

XMO2

Panametrics Smart Oxygen Analyzer



Applications

An oxygen transmitter for use in:

- Inerting/blanketing liquid storage tanks
- Reactor feed gases
- Centrifuge gases
- Catalyst regeneration
- Solvent recovery
- Landfill gas
- Sewage wastewater digester gas
- Oxygen purity

Features

- Measurement ranges from 0.01 percent to 100 percent O₂ in gases
- Explosion-proof and flameproof enclosure with weatherproof protection allows sensor to be remotely mounted at the measurement point
- Push-button, single or dual gas calibration
- Compact, rugged sensor design with no moving parts provides long term reliability and trouble-free operation
- Dual-bridge measurement circuit compensates for variations in background gas composition
- Unique dual-chamber, temperature-controlled cell design provides resistance to contamination and flow fluctuation
- Computer-enhanced accuracy of 1 percent of span and linearity of better than 0.5 percent of span





Smart Oxygen Transmitter

The XMO2 thermoparamagnetic oxygen transmitter is the most stable oxygen analyzer available on the market today. It represents the state of the art in oxygen measurement. With the XMO2 transmitter, reliable process oxygen measurement can be as easy as temperature or pressure measurement.

Top Performance and Ease of Use

The XMO2 combines computer-enhanced, automatic oxygen signal compensation, fast-response software, real-time error detection and automated calibration with a proven thermoparamagnetic oxygen sensor to achieve unequaled performance and ease of use.

The compact, weatherproof, explosion-proof and flameproof XMO2 is specifically designed to be field installed at the process measurement point, thus minimizing sample-conditioning requirements while ensuring the best sample and the fastest possible response. With no moving parts, it is insensitive to mounting position or vibration, and it has excellent long-term reliability. The XMO2's dual-chamber oxygen cell design makes it resistant to contamination and flow variation.

Automatic Background Gas Compensation

An onboard microprocessor gives the XMO2 the computing power to provide advanced online signal conditioning and digital communications via an RS232 interface and menu-driven software. Integrated signal-processing algorithms provide improved linearity and accuracy, and automatic compensation for background gas variations and/or atmospheric pressure effects. A fast-response software routine provides typical response time of less than 15 seconds. When recalibration does become necessary, it can be accomplished quickly and easily through software, with no potentiometers to adjust.

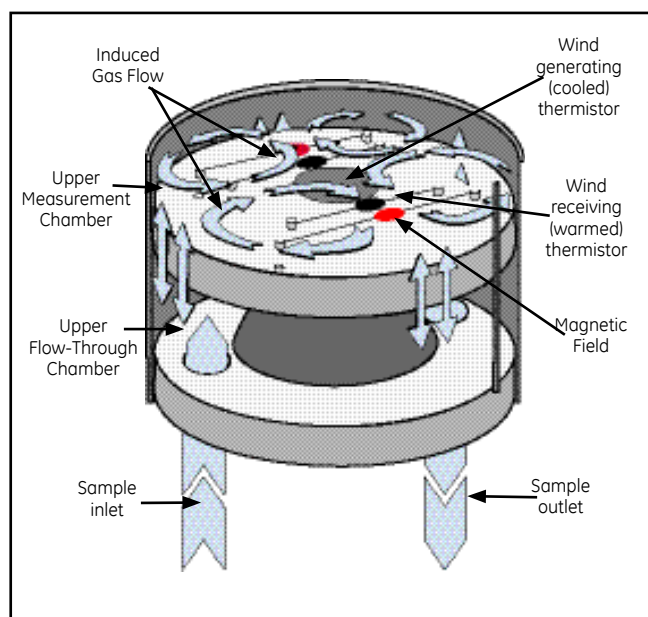
Choice of Enclosures and Ranges

The XMO2 requires 24 VDC power and provides a 4 to 20 mA output signal with fully programmable zero and span settings. The output is proportional to oxygen concentration and internally compensated for background gas and and/or atmospheric pressure variations. The weatherproof, explosion-proof and rack-mount XMO2s are available in a wide variety of measurement ranges.

