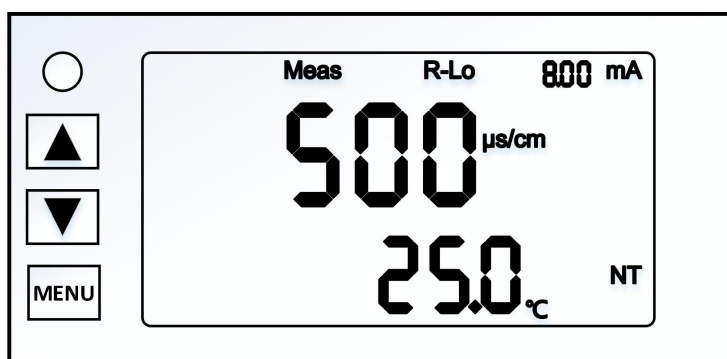


# Industrial on-line Conductivity/Resistance controller

## User manual



Note: Please read this manual carefully before use.

Thank you for purchasing our products. In order to continuously improve the functions of this controller, our company reserves the right to modify the content and icon display at any time. The actual display may differ from the operation manual, so the actual situation is subject to the machine. When using this controller, please follow the functions and installation methods described in the operation manual. The company is not responsible for any indirect or indirect loss or damage caused by any individual or entity due to improper use of this product. If you have any questions or find omissions or errors in the operation manual, please contact our sales staff.

## **Safety and precautions**

1. Please read this operation manual carefully before installation to avoid incorrect records causing safety problems and damage to the controller.
2. Please avoid high temperature, high humidity and corrosive environment to install this controller, and avoid direct sunlight.
3. Electrode signal transmission lines must use special coaxial wires. It is recommended to use the coaxial wires provided by our company instead of ordinary wires.
4. When using the power supply, avoid interference from the power supply, especially when using a three-phase power supply, you should use the ground wire correctly (if there is a power surge interference phenomenon, you can connect the power supply of the controller and the control device such as: dosing machine , The mixer and other power sources are separated, that is, the transmitter uses a separate power source).
5. The output contacts of this controller carry alarm and control functions. For safety and protection reasons, please be sure to connect a relay with sufficient current to carry it to protect the safety of the controller.

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## I. Overview

This type of industrial conductivity/resistance online controller is a new conductivity/resistance controller. This controller has a high degree of intelligence and flexibility. It can measure conductivity/resistance and temperature at the same time, and is widely used in urban sewage Continuous measurement of solution conductivity/resistance in treatment plants, water supply, chemical industry, and other industries.

### Function

1. Temperature compensation: PT1000, NTC10K or Manual.
2. 4-20MA output, isolation technology, strong anti-interference ability.
3. The high and low points of a group of relays can be switched at will, and the hysteresis can be adjusted freely to avoid frequent power on and off.

### Technical parameter

Measuring range: 0.05us/cm – 200ms/cm; 0.00 MΩ·cm~20.00 MΩ·cm

Accuracy:  $\pm 1\%$ FS.

Resolution: 0.01 us/cm; 0.01M

Temperature compensation: 0–100 °C manual/auto(PT1000/NTC10K).

Signal output: 4-20MA output, isolation technology; Max load is 500 Ω .

Alarm output: One set can correspond to high and low point alarm (3A/250 V AC) at will, normally open contact relay.

Power supply: AC220V or DC24V.

Power consumption:  $\leq 15$ W

Working conditions: (1) temperature 0~ 60 °C (2) humidity $\leq 85\%$ RH

Dimensions: 48×96×110mm (H×W×D)

Hole size: 42×90mm (H×W)

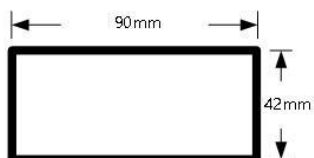
Protection: IP54

## II. Combination and installation

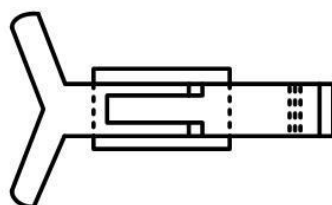
### 2.1 Host fixed

Please reserve a 42mm×90mm square hole on the panel of the control box first, and insert the controller directly from the panel of the control box, insert the holder attached to the controller from the rear, and snap it into the fixing slot, and fix the holders on both sides push forward to clamp.

