1.Technical parameter

Measuring range	1...2000μS/cm
Resolution	±1 μS
Temp. measure range	0.0...60.0℃,0.0...80℃
Temp. compensation	Automatic/Manual
Output signal	RS485;4...20mA
Power supply	DC9-30V(Recommend 12V)
Pressure range	0...4bar
Shell material	PC ,PBT
Thread	M39*1.5,NPT3/4
Cable length	5m or customize
Protection grade	Ip68

M12 connector

signal line

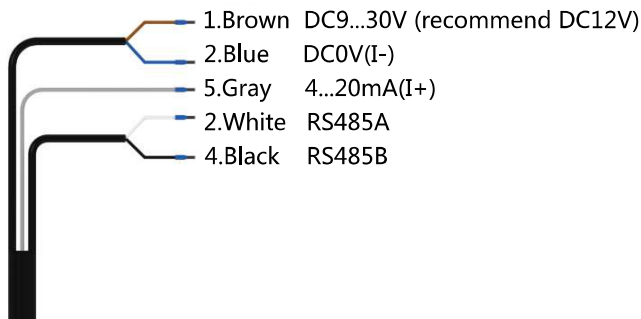**signal line**

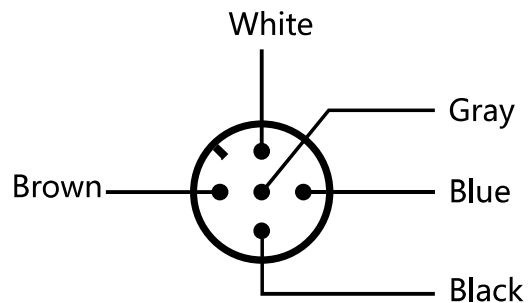RMD-ISEC2M12   RMD-ISEC205   RMD-ISEP105
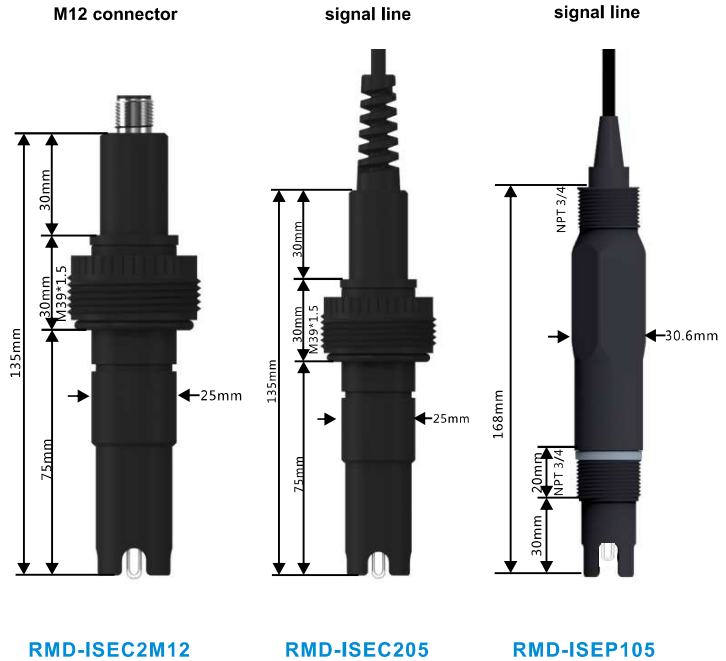
2.Before use

2.1 Please read this instruction carefully before use.

2.2 The EC electrode needs to be dried before storage. Do not store the electrode in distilled or deionized water.

2.3 In the measurement process, if there is dirt, adhesive or scale on the electrode , the measured value will not be accurate or fluctuate. It should be cleaned and calibrated in time.

3.Electrode wiring

3.1 Please follow the instructions carefully and the wrong wiring will result in complete damage to the product.

3.2 It is forbidden to send power before all cable connections are completed, so as to avoid danger. Please carefully check all the wiring of the system before sending power, and confirm that it is completely correct before sending power.

1.Brown   DC9...30V (recommend DC12V)
2.Blue   DC0V(I-)
5.Gray   4...20mA(I+)
2.White   RS485A
4.Black   RS485B

