

KWS-3500 Online Residual Chlorine

Introduction

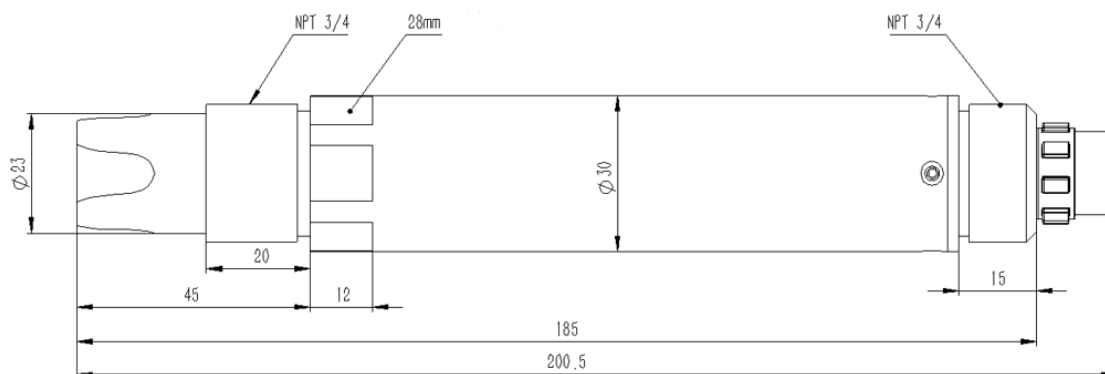
It is used for continuous monitoring of residual chlorine content in aqueous solution in drinking water treatment plants, canning plants, drinking water distribution networks, swimming pools, cooling circulating water, water quality treatment engineering and so on.



Technical Specifications

Model	KWS-3500
Measuring Principle	Constant voltage method
Range Ability	0~2.000mg/L(HClO) / 0.001mg/L
	0~20.00mg/L(HClO) / 0.01mg/L
Precision	±5% or ±0.05mg/L, ±0.3℃
Calibration Function	Two-point calibration (zero and slope)
Working Pressure	<0.1MPa
Ph Range Of The Medium	4~9 pH
Temp. Compensation	Automatic temperature compensation (Pt100)
Signal Output	RS-485 bus, Modbus/RTU protocol
Material	POM
Working Temperature	5~50℃
Installation Mode	Flow cell installation
Size	30×185mm
Velocity Of Flow	30~60L/h
Response Time	<30S
Source	12~24VDC±10%
Power Consumption	0.2w@12V
IP Rating	IP68

Dimension



Installation and Electrical Connection

Installation

Using the matching circulation pool installation, the electrode and the circulation pool are installed closely to ensure that the electrode measurement part is placed in the area near the inlet of the circulation pool, and the flow rate should not be aligned to the outlet as far as possible to ensure the steady flow rate. It is suggested that the flow rate should be controlled at $30 \leq 60\text{L/h}$ to ensure the accuracy of the test.

Wiring

Red wire-power cord (12~24VDC)

Black wire-ground wire (GND)

Blue Line-485A

White Line-485B

Bare wire-shield line

After the wiring is completed, it should be carefully checked to avoid the wrong connection before the power is turned on.

Cable specification: Considering that the cable is immersed in water (including sea water) or exposed to air for a long time, the cable has a certain corrosion resistance. The $\Phi 6\text{ mm}$, joint of cable outer diameter needs waterproof treatment.

Maintenance

Use and maintenance

The new electrode and the long-term electrode need to be activated before use, and the sensor is put in tap water for 24 hours. If the return value is inaccurate, you need to do the following:

Calibration of zero and slope of electrode

Calibration

- a) Zero calibration: the sensor probe is placed in chlorine-free water for zero calibration after numerical stability.
- b) Slope calibration: the sensor probe is placed in the flow pool of residual chlorine standard liquid, and the slope calibration is carried out after the value is stable. It is recommended to use HClO standard liquid of 1~2mg/L. The preparation and determination of standard liquid can be referred to the determination of national standard residual chlorine.

Note: The sensor has been calibrated before leaving the factory, because the preparation of its standard liquid requires high personnel requirements, non-professionals may not be able to do this work, only if the value is not correct, users are advised to calibrate themselves.

