

## Applications

An in situ oxygen transmitter for use in:

- Natural gas or oil-fired utility boilers
- Natural gas or oil-fired process heaters

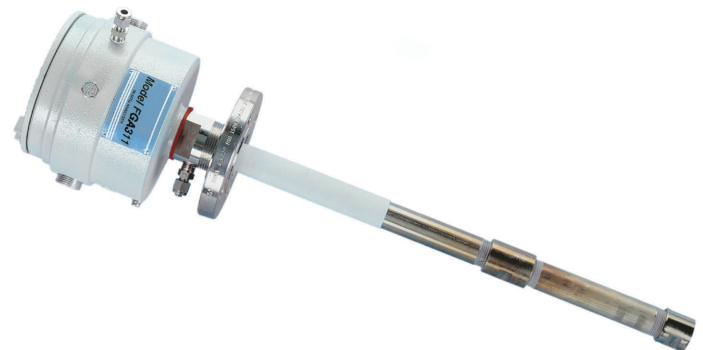
## Features

- In situ flue gas transmitter
- Fast, easy installation and service
- Weatherproof and explosion-proof packages
- Field-programmable ranges
- RS232 communications
- Temperatures up to 1920°F (1050°C)
- Leave-in-place housing—replace sensor without uncoupling flange from process

# FGA 311

## Panametrics In Situ Flue Gas Oxygen Transmitter

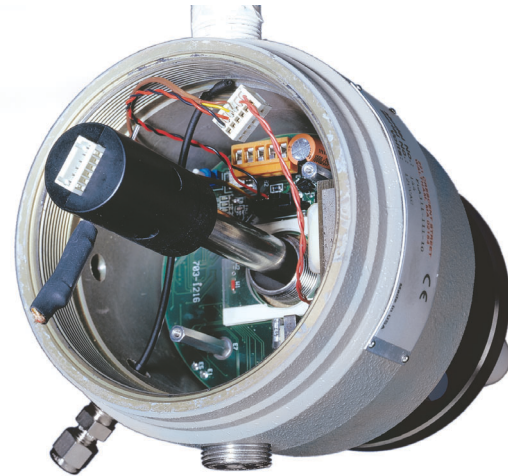
FGA 311 is a Panametrics product. Panametrics has joined other GE high-technology sensing businesses under a new name—GE Industrial, Sensing.



# GE Sensing

## Panometrics In Situ Oxygen Flue Gas Transmitter

The FGA 311 is a simple, low-cost, in situ, flue gas oxygen transmitter. The zirconium oxide oxygen sensor is installed directly into the flue stack or furnace wall. For low-temperature applications, a heater is included to maintain a constant temperature on the zirconium oxide sensor. The FGA 311 is available in both weatherproof and explosion proof configurations. Typical applications for the FGA 311 include natural gas-fired utility and municipal boilers, as well as natural gas-fired process heaters. The FGA 311 is ideal for boiler and furnace manufacturers due to its low-cost, basic transmitter configuration.



*Inside the FGA 311 transmitter*

### Easy Installation

The FGA 311 can be supplied with standard NPT fittings or it can be mounted on existing process flanges, making installation quick, easy and inexpensive.

The electrical connections for the FGA 311 are as simple as 115 to 230 VAC for power and a 4 to 20 mA output signal.

### Easy Configuration

Output ranges for the FGA 311 are user-selectable via a switch or the RS232 interface to accommodate changing measurement needs.

### Easy Troubleshooting

Users can quickly connect the FGA 311's RS232 interface to a PC and view detailed diagnostics via terminal emulation. The FGA 311's microprocessor can report sensor mV output, heater temperature and other system status information, allowing the user to determine quickly any necessary corrective action.

### Easy Removal and Replacement of Sensor and Heater Assembly

Particulates and the corrosives of most flue gases are very harsh to instrumentation located within the process. Conventional in situ flue gas oxygen transmitters require removal of the whole analyzer from the sample point to replace the sensor and heater assembly. The unique design of the FGA 311 makes the replacement easy. The cover on the transmitter housing is unscrewed, the wire harnesses are disconnected, and the sensor and heater assembly are unscrewed and removed. The sensor and heater can then slide out. The transmitter housing and probe remain in place, reducing labor time and effort for any sensor and heater replacement needs.



*Sensor and heater assembly*

# FGA 311 Specifications

## Performance

### Accuracy

±3% of reading or 0.1% O<sub>2</sub>

### Measurement Resolution

Output 4 to 20 mA: 0.01 mA

### RS232 Terminal Interface

0.01% O<sub>2</sub>

### Response Time

Less than 5 seconds for 63% of step change

### Measurement Range

Fully field selectable via RS232 interface or onboard switches:

- 0% to 5% O<sub>2</sub>
- 0% to 10% O<sub>2</sub>
- 0% to 25% O<sub>2</sub>

## Temperature

### Process

- Standard: 300°F to 1200°F (150°C to 650°C)
- High temperature: 300°F to 1920°F (150°C to 1050°C)

