

Wall Mounted Online Optical DO Meter

User Manual

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Attention :

- When using the analyzer, please comply with the operation procedures and attentions of this user manual.
- If the instrument is found to be abnormal or damaged during use, please contact the dealer and do not repair it yourself..
- In order to measure more accurately, the instrument must be regularly calibrated with the electrode; if your electrode has been purchased for about a year or the electrode has quality problems, please replace it.
- Please power on the instrument for 30 minutes before calibration.
- Due to product updates, this manual is subject to change without notice.

1. Product configuration

Please confirm whether the Analyzer and the packaging box you purchased are complete. If the packaging is damaged or there are any shortage of accessories, please contact the dealer as soon as possible.

The configuration is as follows:

1.1 Standard Configuration

- ✧ Dissolved Oxygen controller ×1
- ✧ Optical DO sensor ×1
- ✧ User manual ×1

1.2 Optional Accessories

- ✧ Mounting bracket
- ✧ Connector of 485 communication interface and 485 transfer into 232 or 485 transfer into USB

2. Product introduction

The online fluorescence dissolved oxygen detector is an online intelligent dissolved oxygen detector produced by our company. The dissolved oxygen is measured by fluorescence method, and the emitted blue light is irradiated on the fluorescent layer. The fluorescent substance is excited to emit red light and oxygen. The concentration is inversely proportional to the time at which the fluorescent material returns to the ground state. A reference red light is also set up, and the concentration of oxygen molecules is calculated by measuring the phase difference between the excitation red light and the reference red light and corresponding to the internal calibration value. The use of this advanced analytical technology ensures that the instrument is stable, reliable and accurate over the long term. It has English menu operation, also can be widely used in chemical fertilizer, metallurgy, environmental water treatment engineering, pharmaceutical, biochemical, food, aquaculture and tap water and other solutions in the continuous monitoring of dissolved oxygen values.

Main Feature:

- ✧ Large screen dot-matrix LCD display, English menu operation, multi-channel display at the same time.
- ✧ Automatic/manual temperature compensation function.
- ✧ Communication function: RS-485 communication interface (compatible with MODBUS protocol). (Optional)
- ✧ It can be connected to our online acquisition software for data acquisition and processing. (Optional)
- ✧ Able to Restore factory settings.
- ✧ Watchdog function: ensure that the meter will not crash.
- ✧ Power-off protection > 10 years.
- ✧ Protection grade IP65, waterproof and dust-proof.

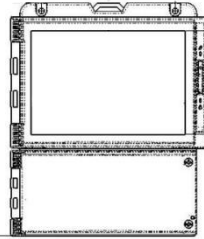
3. Technical indicators

Item	Specification
Measuring Range	0.00–20.00 mg/L, 0–50 °C
Resolution	0.01 mg/L, 0.1 °C
Accuracy	±2% F.S., ±0.3 °C
Temperature Compensation	Automatic, NTC10K
Signal Output	4–20 mA isolated output (photoelectric coupler isolation)
Working Conditions	Ambient temperature: 0–50 °C; Relative humidity: ≤90%
Output Load	<750 Ω (4–20 mA)
Power Supply	220 VAC ±10%, 50/60 Hz (optional DC 24 V or DC 12 V)
Dimensions	218 × 183 × 126 mm (Controller)
Installation	Wall-mounted
Weight	1.5 kg (Controller)
Protection Level	IP65, waterproof, moisture-proof, dust-proof

4. Instrument installation

4.1. Host installation

The instrument should be installed in a clean, dry, well-ventilated location without vibration, and there should be no corrosive gas around it.



The installation method is wall-mounted installation. First, fix the screws on the wall according to the position of the installation hole of the instrument, and then install it firmly.

4.2 Installation of Sensor

Do not put the electrode directly into the water. Installing the electrode into a bracket or flow cup. Before installation, please make sure to use the PTFE tape (3/4 thread) to do the waterproof sealing work to avoid water entering the electrode and then causing short circuit of the DO electrode cable.

