DS103 meter
(Generic) technical specifications

Product Name: Intelligent LCD Instrument

Product model: DS103

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directory

1. Product introduction

1. Product name and model

Intelligent LCD meter, model: DS103

2. Product Introduction

- ✧ Simple and thin, detachable mounting bracket design
- ✧ High brightness, high contrast 3.5 inch color TFT screen
- ✧ Excellent outdoor design IPX5 waterproofing
- ✧ The waterproof head serial port communication, convenient maintenance service

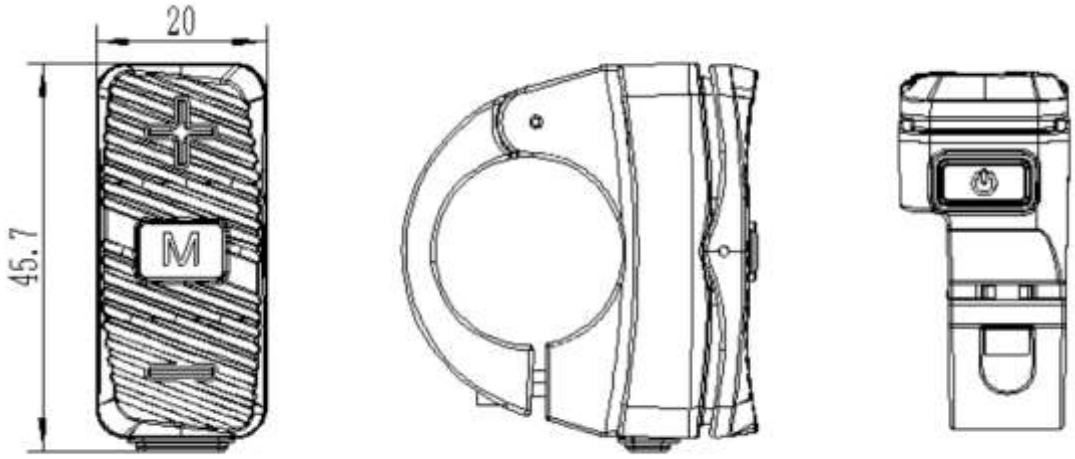
3. Scope of use

Suitable for electrically assisted bicycles that meet EN15194 regulatory standards

