

## Agasthya 2013 Series Insitu Zirconia Oxygen Analyzer Model BI 2100-S



### Features:

- Long Life
- Low Drift
- One point Calibration
- Zero Maintenance
- Thermal shock proof
- Field repairable with ease

### Bhoomi Advantages:

- Customizable product as per client site requirements
- Compact handheld & portable analyzers.
- Provide solutions for Analyzer suitable for installation in Hazardous area.
- Spares and accessories availability guaranteed for years at reasonable price.
- A truly trouble – free sales and customer service experience

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BI2100 In-situ Zirconia O<sub>2</sub> Analyzer provides accurate measurement of excess oxygen in flue gas of combustion processes. Optimal combustion efficiency is achieved by maintaining the ideal level of oxygen in the flue gas.

BI2100 is designed to integrate with various process & site conditions. With no moving parts or sampling apparatus, the analyzer is extremely reliable.

Zirconia sensor is very rugged & can withstand high temperature & pressure with life cycle more than 5 years.

Online calibration can be performed during operation. The available mode of calibration are Auto Cal. & Manual Cal.

BI2100 series is field repairable. All active components can be replaced, including the filter, sensing cell & electronic card.

### Operating Principle:

Zirconia is a type of ceramic that conducts electricity at high temperature through the movement of charged Oxygen ions and this ability is used to measure Oxygen in a gas mixture. At temperatures above 700°C, the openings in the lattice permit the passage of O<sub>2</sub> ions. The principle equation on which Zirconia Analyzers function is called the Nernst Equation,

$$E = \left( \frac{RT}{4F} \right) \ln \left( \frac{P_{O_2(ref)}}{P_{O_2(test)}} \right)$$

E = Millivolt signal

R = Gas constant

T = Absolute temperature

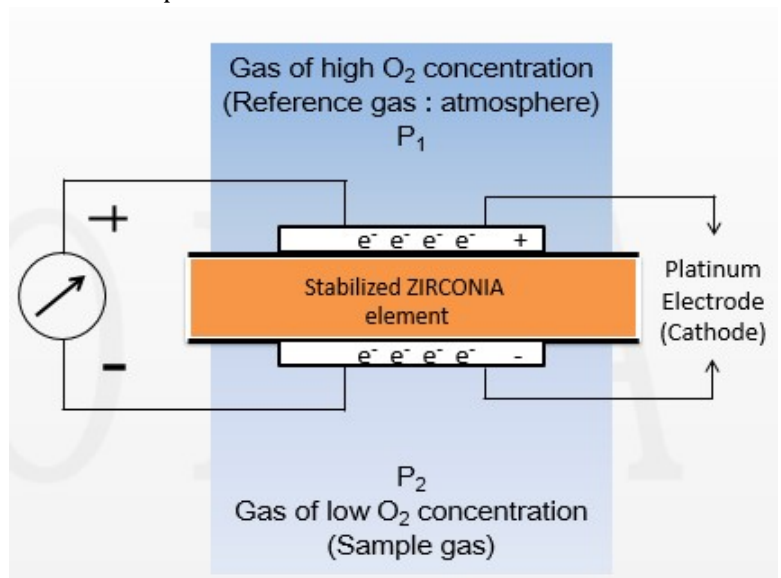
F = Faradays constant

P<sub>O<sub>2</sub>(ref)</sub> = Partial pressure of the oxygen in reference gas

P<sub>O<sub>2</sub>(test)</sub> = Partial pressure of the oxygen in process gas

As seen in the equation, value of O<sub>2</sub> concentration is inversely proportional to the output thereby making the concentration value quite high in case of lower O<sub>2</sub> presence.

With one side of the lattice exposed to the sample gas and the other to the reference gas (usually air), O<sub>2</sub> ions pass through at a rate determined by temperature and the difference in the O<sub>2</sub> partial pressures between these two sides of the lattice. The passage of O<sub>2</sub> ions through the lattice produces a voltage across the sensor electrodes, the magnitude of which is a logarithmic function of the ratio of the O<sub>2</sub> partial pressures of the sample and reference gas. Since the partial pressure of the reference gas is predetermined, the voltage produced by the cell indicates the oxygen content of the sample gas.



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### TECHNICAL SPECIFICATION:

#### Insitu Oxygen Sensor Specification:

- ❖ Technology : Zirconia
- ❖ Range : 0-100% O<sub>2</sub> Programmable
- ❖ Accuracy : ±0.5% of FS
- ❖ Resolution : 0.01%
- ❖ Repeatability : ±0.5% of FS
- ❖ Response Time : T<sub>90</sub> < 3 sec
- ❖ Process Gas Temperature : 0 -700° C
- ❖ Probe MOC : Stainless Steel
- ❖ Diffusion Element : Unbreakable Ceramic. Sintered Steel filter optional on request
- ❖ O<sub>2</sub> Probe Length : 250 mm, 500 mm, 750 mm, 1000 mm, 1500 mm, 2000 mm
- ❖ Flange : ANSI Cl. 150 3RF. Other Flanges on request
- ❖ Reference Air : Clean & Dry Instrument quality air (2 LPM)
- ❖ Are Classification : Safe Area. (Explosion Proof on request.)

#### Oxygen Electronic Unit Specification:

- ❖ Display : Keypad LCD Display
- ❖ Power : 24 VDC. 230 V AC optional on request
- ❖ Output : 4-20 mA Analog Output & 3 Nos. Relay Output
- ❖ Digital Communication : RS 485, Modbus
- ❖ Ambient Temperature : 0 - 65° C
- ❖ Mounting : Wall. Rack optional on request
- ❖ Enclosure Rating : IP65
- ❖ Calibration : Auto & Manual
- ❖ Cable between Sensor & Electronic : 4 core, 25 meter.

### MODEL NO.

Model No.	Sample Gas Temperature	Probe MOC	Probe Length
2100-S-700-SS-500	0 - 700° C	Stainless Steel	500 mm
2100-S-700-SS-1000			1000 mm

**BHOOMI**<sup>®</sup> Process Management Pvt. Ltd.  
(Formerly known as Bhoomi Analyzers)

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