Water EC Sensor Introduce

Type NO.: RD-ET-SOR

1. Product Introduce

The RD-ET-SOR series water quality sensor is a new generation of intelligent water quality sensor independently developed by our company. It has high stability, excellent repeatability and high measurement accuracy. It can accurately measure EC value with RS485, 0～2V, 0～2.5V, 0～5V, 0～10V analog voltage output, 4~20mA analog current output.

2. Product Features

1. A variety of electrodes are available (0.1; 1.0; 10.0), the measurement is more accurate and reliable

2. Cost-effective, suitable for large-scale promotion

3. Digital linearization correction, high precision, high stability

4. Flexible installation, easy to use

5. Can be made into a variety of shapes to facilitate the needs of different customers

3. Product application

It is widely used in online monitoring of Salinity in environmental protection, sewage treatment, thermal power, aquaculture, food processing, metallurgy, chemical, tap water, printing and dyeing, papermaking, pharmaceutical, fermentation, electroplating and other fields.

4. Product Parameter

(1) Technical Parameters

➢ Measure range

- EC : 0～10000us/cm(Other ranges can be customized)

➢ Measurement accuracy

- EC: ±1% FS

➢ Measure resolution

- EC: 0.1us/cm

➢ Automatic temperature compensation: 0～60 ° C

➢ Output:

- Voltage signal (0~2V, 0~2.5V, 0~5V, 0~10V, one of four)

- 4 to 20 mA (current loop)

- RS485 (standard Modbus-RTU protocol, device default address: 01)

- Supply voltage:

- 5~24V DC (when the output signal is 0~2V, 0~2.5V, RS485)

- 12~24V DC (when the output signal is 0~5V, 0~10V, 4~20mA)

- Working environment: temperature 0 ~ 60 ° C; humidity ≤ 85% RH

- Power consumption: ≤0.5W

- Impedance requirements for current signals

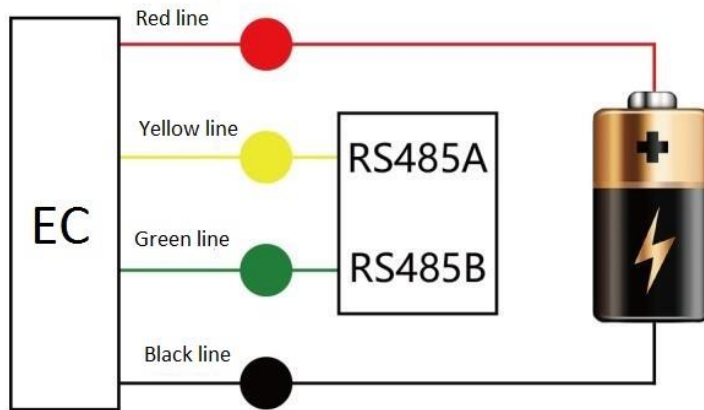| Supply voltage	9V	12V	20V	24V
Maximum impedance	125Ω	250Ω	500Ω	>500Ω