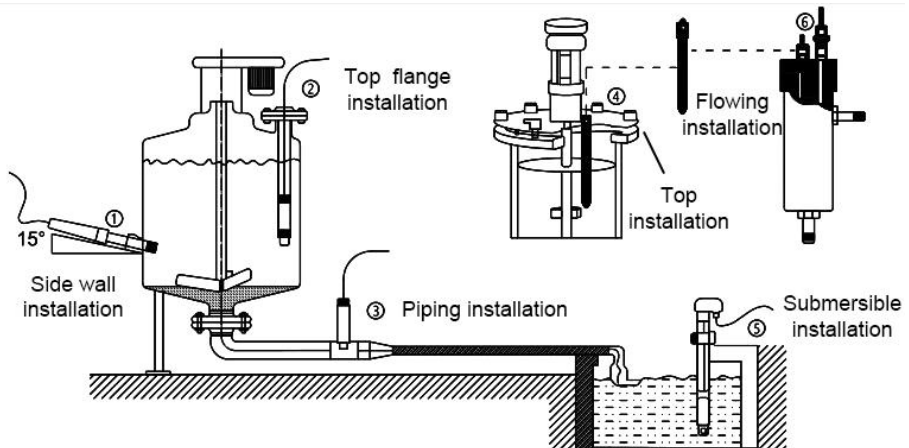


Diagram of installation instruction

5. Instrument panel and wiring instructions

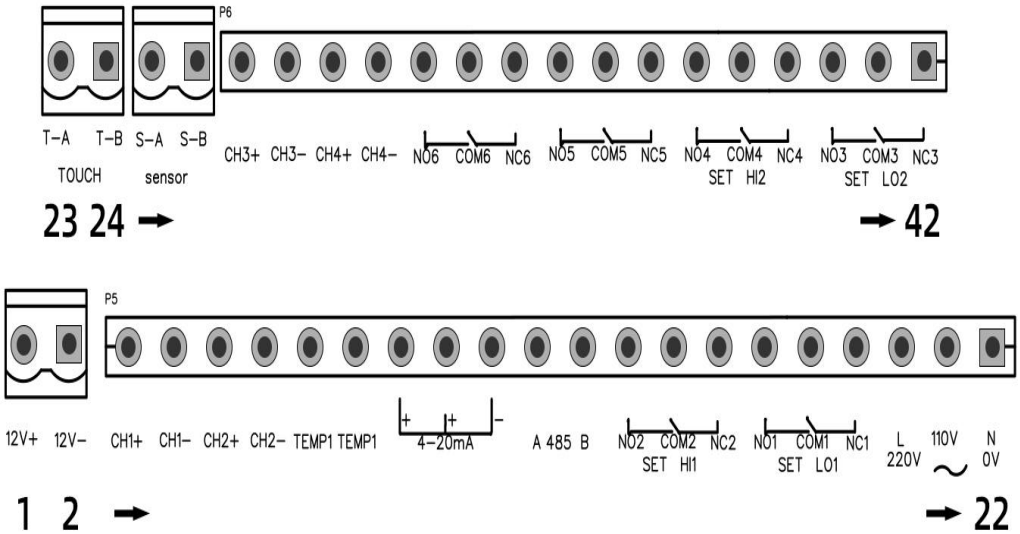
Front panel buttons



1. MENU: menu key or cursor movement key
2. DOWN: cursor move down or numerical decrease key
3. UP: cursor move up or numerical increase key
4. ENTER: confirm key
5. ESC: return or exit key (return to the previous menu)

Key description: Press the MENU key to pop up/move the cursor, press the DOWN key/UP key to modify, and press the ENTER key to store the data. Press the ESC key to return to the previous menu. The same key is accelerated by pressing it several times, then press and hold it to accelerate.

Open the cover under the instrument, the schematic diagram of terminal on the circuit board as follows:



Instrument wiring diagram

1.12V+: Output DC12v DO Sensor	23.Second RS485: T-A
2.12V-: Ouptut DC0V DO Sensor	24.Second RS485: T-B
3.CH1+: 1st Channel +	25.S-A: Sensor rs485A
4.CH1-: 1st Channel -	26.S-B: Sensor rs485A
5.CH2+:2nd Channel +	27. CH3+: 3rd Channel +
6.CH2-: 2nd Channel -	28. CH3-: 3rd Channel +
7.TEMP1 :	29.CH4+ : 4th Channel +
8.TEMP1:	30.CH4+ : 4th Channel -