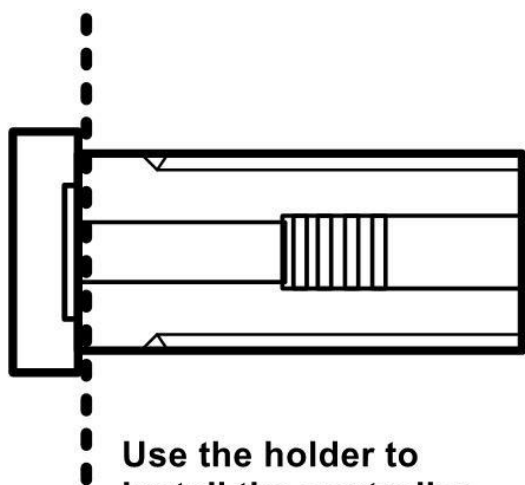
### 2.2 Dimension



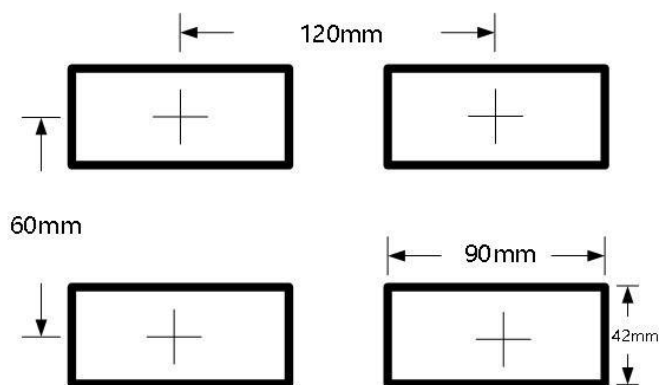
**Digging hole size**



**Holder**



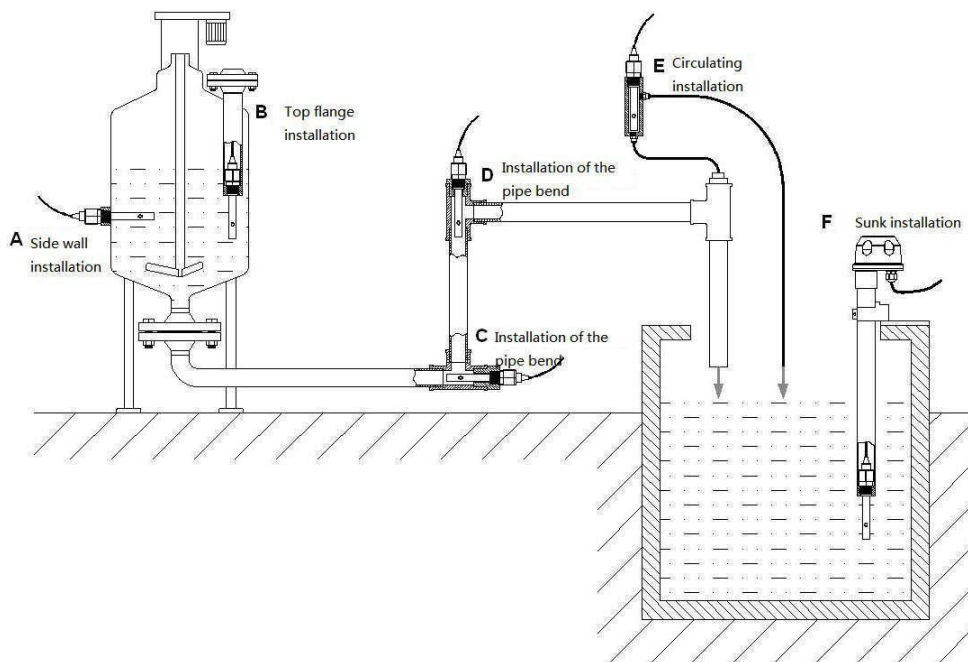
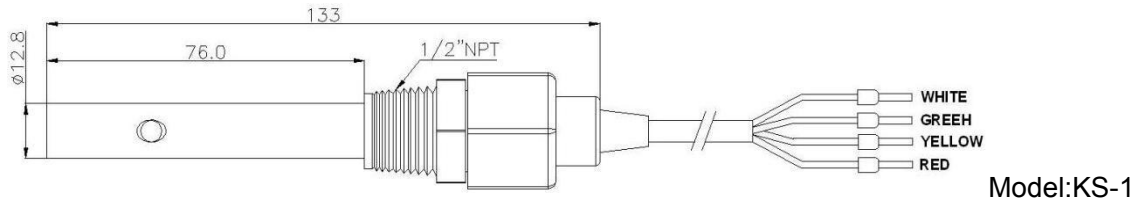
**Use the holder to install the controller**



**Control box hole interval**

## 2.3 Electrode installation

### 2.3.1 Installation

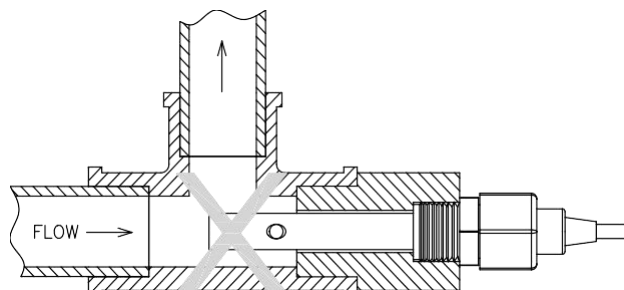


### 2.3.2 Common installation

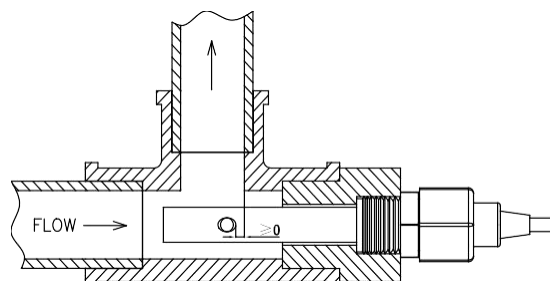
The installation of the sensor is a very careful work. The abnormal installation form cannot obtain satisfactory measurement data. Please choose the installation location carefully when installing the sensor to avoid distortion of the measurement data.

- 1) In picture A, the electrode connector is too long and the extended part is too short. It is easy to form a dead space in the sensor, causing measurement errors. It should be

installed as shown in picture B (deep in the direction of water flow).

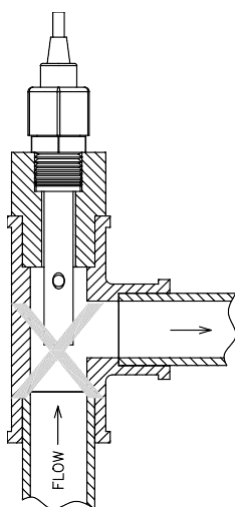


Picture A

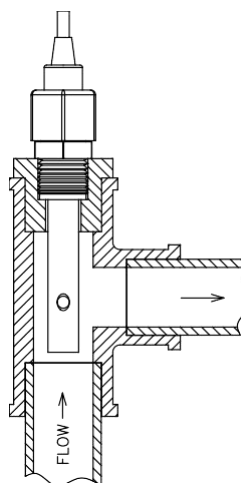


Picture B

2) The installation method in Pict A will cause the flow cell to form an air cavity and cause measurement errors. It should be installed according to Pict B.

