OMD-625 Oxygen Analyzer

Instruction Manual

SOUTHLAND Sensing Ltd

4045 E. Guasti Rd. #203
Ontario, CA 91761 USA
Ph: 1-949-398-2879
Fax: 1-949-315-3622
Email: sales@sso2.com

Table of Contents

Part 1 Introduction

1.1 General Introduction
1.2 Principle of Operation - The Oxygen Sensor
1.3 OMD-625 Specifications
1.4 General Safety Installation
1.5 Location Installation Considerations
1.6 Safety Considerations

Part 2 Installation

2.1 Receiving Your New Oxygen Transmitter
2.2 Mounting The oxygen Analyzer
2.3 Electrical Connections
2.4 Gas Connections
2.5 Installing the Oxygen Sensor
2.6 Integral Sample System Flow Diagram

Part 3 Operation

3.1 Understanding the Controls and Their Operation
3.2 Manual Range Output Adjustment
3.3 Analog Output 4 - 20mA
3.4 Alarm Configuration

Part 4 Maintenance

4.1 Span Calibration, using Ambient Air
4.2 Span Calibration, using Certified Span Gas
4.3 Procedure for Replacing the Sensor
4.4 Troubleshooting

Part 5 Annexures

5.1 Spare Parts List
5.2 Warranty
5.3 Material Safety Data Sheets
5.4 Conformance Certificate

1.1 General Introduction

The Southland Sensing OMD-625 Oxygen Analyzer is a microprocessor based online unit designed for continuous measurements in a variety of applications and gas mixtures.

The analyzer was designed with the customer in mind keeping the operations simple, while still featuring a fast response and rugged design. Every effort has been made to use modern industrial components and materials which have resulted in an advanced design, excellent performance and an overall low cost of ownership.

Southland Sensing Ltd. appreciates your business and recommends to read through the complete manual to be able to get the full experience from your new oxygen transmitter.

1.2 Principle of Operation - The Oxygen Sensor

The precision electrochemical oxygen sensor used in the OMD-625 is designed and manufactured by Southland Sensing Ltd under a strict quality procedure.

To understand how the oxygen transmitter functions, it is important to understand a little bit of the sensor characteristics.

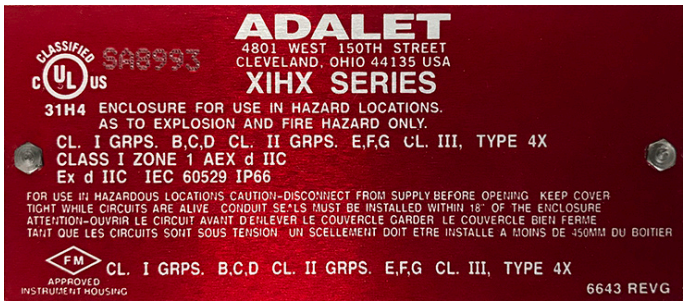
The active components in the precision electrochemical oxygen sensor is the anode, cathode and aqueous electrolyte which is all housed in a cell body. The oxygen molecules in the application pass through the front sensing membrane. A chemical reaction occurs and a raw electrical current is generated.

This electrical current is proportional to the amount of oxygen in the application. The analyzer then processes this raw electronic signal, compensates for temperature and barometric pressure variations and converts the data into a parts-per-million or percent oxygen measurement value.

Once the data is displayed in real time on the full backlite display, the user can automate the control of their process using the standard 4 - 20mA or 1 - 5VDC analog output signal which can be run to a PLC or other type of DCS System.

Precision Electrochemical Oxygen Sensor

OMD-625 PPM Oxygen Analyzer



Designed for the Natural Gas Industry

Class 1, Div 1 Groups B,C,D

Full Scale Range as low as 0 - 1ppm

Precision Fuel Cell Oxygen Sensor Technology

Large Backlight Display w/ Auto-Range

Measure Oxygen from 0.01ppm to 25%

Intuitive User Friendly Interface

Cost Effective and Low Maintenance

2 Fully Configurable Alarm Relay Contacts

Optional Configurations:

- Customizeable Measurement Ranges
- Sample Conditioning Systems
- Bi-Directional RS485 Modbus (Pending)
- Heated Enclosure

