

iEC-306 Online Conductivity Sensor

User Manual



Yantai Chemins Instrument Co.,Ltd

Hangzhou Chemins Sensing Technology Co., Ltd.

en.www.chemins-tech.com

Tel: +86 535-3463801/571-89870583

Add: No.96 Chushan Dong Road, Zhaoyuan City, Shandong Province
No 908, 17 Building, Singapore Science Park, Qiantang District, Hangzhou City, Zhejiang Province

User Notes

- Before use please read this description, and save it for reference.
- Please follow this manual procedures and precautions.
- Upon receipt of the instrument, carefully open the package, whether viewing instruments and accessories due to shipping damage, if any damage is found, immediately notify the manufacturers and distributors, and retain the packaging material for return processing.
- When the instrument malfunction, do not repair itself, please contact the manufacturer's after-sales department.

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I .Application environment description

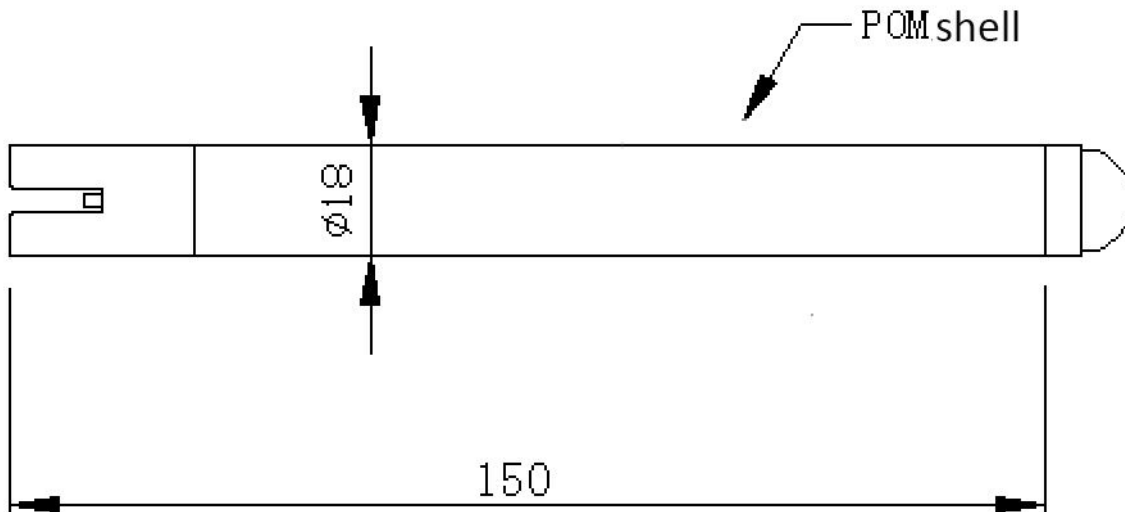
- Drinking water / surface water / various water / industrial water treatment
- Signal output: RS-485 (Modbus / RTU protocol)
- Easy connection to a third-party equipment PLC, DCS, industrial control computer, universal controller, paperless recording instruments and a touch panel.
- Easy installation:Submerged installation .
- IP68 protection class.

II .Technical performance and specifications

1. Technical parameter

Model	iEC-306
Measuring range	0~5000 μ S/cm
Resolution	1 μ s/cm, 0.1 $^{\circ}$ C
Accuracy	\pm 1.5%F.S., \pm 0.5 $^{\circ}$ C
Operating temperature	0 ~ 65 $^{\circ}$ C
Working pressure	<0.6MPa
Power supply	12~24VDC
Signal output	RS-485 (Modbus / RTU)
Wetted	ABS
Installation	Immersion installation
Cable length	5 meters,Other lengths can be customized
Temperature compensation	Automatic temperature compensation (Pt1000)
Calibration methods	Two-point calibration
Power	0.1W@12V
Protection class	IP68

2. Dimensions



III. Installation and electrical connection

1. Installation

When installing the sensor from the testing container bottom and side walls at least 2 cm.

2. Electrical connections

The cable is 4 - core double - stranded shielding wire, the line order definition:

- Red line - the power supply line (12 ~ 24VDC)
- Black line - ground (GND)
- Blue line -485A
- White line -485B

After completing the wiring, should be carefully examined to avoid incorrect connection before applying power.

Cable specification: Considering that the cable is immersed in water (including sea water) for a long time or exposed to the air, all the wiring points are required to do waterproof treatment, the user cable should has certain corrosion resistance.

IV. Care and maintenance

1. Use and maintenance

The conventional electrodes require periodic cleaning and calibration, maintenance cycle is

determined by the customer according to their conditions. The cleaning method of the conventional electrode: clear with a soft brush attachment (taking care to avoid scratching the electrode surface), and then washed with distilled water, followed by a calibration operation.

