

VK-MPDU-TM60 Three-phase 485 Smart Meter

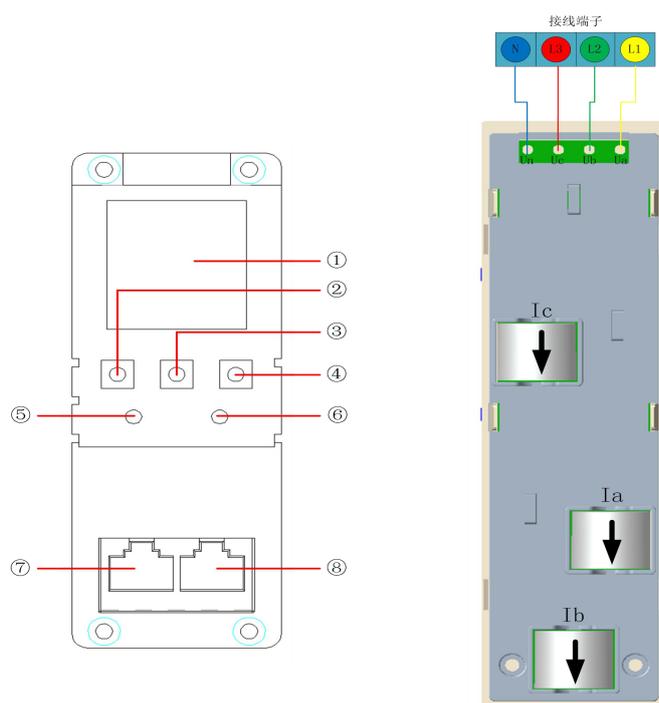


1. Features

| | |
|--------------------------|---|
| Real-time measurement | |
| Current | Three-phase current |
| Phase voltage | Three-phase phase voltage, line voltage |
| Active power | Three-phase active power, total active power |
| Power factor | Three-phase power factor, total power factor |
| Frequency | Power system frequency |
| Electric energy metering | |
| Electricity | Split-phase active energy, total active energy |
| Real-time alert | |
| Overvoltage warning | If the voltage is greater than the set over-voltage value (0V does not turn on, the default is 0V), an alarm will be triggered immediately (the voltage display line flashes + the buzzer |

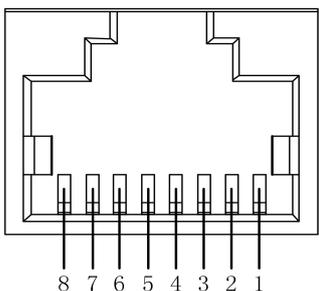
| | |
|----------------------------|---|
| | sounds + the indicator light is always on) |
| Undervoltage alarm | If the voltage is less than the set under-voltage value (0V does not turn on, the default is 0V), an alarm will be triggered immediately (the voltage display line flashes + the buzzer sounds + the indicator light is always on) |
| Overcurrent warning | If the current is greater than the set overcurrent value (0A does not turn on, the default is 0A), an alarm will be triggered immediately (current display line flashes + buzzer sound + indicator light is always on) |
| Current interruption alarm | When the current is less than the set undercurrent value (0A does not turn on, the default is 0A), an alarm will be triggered immediately (current display line flashes + buzzer sound + indicator light is always on) |
| Display | |
| Real-time data | Three-phase voltage, three-phase current, three-phase active power, three-phase reactive power, three-phase power factor, total reactive power/total power factor/total power, frequency, total active energy, split-phase active energy, and communications Address/Baud rate/Check digit. |
| Warning prompt | Alarm information prompt (the corresponding display line of the alarm item flashes), the buzzer sounds, and the red Led light is always on. |
| Operation instructions | When the machine is running normally, the green Led light flashes (0.5S on and 0.5S off), when there is communication (0.1S flashes for 0.1 second off). |
| Communication | |
| RS485 | 1 RS485 interface (2 RJ45 type interfaces) |

