

Trace O₂ Applications

This full-featured oxygen analyzer is typically used in applications such as:

- Air separation plants
- Glove boxes
- Semiconductor manufacturing processes
- Heat treat and metallurgical processes
- Glass and ceramic research
- Inert gas purity
- Blanket gas monitoring
- Medical research
- Gas blending

Special Applications

- Welding atmospheres
- Gas generators
- Air/fuel mixtures

Features

- Fast, easy one-point calibration
- Low maintenance
- Measures oxygen from 0.1 ppm to 100 percent; can measure oxygen in reducing gases
- Fast response (90 percent of step change in less than 1 second)
- Extremely stable sensor operation
- Months of trouble-free service; calibration checks or adjustments seldom required; one-point calibration is sufficient for entire range from ppm to percent oxygen
- Accuracy increases at low oxygen concentrations

CGA 351

Panametrics Zirconium Oxide Oxygen Analyzer

CGA 351 is a Panametrics product. Panametrics has joined other GE high-technology sensing businesses under a new name—GE Industrial, Sensing.





Standard version of CGA 351

Panametrics Zirconium Oxide Oxygen Analyzer

The CGA 351 zirconium oxide oxygen analyzer uses an advanced zirconia sensor to accurately determine oxygen content in process gases. Microprocessor-based electronics allow measurements from ppm levels to 100 percent oxygen.

Applications and Uses

The CGA 351 zirconium oxide oxygen analyzer is suitable for monitoring and/or controlling high purity gas streams or atmospheres such as in air separation, heat treating, ceramic manufacturing and other processes. For dirty or wet gas applications, a suitable sampling system may be required.

How It Works

Sample gas enters the inlet port through a needle valve and flows into a ceramic inlet tube. It then flows through the annular space between the inlet tube and the inside of the zirconium oxide oxygen sensor, then out through the outlet port and a flowmeter. When there are no combustibles present in the sample gas, the analyzer measures total oxygen. When combustibles are present, a platinum-based catalyst at the end of the ceramic tube ensures that the sample reaches equilibrium before contacting the inner electrode. It is therefore possible to measure either oxygen excess or deficiency in air/fuel mixtures.

The zirconium oxide sensor is heated and closely controlled at 1292°F (700°C). As the sample contacts the inner electrode of the heated sensor, an electrical signal is generated. The signal is proportional to the logarithm of the ratio of the oxygen concentration in the sample gas to the oxygen concentration in a reference gas contacting the outer electrode. The electronics displays O₂ in ppm or percent. It also displays other parameters including O₂ sensor millivolts and sensor temperature in °F or °C. Ambient air is used as the reference gas on the outside of the electrochemical cell.

CGA 351 Specifications

Performance

Accuracy

0.1 ppm from 0 to 5 ppm or $\pm 2\%$ of reading

Repeatability

$\pm 0.2\%$ of reading (sensor output)

Response Time

Less than 1 second for 90% of step change

Stability

Less than 0.1% of sensor output per month drift

Atmospheric Pressure Influence

No effect if sampling gas is vented to the atmosphere;
otherwise 0.13% of reading per mm Hg

Ambient Temperature Influence

No effect

Sample Flow Rate Influence

No effect if sample flow rate equals 1000 ± 150 cc/min
(2.1 ± 0.3 SCFH)

