

OX-12B portable dissolved oxygen meter

instruction manual

Shanghai Meixi Intelligent Electronic Instrument Co., Ltd

Welcome to use the dissolved oxygen analyzer developed and produced by Shanghai Meixi Intelligent Electronic Instrument Co., Ltd.

Must read when using

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

Please follow the manual, operation procedures and precautions.

The product is a measuring instrument. It must be sent to the quality and technical testing department for verification every year after use. It can be used continuously after passing the test.

The oxygen sensor is coated electrode. After a certain period of use (two weeks or more), the electrode membrane and solution in the electrode should be replaced.

Please be careful when you open the instrument and check whether the accessories are complete. If any damage is found, please inform our company and distributor immediately, and keep the packing materials for return.

Please do not repair the instrument by yourself, please contact our company directly.

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Executive standard: Q31 / 011500736c003-2020

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Foreword

Ox-12B portable dissolved oxygen analyzer is an electrochemical analyzer based on the principle of polarography. It can measure dissolved oxygen in water.

Dissolved oxygen (unit mg / L and $\mu\text{g} / \text{L}$) refers to the molecular oxygen dissolved in water or liquid phase, and its content is one of the important indicators to measure the quality of water quality. Dissolved oxygen measurement is an indispensable monitoring project in power generation, boiler, aquaculture, water source protection, water supply, sewage treatment and other departments.

一、 Main technical parameters:

Main technical parameters of dissolved oxygen

1. Measuring range of the instrument:

FI (0-20) mg / L resolution 0.01 mg / L

GI (0-999) $\mu\text{g/L}$ resolution 1 $\mu\text{g/L}$

HI (0.0-99.9) $\mu\text{g/L}$ resolution 0.3 $\mu\text{g} / \text{L}$

HB (0.0-99.9) $\mu\text{g} / \text{L}$ resolution 0.1 $\mu\text{g} / \text{L}$

2. Instrument indication error:

FI $\leq \pm 0.3\text{mg/l}$ (6-12) mg / L

GI $\leq \pm 40\mu\text{g/L}$

HI、 HB $\leq \pm 8\mu\text{g/L}$

3. Instrument repeatability:

FI $\leq 0.14\text{mg/l}$ (6-12) mg / L

GI $\leq 14\mu\text{g/L}$

HI、 HB $\leq 3\mu\text{g/L}$

4. Instrument response time:

Not more than 30s (90%, 25 °C)

5. Instrument zero value (error)

(0.0 -20) mg/L $\leq 0.1 \text{ mg/L}$

(0.01 -20) mg/L $\leq 0.05 \text{ mg/L}$

(1-999) $\mu\text{g/L}$ $\leq 5\mu\text{g/L}$

(0.0 -99.9) $\mu\text{g/L}$ $\leq 0.9\mu\text{g/L}$

(0.0 -99.9) $\mu\text{g/L}$ $\leq 0.7\mu\text{g/L}$

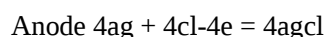
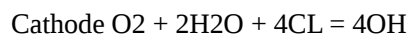
6. Temperature indication error: $\leq \pm 0.5 \text{ }^{\circ}\text{C}$

7. Working conditions of the instrument:

- a) Ambient temperature: (5-35) °C.
- b) Relative humidity: no more than 85% RH.
- c) Power supply: DC (3-2.5) v.
- d) The measured water temperature: (5-40) °C.
- e) There should be no electromagnetic interference affecting the normal operation of the instrument.
- f) Atmospheric pressure: (860-1060) hPa.
- g) The power supply environment and air circulation are good, and there is no interference gas affecting the detection accuracy.
- 8. The influence quantity when the power supply voltage changes: one fifth of the instrument indication error.
- 9. Influence quantity of environmental temperature change: two thirds of instrument indication error.
- Oxygen electrode life is more than 1 years.
- 11. Power consumption: < 2mW.
- 12. External dimension: (165×80×30) mm
- 13. Weight: 310g.