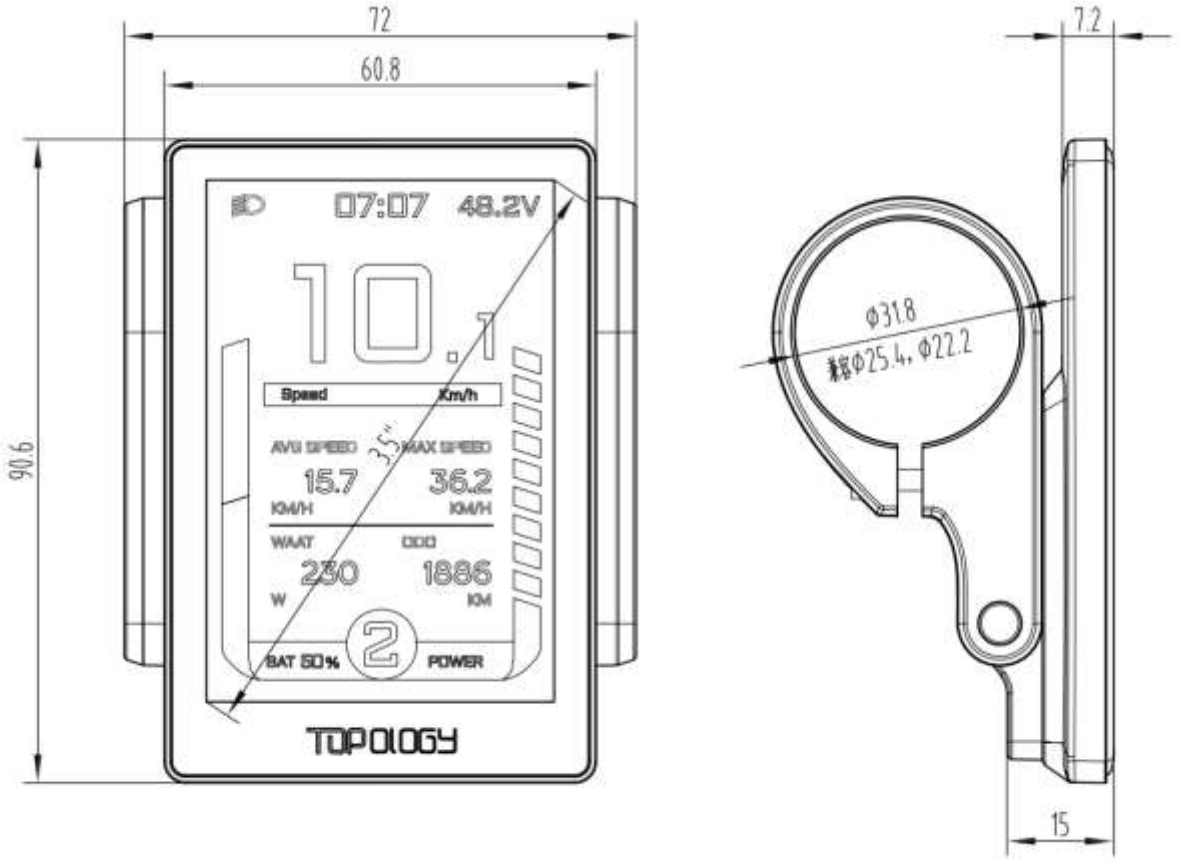
4. Appearance and size

The shell material of the product is PC+ABS, and the window is drilled and tempered glass

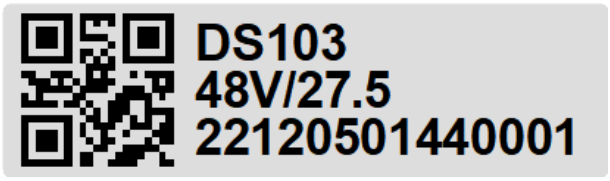
4.1 Key dimensions



4.2 Instrument dimensions



5 Meter Coding Rules



Schematic diagram of the label, which is generally affixed to the back of the product.

Printing rules: Divided into three parts

Part I: Product Model. Example: DS103

Part 2: Voltage Level/Wheel Diameter Information. Example: 48V/27.5

The third part: the serial number is 14 digits, which consists of the order code + product serial number.

The order code is 12 digits, MO2212050144, take the last 10 digits of information + serial number (4 digits), from 0001 to 9999 The entire SN information is composed.

Example: 22120501440001

2. Product description

1. Specifications

1 Power supply：DC 24V/36V/48V

2 Current rating：30mA/36V

3 More: <1uA

4 Screen specifications： 3.5 寸彩色 TFT（480*320pixels）

5 Communication mode: support UART and CAN bus

6 Operating temperature：-20° C ~ 60° C

7 Storage temperature：-30° C ~ 80° C

8 Waterproof rating: IPX5

2. Overview of features

1 Four buttons, easy to operate

2 Power on password function

3 Mileage display: Subtotal Mileage (TRIP), Total Mileage (ODO).

4 Speed display: real-time speed (SPEED), maximum speed (MAX), average speed (AVG).

5 Power assist gear control: 0-5 gears (default 0-1-2-3-4-5 gears)

6 Six-level power indication: 0-5 segments, and undervoltage, power percentage display (percentage value needs to be supported by BMS communication)

7 Metric/Imperial toggle selection

8 TRIP TIME display

9 Backlight brightness adjustment

10 6km/h to assist in the implementation of the function

11 Remaining mileage display (BMS communication support required)

12 Real-time power display (segmented display, real-time value display)

13 System Maintenance Instructions: Prompts maintenance information based on riding distance and number of charging cycles