2. Panel diagram



| No | Function | Describe |
|----|-----------------------------|--|
| ① | LCD display | View measurement data, alarm information and configuration items |
| ② | Up | Display page turning, flashing bit shift right, return to measurement page |
| ③ | Down | Display page turning, flashing digit decreasing value, silence |
| ③ | Set | Enter the setting menu, confirm setting items, confirm save |
| ④ | Run | The indicator light (green light) flashes for 0.5 seconds and goes off for 0.5 seconds, indicating that the machine is operating normally. When there is communication, it flashes for 0.1 seconds and goes off for 0.1 seconds. |
| ⑥ | Alarm | When the indicator light is red, it indicates that there is an alarm message |
| ⑦ | RS485-M | RJ45 type interface, RS485 output |
| ⑧ | RS485-S | RJ45 type interface, RS485 output |
| Ua | A phase voltage input line | A phase voltage sampling and machine power supply |
| Ub | B phase voltage input line | B-phase voltage sampling |
| Uc | C phase voltage input line | C-phase voltage sampling |
| Un | N phase voltage input line | N-phase voltage input and machine power supply |
| Ia | A phase current transformer | For A-phase current sampling, inner hole diameter |
| Ib | B phase current transformer | For B-phase current sampling |
| Ic | C phase current transformer | For C-phase current sampling |

3. RJ45 type interface pin definition

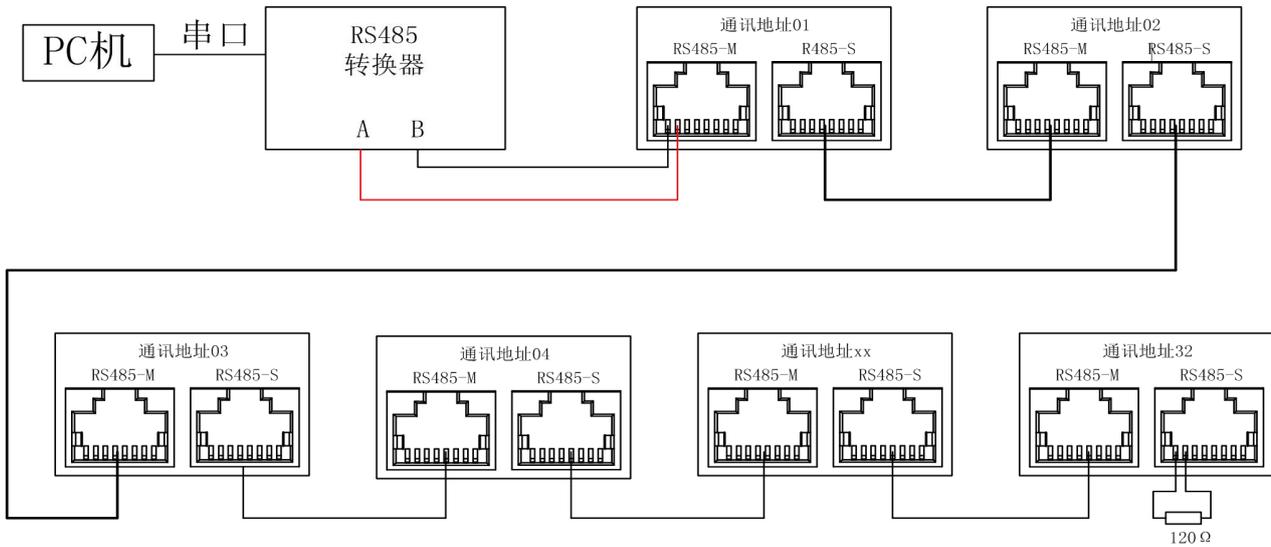
| Schematic diagram | RJ45 port PIN definition | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---------|--|-----|------------|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|---|---------|---|---------|---|---------|--|-----|------------|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|---|---------|---|---------|
|  | <table border="1"> <thead> <tr> <th colspan="2">RS485-M</th> </tr> <tr> <th>PIN</th> <th>Definition</th> </tr> </thead> <tbody> <tr><td>1</td><td>Empty</td></tr> <tr><td>2</td><td>Empty</td></tr> <tr><td>3</td><td>Empty</td></tr> <tr><td>4</td><td>Empty</td></tr> <tr><td>5</td><td>Empty</td></tr> <tr><td>6</td><td>Empty</td></tr> <tr><td>7</td><td>RS485-A</td></tr> <tr><td>8</td><td>RS485-B</td></tr> </tbody> </table> | RS485-M | | PIN | Definition | 1 | Empty | 2 | Empty | 3 | Empty | 4 | Empty | 5 | Empty | 6 | Empty | 7 | RS485-A | 8 | RS485-B | <table border="1"> <thead> <tr> <th colspan="2">RS485-S</th> </tr> <tr> <th>PIN</th> <th>Definition</th> </tr> </thead> <tbody> <tr><td>1</td><td>Empty</td></tr> <tr><td>2</td><td>Empty</td></tr> <tr><td>3</td><td>Empty</td></tr> <tr><td>4</td><td>Empty</td></tr> <tr><td>5</td><td>Empty</td></tr> <tr><td>6</td><td>Empty</td></tr> <tr><td>7</td><td>RS485-A</td></tr> <tr><td>8</td><td>RS485-B</td></tr> </tbody> </table> | RS485-S | | PIN | Definition | 1 | Empty | 2 | Empty | 3 | Empty | 4 | Empty | 5 | Empty | 6 | Empty | 7 | RS485-A | 8 | RS485-B |
| RS485-M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PIN | Definition | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Empty | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Empty | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Empty | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Empty | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Empty | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Empty | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | RS485-A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | RS485-B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RS485-S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PIN | Definition | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Empty | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Empty | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Empty | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Empty | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Empty | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Empty | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | RS485-A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | RS485-B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Note: RS485-M and R485-S are the same 485 communication bus, providing two interfaces to facilitate cascading;</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