5. Product size
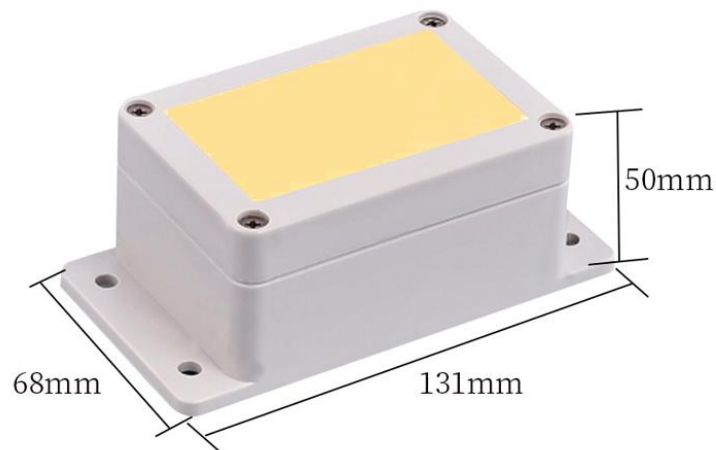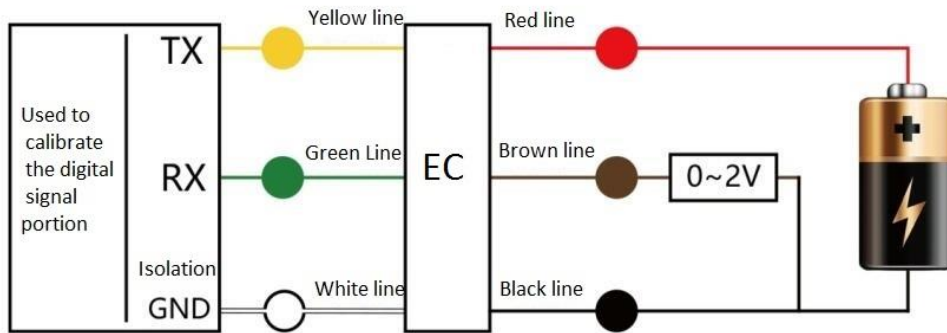
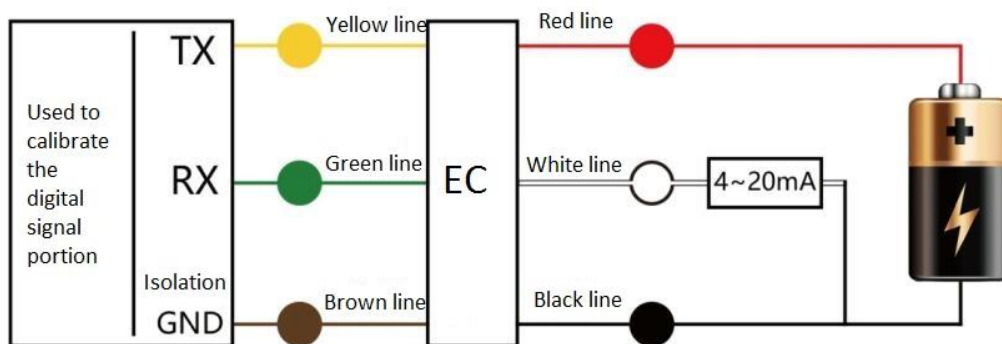

- Electrode

Stainless steel electrode

6. Line connection diagram

(RS485)

(0~2V、0~5V、0~10V)

(4~20mA)

7. Electrode installation method

1. Install types
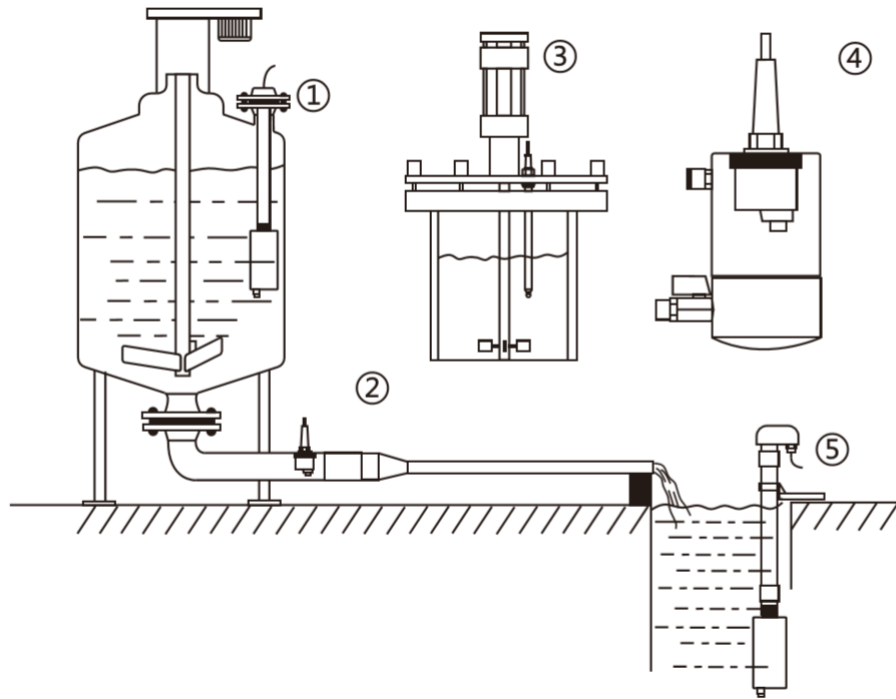
① Top flange mounting

② Pipeline installation

③ Top-plug installation

④ Flow-through installation

⑤ Submerged installation

2. Several common installation methods of electrode

When installing the sensor on site, it should be installed strictly in the correct way in the

following picture. Incorrect installation will cause data deviation.

