

GE Sensing

Applications

A complete oxygen analyzer typically used in applications such as:

- Vapor recovery
- Barge loading
- Flare gas
- Refinery gas
- Olefins such as ethylene and propylene
- Pure hydrocarbons

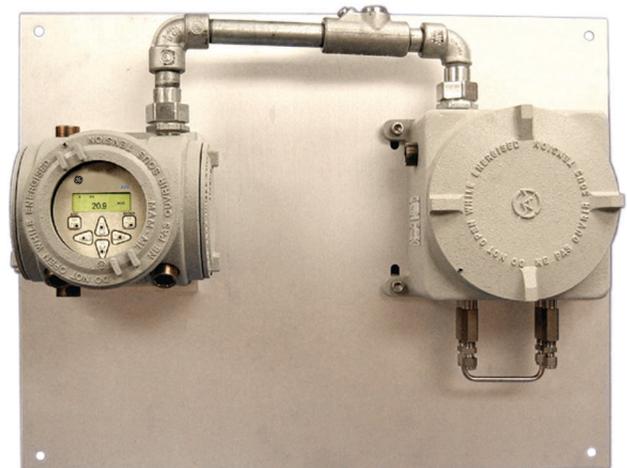
Features

- Advanced background gas compensation for varying gas mixtures
- Infrared (IR) through-glass keypad for easy programming in hazardous areas
- Certified for use in hazardous areas
- Resistant to liquid upsets
- No moving parts
- Universal AC input
- Long term calibration stability
- Calibrate in N₂ only, but use in any background gas

APX

Panometrics Advanced Paramagnetic Oxygen Analyzer

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



GE Sensing

Panometrics Advanced Paramagnetic Oxygen Analyzer

The APX advanced paramagnetic oxygen analyzer is the newest addition to the Panometrics line of thermoparamagnetic oxygen transmitters and analyzers. The APX is specially designed with advanced background gas compensation that makes it ideal for applications with defined or undefined hydrocarbon gases, including vapor recovery, flare gas and refinery gas.

Advanced Background Compensation

The APX's advanced background gas compensation not only measures the thermal conductivity of a gas, but the heat capacity and viscosity as well. By measuring these additional physical properties, the APX is better equipped to differentiate background gases that have significantly different or varying diamagnetic effects. This gives the APX an advantage over other, traditional dumbbell paramagnetic oxygen analyzers, which do not automatically compensate for the inherent diamagnetic effects of changing background gases. The result is that the APX reliably measures oxygen more accurately in a broader range of applications with either known or unknown background gases.

Top Performance and Ease of Use

An onboard microprocessor gives the APX the computing power to provide automatic oxygen signal compensation and integrated signal-processing algorithms. This enhances linearity and improves accuracy for reliable, long-term measurement.

The APX also has sophisticated error-checking software with user-programmable defaults and error limits to detect abnormal measurement conditions, including a loss of flow to the analyzer or a pressure spike. The APX is easily programmed through the multilevel, menu-driven interface, which provides convenient access for changing defaults, analog output scaling and calibration.

Rugged Design and Low Maintenance

Sensor and electronic components are housed in a flameproof and explosion-proof enclosure with

weatherproof protection, allowing installation right at the measurement point to simplify wiring and provide trouble-free operation. The unique dual-chamber, temperature-controlled, oxygen-sensor design provides resistance to contamination, while minimizing temperature and flow sensitivity.

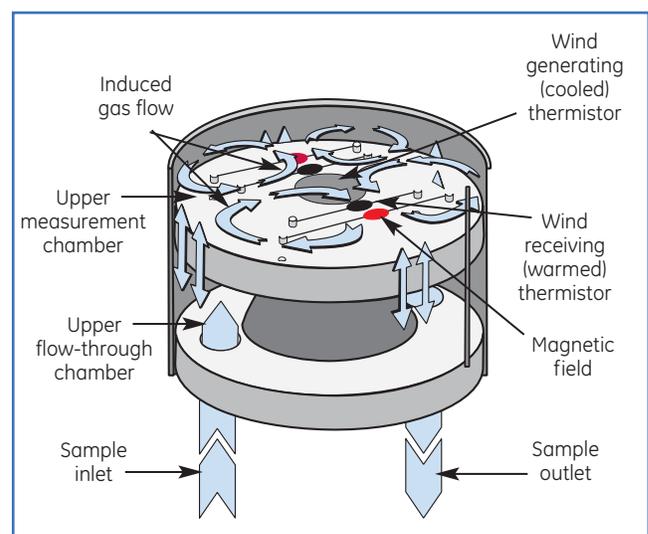
How It Works

Oxygen's paramagnetic property causes a gas sample containing oxygen to move within a magnetic field. Thermistor pairs, which are part of a wheatstone bridge circuit, sense the "magnetic wind" created by the gas movement. The resulting signal, along with heat capacity and viscosity measurements, is used by the microprocessor to calculate the oxygen percentage accurately.

Choice of Ranges

The APX provides a 4 to 20 mA output signal that is fully programmable for zero and span. The output is proportional to oxygen concentration and is internally compensated for background gas and pressure variations. The APX is available in a wide variety of measurement ranges.

Dual-Chamber Design



Flow schematic of the APX thermoparamagnetic oxygen measuring cell. Oxygen's paramagnetic property causes an oxygen-containing gas sample to move within the magnetic field. The gas movement creates a "magnetic wind" that is sensed by the thermistor pairs. Additional sensor elements are used to measure gas heat and viscosity. Oxygen concentration and background gas compensation are determined by the transmitter's microprocessor.