Quality and service

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, no unqualified products leave 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.

Service commitment

The company provides one year from the date of sale of this machine after-sale guarantee, electrodes belong to consumable products warranty for half a year. However, it does not include damage caused by improper use. If repair or adjustment is required, please send it back, but the freight must be borne by yourself, and it is necessary to make sure that the packing is good to avoid damage in transit. We will repair the damage of the instrument free of charge.

Appendix data communication

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).

Parameters such as baud rate can be customized.

2. Information Frame Format

a) Read data instruction frame

06	03	xx xx	xx xx	xx xx
Address	Function code	Register address	Number of registers	CRC check code (low byte first)

b) Read data response frame

06	03	xx	xx..... xx	xx xx
Address	Function code	Bytes	Answer data	CRC check code (low byte first)

c) Write data instruction frame

06	06	xx xx	xx xx	xx xx
Address	Function code	Register address	Write data	CRC check code (low byte first)

d) Write data response frame (same data command frame)

06	06	xx xx	xx xx	xx xx
Address	Function code	Register address	Write data	CRC check code (low byte first)

3. Register Address

register address	name	explain	Number of registers	access mode
40001 (0x0000)	Measured value + temp.	4 double-byte integers, which are the measured value, the decimal place of the measured value, the temperature value, and the decimal place of the temperature value	4 (8byte)	Read
44097 (0x1000)	Zero calibration	When the value is stable in chlorine-free water, the written data	1 (2byte)	Write / read

		is 0 and the readout data is zero offset.		
44101 (0x1004)	Slope calibration	0-2.000mg/L range residual chlorine sensor, calibrated in a flow cell with a known concentration of HCLO (1~2mg/L) solution, the written data is the actual concentration value x1000, and the read data is the slope value x1000; 0 -20.00mg/L range residual chlorine sensor, calibrated in a flow cell flowing with a known concentration of HCLO (10-20mg/L) solution, the written data is the actual concentration value x100, and the read data is the slope value x1000.	1 (2byte)	Write / read
44113 (0x1010)	temperature calibration	Calibration in solution, write data is actual temperature value x10; read data is temperature calibration offset x10	1 (2byte)	Write / read
48195 (0x2002)	Sensor address	The default is 6, and the write data range is 1~255.	1 (2byte)	Write / read
48225 (0x2020)	Reset sensor	The calibration value is restored to the default value, and the written data is 0. Note that after the sensor is reset, it needs to be calibrated again before it can be used.	1 (2byte)	Write

4. Command example

a) Read data command

Function: obtain the residual chlorine value and temperature of the measuring probe; the unit of temperature is °C, and the unit of residual chlorine is mg/l

Request frame: 06 03 00 00 00 04 45 BE

Answer frame : 06 03 08 01 67 00 03 01 6F 00 01 EC 88

Example of reading:

Residual chlorine value	Temperature value
01 67 00 03	01 6F 00 01

For example: Residual chlorine value 01 67 Represents the residual chlorine value of hexadecimal readings, 00 03 Represents the residual chlorine value with 3 decimal points, convert to decimal values to 0.359;

Temperature value 01 6F represents the temperature value of a hexadecimal reading, 00 01 indicates the temperature value with 1 decimal point, converted to decimal value is 36.7.

b) Calibration instruction

Zero calibration

Function: set the calibration value of the residual chlorine zero point of the electrode;

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

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

Slope calibration

Function: set the residual chlorine slope calibration value of the electrode; here the slope value calibration is carried out in a known concentration of residual chlorine solution. (For example, 2 mg ≤ L, replaced by hexadecimal to 7D0)

Request frame: 06 06 10 04 07 D0 CE D0

Answer frame: 06 06 10 04 07 D0 CE D0

c) Change the device address

Function: set the Modbus device address of the electrode;

Change the device address 06 to 01, with the following example

Request frame: 06 06 20 02 00 01 E3 BD

Answer frame: 06 06 20 02 02 01 E3 BD

5. Error response

If the sensor does not execute the host command correctly, 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 – function code error

03 – data error

b) COM : Received function code