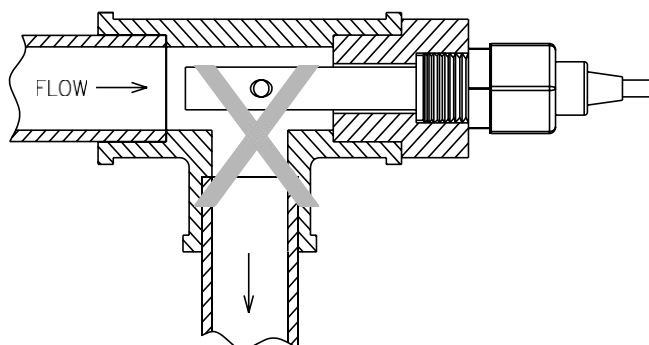


Picture A



Picture B

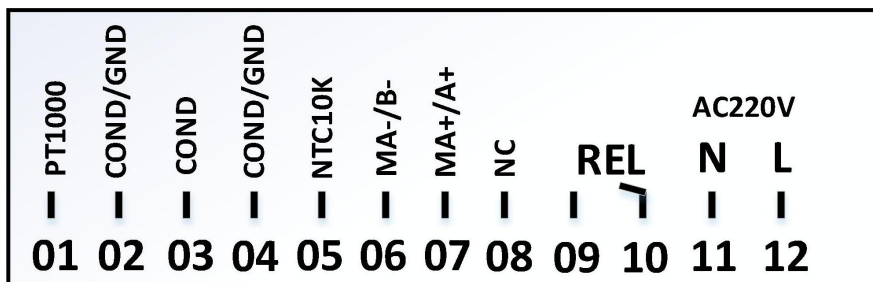
3) Other wrong installation.(Excessive bubbles and affect the reading)





### III. Electrodes and electrical wiring

#### 3.1 Back panel diagram and wiring instructions



- 01 PT1000:** temperature compensation PT1000  
**02 COND/GND:** Conductivity/resistance PT1000(GND)  
**03 COND:** Conductivity/resistance  
**04 COND/GND:** Conductivity/resistance NTC10K(GND)  
**05 NTC10K:** temperature compensation NTC10K  
**06 MA-/B-:** conductivity/resistance current output-/RS485 B  
**07 MA+/A+:** conductivity/resistance current output+/RS485 A  
**08 NC.**  
**09 REL:** alarm control, external relay  
**10 REL:** alarm control, external relay  
**11 N:** AC220V  
**12 L:** AC220V

**Noted: AC: 100~240VAC±10% 50/60Hz**

**DC: 12-24V**

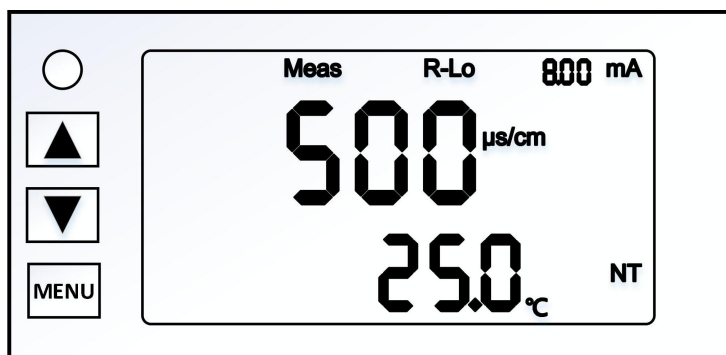
**Power consumption: ≤15W Relay:**

**240VAC, max current 0.5A Current**


**output: Max 500Ω**


## IV. Panel introduction


### 4.1 Panel introduction







### 4.2 Key description

 : Select the corresponding setting in the setting interface, and adjust the value in the calibration interface.

 : Select the corresponding setting in the setting interface, and adjust the value in the calibration interface.

 : Trigger the setting interface in the measurement mode, confirm to change the setting in the setting interface and enter the next menu.

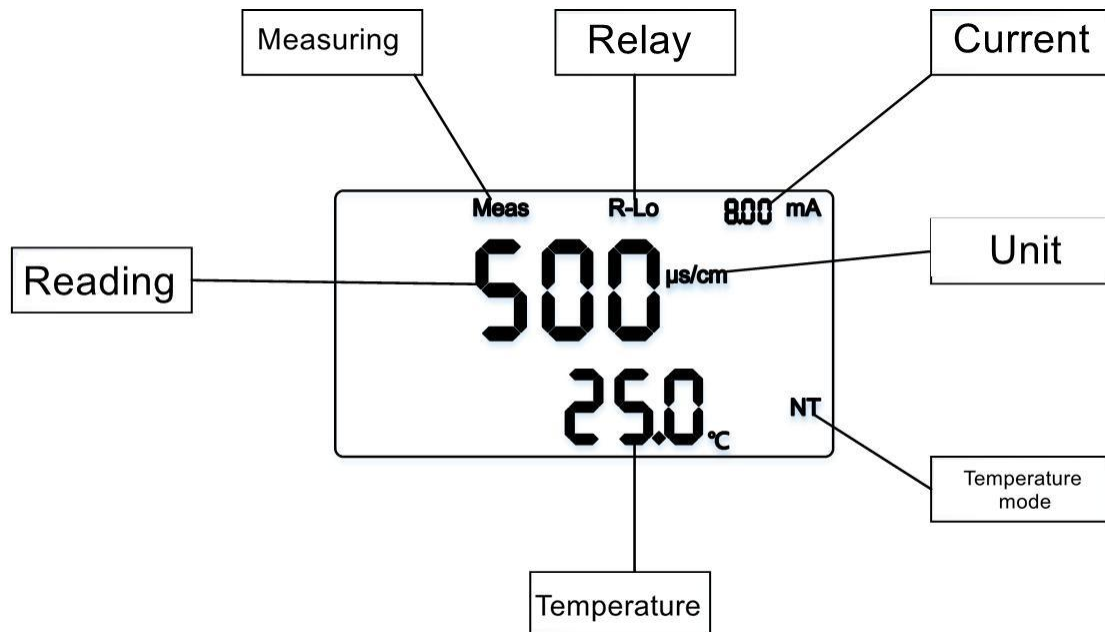
 +  : Press simultaneously in the measurement mode to directly enter the user calibration interface.