### Electronics

-4°F to 160°F (-20°C to 70°C) ambient

## Calibration

### Methods

- Semiautomatic by push-button
- RS232 interface
- Digipot adjustment

### Recommended Gas Mixtures

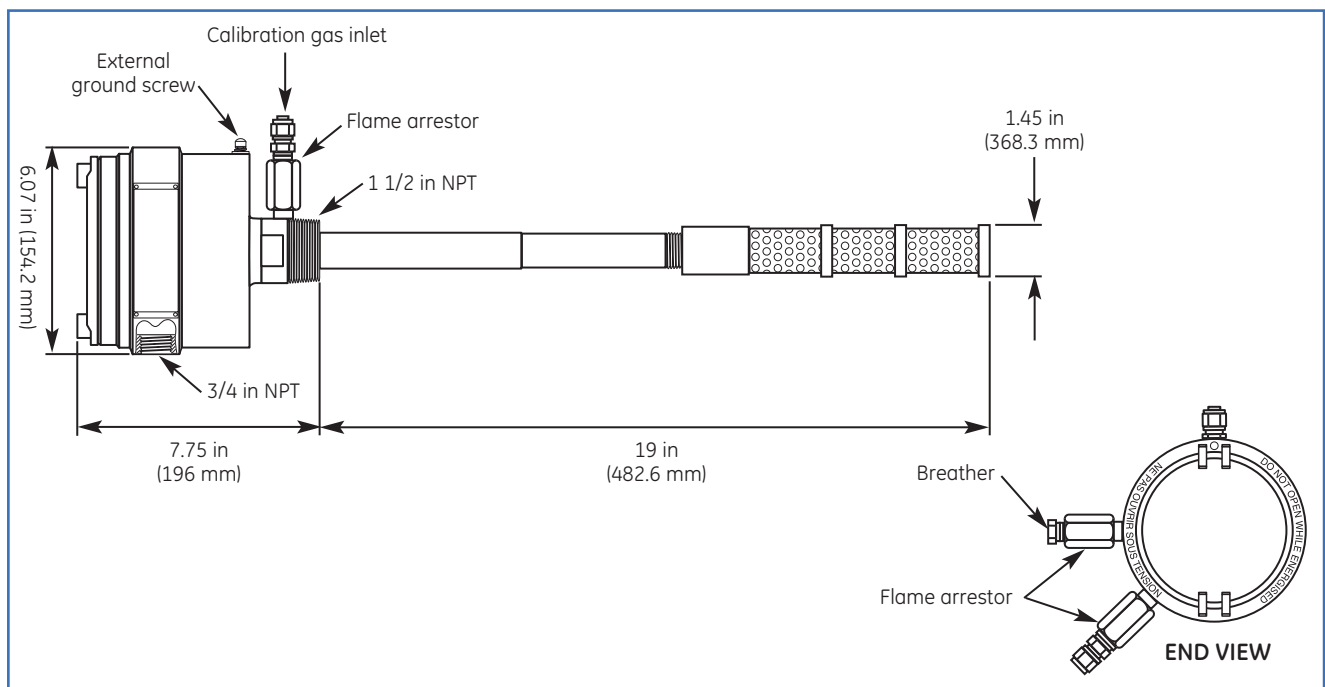
5.0% O<sub>2</sub>, balance N<sub>2</sub> (dependent on application and range)

### Calibration Gas Flow

2000 cc/min (4 SCFH)

### Reference Air

20 to 50 cc/min, clean, dry instrument quality air (20.93% O<sub>2</sub>), regulated to 3 psi (0.2 bar)



Explosion proof version of FGA 311 in situ oxygen flue gas transmitter.

# FGA 311 Specifications

## Functional

### Output

- Analog output: 4 to 20 mA DC, 600  $\Omega$  maximum, isolated
- Digital output: RS232 communications

### Power Consumption

- 115 VAC, 75 W
- 230 VAC, 135 W

### Process Connection

- Standard: 1 1/2 in NPTM
- Optional: 2 in (50 mm) and larger flanges

## Physical

### Materials

- Probe: Process wetted or welded parts
- Standard temperature: 316 stainless steel
- High-temperature: Inconel® alloy

### Enclosure

Epoxy-coated aluminum

### Dimensions

15 lb (6.8 kg); 19 in (482.6 mm) probe length

### Mounting

Vertical or horizontal, 1 1/2 in NPT, flanges available in most sizes

## Hazardous Location Certifications

Explosion-proof/flameproof:  
Class I, Division 1, Groups B,C&D  
T6 (electronic housing)  
T4 (sensor probe)  
ISSeP02ATEX028 X, Electronics:  
Ⓔ II 2 GD EEx d IIB T6  
ISSeP02ATEX028 X, Process:  
Ⓔ II 2 GD EEx d IIB T2

## Environmental

Weatherproof Type 4x/IP66

## European Compliance

Complies with EMC Directive 89/336/EEC, 73/23/EEC LVD (Installation Category II, Pollution Degree 2)

## Order Information

Record selected option in blank indicated at bottom of form.

### FGA 311 In Situ Flue Gas Analyzer

#### Package

- 1 Weatherproof
- 2 Explosion-proof; 19 in (0.5 m) only

#### Power

- 1 115 V
- 2 230 V

#### Probe Length

- 1 19 in (0.5 m)
- 2 39 in (1 m)
- 3 60 in (1.5 m)
- 4 79 in (2 m)

#### Temperature

- 1 Standard temperature, 1202°F (650°C) maximum
- 2 High temperature, 1922°F (1050°C) maximum

#### Special

- 0 None
- 1 Special (consult GE)

FGA 311 - - - - - Use this number to order product



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