

# XZR500

## Combustion Control Analyzer

The XZR500 oxygen analyzer from Michell Instruments determines the excess air required for optimum efficiency in industrial combustion processes. It uses innovative, sealed-reference zirconium oxide technology to measure levels of oxygen in harsh conditions such as boilers, incinerators and furnaces. It provides fast, accurate and reliable readings in the most difficult environments.



### Highlights

- Innovative, Metallic Sealed Reference Sensor provides reliable and repeatable measurements with low maintenance
- Simple air calibration reduces cost of ownership
- Robust design maximizes sensor life
- Flexible installation reduces retrofitting and start-up costs
- Advanced design is easy to operate and maintain
- No chance of thermal shock to sample cell

### Applications

Control combustion efficiency and monitor emissions of:

- Boilers
- Industrial and waste incinerators
- Coal-fired power plants
- Petrochemical furnaces
- Annealing and galvanizing furnaces
- Soaking pits
- Glass and melting furnaces
- Cement kilns
- Crematoria

## Michell XZR500

### Combustion Control Analyzer

The XZR500 measures levels of oxygen in combustion processes and flue gases to help maintain the optimum level of combustion efficiency. Accurate control of combustion efficiency is critical for optimal fuel usage and reducing plant operating cost.

The XZR500 flue gas analyzer can be located close to the gas stream, further reducing costs. Due to its unique design the sensor is protected from damaging conditions, providing long life in difficult environments.

Michell Instruments has over 30 years' experience developing high performance instrumentation capable of operating in extreme conditions. Our customers benefit from our knowledge of oxygen measurement at high temperatures and in corrosive, acidic gases.

### Benefits

Easy to service and virtually maintenance free, the XZR500 provides the following benefits:

#### Reliable and repeatable measurements

Innovative, Metallic Sealed Reference Sensor (MSRS) technology is resistant to contamination and virtually drift free, resulting in extended calibration intervals. These reduce maintenance, which is extremely beneficial where measurement point locations are difficult to access.

#### Easy to calibrate

The MSRS of the XZR500 allows the use of dry air as a single calibration gas for most applications. Expensive calibration gases are not needed. Auto calibration is available as an option.

#### Quick and easy to install in almost any location

The compact XZR500 can be installed in almost any location. It can be used with most flange types to replace other analyzers without expensive retrofitting. Insertion probes are available in special lengths on request and can be supplied in a range of materials including Inconel, ceramic and others to suit application needs.

#### Simple to use

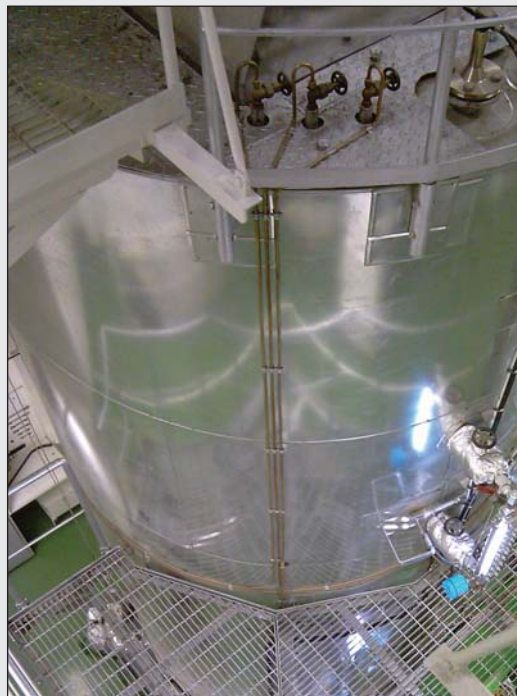
The analyzer is easy to operate with intuitive, menu-driven software to select and adjust parameters.

#### Easy to maintain

For high-dust applications including coal-fired power stations, the XZR500 features a highly efficient blow-back system to clear the insertion probe of debris, further reducing maintenance.

#### Close-Coupled Extractive

The sensor is located in an oven inside the sensor head which is bolted directly to the flue/stack. Unlike in-situ analysers the sensor is not in the probe this ensures a longer life, greater accuracy and no chance of thermal shock damaging the sensor.



Marine Auxiliary Boiler

#### No need for aspirator or reference air:

The sample is drawn into the sensor via a Pitot effect created in the sample probe and vented back into the stack. This means there is no need for an aspirator (eductor) air supply saving ongoing cost. There are no utilities required to operate the analyser (unless the back flush option is required for extremely dusty applications).