 +  : Press at the same time for more than 3 seconds in the measurement mode to restore the factory calibration

**MENU** + **▼** : Press at the same time in any mode to return to the measurement interface.

**MENU** + **▼** : Press at the same time for more than 3 seconds in any mode to restore factory settings.

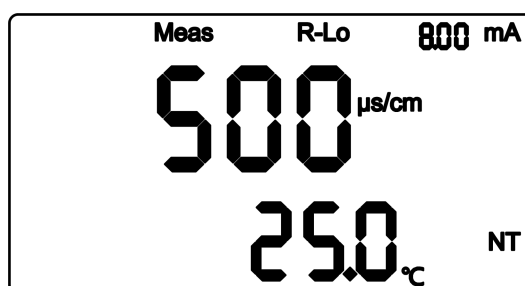
### 4.3 Display description



## V. Operating

### 5.1 Measuring

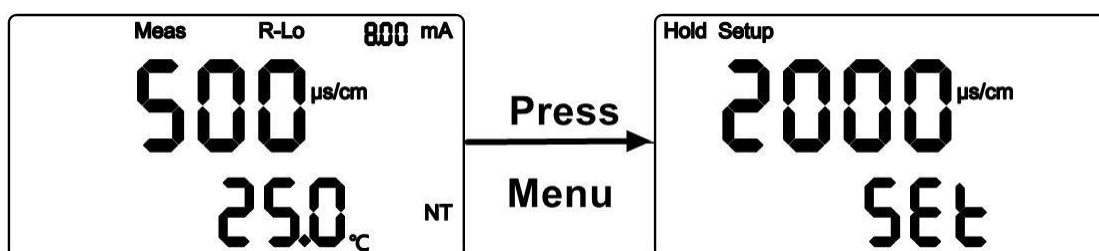
Confirm that all wiring has been completed and correct. After the controller is powered on, it will automatically enter the factory preset or last set measurement mode and start measurement monitoring.



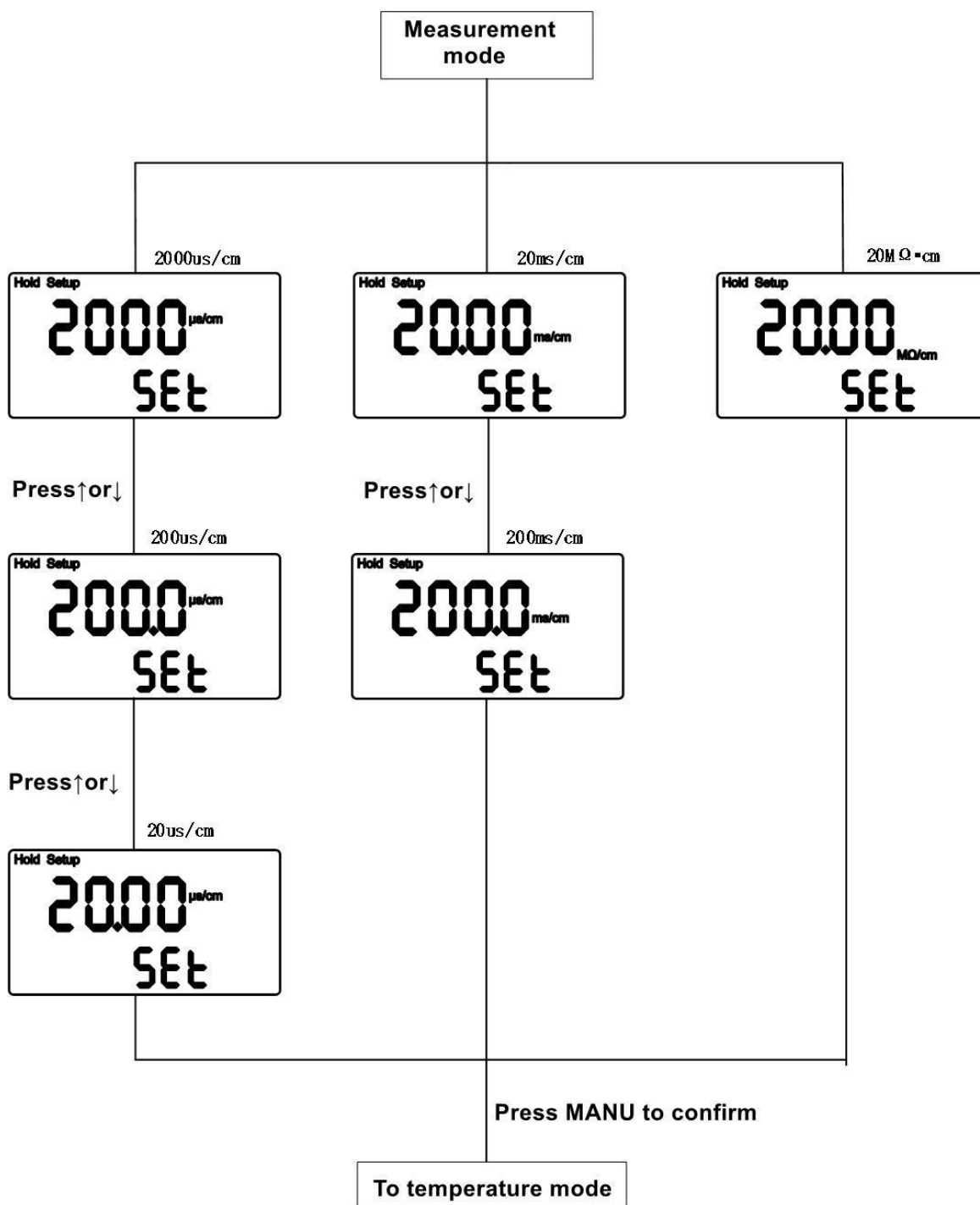
### 5.2 Parameter setting mode

In the measurement mode, press  key to enter the parameter setting model.