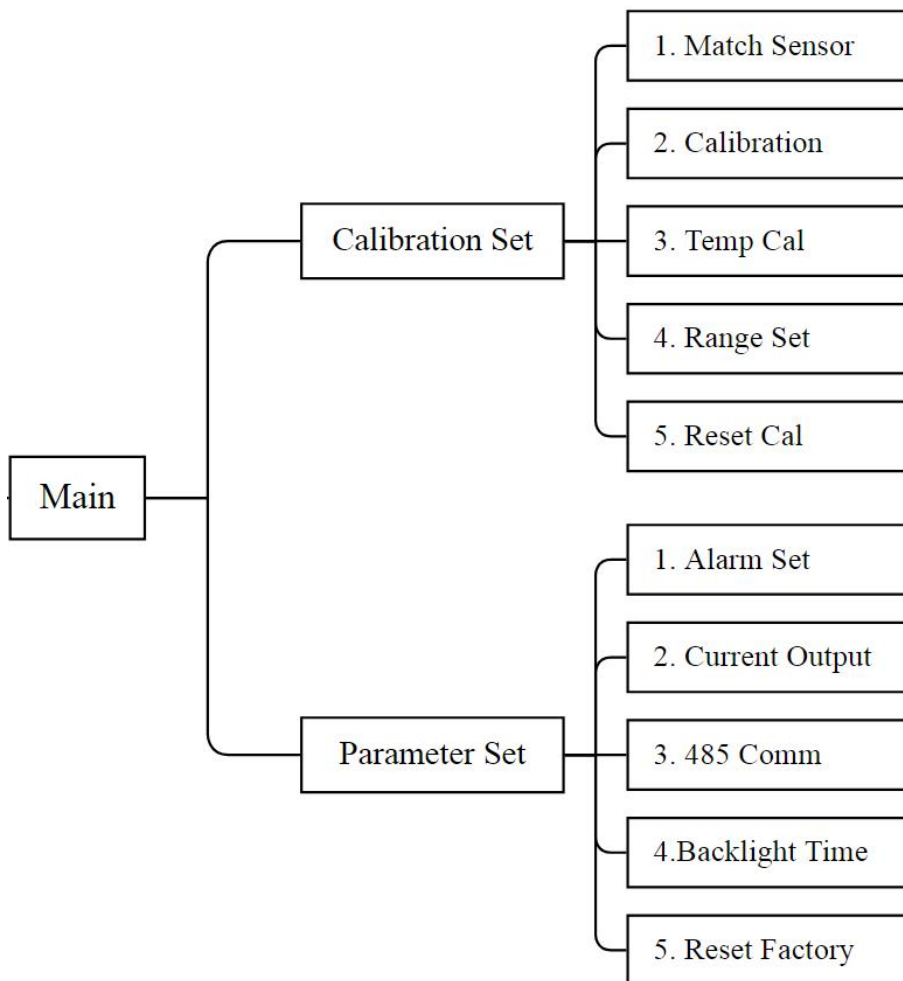
9.First Way:4-20mA+: DO	31. NO6:Relay NO
10.Second Way:4-20mA+: Temp.	32. COM6:Relay COM
11.4-20MA-: COM	33. NC6:Relay NC
12. First RS485: A	34. NO5:Relay NO
13. .First RS485: B	35. COM5:Relay COM
14.NO2: Relay NO	36. NC5:Relay NC
15. COM2: Relay COM	37. NO4:Relay NO
16.NC2: Relay NC	38. COM4:Relay COM
17. NO1: Relay NO	39. NC4:Relay NC
18. COM1: Relay COM	40. NO3: Relay NO
19. NC1: Relay NC	41. COM3: Relay COM
20. L: 220V Live Wire	42. NC3 : Relay NC
21. None	
22. N: 0V Neutral wire	

Note: If you want RS-232 function, please select the appropriate RS-485 to RS-232 device. The RS-485 interface part of this instrument is compatible with MODBUS protocol. Please consult the manufacturer or dealer for details.

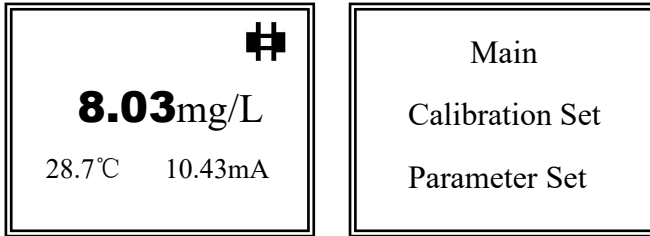
1. Make sure the wiring is correct before turning on the power. Incorrect wiring may cause damage to the meter.
2. The power cannot be bypassed from high-power equipment, and the power line and signal line should be separated when wiring.