Electrode outlet

White

Gray

Brown

Blue

Black

M12 connector

4.Electrode calibration

4.1 The instrument has been calibrated before shipment, and the user can directly use it.
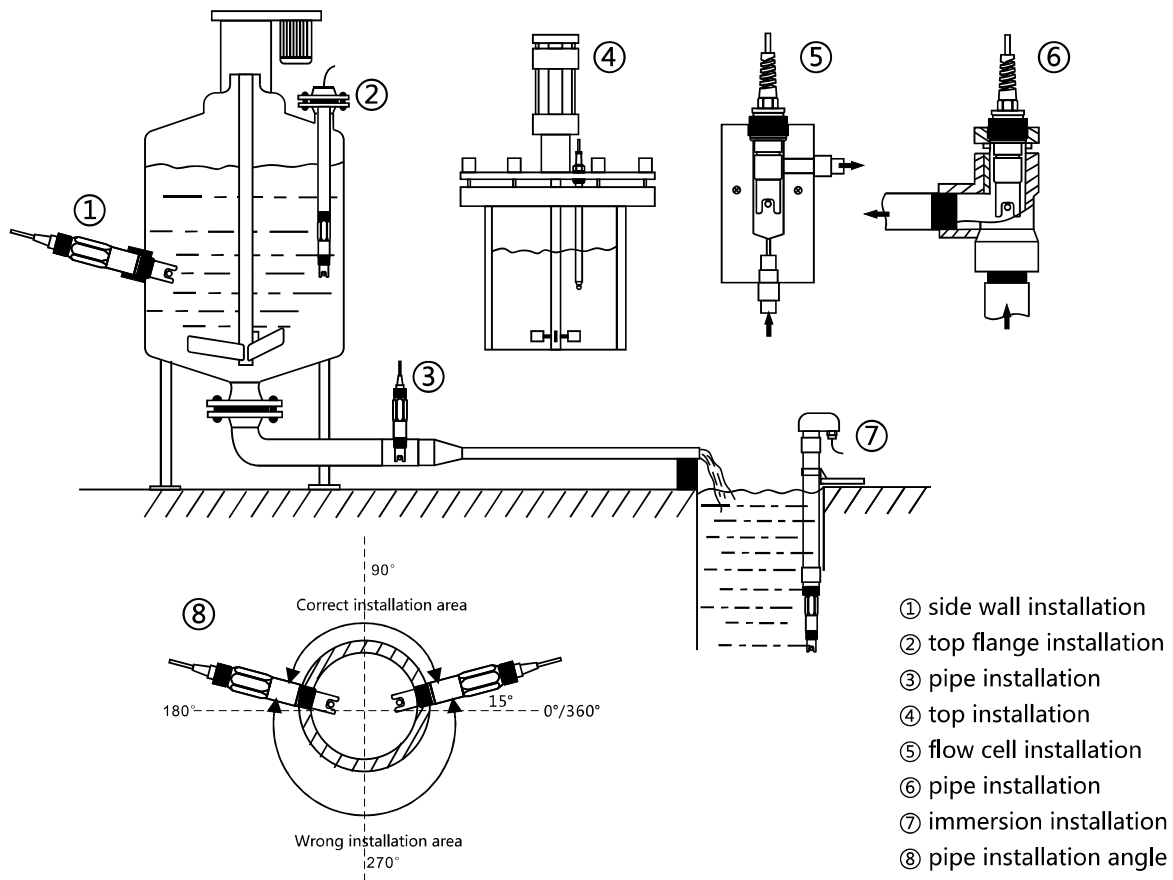
4.2 In order to ensure the measurement accuracy of the conductivity meter, the electrode constant is re-calibrated before use. At the same time, the conductivity electrode constant should be calibrated regularly. If the error is large, the conductivity electrode should be replaced in time.

4.3 Users are recommended to calibrate every 1 to 2 months.

5.Electrode installation

5.1 Conductivity electrode is recommended to be installed in the flow cell for more stable and accurate measurement.

5.2 Installation method

① side wall installation
② top flange installation
③ pipe installation
④ top installation
⑤ flow cell installation
⑥ pipe installation
⑦ immersion installation
⑧ pipe installation angle

Immersion installation requires attention:

1. This kind of installation is prone to scale formation during the measurement process and needs to be cleaned regularly.

2. Measurement is uneven.

3. Different insertion depths will affect the measured value.

4. The position of the probe must be above the sediment.

6.Electrode communication

6.1 Address description

Name	Hosting number	Data type	Length	Read/write	Description
Conductivity value	0X 00 00	Float	2	read	The default unit is mS/cm. If it needs to be converted to uS/cm, multiply by 1000
Resistivity value	0X 00 02	Float	2	read	Ω·cm
Temperature	0X 00 04	Float	2	read	℃
TDS	0X 00 06	Float	2	read/write	ppm or mg/L
Salinity	0X 00 08	Float	2	read/write	ppm or mg/L
Conductivity constant	0X 00 0A	Float	2	read/write	
Compensation coefficient	0X 00 0C	Float	2	read/write	
Manual compensation temperature	0X 00 0E	Float	2	read/write	
Temperature offset	0X 00 10	Float	2	read/write	
Baud rate	0X 00 12	Float	2	read	
Slave address	0X 00 14	Float	2	read	
Filtered seconds	0X 00 16	Float	2	read	
Electrode sensitivity	0X 00 18	Float	2	read	
Compensation mode	0X 00 1A	Float	2	read	
Model. Compensation type	0X 00 1C	Float	2	read	950.0-PT1000, 950.1-NTC10K
Software version	0X 00 1E	Float	2	read	
4-20mA high point value	0X 00 20	Float	2	read	
High range resistivity	0X 00 22	Float	2	read	
Acquisition cycle	0X 00 24	Float	2	read	
Operating mode	0X 00 26	Float	2	read	
Modify baud rate	0X 00 12	Integer	1	write	2400,4800,9600,19200 38400,43000,57600
Modify slave address	0X 00 14	Integer	1	write	1-254
Modify filter seconds	0X 00 16	Integer	1	write	Second value
Modify compensation mode	0X 00 1A	Integer	1	write	0: automatic, 1: manual
Adjust float order	0X 00 32	Integer	1	write	0 : positive, 1: negative
Modify temperature compensation type	0X 00 33	Integer	1	write	0: PT1000, 1: NTC10K
Restore default	0X 00 64	Integer	1	write	1
Restore baud rate and address	0X 27 0F	Integer	1	write	1
Modify 4-20mA high point value	0X 00 12	Float	2	write	
Modify high range resistivity	0X 00 14	Float	2	write	
Modify the sensor acquisition cycle	0X 00 16	Float	2	write	300-30000ms
Modify operating mode	0X 00 28	Integer	1	write	0 : Periodic acquisition; 1 : Trigger acquisition
Modify 4-20mA coefficient	0X 00 20	Float	2	write	

