.6 注意事项 Matters need attention

1. 输入的电压不得高于产品的额定输入电压的 120%，在电压输入端须安装 1A 保险丝；

The input voltage shall not exceed 120% of the rated input voltage of the product;

2. 电流输入应使用外部分流器或霍尔电流传感器。

External shunt or Hall current sensor should be used for current input.

5. 操作与显示 Operation and Display

5.1 按键功能说明 key function description

表 4 按键功能说明

按键图标 Button icon	按键名称 Key name	按键功能 Key function
	菜单键 Menu key	进入/退出菜单 Entry/exit menu
	向左键 Left arrow key	查看电力参数、 编程界面中左移及闪烁移位 Check power parameters、 Left shift and scintillation shift in programming interface
	向右键 Right arrow key	查看电力参数、 编程界面中右移及修改闪烁位 Check power parameters、 Left shift and scintillation shift in programming interface
	编程确定键 Programming definition key	编程界面中确定保存设置 Check power parameters、 Left shift and scintillation shift in programming interface



5.2 显示界面 Display Tab

5.2.1 液晶显示界面 LCD interface

上电后显示当前总电量。可通过左右键实现翻页显示。各类显示界面顺序说明如下：

Display current total power after power-on.

表 5 显示界面说明

	当前正向总电量、当前正向总尖电量、当前正向总峰电量、当前正向总平电量、 当前正向总谷电量、当前反向总电量、当前反向总尖电量、当前反向总峰电量、 当前反向总平电量、当前反向总谷电量、当前时间（年月日）、当前时间（时 分秒）、电压、电流、功率、版本号。
	current forward total spike power, current forward total peak power, current forward

	total level power, current forward total Valley power, current reverse total spike power, current reverse total peak power, current reverse total level power, current reverse total Valley power, date, time, voltage, current, power, version number.
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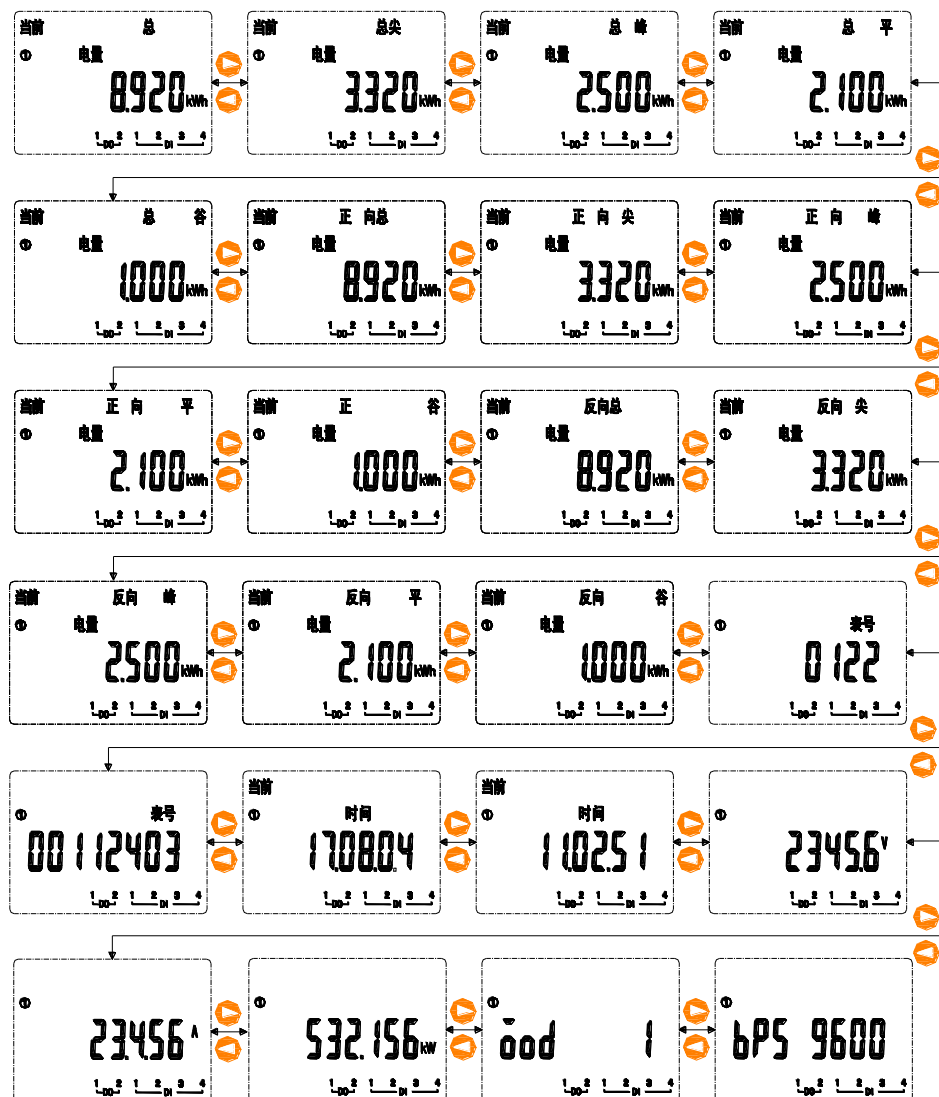
说明:

1、以上所列为 PZ 系列直流电能表所有显示界面名称，左、右按键可切换不同类型的显示内容，切换顺序如上所述；

All display interface names of PZ series DC watt-hour meters listed above. Left and right buttons can switch different types of display contents. The order of switching is as follows:

2、对于不带有复费率功能的仪表，不显示日期、时间及各类的分时电能（即尖、峰、平、谷四种费率时段的电能）。

For instruments without the multi-rate function, the date and time and multi-rate energy are not displayed.



注：可根据界面中显示的信息来判断显示含义。

Note: The display meaning can be judged by the information displayed in the interface.

5.2.2 数码管显示界面 Digital Tube Display Interface

在正常测量状态下，可以按左、右键进行查看所测各电量参数。

In the normal measurement state, you can press the left and right buttons to view the measured electric parameters.



说明: Description

U: 电压值（一次侧），单位：伏特(V)

Voltage value(primary side), Unit: V

A: 电流值（一次侧），单位：安培(A)

Current value(primary side), Unit: A

P: 功率（一次侧），单位：千瓦(kW)

Power(primary side), Unit: kW

Ep: 正向电能（一次侧），单位：千瓦时(kWh)


Positive energy(primary side), Unit: kWh

Eq: 反向电能（一次侧），单位：千瓦时(kWh)

Reverse energy(primary side), Unit: kWh

5.3 菜单编程界面（LCD、LED 通用）Button setting parameters

在测量显示菜单中的任一显示项下，按  可进入“PASS”界面，再按  显示“0000”，提示输入密码

后再按 ，若密码输入错误，则返回“0000”可重新输入；若密码输入正确，则可进行参数设置。设置完成

后再按  进入“SAvE”界面，“YES”下按  则保存后退出，“no”下按  则不保存直接退出。

In the normal display interface, press SET to enter the PASS interface. Press ENTER to display 0000, Enter the correct password and press ENTER, If the password is wrong, the display will return to the normal interface and you will need to re-enter the password. If the password is correct, the setup menu will be displayed. Press SET after the parameter setting is completed until SAVE is displayed. No is displayed after pressing the ENTER key, After pressing the right button, Y will be displayed, then press ENTER, and the parameter setting is successful.