A. Several common wrong installation methods

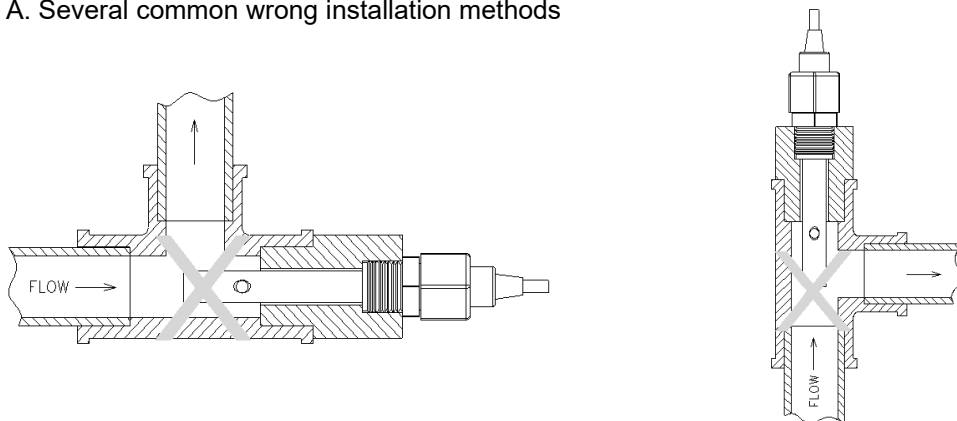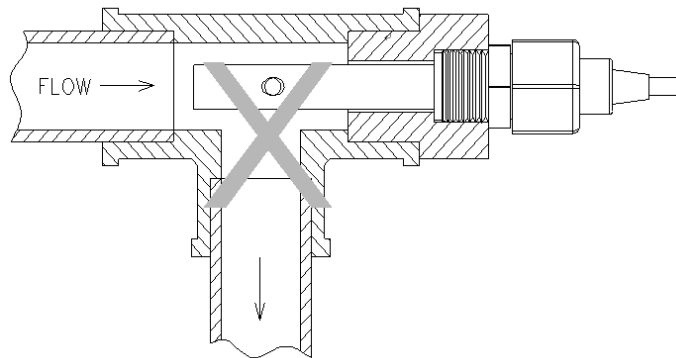The cause of the error: the electrode connector is too long, the extension part is too short,

and a dead cavity is easily formed in the sensor, causing measurement error.

Cause of error: may cause measurement error or instability due to water flow cannot

guarantee full pipe or gas accumulation in high place

B. The correct installation method
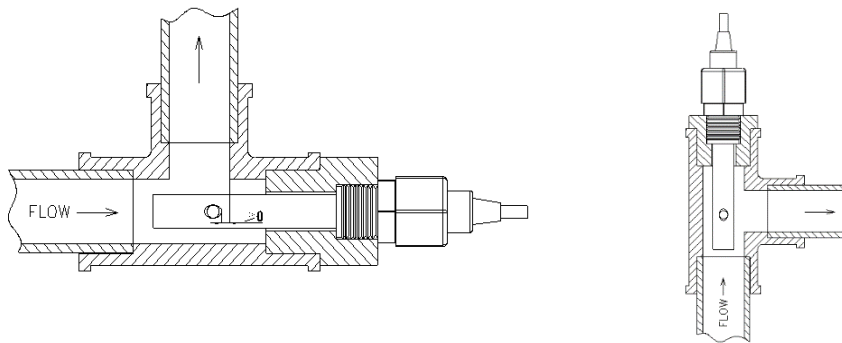
8. Data conversion method

(1) The water quality salinity sensor has good linear characteristics. The following is a typical

calibration formula.

V: voltage value collected by the collector, unit: V;

A: Current value collected by the collector, unit: mA

E: EC

output signal	Salinity conversion method		
	0 ~ 200uS/cm	0 ~ 2000uS/cm	0 ~ 20000uS/cm
0 ~ 2V DC	E = 100*V	E = 1000*V	E = 10000*V
0 ~ 5V DC	E = 40*V	E = 400*V	E = 4000*V
0 ~ 10V DC	E = 20*V	E = 200*V	E = 2000*V
4 ~ 20mA	E = 12.5*A − 50	E = 125*A − 500	E = 1250*A − 5000

(2) RS485 signal (default address 01):

Standard Modbus-RTU protocol, baud rate: 9600; check digit: none; data bit: 8; stop bit: 1

