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 service and maintenance, 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).
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 pressurised air, with 6m special cable and 400m 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

### 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% to 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 minimum rate
- **Maximum sample pressure:** Depending on application
- **Sample temperature:** +1300 °C (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 to 25%

### Dimensions (mm)

![Dimensions Diagram](image_url)

### Alarms
- 2 alarms; user adjustable (10W), 1 fault alarm

### Display resolution
- 0.1% standard

### 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 to +55 °C

### Sensor temperature
- +700 °C

### Operating humidity
- 5 to 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):**
  - 304L stainless steel: up to +700 °C
  - Inconel: up to +1000 °C
  - HR160: from +600 to +1000 °C
  - C 2000: up to +600 °C
  - Halar® coated: up to 120 °C
  - Ceramic: up to +1400 °C
  - Silicon Carbide % Ceramic: 1300 °C
- **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

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Michell Instruments adopts a continuous development programme which sometimes necessitates specification changes without notice.

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