

KWS-360 Online Salinity Sensor

Catalog

1.Feature	2
2.Technical Specifications	2
3.Dimension	2
4.Installation and Electrical Connection	3
4.1 Install	3
4.2 Wiring	3
4.3 Wiring instructions	3
5.Maintenance	3
6.Quality and Service	4
6.1 Quality assurance	4
6.2 Service commitment	4
7.Appendix Data Communication	4
7.1 Data Format	4
7.2 Modbus Frame Format (xx represents a byte)	4
7.3 Register Address	5
7.4 Command example	5
7.5 Error response	6

1.Feature

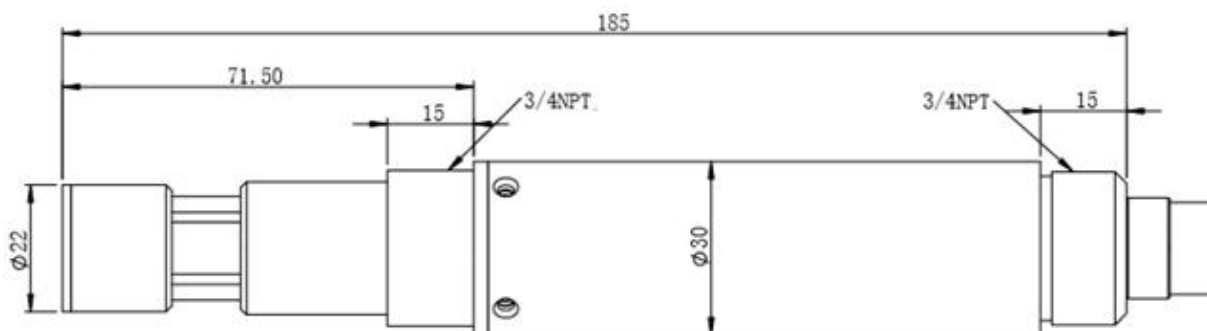
- Sea water / high salt water / various water supply / industrial water treatment
- Signal output: RS-485 (Modbus/RTU digital signal)
- Conveniently connect to third-party equipment such as PLC, DCS, industrial control computer, general controller, paperless recording instrument or touch screen.
- Immersion type installation, 3/4" NPT pipe thread, easy for immersion installation or installation in pipelines and tanks.
- IP68 protection level.



2.Technical Specifications

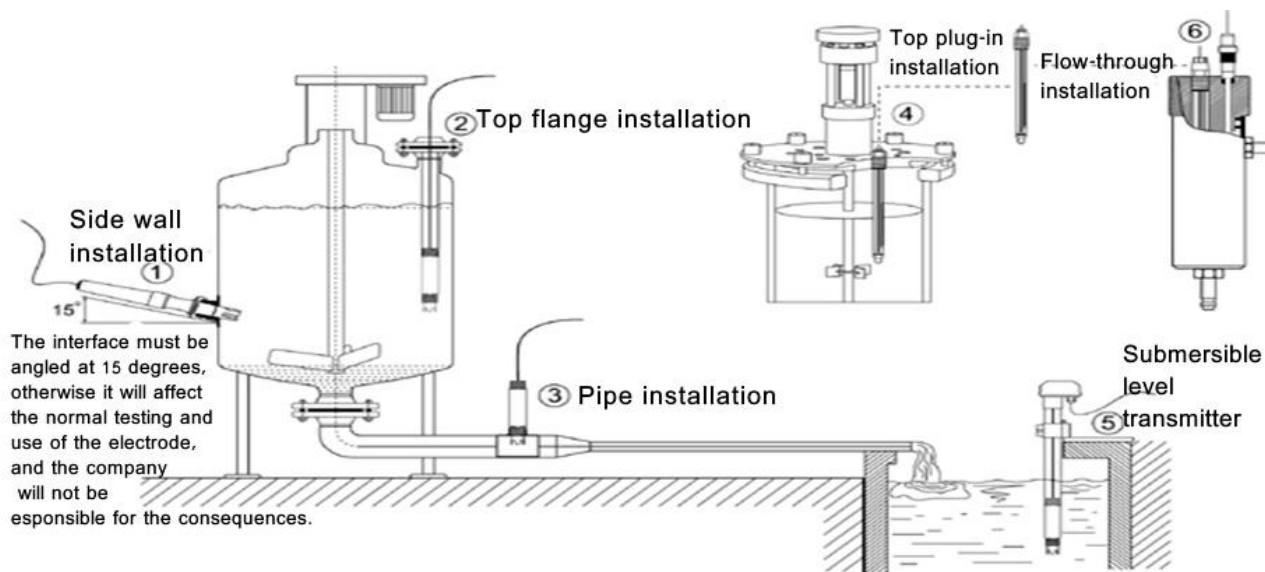
Model	KWS-360
Case Material	ABS/POM
Measurement principle	Electrode method
Measuring Range	0~70.0PSU
Resolution	0.1
Accuracy	±1.5%F.S, ±0.3℃
Response time (T90)	<30s
Minimum detection limit	0.1PSU
Calibration Method	Two-point calibration
Cleaning method	/
Temperature compensation	Automatic temperature compensation (Pt1000)
Output	RS-485, MODBUS protocol
Storage temperature	0~65℃
Working conditions	0~50℃, <0.6MPa
Installation	Immersion mounting, 3/4 NPT thread
Power Consumption	<0.2W@12V
Power Supply	12~24VDC
Ip Grade	IP68
Cable Length	5 m,customizable

3.Dimension



4. Installation and Electrical Connection

4.1 Install



Note: When installing the sensor for testing, keep it at least 5cm from the bottom of the container and at least 2cm from the side wall.