XMO2 Accessories

GE provides a complete line of accessories for use with the XMO2. This includes sample systems custom-designed for specific applications, a 24 VDC power supply and a four-wire color-coded cable in lengths up to 4000 ft (1200 m). The XMO2 can also be interfaced with other GE displays and analyzers, such as the TMO2D, XDP and Moisture Series analyzers. The TMO2D and XDP displays provide microprocessor-based oxygen signal compensation for maximum accuracy, software-enhanced response and automatic calibration of the XMO2 transmitter.

Dual-Chamber Design



Flow schematic of the XMO2 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. Oxygen concentration and background gas compensation are determined by the transmitter's microprocessor.

XMO2 Specifications

Accuracy

- $\pm 1\%$ of span
- $\pm 2\%$ of span for 0 to 1% range
- $\pm 0.2\%$ O₂ for 90 to 100% and 80 to 100% ranges

Linearity

$\pm 0.5\%$ of span

Repeatability

$\pm 0.2\%$ of span

Measurement Resolution

0.01 mA

Zero Stability

$\pm 1\%$ of span per month ($\pm 2\%$ for 0 to 1% range)

Span Stability

$\pm 0.4\%$ of span per month ($\pm 0.8\%$ for 0 to 1% range)

Measurement Ranges (Typical)

- 0% to 1%
- 0% to 2%
- 0% to 5%
- 0% to 10%
- 0% to 21%
- 0% to 25%
- 0% to 50%*
- 0% to 100%*
- 90% to 100%*
- 80% to 100%*

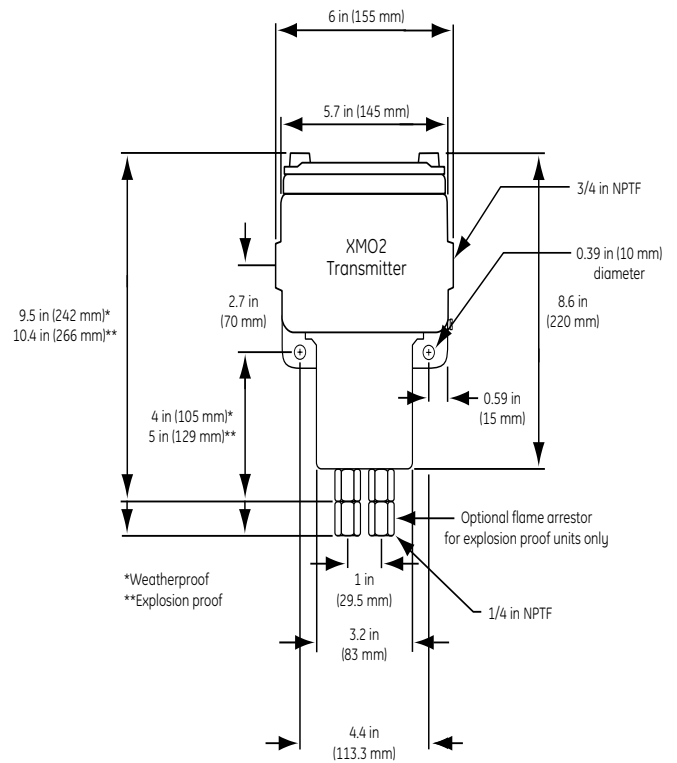
*Pressure compensation required

Transmitter Temperature

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



The XMO2 output may be used as an input to GE Moisture Series analyzers for simultaneous measurement and display of both moisture and oxygen content.