Background Gas Variation Effect

No effect if sample gas is clean, dry and free of
combustibles

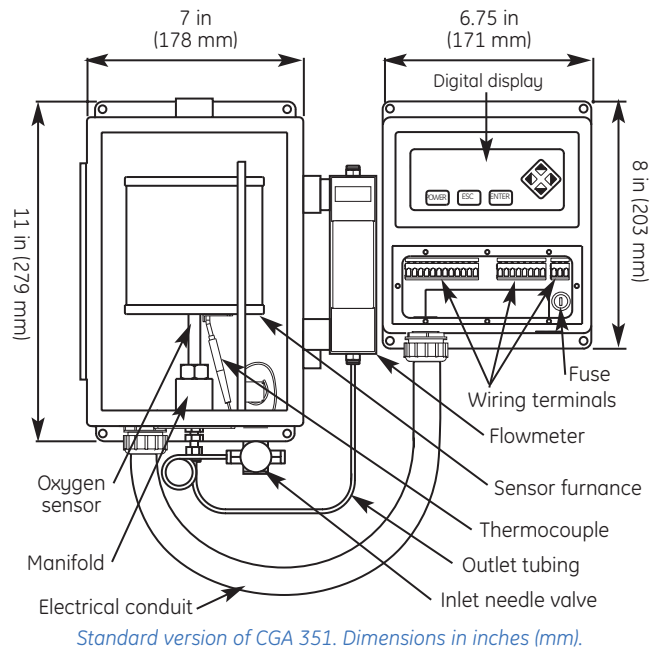
Operating

Standard Measuring Range

Any portion of the range from 0.1 to 10 ppm O₂

Optional Measuring Ranges

- Field-selectable for any portion of the 0.1 ppm to 100% range
- The digital panel meter is software-configurable to display the following parameters:
 - Oxygen (ppm or %)
 - Temperature (°F or °C)
 - Sensor (mV)
 - CJC temperature (°F or °C)



Output Ranges

0/4 to 20 mA

Alarm Circuits

- Dual alarm contacts
- Contact rating 2 A, 28 VDC, SPDT, fail-safe

Communications

Standard RS232 serial port

Sample Requirements

- Sample flow: $1,000 \pm 150$ cc/min (2.1 ± 0.3 SCFH)
- Sample pressure: Atmosphere

Ambient Requirements

- Relative humidity: 90% maximum
- Temperature range: 13°F to 122°F (25°C to 50°C)

Power

100/115/220/240 VAC, 50 to 60 Hz, 250 W maximum

Line-Voltage Influence

$\pm 10\%$ nominal line voltage

Fuse

3 A, 250 V, antisurge, 5 x 20 mm

Materials Contacting Sample Gas

316 stainless steel, ceramic and platinum

Connections

- Sample inlet and outlet: 6-mm Swagelok®
- Electrical analyzer and D/O unit: 1/2 inch conduit

CGA 351 Specifications

Dimensions

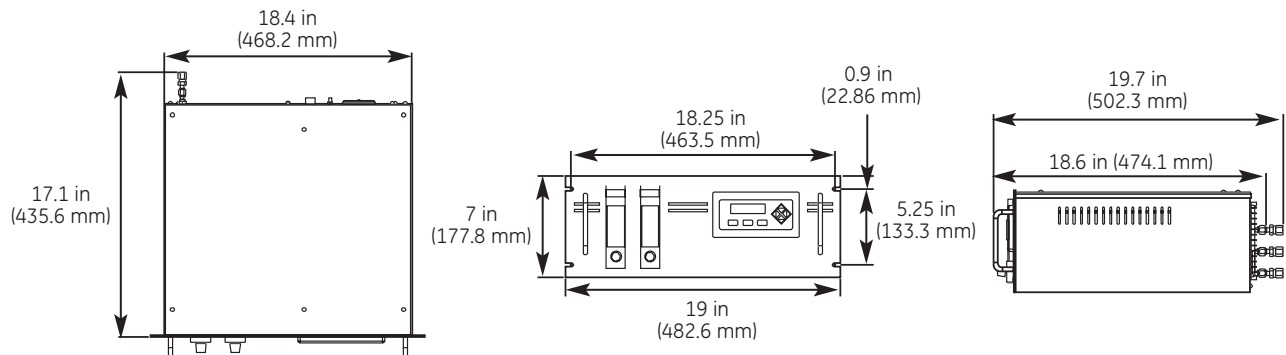
- Sensor enclosure: 7.0 in x 11.0 in (178 mm x 279 mm)
- Electronics enclosure: 6.75 in x 8.0 in (171 mm x 203 mm)

Warm-Up Time

- 45 minutes
- Calibration at alarm or control level with certified mixtures of O₂ in N₂

European Compliance

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



Rack mount version of CGA 351

Order Information

Record selected option in blank indicated at bottom of form.

CGA 351 Zirconium Oxide Oxygen Analyzer

Power

- 1 100 VAC, 50 to 60 Hz
- 2 115 VAC, 50 to 60 Hz
- 3 230 VAC, 50 to 60 Hz
- 4 240 VAC, 50 to 60 Hz

Package

- 1 Wall mount
- 2 Rack mount (220 and 240 VAC only)

Connections

- 1 1/4 in tube fitting
- 2 6 mm tube fitting

CGA 351 - _ _ _ Use this number to order product



©2005 GE. All rights reserved.
920-026B

All specifications are subject to change for product improvement without notice. GE® is a registered trademark of General Electric Co. Other company or product names mentioned in this document may be trademarks or registered trademarks of their respective companies, which are not affiliated with GE.

