

Dissolved oxygen meter
Committed to process automation solutions
Datasheet



DO-7011

Dissolved oxygen sensor

Dissolved oxygen sensor DO-7011

Product description:

DO-7011 type oxygen electrode with high stability and stress resistant, can be used in a more harsh environment, maintenance volume is smaller, suitable for urban sewage treatment, industrial wastewater treatment, aquaculture and environmental monitoring and other fields of continuous measurement of dissolved oxygen.



DO-7011 Dissolved Oxygen sensor

Application:

• Foods and Beverages

Many foodstuffs are packed in conditions where require a low or controlled oxygen level. Dissolved oxygen levels in drinks, such as beer, should be kept in specific range. Practice of adding oxygen under pressure to bottled water to make oxygenated water has become more common. These dissolved oxygen measurements required dissolved oxygen probes that can be cleaned at elevated temperatures without being removed from the application.

• Waste Water Treatment

Waste water treatment is critical in these years. It is no longer enough just to filter the water and dump it into the sea directly. The larger part of the waste is mainly organic, and this must be treated in sludge tanks to break it down for further filtration. Sludge tank dissolved oxygen measurement and control is kept. Flow measurement, such as suspended solids measurement, sludge blanket detection, conductivity measurement, nitrate measurement and phosphate measurement utilizing the DO sensors are also all used to enable the efficient and effective cleaning of waste water.

• Aquaculture (Fish Farming)

Dissolved oxygen sensors, such as multi-channel dissolved oxygen meters, are needed for fish farmers. It is essential to have such instrument to measure and control the dissolved oxygen level in the water body. Dissolved oxygen monitoring and logger are encompassing alert units with both high dissolved oxygen alarm and low dissolved oxygen alarm.

• Sea cages

Since it is difficult to control the dissolved oxygen content of the sea, dissolved oxygen measurement is very important because the feed uptake and dissolved oxygen levels are interconnected. Intensive feeding after fish have experienced low dissolved oxygen levels can not only be a waste of food, but can actually harm the fish. The measurement of dissolved oxygen levels enables feed to be dosed optimally and, if relayed to the shore can warn that the cage should be moved if extremely low dissolved oxygen levels should occur.

Measuring principle

The polarographic sensor operates by detecting a change in this current caused by the variable pressure of oxygen while the potential is held constant at 0.8 V. The more oxygen passing through the membrane and being reduced at the cathode, the greater the electrical signal (current) read by the probe. As oxygen increases, the signal increases and, conversely, as oxygen decreases, the signal decreases. Chemically, this is described as the oxidation of the silver and reduction of oxygen at the gold cathode as follows:

Silver Anode Reaction: $4Ag + 4Cl^- \rightarrow 4AgCl + 4e^-$ Gold

Cathode Reaction: $O_2 + 2H_2O + 4e^- \rightarrow 4OH^-$ Overall

reaction: $O_2 + 2H_2O + 4Ag + 4KCl \rightarrow 4AgCl + 4KOH$

Technical Specifications

Measurement principle	Polarographic
Breathable membrane thickness	50µm
Electrode shell material	UPVC or stainless steel
Temperature compensation resistor	PT1000;PT100;10K; ;30K 2.252K.
Lifetime	>1 years
Cable length	5m; 10m (Double shield)

Function

Measurement Lower Limit	0.01mg/l(20 °C)
Measurement upper Limit	20mg/l
Response time	3min(90%, 20 °C)
Polarization time	1h
Minimum flow rate	2.5cm/s
Drift	<2%/month
Measurement error	<±0.1mg/l
Output Current	20-25nA/0.1mg/l; Maximum current 3.5uA
Polarization voltage	0.7V
Zero oxygen	<0.1mg/l(5min)
Calibration interval	>60days
Measured water temperature	0—60 °C

- (1) Place the electrode in vertical position, unscrew the electrode protective sleeve.
- (2) Unscrew electrode membrane part.
- (3) Wash the electrode with distilled water and use tissue paper to dry the inner core,
if electrode core silver ring was found black after the electrode used for a period of time, polish with 0.04mm fine paper.
- (4) Pour the electrolyte into the new membrane components (about two-thirds of the volume), screw membrane part into the inner core components carefully.

Electrode
shape

When screw, use "forward 2 circle, back 1 circle) method, make the membrane approach gold electrode face gradually. When screw the membrane please note, screw to tighten slowly to avoid the excess electrolyte in membrane assembly can not be discharged in time, that may cause the gold electrode membrane blow up, also may cause the electrode response and zero oxygen value.

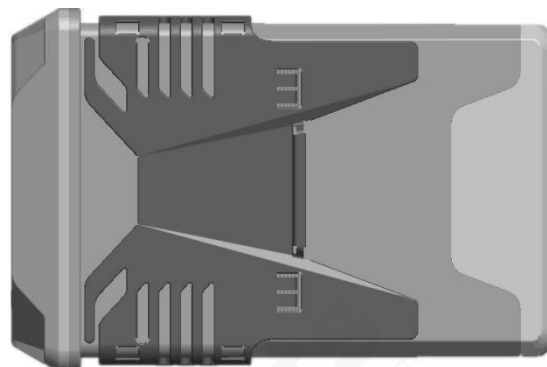
- (5) Electrode should be re-polarization and re-calibrate after change membrane or exchange membrane electrolyte.
- (6) Electrode Polarization: When electrode is connected to the instrument, more than two hours of continuous energization, that is polarization, calibration can only process after the electrode polarization.

Cable
connection of
dissolved
oxygen
electrode

No.	Cable color	Type	Connect point
1	Red	Temperature	TEMP
2	Yellow	Temperature	TEMP
3	Small black	Electrode anode	DO-
4	White core	Electrode cathode	DO+
5	Big black	Outside shield	GND

① dissolved oxygen transmitter

Open a 92.5 * 92.5(mm) installation hole on the instrument cabinet or installation panel (the dimension is 100*100*150mm). Insert the instrument into the installation hole and latch on the butterfly clasp, as shown below.

Installation
methods

② dissolved oxygen sensor



Dissolved Oxygen Sensor
(Replaceable membrane head)

The measurement value is correct or not, have a great relationship with the measuring electrodes, therefore, the maintenance of measuring electrodes is very important for the measurement system.

(1) If the measurement system response time is long, membrane break, anaerobic medium current increases and so on, indicates the membrane and electrolyte needs to be replaced. Replace the membrane and electrolyte every six months. The oxygen electrode membrane and electrolyte replacement operation method as shown in Figure 1. The electrode should be re-polarized and re-calibrated after change membrane or electrolyte.

(2) Gold cathode processing.

After a period time of using, the gold cathode surface of the oxygen electrode appears some brownness, remove the membrane holder, washing with distilled water, dry with No. 005 sandpaper and rub over the gold surface microstructure gently, polish. Clean installation membrane frame with distilled water after polish.

(3) Electrode membrane surface cleaning: If the pollution resistant Teflon membrane was polluted, clean with gauze with a small amount of dilute detergent gently, or install a water jet cleaning device, automatic timing clean the measurements on dissolved oxygen electrode membrane surface.

Electrode
Maintenance