



O2X1 Oxygen Transmitter



Accurate oxygen measurement from 1 ppm to 25% in an intrinsically safe and weatherproof, loop-powered, 2-wire transmitter.

The O2X1 Transmitter Offers Reliable, Cost Effective O₂ Analysis.

Finally, a reliable, cost-effective oxygen transmitter has arrived. The O2X1 is a two-wire, loop-powered transmitter with a linearized 4- to 20-mA output. It measures oxygen in four ppm ranges (10, 100, 1000, and 10,000 ppm) and three percentage ranges (1, 10, and 25%). All ranges are user-programmable. This compact transmitter uses proven sensor technology to accurately measure O₂ in a variety of gases, even in hazardous environments.

Proven sensor technology.

The O2X1's oxygen sensor is an advanced galvanic fuel cell that provides superior performance, accuracy, stability, and longer life. The cell's innovative design eliminates the potential for negative signal output, reduces sources of contamination, and eliminates electrolyte leakage.

The cell is unaffected by other background gases or hydrocarbons and is compatible with acid gases (OX-2 and

OX-4 cells). Recovery from air at low ppm levels takes just a few minutes. Because the cell is self-contained, little maintenance is required. There is no electrolyte to change or electrodes to clean.

Intrinsically safe.

When equipped with the optional MTL706 barriers, the O2X1 can be mounted in a hazardous (classified) location as defined by the National Electrical Code (NEC). The O2X1 is approved by Factory Mutual Research Corporation as intrinsically safe for use in Class I, II, III; Div. 1; Groups A, B, C, D, E, F and G hazardous (indoor/outdoor) NEMA 4X locations. The O2X1 is certified for BASEEFA EEx ia IIC T4 (T_{amb} = -20°C to 60°C).

Control at the tip of a finger.

The rugged O2X1 is controlled by a microprocessor that enables you to select the range, trim outputs, and perform calibration. Programming is easily done using the three-button keypad and the three light-emitting diodes (LEDs). These switches allow complete functionality while in the hazardous area when equipped with MTL706 barrier.

Installation flexibility.

The compact O2X1, with its built-in microprocessor, is designed to fit easily into any installation site. The O2X1 can

O2X1 Features

- Microprocessor-based, all-digital technology for reliable operation.
- Programmable ranges for ppm and percent oxygen.
- Proven galvanic fuel cell O₂ sensor technology.
- 2-wire, loop-powered 4- to 20-mA transmitter.
- Continuous on-line monitoring.
- Economical and compact.
- Low maintenance.
- Intrinsically safe.

Applications.

The O2X1 is an integral component in assuring the quality and efficiency of your application. The O2X1 Transmitter is ideal for applications such as:

- Heat treating and bright annealing.
- Glove box leak detection.
- Process monitoring of gaseous monomers.
- Pure, gaseous hydrocarbon stream monitoring.
- Inert gas welding of exotic metals.

be installed right at the sampling point, whereas other transmitters must be rack or panel mounted.

Sample systems.

In addition to standard features and options, Panametrics offers a full line of sample handling systems for a variety of applications. If needed, Panametrics can design and build a sample conditioning system to meet the unique demands of your application. Panametrics offers a variety of standard sample systems. Please contact Panametrics for details.

