The ZS8 TIIS Flameproof Zirconia Oxygen Analyzer with a proven track record of performance and durability further enhances the reliability of monitoring and controlling of oxygen concentration in explosive atmospheres. This oxygen analyzer is most suitable for monitoring combustion and controlling the low-oxygen combustion of various industrial furnaces in explosive atmospheres such as at petroleum refineries, petrochemical plants, and natural gas plants.

**Features of Detector**
- **TIS Flameproof Structure**
  - Exd I BT4X flameproof structure
- **Heat Insulation above Sulfuric Acid Dew Point**
  - Using heat insulation provided by electric heaters or steam heaters, the probe is always set at a temperature higher than the dew point of sulfuric acid (120 to 160°C). Thus, there is no corrosion caused by sulfur contained in the sample gas. In the case of heat insulation provided by electric heaters, if the temperature of the heater decreases, the ejector air can be cut off to protect the analyzer.
- **Highly Reliable Oxygen Analysis at High Temperatures**
  - Available such as prediction of sensor life, and response check.
- **Self-diagnostic Function**
  - A variety of self-diagnostic functions are available such as prediction of sensor life, impedance check, and response check.
- **One-touch Calibration**
  - Calibration can be executed by simply pressing the calibration button after flowing air and the standard gas (when the flow setting unit is included).
- **Highly Reliable Oxygen Analysis at High Temperatures**
  - Available such as prediction of sensor life, and response check.

**Model and Suffix Codes**

<table>
<thead>
<tr>
<th>Model Suffix Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>ZS8C, ZS8D</td>
<td>Flameproof Zirconia Oxygen Analyzer</td>
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**Flameproof Converter**

<table>
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<tr>
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</table>

**Features of Converter**
- **TIS Flameproof Structure**
  - Exd I BT4X Flameproof structure
- **Large, Easy-to-Read Digital Display**
  - The large digital display can display the cell emf and temperature as well as oxygen concentration. If any abnormality occurs, an alarm is displayed.
- **Self-diagnostic Function**
  - A variety of self-diagnostic functions are available such as prediction of sensor life, impedance check, and response check.
- **One-touch Calibration**
  - Calibration can be executed by simply pressing the calibration button after flowing air and the standard gas (when the flow setting unit is included).
- **Easy Replacement of Zirconia Cell**
  - The same cell can be used for both non-flameproof and flameproof models, and easy to replace.
- **Zirconia Cell Enables Quick Response and Long-term Stability**
  - The Zirconia Cell Enables Quick Response and Long-term Models, and easy to replace. The same cell can be used for both non-flameproof and flameproof models, and easy to replace.

Energy and Environmental Protection
Flameproof Zirconia Oxygen Analyzer

**ZS8C, ZS8D**

**Long Service Life and Stable Operation with a Zirconia Sensor**
Sensor Replacement is Easy

- A molecular bonding method completes installation of platinum, electrodes, and its inherent connection prevents separation of platinum from the zirconia element.
- A lead-less electrode design eliminates electrical disconnection.
- Special coating protects the platinum and prevents the sensors from deteriorating or becoming damaged.
- No special tool is required for cell replacement. Whenever required, the cell is easily removed by removing four screws from the top of the probe. Down time from the time installation is started until it is completed is minimized to approximately ten minutes. After the cell is replaced, the analyzer requires a zero and span calibration only once.

**Principle of Zirconia Oxygen Analyzer**

The principle of the zirconia oxygen analyzer is as follows:

1. High temperature and high pressure air enters the detector cell; it's converted to high temperature air and high pressure air. Installing the platinum, electrodes, and their inherent connection prevents separation of platinum from the zirconia element.
2. A lead-less electrode design eliminates electrical disconnection.
3. Special coating protects the platinum and prevents the sensors from deteriorating or becoming damaged.
4. No special tool is required for cell replacement. Whenever required, the cell is easily removed by removing four screws from the top of the probe. Down time from the time installation is started until it is completed is minimized to approximately ten minutes. After the cell is replaced, the analyzer requires a zero and span calibration only once.
Energy and Environmental Protection

The ZS8 TIS Flameproof Zirconia Oxygen Analyzer with a proven track record of performance and durability further enhances the reliability of monitoring and controlling of oxygen concentration in explosive atmospheres. This oxygen analyzer is most suitable for monitoring combustion and controlling the low-oxygen combustion of various industrial furnaces in explosive atmospheres such as petroleum refineries, petrochemical plants, and natural gas plants.