5.4 可设置数据项 Data that can be set

表 6 设置菜单说明

序号 Serial number	一级菜单 First class menu		二级菜单 Second class menu		
	符号	含义	符号	含义	范围

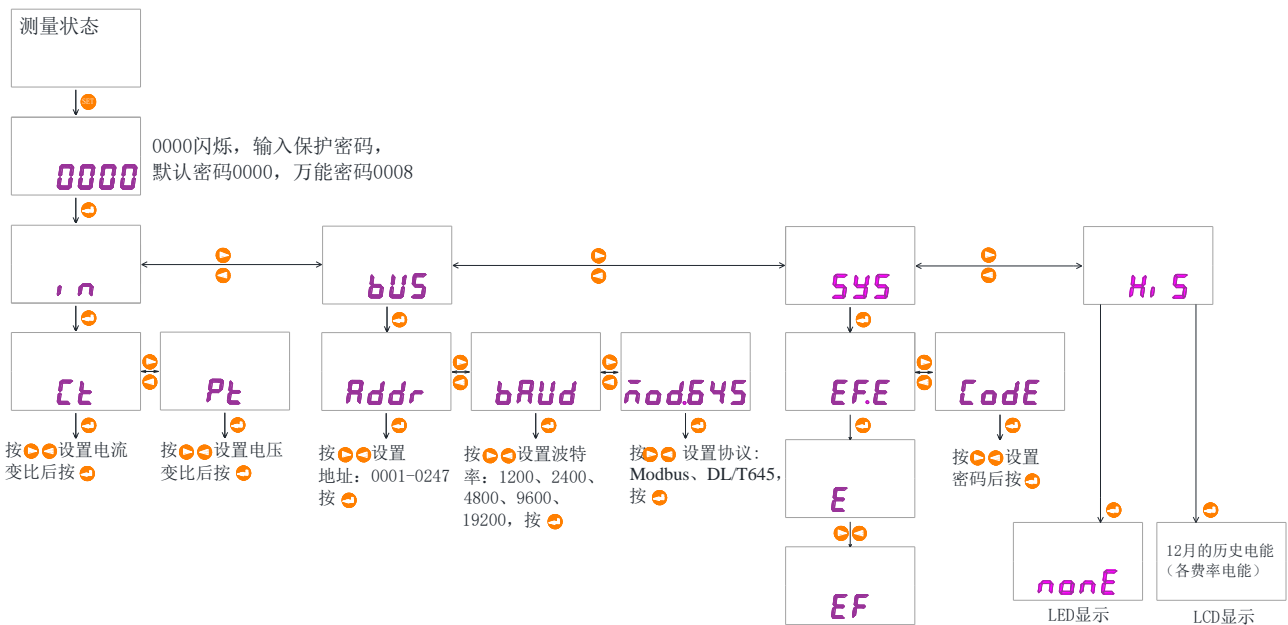
	Symbol	Meaning	Symbol	Meaning	Range
1	In	变比 设置	Pt	Voltage ratio	1-1000(Cannot be changed in case of direct access)
		Variable ratio setting	Ct	Current ratio	1-2500
2	BUS	通讯 设置 通讯设置 Communication settings	Addr	ModbUs 协议通讯地址	1-247
			Buad	波特率选择 Buad	38400、19200、9600、 4800、2400、1200
			Parity	校验位 Parity bit	nonE(无)、EvEn(偶)、odd(奇)
			Stop	停止位 Stop bit	1、2
			Id1	Id1	000000-999999
			Id2	Id2	000000-999999
3	SyS	系统设置 System set up	EF.E	复费率选择 Multi-rate selection	EF:复费率 Multi-rate E:非复费率 non- Multi-rate
			Code	密码设置 Code setting	0000-9999
			Lcd	背光时间设置 (仅 LCD 可设) Light setting	00-99
			Language	显示界面设置 Language	Chinese:中文界面 English:英文界面
4	HiS	历史 电能 History energy	/	/	/
5	Alarm	报警设置 Set alarm	U.H	电压高报警 High voltage alarm	5-2000(unit 0.1%)
			U.L	电压低报警 Low voltage alarm	5-2000(unit 0.1%)
			A.H	电流高报警 High current alarm	5-2000(unit 0.1%)
			A.L	电流低报警 Low current alarm	5-2000(unit 0.1%)
			P.H	功率高报警 High power alarm	5-2000(unit 0.1%)
			P.L	功率低报警 Low power alarm	5-2000(unit 0.1%)
			AL.T	报警延时	5-999(unit 0.01S)