4.2 Wiring

- Red line -----power cord (12 ~ 24V)
- Black line - -ground (GND)
- Blue line - --485A
- White line - 485B

After wiring, it should be carefully checked to avoid incorrect connections before powering up.

4.3 Wiring instructions

Considering that the cables have been immersed in water (including seawater) or exposed to air for a long time, all wiring positions are required to be waterproof, and the cables should have certain corrosion resistance.

5. Maintenance

1. Use and maintenance

How to clean the electrode:

- The inductive salinity electrode is basically maintenance-free, and the pollution or slight fouling of the shell will not affect its normal operation.
- If cleaning is required, use a soft brush or sandpaper to remove the attachments, then rinse with distilled water, and then perform calibration operations.
- Since the inductive electrode often works in an environment that is prone to fouling or dirt, the cleaning can be appropriately increased. Slightly scratching the surface of the electrode will not affect the normal operation of the electrode, but avoid penetrating the electrode shell.

2. Calibration

a) Zero-point calibration

Rinse the sensor with distilled water and blot the liquid with filter paper. Turn the sensor on and place it in the air vertically, and let it stand for about 3 minutes. After the value is stable, perform zero point calibration.

b) Slope calibration

Place the sensor vertically in the standard solution (20% full scale-full scale), pay attention that the front of the sensor is at least 2 cm away from the bottom and side walls of the container, and perform slope calibration. For instructions, refer to the calibration instructions in the appendix data communication.

6. Quality and Service

6.1 Quality assurance

- Quality inspection departments have standardized inspection procedures, with advanced detection equipment and instruments, and in strict accordance with the test procedures for products that do 72 hours aging test, stability test, not asubstandard products factory.
- The receiving party directly returns the product batch with a failure rate of 2%, and all the costs incurred are borne by the supplier. The reference standard refers to the product description provided by the supplier.
- Guarantee the quantity of goods and the speed of shipment.

6.2 Service commitment

The company provides local after-sales service within one year from the date of sale, but does not include damage caused by improper use. If repair or adjustment is required, please return it, but the shipping cost must be conceited. Damaged on the way, the company will repair the damage of the instrument for free.

7. Appendix Data Communication

7.1 Data Format

The default data format for Modbus communication is: 9600, n, 8, 1 (baud rate 9600bps, 1 start bit, 8 data bits, no parity, 1 stop bit).

7.2 Modbus Frame Format (xx represents a byte)

a) Read data instruction frame

08	03	xx xx	xx xx	xx xx
Address	Function code	Register start address	Number of registers	CRC check code (low bytes in front)

b) Read data response frame

08	03	xx	xx xx	xx xx
Address	Function code	Number of bytes	Response data	CRC check code (low bytes in front)

c) Write data instruction frame

08	06	xx xx	xx xx	xx xx
Address	Function code	Register address	Read-in data	CRC check code (low bytes in front)

d) Data response frame

08	06	xx xx	xx xx	xx xx
Address	Function code	Register address	Read-in data	CRC check code (low bytes in front)

7.3 Register Address

Register Address	Name	Instruction	Number of Registers	Access Method
40001 (0x0000)	Measured value + temperature	4 double-byte integers, which are the measured value, the measured number of decimal places, the temperature value, and the decimal value of the temperature value.	4 (8 bytes)	Read
44097 (0x1000)	Zero calibration	Calibrate in the air, the read data is 0.	1 (2 bytes)	Write
44101 (0x1004)	Slope calibration	Calibrated in a known standard solution (20% full scale - full scale), the read value is actual value of standard solution *10	1 (2 bytes)	Write
44113 (0x1010)	Temperature value	Calibrated in solution, the written data is the actual temperature value x 10; the read data is the temperature calibration offset x 10 .	1 (2 bytes)	Write/Read
48195 (0x2002)	Device address	The default is 8, writing data range 1-255.	1 (2 bytes)	Write/Read
48196 (0x2003)	Baud rate	The default is 9600. 0--9600, 1--19200.	1 (2 bytes)	Write/Read
48225 (0x2020)	Reset	The calibration value is restored to the default value and the write data is 0. Note: The sensor needs to be calibrated again after resetting.	1 (2 bytes)	Write

7.4 Command example

a) Start measurement command

Function: Obtain the salinity value and temperature measured by the sensor; the unit of temperature is °C, and the unit of salinity is PSU;

Request frame: 08 03 00 00 00 04 44 90

Response frame: 08 03 08 01 02 00 01 00 B0 00 01 A4 A0

Examples of readings:

salinity value	temperature value
01 02 00 01	00 B0 00 01

For example, the salinity value 01 02 represents the hexadecimal reading salinity value, and 00 01 represents the salinity value with 1 decimal point, converted to a decimal system of 25.8 .

The temperature value 00 B0 represents the hexadecimal reading temperature value, and 00 01 represents the temperature value with 1 decimal point, converted to a decimal system of 17.6 .

b) Calibration instruction:

Zero calibration

Function: Set the salinity zero-point calibration value of the sensor; here the zero point calibration is carried out in the air;

Request frame: 08 06 10 00 00 00 8D 93

Response frame: 08 06 10 00 00 00 8D 93

Slope calibration

Function: Set the salinity slope calibration value of the sensor; here the slope value is based on the actual standard solution value, take 50PSU as an example to refer to the calibration;

Request frame: 08 06 10 04 01 5E 4C 3A

Response frame: 08 06 10 04 13 88 C1 04

c) Set the device ID address:

Function: set the MODBUS device address of the electrode;

Change the device address 08 to 01, with the following example

Request frame: 08 06 20 02 00 01 E2 93

Response frame: 08 06 20 02 00 01 E2 93

7.5 Error response

If the sensor does not execute the upper computer command correctly, the following format information is returned:

definition	address	FC	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