4. Communication

RS485-M and RS485-S are the same RS485 communication bus, providing two interfaces to facilitate cascading;

The RS-485 communication mode allows up to 32 instruments to be connected to a bus, which is connected to the host computer through an RS-485 converter. The communication cable can use ordinary

shielded twisted pair, and the total length should not exceed 1200 meters. The positive and negative polarity of the RS-485 ports of each device must be connected correctly. If the shielded twisted pair is long, it is recommended to connect a resistance of about 120Ω at its end to improve the reliability of communication.



5. Use and operation

5.1 Button definition

| Logo | Name | Function |
|---|------|--|
|  | UP | 1. When measuring, short press to scroll up to display; 2. When setting, in the parameter screen, short press to exit the menu; 3. When setting, in the editing screen, short press the flashing bit to move to the right. |
|  | DOWN | 1. When measuring, short press to scroll down to display; 2. When setting, in the parameter screen, short press to turn the screen to display; 3. When setting, in the editing screen, short press the flashing digit to decrease the value. 4. When alarming, press and hold for 3 seconds to enter the "silence" state; |
|  | SET | 1. Measuring screen, short press to enter the parameter screen; 2. When setting, in the parameter screen, short press to enter the edit screen; 3. When setting, in the edit screen, short press to confirm and save; |

5.2 Show description

5.2.1 Display function description

1) It adopts segment code liquid crystal display and white text display on blue background. The display mode is automatic cycle display and key switch display.

- Automatic cycle display, each page stays for 3 seconds;
- You can switch to the page you want to view by pressing or.

2) Can view electrical parameters and communication parameters

- Cycle display content: three-phase voltage, three-phase current, three-phase active power, three-phase reactive power, three-phase power factor, total reactive power/total power factor/total

active power, frequency, total active energy, A-phase active energy, B-phase active energy, C-phase active energy and communication address/check digit/ baud rate, etc.

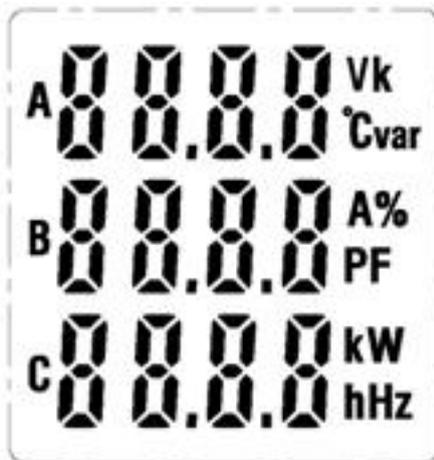
- Inquire and set the communication address, baud rate, parity bit, high voltage alarm value, low voltage alarm value, high current alarm value, low current alarm value, high power alarm threshold, buzzer switch, LCD Parameters such as delay extinguishing:

3) Indicator light

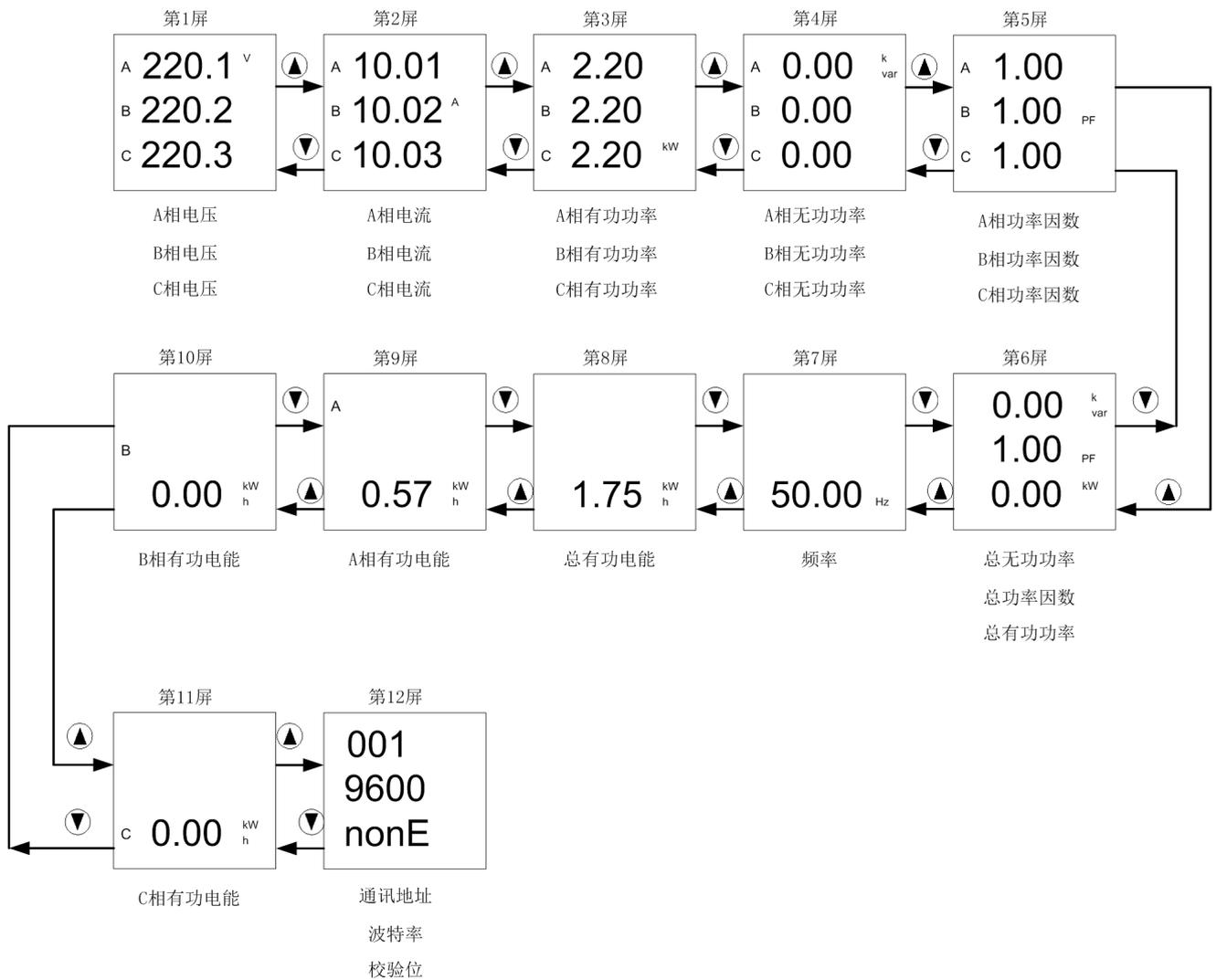
- RUN (green): in normal operation, 0.5S on and 0.5S off, when there is communication, 0.1S on and 0.1S off.
- ALARM (alarm) (red): always on when there is an alarm, and usually off.

5.2.2 Data display screen description

1) When the device is powered on, the LCD enters the full display state, the ALARM light is always on for 3 seconds, the backlight is on (it will automatically turn off after a delay of 60 seconds if there is no key operation), and the full LCD display is as follows:



2) When the device is displaying automatically in a loop, it will automatically switch between the following screens 1 to 12, and each page of the automatic loop display will stay fixed at 3 seconds. You can short press the up and down keys to view the desired page, as follows:

