BT-COD-308
Online COD Sensor

User Manual



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User Instructions

Please read this manual carefully before use and keep it for future reference.

Please follow the operating procedures and precautions in this manual.

Upon receiving the instrument, please carefully unpack it and check whether the instrument and accessories are damaged during transportation. If any damage is found, please immediately notify the manufacturer and dealer, and retain the packaging for return processing.

In case of instrument failure, do not attempt to repair it yourself. Please contact the after-sales department of the manufacturer directly.

1. Working Principle

Many organic compounds dissolved in water absorb ultraviolet light. Therefore, by measuring the absorption of these organic compounds at a wavelength of 254nm, the content of dissolved organic pollutants in water can be accurately measured.

The BT-COD-308 Online COD Sensor employs two light sources: one ultraviolet light for measuring COD content in water, and one reference light for measuring water turbidity. Additionally, through specific algorithms, it compensates for optical path attenuation and can eliminate interference from particulate suspended impurities to a certain extent, achieving more stable and reliable measurements.

2. Product Features

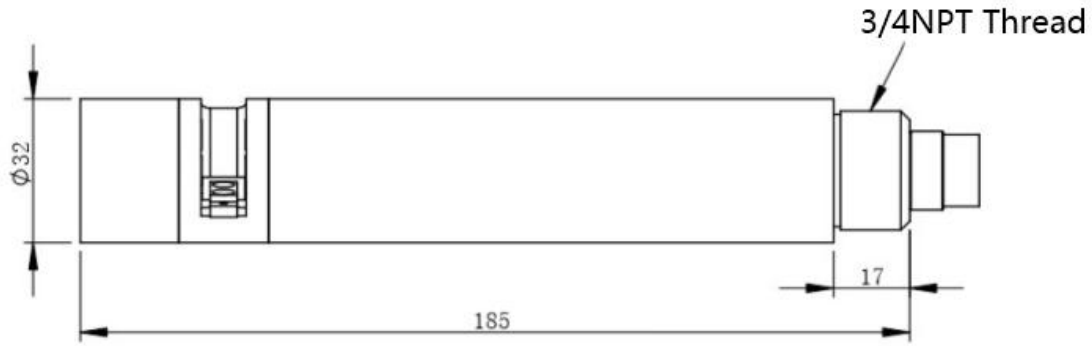
- No reagents required, environmentally friendly, and economical
- Compact size, easier installation, and continuous online water quality monitoring
- Measures COD, turbidity, and temperature parameters
- Automatically compensates for turbidity interference
- Equipped with a cleaning brush to prevent biofouling
- Small drift, fast response, and more accurate measurements
- Excellent stability even during long-term monitoring
- Maintenance-free, long service life, and low operating costs

- Digital sensor, RS-485 interface, Modbus/RTU protocol
- Low power consumption design and anti-interference design

3. Technical Specifications and Performance

Model	BT-COD-308	
Measurement Principle	Dual-wavelength Ultraviolet Absorption Method	
Measurement Range	COD	Turbidity
	0～200mg/L equiv. KHP	0～100NTU
	0～500mg/L equiv. KHP	0～200NTU
COD Accuracy	±5%	
Response Time (T90)	＜10s	
Minimum Detection Limit	0.2mg/L（0-200mg/L）	
	0.4mg/L（0-500mg/L）	
COD Resolution	0.1mg/L	
Turbidity Accuracy	±5%	
Turbidity Resolution	0.1NTU	
Calibration Method	Two-point calibration	
Output Mode	RS-485（Modbus/RTU）	
Power Supply	12～24VDC	
Power Consumption	0.4W@12V（operating）	
	2W@12V（cleaning）	
Storage Temperature	-5～65℃	
Operating Conditions	0～50℃，＜0.2MPa	
Protection Rating	IP68	
Installation Method	Submersible installation	
Cable Length	5 meters, other lengths can be customized	
Enclosure Material	316L Stainless Steel	

