

Applications

An in situ oxygen analyzer for

- Utility boilers; natural gas or oil fired
- Process heaters; natural gas or oil fired

Features

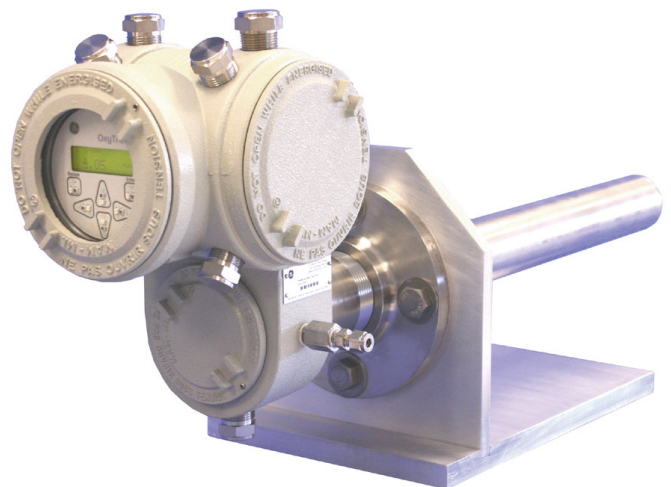
- Self calibrating
- Sealed internal reference sensor—no reference gas required
- IR through-the-glass keypad for Zone 1/Division 1 areas

- Probe lengths of 19, 39 or 60 inches (0.5, 1 or 1.5 m)
- One-step, one-gas, calibration verification
- Drop-down menu user program
- RS485 or RS232 communications port
- Isolated current loop or voltage output
- Fail-safe fault alarm
- Onboard system diagnostics

OxyTrak™ 411

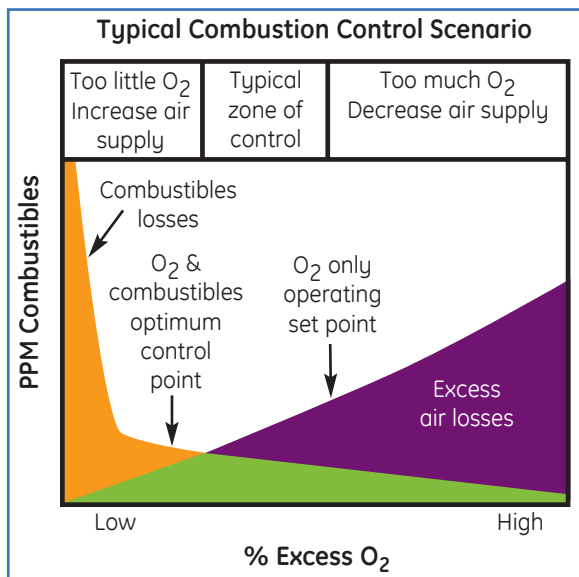
Panametrics In Situ Flue Gas Oxygen Analyzer

OxyTrak 411 is a Panametrics product. Panametrics has joined other GE high-technology sensing businesses under a new name—GE Industrial, Sensing.



Why Monitor Flue Gas?

Ideally, every burner should mix a precise ratio of air and fuel, and the fuel should burn stoichiometrically to yield only heat, water vapor and carbon dioxide. In reality, this rarely happens. Burners age, mixing is imperfect, colorific value of fuel varies, firing rates change, and the weather changes from day to day. Any of these factors can change the amount of air required for safe and efficient combustion of fuel. Accurate flue gas analysis minimizes fuel costs and reduces pollution in all combustion processes.



Combustion applications typically trim burner air supply to run excess oxygen at an optimal level to ensure complete combustion.

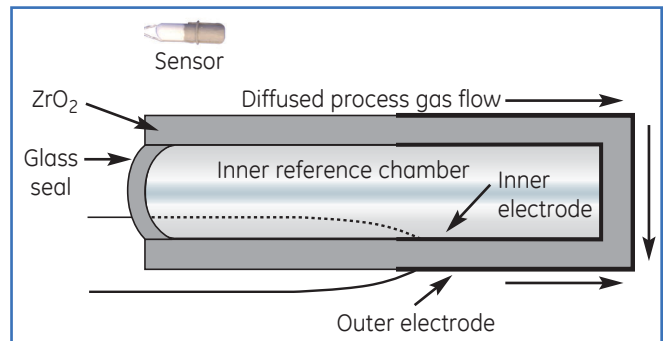
Accurate and reliable oxygen measurement has always been dependent upon tedious sensor calibration and costly reference gases—until now.

