



# XZR500

## Combustion Control Analyzer

The XZR500 oxygen analyzer from Michell Instruments is designed to determine the excess air required for optimum combustion. It uses advanced zirconium oxide technology to measure levels of oxygen in boilers, incinerators and furnaces. It provides fast, accurate readings taken in the harshest of conditions.



### Highlights

- Reliable and repeatable measurements
- Simple to maintain and calibrate
- Robust design
- Quick and easy to install
- Virtually no chance of thermal shock to sample cell
- Long-life zirconia cell

### Applications

- Combustion and control efficiency in boilers
- Crematoria
- Waste and industrial incinerators
- Coal-fired power plants
- Annealing and galvanizing furnaces
- Auxiliary marine boilers

# XZR500 Combustion Control Analyzer

The XZR500 is designed to measure levels of oxygen in flue gases and combustion processes to help maintain the optimum combustion for peak efficiency.

Michell Instruments has 40 years' experience in developing highly sensitive instrumentation for operation in extreme conditions. Our customers benefit from our extensive knowledge of oxygen measurement – in both high temperatures and aggressive, acidic gases.

### Benefits

Easy to install and maintain, the XZR500 offers the following benefits:

#### Reliable and repeatable measurements

Michell's advanced Metallic Sealed Reference Sensor (MSRS) technology is resistant to pollution and virtually drift-free, resulting in reduced requirement for calibration. This is beneficial for measurement points with difficult access where frequent removal for calibration requires increased effort.

#### Easy to calibrate

The MSRS of the XZR500 allows operators to use a single calibration gas for most applications. Auto-calibration is also available as an option.

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

The compact size of the XZR500 means that it can be installed in almost any location. It can be supplied with a weld-on mounting plate or tubular counter-flange; this means that it can be installed without needing an expensive re-fit.

#### Simple to use

With only three buttons to select and alter parameters, the analyzer is easy to use.

#### Easy to maintain

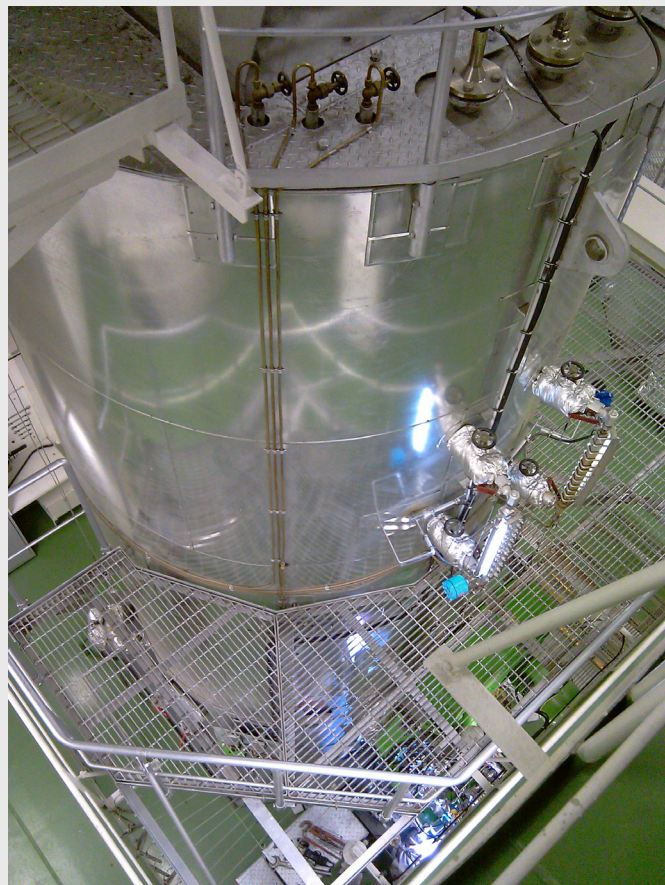
For high-dust applications, such as coal-fired power stations, the XZR500 features a highly efficient blow-back to keep the insertion probe clear of debris thus reducing the need for maintenance.

#### 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 analyzers, the sensor is not in the probe; this ensures a longer life, greater accuracy and almost no chance of thermal shock damaging the sensor.

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

The MSRS (see next page) provides a known quantity of oxygen internal to the sensor, meaning a supply of reference gas or fresh ambient air is not needed. The sample is drawn into the sensor via a Pitot effect created in the sample probe and vented back into the stack. This means for most applications there is no need for an aspirator (eductor) air supply, saving ongoing cost (unless the back flush option is required for extremely dusty applications).