6. Instrument Function Settings

6.1. Menu Structure



6.2. Main Interface and Main Menu

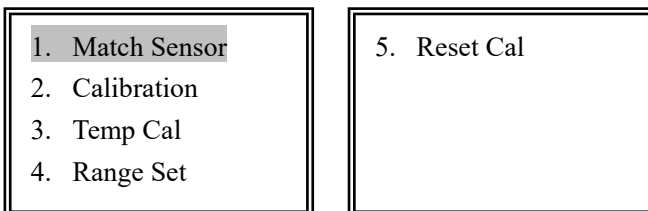


The DO value in the main interface is the main display, and the temperature and current values are sub-displays. The lower right corner is the current value of DO measurement, and 10.43mA is the current output value. The icon  in the upper right corner indicates that the sensor has communicated. If an icon  is displayed in the upper right corner, it means that the sensor is not communicating. At this time, the measured value is generally 0, and functions other than matching the sensor under the Match Sensor menu cannot be used.

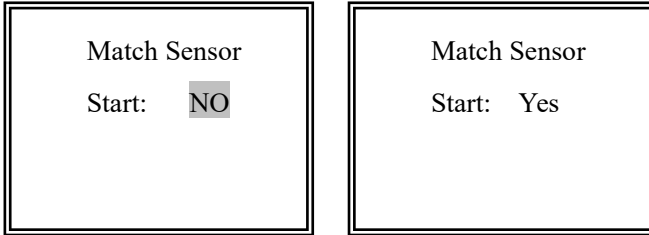
6.3 Calibration Set

6.3.1 Match sensor

In the main menu, press the up and down keys to select the Calibration Set, and press the ENTER key to enter the Calibration Set menu. Press the up and down keys to select various settings, the first item in this section.



Press ENTER to enter the match sensor menu. Press the MENU selection key to pop up the cursor, move the cursor, press the up and down keys to modify, select "Yes" to execute the action, select "No" to cancel. Press the ENTER key to store the data, and press the ESC key to return to the previous menu.



The instrument communicates with the sensor through RS485, the sensor slave ID should be 1, and the baud rate should be 9600. If the sensor is not with this configuration, the meter cannot read sensor data and set the sensor. At this time, the sensor can be modified to slave ID 1, and the baud rate is 9600 by matching the sensor function.

6.3.2 Dissolved Oxygen Calibration

The DO sensor has been professionally calibrated before leaving the factory, and it does not need to be calibrated during normal use. When the measured value is deviated, please give priority to cleaning and maintenance. If you really need to calibrate, please ensure the accuracy of the standard solution used for calibration.

The type of calibration can be selected on the Type, zero calibration and slope calibration.

Zero Calibration

The instrument should clean the electrode with distilled water first, then prepare the anaerobic water.

Anaerobic water preparation: 5% anhydrous sodium sulfite (Na_2SO_3) was added to 250 ml of distilled water to prepare a saturated solution, which can be regarded as oxygen-free water. By default, the oxygen content in the water is 0 mg/L.

Put the cleaned DO electrode into the anaerobic water, enter the Zero Cal menu, then press the MENU menu selection key to pop up the cursor, wait value to be stable, press ENTER to confirm and save the data. Press ESC key to return to the previous menu. (Note: Usually the zero point has been calibrated in the factory, and the slope is calibrated directly.)

Type:	Zero Cal
DO:	7.92mg/L
VAL:	0.00mg/L
0	Confirm

Type:	Zero Cal
DO:	7.92mg/L
VAL:	0.00mg/L
0	Confirm

Slope Calibration

Take the DO electrode out of the oxygen-free water, clean it with pure water and dry it with filter paper, then place the electrode vertically in the air and keep it still. Enter the DO Slope Cal menu and press ENTER to enter, then press MENU menu selection key to pop up the cursor, and press ENTER to confirm and save the completion of the slope calibration after the DO value is stable. Press ESC key to return to the previous menu.

Type:	Slope Cal
DO:	7.92mg/L
VAL:	0.00mg/L
0	Confirm

Type:	Slope Cal
DO:	7.92mg/L
VAL:	0.00mg/L
0	Confirm

6.3.3 Temperature Calibration

In the main menu, press the up and down keys to select the Temp Cal, and press the ENTER key to enter the meter setting menu, as shown below, the left picture is the first page, and the right picture is the second page. Press the up and down keys to select various settings, select the first item in this section.