Self Calibrating with No Reference Gas

The OxyTrak 411 uses a patented miniaturized zirconia sensor with a sealed internal-reference chamber to accurately determine flue gas oxygen content and rapidly respond to process changes. This new sensor's unique design is self calibrating. The internal electrical calibration of the sensor is performed automatically without the need for calibration gases.

The system works by pumping oxygen out of sealed reference chamber to establish a baseline and then measuring the electrical charge as oxygen ions re-equalize back into the chamber equal to oxygen partial pressure in the flue gas. The electrical charge measured is directly proportional to oxygen concentration.

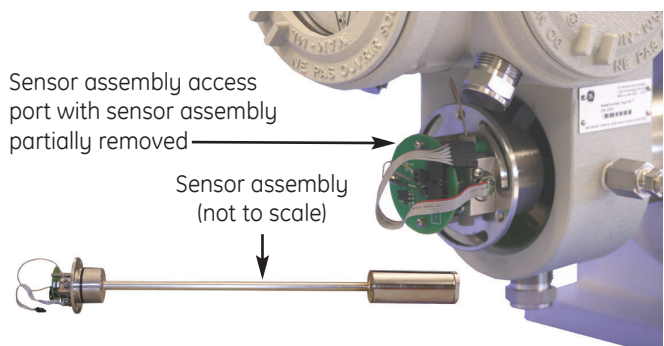
In addition, the sensor's sealed internal-reference chamber eliminates the need for a reference gas. If manual calibration verification is desired, a gas port is provided for a simple, one-gas, one-step procedure, using air or other gases and remote or local user interfaces.



Sealed-reference zirconia oxygen sensor and sensor technology

User-Friendly

The OxyTrak 411 is a modular design that maximizes serviceability. A separate port is provided for access to the sensor core.



Sensor assembly access port and probe assembly

OxyTrak 411 Specifications

Performance

Accuracy

$\pm 0.1\%$ O₂ or 1% of reading whichever is greater

Repeatability

$\pm 0.05\%$ O₂

Output Resolution

$\pm 0.01\%$ O₂

Measurement Range

0% to 25% O₂

Ambient Temperature Effect

$\pm 0.02\%$ oxygen/°F (°C)

Process Pressure Effect

Less than $\pm 0.05\%$ O₂ per psi pressure compensation

Process Pressure Range

450 to 1000 mm Hg

Supply Voltage Effect

Less than $\pm 0.05\%$ O₂

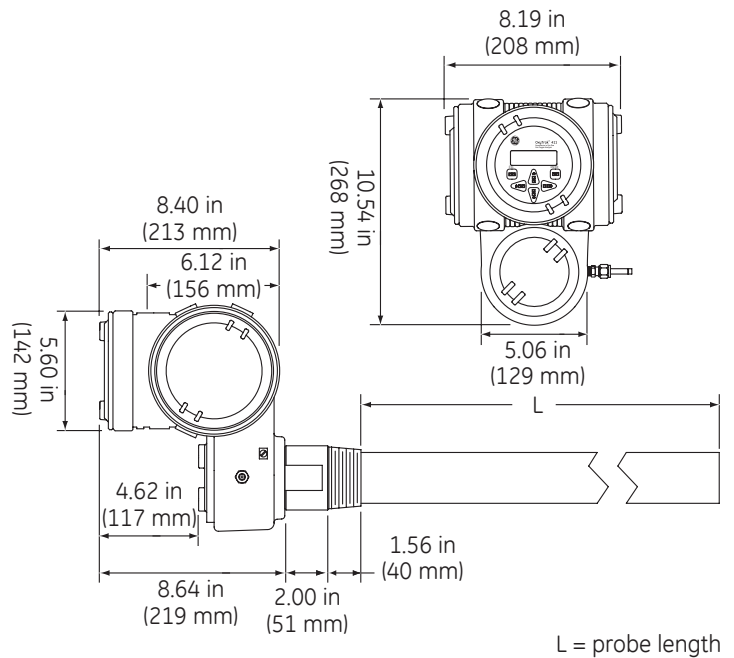
Alarm Output

- One fail-safe, Form C fault alarm
- Two Form C, general purpose, assignable alarm outputs
- Two Form C autocal alarms