				Alarm delay	
6	DIDO	DIDO set	DI1 State	DI1 状态 DI1 State	Open:常开、Close:常闭
			DI1 Kind	DI1 编程内容 DI1 programming content	Normal:普通 DI、 Link1:联动 1、 Link2:联动 2
			DI2 State	DI2 状态 DI2 State	Open:常开、Close:常闭
			DI2 Kind	DI2 编程内容 DI2 programming content	Normal:普通 DI、 Link1:联动 1、 Link2:联动 2
			DO1 Mode	DO1 模式 DO1 Mode	Level:电平、Pulse:脉冲
			DO1 Kind	DO1 配置内容 DO1 configuration content	Normal:普通 DO、 all:总故障、 alldi12:总故障+DI1+DI2、 di1:DI1、 di2:DI2、 di12:DI1+DI2
			DO1 Time	DO1 脉冲宽度(单位 S) DO1 pulse width	1-5
			DO2 Mode	DO2 模式 DO2 Mode	Level:电平、Pulse:脉冲
			DO2 Kind	DO2 配置内容 DO2 configuration content	Normal:普通 DO、all:总故障、 alldi12:总故障+DI1+DI2、 di1:DI1、di2:DI2、 di12:DI1+DI2
DO2 Time	DO2 脉冲宽度(单位 S) DO2 pulse width	1-5			

5.5 编程示例 Programming example

编程示例以流程图的形式介绍改变编程菜单中的某些选项，如电流倍数等。

Programming examples introduce some options in changing the programming menu in the form of flow charts , such as current multiples, etc.



注：1.LCD 显示带复费率仪表增加了 12 月的历史电能（各费率电能）菜单。

Note: 1. Electric meter with LCD display and Multi-rate adds 12 months of historical energy menu.

1. 在设置或选择完成后，需按回车键进行确认，确认完成后连续点按 SET 键直到出现 SAVE 页面，此时必须按回车键，显示 YES/No 界面，按右移（右起第 2 个按键）或左移（右起第 3 个按键）切换至显示 YES，然后按回车键（右起第 1 个按键）对修改进行保存，否则设置无效。

After setting or selecting, you need to press the enter key to confirm it ,and then press the set key continuously until the save page appears.at the same time, you must press the enter key to display the Yes/No interface , press the right key or left key to switch to display Yes, and then press set key to save the modification ,otherwise it will be invalid.

6. 通信说明 Communication instructions

仪表 RS485 通信接口支持 MODBUS-RTU 通信协议与 DL/T645-2007 通讯协议，仪表具体采用哪种协议可在接收到数据之后自适应，通信口波特率可在 1200bps、2400 bps、4800 bps、9600bps、19200 bps 和 38400bps 之间设置。

Instrument RS485 communication interface supports MODBUS-RTU communication protocol and DL/T 645-2007 communication protocol. which protocol appearance adopt after receiving data then self-adaption . Communication port baud rate can be set between 1200 bps, 4800 bps, 9600 bps, 19200 BPS and 38400 bps.

仪表的 RS485 通信口要求使用屏蔽双绞线连接，布线时要考虑整个网络的布局：如通信线缆的长度、走向、上位机的位置、网络末端的匹配电阻、通信转换器、网络可扩展性、网络覆盖范围、环境的电磁干扰情况等因素，都要综合考虑。

The RS485 communication port of the instrument require to use the screen twisted pair connection. when wiring ,the layout of the hole network should be taken into account ,such as the length of the communication cable, the direction, the position of the host computer, the matching resistance at the end of the network, the communication converter, the network scalability ,the coverage of the network and the environment, etc, all of them should be considered comprehensively.

