

Fluorescence Dissolved Oxygen Sensor

FDOS 5.0

Operation Manual



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Chapter 1 Product Specifications

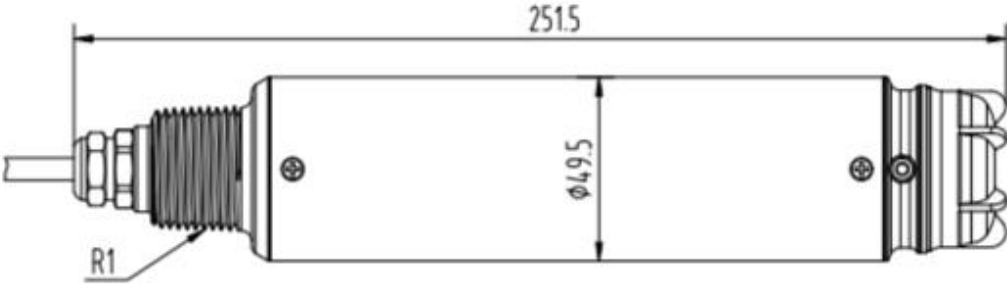
Specifications	Details
Size	Diameter 49.5mm*Length 251.1mm
Weight	1.4KG
Main Material	SUS316L+PVC (Ordinary Version), Titanium Alloy (Seawater Version)
	O-ring: Fluoro-rubber
	Cable: PVC
Waterproof Rate	IP68/NEMA6P
Measurement Range	0-20mg/L(0-20ppm)
	Temperature: 0-45°C
Indication Resolution	Resolution: $\pm 3\%$
	Temperature: $\pm 0.5^\circ\text{C}$
Storage Temperature	-15~65°C
Environment Temperature	0~45°C
Pressure Range	$\leq 0.3\text{Mpa}$
Power Supply	12 VDC
Calibration	Automatic air calibration, Sample calibration
Cable Length	Standard 10-Meter Cable, Max Length: 100 Meters
Warranty Period	1 Year
External Dimension:	
 <p>The drawing shows a cylindrical sensor with a threaded end on the left and a connector end on the right. The total length is 251.5 mm and the diameter is 49.5 mm. A detail R1 is shown at the threaded end.</p>	

Table 1 Dissolved Oxygen Sensor Technical Specifications

Chapter 2 Product Information

The dissolved oxygen sensor measures the dissolved oxygen by the fluorescence method, and the emitted blue light is irradiated on the phosphor layer. The fluorescent substance is stimulated to emit red light, and the oxygen concentration is inversely proportional to the time when the fluorescent substance returns to the ground state. By using this method to measure the dissolved oxygen, it will not produce oxygen consumption, thus assuring data stability, reliable performance, no interference, and simple installation and calibration.

The product is widely used in sewage plant, water plant, water station, surface water, farming, industry and other fields. Dissolved oxygen sensor appearance is shown as figure 1.

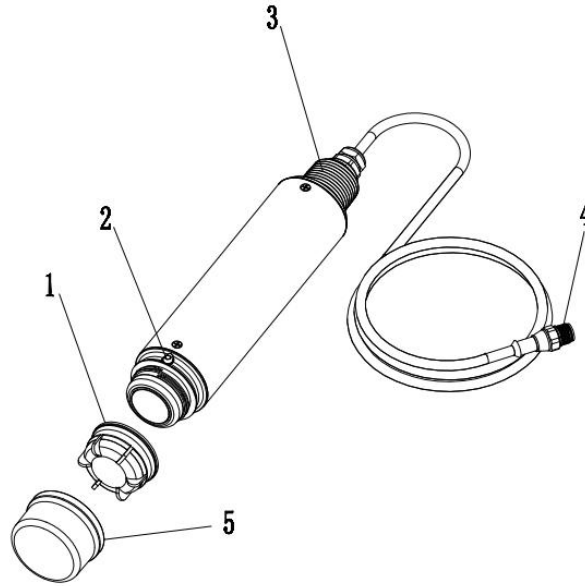


Figure 1 Dissolved Oxygen Sensor Appearance

1- Measurement Cover	2- Temperature Sensor	3- R1
4- Joint	5- Protective cap	

Chapter 3 Installation

3.1 Installation of Sensors

The specific installation steps are as follows:

- Install the 8 (mounting plate) on the railing by the pool with 1 (M8 U-shape clamp) at the sensor mounting position;
- Connect 9 (adapter) to 2 (DN32) PVC pipe by glue, pass the sensor cable through Pcv pipe until the sensor screws into 9 (adapter), and do waterproof treatment;
- Fix 2 (DN32 tube) onto 8 (mounting plate) by 4 (DN42U-shape clamp).