#### Probe Selection:

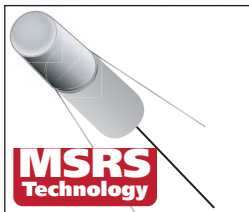
Due to the modular construction of the XZR500 it is possible to offer a range of probes to suit a variety of applications. There is a choice of 3 lengths 0.4m (1.3'), 0.6m (1.9') & 0.9m (2.9') as well as 6 different materials including 304L stainless steel for low temperature easy applications, alloys for corrosive samples and ceramic for temperatures up to 1300°C (2372°F).



## Technology

The MSRS (Metallic Sealed Reference Sensor) technology was developed from a sensor originally designed for ultra harsh applications in volcanoes. This makes it the instrument of choice for oxygen measurement in a range of applications such as

power generation, waste management etc.



In processes where the analyzer operates under extreme conditions facing high temperatures or polluted gas, the MSRS technology of the XZR500 delivers reliable and fast combustion efficiency information.

The MSRS responds quickly, within seconds for a 90% step change. It is based on a metallic sealed reference which not only shows superior performance to other sensors on the market, but also makes the MSRS resistant to pollution and virtually drift-free, reducing the need for calibration. It also does not require a reference air supply.

## XZR500 Range

### Sensor head



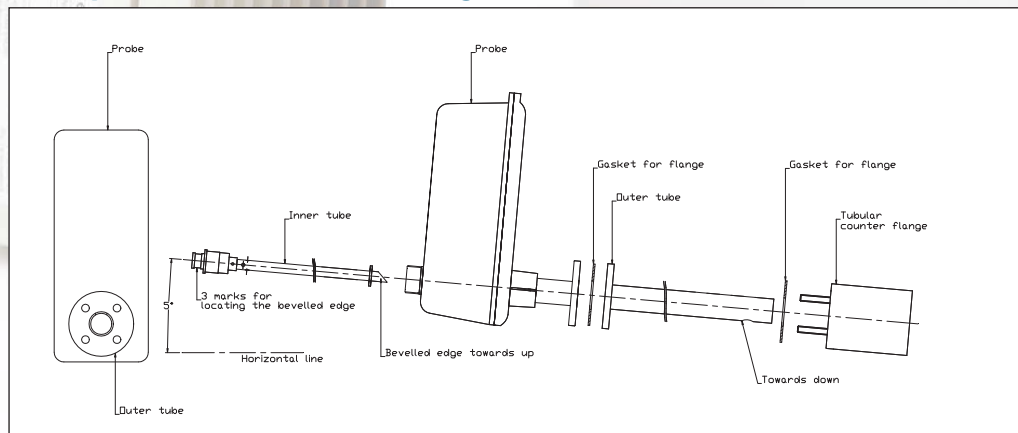
Stack combination Oxygen Unit with metallic sealed reference MSRS, requiring no ambient or pressurised air, with 6m (19.7') special cable and 400mm (15.7") long probe

### Control unit



Combustion oxygen analyzer control unit in weather-proof wall mounting cabinet associated with the XZR500-ST.