注:

1、 在布线工程上要严格按照要求施工;

Strictly comply with the requirements of construction in wiring engineering;

2、 对于暂时不需要通信的仪表都要将他们连接到 RS-485 网络上, 以便于诊断和测试;

Instruments that do not need communication should be connected to RS-485 network for diagnosis and testing;

3、 进行 RS-485 电缆连接时, 尽量使用双色双绞线, 485 通信口“A”端接同一种颜色, “B”端接另一种颜色。

When connecting RS-485 cable, try to use double-color twisted pair ,485 communication port “A” terminal connects the same color ,and “B” terminal connects another color.

4、 RS-485 总线(从上位机通信口开始到末端被连接的仪表终端通信口)长不超过 1200 米。

RS-485 bus does not exceed 1200 meters.(Line length from pc communication port to the end of instrument terminal communication port connected).

6.1 Modbus 协议通讯地址表

Modbus protocol communication address table

仪表支持 MODBUS-RTU 协议中的 03H 命令与 10H 命令, 03H 为读多个寄存器, 10H 为写多个寄存器, 协议数据格式请自行查询。下表为仪表的寄存器地址表:

The meter supports 03H command and 10H command in Modbus-RTU protocol. 03H command reads multiple registers, and 10H command writes multiple registers. Please check the protocol data format by yourself. The following table shows the register address table of the meter.

表 8 通讯地址表

地址	名称	属性	备注
0000	电压有效值 Voltage rms	R	
0001	电压指数位 Voltage index bit	R	
0002	电流有效值 Current rms	R	
0003	电流指数位 Current index bit	R	
0004	/	R	
0005	/	R	
0006	/	R	
0007	/	R	
0008	功率有效值 Power rms	R	
0009	功率指数位 Power index bit	R	
000A	/	R	
000B	/	R	
000C	当前正向总有功电能[1] Total forward active energy[1]	R	

000D	当前正向总有功电能[0] Total forward active energy[0]	R	
000E	当前反向总有功电能[1] Current total reverse active energy[1]	R	
000F	当前反向总有功电能[0] Current total reverse active energy[0]	R	
0010	电压变比 Voltage ratio	R/W	
0011	电流变比 Current ratio	R/W	
0012	报警及 I/O Alarm and I/O	R	详细说明见下方 See below for details
001E	分秒 Minute second	R/W	高位：分，低位：秒；数据为 BCD 码格式，只可用 06H 命令下发 High byte: minute、 Low byte: second、 BCD code、 Only available with the 06H command
001F	日时 Day hour	R/W	高位：日，低位：时；数据为 BCD 码格式，只可用 06H 命令下发 High byte: day、 Low byte: hour、 BCD code、 Only available with the 06H command
0020	年月 Year month	R/W	高位：年，低位：月；数据为 BCD 码格式，只可用 06H 命令下发 High byte: year、 Low byte: month、 BCD code、 Only available with the 06H command
0025	功率高报警阈值 High power alarm threshold	R/W	/
0026	功率高报警延时时间 High power alarm time	R/W	默认值：5s Defaults:5s
0027	功率低报警阈值 Low power alarm threshold	R/W	/
0028	功率低报警延时时间 Low power alarm time	R/W	默认值：5s Defaults:5s

