PA/PZ666 - □ Series Single Phase Digital Ammeter/Voltmeter
User Manual

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User Manual

1. Overview

1.1 Application

PA/PZ666 –□ Series ammeter and voltmeter (hereinafter referred to as meters) are mainly used for real-time measurement and display of single-phase AC or DC current and voltage in electrical circuits. It is widely used in low-voltage distribution incoming switch cabinet, feeder switch cabinet, etc. it is designed for power monitoring of power system, communication industry, construction industry, etc. it integrates measurement, communication, alarm and transmission.

It meets the following technical standards:

GB/T 22264.1 Mounted digital display electrical measuring instruments-Part 1: definitions and general requirements.

GB/T 22264.2 Mounted digital display electrical measuring instruments-Part 2: Particular requirements for ammeters and voltmeters.

GB/T 22264.8 Mounted digital display electrical measuring instruments-Part 8: Recommended test methods.

1.2 Features

1) Modular structure design, SMT production process;

2) The display range of voltage and current measurement can be set freely;

3) Switch output function (relay alarm);

4) Analog output (transmission);

5) Communication function (RS485), ModBus-RTU communication protocol;

1.3 Naming rules
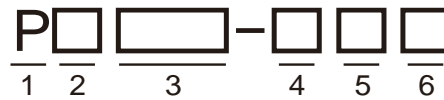
① Product code: Chint digital panel meter

②Group code: A: ammeter Z: voltmeter

③ Registration code: 666

④ Panel size code:

 2：72mm×72mm 3：96mm×96mm 4：48mm×48mm

⑤ Signal input category:

None: single phase AC signal input

⑥ Auxiliary function option:

None: linear power supply, no auxiliary function

T: Switching power supply, RS485 communication function

1.4 Environmental

Specified working temperature range: - 10 ℃ ~ + 45 ℃.

Limit of working temperature range: - 25 ℃ ~ + 70 ℃.

Relative humidity: annual average < 93%, no condensation, no corrosive gas place.

Atmospheric pressure: 86kPa ~ 106kPa.

2. Working principle

Modular structure design, auxiliary function optional. Fixed by fixed clamp, easy to install and universal. MCU samples the input signal in real time, processes and displays the sampling results, outputs the upper and lower limits of the measured value according to the parameter values programmed by the selected function module and keyboard, and outputs the measured power data through remote transmission, and communicates with the host computer through RS485 interface to realize networking.
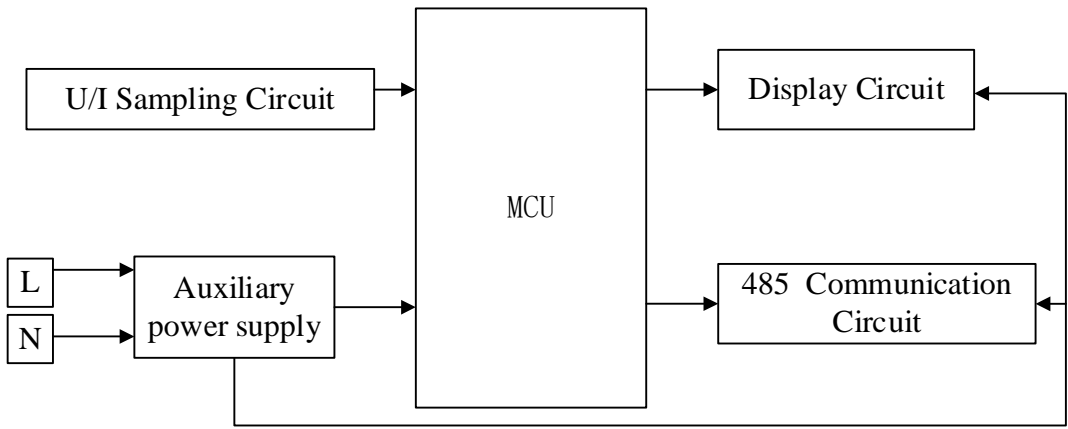
Figure 1 Working principle diagram