Applications:

- Natural Gas Extraction & Pipelines
- Natural Gas Processing
- Acid (CO2) Gas Streams
- Inert, Hydrocarbon, Hydrogen Processing
- And Many Other Industrial Applications

Specifications:

Accuracy:	< +/-1% Full Scale Range* < +/- 5% (0 - 1ppm range)*
Alarms:	2 Configurable Relay Contacts
Analyzer Range:	0 - 1/10/100/1000ppm/25%
Approval:	CE (Pending) CSA International (Pending)
Area Classification:	Class 1, Div 1, Groups B,C,D
Dimensions:	15.25" x 12.5" x 5.25"
Flow:	0.1 - 5.0 SCFH
Gas Connections:	1/4" Swagelok Tube Fittings
Output:	Isolated 4 - 20mA
Power:	12 - 24 VDC
Pressure	0.1 - 50 PSIG Inlet, vent to atm
Response Time:	T90 in 10 Seconds
Sample System:	Optional
Sensor:	Precision Fuel Cell
Temperature:	-10 to 50 deg C
Warranty Sensor:	12 Months
Warranty Electronics:	12 Months
Weight:	18.5 lbs

*Accuracy at constant conditions

"Inquiry for Application Expertise"

SOUTHLAND Sensing Ltd

Phone: 1-949-398-2879; Fax: 1-949-315-3622
E-mail: sales@sso2.com; Web: www.sso2.com
4045 E. Guasti Rd. #203 Ontario, CA 91761 USA

OMD-625 Oxygen Analyzer Product Specifications

Oxygen Analyzer:

The model OMD-625 oxygen analyzer combines a rugged design with SSO2's precision oxygen sensors. The result is a highly reliable and cost effective compact design with easy-to-use user interface designed specifically for the Natural Gas Industry.

The oxygen analyzer is designed to meet CSA / UL standards for Class 1, Div 1, Groups B,C,D installation - certification is pending at this time.

The oxygen analyzer is isolated both on the power input and analog output. This eliminates most electronic gremlins seen with existing competitive equipment in the field.

Standard ranges include 0 - 1ppm, 0 - 10ppm, 0 - 100ppm, 0 - 1000ppm, 0 - 25%.

Gas connections are made with 1/4" Swagelok tube fittings.

Power Requirements:

Input Power:	12 - 24 V DC
Current Draw:	100 mA

Oxygen Sensor Technology:

The oxygen sensor used in the OMD-625 is based on the galvanic electrochemical fuel cell principal. All oxygen sensors are manufactured in house by Southland Sensing Ltd. under a strict quality program.

The standard cells are unaffected by other background gases such as H2, He or Hydrocarbons. The acidic cells work well when acid gases such as CO2 or Natural Gas are present.

The sensors are self-contained and minimal maintenance is required - no need to clean electrodes or add electrolyte.

The SSO2 precision oxygen sensors offer excellent performance, accuracy and stability while maximizing the expected life.

Oxygen Sensors:

TO2-133 PPM Oxygen Sensor: Trace Analysis, Standard
TO2-233 PPM Oxygen Sensor: Trace Analysis, Acidic

Oxygen sensors should be periodically calibrated. Factory recommendation is every 2 - 3 months or as the application dictates. Sensors offer excellent linearity with an air calibration, or calibrate to a certified span gas to maximize accuracy.

Order Information:

Record Part Number with selected options in Blank Indicated Area of Form

Model Number:
OMD-625 Oxygen Analyzer

Selected Range & Sensor:
1 Trace Analysis Standard (TO2-133): 0 - 1ppm, 0 - 10ppm, 0 - 100ppm, 0 - 1000ppm, 0 - 25%
2 Trace Analysis Acidic (TO2-233): 0 - 1ppm, 0 - 10ppm, 0 - 100ppm, 0 - 1000ppm, 0 - 25%

Electronics Package:
2 12 - 12V DC Input Power

Gas Connections:
4 1/4" Swagelok Tube Fittings

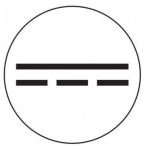
OMD-625 - _____ - _____ - _____ Use This Part Number When Ordering

SOUTHLAND Sensing Ltd

Phone: 1-949-398-2879; Fax: 1-949-315-3622
E-mail: sales@sso2.com; Web: www.sso2.com
4045 E. Guasti Rd. #203 Ontario, CA 91761 USA

1.4 General Safety & Installation

This section summarizes the precautions applicable to the OMD-625 Oxygen Analyzer. Additional precautions specific to this analyzer are contained in the following sections of the manual. To operate the analyzer safely and to obtain the best performance, follow the basic guidelines outlined in this owner's manual.