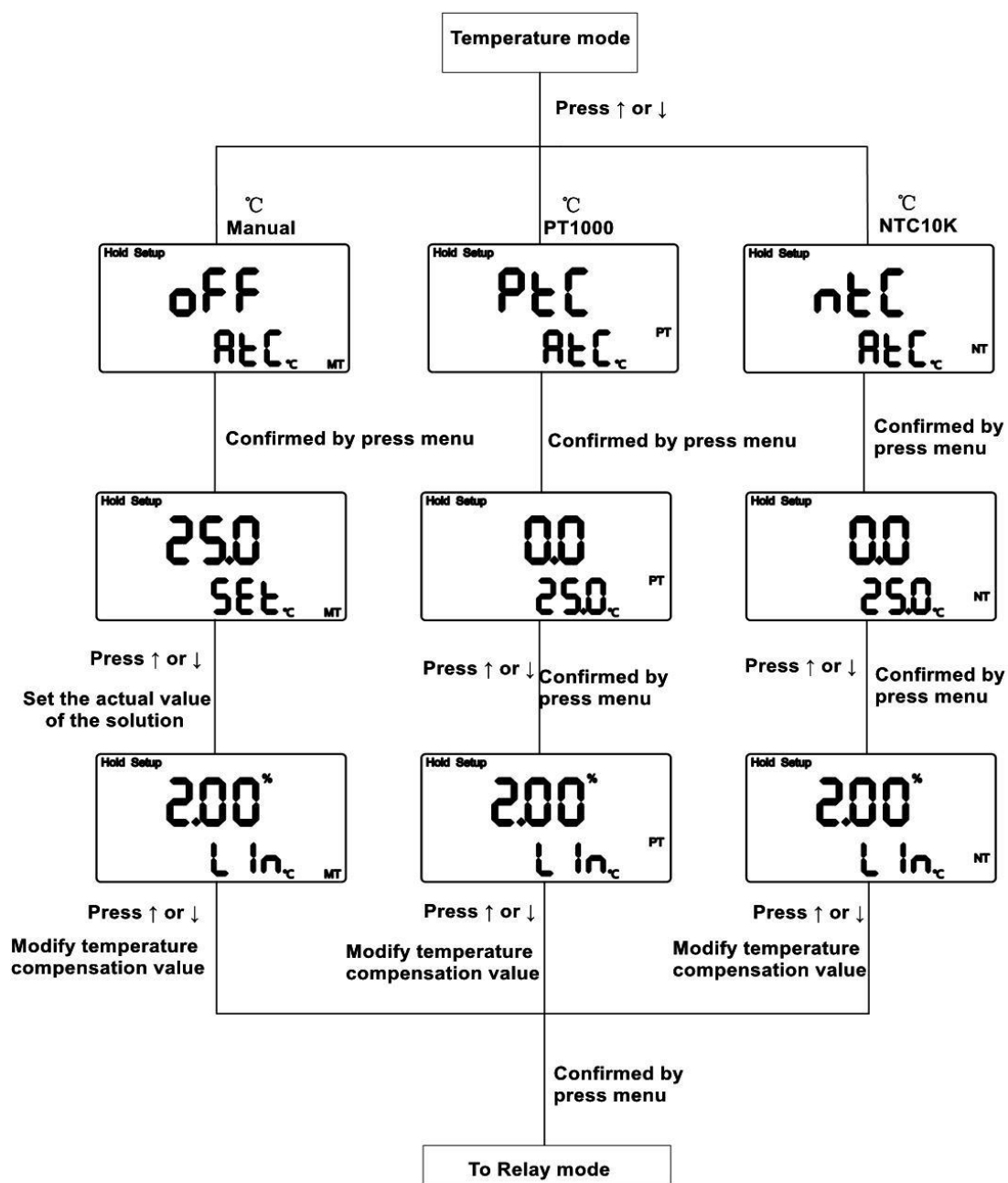
Process:



### 5.3 Measurement mode



## 5.4 Temperature mode



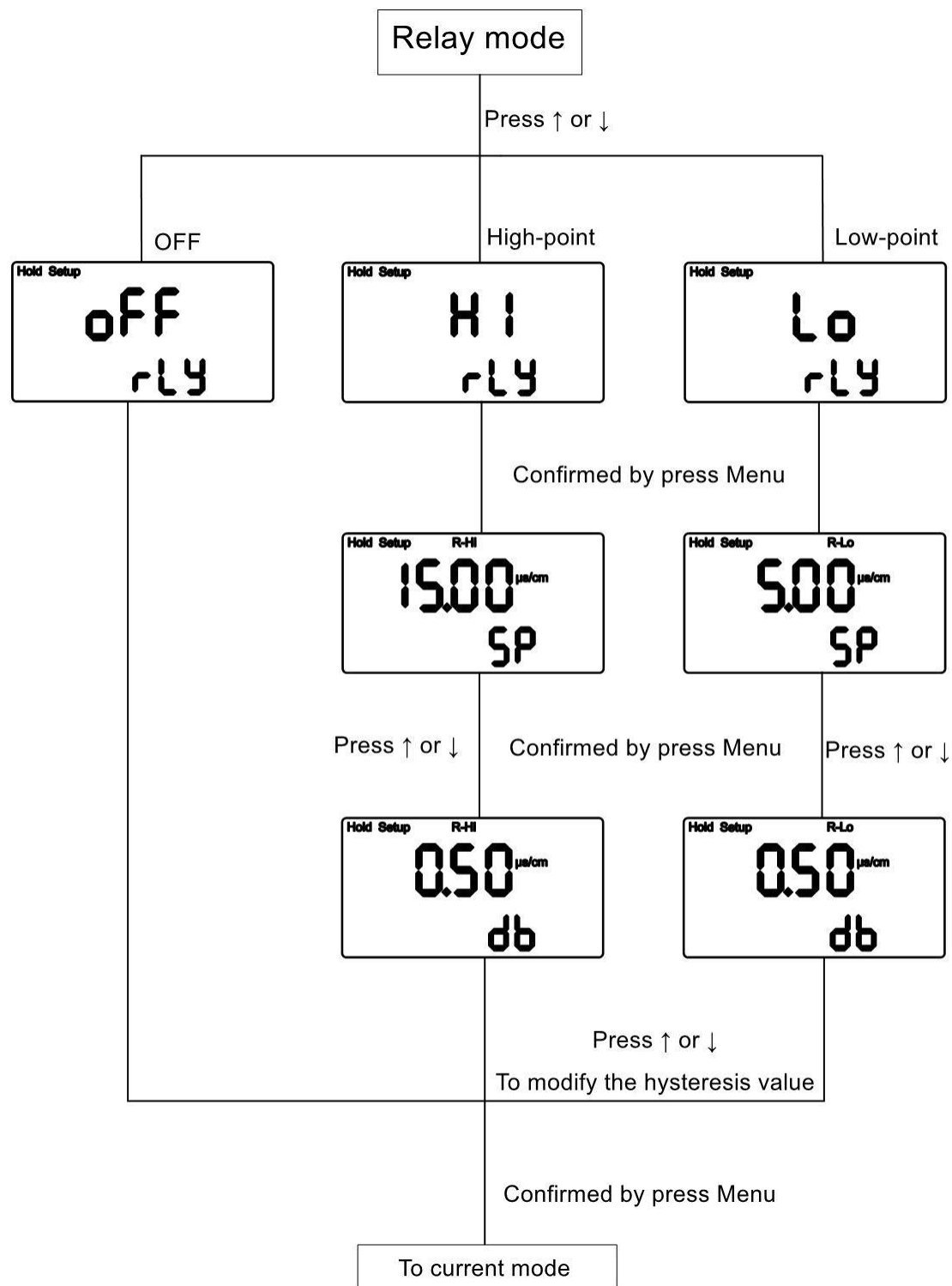
Noted: The Fahrenheit setting method is the same as the Celsius process.

