OXYGEN ANALYZERS

PROCESS CONTROL INSTRUMENTATION

920-035

APPLICATIONS

Oxygen transmitter for use in:

- Heat treating & bright annealing
- Process monitoring of gaseous monomers
- Pure gaseous hydrocarbon streams
- Inert welding gases
- Glove box leak detection
- Breathing air

FEATURES

- Intrinsically safe
- 2-wire, loop-powered 4- to 20-mA transmitter
- Proven galvanic fuel cell O_2 sensor technology
- Programmable ranges for ppm and percent oxygen
- Microprocessor-based, all-digital technology for reliable operation
- Continuous monitoring
- Low maintenance
- Economical and compact

O2X1

OXYGEN TRANSMITTER

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 O_2 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 long 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 316 SS package 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, and is certified by BASEEFA II 1 G EEx ia IIC T4 (Tamb = –20°C to +60°C).

GE Panametrics

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

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%

NONHAZARDOUS (SAFE) INSTALLATION

No zener barrier is used

Process Wetted Materials

- 316 SS process unit: 316 SS, Viton® O-ring and Teflon®
- Delrin process unit: Delrin®, Viton O-ring and Teflon
- Ambient air monitoring unit: Delrin, Viton O-ring and Teflon

Power Requirements

9 to 28 VDC loop powered, 0.6 W max

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 × 0.04Ω/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 O_2 (316 SS package only)
- 0 to 100 ppm_v O_2
- 0 to 1000 ppm_v O_2
- 0 to 10,000 ppm_v O_2

Percent sensors:
- 0 to 1% O_2
- 0 to 10% O_2
- 0 to 25% O_2

Accuracy

- ± 1% of span at calibration point
- ± 2% of span at the calibration point for the 0 to 10 ppm_v range (316 SS package only)

Repeatability

- ± 1% of span
- ± 2% of span for the 0 to 10 ppm_v range (316 SS package only)

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

OXYGEN SENSOR INTERFERENCE GASES

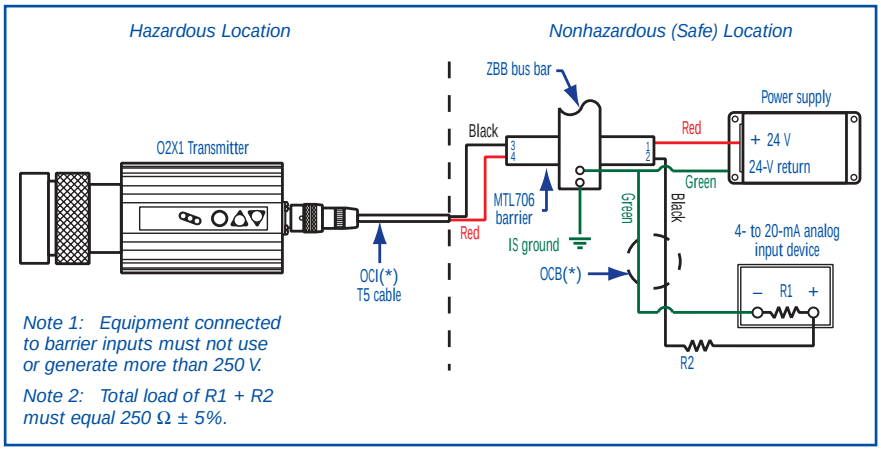
Gas	OX-1, ppm Cont.	OX-2, ppm Cont.	OX-3, % Cont.	OX-3, % Int. [1]	OX-4, % Cont.	OX-4, % Int.
H_2S	< 5 ppm	< 10 ppm	0.0005%	0.01%	0.001%	0.1%
SO_3	< 10 ppm	< 10 ppm	0.01%	0.1%	0.01%	0.1%
SO_2	< 10 ppm	[3]	0.01%	0.1%	[3]	[3]
HCI	< 1,000 ppm	[3]	0.1%	1.0%	[3]	[3]
HCN	< 1,000 ppm	[3]	0.1%	1.0%	[3]	[3]
CO_2	< 1,000 ppm	[3]	0.1%	20%	[3]	[3]
NO_2	[2]	[2]	[2]	[2]	[2]	[2]
CI_2	[2]	[2]	[2]	[2]	[2]	[2]

Cont. = Continuous, Int. = Intermittent

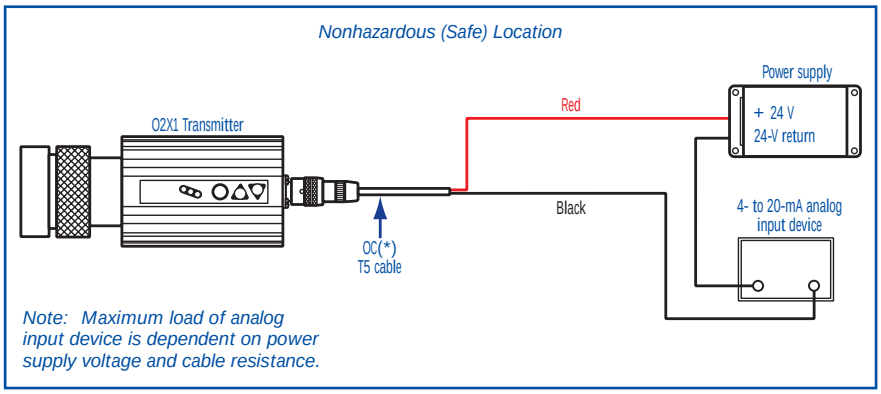
[1] Recommended maximum exposure 30 minutes followed by flushing with ambient air for equal period.

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

[3] Minimal effect on sensor performance.



O2X1 Intrinsically safe installation



O2X1 Nonhazardous (safe) installation

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

- 316 SS & Delrin process units: 1/8-in. NPT inlet and outlet
- Ambient air monitoring unit: None

Sample Flow Rate

1.0 SCFH (500 cc/min) recommended for process units

Electrical Classification/Certification

- Weatherproof, 316 SS & Delrin process packages only: NEMA 4X, IP66
- Intrinsically safe, 316 SS package only: Cl. I, II, III; Div. 1; Groups A,B,C,D,E,F,G; FM J.I.2D6A6.AX (3610); CSA LR 44204-19

  ⟨Ex⟩ II 1 G EEx ia IIC T4 (Tamb = –20°C to +60°C); BAS01ATEX1094X
  316 SS ATEX compliance with EN50104 from 0°C to 40°C

European Compliance

Complies with EMC Directive 89/336/EEC, 73/23/EEC Low Voltage Directive (Installation Category II, Pollution Degree 2), and Pressure Equipment Directive 97/23/EC for DN<25

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 %

Package:
- 0 – 316 SS process FM/CSA
- 1 – Delrin process
- 2 – Delrin ambient air monitoring
- 3 – 316 SS Process ATEX
- 9 – 316 SS general purpose

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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GEA-13632

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