Marine Auxiliary Boiler

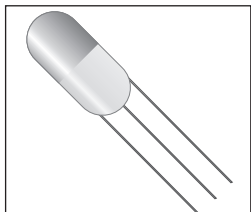
#### Probe selection:

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: 0.4, 0.6 and 0.9m, as well as 6 different materials including 316L stainless steel for low temperature applications, alloys for corrosive samples and ceramic and silicon carbide probes for temperatures up to +1400 °C.



## 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

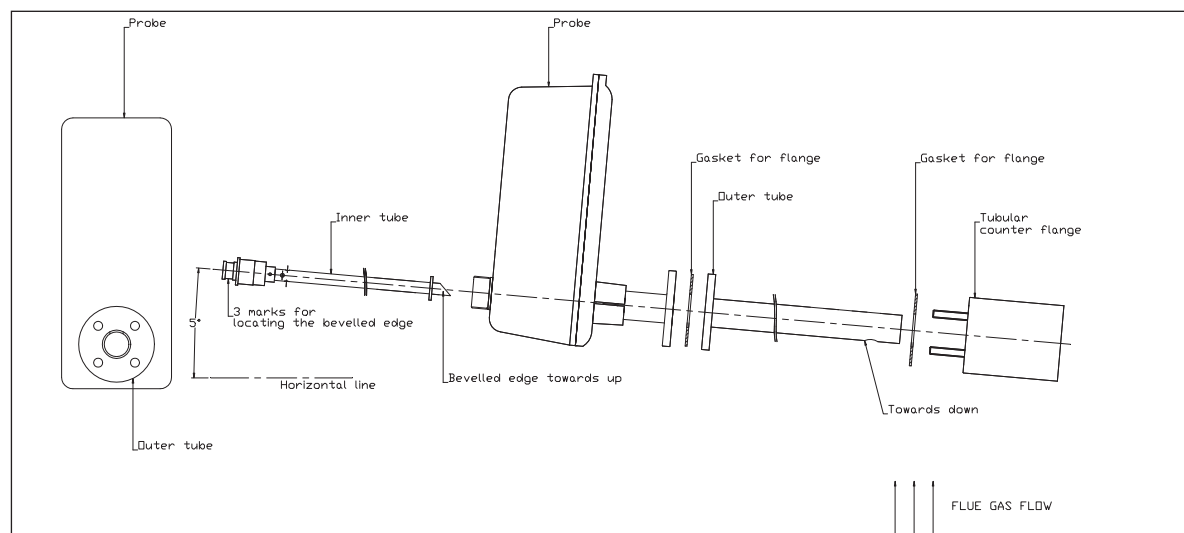
Stack combination oxygen unit with Metallic Sealed Reference Sensor (MSRS), requiring no ambient or pressurized air, with 6 m inter-connecting cable and 400 mm probe.