Oxygen Sensor Interference Gases

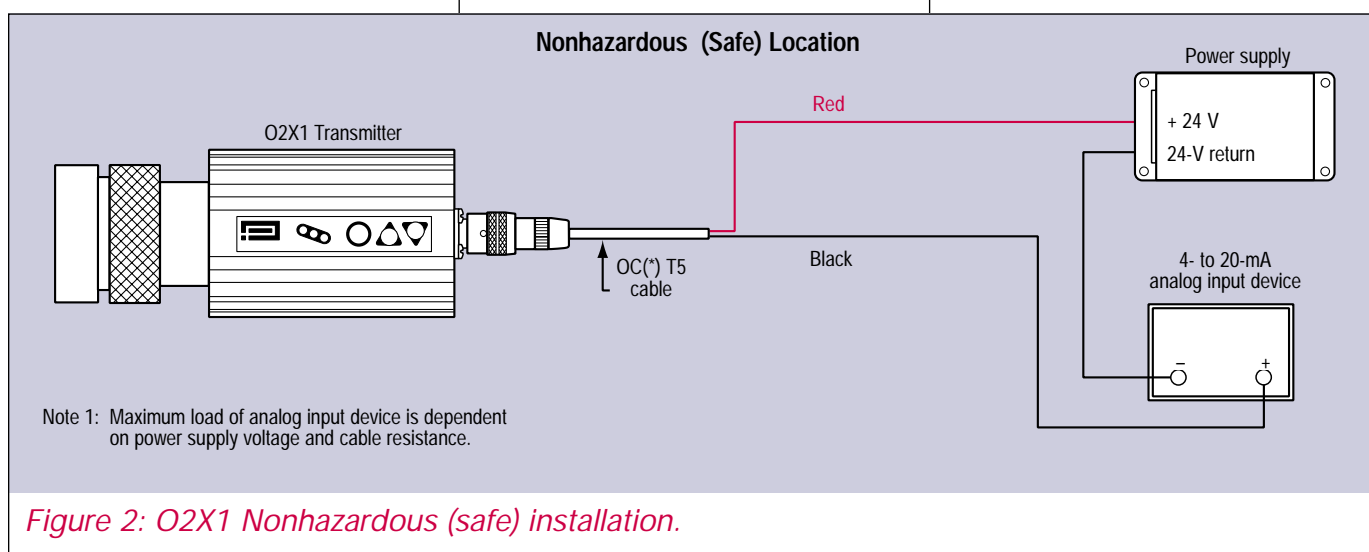
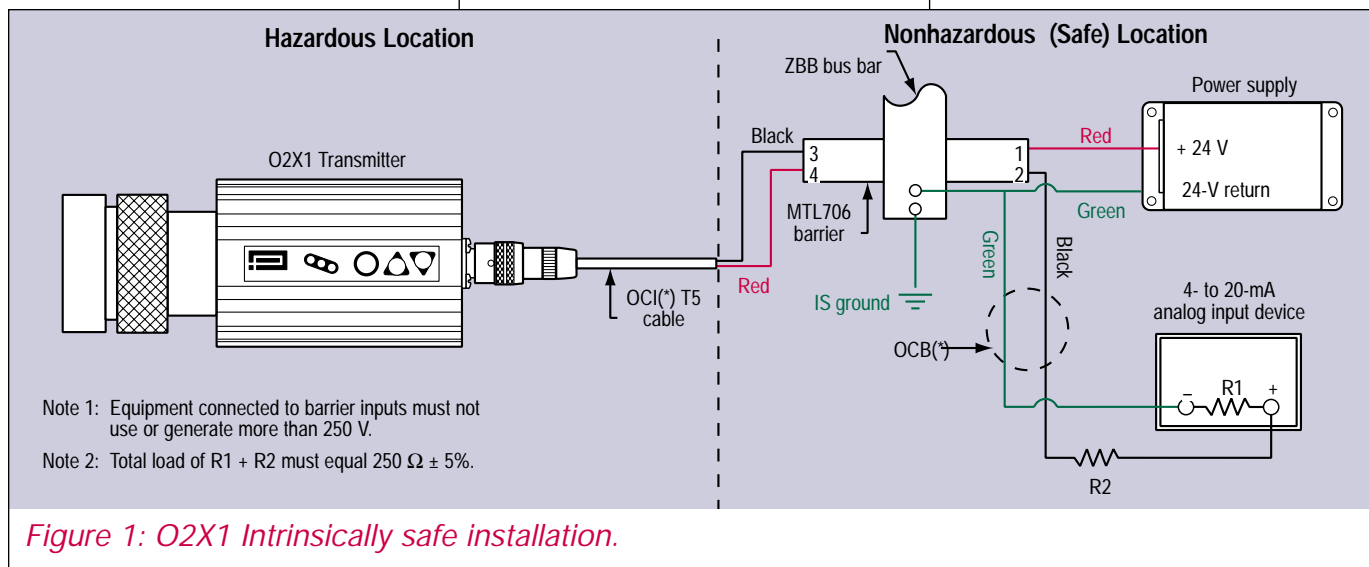
Gas	OX-1, ppm Cont.	OX-2, ppm Cont.	OX-3, % Cont. Int. [1]		OX-4, % Cont. Int.	
H ₂ S	< 5 ppm	< 10 ppm	0.0005%	0.01%	0.001%	0.1%
SO ₃	< 10 ppm	< 10 ppm	0.01%	0.1%	0.01%	0.1%
SO ₂	< 10 ppm	[3]	0.01%	0.1%	[3]	[3]
HCl	< 1,000 ppm	[3]	0.1%	1.0%	[3]	[3]
HCN	< 1,000 ppm	[3]	0.1%	1.0%	[3]	[3]
CO ₂	< 1,000 ppm	[3]	0.1%	20%	[3]	[3]
NO ₂	[2]	[2]	[2]	[2]	[2]	[2]
Cl ₂	[2]	[2]	[2]	[2]	[2]	[2]

Cont. = Continuous, Int. = Intermittent

[1] Recommended maximum exposure 30 minutes followed by flushing with ambient air for equal period.

