BQ-OIW
Online Oil in water Sensor
User Manual

SHANGHAI BOQU INSTRUMENT CO.,LTD

Contents

Preface

Dear customer

Thank you for purchasing sensor from BOQU Instrument. It is strongly recommended to read the entire manual before use in order to operate and maintain the instrument and avoid unnecessary faults.

Please observe the operating procedures and precautions in this manual.

To make sure the effective after-sales protection provided by the instrument, please do not use any operation or maintenance other than which mentioned in the manual.

Due to non-compliance with the precautions specified in this manual, any fault and loss caused shall not be covered by the warranty, and the manufacturer shall not bear any relevant responsibility. If you have any questions, please contact our after-sales service department or representative.

If any parts or materials are damaged or lost, please contact our customer service department or authorized dealer immediately.

Save all packing materials until you are sure that the instrument functions properly. Any damaged or defective items must be returned in their original packaging materials.

Overview

BOQU Instrument online OIW sensor is based measurement principle of ultraviolet fluorescence method. Compared with other methods, the fluorescence method is proven to be more efficient, fast and repeatable. It is widely used in environmental monitoring, analytical chemistry, limnological and oceanographic biology.

The sensor has an integrated cleaning brush, which can automatic clean up air bubbles, debris, and biofilm, therefore reduce the interference of contamination on measurement data, make the maintenance period longer, and maintain excellent stability for long-term online use.

Typical applications include: crude and refined oil detection, leakage control at offshore oil pipelines, monitoring of BTXE and polycyclic aromatic compound in fresh water, industrial and municipal sewage works.

Features

RS - 485 output, Modbus protocol compatible

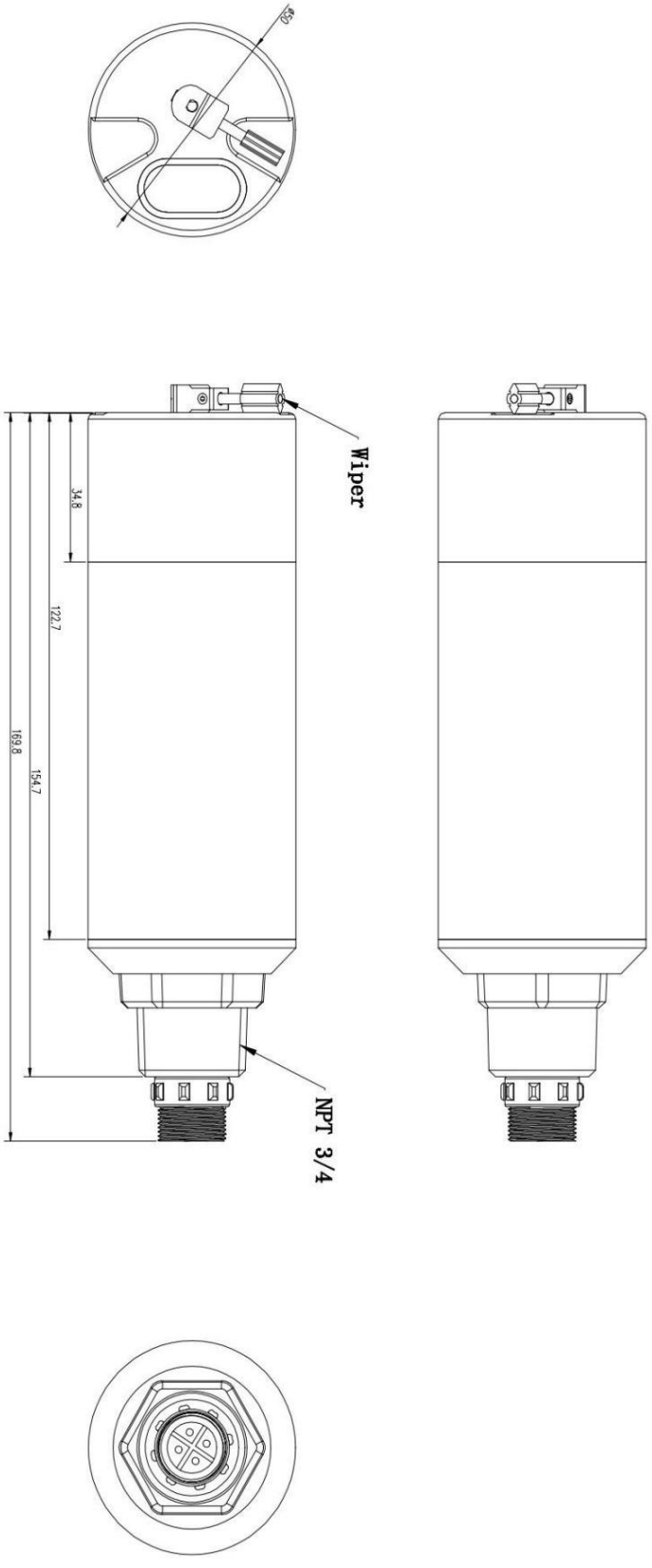
Integrated automatic cleaning brush, eliminating measurement interference