14 Support communication interface, convenient for system maintenance and parameter setting

15 Fault message is displayed

16 * Bluetooth communication function, connect through mobile phone, set parameters, upgrade firmware and information mapping (Bluetooth function optional)

3. Installation

1 According to the diameter of the pipe, confirm whether it is necessary to select the corresponding installation locking clamp and rubber clamp (applicable pipe specifications: Φ22.2, Φ25.4, Φ31.8), open the instrument locking clamp, and then put the rubber clamp into the correct position of the locking clamp.

2 Match the instrument mounting bracket with the rubber ring and put it on the handlebar, adjust the angle of the instrument, make it easier to see the instrument screen when riding, and tighten the screws after determining the angle. Locking torque: 0.8N.m

3 Open the lock ring of the control switch and put it on the left side of the handlebar in a suitable operating position, adjust the switch angle, make it easier to see the switch and operate it when riding (suitable for handles with an outer diameter of Φ22.2)

4 用 M3 内六角扳手固定并拧紧车把固定螺钉。 锁紧力矩：0.8N.m

5 Dock the instrument connector with the controller connector according to the identification.

Note: Meter damage caused by excessive torque is not covered by the warranty.

4. Display interface

4.1 Boot interface (dynamic, schematic only)

1 The boot interface is displayed for 2 seconds when booting up.

4.2 Riding interface

1 Headlight: Displayed when the headlight is on; If the headlights are off or there is no such function, the icon will not be displayed;

2 Speed: Displays the current speed value, KM/H: kilometers per hour, MPH: miles per hour;

3 Power Assist Gear: Display the current power assist gear, from low to high: 1st gear, 2nd gear, 3rd gear, 4th gear, 5th gear, and the default 1 gear when booting up; Gear 0 means no assistance;

4 Battery level: five-stage power indication, power percentage value display (percentage value needs to be supported by communication battery BMS);

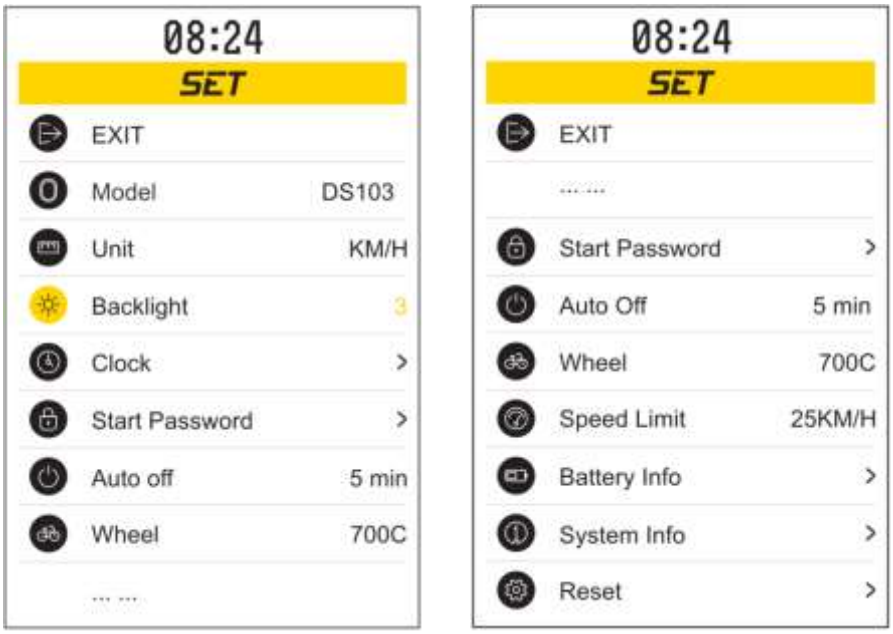
5 Power: display the instantaneous power value watt and 10 segments to indicate the power of the motor;

