KDM-202 Series Conductivity (Salinity) Transmitter User Manual

Catalog

1. Equipment Application Environment

● Pure water / drinking water / surface water / various water supply / industrial wastewater treatment

● A variety of signal output: 4-20mA (2-wire analog signal), RS485 (Modbus / RTU digital signal).

● Easy to connect to PLC, DCS, industrial control computer, general controller, paperless recording instrument or touch screen and other third party equipment.

● The electrode can use a variety of connectors, including gold-plated VP connector, BNC connector and so on. It is easy to change the electrode by screwing.

● Easy to install: 3/4-inch NPT thread (pipe thread), easy to install in the pipeline and tank. The probe and display section can be separated and connected by a cable.

● IP65 / IP68 degree of protection.

2. Technical Parameters, Functions, Specifications

2.1. Technical Parameters

Model	KDM-202 KDM-203
Measurement Range	0.01μS/cm～600mS/cm or 0～100PSU Range can be customized according to customer needs.
Resolution	0.1mS/cm or 0.1PSU
Accuracy	±1.5%F.S.
Operating temperature	0～65℃
Working pressure	＜0.6MPa

Power Supply	KDM-202：12VDC～24VDC ±10% KDM-203：24VDC ±10%
Output Mode	KDM-202：Rs485(Modbus/RTU) KDM-203 ： 4 ～ 20mA(Two-wire isolated signal)
Wetted material	PP(default）/PPS/PVC(customizable）
Installation	3/4 "NPT thread, immersion mounting
Cable Length	5m, other length can be customized
Display method	KDM-202：No display KDM-203：4 LED display
Temperature compensation	Automatic temperature compensation (PT1000)
Calibration method	Two-point calibration
Degree of protection	IP68/IP65

2.2. Size chart

DDM-202:
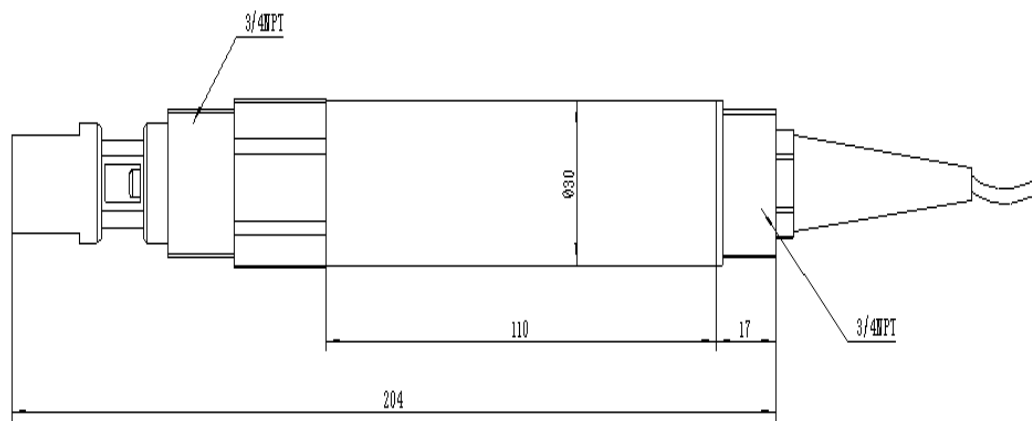
DDM-203:
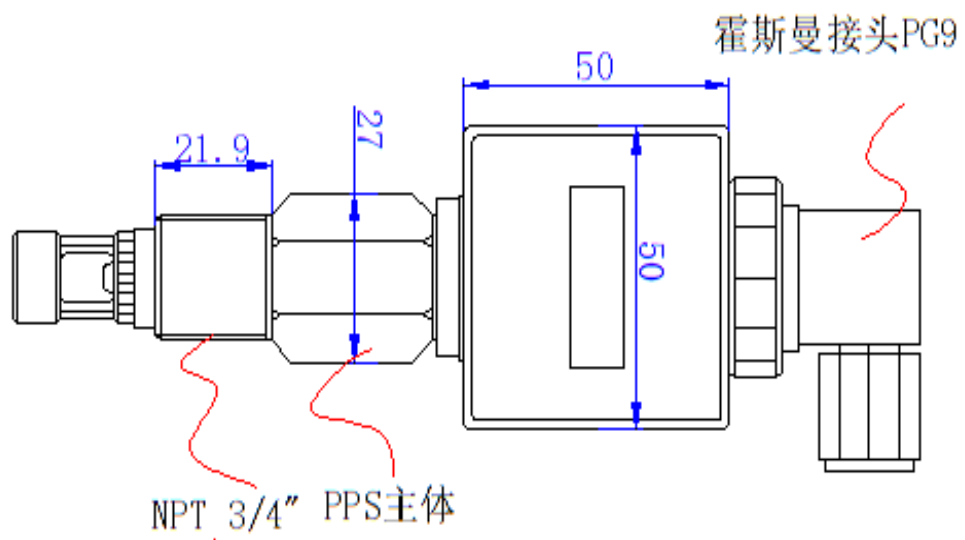
2.3. Data communication

2.5.1 Data format

Default data format: 9600,N, 8, 1 (baud rate 9600 bps, 1 start bit, 8 data bits, no parity, 1 stop bit).