XMO2 oxygen transmitter dimensions

Pressure Effect

- $\pm 0.2\%$ of reading per mm Hg (without pressure compensation)
- Option available for pressure compensation

Required Sample Flow Rate

0.1–2.0 SCFH (50–1,000 cc/min),
1.0 SCFH (500 cc/min) nominal

Sample Flow Rate Effect

Less than 1% of span for flow range of 0.1 to 2.0 SCFH (50 to 1000 cc/min) for weatherproof XMO2 with background gas compensation

Response Time, 90% Step Change

- Fast 15 seconds
- EN50104 45 seconds
- Standard 70 seconds

Warm-Up Time

30 minutes

Functional

Analog Output

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

Digital Output

RS232, three-wire

Power

24 VDC ±4 VDC, 1.2 A maximum

Cable

- Standard: 10 ft (3 m), four-wire
- Lengths up to 4000 ft (1200 m) available for current output

Ambient Temperature Range

(Sample Conditions):

- -4°F to 104°F (-20°C to 40°C), standard cell operating temperature of 113°F (45°C)
- 23°F to 131°F (-5°C to 55°C), optional cell operating temperature of 140°F (60°C)

Maximum Pressure

20 psig (2 bar)

Physical

Wetted Sensor Materials

- Standard: 316 stainless steel, glass and Viton® O-rings
- Optional: Hastelloy® C276 and Chemraz® O-rings


Dimensions

- Weatherproof unit (h x dia): 9.53 in x 5.71 in (242 mm x 145 mm)
- Explosion-proof/weatherproof unit (h x dia): 10.47 in x 5.71 in (266 mm x 145 mm)

Weight

9.5 lb (4.3 kg)

Environmental, Transmitter

- Weatherproof: Type 4X/IP66
- Explosion-proof: Class I, Division 1, Groups A,B,C&D, FM/CSA
- Flameproof:
 II 2 GD EEx d IIC T6
ISseP02ATEX022;



Ex d II C T6 IP66 Class I, Zone 1

ATEX compliance with EN50104 requires response-time calibration to EN50104 and constant control of sample-system pressure or pressure compensation of XMO2.

Environmental, Rack Mount

Rack-mount configuration is suitable for ordinary locations only. Not suitable for use in hazardous (classified) locations.

European Compliance

Complies with EMC Directive 2004/108/EC and PED 97/23/EC for DN<25 (CE approval pending for rack mount)

Lloyd's Registry Approval

Please refer to the XMO2-LR data sheet for details.

Order Information

Record selected option in blank indicated at bottom of form.

XMO2 Thermomagnetic Oxygen Transmitter

Package

- 1 Weatherproof enclosure
- 2 Explosion-proof/weatherproof enclosure
- 3 Rack mount configuration
- 4 Without enclosure (spare)

CE Compliance

- H Standard
- C CE compliant

Compensation

- 3 Background gas only (standard)
- 4 Atmospheric pressure and background gas (optional)

Materials

- 1 316 stainless steel
- 2 Hastelloy C276

XMO2 - _____ Use this number to order product

XMO2 Calibration Specifications

Range of Oxygen Output

- | | | |
|-------------|--------------|---------------|
| 1 0% to 1% | 5 0% to 21% | A 90 to 100%* |
| 2 0% to 2% | 6 0% to 25% | B 80 to 100%* |
| 3 0% to 5% | 7 0% to 50% | S Special |
| 4 0% to 10% | 8 0% to 100% | |

Compensation Signal

- 1 Background gas, standard N₂/CO₂
- 2 Atmospheric pressure, standard range (700 to 800 mm Hg)

Response

- 1 Standard response
- 2 Response to meet EN50104
- 3 Fast response

XCAL- _____ Use this number to order product

*Requires pressure compensation option



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Instructions: Please fill out the fields in color. Any field with a block is a required field.

Today's Date: **GE Sensing TMO2/XMO2/APX Analyzer Application Data Sheet**

Contact Information

Name:	 	Phone:	
Company:	 	Fax:	
Address:	 	E-mail:	
Installation Address:	 	Delivery Want	
Measurement Points	 		
Account Manager/Sales rep (if known)	 		

Process Data

Process/Application:	 				
Physical State of material:	<input type="checkbox"/> Gas	<input type="checkbox"/> Liquid			
Complete Chemical Composition:	Component Name	Chemical Formula	Volume Percent		
Gas A	Oxygen	O2	Nominal:	% +/-	%
Gas B			Nominal:	% +/-	%
Gas C			Nominal:	% +/-	%
Gas D			Nominal:	% +/-	%
Gas E			Nominal:	% +/-	%
Gas F			Nominal:	% +/-	%
Other*			Nominal:	% +/-	%
			Total**	100%	