6.2 Communication description (factory default):

factory default	
baud rate	9600
data bit	8
stop bit	1
check bit	no
address	1 (default)

6.3 Host computer transmission format

	ID address	Function	Data address		Data Qty		CRC16	
	Slave ID	Function	Address_H	Address_L	Quantity_H	Quantity_L	CRC_L	CRC_H
Length	1byte	1byte	1byte	1byte	2byte	2byte	1byte	1byte
Example 1 Read conductivity value	0X 01	0X 03	0X 00	0X 00	0X 00	0X 02	0X C4	0X 0B
Example 2 Read resistivity value	0X 01	0X 03	0X 00	0X 02	0X 00	0X 02	0X 65	0X CB
Example 3 Read temperature value	0X 01	0X 03	0X 00	0X 04	0X 00	0X 02	0X 85	0X CA
Example 4 Read TDS value	0X 01	0X 03	0X 00	0X 06	0X 00	0X 02	0X 24	0X 0A
Example 5 Read salinity value	0X 01	0X 03	0X 00	0X 08	0X 00	0X 02	0X 45	0X C9

6.4 Slave computer response format

	ID address	Function	Data Qty	Data content		CRC16	
	Slave ID	Function	Quantity	Data_H	Data_L	CRC_L	CRC_H
Length	1byte	1byte	1byte	2byte	2byte	1byte	1byte
Example 1 Conductivity value return	0X 01	0X 03	0X 04	0X 3E 95	0X 89 C7	0X C1	0X F5
Example 2 Resistivity value return	0X 01	0X 03	0X 04	0X 45 7B	0X 35 1D	0X 48	0X 7F
Example 3 Temperature value return	0X 01	0X 03	0X 04	0X 41 8C	0X BD E0	0X 5F	0X 3C
Example 4 TDS value return	0X 01	0X 03	0X 04	0X 43 12	0X 08 8C	0X 49	0X D7
Example 5 Salinity value return	0X 01	0X 03	0X 04	0X 43 12	0X 08 8C	0X 49	0X D7

Note: 1. Data starting at 0x represents hexadecimal

2. The check code is 16CRC, the low byte is in the front and the high byte is in the back.

3. Floating point occupy four bytes

4. Converts the data content conductivity return value 3E 95 89 C7 to floating point 0.292;

Resistivity return value 45 7B 35 1D, converted to floating point is 4019.3;

Temperature return value 41 8C BD E0, converted to floating point is 17.592;

TDS return value 43 12 08 8C, converted to floating point is 146.03;

Salinity return value 43 12 08 8C, converted to floating point is 146.03.

7.Maintenance, care and storage

7.1 The organic dirt on the electrode can be cleaned with warm water containing detergent or alcohol. After cleaning the electrode, only soft tissue can be used to absorb water.

7.2 When the electrode is stored, it shall be dried and stored after drying.

7.3 Cable connector must be kept clean and free of moisture or water.

8.Troubleshooting

8.1 When the measurement is inaccurate, the failure rate of the general instrument is low, mainly because the EC electrode has changed, so it is necessary to check whether the EC electrode is in good condition. And EC electrode is not easy to damage, generally the bubble damage, scaling, reference poisoning, plug, and so on, should be timely maintenance or replacement.

8.2 If the value of the instrument is too large, too small or no change, Check whether the electrode is in good condition with the instrument connection line or joint.

8.3 Modbus troubleshooting:

Problem	Possible reason	Solution
Modbus no response	The baud rate, or stop bit does not match the Modbus master settings	Verify that the settings match the Modbus master device settings, and verify that the Modbus master device parity check is set to None
	Rs232 or RS485 cable is faulty	Replace/repair cables
	No network offsets and terminations, or network offsets and terminations are not suitable.	Check the termination or offset Settings for all network devices. Only the endpoints of the network should be turned on and terminated, and there should be only a point on the network to provide an offset.
	The slave address is incorrect, or the slave address is the same as the address of another bus device	Verify that all addresses are unique and are between 1 and 247.
Modbus abnormal response	Register not supported	Verify that the register is supported
	Incorrect data type	Verify that the requested register data type matches the Modbus master device request; for example, you cannot access a floating point data using 2-byte integer data. When a floating point data (2 registers / 4 bytes) is requested, two registers must be requested at the same time.