ASAIR

Data Sheet AO-02

Oxygen Sensor

- Linear output from 0 to 100%
- No external power supply
- Temperature compensation
- Quick response
- Accurate and reliable
- Anti-interference

Product Summary

The high-quality AO-02 oxygen sensor is an electrochemical sensor for oxygen concentration detection. It adopts a molded body design, and has the advantages of fast response and durability. Its structure and temperature compensation are optimized to superior performance at low cost.

1 Product Description

The AO-02 oxygen sensor is designed to be for various instruments related to oxygen testing, such as motor vehicle exhaust gas detection equipment, exhaust gas environmental protection detection equipment and oxygen index testing equipment, etc. The use is limited to system monitoring. The data provided in this document are valid at 20°C, 50% RH and 1013 mBar for 3 months from the date of sensor manufacture. Please strictly follow the instructions for operating the oxygen analyzer and replacing the oxygen sensor.



Figure 1. AO-02 Oxygen Sensor

2 Sensor Specifications

2.1 Technical Specifications

Table 1. Sensor Technical Specifications

Measurement[1]	
Operating Principle	Partial Pressure Electrochemical
Output	9 - 13 mV in Air
Measurement Range	0 - 100%Vol.O_2
Response Time (T_{90})	<5 s
Response Time ($T_{99.5}$)[2]	<40 s
Baseline Offset	<20 μV
Linearity	Linear 0-100%Vol.O_2
Electrical	
Temperature Compensation	<2% O_2 equivalent variation from 0 °C to 40 °C
External Load Resistor	≥ 10 kΩ
Connector	3 Pin Molex header (MOLEX 22-29-2031)
Recommended Mating Part[3]	Molex 3-Way Housing (MOLEX 22-01-2035) Molex Crimp Terminals (MOLEX 08-45-0110)
Mechanical	
Housing Material	Red ABS
Weight	40 g (nominal)
Orientation	Any
Environmental	
Operating Temperature Range	0 °C to +50 °C
Operating Pressure Range	0.5 - 2.0 Bar
Differential Pressure Rang	0 - 500 mBar
Operating Humidity Range	0 - 99% RH non-condensing
Lifetime	
Long Term Output Drift in 100% O_2[4]	< 10% signal loss/year
Expected Operating Life	3.6×10^5% O_2 hours at 20 °C 2.86×10^5% O_2 hours at 40 °C 2 years in air at STP
Packaging	Sealed blister

[1] Specifications are based on measurements made with cylinder gases using a flow rate of 100 mls/min and are valid at 20 °C, 50% RH and 1013 mBar, using recommended circuitry. Performance characteristics outline the performance of sensors supplied within the first 3 months.

[2] $T_{99.5}$ response is equivalent to a change in concentration from 20.9% O_2 to 0.1% O_2.

[3] Only use recommended mating parts for connection. Welding will damage the sensor and void the warranty.

[4] Output signal can drift below the lower limit over time.