The temperature compensation reference temperature of this controller is fixed at 25°C, and the calculation formula is:  $C_t = C_{25}\{1+\alpha(T-25)\}$

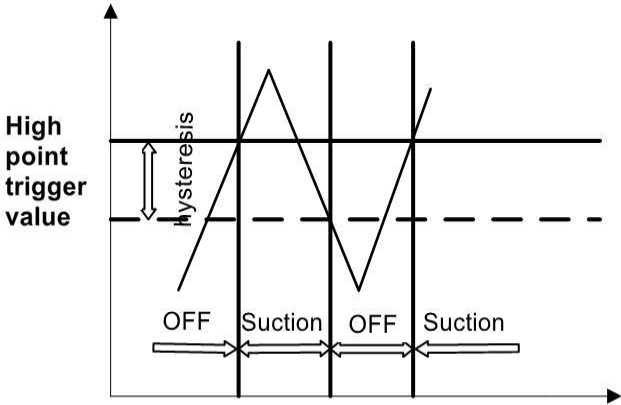
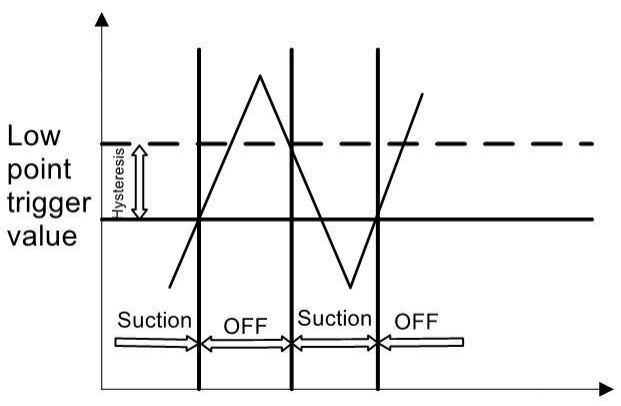
C<sub>25</sub>: The conductivity value at 25°C.      α: Temperature compensation coefficient

T: The temperature of the measured solution      C<sub>t</sub>: The temperature value at T°C