0029	密码 password	R/W	默认值: 0000 Defaults: 0000
002A	通讯地址、通讯波特率 Addr、 baud	R/W	默认值: 地址: 1、波特率: 9600 Defaults:addr:1、 baud:9600
002B	校验位、停止位 Parity、 stop	R/W	高位: 0-无校验, 1-奇校验, 2-偶校验; 低位: 0-1 位停止位, 1-2 位停止位; 默认值: 0x0200 High byte:0-none,1-even,2-odd Low byte:0-stop bit=1,1-stop bit=2. Defaults:0x0200
002C	电压变比 Voltage ratio		
002D	电流变比 Current ratio		
002E	脉冲常数 EC Pulse constant	R	
002F	液晶背光设置 LCD backlight settings	R/W	默认: 常亮 Defaults: light
0030	额定电压 Rated voltage	R/W	
0031	额定电流 Rated current	R/W	
0032	报警允许位设置 Alarm enable bit setting	R/W	Bit0: 电压高报警 High voltage alarm; Bit1:电压低报警 Low voltage alarm; Bit2:电流高报警 High current alarm; Bit3:电流低报警 Low current alarm; Bit4:功率高报警 High Power alarm; Bit5:功率低报警 Low Power alarm;
0033	电压高报警阈值 High voltage alarm threshold	R/W	默认值: 120% Defaults:120%
0034	电压高报警延时时间 High voltage alarm delay time	R/W	默认值: 5s Defaults:5s
0035	电压低报警阈值 Low voltage alarm threshold	R/W	默认值: 80% Defaults:80%
0036	电压低报警延时时间 Low voltage alarm delay time	R/W	默认值: 5s Defaults:5s
0037	电流高报警阈值	R/W	默认值: 200%

	High current alarm threshold		Defaults:200%
0038	电流高报警延时时间 High current alarm delay time	R/W	默认值: 5s Defaults:5s
0039	电流低报警阈值 Low current alarm threshold	R/W	默认值: 50% Defaults:50%
003A	电流低报警延时时间 Low current alarm delay time	R/W	默认值: 5s Defaults:5s
003B			
003C			
003D	DI1 状态 DI1 state	R/W	0: 常开; 1: 常闭 0:open; 1:close
003E	DI1 编程内容 DI1 programming content	R/W	
003F	DI2 状态 DI2 state	R/W	0: 常开; 1: 常闭 0:open; 1:close
0040	DI2 编程内容 DI2 programming content	R/W	
0041	DO1 模式 DO1 mode	R/W	0: 电平; 1: 脉冲 0:level; 1:pulse
0042	DO1 配置内容 DO1 configuration content	R/W	0-普通 DO(normal DO); 1-总故障 (total error); 2-总故障(total error)+DI1+DI2; 3-DI1;4-DI2;5-DI1+DI2;
0043	DO1 脉冲宽度 DO1 pulse width	R/W	1-5S
0044	DO2 模式 DO2 mode	R/W	0: 电平; 1: 脉冲 0:level; 1:pulse
0045	DO2 配置内容 DO2 configuration content	R/W	-普通 DO(normal DO); 1-总故障 (total error); 2-总故障(total error)+DI1+DI2; 3-DI1;4-DI2;5-DI1+DI2;
0046	DO2 脉冲宽度 DO2 pulse width	R/W	1-5S
0047	DI3 状态 DI3 state	R/W	0: 常开; 1: 常闭 0:open; 1:close
0048	DI3 编程内容 DI3 programming content	R/W	
0049	DI4 状态	R/W	0: 常开; 1: 常闭