Data type: Float Type

2.5.2 Message frame format

a) Data read instruction

06	03	xx xx	xx xx	xx xx
Device	Function code	Register address	Register count	CRC code (low byte first)

b) Data read response

06	03	xx	xx......xx	xx xx
Device	Function code	Data bytes count	Data bytes	CRC code (low byte first)

c) Data write instruction

06	06	xx xx	xx xx	xx xx
Device	Function code	Register address	Data to write	CRC code (low byte first)

d) Data write response(same with data write instruction)

06	06	xx xx	xx xx	xx xx
Device	Function code	Register address	Data to write	CRC code (low byte first)

2.5.3 Register address

Register address	Name	Instruction	Number of registers	Access method

40001 (0x0000)	value and temperature	4 double-byte integers, which are DO value, DO value decimal digits, temperature value, temperature value decimal digits.	4（8 bytes）	Read
44097 (0x1000)	Zero calibration	Calibrate in air, write data to zero.	1（2 bytes）	Write
44101 (0x1004)	Slope calibration	Calibrate and write the actual value of the standard solution in the full scale standard.	1（2 bytes）	Write
44103 (0x1006)	Zero calibration value	Returns the zero point of the calibration.	1（2 bytes）	Read
44105 (0x1008)	Slope calibration value	The slope calibration value is multiplied by 1000.	1（2 bytes）	Read
48195 (0x2002)	Device address	Default address is 6, data range is 1-64.	1（2 bytes）	Write/Read
48225 (0x2020)	factory reset	Restore calibration values to factory settings, write data to 0.	1（2 bytes）	Write

Note：

a) The register address defined here is the register address with the type of the register. (The actual register address is represented in the bracket).

b) When address of the device is changed, the response to the data write instruction would contain the new changed address.

c) The data definition of the read response value:

XX XX	XX XX	XX XX	XX XX
2 bytes test value	2 bytes decimal digits	2 bytes temp value	2 bytes decimal digits

The default data type is double-byte integer (high byte first), other data format such as floating point type is optional.

2.5.4 Command sample

a) set the device address

Function: setting the Modbus device address of the sensor meter;

Change the device address 06 to 01, and the example is as follows:

Request frame：06 06 20 02 00 01 E3 BD

Response frame：01 06 20 02 00 01 E2 0A

b) began to measure instructions

The temperature is measured in degrees Celsius and the conductivity (or salinity) is expressed in mS / cm (or uS / cm or PSU). The value of the conductivity (or salinity)

Request frame：06 03 00 00 00 04 45 BE

Response frame：06 03 08 01 02 00 01 00 B0 00 01 14 B4

Reading sample:

Conductivity (Salinity) value	Temperature value
01 02 00 01	00 B0 00 01

For example:

The conductivity (or salinity) value 01 02 indicates the conductivity (or salinity) value in hexadecimal, 00 01 indicates the conductivity (or salinity) value with 1 decimal place;

Temperature value 00 B0 is the hexadecimal reading temperature value, 00 01 is the temperature value 1 decimal place

    c) calibration instructions

Zero calibration, the role of: set the electrode conductivity (or salinity) zero calibration value; where the zero calibration in the air;

    Request frame：06 06 10 00 00 00 8C BD

    Response frame：06 06 10 00 00 00 8C BD

Slope calibration, the role of: set the electrode conductivity (or salinity) slope calibration value; where the slope of the actual standard solution value, Example See Calibration;

    Request frame：06 06 10 04 01 F4 CD 6B

    Response frame：06 06 10 04 01 F4 CD 6B

2.5.5 Error response

If the sensor does not correctly execute the host command, it will return the following format information:

| Definition	Address	Function code	CODE	CRC check
Data	ADDR	COM+80H	xx	CRC 16
Number of bytes	1	1	1	2