Inductive electrode cleaning method:

- Inductive electrode basically maintenance-free, contamination of the housing or mild fouling does not affect the normal work.
- For washing with a soft brush or sandpaper remove adhesive, and then washed with distilled water, followed by a calibration operation.
- Since the inductor electrodes is often easy to scale or dirt in the work environment, it may be appropriate to increase the intensity of cleaning. Slight scratch the surface of the electrode does not affect the normal operation of the electrode, but avoid penetrating the housing electrodes.

2. Calibration

a) Zero calibration

Rinse the sensor with distilled water, blotted dry with filter paper and the liquid. The power sensor is placed vertically in air, allowed to stand for about 3 minutes, until a stable value, zero calibration. Appendix calibration instructions.

b) slope calibration

The electrode is placed perpendicular to the standard solution (20% of full scale - full scale), note that the electrode from the container bottom and side walls at least 2 cm, For slope calibration. See Appendix calibration instructions.

V. Quality and service

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 a substandard products factory.
- Ship direct return on the failure rate of 2% of the batches of products, all costs borne by the supplier. Consider the standard reference product descriptions provided by the supplier.
- Ensure supply quantity and delivery speed.

2. Accessories and spare parts

This product includes:

- Sensor 1
- Manual 1
- Certificate 1

3. Aftersales service commitment

The company provides sales starting from the date of this machine after-sales service within one year, but does not include damage caused by improper use, if necessary repairs or adjustments, please return, but the freight to be conceited, to be determined to avoid a return of good packaging when shipping damaged in transit, the company will damage the free repair of the instrument.

Appendix data communications

1. Data format

Modbus communication default data format: 9600, n, 8,1 (9600bps baud, 1 start bit, 8 data bits, no check, 1 stop bit).

Baud rate and other parameters can be customized.

2. Information frame format(xx represents one byte)

a) Read data instruction frame

06	03	xx	xx	xx	xx	xx	xx
Address	FC	Register start address		Number of registers		CRC check code (low bytes in front)	

b) Read data response frame

06	03	xx	xx	xx	xx
Address	FC	Number of bytes	Response data	CRC check code (low bytes in front)	

c) Write data instruction frame

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

d) Data response frame

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

3. Register Address

Register address	Name	Explanation	Register number	interview method
40001 (0x0000)	Temperature measured value +	4-byte integers, respectively, the measured value, the measured value of decimal places, the temperature value, the temperature value of decimal places.	4 (8 bytes)	Read
44097 (0x1000)	Zero calibration	In the air calibration, the write data is 0. The readout value is zero offset.	1 (2 bytes)	Write/Read

44101 (0x1004)	Slope calibration	Calibrate in a known standard solution (20% full scale -- full scale) and the write data is the actual value of the standard solution. Readout value is slope value \times 1000.	1 (2 bytes)	Write/Read
44113 (0x1010)	Temperature Calibration	In the calibration solution, write data is the actual temperature value \times 10; read data to the offset temperature calibration \times 10.	1 (2 bytes)	Write / Read
48195 (0x2002)	Sensor address	The default is 6, the write data range 1-127.	1 (2 bytes)	Write / Read
48225 (0x2020)	Reset sensor	The calibration value restores the default value, and the write data is 0. Note that the sensor needs to be calibrated again after resetting.	1 (2 bytes)	Write

4. Command Example

a) Start measurement instruction:

Function: obtaining the conductivity value and temperature of the measuring probe; The unit of temperature is Celsius and the value of conductivity is mS/cm (or uS/cm).

Request frame: 06 03 00 00 00 04 45 BE

Response frame: 06 03 08 01 02 00 01 00 B0 00 01 90 48

Reading example:

Conductivity value	Temperature value
01 02 00 01	00 B0 00 01

Such as: conductivity value 01 02 hexadecimal value of conductivity reading, 00 01 represents the conductivity value with a decimal point (decimal point and the relevant range), is converted to a decimal value of 25.8.

Temperature 00 B0 represents a hexadecimal value of temperature readings, 00 01 indicates a temperature value with a decimal point, it is converted to a decimal value 17.6.

b) Calibration instructions

Zero calibration

Action: Conductivity nulling electrode set value; here the zero calibration in air;

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

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

Slope calibration

Function: slope of the calibration value setting Conductivity electrode; actual numerical values where the slope of the standard solution was subject to 5000us/ cm for the reference calibration sample;

Request frame:06 06 10 04 13 88 C0 2A

Response frame:06 06 10 04 13 88 C0 2A

c) Set the device ID address

Function: Set the Modbus device address electrodes;

The device address06Changed01, Like this

Request frame:06 06 20 02 00 01 E3 BD

Response frame:06 06 20 02 00 01 E3 BD

5. Error response

If the sensor can not execute PC commands correctly, the format information is returned as follows:

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

a) CODE: 01 - Function code error

03 - Data error

b) COM: Function code received