6 Riding time: Riding time display, display format: hours: minutes;

7 Subtotal mileage and unit: subtotal mileage display;

8 Remaining Mileage: Displays the estimated riding mileage remaining of the battery under the current power assist gear (only the estimated value, and the communication battery BMS is required)

4.3 Settings interface



5 button definitions

On/off key:⏻, mode key:M, press the upper button:+, press the next button:−

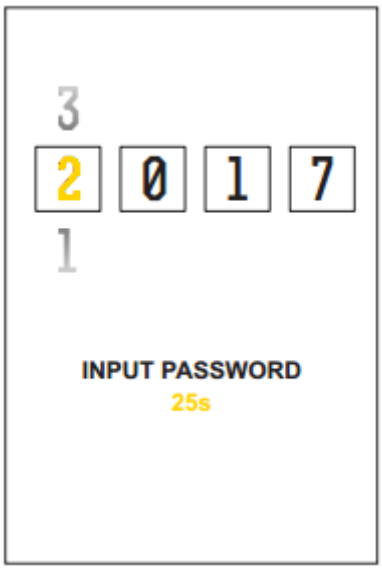
6. Functional operation

6.1 Power on/off

Keep the normal connection between the instrument and the controller, press

and hold the button (2 seconds) when the instrument is off⏻, the instrument will display the boot interface with full display, and then enter the basic interface normally and start working; Press and hold (2 seconds) when the device is on⏻, and the meter will turn off. If the rider does not do anything with the gauge for 5 minutes (speed is 0), the gauge will automatically turn off.

6.2 Power on password



After the instrument boots screen, it enters the password input interface, if the password is not entered or entered incorrectly within 30s of the countdown, the instrument will automatically shut down; Enter the password correctly to enter the normal riding interface. (The factory boot password of the meter is not enabled by default)

Press the Mkeys from left to right to select the number of password digits, press+/—select the password value of the current digit, press the key after the four-digit password is enteredM, the password will enter the boot interface correctly, the password is wrong, and you need to re-enter it.

The boot password function can be enabled or disabled in the settings interface, and the password can be changed;

6.3 Assist gear selection

Press+ or —to switch the power assist gear, change the output power of the

motor, the lowest 1 gear, the highest 5 gear, the default 1 gear when the instrument is turned on, and the display of 0 is neutral, no power assist.

The power gear selection interface is as follows:

Stop 0 (gray), 1 stop (green), 2 stop (yellow), 3 stop (orange), 4 stop (pink), 5 stop (red).

6.4 Speed and mileage display switching

Short press M Key cycle display: Ride time(TRIP TIME)/Subtotal mileage(DISTANCE)/Miles remaining(RANGE)/Total mileage(ODO)/-> Average(AVG SPEED)/Maximum speed (MAX SPEED)/power (WATT)/Total mileage (ODO)。

The display interface is as follows:

TRIP TIME/DISTANCE/RANGE/ODO AVG SPEED/MAX SPEED/ODO/RANGE

6.5 Assist in the implementation of the model

Press and hold—, after 2 seconds, the instrument enters the state of power push, and the gear display area is displayed as "  ", release, —exit the power push mode, and return to the normal display interface. The interface for switching the mode of assistance is shown in the following figure (only in the implementation state):

Assist in the implementation of the normal model

6.6 Headlight switch

Long press+ button, after 1 second, the headlight is turned on (controller support is required), the instrument display interface is switched to night mode, the headlight indicator icon lights up, and at the same time, press and hold the long+ button again, after 1 second, the headlight is turned off, the instrument display interface switches to day mode, and the headlight indicator icon is off.