Features of Detector
- **TIS Flameproof Structure**
  - Exd I B1S Flameproof structure.
- **Heat Insulation above Sulfuric Acid Dew Point**
  - Using heat insulation provided by electric heaters or steam heaters, the probe is always set at a temperature higher than the dew point of sulfuric acid (120 to 160 °C). Thus, there is no corrosion caused by sulfur contained in the sample gas. In the case of heat insulation provided by electric heaters, if the temperature of the heater decreases, the ejector air can be switched off to protect the analyzer.
- **Highly Reliable Oxygen Analysis at High Temperatures**
  - (-2) Select whether to discharge mixed gases (the sample gas sucked in by the ejector plus the purge gas) outside the furnace or to recirculate them in the furnace. If -1 is selected, a gas-return pipe is provided. By selecting either -1 or -2, the steam heater or electric heater is installed. For high-temperature probes, only “discharge outside furnace” is applied.
- **Easy Replacement of Zirconia Cell**
  - The same cell can be used for both non-flameproof and flameproof models, and easy to replace.
- **Zirconia Cell Enables Quick Response and Long-term Stability**

Features of Converter
- **TIS Flameproof Structure**
  - Exd I B1S Flameproof structure.
- **Large, Easy-to-Read Digital Display**
  - The large digital display can display the cell emf and temperature as well as oxygen concentration. If any abnormality occurs, an alarm is displayed.
- **Self-diagnostic Function**
  - A variety of self-diagnostic functions are available such as prediction of sensor life, impedance check, and response check.
- **One-touch Calibration**
  - Calibration can be executed by simply pressing the calibration button after flowing air and the standard gas (when the flow setting unit is included).
- **Simple and High-Reliability Design**
  - The same cell can be used for both non-flameproof and flameproof models.
- **Highly Reliable Oxygen Analysis at High Temperatures**
  - As at petroleum refineries, petrochemical plants, and natural gas plants.

Model and Suffix Codes

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Probe and Suffix Codes

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For more detailed specifications and features, please refer to the Yokogawa website at www.yokogawa.com.
Yokogawa Zirconia Oxygen Analyzer for Saving Energy and Environmental Protection

Flameproof Zirconia Oxygen Analyzer

ZS8C, ZS8D

Long Service Life and Stable Operation with a Zirconia Sensor

Sensor Replacement is Easy

- A molecular bonding method completes installation of platinum electrodes, and its inherent connection prevents separation of platinum from the zirconia element.
- A leadless electrode design eliminates electrical disconnection.
- Special coating protects the platinum and prevents the sensors from deteriorating or becoming damaged.
- No special tool is required for cell replacement. Whenever required, the cell is easily replaced by removing four screws from the top of the probe. Down time from the time installation is started until it is completed is minimized to approximately ten minutes. After the cell is replaced, the analyzer requires a zero and span calibration only once.

Principle of Zirconia Oxygen Analyzer

The principle of the zirconia oxygen analyzer is as follows. In high-temperature glow-discharge, the oxygen ion obtained by atomization is consumed into anode by the zirconia oxygen ion valence exchange reaction. Flowing the exhaust gas through the difference in the oxygen concentration of gases in the exhaust gas to the opposite side of the zirconia element causes the zirconia element to be electrified. The electrified zirconia element generates an electromotive force, which is converted into a current signal. The generated current signal is converted into an oxygen concentration signal. The range of the generated current is from 20 mA to 4 mA.

Characteristics

- Calibration gas: 0.3 to 25 vol% O2 (min. setting unit: 0.01 vol% O2)
- Flow rate: 300 ml/min
- Flow velocity: 30 m/s or less
- Pressure: -5 to 5 kPa for ZS8D-L general purpose
- ±2-inch (JIS 50 A) mounting
- Sampling method: Air ejector method
- Heat insulation: Steam heater when heavy oil fuel or heavy oil and fuel is used.
- Paint: Baked epoxy resin
- Weight: Approx. 10.3 kg to 17 kg
- Construction: Flameproof Exd II BT6, JIS C0920 waterproof, NEMA3 or equivalent
- Warm-up time: Approx. 30 minutes
- Linearity: ±2.5%
- Response time: 5 to 10 minutes
- Applications: Measurement object: Oxygen concentration in combustion exhaust gases

External Dimensions

- Sampling pipe: 1.25 mm2 or more, 4-wire shielded cable
- Detector heater power wiring: 1.25 mm2 or more, 8-wire shielded cable
- Linearity: ±2.5%
- Response time: 5 to 10 minutes
- Applications: Measurement object: Oxygen concentration in combustion exhaust gases

Standard Specifications

- General Specifications
  - Sampling pipe: 1.25 mm2 or more, 4-wire shielded cable
  - Detector heater power wiring: 1.25 mm2 or more, 8-wire shielded cable
  - Linearity: ±2.5%
  - Response time: 5 to 10 minutes
  - Applications: Measurement object: Oxygen concentration in combustion exhaust gases