APX Specifications

Performance

(Specifications for defined background gas variations)

Accuracy

- $\pm 0.15\%$ O₂ if calibrated in the critical gas
- $\pm 0.25\%$ O₂ in any gas mixture

Repeatability

$\pm 0.1\%$ O₂

Measurement Resolution

0.01 mA/0.1% O₂

Stability

$\pm 0.05\%$ O₂ per month

Measurement Ranges (Typical)

- 0% to 2%
- 0% to 5%
- 0% to 10%
- 0% to 21%
- 0% to 25%

Analyzer Temperature

- Standard: Controlled to 113°F (45°C)
- Optional: Controlled to 140°F (60°C)

Required Sample Pressure

Regulate inlet pressure to 5 psig (0.3 bar)

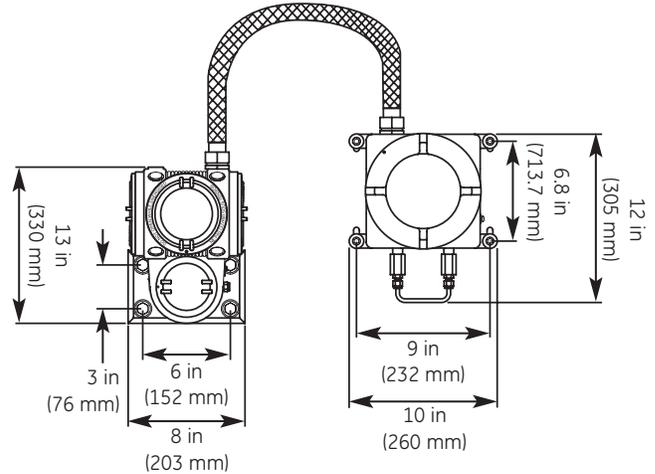
Functional

Analog Output

4 to 20 mA, isolated, 800 Ω maximum, field programmable

Alarms

- Four SPDT rated to 2 A at 28 VDC
- One dedicated fault alarm rated to 2 A at 28 VDC



Depth required = 10 in (260 mm) minimum

Schematic of flameproof APX. Sensor housing and controller close coupled via certified flexible conduit. Maximum separation = 32 in (812.8 mm). Approved for II 2 GD EEx d T6, IP66.

Power

85 to 264 VAC, 47 to 63 Hz

Operating Temperature

Standard: 113°F (45°C)

Ambient Temperature Range

-4°F to 95°F (-20° to 35°C), standard cell operating temperature of 113°F (45°C)

Pressure Range

-5 psig to 5 psig (-0.3 bar to 0.3 bar)

Physical

Wetted Sensor Materials

Standard: Stainless steel, glass and Viton® O-rings

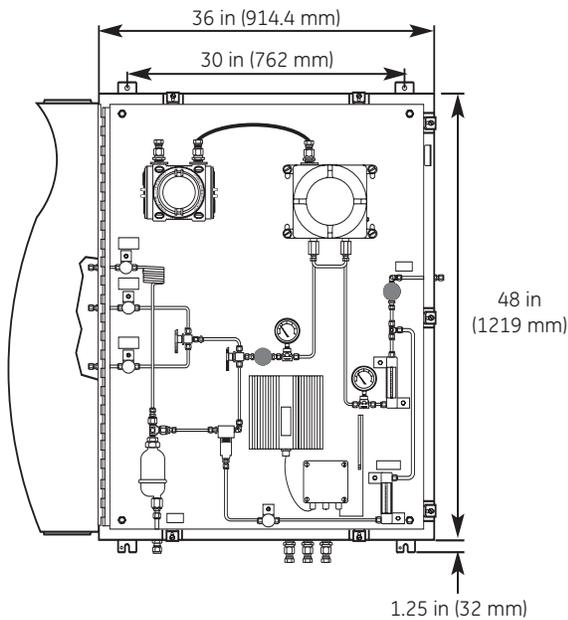
Environmental

- Explosion-proof design:
 - CSA C US Class I, Division 1, Group B,C&D, Type 4X (approval pending)
- Flameproof design:
 - Ex II 2 GD EEx d IIC T6, IP66
 - ISSeP03ATEX096

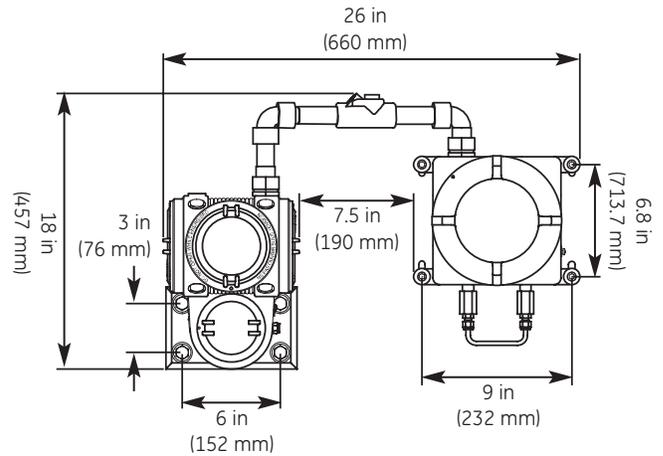
European Compliance

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

APX Specifications



Schematic of typical flameproof APX sample system



Depth required = 10 in (260 mm) minimum

Schematic of explosion-proof APX. Sensor housing and controller close coupled via rigid metal conduit. Class I, Division 1, Groups A,B,C&D.

Order Information

Record selected option in blank indicated at bottom of form.

APX Advanced Paramagnetic Oxygen Analyzer

Package

2 Explosion-proof/weatherproof enclosure

Power

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

Keypad

1 IR keypad

Configuration

- 1 Close coupled, explosion-proof design, Class I, Division 1
- 2 Close coupled, flameproof design, EEx d T6

APX - _____ Use this number to order product



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