### 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





Oxygen Analyzers

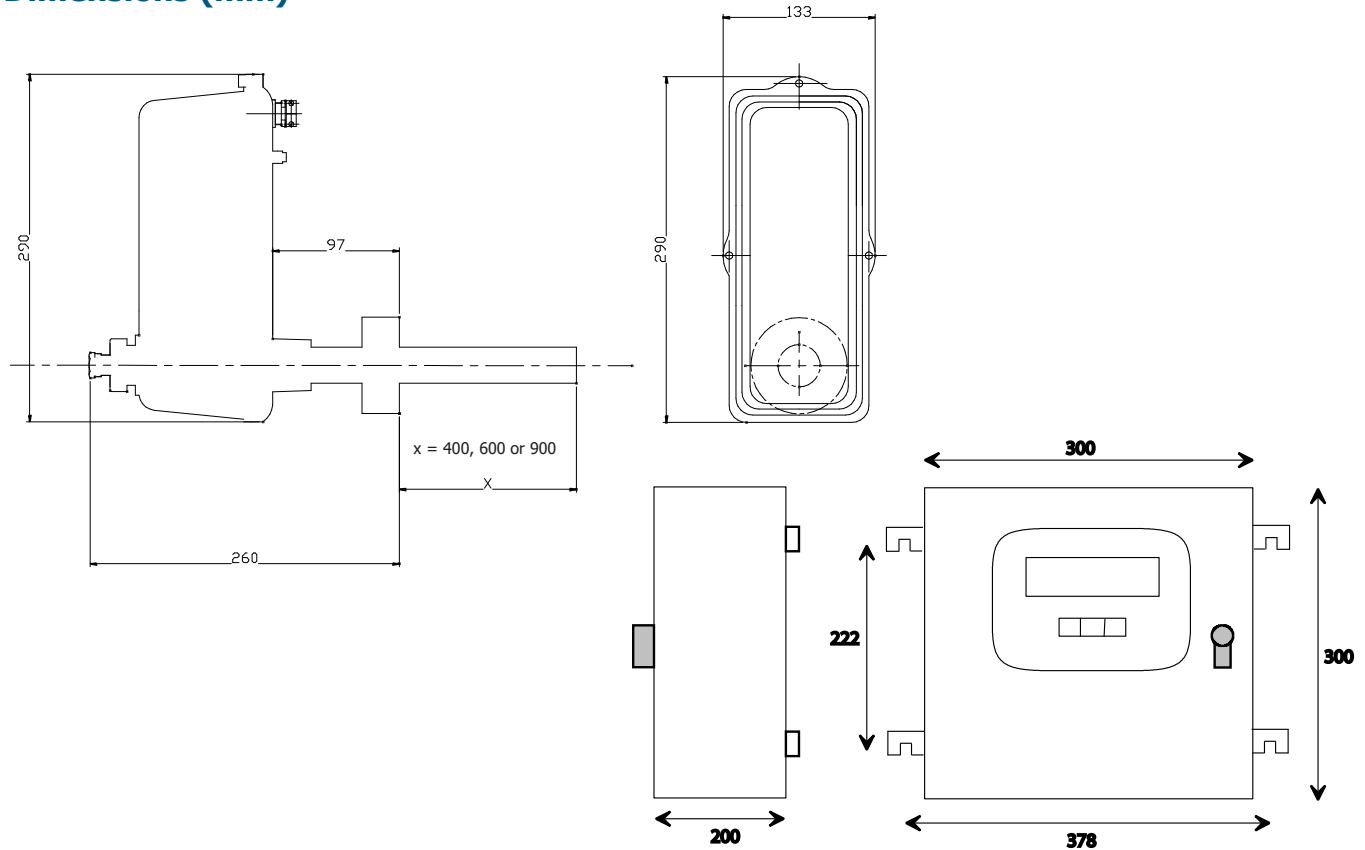
Technical Specifications

Sensor Type	
Measurement Principle	Zirconium oxide sensor with metallic sealed reference and K Type T/C (MSRS)
Performance	
Gas Requirements	Typical exhaust gas
Measurement Range	0.01 %...25 % oxygen
Accuracy	Better than ±2 % of reading
Response Time (T90)	20 seconds
Repeatability	±0.1 %
Drift	< 1 % per month
Linearity	Better than ±1 %
Sample Flow Rate	Flue gas at 0.5 m/sec (17.65 ft/s) minimum rate
Maximum Sample Pressure	Depending on application
Dust Loading	The back flush option is required for any sample containing > 250 mg/m <sup>3</sup> particulates
Sample Temperature	Up to 1400 °C (2552 °F) (see probe selection in 'wetted materials')
Outputs	
Output Signal	One 0/4...20 mA linear with galvanic insulation output; 2nd optional output
Output Load	Over 1000 Ω
Self-Diagnostics	Included in readout
Output Ranges	Freely configured between 0.01 and 25 %

Alarms	2 alarms; user adjustable (10W), 1 fault alarm
Display Resolution	0.1 % standard
Power Supply	110 V (100...120) 50...60 Hz or 220 V (190...240) 50 Hz
Power Consumption	110 V A
Ambient Temperature Range	0...+55 °C (+32...+131 °F)
Sensor Temperature	+700 °C (1292 °F)
Operating Humidity	5...90 % rh without condensation
Physical	
Dimensions	Control: 300 x 300 x 200 mm Sensor: 290 x 135 x 650 mm
Weight	Control unit: 7 kg Sensor head: 3.5 kg Probe: 1.5kg to 4.5 kg
Wetted Materials (maximum temperature)	316 L stainless steel: up to +700 °C (1292 °F) Inconel: up to +1000 °C (1832 °F) HR160: +600...+1000 °C (1112...1832 °F)* C 2000: up to +600 °C (1112 °F)* Halar® coated: up to 120 °C (248 °F)** Ceramic: up to +1400 °C Silicon Carbide: 1300 °C (2372 °F)
Probe Lengths	0.4, 0.6 and 0.9 m
Installation	Stack and wall mounting
Housing Ingress Protection	Sensor Head: IP53 Control unit: IP52

\*For corrosive environment  
\*\*Wet process – for incinerator

Dimensions (mm)



Michell Instruments adopts a continuous development programme which sometimes necessitates specification changes without notice.  
Issue no: XZR500\_97205\_V6.1\_EN\_0322