- Detector
  - Calibration gas: 0.3 to 25 vol% O2 (min. setting unit: 0.01 vol% O2)
  - Flow rate: 300 ml/min
  - Flow velocity: 30 m/s or less
  - Pressure: -5 to 5 kPa for ZS8D-L general purpose
  - ±2-inch (JIS 50 A) mounting
  - Sampling method: Air ejector method
  - Heat insulation: Steam heater when heavy oil fuel or heavy oil and fuel is used.
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  - Linearity: ±2.5%
  - Response time: 5 to 10 minutes
  - Applications: Measurement object: Oxygen concentration in combustion exhaust gases

- Converter
  - Calibration gas: 0.3 to 25 vol% O2 (min. setting unit: 0.01 vol% O2)
  - Flow rate: 300 ml/min
  - Flow velocity: 30 m/s or less
  - Pressure: -5 to 5 kPa for ZS8D-L general purpose
  - ±2-inch (JIS 50 A) mounting
  - Sampling method: Air ejector method
  - Heat insulation: Steam heater when heavy oil fuel or heavy oil and fuel is used.
  - Paint: Baked epoxy resin
  - Weight: Approx. 10.3 kg to 17 kg
  - Construction: Flameproof Exd II BT6, JIS C0920 waterproof, NEMA3 or equivalent
  - Warm-up time: Approx. 30 minutes
  - Linearity: ±2.5%
  - Response time: 5 to 10 minutes
  - Applications: Measurement object: Oxygen concentration in combustion exhaust gases

- Applications
  - Boiler (fuel oil and gas)
  - Boiler (coal)
  - Boiler (pulverized coal)
  - Boiler (fuel oil, gas, coal)
  - Heat exchanger
  - Pressure regulator
  - Seven G3/4 openings for wiring (without flame arrester)
  - Six G3/4 openings for wiring (with flame arrester)
  - Zero gas
  - Flare gas
  - Stack gas
  - Chemical
  - Reactor
  - parking garage
  - Ejector
  - Flow setting unit (ZA8F)

- Options
  - Option code: inlet 750˚C and the correspondingly reactive electromotive force E = PX = PA 50.74
The ZS8 TIIS Flameproof Zirconia Oxygen Analyzer with a proven track record of performance and durability further enhances the reliability of monitoring and controlling of oxygen concentration in explosive atmospheres. This oxygen analyzer is most suitable for monitoring combustion and controlling the low-oxygen combustion of various industrial furnaces in explosive atmospheres such as at petroleum refineries, petrochemical plants, and natural gas plants.

**Features of Detector**
- TIIS Flameproof Structure: Exd II BT4 Flameproof structure.
- Heat Insulation above Sulfuric Acid Dew Point: Using heat insulation provided by electric heaters or steam heaters, the probe is always set at a temperature higher than the dew point of sulfuric acid (120 to 160°C). Thus, there is no corrosion caused by sulfur contained in the sample gas. In the case of heat insulation provided by electric heaters, if the temperature of the heater decreases, the ejection air can be cut off to protect the analyzer.
- Highly Reliable Oxygen Analysis at High Temperatures (up to 1400°C): A self-diagnosis function is included in the probe to prevent abnormality. The large digital display can display the cell emf and temperature as well as oxygen concentration. If any abnormality occurs, an alarm is displayed.
- Easy Replacement of Zirconia Cell: The same cell can be used for both non-flameproof and flameproof models, easy to replace.
- Zirconia Cell Enables Quick Response and Long-term Stability

**Features of Converter**
- TIIS Flameproof Structure: Exd II BT6 Flameproof structure.
- Large, Easy-to-Read Digital Display: The large digital display can display the cell emf and temperature as well as oxygen concentration. If any abnormality occurs, an alarm is displayed.
- Self-diagnostic Function: A variety of self-diagnostic functions are available such as prediction of sensor life, impedance check, and response check.
- One-touch Calibration: Calibration can be executed by simply pressing the calibration button after flowing air and the standard gas (when the flow setting unit is included).
- Energy and Environmental Protection: The ZS8 TIIS Flameproof Zirconia Oxygen Analyzer with a proven track record of performance and durability further enhances the reliability of monitoring and controlling of oxygen concentration in explosive atmospheres. This oxygen analyzer is most suitable for monitoring combustion and controlling the low-oxygen combustion of various industrial furnaces in explosive atmospheres such as at petroleum refineries, petrochemical plants, and natural gas plants.

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**Probes with Flameproof Terminal Box (0 to 600°C)**

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**Flameproof Zirconia Oxygen Analyzer**

- www.yokogawa.com