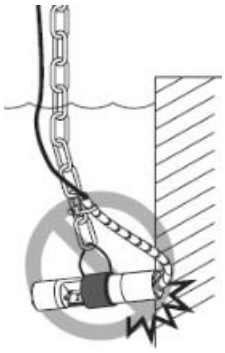
4. Dimension(mm)



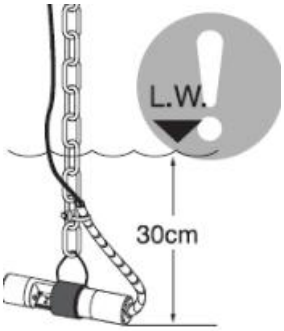
5.Installation and Electrical Connection

5.1 Installation

When hanging the sensor, avoid sensor impacts against walls or other hydraulic structures due to water flow. If the water flow is strong, please fix the sensor.

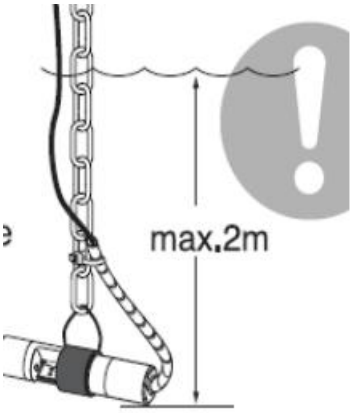


Considering water level fluctuations, submerge the sensor at least 30 cm below the possible lowest water level.



Install sensors at a depth of no more than 2 meters above the water

surface.



The sensor is placed in a location where there are no bubbles in the water.



Note:

It is recommended to install a cable protective sleeve outside the sensor cable. The sensor can be placed in the water in any direction. It is recommended to place the sensor horizontally and fix it securely, with the measurement area facing the water flow direction.

5.2 Electrical Connection

The cable is a 4-core twisted shielded cable, with the following wire sequence definition:

Red wire - Power line (12～24VDC)

Black wire - Ground wire (GND)

Blue wire - 485A

White wire - 485B

Before powering on, carefully check the wiring sequence to avoid unnecessary losses due to wiring errors.

Wiring instructions: Considering that the cable is long-term immersed in water (including seawater) or exposed to the air, all wiring connections require waterproof treatment, and the user's cable should have a certain degree of corrosion resistance.

6.Maintenance and Care

6.1Maintenance Schedule and Methods

6.1.1Maintenance Schedule

To ensure accurate measurements, cleaning is crucial. Regular cleaning of the sensor contributes to data stability.

Maintenance Task	Recommended Maintenance Frequency
Calibrate the sensor (if required by the authorities)	Based on the maintenance schedule required by the authorities
Maintain and inspect the self-cleaning brush	Return to the factory for inspection and maintenance of the self-cleaning brush every 18 months

Note:

The maintenance frequencies in the above table are only suggestions. Maintenance personnel should clean the sensor based on its actual usage.

6.1.2Maintenance Methods

1) Sensor Exterior Surface: Clean the exterior surface of the sensor with tap water. If debris remains, wipe it with a damp soft cloth. For stubborn dirt, you can add some household detergent to the tap

water for cleaning.

2) Check Sensor Cable: The cable should not be tightened during normal operation, as it can easily cause internal wire breakage, causing the sensor to malfunction.

3) Check Sensor Measurement Window: Inspect if the sensor's measurement window is dirty and if the cleaning brush is functioning properly.

4) Inspect Self-cleaning Brush: Check if the sensor's cleaning brush is damaged.

5) Replace Dynamic Seal after Continuous Use for 18 Months: Replace the dynamic seal after 18 months of continuous use.

6.1.3 Precautions

The sensor contains sensitive optical and electronic components. Ensure that the sensor is not subjected to severe mechanical impacts. There are no user-maintainable components inside the sensor.