3. Basic Specifications

Table 1 Technical parameters

Technical parameter			Values
Input	Network		single-phase
	Voltage	Rating	AC voltage: AC 100V, AC 450V;
		Overload	Duration: 1.2 times, instantaneous: 2 times /5s
		Power consumption	$\leq$ 2Va (per phase)
	Electric current	Rating	AC current: AC 5A;
		Overload	Duration: 1.2 times, instantaneous: 10 times / 5s
		Power consumption	$\leq$ 1VA (per phase)
	AC frequency range		45Hz～65Hz
Output	Display mode		Four LED display
	Communication	Mode	RS485
		Protocol	ModBus-RTU
		Baud rate	1200 bps, 2400 bps, 4800 bps, 9600 bps, 19200 bps, default: 9600 bps
Accuracy Grade	Voltage and current		Class 0.5
Power Supply	Range		Linear power supply AC220 V $\pm$ 10%, 50 Hz / 60 Hz
	Power consumption		Active power consumption $\leq$ 3W, Apparent power consumption $\leq$ 15VA

Table 2 Electromagnetic compatibility and safety

Security	AC withstand voltage	The voltage between the terminals larger than 40V and the terminals smaller than 40V can withstand AC withstand voltage of AC 2kV / 5mA / 1min
	Pulse voltage	The voltage between the terminals larger than 40V and the terminals smaller than 40V can withstand ± 4kV 1.2/50 μ s pulse voltage (10 times per polarity)
	Insulation resistance	Input and output terminals to case > 100MΩ
	Outage data retention time	Over 10 years
Electroma gnetism compatibl e	Electrostatic discharge immunity	GB/T 17626.2 class 4 (air discharge 15kV)
	Radio frequency electromagnetic field immunity	GB/T 17626.3 class 3 (10V/m)
	Electrical fast transient burst immunity	GB/T 17626.4 class 3 (2kV/5kHz)
	Surge immunity	GB/T 17626.5 class 4 (power supply line 4kV, voltage line 2kV)
	Conducted disturbance immunity of RF field induction	GB/T 17626.6 class 3 (150kHz-80mHz, 10V)
	Attenuation oscillation wave immunity	GB/T 17626.12 class 3 (common mode 2.5kV, differential mode 1kV)
	Radio interference suppression	GB/T 9254 class B

4. Functions

4.1 Display function

Minus sign indicator

Upper limit alarm indicator

Lower limit alarm indicator

AH

AL

Digital tube display

Unit indicator k:thousand

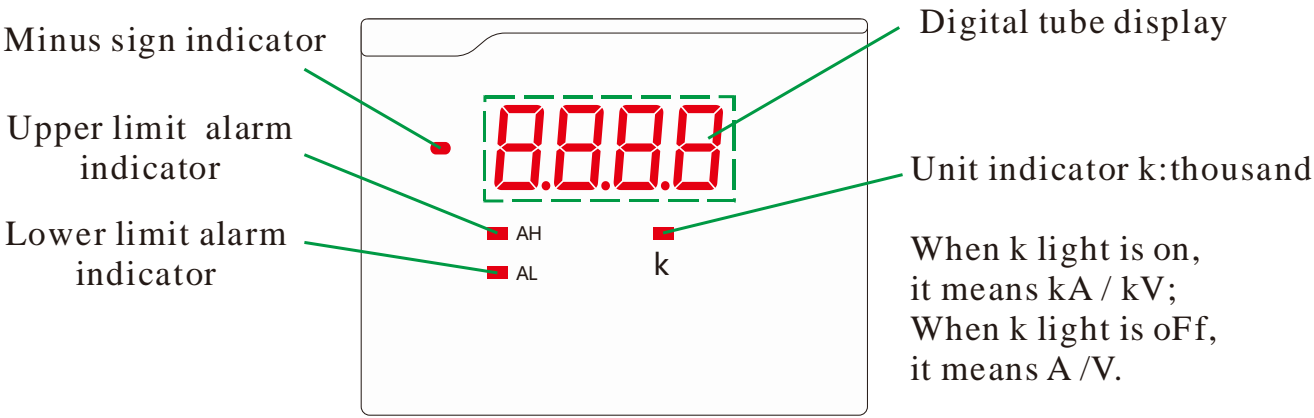When k light is on, it means kA / kV; When k light is oFf, it means A /V.