The display interface is shown in daytime mode/night mode as shown below

6.7 Power display

When the battery level is normal, according to the change of battery capacity, the battery power percentage will be displayed in real time and 1-5 bars will be displayed. When the battery level is less than 5%, a 0 bar is displayed, and the battery icon is yellow and flashing. Hint: Charges need to be charged immediately. The battery level is shown as follows:

Undervoltage flashing 1 grid power, 2 grid power, 3 grid power, full power

6.8 Power display

During riding, the instrument displays the real-time power value and indicates the power in five levels, from low to high are 0~5 levels, and 0 levels indicate that the motor has no output power.

Level 0, Level 2, Level 4, Level 6, Level 8, Level 10

7 User Settings

Setting items: Bluetooth switch, unit setting, backlight setting, clock setting, boot password setting, automatic shutdown time setting, *wheel diameter information, *speed limit information, *battery information, *system information, factory settings. (Hit * only for project information display, cannot be set by default).

7.1 Enter the settings interface

- ✧ Within 10 seconds of entering the basic interface after booting, press and hold the M button (3 seconds) to enter the user setting interface, and the relevant parameters can be set and viewed in this state.
- ✧ Press and hold (M 3 seconds) to exit and save the setting state; Select [Exit] on the settings screen, and press the short M button to exit and save the setting status.
- ✧ In the user setting interface state, if no operation is performed for 10 seconds, the instrument will return to the normal riding state and the parameter settings will not be saved.
- ✧ In the user settings interface, in the setting items, short press M to select the setting content, and short press / + — switch between the upper and lower items.

7.2 Exit Entry

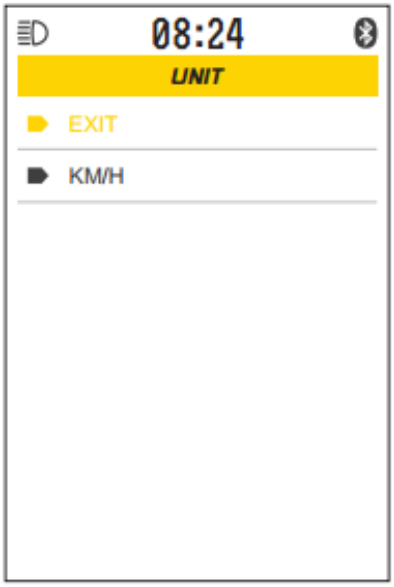
Select the Exit, short buttonM, save the setting parameters, exit the settings interface, and return to the riding interface.

7.3 Unit Settings

Units: Metric/Imperial

Enter the unit setting interface, short press+/—key to select KM/H or MPH; When selected, the short button Msaves the parameters and exits the unit setting interface to return to the user settings interface

The interface is as follows



7.4 Backlight Settings

Brightness 调节界面

Brightness: Backlight adjustment items 1, 2, 3, 4, 5: 5 levels of backlight brightness adjustment, 1 level is the lowest, 5 levels are the highest; Short press+ —/ key to select 1~5 brightness, key Mto confirm the selection and exit to the backlight setting interface.

The interface is as follows:

7.5 Power on password setting

Exit：退出 START PASSWORD 界面；

Start Password----ON/OFF： 开机密码功能----开/关

Setting Password：设置开机密码；

Short press+/—键选择 Exit、Start Password、Setting Password，Selected ExitShort pressM key to exit to SET interface, checked Start Password, Short press M key toggle ON/OFF, Selected Setting Password, press M keys from left to right to select the number of password digits and press +/— Modify the password value of the selected digit, and press after the four-digit password is entered Mkey to verify the original password, and the original password is wrong to exit directly SET Interface.

If the original password is entered correctly, jump to the new password entry screen and enter the new password

After the new password is successfully entered, you will be prompted to enter it again.

After the new password is confirmed to be correct twice, the instrument will automatically open the boot password, and the new password needs to be entered to enter the normal working interface.