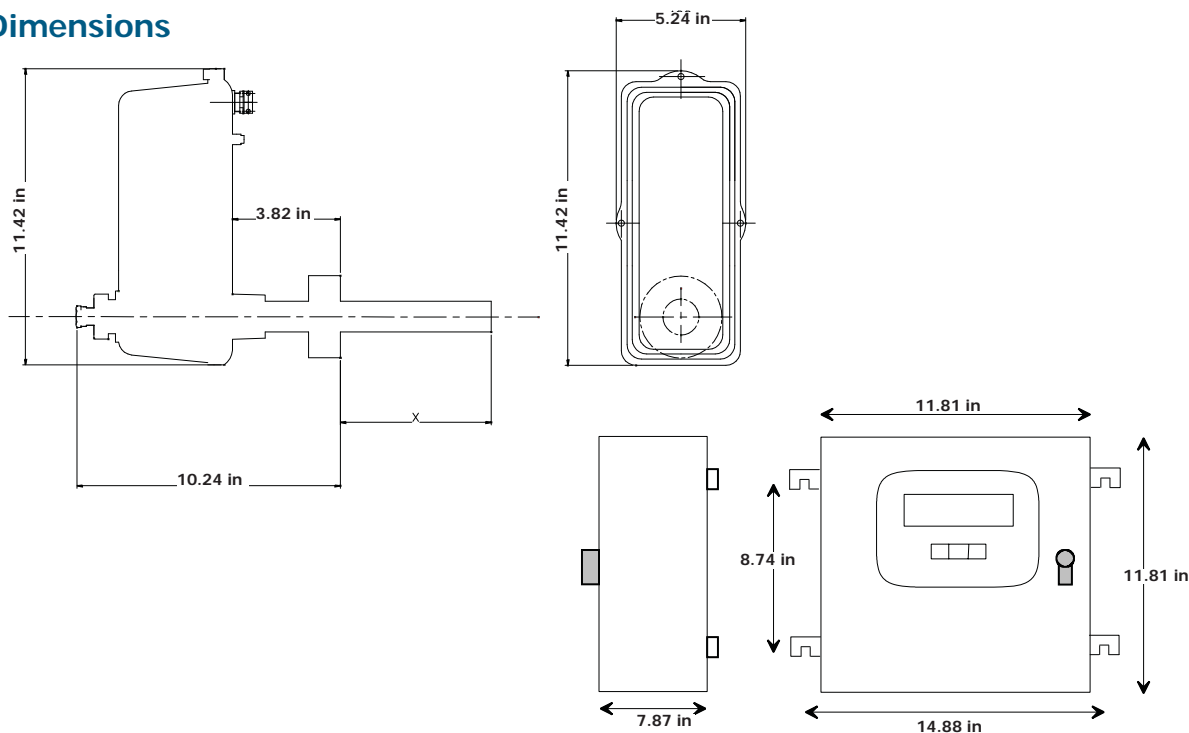
### Exploded view of sensor head assembly with probe and counter flange



## Technical Specifications

<b>Sensor Type</b>	
Measurement Principle	Zirconium oxide sensor with metallic sealed reference and K Type T/C
<b>Performance</b>	
Gas Requirements	Typical exhaust gas
Measurement Range	0.01% to 25% oxygen
Accuracy	Better than $\pm 2\%$ of reading
Response Time (T90)	20 seconds
Repeatability	$\pm 0.1\%$ of reading
Stability	1% per month
Linearity	Better than $\pm 1\%$ of reading
Sample Flow Rate	Flue Gas at 0.5m/s (17.65ft/s) minimum rate
Maximum Sample Pressure	Application dependent
Maximum Sample Temperature	1300°C (2372°F) (see probe selection in Wetted Materials)
<b>Outputs</b>	
Output Signal	One 0/4-20 mA linear, with isolated output; 2nd output optional
Output Load	Over 1000 $\Omega$
Self-diagnostics	Includes: oven under temperature; thermocouple separation; calibration fail; EEPROM corruption. (Diagnostic information displayed on panel meter.)
Output Ranges	Configurable between 0.01 to 25%
<b>Alarms</b>	
	2 Alarms; user adjustable (10W) 1 Fault Alarm
Display Resolution	0.1% in standard (0.01% on request)
Power Supply	110 V (100 to 120) 50-60 Hz or 220 V (190 to 240) 50 Hz
Power Consumption	110 V A
Ambient Temperature Range	0°C (32°F) to 55°C (131°F)
Sensor Temperature	700°C (1292°F)
Operating Humidity	5 to 90% RH non-condensing
<b>Physical</b>	
Dimensions	control unit 300 x 300 x 200mm (11.8 x 11.8 x 7.8") sensor 290 x 135 x 650mm (11.4 x 5.3 x 25.6")
Weight	10 to 15 kg (22 to 33 pounds) depending on configuration
Wetted Materials (Maximum Temperature)	304 L Stainless steel (700°C (1292°F)) Inconel 600 (1000°C (1832°F)) HR160 (600°C to 1000°C (1112°F to 1832°F)) C2000 (600°C (1112°F)) Halar coating (120°C (248°F)) Ceramic (1300°C (2372°F))
Probe Lengths	0.4, 0.6 and 0.9m (15.75, 23.62, 35.43 in)
Installation	Stack and Wall-Mount
Housing Ingress Protection	Weather proof enclosure to sensor: IP53 Control unit: IP52

## Dimensions



**Michell Instruments, Inc** 319 Newburyport Turnpike, Suite 207, Rowley, MA 01969  
 Tel: 978 484 0005, Fax: 978 843 7669, Email: [us.info@michell.com](mailto:us.info@michell.com), Web: [www.michell.com/us](http://www.michell.com/us)

Michell Instruments adopts a continuous development programme which sometimes necessitates specification changes without notice.  
 Issue no: XZR500\_97205\_V5\_US\_0413