	DI4 state		0:open; 1:close
004A	DI4 编程内容 DI4 programming content	R/W	
004B			
004C	附加功能 Additional features	R/W	Bit0-Bit1:0-3, 小数点位(Decimal point); Bit2:0-Modbus, 1-DLT645; Bit3:0-单费率(single rate), 1-复费率(Multiple rate); Bit4:0-无 DI(DI disable), 1-DI 输入(DI enable); Bit5:0-无 DO(DO disable), 1-DO 输出(DO enable); Bit6:0-中文显示(Chinese), 1-英文显示(English)
004D	抄表日 Settlement date	R/W	日-时 Day-hour
0055	第 1 时区时段表号/第 1 时区起始日期: 日 Timetable number for time zone 1/Start date of time zone 1:day	R/W	时区表 time zone
0056	第 1 时区起始日期: 月/第 2 时区时段表号 Start date of time zone 1:month/Timetable number for time zone 2	R/W	
0057	第 2 时区起始日期: 日/第 2 时区起始日期: 月 Start date of time zone 2:day/Start date of time zone 2:month	R/W	
0058	第 3 时区时段表号/第 3 时区起始日期: 日 Timetable number for time zone 3/Start date of time zone 3:day	R/W	
0059	第 3 时区起始日期: 月/第 4 时区时段表号 Start date of time zone 3:month/Timetable number for time zone 4	R/W	
005A	第 4 时区起始日期: 日/第 4 时区起始日期: 月 Start date of time zone 4:day/Start date of time zone 4:month	R/W	
005B	第 1 时段费率号/第 1 时段起始:分 Rate number for period 1/Start of period 1: minutes	R/W	第一套时段表 Timetable 1

005C	第 1 时段起始:时/第 2 时段费率号 Start of period 1: hour/Rate number for period 2	R/W	
005D	第 2 时段起始:分/第 2 时段起始:时 Start of period 2: minutes/Start of period 2: hour	R/W	
005E	第 3 时段费率号/第 3 时段起始:分 Rate number for period 3/Start of period 3: minutes	R/W	
005F	第 3 时段起始:时/第 4 时段费率号 Start of period 3: hour/Rate number for period 4	R/W	
0060	第 4 时段起始:分/第 4 时段起始:时 Start of period 4: minutes/Start of period 4: hour	R/W	
0061	第 5 时段费率号/第 5 时段起始:分 Rate number for period 5/Start of period 5: minutes	R/W	
0062	第 5 时段起始:时/第 6 时段费率号 Start of period 5: hour/Rate number for period 6	R/W	
0063	第 6 时段起始:分/第 6 时段起始:时 Start of period 6: minutes/Start of period 6: hour	R/W	
0064	第 7 时段费率号/第 7 时段起始:分 Rate number for period 7/Start of period 7: minutes	R/W	
0065	第 7 时段起始:时/第 8 时段费率号 Start of period 7: hour/Rate number for period 8	R/W	
0066	第 8 时段起始:分/第 8 时段起始:时 Start of period 8: minutes/Start of period 8: hour	R/W	
0067	第 9 时段费率号/第 9 时段起始:分 Rate number for period 9/Start of period 9: minutes	R/W	
0068	第 9 时段起始:时/第 10 时段费率号 Start of period 9: hour/Rate number for period 10	R/W	
0069	第 10 时段起始:分/第 10 时段起始:时 Start of period 10: minutes/Start of period 10: hour	R/W	
006A	第 11 时段费率号/第 11 时段起始:分 Rate number for period 11/Start of period 11: minutes	R/W	
006B	第 11 时段起始:时/第 12 时段费率号 Start of period 11: hour/Rate number for period	R/W	

	12		
006C	第 12 时段起始:分/第 12 时段起始:时 Start of period 12: minutes/Start of period 12: hour	R/W	
006D	第 13 时段费率号/第 13 时段起始:分 Rate number for period 13/Start of period 13: minutes	R/W	
006E	第 13 时段起始:时/第 14 时段费率号 Start of period 13: hour/Rate number for period 14	R/W	
006F	第 14 时段起始:分/第 14 时段起始:时 Start of period 14: minutes/Start of period 14: hour	R/W	
0070	第 1 时段费率号/第 1 时段起始:分 Rate number for period 1/Start of period 1: minutes	R/W	第二套时段表 Timetable 2
0071	第 1 时段起始:时/第 2 时段费率号 Start of period 1: hour/Rate number for period 2	R/W	
0072	第 2 时段起始:分/第 2 时段起始:时 Start of period 2: minutes/Start of period 2: hour	R/W	
0073	第 3 时段费率号/第 3 时段起始:分 Rate number for period 3/Start of period 3: minutes	R/W	
0074	第 3 时段起始:时/第 4 时段费率号 Start of period 3: hour/Rate number for period 4	R/W	
0075	第 4 时段起始:分/第 4 时段起始:时 Start of period 4: minutes/Start of period 4: hour	R/W	
0076	第 5 时段费率号/第 5 时段起始:分 Rate number for period 5/Start of period 5: minutes	R/W	
0077	第 5 时段起始:时/第 6 时段费率号 Start of period 5: hour/Rate number for period 6	R/W	
0078	第 6 时段起始:分/第 6 时段起始:时 Start of period 6: minutes/Start of period 6: hour	R/W	
0079	第 7 时段费率号/第 7 时段起始:分 Rate number for period 7/Start of period 7: minutes	R/W	
007A	第 7 时段起始:时/第 8 时段费率号	R/W	