### 5.5 Relay mode

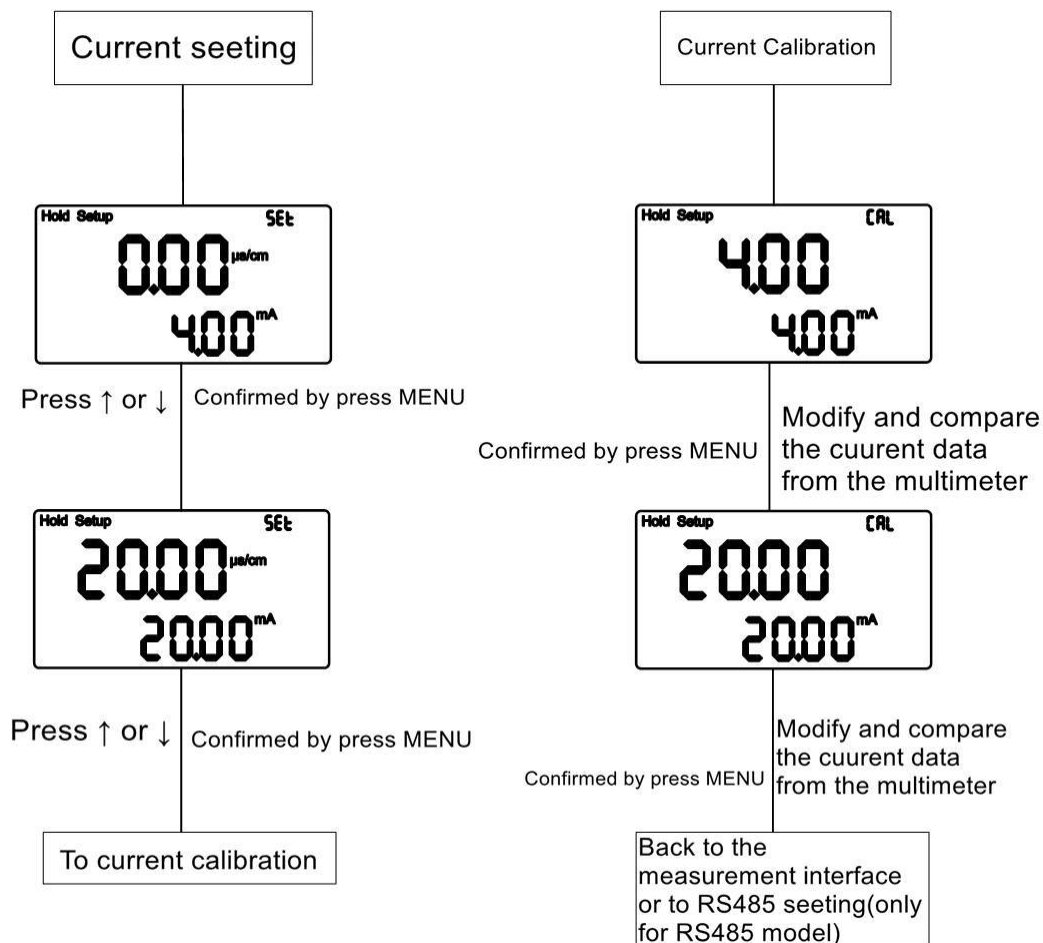


**Examples of relay settings:**

	<p><b>High point mode:</b>          Relay1 trigger value=1500us/cm          Relay1 hysteresis value=100us/cm          When the displayed value is higher than 1500us/cm, the relay is suction, and when the value is lower than 1400us/cm, the relay is off.          High point mode: Off value=trigger value- hysteresis value</p>
	<p><b>Low point mode:</b>          Relay1 trigger value=1000us/cm          Relay1 hysteresis value=100us/cm          When the displayed value is lower than 1000us/c, the relay is suction, and when the value is higher than 1100us/cm, the relay is off.          Low point mode, Off value= trigger value+hysteresis value</p>



## 5.6 Current setting and calibration



**Noted: The conductivity value and current value set by 4-20ma**

**correspond one-to-one, and the calculation formula is:**

$$\text{outMa} = (20.00 - 4.00) / (\text{endMa} - \text{startMa}) * (\text{hold} - \text{startMa}) + 4.00$$