➢ Modify the address, for example: change the address of the transmitter with address 1 to

2, host → slave

Original address	Function code	Reserved 1	Reserved 2	Reserved 3	new address	CRC16 low	CRC16 high
0X01	0X06	0X00	0X00	0X00	0X02	0X08	0X0B

If the transmitter receives correctly, return the following data, slave → host

Original address	Function code	Data length	Reserved 1	new address	CRC16 low	CRC16 high
0X01	0X06	0X02	0X00	0X02	0X39	0X49

Remark: If you forget the original address of the sensor, you can use the broadcast address

0XFE instead. When using 0XFE, the host can only be connected to one slave, and the return

address is still the original address, which can be used as the address query method.

➢ Query data

Query the data of the transmitter (address 1) (EC), host → slave

Address	Function code	Start register address high	Start register address low	Register length high	Register length low	CRC16 low	CRC16 high
0X01	0X03	0X00	0X00	0X00	0X01	0X84	0X0A

If the transmitter receives correctly, return the following data, slave → host

Address	Function code	Data lenght	Register 0 data	CRC16 low	CRC16 high
0X01	0X03	0X04	0X02	0XD8	0X99
			0XAE		
			EC		

Data representation method:

A. EC

Convert the returned data to decimal data

The above data indicates that EC: 686uS/cm

➢ Make the linear calibration of the electrode constant

(1) Check the present electrode constant

Address	Function code	Start register address high	Start register address low	Data length high	Data length low	CRC16 low	CRC16 high
0X01	0X03	0X00	0X53	0X00	0X01	0X74	0X1B

If the transmitter receives correctly, return the following data, slave → host

Address	Function code	Start register address high	Start register address low	Electrode constant high	Electrode constant low	CRC16 low	CRC16 high
0X01	0X03	0X00	0X53	0X03	0XE8	0XB5	0X65

So the present electrode constant is 03E8(HEX)=100(Decimal)/100=1.0

(2) Change the electrode constant

The default is 03 E8, that means the electrode constant is 1.00, if want to change the present

EC values into 998, so need change the electrode constant in 03 E6, the instruction as

following:

Address	Function code	Start register address high	Start register address low	Electrode constant high	Electrode constant low	CRC16 low	CRC16 high
0X01	0X06	0X00	0X53	0X03	0XE6	0XF8	0XA1

If success, will return: 01 06 00 53 03 E6 F8 A1.

If the electrode constant change into the 0.98 times, and the EC TDS salinity will also change

into 0.98 times.

9. Precautions for use

1. Please observe the operating procedures and precautions of this manual when using.

2. The Salinity cell should be installed in the pipeline with stable flow rate and not easy to generate bubbles. It can be installed by bypass.

In order to avoid inaccurate measurement.

3. Concentric tubular electrodes should be installed in the FLOW direction, such as flat, diagonal or vertical installation. And deep into the flowing water body; other structurally shaped electrodes prevent sparse flow in the measuring chamber due to turbulence during lateral installation. The air pressure caused the measurement data to be disordered.

4.The measurement signal is a weak electrical signal, and the acquisition cable must be independently routed. It is forbidden to connect with the power line and control line.

Connected to the same set of cable joints or terminal blocks, it is forbidden to wear pipes and bundles together with the power and control lines to avoid interference. Break down the meter measurement unit during measurement or breakage.

5.The cable of the electrode before leaving the factory is a standard fixed length and is a special cable. When the measuring cable needs to be lengthened, please supply before delivery. As agreed with the manufacturer.

6.Please keep the electrode measurement part clean during installation. Do not touch the surface directly with hands or dirty objects.

Accurate values cannot be measured for a long time after stains and greases or gels.

7.The Salinity cell is a precision measuring component, can not be decomposed, can not change the shape and size of the electrode, nor can be used strong

Acid, alkali cleaning, soaking and mechanical scraping, these operations will lead to changes in the electrode constant, affecting the system's measurement volume accuracy.

8.The measuring cable is a special cable. It is not allowed to replace cables of other specifications at will, and all the cables are not changed according to the requirements.

Connections and changes can cause measurement errors.

9.The instrument is assembled with precision integrated circuits and electronic components.

Do not install it in direct sunlight.In a dry environment or in a control box, avoid leakage or

measurement errors caused by water droplets or moisture.

10.In order to ensure the safety of the installation operation, turn on the power after the

installation is checked.