

OXYGEN SENSOR

MODEL TOX-O₂

FEATURES

- 10 year sensing element life
- Low voltage circuits
- Linear 4 to 20 mA output
- Explosion Proof Housing
- Meets ASHRAE Std. 15-1994
- Two Form C relay outputs
- Power indicator
- Sensor failure indicator
- Loop current indicator
- Interfaces directly to DDC systems
- Relay output indicators

GENERAL DESCRIPTION:

The Models TOX-O₂ oxygen sensors are an electrochemical cell with extremely long sensor element life. The sensor element is the self-powered, diffusion limited, metal-air battery type. The rate at which atmosphere gases can get to the electrode through a diffusion barrier is dependent on the concentration of gases (O₂ in this case) in the atmosphere. A voltage is generated that is proportional to the rate of consumption of oxygen in the sensor cell.

Most electrochemical sensors use a very thin plastic membrane and have a short life. The TOXALERT oxygen sensor uses a heavy membrane which allows gas to diffuse into the sensor making it extremely robust and stable, plus it gives the element exceptionally long life expectancy, but still responds quickly to oxygen content changes.

The model TOX-O₂/4 oxygen sensor/controller is designed to monitor oxygen levels and to close “warning” contacts, when oxygen levels drop to 19.5%, for the operation of ventilation equipment. A second set of “alarm” contacts are provided to operate alarm(s) and /or signal building management systems (BMS), when oxygen levels drop to 18.5%. The warning and alarm setpoints are field adjustable.

The model TOX-O₂/1 oxygen sensor/transmitter is designed to monitor oxygen levels and has a linear 4 to 20 mA output signal. This signal may be interfaced directly to a TOXALERT control unit or any other standard BMS controller and provide actual percent oxygen concentration for control and/or display.



TOX-O₂/1

GUIDE SPECIFICATIONS

MODEL TOX-O₂/1 ANALOG SENSOR:

Provide an oxygen sensor(s) with a range of 0 to 25% and a linear 4 to 20 mA output signal over its range. The sensors output shall be designed to work into a minimum of a 500 OHM load. The sensor shall be housed in an industrial style explosion proof housing. The sensing element shall be electro chemical diffusion barrier type and be designed for ten (10) year element life. Electro chemical cells with a three year or less expected life are not acceptable. The sensor shall be 24 vdc powered and its 4 to 20 mA output shall be directly proportional to the percent of oxygen being detected. If the sensor should fail, it shall drive its output signal to zero indicating zero percent oxygen and an alarm condition.

The oxygen sensor shall have the following diagnostic light emitting diodes (LED's):

- 1) Power
- 2) Sensor failure
- 3) LOOP UP (LED varies in intensity indicating 4 to 20 mA loop current to controller).

Sensor shall have volt meter terminals on face of sensor to indicate percent oxygen being detected.

MODEL TOX-O₂/4 RELAY SENSOR:

Provide an oxygen sensor(s) with a range of 0 to 25%, have a 4 to 20 mA output signal and two adjustable output relays over its range. The sensor shall be housed in an industrial style explosion proof housing. The sensing element shall be electro chemical diffusion barrier type and be designed for ten (10) year element life. Electro chemical cells with a three year or less expected life are not acceptable. The sensor shall be 24 vdc powered. If the sensor should fail, it shall drive its output signal to zero indicating zero percent oxygen and energizing both output relays.

The oxygen sensor shall have the following diagnostic light emitting diodes (LED's):

- 1) Warning relay energized
- 2) Alarm relay energized
- 3) Power
- 4) Sensor failure

The warning relay and alarm relay shall be Form C contacts and the relay setpoints shall be field adjustable without calibration gas. Relay contacts shall be rated for 1 amp at 24 vdc.

Sensor shall have volt meter terminals on face of sensor to indicate percent oxygen being detected.

UNIT INDICATORS:

Refer to Figure 1.

The Tox-O₂ has five LED's (light emitting diodes) to assist in installation and system diagnostics.

1. Power:

Green LED indicates power to sensor.

2. Loop Current:

Green LED indicates that the 4 to 20 mA loop is flowing in output circuit. LED intensity varies with current flow.

3. Sensor Failure:

Red LED indicates the sensor has failed.

4. Warning Relay (K1):

Red LED indicates oxygen concentration is below relay setpoint and relay is energized.

5. Alarm Relay (K2):

Red LED indicates oxygen concentration is below relay setpoint and relay is energized.