2.2 Product Dimensions（unit：mm）

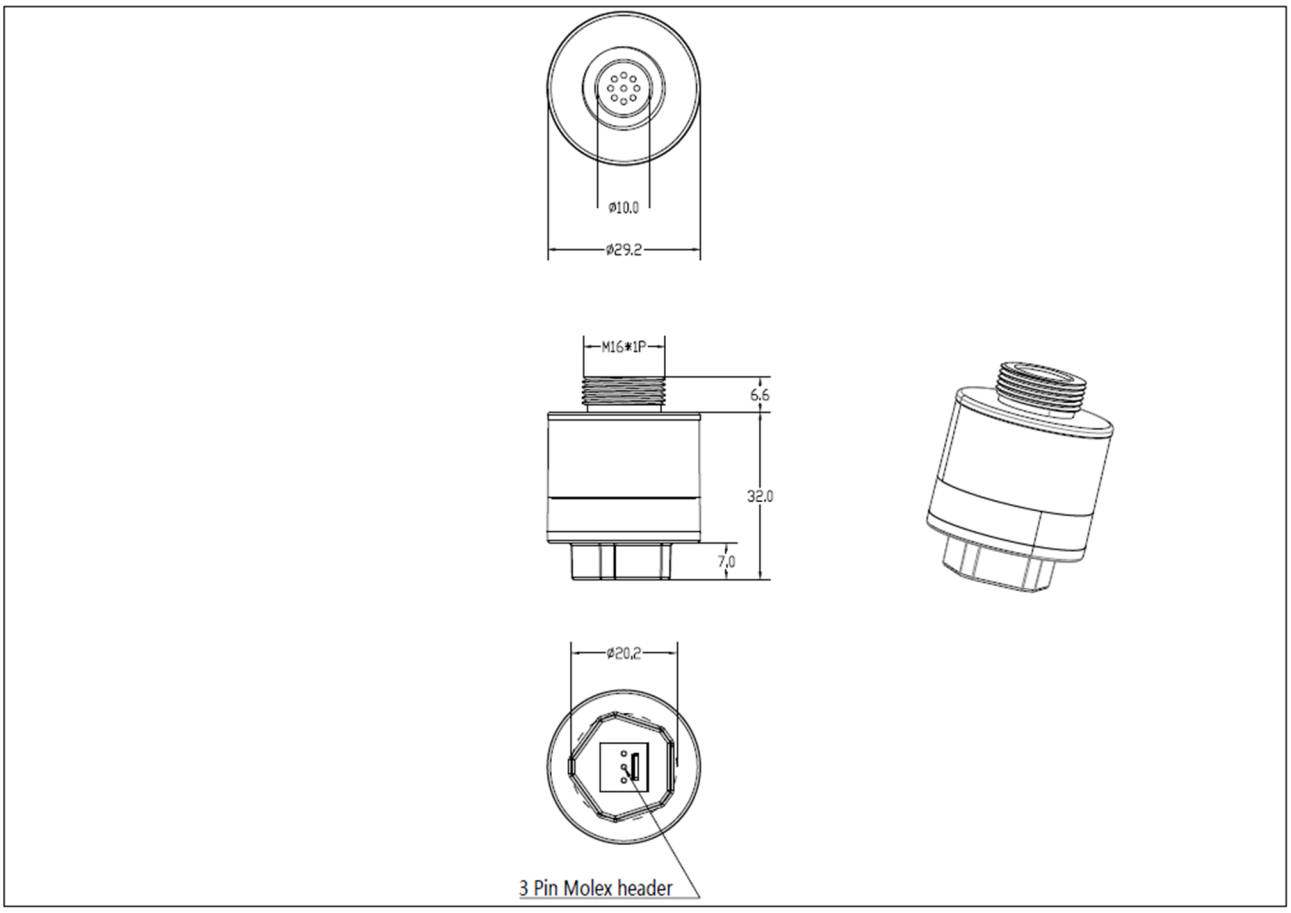

Figure 2. AO-02 Dimensions

3 Installation and Use

3.1 Mechanical Installation

During installation, AO-02 must only be screwed in hand-tight with gas tightness ensured. Spanners and similar mechanical aids may not be used, as excessive force may damage the sensor thread.

3.2 Storage and Use

AO-02 is designed to operate in various environments and harsh conditions, but it is still necessary to avoid exposure to high concentrations of solvent vapor during storage, installation and operation.

When using a sensor with a printed circuit board (PCB), use a degreaser before installing the sensor. Do not paste directly on or near the case, as the solvent may cause the plastic to crack.

3.3 Cleaning

In case of contamination the sensor may be cleaned with distilled water and dried naturally. The sensor is not suitable for sterilisation by steam or exposure to chemicals such as ethylene oxide and hydrogen peroxide.

3.4 Cross Sensitivity Table

Although AO-02 is designed to be oxygen-selective, it has a certain degree of response to other gases. Other gases not included in Table 2 may interfere the sensor as well.

IMPORTANT NOTE: The cross-sensitivity data shown in the table below does not form part of the product specifications and is for reference only. The data result is based on tests performed on a small number of sensors, and changes may occur in any batch. In order to obtain the most accurate measurement result, the instrument should be calibrated with the target gas.

Table 2. Sensor Cross Sensitivity

Test gas	Concentration	Balance	% O_2 Error
Carbon Dioxide, CO_2	16%	N_2	< 0.1
Carbon Monoxide, CO	6%	N_2	< 0.1
Nitric Oxide, NO	3000 ppm	N_2	< 0.1
n-Hexane	2000 ppm	N_2	< 0.1
Hydrogen, H_2	5000 ppm	N_2	< 0.1

4 Safety Note

- In order to ensure the normal operation of the sensor and/or the instrument that employs the sensor, it is required to confirm the performance of the equipment in the target gas (blow check) before each use of the sensor and/or. Failing to perform such tests may endanger personal and property safety.
- Please read the data sheet and product manual carefully, failing to follow these instructions may result in death or serious injury.
- In no event shall Aosong Electronics be liable for consequential, special, or indirect damages.