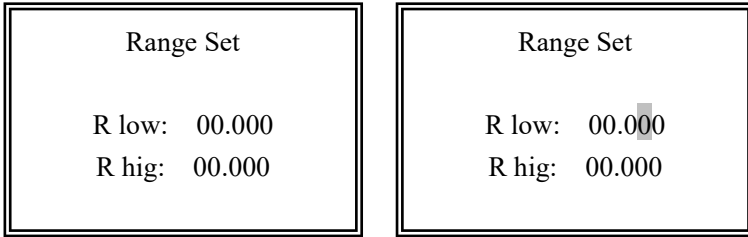
Temp Cal	
Temp:	28.76°C
Set :	28.76°C

Temp Cal	
Temp:	28.76°C
Set :	28.76°C

Press the MENU selection key to bring up the cursor, press the UP and DOWN keys to adjust the value, press ENTER to confirm and save the temperature value. Press ESC to return to the previous menu.

6.3.4 Range Set

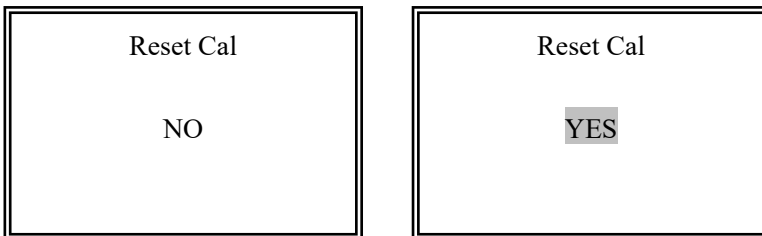
This function is to set the sensor range. Select the range setting in the sensor setting menu, and press the ENTER key to enter the range setting interface.



Press the MENU selection key to pop up the cursor, move the cursor, and press the up and down keys to modify the range value. Press the ENTER key to save the data, or press the ESC key to return to the previous menu.

6.3.5 Reset Cal

This function can restore the calibration status of the sensor to the factory settings. Select Restore sensor in the sensor setting menu and press the ENTER key to enter the restore sensor interface. Press the MENU selection key to pop up the cursor, move the cursor, and press the up and down keys to select and confirm.



6.4 Parameter Set

In the main menu, press the up and down keys to select the Parameter Set, and press the ENTER key to enter the meter setting menu, as shown below, the left picture is the first page, and the right picture is the second page. Press the up and down keys to select various settings, select the first item in this section.

2. Alarm Set
3. Current Output
4. 485 Comm
5. Backlight Time

1. Reset Factory

6.4.1 Alarm Set

Select the Alarm Set in the Parameter Set menu and press the ENTER. Press the MENU to pop up the cursor and move the cursor. You can press the UP and DOWN keys to modify it.

High : 00.000
Lag H : 00.000
Low: 00.000
Lag L: 00.000

High : 00.000
Lag H : 00.000
Low: 00.000
Lag L: 00.000

High limit H: High limit setting of warner; Lag “H”: Delayed alarm of high limit; low limit L: Low limit setting of warner; Lag “L”: Delayed alarm of low limit.(Note: Delayed figure was set between high limit~low limit.)

In order to avoid the relay from fluctuation or controlling the DO value of the solution, the instrument sets this function. The specific operation is as follows: Press the up and down keys adjust to delayed figure

High limit relay: It will be activated when the actual measured value is higher than the high limit alarm setting value HIGH value, and the actual measured value will fall again below (High limit H value - Delayed figure H value).

Low limit relay: It will be operated when the actual measured value is lower

than the low limit alarm setting value LOW value, and the actual measured value will rise again when it rises above (low limit L value + Delayed figure L value). Useful to extend the life of the relay or AC contactor. Therefore, the user must set the high, low and hysteresis according to the actual situation.

6.4.2 Current Output

In this function, 4-20mA corresponding to DO value and temperature value can be set. The factory value of the 4-20mA output is corresponds to default measurement range of meter, but the user can arbitrarily set the corresponding value according to his own requirements to meet the industrial control needs. Press ENTER to pop up the cursor, move the cursor. You can press the up and down keys to modify. Press ENTER to save the data, press ESC return to the previous menu. Press the ESC return to previous menu.

Note: Output current (mA)

Forward control: $I = 16 \times (C - A) / (B - A) + 4$ $4\text{mA} \leq I \leq 20\text{mA}$

Reverse control: $I = 16 \times (A - C) / (A - B) + 4$ $4\text{mA} \geq I \geq 20\text{mA}$

I is the output current value

C is the current measured PH value of the meter, $0.00 \leq C \leq 14.00$.