Use of unique optical and electronic optical filtering technique eliminates the impact of ambient light on the measurement

UVC LED light source with low power consumption, high stability, low drift and long lifetime

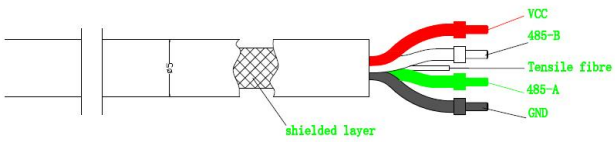
No affection by particulate matter suspended in water

Introduction


Wiper
34.8
122.7
154.7
169.8
NPT 3/4

Wire Definition

4 AWG-24 wires or AWG-26 shielding wire. OD=5mm



1, Red—Power (VCC)

2, White—485 Date_B (485_B)

3, Green ---485 Date_A (485_A)

4, Black --- Ground (GND)

Technical Specifications

Name	Parameter
Item	BQ-OIW
principle	Ultraviolet fluorescence
The laser wavelength	254nm
Fluorescence wavelength	360nm
Range	5ppm（NDSA） equiv. to 1.1ppm（BTEX）
Resolution	0.01ppb
MDL	5ppb (NDSA)， 1ppb (BTEX)
Linearity	$R^2 > 0.999$
Housing IP Rating	IP68
Depth Rating	30m Max
Temperature Range	0 ~ 50℃
Interface	Support RS-485， Modbus protocols
Power Requirements	DC 12~24V ±5%， current <50mA
Cable Length	10m (default), custom length available
Body materials	SS316 (Ti)
Calibration	One point at zero or two point calibration

The specifications are tested in lab condition using reference standards

Installation

Part List

Item	Number	Note
OIW Sensor	1	
Cable	1	10m
Brush	1	
Assembly adapter	1	

Sensor Installation

1) Wiring and power supply:

- Do not use the sensor cable to pull the sensor! It is required to install sensor in a secure and stable mounting bracket.
- The female and male connector of sensor cable should be screwed tightly to avoid moisture incursion

- **Important**: Make sure power supply voltage is correct before turning the power on.

Sensor installation:

- It is recommended to install the sensor vertically with probe facing down.
- Considering the basic principle of sensor optics, the distance between the end face of the sensor optical window and the bottom of the container/device should be more than 10cm!
- In consideration of the fluctuation of water level, install the sensor below water level of 30cm to submerge, and try to install it in the position where there are no bubbles in the water;
- The sensor must be securely installed to avoid damage caused by water flow and other things.

Calibration

PC tool name: SmartPC(DO).exe.

Note: If need any help, please contact Customer Service.

Calibration Solution Preparation

Labware and materials required

Analytical balance, Lab spoon, 50mL beaker, 100mL measuring cylinder, glass rod, Pipette 1L volumetric flask, 1L brown flask

NDSA (1, 5-Naphthalene disulfonic acid disodium salt dihydrate), CAS: 76758-30-0

Stock Solution Preparation

Wise 0.1g NDSA, dissolve it in deionized water, transfer it to volumetric flask, constant volume to 1L, and get 100ppm NDSA stock solution.