k

Figure 2 shows

4.2 Programming function

4.2.1 Programming operation steps

Key Description: "SET" key means "OK", or "cursor shift" (when inputting numbers), "ESC" key means "exit", "[∨]"Key means "minus", "[∧]"The key means "plus". Input the password (default 701) to enter the submenu item of "system settings".
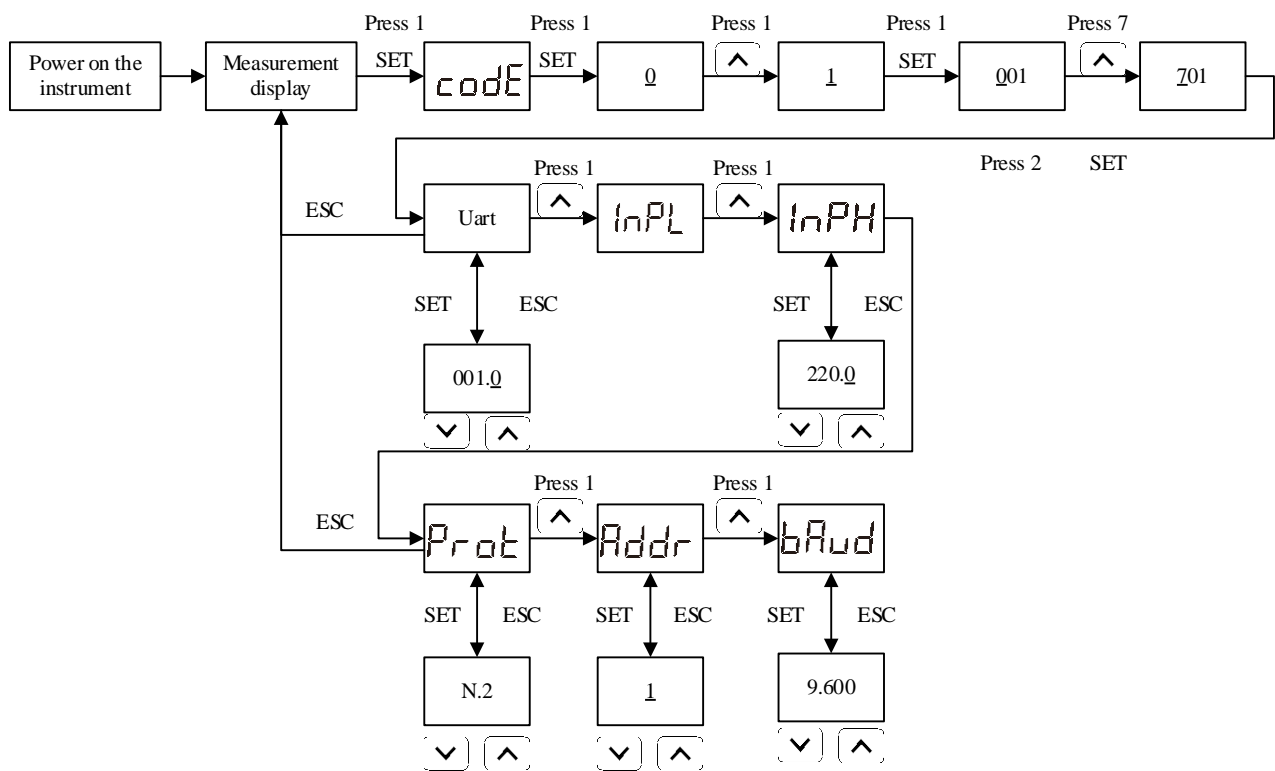

Figure 3 Programming operation

4.2.2 Programming parameter

Table 3 Programming parameters

Serial number	Parameter code	Parameter name	Range	Description
1	dP	Decimal point dP	0～3	Number of decimal places

2	InPL	Range setting InPL	0～9999	Reserve
3	InPH	Range setting InPH	0～9999	Set the display value corresponding to the nominal input signal, which is divided by the nominal signal to be the signal transformation ratio
4	Addr	Communication address Addr	1～247	Set the local communication address of the meter, and the address shall not be the same as other slave addresses in the whole communication bus
5	bAud	Baud rate bAud	0～4	Must be the same as the host settings 0: the baud rate of communication is 1200bps 1: the baud rate of communication is 2400bps 2: the baud rate of communication is 4800bps 3: the baud rate of communication is 9600bps 4: the baud rate of communication is 19200bps
6	Prot	communication Protocol configuration	1～4	Must be the same as the host settings 1: 8N2, 8 data bits, no check, 2 stop bits; 2: 8N1, 8 data bits, no check, 1 stop bit; 3: 8E1, 8 data bits, even check, 1 stop bit; 4: 8O1, 8 data bits, odd check, 1 stop bit;

4.3 Communication

This meter provides standard RS-485 communication interface and ModBus-RTU communication protocol (see Appendix). The parameters that can be read or modified by communication are as follows:

Table 4 Communication description

parameter address	Parameter code	Parameter description	Data type	Data length Word	Read write properties
Keyboard parameters (see programming parameter description for specific functions, actual value of parameters with (*) = communication parameter value × 0.1)					
0000H	rEV	Software version rEV	16Bit signed	1	R
0001H	codE	User password codE	16Bit signed	1	R/W

0002H	dP	Decimal point dP	16Bit signed	1	R/W
0003H	InPL	reserve	16Bit signed	1	R/W
0004H	InPH	Range setting InPH (*)	16Bit signed	1	R/W
0005H	reserve	reserve	16Bit signed	1	
0006H	reserve	reserve	16Bit signed	1	
0007H	reserve	reserve	16Bit signed	1	
0008H	reserve	reserve	16Bit signed	1	
0009H	reserve	reserve	16Bit signed	1	
000AH	reserve	reserve	16Bit signed	1	
000BH	reserve	reserve	16Bit signed	1	
000CH	Addr	Address Addr	16Bit signed	1	R/W
000DH	bAud	Baud rate of communication bAud	16Bit signed	1	R/W
000EH	Prot	Modbus RTU communication mode word, data is 1:8N2, 2:8N1, 3:8E1, 4:8O1;	16Bit signed	1	R/W
000FH	reserve	reserve	16Bit signed		
0010H	*AI*	Voltage (current) value (*)	16Bit signed	1	R

5. Installation dimensions

Table 5 Installation dimensions

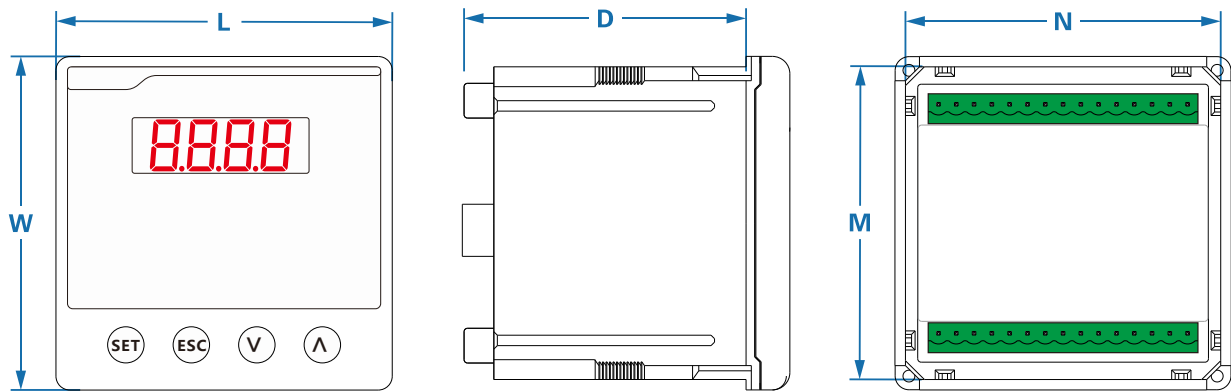| Model	Panel dimension (L × W)	Main part dimension (length M × width N × depth D)	Hole spacing dimension (length × width)
P□666-2	72mm×72mm	66mm×66mm×92mm	68mm×68mm
P□666-3	96mm×96mm	90mm×90mm×84mm	92mm×92mm
P□666-4	48mm×48mm	44mm×44mm×92mm	45mm×45mm

Figure 4 Dimension diagram

6. Installation guide

6.1 Installation inspection

1) Before installation, check whether the model and specification of the product marked on the package box are consistent with the real object. If not, please contact the supplier;

2) Check whether the shell of the product in the packing box is damaged. If there is any damage, please contact the supplier;

6.2 Installation steps

The installation mode is embedded installation, and the fixed mode is fixed clip type. The specific operation is as follows:

1) On the fixed distribution board, select a suitable place to open an installation hole with the same size as the opening of the installed meter;

2) Take out the meter and clamp, and insert the meter into the installation hole of the power distribution panel;