二、 Principle

The oxygen detector adopts the principle of polarography and the film covered oxygen electrode (also known as Clark electrode). Molecular oxygen from the liquid medium through the membrane into the electrode electrolyte, under a certain polarization voltage, oxygen is reduced, resulting in current. The oxygen in the coated oxygen electrode reacts as follows in neutral electrolyte



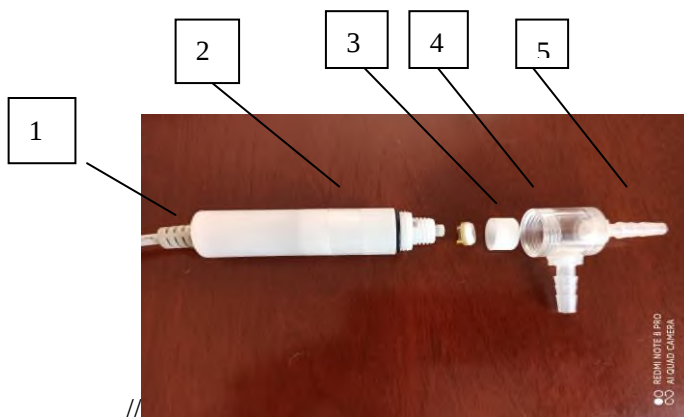
The current is directly proportional to the oxygen concentration. The electrolytic current is amplified and calculated by the electronic unit to display the oxygen concentration.

In the process of oxygen reduction, the electrode consumes oxygen, which must be continuously supplied by the medium. Therefore, when measuring the oxygen concentration with the instrument, the medium must flow continuously to ensure the accuracy and reliability of the measurement.

三、 Structure and installation:

(1) Oxygen electrode:

The structure of oxygen electrode is shown in Figure 1



1. Cable; 2, oxygen electrode; 3, PA electrode film; 4, pressure film ring nut; 5, water head

(2) Portable instrument:

See Figure 2 on the right for portable instruments



Water intake

(3) Installation of oxygen electrode:

The oxygen electrode of the newly purchased instrument has been installed and can be put into use immediately without re installation. Please refer to "instructions for re installation".

Installation of instrument power supply:

Open the battery cover on the back of the instrument and install 2 batteries No.5. When the display screen is under voltage, please replace the battery immediately to avoid battery leakage and corrosion of circuit board.

In different applications, appropriate interfaces are needed. In order to achieve the purpose of correct measurement.

四、 Operation

(1) Function of the instrument function key:

1. There is a power switch key at the bottom left of the instrument display screen, which is used for the instrument switch.
2. There is a knob screw in the middle of the right side of the instrument to adjust and calibrate.

(2) Determination of dissolved oxygen

1. Instrument calibration-----after the instrument is powered on for about 15 minutes, the oxygen electrode is placed in the air. After the display is stable, check the dissolved oxygen value at atmospheric pressure and temperature according to the temperature on the display screen of the instrument. .

2. Sample determination ---- after the instrument is calibrated, install the oxygen electrode flow cell, and put the sample into the flow cell, and keep the flow rate of the sample greater than 13cm / s. After the instrument shows stable (2-3) minutes, record the instrument reading. It is the dissolved oxygen of the sample.

五、 Use instructions and maintenance:

1. The oxygen electrode of the instrument has been installed before leaving the factory, so it can be put into use directly without re installing the oxygen electrode. If the electrode membrane needs to be re installed,

Please follow the steps below:

(1) The electrode cavity was flushed twice by injecting distilled water into syringe, and then 0.2ml of DO-100 electrolyte was extracted to leave some space. (schematic diagram of changing membrane and liquid medicine)



(2) Add a drop of electrolyte on the electrode head, rinse the PA-100 membrane coil with electrolyte twice, and then slowly buckle it on the electrode head after filling, and screw it with the pressure film ring. Clean the electrode with water, then dry it with absorbent paper and screw on the sheath. The oxygen electrode is connected to the instrument and can be used only after the power is turned on for 24 hours.

2. If the reading of the instrument fluctuates greatly and cannot be measured correctly. Please tap the oxygen electrode gently. When the reading fluctuation of the instrument is greater than 0.5%, it is due to the movement, perforation or rupture of the PA type membrane, so the electrode membrane should be replaced. Please refer to Article 1 of this chapter for replacement of electrode film.

3. When the oxygen electrode is not in use, it should be covered with a water head, and the inside of the electrode should be moistened with absorbent cotton, and water should be added frequently to keep it moist.
 4. When using the instrument, please call and ask. If you have any problem, please send it to the repair Department of our company. Please don't open the back cover of the instrument by yourself. The adjustable parts inside should not be moved, so as to avoid trouble for our company.
 5. For instruments with dry batteries, if the batteries have to be replaced after half a year of service, an undervoltage prompt will be displayed in the lower left corner of the display, and a new battery should be replaced.
 6. When the reading of the instrument decreases gradually, it indicates that the surface active substance is adsorbed on the electrode surface. Wipe the cathode surface of the electrode with cotton or filter paper dipped with pure ethanol. After changing the electrolyte, install a new electrode membrane.
 7. This instrument is a measuring instrument. In order to ensure the accurate use of the instrument, it should be sent to the local quality and technology testing department for verification or our company's inspection every year.
- Under different atmospheric pressure, the dissolved oxygen content can be checked as follows:

Table 1 saturation concentration of oxygen in water with different water temperature and atmospheric pressure

Temperature /°C	Atmospheric pressure/hPa									
	800	833	867	900	933	967	1000	1013	1033	1066
0	11.53	12.01	12.49	12.98	13.46	13.94	14.43	14.62	14.91	15.39
1	11.21	11.68	12.15	12.62	13.09	13.56	14.03	14.22	14.50	14.97
2	10.90	11.36	11.82	12.27	12.73	13.19	13.65	13.83	14.10	14.56
3	10.61	11.05	11.50	11.94	12.39	12.84	13.28	13.46	13.73	14.17
4	10.33	10.76	11.20	11.63	12.06	12.50	12.93	13.11	13.37	13.80
5	10.06	10.48	10.91	11.33	11.75	12.18	12.60	12.77	13.02	13.45
6	9.80	10.22	10.63	11.04	11.46	11.87	12.28	12.45	12.69	13.11
7	9.56	9.96	10.37	10.77	11.17	11.57	11.98	12.14	12.38	12.78
8	9.33	9.72	10.11	10.51	10.9	11.29	11.69	11.84	12.08	12.47
9	9.10	9.48	9.87	10.25	10.64	11.02	11.41	11.56	11.79	12.17
10	8.88	9.26	9.64	10.01	10.39	10.76	11.14	11.29	11.51	11.89
11	8.68	9.04	9.41	9.78	10.15	10.51	10.88	11.03	11.25	11.61
12	8.48	8.84	9.20	9.56	9.92	10.27	10.63	10.78	10.99	11.35
13	8.29	8.64	8.99	9.34	9.69	10.04	10.40	10.54	10.75	11.10
14	8.10	8.45	8.79	9.14	9.48	9.82	10.17	10.31	10.51	10.86
15	7.93	8.26	8.60	8.94	9.28	9.61	9.95	10.08	10.29	10.62
16	7.76	8.09	8.42	8.75	9.08	9.41	9.74	9.87	10.07	10.40
17	7.59	7.92	8.24	8.56	8.89	9.21	9.54	9.67	9.86	10.18
18	7.43	7.75	8.07	8.39	8.70	9.02	9.34	9.47	9.66	9.98
19	7.28	7.59	7.91	8.22	8.53	8.84	9.15	9.28	9.46	9.77
20	7.13	7.44	7.75	8.05	8.36	8.66	8.97	9.09	9.28	9.58
21	6.99	7.29	7.59	7.89	8.19	8.49	8.79	8.92	9.10	9.40
22	6.85	7.15	7.45	7.74	8.04	8.33	8.63	8.74	8.92	9.21

Temperature /°C	Atmospheric pressure /hPa									
	800	833	867	900	933	967	1000	1013	1033	1066
23	6.72	7.01	7.30	7.59	7.88	8.17	8.46	8.58	8.75	9.04
24	6.59	6.88	7.16	7.45	7.73	8.02	8.30	8.42	8.59	8.87
25	6.47	6.75	7.03	7.31	7.59	7.87	8.15	8.26	8.43	8.71
26	6.35	6.62	6.90	7.18	7.45	7.73	8.00	8.11	8.28	8.55
27	6.23	6.50	6.77	7.05	7.32	7.59	7.86	7.97	8.13	8.40
28	6.12	6.38	6.65	6.92	7.19	7.45	7.72	7.83	7.99	8.25
29	6.01	6.27	6.53	6.80	7.06	7.32	7.59	7.69	7.85	8.11
30	5.90	6.16	6.42	6.68	6.94	7.20	7.46	7.56	7.71	7.97
31	5.80	6.05	6.31	6.56	6.82	7.07	7.33	7.43	7.58	7.84
32	5.69	5.95	6.20	6.45	6.70	6.95	7.20	7.31	7.46	7.71
33	5.59	5.84	6.09	6.34	6.59	6.84	7.08	7.18	7.33	7.58
34	5.50	5.74	5.99	6.23	6.48	6.72	6.97	7.07	7.21	7.46
35	5.40	5.64	5.89	6.13	6.37	6.61	6.85	6.95	7.09	7.34
36	5.31	5.55	5.79	6.03	6.26	6.50	6.74	6.84	6.98	7.22
37	5.22	5.46	5.69	5.93	6.16	6.40	6.63	6.73	6.87	7.10
38	5.13	5.36	5.60	5.83	6.06	6.29	6.53	6.62	6.76	6.99
39	5.04	5.27	5.50	5.73	5.96	6.19	6.42	6.52	6.65	6.88

This table is extracted from 《JJG291-2018 verification regulation of dissolved oxygen analyzer》