Functional

Analog Output

Linearized, isolated, 0/4 to 20 mA or 0 to 2 V output, user selectable, field programmable for any range from 0 to 25% O₂ (e.g., 0 to 5% O₂)



Digital Output

RS485 or RS232, user selectable

Output Load

600 Ω at 20 mA output

Power

100, 115, 230 or 240 VAC

Ambient Temperature Range

-4°F to 140°F (-20°C to 60°C)

Sensor Temperature

Self-heated and controlled 1382°F (750°C)

Flue Gas Temperature Range

302°F to 1202°F (150°C to 650°C)

Calibration Verification

Gas flow rate (optional) 100 ± 10 cc/min

OxyTrak 411 Specifications

Physical

Sensor Type

Patented, sealed, internal-reference, zirconium oxide sensor

Wetted Materials

316 stainless steel, ceramic

Probe Lengths

- Standard: 19 in (0.5 m)
- Optional: 39 in (1 m) or 60 in (1.5 m)

Electronics Dimensions (w x h x d)

9 in x 10 in x 9 in (229 mm x 254 mm x 229 mm)

Total Length (19 inch probe)

31 in (787 mm)

Total Weight (19 inch probe)

31 lb (14 kg)

Mounting

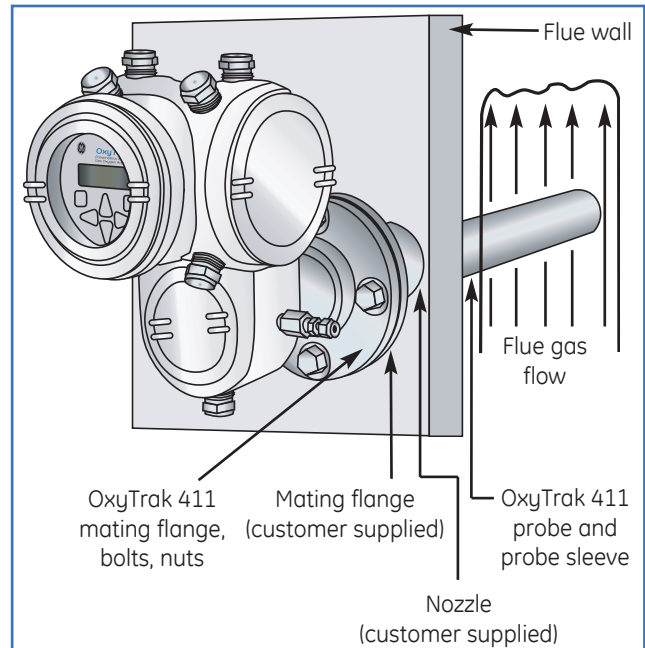
- Standard: 2 1/2 in MNPT
- Optional: 2, 2 1/2 in, 3 in or 4 in flange

Housing

Weatherproof: Type 4X, IP66

Hazardous Area Certifications

- Explosion-proof design: Suitable for Class I, Division 1, Groups C&D Type 4X (approval pending)
- Flameproof design: Ex d IIC T5 (approval pending)



Typical horizontal flue gas analyzer installation

European Compliance

Complies with EMC Directive 89/336/EEC, 73/23/EEC LVD (Installation Category II, Pollution Degree 2) and PED 97/23/EC for DN<25

Order Information

Record selected option in blank indicated at bottom of form.

OxyTrak 411 In Situ Flue Gas Analyzer

Package

- 1 Weatherproof
- 2 Explosionproof

Power

- 1 100 VAC
- 2 115 VAC
- 3 230 VAC
- 4 240 VAC

Probe Length

- 1 19 in (0.5 m)
- 2 39 in (1 m)
- 3 60 in (1.5 m)

OxyTrak 411- _ _ _ Use this number to order product



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