3) Push the retainer into the meter slot from the back to the front until the meter is fixed on the mounting plate.
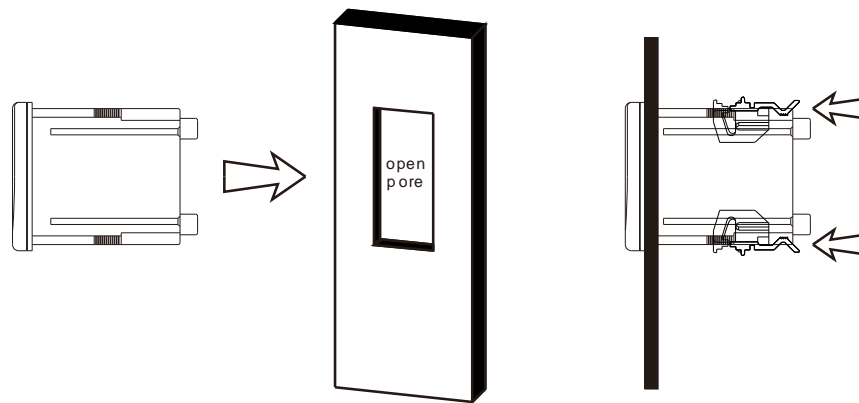
Figure 5 Installation drawing

6.3 Typical wiring

The input signal and auxiliary power supply must be cut off before the meter wiring operation. Before power on, check whether the meter wiring is correct and consistent with the wiring diagram on the meter shell.
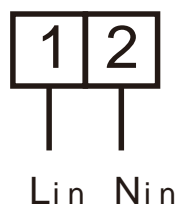
6.3.1 Auxiliary power supply

Figure 6 Auxiliary power supply

1Terminal 2 and terminal 2 are auxiliary power input terminal block

6.3.2 Signal input

```
┌──┬──┐
│11│14│
└──┴──┘
   │  │
   U
```
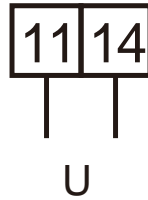
Figure 7 Voltage signal input

Voltage signal input: terminal 11 is connected to the high end of AC / DC voltage input signal, and terminal 14 is connected to the low end of AC / DC voltage signal.
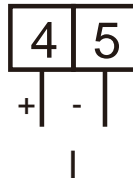
```
┌──┬──┐
│ 4│ 5│
└──┴──┘
 +│ -│
   I
```

Figure 8 Current signal input

Current signal input: terminal 4 is connected to the high end of AC / DC current signal, and terminal 5 is connected to the low end of AC / DC current signal.

The input signal should not be higher than the nominal input value of the meter, otherwise the AC voltage should be connected through PT, the AC current should be connected through CT, and the DC current can be connected through shunt sampling.

6.3.3 Auxiliary function port

```
┌──┬──┐
│58│59│
└──┴──┘
   │  │
   A  B
```
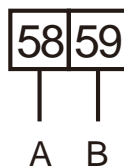
Figure 9 auxiliary function port

Terminal 58 is RS485 bus terminal A and terminal 59 is RS485 bus terminal B.

7. Common troubleshooting

Table 6 Common troubleshooting

Fault phenomenon	Cause analysis	Exclusion method	Remarks
The meter cannot be powered on	Wrong wiring	Check: check whether the wiring is consistent with the wiring diagram; use a multi-meter to measure whether the voltage of the auxiliary power supply is within the nominal range of the meter.	When checking the relevant lines, make sure that the signal current, voltage and auxiliary power supply are disconnected to ensure personal safety.
Communication failure	The setting of communication address, baud rate and check mode of upper computer is inconsistent with the table;	Check: check whether the setting of the upper computer is consistent with the communication setting information of the meter, such as communication address, baud rate and verification mode. If there is no problem with the setting, add a matching resistance on the bus (510 ohm is recommended).	

8. Transportation and storage

Instrument packaging should be used in line with environmental requirements of the material, the instrument and accessories in the packaging conditions should be stored in a ventilated dry place, to avoid moisture and corrosive gases, the limit of the ambient temperature of the storage -40 ℃ ~ +70 ℃, relative humidity does not exceed 75%.

The packaging of the instrument meets the requirements of GB/T 13384, and the ambient temperature requirement and transportation of conventional storage meet the requirements of GB/T 25480.

9. Warranty and service

Within 18 months from the date of delivery, if the quality problem is found, the manufacturer

shall repair or replace the meter free of charge under the condition that the user complies with the requirements of the manual and the lead seal of the manufacturer is in good condition.

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Dear customers:

Please help us to do one thing, when the product is at the end of its life, in order to protect our environment, please do a good job in recycling the product or its parts and materials.For materials that cannot be recycled, please handle them well.Thank you very much for your cooperation and support.

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