A is the value corresponding to 4 mA in the setting

B is the value corresponding to 20mA in the setting

4-20mA Set	
Output: DO	
4 mA:	00.000
20 mA:	20.000

4-20mA Set	
Output: TEMP	
4 mA:	00.000
20 mA:	50.000

6.4.3 485 Communication

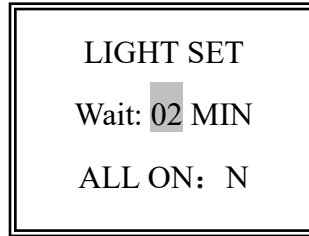
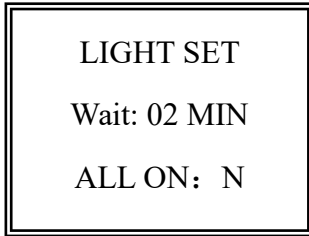
485Comm Set	485Comm Set
ADD: 01	ADD: 01
BAUD: 9600	BAUD: 9600

Select the 485 Comm Set in the Parameter Set menu and press the ENTER. Press MENU to pop up the cursor, you can press the UP and DOWN keys to adjust. Communication address (hexadecimal), press ENTER to save the data, press ESC return to the previous menu. (Note: Please consult the manufacturer or distributor for specific protocol specifications)

The address ID can be adjusted from 1 to FF, and a variety of baud rate options are provided so that the user can set it to 1200, 2400, 4800, or 9600 as needed to accommodate different communication needs.

6.4.4 Backlight Time

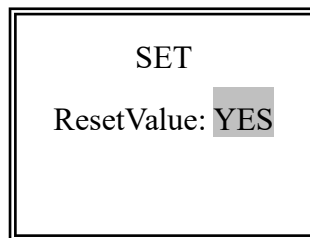
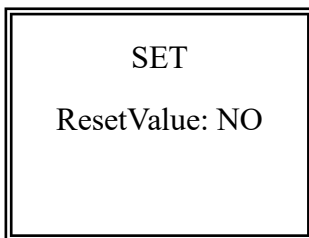
Select Backlight Time setting in the Parameter Set menu and press ENTER. Press MENU to pop up the cursor, move the cursor. You can press the up and down keys to modify. Press ENTER to save the data, press ESC return to the previous menu. Press the ESC return to previous menu. Backlight control allows the meter to save power, protect the display and extend life.



6.4.5 Reset Factory

The instrument can be restored to the factory settings if it is misused, mis-calibrated or detects incorrect data during use. It is recommended that the calibration needs to be performed again after restoring the factory values.

Select Restet Factory Value in the Parameter Set menu, press ENTER to enter the Reset Factory menu. Press MENU key to pop up the cursor, you can press the up and down keys to modify. Press ENTER to store data, press ESC to return to the previous menu.



7. Daily Maintenance Points

In order to obtain the best measurement results, it is very necessary to maintain the sensor regularly. Maintenance mainly includes cleaning, inspecting damage of the sensor, and periodic calibration.

7.1 Sensor Cleaning

It is recommended that the sensor should be cleaned at regular intervals (usually 3 months, depending on the site environment) to ensure the accuracy of the measurement.

Use water to clean the outer surface of the sensor. If there is still debris, wipe it with a damp soft cloth. Do not place the sensor in a direct sunlight or near radiation. In the entire life of the sensor, if the total sun exposure time reaches to one hour, it will cause the fluorescent cap aging and going wrong, and consequently leading to the wrong reading.

7.2 Inspection on the Damage of Sensor

According to the appearance of sensor to check if there is damage; if any damage is found, please contact after-sales service maintenance center in time for replacement to prevent malfunction of sensor caused by water from the damaged cap.

7.3 Preservation of Sensor

- A. When you are not using it, please cover the product's original protective cap to avoid direct sunlight or exposure. In order to protect the sensor from freezing, the DO probe should be stored in a place where it will not freeze.
- B. Keep the probe clean before storing it for a long time. Keep the equipment in a shipping box or a plastic container with electric shock protection.

Avoid touching it with hand or other hard objects in case of scratching the fluorescent cap.

- C. It is forbidden that the fluorescent cap is exposed to direct sunlight or exposure.

7.4 Replacement of Sensor Cap

The sensor's measurement cap needs to be replaced when it's damaged. In order to ensure the accuracy of the measurement, it is recommended to change it every year or it is necessary to be replaced when the cap is found severely damaged during the inspection.

Fluorescent Cap Replacement: Simply screw the old fluorescent cap off the sensor and screw the new fluorescent cap on.