Membrane Type Galvanic Cell Method Sensor: OS

Stationary sensor
Example: OS-B11

Portable sensor
Example: OS-BM2

Category	Detectable gas
Electrochemical	Oxygen

1. Brief description

This is a simple, traditional sensor based on the principles of cells. Requiring no external power supply, the sensor maintains stability over the long term.

2. Structure and principles

[Structure]

The sensor is structured with a cathode (precious metal) and anode (lead) placed in an electrolytic solution and with a separation membrane closely attached to the outside of the cathode. With the cathode and anode connected via a fixed resister, it outputs a voltage value.

[Principles]

Oxygen passes through the separation membrane and becomes reduced at the cathode; at the same time, at the anode, lead dissolves into the electrolytic solution (becomes oxidized). At the electrodes, the following reactions occur:

$$\text{Cathode: } O_2 + 2H_2O + 4e^- \rightarrow 4OH^-$$
$$\text{Anode: } 2Pb \rightarrow 2Pb^{2+} + 4e^-$$
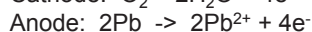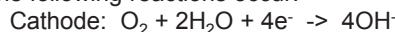
The current that flows because of the reduction reaction is converted into a voltage by the resister and then output from the output terminal. The sensor output is proportional to the oxygen concentration (partial pressure).
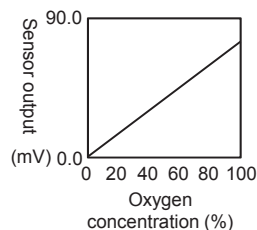
[Structure]
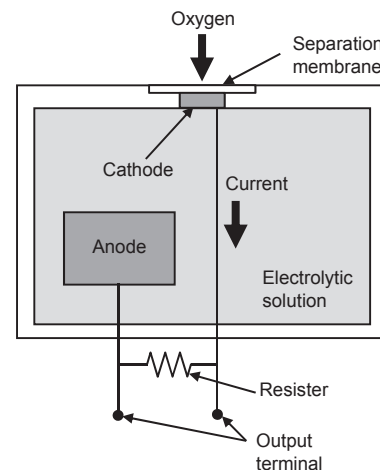
## 3. Features (of the sensor OS-B11 as an example)

○ **Output characteristics**

The oxygen concentration is proportional to the current value. The sensor converts the current value into a voltage value before outputting it and the oxygen concentration is, therefore, proportional to the sensor output in the range between 0 and 100%.

○ **Responsiveness**

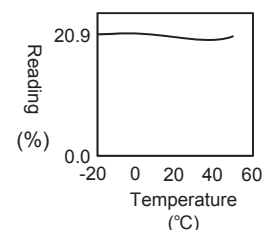With a high response speed, this sensor excels in accuracy and reproducibility.
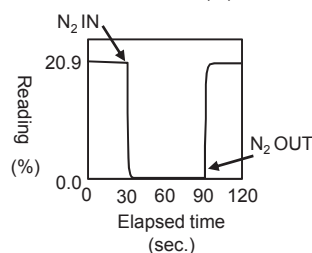
○ **Aging characteristics**

With a long life, the sensor can be actually used for two to three years.

○ **Temperature and humidity characteristics**

The sensor uses a thermistor built in it to perform temperature compensation and therefore readings almost do not depend on temperature.

4. Detectable gas, molecular formula, model, and detection range (examples)

Detectable gas	Molecular formula	Model #	Detection range
Oxygen	O_2	OS-B11	0-25%
		OS-BM1	
		OS-BM2	

5. Products of this type (examples)

○ **Stationary products**
... OX-600, GD-70D, SD-1OX, GD-F3A-A, GD-F4A-A,

○ **Portable products**
... GW-3(O_2), OX-04G, GX-3R, GX-3R Pro, OX-08, GX-2012, GX-8000 (TYPE O_2L/N)

OX-08