**outMa: Output current value**

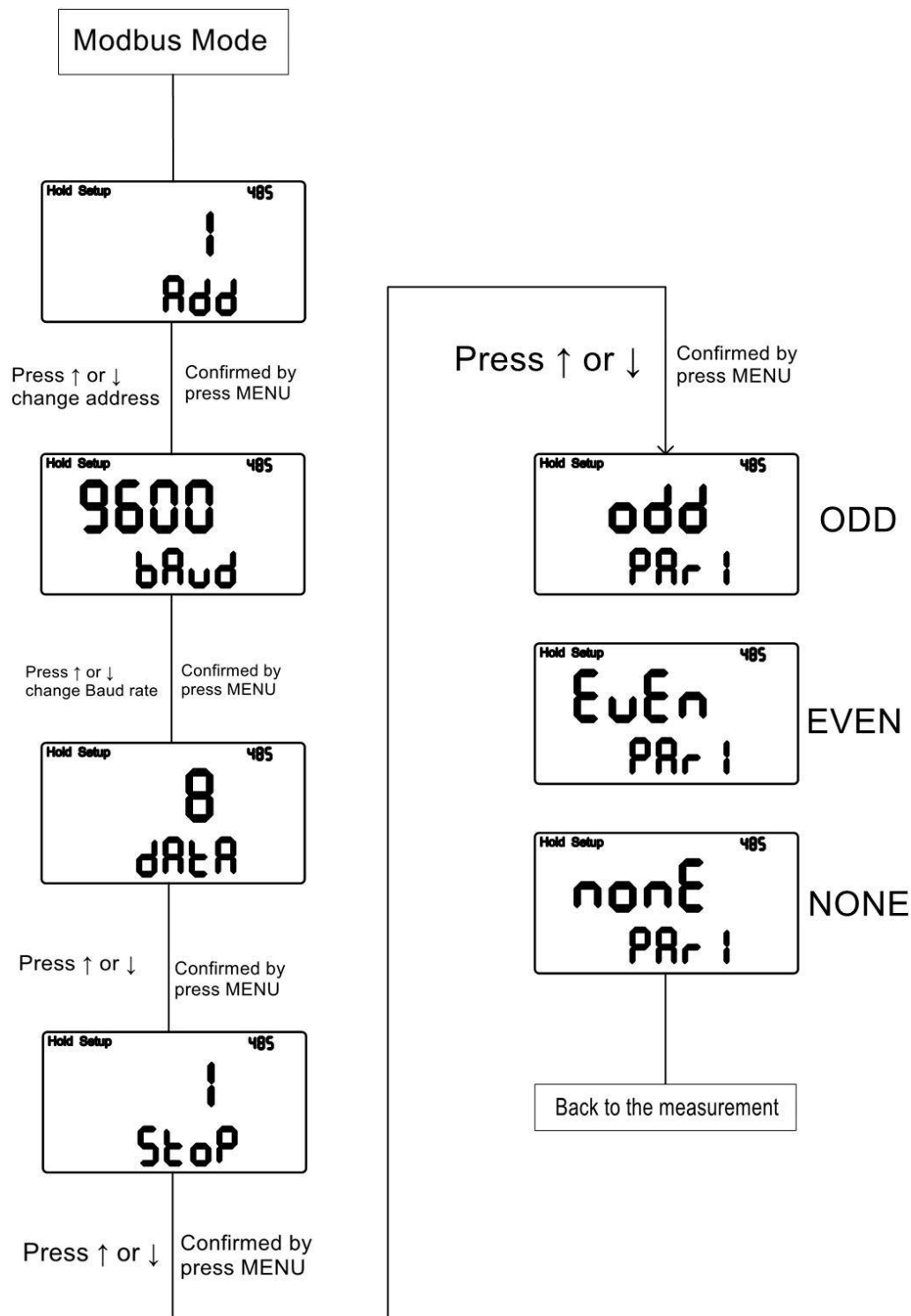
**startMa: 4mA conductivity value**

**endMa: 20mA conductivity value**

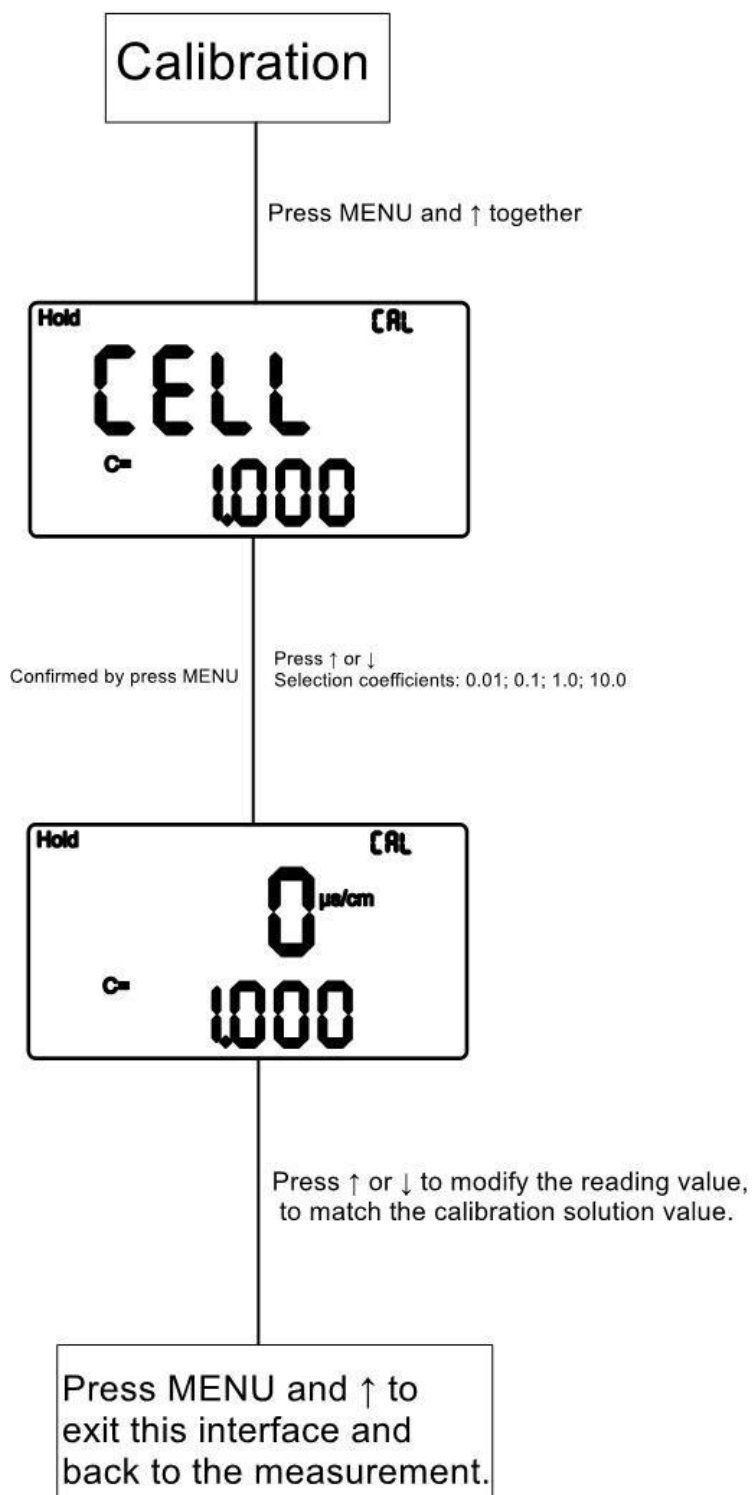
**hold: measuring value**

**For example: 4mA is 0.00us/cm, 20mA is 20.00 us/cm, when the conductivity is 10.00 us/cm, the current output is 12.00mA.**

### 5.7 Modbus 485 protocol (Only for RS485 model)



## VI. Calibration



## **VII. Maintenance**

- 1. The flow cell should be installed in the pipeline where the flow rate is stable and not easy to generate bubbles. It can be installed in a bypass mode to avoid inaccurate measurement.**
- 2. The concentric tubular electrode should be installed with its front end facing the direction of water flow and deep into the flowing water body for flat, oblique or vertical installation; electrodes with other structural shapes prevent the evacuation pressure caused by turbulence in the measurement chamber during lateral installation Cause measurement data disorder.**
- 3. The measurement signal is a weak electrical signal. The collection cable must be routed independently. It is forbidden to connect with the power line and control line in the same set of cable connectors or terminal boards. It is forbidden to pass through and bind the power and control lines together to avoid interference with the measurement or damage Time breakdown of the instrument measuring unit.**
- 4. The electrode cable is a standard fixed length and special cable before leaving the factory. When the measuring cable needs to be extended, please make an agreement with the manufacturer before delivery.**
- 5. Please keep the electrode measuring part clean during installation. Do not directly touch the surface with your hands or dirty objects. After contact with oil, grease, and glue, accurate values cannot be measured for a long time.**

6. The flow cell is a precision measurement component. It cannot be decomposed. The shape and size of the electrode cannot be changed. It cannot be cleaned with strong acid or alkali, soaked and mechanically scratched. These operations will cause the electrode constant to change and affect the measurement accuracy of the system.
  
7. The measurement cable is a dedicated cable, and cables of other specifications cannot be replaced at will. Any unauthorized changes or modifications that do not meet the requirements will cause measurement errors.
  
8. The controller is assembled with precision integrated circuits and electronic components. Do not install it in direct sunlight. It should be placed in a dry environment or in a control box to avoid meter leakage or measurement errors caused by water droplets or moisture.
  
9. To ensure the safety of installation and operation, turn on the power after the installation is completed and checked.