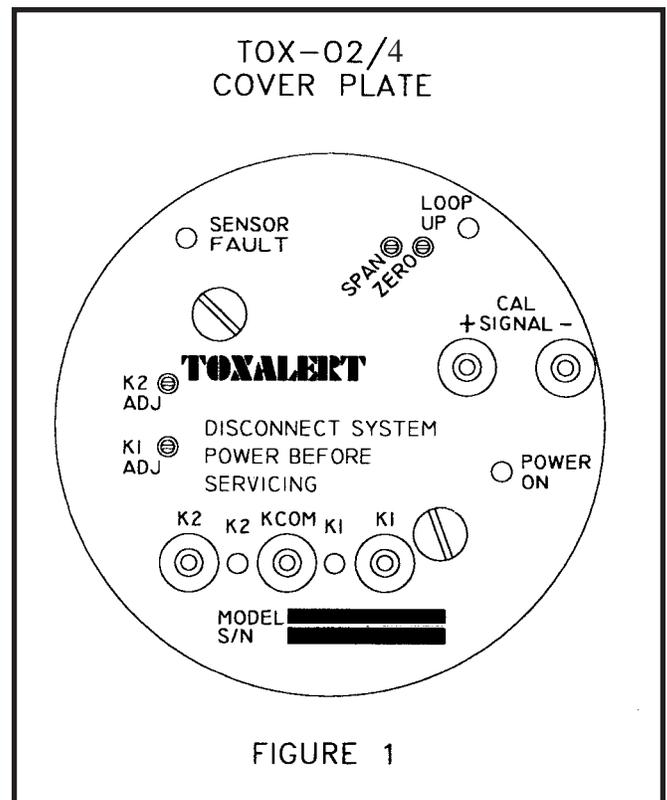


FIGURE 1

SPECIFICATIONS

Type: Electrochemical cell diffusion barrier oxygen sensor.

Range: 0-25% Oxygen

Response Time: 10 seconds to 90% of change

Sensing Element Life: 10 years in normal service

Accuracy: + / - .75% of Full Scale

Electrical Data:

Input voltage: 24 vdc nominal (8.5 to 26.4 vdc)

Input power: Less than one watt

Loop resistance: 600 ohms maximum

Input current: 25 mA

Wiring: 3 wire non-isolated

Unit Construction:

Housing: Division 1, Class 1, Group B, C & D

Physical: 7" H x 4-1/2" W x 3-3/4" D

Operating Temperature: 41°F to 104°F
(5°C to 40°C)

Storage Temperature: -4°F to 140°F
(-20°C to 60°C)