6.2Sensor Calibration

6.2.1Turbidity Calibration

1）Zero Calibration: Use a larger beaker to measure an appropriate amount of zero-turbidity solution, place the sensor vertically in the solution, and wait for 3-5 minutes for the value to stabilize before

performing zero calibration. Instructions are provided in the appendix.

2） Slope Calibration: Place the sensor in a 100 NTU standard solution, wait for 3-5 minutes for the value to stabilize, and then perform slope calibration. Instructions are provided in the appendix.

6.2.2COD Calibration

1）KHP (Potassium Hydrogen Phthalate, C8H5KO4) is a commonly used chemical reagent for preparing COD standard solutions.

2）Prepare Standard Solution

A. Accurately weigh 0.8503 g of KHP and place it in a 1000 mL flask. Fill to the maximum mark with distilled water or deionized water. This solution is a 1000 mg/L COD solution.

B. Take 100 mL of this solution and pour it into a 1000 mL flask, then fill to the maximum mark with distilled water or deionized water. After shaking well, the COD concentration is 100 mg/L. Prepare a 20 mg/L solution using the same method.

C. Store the concentrated standard solution (Step 6.2.1) in a black glass bottle and store it at low temperatures to prevent decomposition. The diluted standard solution (Step 6.2.2) should be used within 24 hours after preparation.

3)Calibration (Two-point Calibration)

a. Calibration for the 0～200mg/L Range

① Place the sensor in a 5mg/L COD solution and ensure that all optical paths are submerged more than 2cm underwater with no bubbles. Perform the zero calibration following the commands in the appendix.

② Place the sensor in a 200mg/L COD solution and perform the slope calibration following the commands in the appendix.

b. Calibration for the 0～500mg/L Range

① Place the sensor in a 20mg/L COD solution and ensure that all optical paths are submerged more than 2cm underwater with no bubbles. Perform the zero calibration following the commands in the appendix.

② Place the sensor in a 400mg/L COD solution and perform the slope calibration following the commands in the appendix.

Note:

1.KHP poses a cancer risk, so please wear gloves during operation to avoid skin contact.

2.During calibration, calibrate the temperature first, followed by turbidity, and then COD.

3.If the sensor value does not change within 3 minutes after slope calibration, power off and then power on again.

6.2.3Precautions

- Avoid exposing the sensor to direct sunlight.
- Do not touch the measurement area of the sensor with your hands.
- Avoid bubbles attaching to the sensor surface during measurement and calibration.

- Avoid applying any direct mechanical stress (pressure, scratches, etc.) to the sensor during use.

6.2.4 Common Issues and Solutions

Issue	Possible Cause	Solution
Unable to connect to the operating interface or no measurement results	Faulty connection between the controller and	Reconnect the controller and cable
	Cable malfunction	Please contact us
Excessively high, low, or continuously unstable measurement values	Foreign matter adhering to the sensor window	Clean the surface of the sensor window
	Damage to the sensor's self-cleaning mechanism	Replace the cleaning brush

7.Quality and Service

7.1Quality Assurance

- The quality inspection department has standardized inspection procedures, advanced and comprehensive testing equipment and methods, and strictly follows the procedures to conduct inspections, including 72-hour aging tests and stability tests on the products, ensuring that no defective products leave the factory.
- The recipient may directly return batches of products with a defect rate of 2%, and all expenses incurred shall be borne by the supplier. The inspection standards refer to the product description provided by the supplier.
- We guarantee the quantity of supply and delivery speed.

7.2Accessories and Spare Parts

This product includes:

1 sensor

1 instruction manual

1 certificate of conformity

1 cable (5 meters)

7.3.After-Sales Service Commitment

Our company provides after-sales service for this machine within one year from the date of purchase, excluding damage caused by improper use. If repair or adjustment is needed, please send it back at your own expense, ensuring it is well-packaged to avoid damage during transportation. Our company will repair the damaged instrument free of charge.