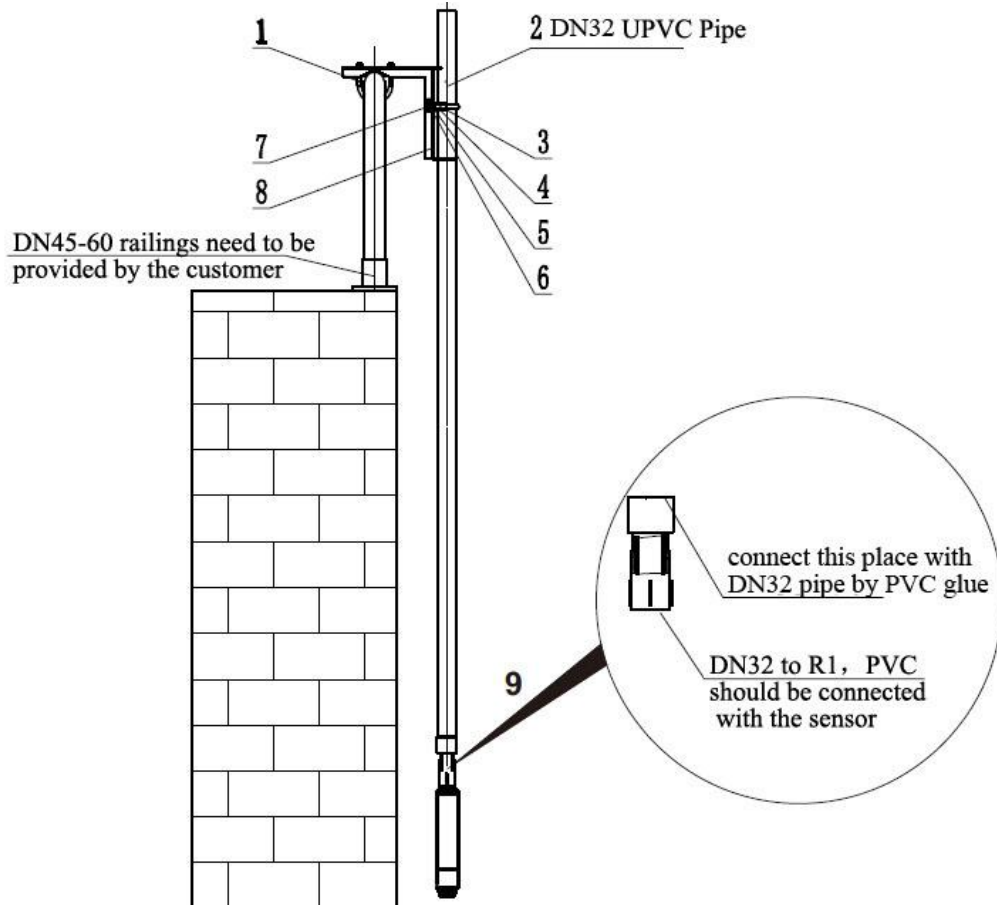


Figure 2 Schematic Diagram on the Installation of Sensor

1-M8U-shape Clamp (DN60)	2- DN32 Pipe (outside diameter 40mm)
3- Hexagon Socket Screw M6*120	4-DN42U-shape Pipe Clip
5- M8 Gasket (8*16*1)	6- M8 Gasket (8*24*2)
7- M8 Spring Shim	8- Mounting Plate
9-Adaptor(Thread to Straight-through)	

3.2 Connection of Sensor

The sensor should be correctly connected by the following definition of wire core:

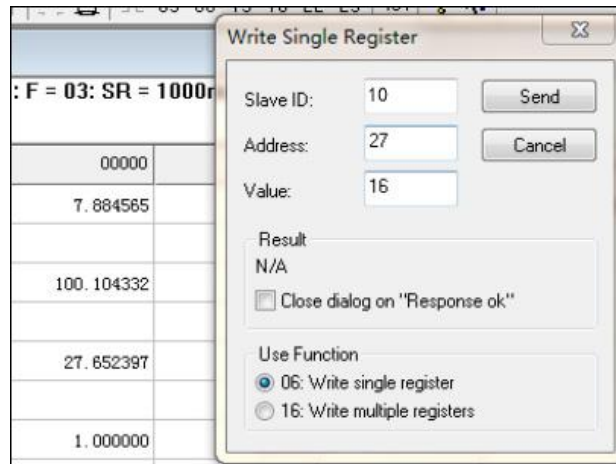
Serial No.	1	2	3	4
Sensor Cable	Brown	Black	Blue	White
Signal	+12VDC	AGND	RS485 A	RS485 B

Chapter 4 Calibration of Sensor

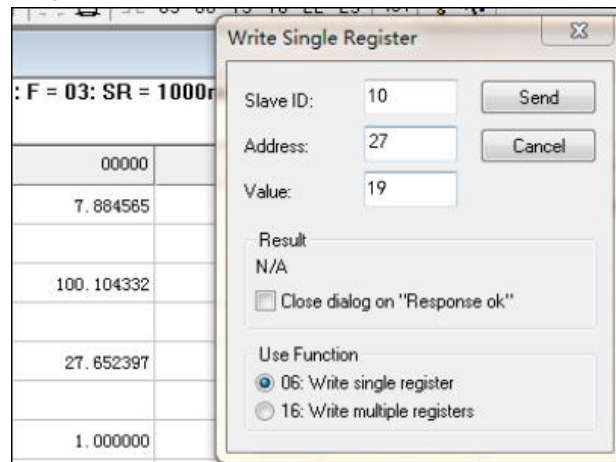
The dissolved oxygen sensor has been calibrated at the factory, and if you need to calibrate yourself, follow the steps below

Air Calibration The specific steps are as follows:

① Double-click the "06", and a box pops out on the right. Change the Value to 16 and click "Send".



② Dry the sensor and put it into the air, after the measured data is stable, double-click the "06", change the Value to 19 and click "Send".



Chapter 5 Communication Protocol

The sensor is equipped with MODBUS RS485 communication function, please refer to this manual section 3.2 to check the communication wiring . The default baud rate is 9600, the specific MODBUS RTU table is shown in the following table.

MODBUS-RTU	
Baud Rate	4800/9600/19200/38400/57600
Data Bits	8 bit
Parity Check	no
Stop Bit	1bit

Register Name	Address Location	Data Type	Length	Read/Write	Description	
Dissolved Oxygen Value	0	F(Float)	2	R(only read)		Dissolved Oxygen Value
Dissolved Oxygen Concentration	2	F	2	R		Dissolved Oxygen Concentration
Temperature	4	F	2	R		Temperature
Slope	6	F	2	W/R	Range: 0.5-1.5	Slope
Deviation Value	8	F	2	W/R	Range: -20-20	Deviation Value
Salinity	10	F	2	W/R		Salinity
Atmospheric Pressure	12	F	2	W/R		Atmospheric Pressure
Baud Rate	16	F	2	R		Baud Rate
Slave Address	18	F	2	R	Range: 1-254	Slave Address
Response Time of Read	20	F	2	R		Response Time of Read

Modift Baud Rate	16	Signed	1	W		0-4800 1-9600 2-19200 3-38400 4-57600
Modify Slave Address	17	Signed	1	W	Range: 1-254	
Modify Response Time	30	Signed	1	W	6-60s	Modify Response Time
Air Calibration	Step 1	27	Signed	1	W	16
	Step 2	27	Signed	1	W	19
	It should be cancelled if you don't want to calibrate after the execution of "Step 1".					
	Cancel	27	Signed	1	W	21
Function Code	R:03 Write 06 as the reshaping data 06 Write 16 as the floating point data					

Chapter 6 Maintenance

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.

6.1 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.

6.2 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.

6.3 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.

6.4 Replacement of Measurement 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.