7.6 Automatic shutdown time setting

Exit: quit AUTO OFFinterface;

1minutes: 1 minute auto shutdown time;

2minutes: 2 minutes auto power off time;

3minutes: 3 minutes auto shutdown time;

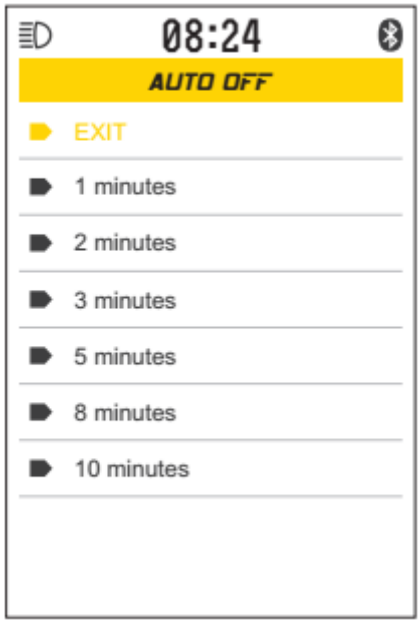
5minutes: 5 minutes auto shutdown time;

8minutes: 8 minutes auto power off time;

10 minutes: 10 minutes auto shutdown time;

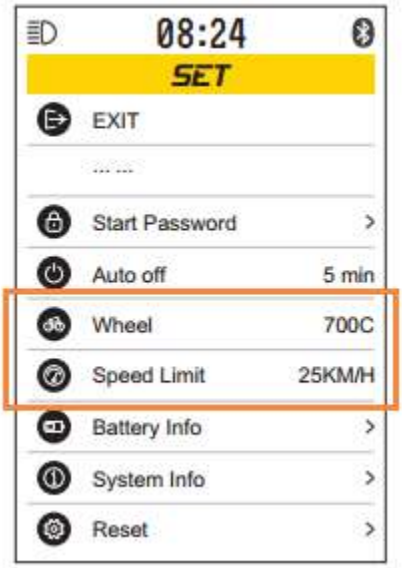
Short press +/— key to select Exit、1 minutes、2minutes、3 minutes、5minutes、8minutes、10 minutes,选中 Exit Short press M key to exit to SET interface, checked 1 minutes、2minutes、3 minutes、5 minutes、8 minutes、10 minutesSave the settings and exit to the SET interface;

After the setting is completed, in the meter operation interface, when the speed is zero and there is no button operation, the instrument will automatically shut down after the automatic shutdown time is up, and the instrument can only ⏻ be turned on again by the button



7.7 Wheel diameter and speed limit information

As shown in the figure below



(Default) wheel diameter and speed limit can only be set by the host computer, and the user can only view, not set.

7.8 Battery Information

Exit：退出 BATTERY INFO 界面；

Temp: Battery temperature

Battery Cap：电池容量

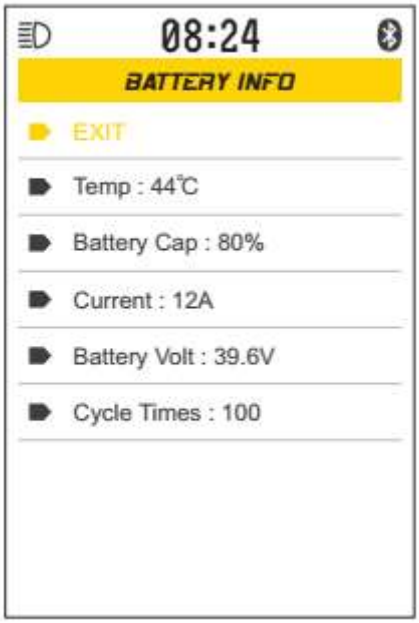
Current: current

Battery Volt：电池电压；

Cycle Times：充电次数；

short Mbutton, you can also exit to the user settings interface;

The interface is as follows: (requires battery BMS communication support)



7.9 System Information Viewing

S/N: device number;

FW version：固件版本号；

HW version：硬件版本号

*Motor INFO (Communication Protocol Support Required)

*BMS INFO (protocol required)

