



ALPHA OMEGA  
INSTRUMENTS

# ZrO<sub>2</sub> 2000

## **FAST RESPONSE** **OXYGEN ANALYZER**



### **FEATURES**

- ✓ Advanced Solid State Sensor.
- ✓ Measures PPB to 100%
- ✓ Instantaneous Response.
- ✓ Non-depleting Sensor
- ✓ User Scalable Analog Outputs
- ✓ Dual User Adjustable Alarms
- ✓ Microprocessor Controlled
- ✓ Non-laser Based Diode Technology

### **BENEFITS**

- Provides High Precision Oxygen Measurements.
- One Instrument Does it All.
- Provides Exceptional Tracking of Process Conditions.
- Designed to Provide Years of Operation.
- Better Defines the Concentration Range of Interest.
- Set Critical Process Limits.
- Helps to Ensure Dependable and Accurate Readings.
- Eliminates Calibrations Shifts due to Temp/Vibration.

## System Description

### ZrO<sub>2000</sub> FAST Response Oxygen Analyzer

The ZrO<sub>2000</sub> FAST Response Oxygen Analyzer can be used as either a portable or fixed oxygen analyzer and is designed to provide accurate and repeatable trace and percent oxygen measurements in a variety of gases. The rugged and compact design of the ZrO<sub>2000</sub> FAST Response Oxygen Analyzer makes it ideally suited for industrial applications where continuous oxygen measurements are required. The ZrO<sub>2000</sub> FAST Response Oxygen Analyzer is capable of measuring from parts per billion levels to 100% with a response time that significantly exceeds that of other comparable measuring techniques.

The ZrO<sub>2000</sub> FAST Response Oxygen Analyzer features a patent pending, non-depleting solid state zirconium oxide sensor. The sensor, coupled with state-of-the-art electronics, provides exceptional measurement accuracy and stability. With no consumable components, the oxygen sensor in the ZrO<sub>2000</sub> FAST Response Oxygen Analyzer will obviate the need to replace sensors. Every ZrO<sub>2000</sub> FAST Response Oxygen Analyzer receives a full factory calibration at the factory using NIST Traceable Standards.

## Principle of Operation

The ZrO<sub>2000</sub> FAST Response Oxygen Analyzer features a highly advanced solid state zirconium oxide oxygen sensor that is sensitive to changes in the partial pressure of oxygen. Sample gas entering through the gas inlet port of the ZrO<sub>2000</sub> FAST Response Oxygen Analyzer is guided to the inside of the zirconia tube. At its optimal operating temperature of 750°C, the zirconia tube becomes an oxygen ion conducting solid electrolyte. On opposite sides of the zirconia tube are platinum electrodes (anode and cathode). When the sensor is exposed to gases that have different oxygen partial pressures, an electrical signal (emf) is generated proportional to the logarithm of the ratio of the oxygen concentration in the sample gas to that of air (reference gas) that surrounds the outside of the tube. The voltage developed across the electrodes by the differential in partial pressures of oxygen follows the Nernst equation. The log signal generated is then processed with by a high resolution A/D converter and microprocessor and either parts per million or percent concentrations of oxygen are calculated and displayed on the analyzer's front panel meter. Tight temperature control of the zirconium oxide sensor is essential and to that end, the ZrO<sub>2000</sub> FAST Response Oxygen Analyzer uses a highly accurate PID temperature control algorithm to accomplish that goal. There are certain categories of gases that are not recommended for use with zirconium oxide sensors such as hydrogen, hydrocarbons, corrosive gases, etc. Contact Alpha Omega Instruments for more information.

## SPECIFICATIONS

### PERFORMANCE

<b>Measurement Range:</b>	0.1 PPM to 100%.
<b>Measurement Error:</b>	<b>Percent:</b> ± 2.0% of reading or ± 0.05% absolute, whichever is greater. <b>Trace (PPM):</b> ± 2.0% of reading or ± 0.5 PPM absolute, whichever is greater.
<b>Repeatability:</b>	<b>Percent</b> ± 0.4% of reading or 0.2% O <sub>2</sub> absolute. <b>Trace:</b> ± 0.4% of reading or 0.1 PPM O <sub>2</sub> absolute.
<b>Response Time</b>	Less than 5 seconds over one decade.
<b>Sensor Type:</b>	Zirconium Oxide.
<b>Sample Flow Rate:</b>	150 SCCM optimum.
<b>Operational Temperature Range:</b>	40° to 104°F (10° to 40° C).
<b>Sample Gas Pressure Limits:</b>	0.1 to 0.5 psig.

### ELECTRICAL

<b>Power Source:</b>	90-264 VAC/50-60 Hz.
<b>Dual Analog Outputs:</b>	4-20 mADC & 0-20 mADC (field scalable).
<b>Enclosure:</b>	Powder coated, painted, aluminum.
<b>Display:</b>	6 digit backlit liquid crystal display.
<b>Dimensions (inches):</b>	10.75 W x 6.30 H x 13.10 D.
<b>Weight:</b>	9.5 pounds (10.4 pds. with pump).
<b>Oxygen Alarm Relays:</b>	Two (2) SPDT Form C contacts rated 10A @ 30VDC/115/230 VAC.

### Applications

**Modified Atmosphere Packages (MAP)**

**Glove Boxes**

**Biological Reactors**

**Air Separation**

**Critical Welding**

**Pharmaceutical Processing**

**Semiconductor Manufacturing**

**Vessel Blanketing**

**Heat Treating**

**Leak Detection**

### Optional Equipment

**Sample Pumps**  
**Pressure Regulators**



**Call Us Toll Free**  
**800-262-5977**

30 Martin Street, Cumberland, RI USA 02864  
Tel: 401.333.8580; Fax: 401.333.5550  
Email: [contact@aoi-corp.com](mailto:contact@aoi-corp.com)  
Web: <http://www.aoi-corp.com>

Alpha Omega Instruments reserves the right to change specifications at any time (04/07)