	Start of period 7: hour/Rate number for period 8		
007B	第 8 时段起始:分/第 8 时段起始:时 Start of period 8: minutes/Start of period 8: hour	R/W	
007C	第 9 时段费率号/第 9 时段起始:分 Rate number for period 9/Start of period 9: minutes	R/W	
007D	第 9 时段起始:时/第 10 时段费率号 Start of period 9: hour/Rate number for period 10	R/W	
007E	第 10 时段起始:分/第 10 时段起始:时 Start of period 10: minutes/Start of period 10: hour	R/W	
007F	第 11 时段费率号/第 11 时段起始:分 Rate number for period 11/Start of period 11: minutes	R/W	
0080	第 11 时段起始:时/第 12 时段费率号 Start of period 11: hour/Rate number for period 12	R/W	
0081	第 12 时段起始:分/第 12 时段起始:时 Start of period 12: minutes/Start of period 12: hour	R/W	
0082	第 13 时段费率号/第 13 时段起始:分 Rate number for period 13/Start of period 13: minutes	R/W	
0083	第 13 时段起始:时/第 14 时段费率号 Start of period 13: hour/Rate number for period 14	R/W	
0084	第 14 时段起始:分/第 14 时段起始:时 Start of period 14: minutes/Start of period 14: hour	R/W	

说明 Description:

电压、电流、功率等数据数值计算方法：读数 = 有效值×10（指数位-3）

Calculation of voltage, current and power data: Actual value = rms value × 10^{index bit -3}

0012H:报警及开关量输入/输出状态字 Alarm and I/O status word:

15	...	11	10	9	8	7	6	5	4	...	1	0
—		A.-H	A.-L	U.-H	U.-L	DI1	DI2	DI3	DI4	—	DO1	DO2
-		电流高、低报警 Current high /		电压高、低报警 Voltage high /		开关量输入 DI					开关量输出 DO	

	low alarm	low alarm			
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说明 Description:

- ① “—” 表示保留字或保留位 Reserved word or reserved bit.
- ② 报警标志位: 1 为有报警, 0 为无报警。 Alarm flag:1 is alarm, 0 is no alarm.

7 常见故障的诊断、排查方法 Diagnosis and troubleshooting of common faults

● 仪表测量不准确 Inaccurate meter measurement

检查输入电压、电流接线的极性方向是否正确。

Check the voltage and current wiring polarity.

● 电压、电流测量正确但功率测量不准确

Voltage and current measurements are correct, but power measurements are incorrect.

检查电流输入方向是否正确;

Check if the current input direction is correct.

● 通信不正常 Communication is abnormal

检查通讯连接线是否连接正常; Check if the communication line is connected properly.

检查通信的 A、B 端子是否交错; Check if the A and B terminals of communication are wrong.

检查仪表的地址是否设定正确, 通讯波特率是否设定正确; Check if the address and baud rate settings of the meter are correct.

多装置通讯不正常时, 先试一下单机通讯是否正常。When the communication of multiple devices is abnormal, test whether the communication of single device is normal.