*Attach additional pages if more space is needed **Gas composition must total 100%

Pressure at sample points:	Units	Minimum	Maximum	Nominal
Temperature at sample points:	Units	Minimum	Maximum	Nominal
Sample Outlet:	<input type="checkbox"/> Vent to atmosphere		<input type="checkbox"/> Return to process	
If sample will be returned to process, pressure at sample return point:				
	Units	Minimum	Maximum	Nominal
Temperature at sample return point:				
	Units	Minimum	Maximum	Nominal

Measurement Parameters

Analyzer range (e.g. 0-25%)	 % O2	
Utilities available at transmitter:	<input type="checkbox"/> Air, pressure	 psig
	<input type="checkbox"/> Water, pressure	 psig
	<input type="checkbox"/> Temperature	 Deg F <input type="checkbox"/> Deg C
	1.2-A, 24-VDC power	<input type="checkbox"/> Available <input type="checkbox"/> Not available
4 to 20 mA output isolation:	<input type="checkbox"/> Not required <input type="checkbox"/> Required	
RS232 port (XMO2):	<input type="checkbox"/> Not required <input type="checkbox"/> Required	
Area classification:	<input type="checkbox"/> Nonhazardous <input type="checkbox"/> Hazardous	
If hazardous:	Class	Division
Ambient pressure:	Units	Minimum
Ambient temperature:	Units	Minimum

Electronics/Display Package

Digital display:	<input type="checkbox"/> Local <input type="checkbox"/> Remote <input type="checkbox"/> Not required
Type:	<input type="checkbox"/> Weatherproof <input type="checkbox"/> Explosionproof <input type="checkbox"/> Rack <input type="checkbox"/> Bench <input type="checkbox"/> Panel
Automatic calibration:	<input type="checkbox"/> Not required <input type="checkbox"/> Required
RS232 port (TMO2D):	<input type="checkbox"/> Not required <input type="checkbox"/> Required
Alarm relays:	<input type="checkbox"/> Not required <input type="checkbox"/> Required
Output units:	<input type="checkbox"/> Single 4 to 20 mA (isolated) <input type="checkbox"/> Dual 4 to 20 mA (isolated)
Power available:	<input type="checkbox"/> VAC <input type="checkbox"/> HZ <input type="checkbox"/> Other
Area classification:	<input type="checkbox"/> Nonhazardous <input type="checkbox"/> Hazardous
If hazardous:	Class
Distance between display(s) & transmitter:	<input type="checkbox"/> ft <input type="checkbox"/> m Choose one
Tagging:	<input type="checkbox"/> Not required <input type="checkbox"/> Required
Drawings:	<input type="checkbox"/> Not required <input type="checkbox"/> Required
sample system fitting Requirements:	Parker / Swagelok / Other

Additional Measurements

Moisture:	<input type="checkbox"/> Not required <input type="checkbox"/> Required
Flow:	<input type="checkbox"/> Not required <input type="checkbox"/> Required
Energy flow rate:	<input type="checkbox"/> Not required <input type="checkbox"/> Required

Hydrogen concentration:	<input type="checkbox"/>	Not required	<input type="checkbox"/>	Required	
Thermal conductivity:	<input type="checkbox"/>	Not required	<input type="checkbox"/>	Required	
Flue gas analysis:	<input type="checkbox"/>	Not required	<input type="checkbox"/>	Required	
Combustible gas:	<input type="checkbox"/>	Not required	<input type="checkbox"/>	Required	
Wobbe index:	<input type="checkbox"/>	Not required	<input type="checkbox"/>	Required	
CARI:	<input type="checkbox"/>	Not required	<input type="checkbox"/>	Required	
Calorific value:	<input type="checkbox"/>	Not required	<input type="checkbox"/>	Required	
Carbon potential:	<input type="checkbox"/>	Not required	<input type="checkbox"/>	Required	
Special Requirements:					
Please attach a brief description or sketch of the process					