# OEM Oxygen Sensors

Overview:

Oxigraf is a leading supplier of Laser Diode Absorption Spectroscopy sensors for a wide range of industrial, medical, aerospace, and research equipment applications. Our patented technology in these solid state sensors provides unparallel reliability with fast response times for oxygen measurements over a range of 0-100% levels and resolutions up to 0.01% with high accuracy and repeatability.

The Oxigraf sensor uses laser diode absorption technology to measure oxygen concentration in the gas sample. A laser diode produces light in the visible spectrum at 760 nanometers, which is absorbed by oxygen. To analyze oxygen the laser beam is focused through the sample gas onto a detector. Oxygen concentration is inversely proportional to the amount of light reaching the detector. An analysis is made every 9.2 milliseconds, with the analyzer automatically zeroing at each measurement interval by electronically tuning the laser to oxygen non-absorption wavelength. The peak absorption measurement and line width measurement are used in an Oxigraf proprietary algorithm to compute O2 concentration independent pressure or foreign gas composition.

Temperature and Pressure compensation is performed automatically by the sensor.
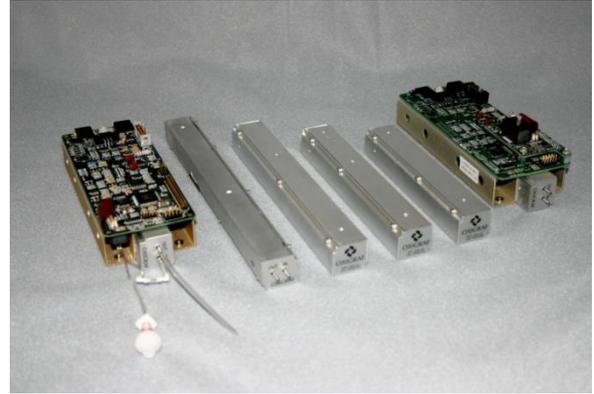
Cross sensitivity to other gas molecules within the sample mixture is also minimized. Single and dual point calibration to known gas values provides accurate measurements.

An auxiliary carbon dioxide sensor can also be incorporated into the O2 housing and all interfaces are contained on one common PCB electronics package.

Digital and Analog outputs are provided for O2 and optional CO2 measurements. Setup and control is performed though the RS-232 digital interface for easy integration and control.

Custom configurations and pre/post sale engineering support for your needs are available from our team in California.

Oxigraf sensors are proven solutions for systems and products used by a variety of manufacturers in very diverse industries; let us know how we can serve you.

Sensors:

	Model X3003	Model X3013	Model X3004	Model X3014	Model X3005	Model X3015	Model X3008	Model X3018
Application	Anesthesia		Exercise Test and Respiratory Gas Monitoring		Plant and Animal Physiology		Dry Box Purge Verification	
Sensor Length/Mode	6 inches / XC		7 inches / XC or LN		8 inches / XC or LN		9.25 inches / LN only	
Oxygen Range	2-100%	2-100%	2-100%	2-100%	2-100%	2-100%	0-100%	0-100%
CO2 Range		0-10%		0-10%		0-10%		0-10%
Stability (24 hours)	+/- 0.4%		+/- 0.2% LN +/- 0.4% XC		+/- 0.1% LN		+/- 0.1%	

Details:

Gas Input/Output: 1/16 inch OD single barb stainless steel tubing.

Gas Flow: Up to 350 ml/minute, higher flow will create noisy data due to turbulence in the sensor.

Control and Output: Full Duplex RS-232 serial digital (RS-232 levels or CMOS levels available). Sensor digital output is 8 bit serial stream at 9600 baud.

Sensor Output: Analog, 1Vp-p (both O2 and optional CO2).

Power: +5V/+12VDC power or +12VDC only optional. +5V at 0.5A typical (2A max)/+12V at 0.3A typical (0.8A max) or 12VDC at 0.8A typical (1.8A max) with heat sink temperature 0°-45°C . Note: Heat Sink temperature cannot exceed 55°C and may require forced air cooling.

Pressure Correction: The pressure corrected range for the O2 sensor is 250-1200 mbar absolute and CO2 sensor for 450-1200mbar absolute. For the oxygen sensor, an optional range of 150 to 2000 mbar is available. The sensor should not be exposed to pressures above the corrected range.

Temperature Correction: The sensor cell is heated to 45°C and corrects for temperature ranges over 45° to 55°C.

Operating Modes:	Depending on model, the analyzer can operate in two fundamental measurement modes, cross sensitivity mode (XC) and low noise mode (LN). In XC mode the area of the oxygen absorption line is measured to compensate for broadening due to foreign composition. This makes measurements in this mode nearly independent of gas composition, which is useful where there is strong interference as with gasses such as He, Ar, N2O, and CO2. LN mode improves on the noise performance of XC mode by only relying on the peak absorption amplitude for computation of oxygen concentration. This mode is useful where the measurement range is limited; the interference weak (as with N2); or the O2 concentration is very low or near 100%. The cross sensitivity is worst at a 50/50 gas mixture and becomes linear at low and high O2 concentrations, where it can be calibrated out. Operating mode is set at the factory in firmware.
Electronic Filtering:	Basic Measurement frequency is 108.7 Hz or 9.2ms per sample. Oxigraf sensors have built-in electronic filtering for response time adjustment and compensation for flow rates and stability of measurements. Filtering can be set at No filtering, 20/40/80/160ms running average, 200/300/500ms, 1/2/4/8/16 second exponential response, or Prediction filter to enhance response time. Complete data on flow and filter response times available to tailor settings for your application.
Initialization time:	40 seconds to operation, 5 minutes to meet accuracy specification at a start temperature of 20°C.
CO2 Sensor Option:	Integrated sensor with 0-10% reading, range of 0-30% is also available. Pressure correction for these sensors is over 500-1180 mbar absolute.
Optional features:	Latching Molex connectors or single voltage power input.
Sensor Lifetime:	Operating laser diode median lifetime > 100,000 hrs.
Weight:	Approximately 0.9 lbs (450 grams)
Dimensions:	PCB and Heat Sink are Approximately 6.5 inches (165.1mm) long by 2.5 inches (63.5) wide by 1.525 inches (38.7mm) height, excluding sensor extrusion protrusion and gas input/output tubes.
Limited warranty:	1 year repair/replace at factory