Relative Humidity: 0 to 95% non-condensing

Relay Output Indicator: Red LED when energized

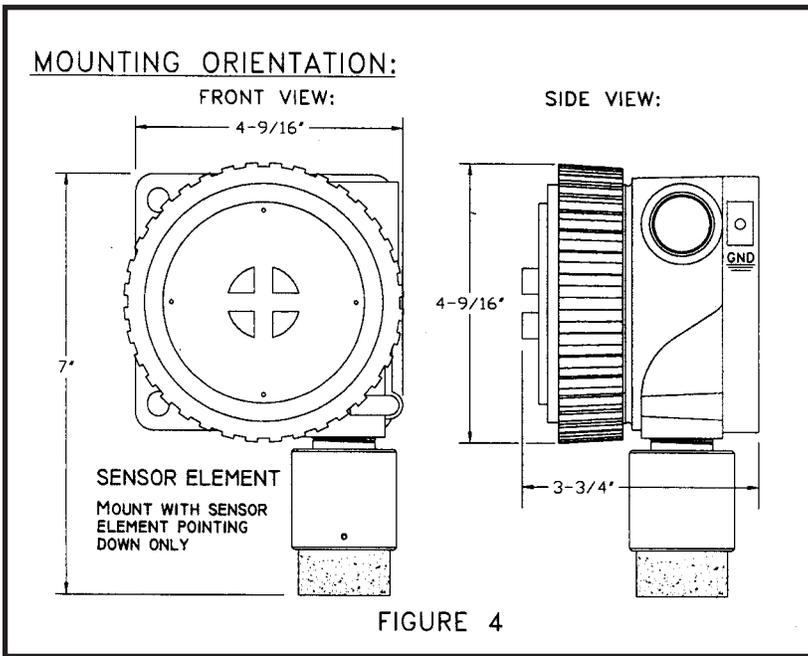
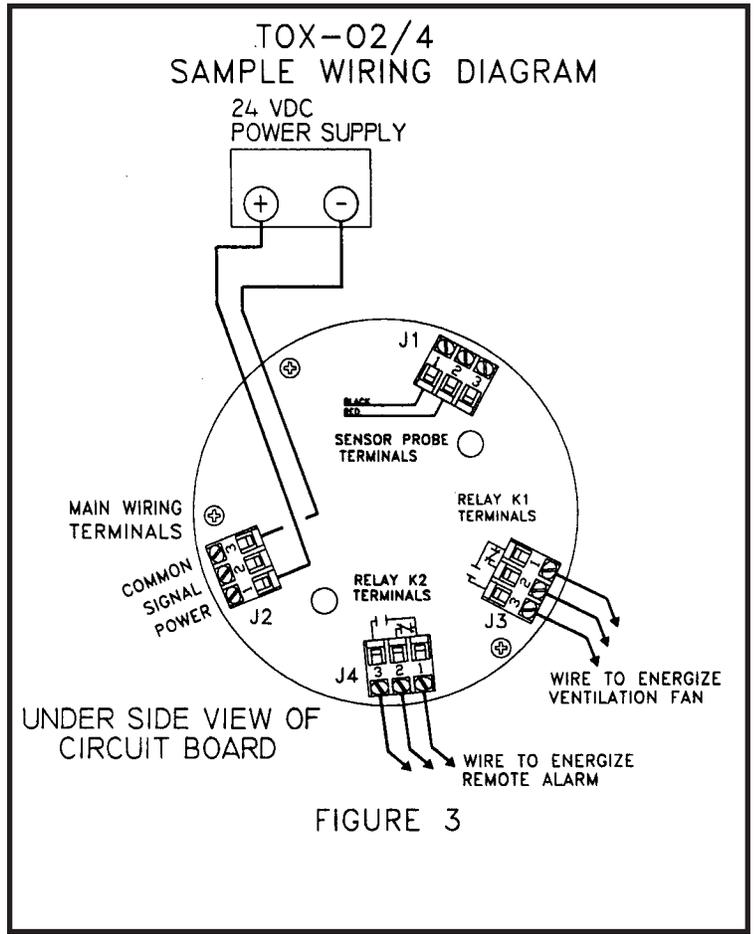
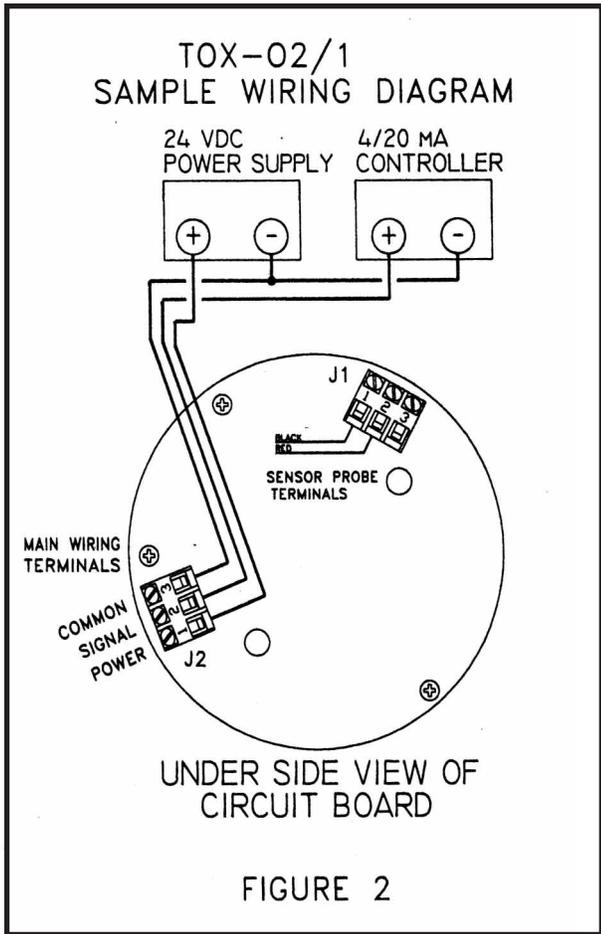
Output Signal:

Tox-O₂/1 - Linear 4 to 20 mA Sensor failure 2 mA or less

Tox-O₂/4 - Warning relay and alarm relay

Mounting style: Surface

Weight: 2 pounds



How to order (sensor part numbers)

Tox-O₂/X

(Replace "X" with one of the following)

1 = 4-20mA output

4 = 4-20mA & relays