*Controller INFO （需通讯协议支持）

Short press+/—key to select Exit, Select it and press it shortMto exit the user settings screen

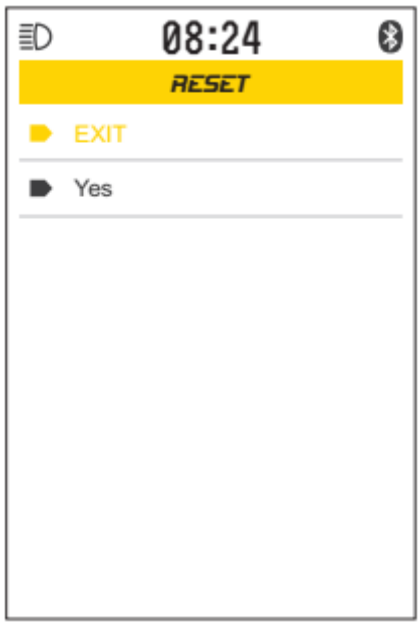
7.10 Factory settings

Exit：退出 RESET 界面；

Yes: factory reset;

Select ＋Exit and Yes by pressing the short press/button, select the Yes short button —to restore factory settings and exit to the user settings interface, and select the Exit short buttonM Mto exit to the SET interface;

The interface is as follows:



8. Data clearing

After 10 seconds of powering on, press and hold the mode button (3 seconds) to enter the data clearing interface; Within 10 seconds, the short Mbutton clears the subtotal mileage (TRIP), riding time (TRIP TIME), average speed (AVG) and maximum speed (MAX), pops up the confirmation option (YES/NO), and the Z button is pressed againM, and all the following are cleared; If you don't press any buttons within 10 seconds, it will automatically return to the riding interface and the data will not clear to zero.

The following is the data eraser interface:

9. Fault interface definition

9.1 Fault Display

The instrument can provide warning for the vehicle failure, and the instrument interface displays the fault code ERROR 30 when the fault is detected, and the rest of the error code is defined by the controller The instrument is only displayed, which can be referred to the communication protocol document.

The interface is displayed as follows:

9.2 Fault Code Definitions

The fault code is obtained from the controller command. The meaning of the error code is generally defined by the controller. The meter only defines the inability to communicate ERROR 30.

Fault codes	Fault description	Troubleshooting and analysis
E30	Communication failure, the meter does not receive the data from the controller or the received data is wrong data.	1: Check whether the TX and RX communication cables are connected correctly. 2: Check whether the wiring harness and connector are loose or broken. 3: Check whether the instrument communication protocol matches.

10 Wiring Definition

Table 1 Cable sequence of standard connectors

Wiring is standard	Standard line color	function
1	Red (VCC)	Meter power cord
2	Blue (KP)	The power control cable of the controller
3	Black (GND)	Gauge ground
4	Green (RX)	The data receiving line of the meter
5	Yellow (TX)	The data transmission line of the meter

Note: The actual line sequence definition is confirmed according to the customer's needs.

3. Precautions

- ✧ Do not knock on the LCD window area to avoid cracking of the LCD screen or cracking of the shell into water or leakage, pay attention to the safety of the instrument.
- ✧ Try to avoid use in bad weather conditions, heavy rain, heavy snow, and sun exposure.
- ✧ The instrument should not be forcibly powered off by plugging and unplugging the connector when the power is turned on, so as not to cause the instrument to burn out.
- ✧ The instrument should not be soaked in water, so as not to cause a short circuit in the water. The instrument should not be in contact with the fire source to avoid melting of the plastic shell, cracking of the LCD screen and environmental pollution.

- ✧ The wiring of the instrument needs to be defined and docked according to the wire color, and it cannot be wired at will to avoid burning.
- ✧ When the instrument cannot be used normally, it needs to be repaired in time.

This is a general version. Some of the instructions for the actual software may differ from the specification, depending on the reality
The version used.