Different concentrations of standard solution preparation

Dilute 100ppm NDSA stock solution according to the required concentration. For example, take 50mL 100ppm NDSA stock solution and volume it with deionized water to 1L, then get 5ppm NDSA standard solution.

Note:

- Please operate carefully in the process of configuring standard liquid, and wear gloves;
- The test should be carried out in a brown light-proof bottle;
- In the calibration process, please use deionized water to clean the sensor and dry it to avoid contaminating the standard solution.

Maintenance

Maintenance Schedule

The cleanliness of the measuring window is very important to maintain accurate readings.

It is recommended to clean the sensor light Windows and dry them with a clean cloth before testing.

Maintenance task	Frequency
Sensor cleaning	**Every 30 days**
Calibration	**Every 3-4 weeks**
Replace brush	**Every 3 months**

Maintenance

1) Clean the sensor surface： Wash the outer surface of sensor with tap water, if there is still residue, using soft brush, for some stubborn dirt, household detergent can be added in tap water to clean.

2) Window surface: clean the outer surface of the sensor with tap water. For some stubborn dirt, traditional detergent and soft cloth can be used to clean it. It is forbidden to scrape the window surface with hard objects.

3) Check the cable： inspect the sensor cable if there is damage.

4) Check whether the sensor shell is damaged due to corrosion or other reasons.

5) Check whether the sensor's cleaning brush is damaged, excessive wear leads to less than the light window and other abnormalities.

Attention

The sensor contains sensitive optical and electronic components.

Make sure the sensor is not subjected to severe mechanical impact.

There are no components inside the sensor that require user maintenance.

Trouble Shooting

Table 5-1 lists the symptoms, possible causes, and recommended solutions for common problems encountered with the OIW sensor. If your symptom is not listed, or if none of the solutions solves your problem, please contact us.

Table 5-1

ERROR	POSSIBLE CAUSE	SOLUTION
Communication abnormal	Power supply or wiring issues	Check whether the power supply and wiring are correct according to the instruction
	Interface or protocol issues	1. Use our SmartPC upper computer software to check whether the communication is normal 2. Check according to the supporting communication protocol of the product
No change in reading	Cleaning brush failure	1. Check whether the brush is entangled by foreign matter, if so, please remove the foreign matter; 2. Turn on the power again and observe whether the brush rotates. If it cannot rotate or rotates abnormally, please contact customer service
		Check whether the power supply meets the requirements, to avoid the low power supply can not drive the brush rotation
	Hardware or software issues	Contact customer service
Measured value is too high, too Low or instability	Sensor's window is dirty and worn	Clean sensor body, special light window table
	Sensor's brush is worn	Change brush
	Calibration is required	Perform user calibration
Other errors	Contact customer service	

Quality Assurance

Warranty period:

Sensor warranty period is 1 year

Electrode warranty period is 4 months (Non-chemical environment, Non industrial wastewater).

If there are defects found during the warranty period, Promises to repair or replace the defective products, or return the payment of product except the charge for the first time for transport and related formalities. In the warranty period, repair or replacement of any product will only enjoy the rest of the original warranty.

After receiving feedback for the product quality problems from the customer, We will confirm whether the product need repair within two weeks; It can't be returned without approval to repair the product.

This warranty does not include the following：

- Damage caused due to force majeure, natural disasters, social unrest, war (published or unpublished), terrorism, civil war or any government forced.
- Damage caused due to improper use, negligence, accident, or caused by the improper application and installation.
- Freight of products shipped back to our company.
- Freight for parts or products express or express delivery within the warranty.
- Travel expense for repair in local in warranty

The quality assurance includes all content of products provided by our company.
It is the final, complete and unique statement of quality assurance, and no person or agent has the right to develop other warranties in the name of our company.

As mentioned above, remedies such as repair, replacement or refund of product payment do not violate the warranty and are only for our own products. According to strict liability or other legal theories, our company is not responsible for defects or any other damage caused by careless operation, including subsequent damage with causal relationship between these situations.