  a) CODE: 01 – Functional code error

      03 – Data error

b) COM: Received function code

2.4. Installation method

When installing the transmitter, avoid excessive force and sharp impact to damage the electrode. After completing the wiring, it should be carefully checked to avoid the wrong connection before powering on. In the normal operation of the instrument, to ensure that the sensor and the measured medium full contact. The measurement error is often due to air filling the electrode internal space or unreasonable installation caused.
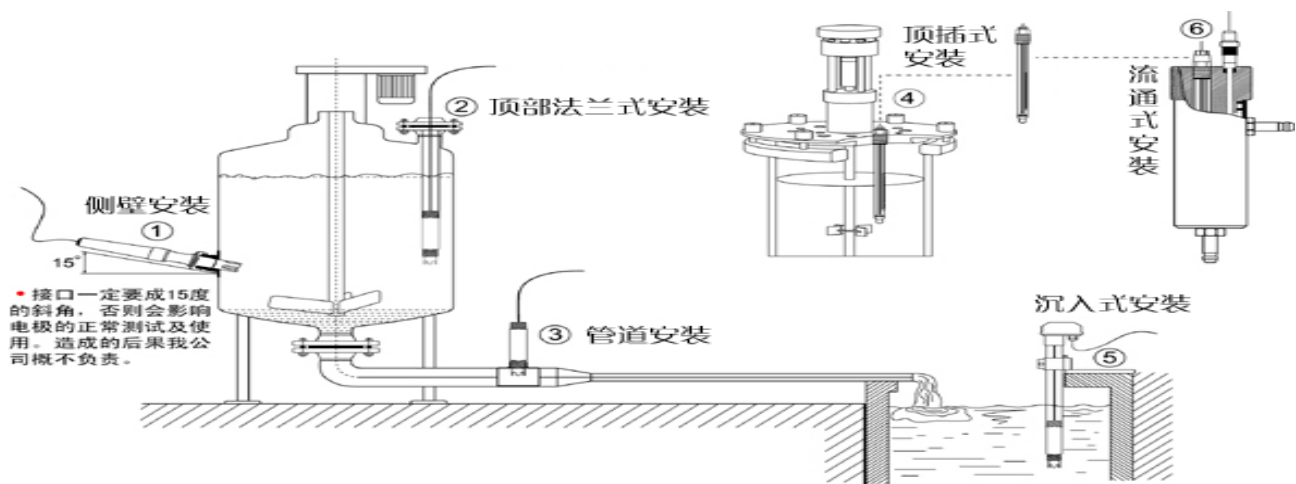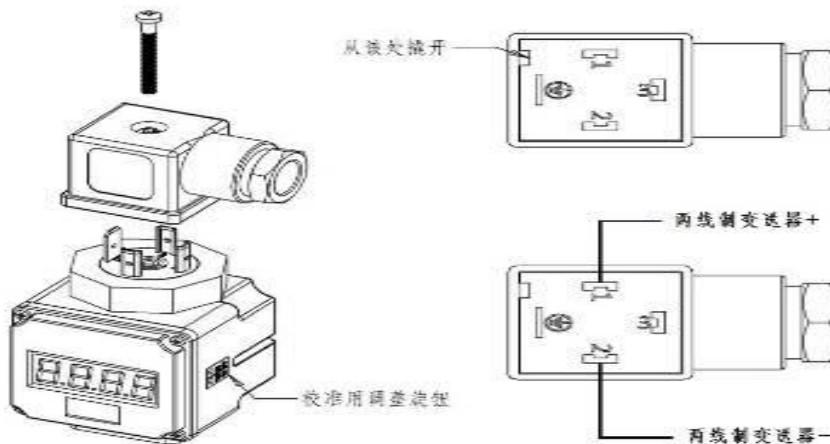

2.5. Wiring

2.5.1 Cable information

- 485 signal output is defined as:

    1. Red wire - Power cord (12 ~ 24V)

    2. Black wire - ground (GND)

    3. Blue line-485A

    4. White wire-485B

    5. Bare wire – shield

- 4 ~ 20mA signal output and its definition:

2.5.2 Cable specification

It is required that the cables have a certain degree of corrosion resistance, taking into account long-term immersion in water (including seawater) or exposure to air. Cable diameter Φ6 mm, all interfaces are required to do waterproofing.

2.6. Maintenance

Conventional electrodes need to be periodically cleaned and calibrated, the maintenance cycle by the customer according to their own conditions to decide. Conventional electrode cleaning methods: with a soft brush to remove the attachment (note to avoid scratching the electrode surface), then distilled water, after the calibration operation.

Inductive electrode cleaning method:

● Inductive electrode is basically maintenance-free, shell pollution or mild scaling does not affect its normal work.

● For cleaning, use a soft brush or sandpaper to remove the deposit, and then wash with distilled water, and then perform the calibration operation.

● As the inductive electrodes often work in the easy to fouling or dirty environment, cleaning may be appropriate to increase the intensity. Minor scratches the surface of the electrode does not affect the normal working electrode, but avoid penetrating the housing electrodes.

2.7. Parts And Spare Parts

This product includes:

- Transmitter
- Specification
- certificate
- Calibration solution (optional)
- Threaded seat (optional)

2.8. Quality Assurance

The company provides sales from the date of the play within one year of the machine warranty, but do not cover damage caused by improper use. If you need to repair or adjustment, please return, but the freight to be conceited, sent back to determine the fine packing to avoid damage during transport, the company will repair it free of charge damage to the instrument.