[2] Minimal effect on sensor performance, but produces signal interference of 1:2 ratio.

[3] Minimal effect on sensor performance.



Specifications: Intrinsically Safe Installation.

Intrinsically safe installations require an MTL706 zener barrier.

Power requirements:

24 to 28 VDC at 50 mA.

Cable:

OCI(*) T5 in hazardous area:
2 conductor, twisted pair with connector, 22 AWG, 1100 ft maximum cable length.

OCB(*) in nonhazardous (safe) area:
3 conductor, 22 AWG.

Output:

Total load must equal 250 Ω ± 5% (see Figure 1).

Nonhazardous (Safe) Installation.

No zener barrier is used.

Process wetted materials:

316 SS, Viton O-ring and Teflon.

Power requirements:

9 to 28 VDC loop powered,
0.6 W maximum.

Cable:

OC(*) T5:
2 conductor, twisted pair with connector, 22 AWG, 0.04 Ω/ft.

Output:

Max. load (Ω) = [40 Ω × (PSV – 8)] – RC
where
PSV = power supply voltage in volts DC and
RC = cable resistance, 22 AWG cable has 0.04 Ω/ft

Example:

Given a 24-VDC power supply and a 1000-ft cable (22 AWG, 0.04 Ω/ft),
RC = 1000 ft × 0.04 Ω/ft = 40 Ω
Max. load = [40 × (24 – 8)] – 40
= [40 × 16] – 40
= 600 Ω

Field Programmable Measurement Ranges.

PPM sensors:

- 0 to 10 ppm_v O₂.
- 0 to 100 ppm_v O₂.
- 0 to 1000 ppm_v O₂.
- 0 to 10,000 ppm_v O₂.

Percent sensors:

- 0 to 1% O₂.
- 0 to 10% O₂.
- 0 to 25% O₂.

Accuracy:

- ± 1% of span at calibration point except
- ± 2% of span at the calibration point for the 0 to 10 ppm_v range.

Repeatability:

- ± 1% of span except ± 2% of span for the 0 to 10 ppm_v range.

Resolution:

- ± 0.1% of span.

Linearity:

- ± 2% of span.

Operating temperature:

- 0 to 45°C.

Ambient temperature effect:

- ± 3% of reading over operating temperature range.

Sample pressure:

- Vented to atmosphere during operation and calibration.

Atmospheric pressure effect:

- ± 0.13% of reading per mm Hg (directly proportional to absolute pressure).
- During calibration, pressure and flow must be kept constant.

Process connection:

- 1/8-in. NPT inlet and outlet.

Sample flow rate:

- 1.0 SCFH (500 cc/min) recommended.

Electrical Classification/Certification.

Intrinsically safe:

- NEC/CEC Classes I, II, III; Div. 1;
- Groups A, B, C, D, E, F, G;
- FM approval. J.I.2D6A6.AX (3610);
- CSA File LR 44204-19 (157-92).
- CENELEC EEx ia IIC T4 (T_{amb} = -20°C to +60°C); BASEEFA Cert. Nos. Ex 96D2442 and Ex 96D2444.
- CE European Union Compliance.

Order Information

Record selected option in blank indicated at bottom of form.

O2X1 Oxygen Transmitter

Sensor:

- 0 – None
- 1 – Standard ppm
- 2 – Acid ppm
- 3 – Standard %
- 4 – Acid %

Miscellaneous:

- 0 – None
- S – Special

O2X1 – — —
Use this number to order product.

Order Information

Record selected option in blank indicated at bottom of form.

OX Spare Oxygen Sensor

Sensor:

- 1 – Standard ppm
- 2 – Acid ppm
- 3 – Standard %
- 4 – Acid %

OX – —
Use this number to order product.

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