

**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

HJ 925-2017

**Technical requirement and test procedures for portable
dissolved oxygen meter**

便携式溶解氧测定仪技术要求及检测方法

(English Translation)

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Foreword

In order to implement the "Law of the People's Republic of China on Environmental Protection" and the "Law of the People's Republic of China on Prevention and Control of Water Pollution", protect the environment, Protection of human health, standardization of portable dissolved oxygen analyzer technical requirements, the development of this standard.

This standard specifies the technical requirements for portable dissolved oxygen analyzer, performance indicators and testing methods.

Appendix A of this standard is an informative annex.

This standard is released for the first time.

This standard by the Environmental Protection Department of Environmental Monitoring Division and Science and Technology Standards Division to develop.

This standard was drafted. Jiangsu Provincial Environmental Monitoring Center.

This standard MEP approved on December 28, this standard since April 1, 2018 come into operation.

This standard is interpreted by the MEP.

Portable dissolved oxygen analyzer technical requirements and testing methods

1 Scope of application

This standard specifies the technical requirements for portable dissolved oxygen analyzer, performance indicators and testing methods.

This standard applies to portable dissolved oxygen analyzer production and testing.

2 Normative references

This standard references the following documents or the terms. For undated references, the effective version applies to this standard.

GB 4208 enclosure protection (IP code) GB 7489 Determination of dissolved oxygen - iodine method GB/T 12519 analytical instruments General technical conditions HJ 506 Water quality - Determination of dissolved oxygen - Electrochemical probe method

3 Terms and definitions

The following terms and definitions apply to this standard.

Zero error

Place the probe in anaerobic water to measure the difference between the oxygen measurement and the zero value.

Response time

The probe from the oxygen-free water into the $(20 \pm 1) ^\circ\text{C}$ saturated dissolved oxygen water until dissolved oxygen analyzer showed the value rose to the theoretical value 90% of the time required.

Indication error indication error Place the probe in a constant temperature, saturated DO, and measure the difference between the DO and the theoretical value.

Repeatability Multiple measurements under the same conditions, the degree of agreement between the dissolved oxygen measurements obtained, with multiple measurements the standard deviation to represent.

Temperature indication error the probe and the standard thermometer at the same time into the water temperature measurement of water temperature, instrument measurements and standard thermometer measurements the difference between the values.

4.1.1 Covered electrode method

The membrane electrode method determines the amount of dissolved oxygen in water based on the diffusion rate of oxygen molecules through the selective membrane. Film electrode France dissolved oxygen detector probe with a selective membrane closed

chamber, the room has two metal electrodes and full of electrolysis quality. Oxygen and a certain amount of other gases and lyophilic substances can penetrate the membrane, but water and soluble substances almost can not permeate the membrane.

Film electrode method can be divided into current and polarographic two.

Current-based principle is immersed in the probe when the water, due to the role of the battery potential difference between the two electrodes, so that the metal from the son enters the solution at the anode while the oxygen diffuses through the membrane at the cathode to obtain electrons to be reduced and the resulting current flows through the membrane and the electrolyte layer is proportional to the oxygen transmission rate, that is, at a certain temperature, the current and the oxygen partial pressure (or concentration) into is proportional. The polarographic principle is that when the probe is immersed in water, the potential difference between the two electrodes is generated by the applied voltage so that the positive Extremely oxidized, while oxygen is diffused through the thin film at the cathode to obtain electrons are reduced, the resulting current flow through the thin film and the electrolyte Layer oxygen transmission rate is proportional to that at a certain temperature, the current and water partial pressure of oxygen (or concentration) is proportional to.

4.1.2 Fluorescence method

Fluorescence method according to the principle of oxygen molecules on the fluorescence quenching effect to determine the dissolved oxygen content in water. Fluorescence dissolved oxygen the front of the detector probe is a composite of fluorescent material foil, the surface coated with a black light-insulating material to avoid sunlight and water Other fluorescent interference, the probe is equipped with an excitation light source and photosensitive components. The blue light shines on the fluorescent substance to make the fluorescent substance Mass excitation and emit red light, as oxygen molecules can take away the energy to reduce the fluorescence intensity (quenching effect), at a certain temperature Degrees, the time and intensity of excited red light is inversely proportional to the concentration of oxygen molecules. By measuring the phase difference between the excited red light and the reference light, and compared with the internal calibration value, calculate the concentration of oxygen molecules.

4.2 Measuring range

The measuring range of the instrument is 0 mg/L ~ 20 mg/L, the minimum graduation value is ≤ 0.1 mg/L.

5.1.1 Covered electrode method

By the cathode, anode, thermometer, electrolyte, etc., with a diaphragm (through oxygen film, such as fluororesin, poly Ethylene, silicone rubber, etc.) to cover the electrode probe with the configuration that the sample does not directly contact the anode and the cathode.

The probe cavity should be Support electrolyte, no bubbles, the diaphragm intact.

5.1.2 Fluorescence method

By the excitation light source, fluorescent coating, photosensitive components, thermometers and other components. Fluorescent coating is stable under the excitation of blue light Given the fluorescent material, its properties are stable, not easy to oxidize or fall off.

5.2 Electronic unit

By the converter, batteries, circuits and other components, should have a waterproof drip structure.

5.3 Monitor

The display can be a monochrome or color display and should have a water-proof drop structure.

6.1 Basic requirements

6.1.1

The appearance of the instrument, inspection rules and labeling, packaging, transportation and storage meet the requirements of GB/T 12519.

6.1.2

Reasonable structure, solid product assembly, parts without loosening, plating (coating) layer, no peeling, rust and blistering.

6.1.3

In normal operation, it can work smoothly without any potential safety hazard.

6.1.4

The parts are not easy to produce machinery, circuit failure, no security risk structure.

6.1.5

Do not affect the performance of the instrument due to water infiltration, condensation and so on.

6.1.6

The monitor should be free from stains and damages; the character strokes are uniform and clear; the screen has no hidden corners, dark spots, Bubbles, dark display, hidden planning, do not show, flashing and so on.