



APOGEE OXYGEN SENSORS | SO-100, SO-200, & SO-400 Series

Features

Output Options

- 0 to 50 mV analog
- SDI-12
- or hand-held meter

Heated Detector

The gas permeable membrane inlet can be heated to prevent water vapor from condensing and blocking the diffusion path. When sensors are used in soil or compost.

Unique Design

Sensors have an internal thermistor fully sealed for temperature monitoring. Sensors are housed in a polypropylene body for long-term use underground. Two head options include a diffusion head for field use and a flow-through head for laboratory use.

Simple Calibration

Voltage output is linearly proportional to absolute amount of oxygen. Calibration is accomplished by measuring the voltage under ambient conditions (atmosphere is 20.95 % O₂) and deriving a linear calibration factor. A zero offset can be obtained with N₂ gas (recommended for measurements below 10 % O₂).

Typical Applications

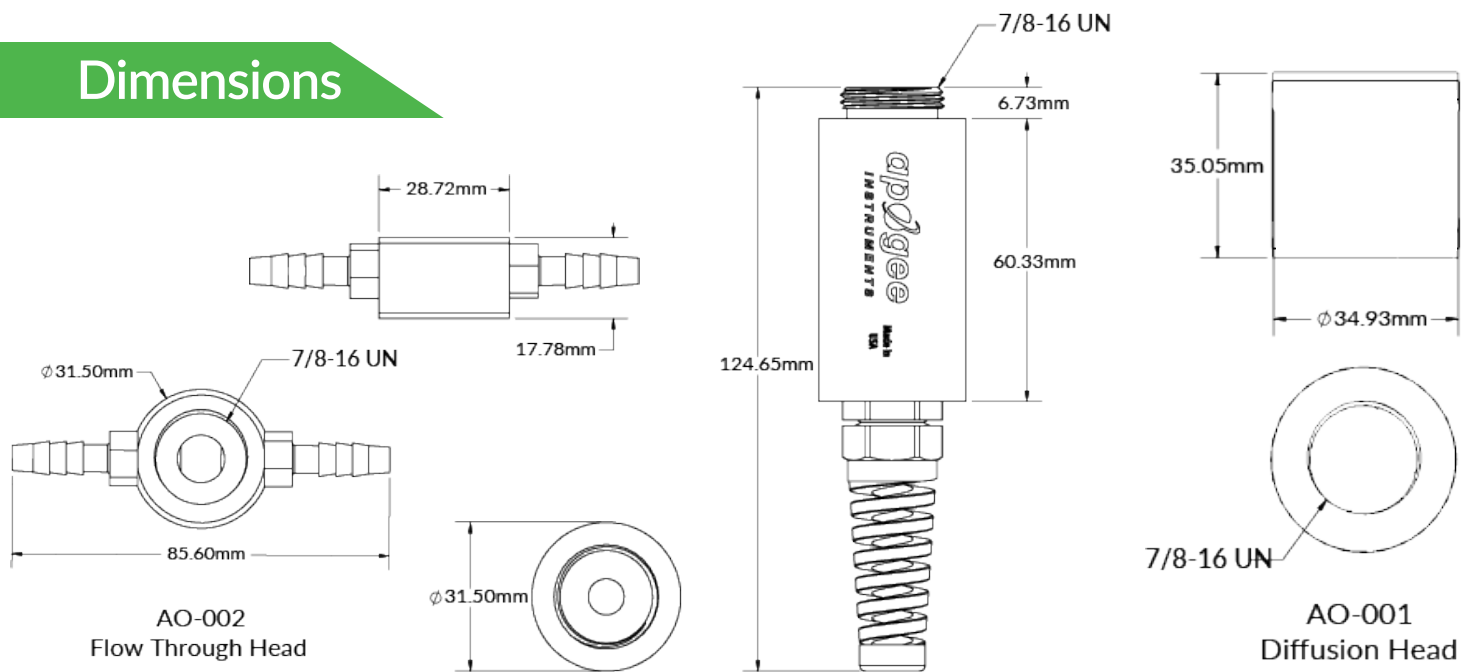
- Measurement of O₂ in laboratory experiments or of O₂ gradients in soil/underground
- Monitoring gaseous O₂ in indoor environments for climate control, in compost piles, and in mine tailings
- Monitoring redox potential in soils
- Determination of respiration rates through measurement of O₂ consumption in sealed chambers



Measure gaseous O₂ in the laboratory and underground



Dimensions



Product Specifications

	SO-110	SO-210	SO-411	SO-421
Input Voltage Requirement	—		5.5 to 24 V DC	
Current Draw	—		0.6 mA (quiescent); 1.3 mA (active)	
Input Voltage (heater and thermistor)	12 V DC continuous (for heater); 2.5 V DC excitation (for thermistor)			
Heater Current Draw	6.2 mA (74 mW power requirement when powered with 12 V DC source)			
Thermistor Current Draw	0.1 mA DC at 70 C (maximum, assuming input excitation of 2.5 V DC)			
Reference Temperature Sensor	Thermistor Type-K Thermistor	Thermistor Type-K Thermocouple	Thermistor	Thermistor
Measurement Range	0 to 100 % O ₂			
Output (Sensitivity)	2.6 mV per % O ₂	0.6 mV per % O ₂	—	
Output at 0 % O ₂	5 % of output at 20.95 % O ₂	2 % of output at 20.95 % O ₂	—	
Measurement Repeatability	Less than 0.1 % of mV output at 20.95 % O ₂			
Non-linearity	Less than 1 %			
Long-term Drift (Non-stability)	1 mV per year	0.8 mV per year	1 mV per year	0.8 mV per year
Oxygen Consumption Rate	2.2 μmol O ₂ per day at 20.95 % O ₂ and 23 C (galvanic cell sensors consume O ₂ in a chemical reaction with the electrolyte, which produces an electrical current)			
Response Time	60 s	14 s	60 s	14 s
Operating Environment	-20 to 60 C; 0 to 100 % relative humidity (non-condensing); 60 to 140 kPa			
Dimensions	32 mm diameter, 68 mm length			
Diffusion Head (Accessory)	35 mm diameter, 35 mm length, 125 mesh screen			
Flow Through Head (Accessory)	32 mm diameter, 91 mm length, 0.25 in barbed nylon connectors			
Mass	175 g (with 5 m of lead wire)			
Cable	5 m of six conductor, shielded, twisted-pair wire			
Influence from Various Gases	Sensors are unaffected by CO, CO ₂ , NO, NO ₂ , H ₂ S, H ₂ , and CH ₄ . There is a small effect (approximately 1 %) from NH ₃ , HCl, and C ₆ H ₆ (benzene). Sensors are sensitive to SO ₂ (signal responds to SO ₂ in a similar fashion to O ₂). Sensors can be damaged by O ₃ .			
Warranty	4 years against defects in materials and workmanship			