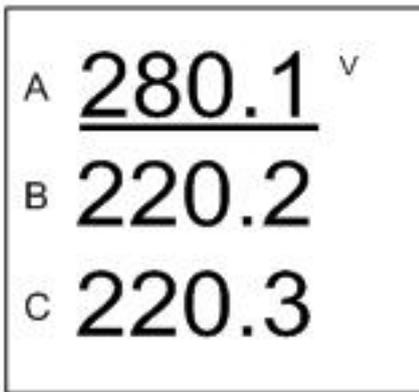


3) Display resolution and displayable range

| No | Display item | Resolution | Display range | Note |
|----|--------------|------------|------------------|---|
| 1 | V | 0.01 | 0.00~99.99 | / |
| | | 0.1 | 100.0~999.9 | / |
| 2 | A | 0.01 | 0.00~99.99 | / |
| | | 0.1 | 100.0~999.9 | / |
| 3 | kW | 0.01 | -9.99~99.99 | Signed, 4 digits can be displayed in total |
| | | 0.1 | -100.0~999.9 | Signed, 4 digits can be displayed in total |
| | | 1 | -999~9999 | Signed, 4 digits can be displayed in total |
| 4 | kWh | 0.01 | 0.00~42949672.95 | >42949672.95kWh, Will start counting from 0 again |
| 5 | Power factor | 0.01 | -1.00~1.00 | / |
| 6 | Hz | 0.01 | / | / |
| 7 | kvar | 0.01 | 0.00~99.99 | / |
| | | 0.1 | 100.0~999.9 | / |
| | | 1 | 1000~9999 | / |

5.2.3 Alarm screen

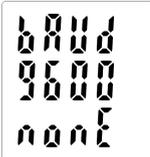
1) When voltage and current alarms are generated, the corresponding display line flashes, and the gray part is added to the following screen:



2) When $U >$ high voltage alarm threshold or $I >$ high current alarm threshold or $U <$ low voltage alarm threshold or $P >$ high power alarm threshold, the system enters the alarm, the buzzer sounds, the corresponding display line flashes, ALARM The light is always on;

3) The buzzer alarm sound corresponds to the output fixed frequency, the output frequency is 1Hz (di-di-);

5.2.4 Parameter setting screen

| No | Menu screen | Meaning | Settable range | Factory default |
|----|---|------------------------------|------------------------------|---|
| 1 |  | Communication address | 001- 247 | 001 |
| 2 |  | Baud rate and parity bit | 1200 2400 4800 9600 | 9600 |
| | | | nonE Odd Even | nonE |
| 3 |  | High voltage alarm threshold | 000.0~600.0 | Set to 0, turn off the alarm, Factory default: 0 |
| 4 |  | Low voltage alarm threshold | 000.0~600.0 | Set to 0, turn off the alarm, Factory default: 0 |
| 5 |  | High current alarm threshold | 000.0~600.0 | Set to 0, turn off the alarm, Factory default: 0 |

| | | | | |
|----|--|---------------------------------|-------------|---|
| 6 | | High power alarm threshold | Unlimited | Set to 0, turn off the alarm, Factory default: 0 |
| 7 | | Buzzer switch | On | Factory default: on |
| | | | Off | |
| 8 | | Phase voltage threshold | 000.0~600.0 | Reserved function |
| 9 | | Phase failure current threshold | 000.0~600.0 | Reserved function |
| 10 | | LCD turn off delay time | 0~250 秒 | Default: 60 seconds |
| 11 | | Power zero | Fixed 3366 | The default is 0000, and the password is incorrectly entered. |

Note:

- ① The factory default value, if there are special requirements, it should be noted when ordering, and it will be set according to the requirements before leaving the factory;
- ② Alarm threshold. When it is set to 0, this function does not work. To alarm, other corresponding values must be set.
- ③ The high power alarm value means that any phase of A phase, B phase, and C phase exceeds this value and an alarm will be generated.

5.2.5 Parameter query and setting

In the measurement screen, short press the SET key to enter the first-level setting screen, short press the scroll key to view the specific value of the parameter item, select the parameter item to be set, and short press the SET key to enter the edit page, as follows:

3) In the first level menu, press the  key to return to the measurement screen.

5.2.6 Mute/unmute method

- 1) Long press the  key to enter the "silence state", after silence, you can query the specific alarm item by pressing the button (the alarm item display line flashes);
- 2) An alarm has been generated and has not been released, and at the same time it has entered the silence mode. At this time, a new alarm type is generated, and the buzzer will sound again;
- 3) When an alarm is generated and the sound is not silenced, enter the setting menu at this time, and the buzzer is temporarily turned off. When returning to the measurement screen, the buzzer will continue to sound.