CAUTION: This symbol is used throughout the owner's manual to Caution and alert the user that this device is operated on Direct Current Voltage (VDC)

CAUTION: This symbol is used throughout the owner's manual to Caution and alert the user to recommend safety and / or operating guidelines.

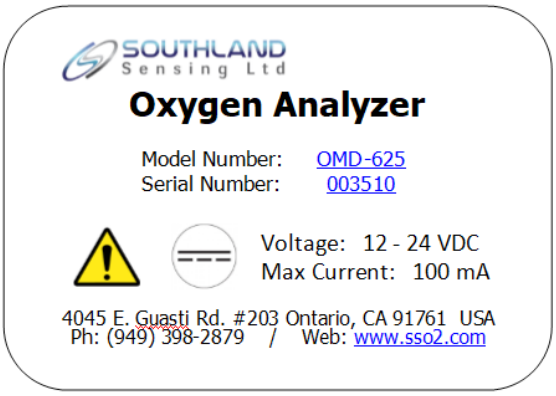
WARNING: This symbol is used throughout the owner's manual to warn and alert the user of the presence of electrostatic discharge.

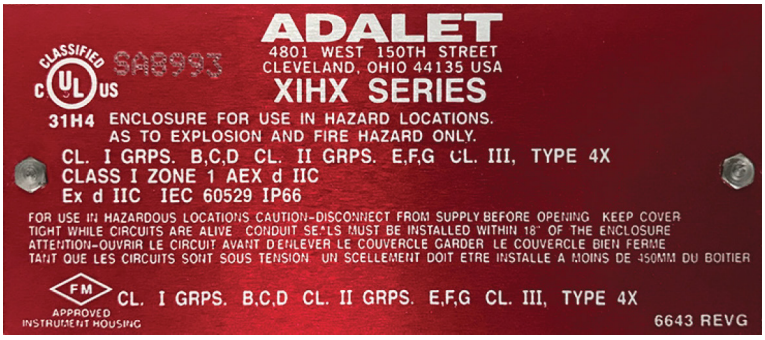
READ INSTRUCTIONS: Before operating the oxygen transmitter, read the instructions.

RETAIN INSTRUCTIONS: The safety precautions and operating instructions found in the owner's manual should be retained for future reference.

FOLLOW INSTRUCTIONS: Observe all precautions and operating instructions. Failure to do so may result in personal injury or damage to the transmitter.

OXYGEN ANALYZER LABEL:





1.5 Location Installation Considerations

The Southland Sensing OMD-625 Oxygen Analyzer is designed to be mounted on a wall or on a pipe in a general purpose, Class 1 Division 1 or Class 1 Division 2 Group B, C, D area. When installed outdoors in cold areas an optional heater is recommended as well as a heavy duty enclosure. Consider also giving the analyzer a sun shield if it is going to be mounted in the direct sunlight.

Seals are required on the power and signal condulet entries, whether the area classification is Division 1 or Division 2. Reference your local electrical authority for the proper installation.

The analyzer is EMI / RFI protected, however it is good practice not to mount it too close to sources of electrical interference such as large transformers, motor start contactors, relays, large pumps, etc. Also, avoid subjecting the analyzer to significant vibration.

The analyzer has a local display, mount the unit at a suitable eye level for easy reading. Gas connections are located on the bottom of the analyzer, make sure there is room to hook up your gas lines.

1.6 Safety Considerations

The oxygen analyzer is designed for installation into either a general purpose area, or a Class 1 Division 1 or a Class 1 Division 2 Group B, C, D area, but it is also designed so that a hazardous gas may be introduced into the main sensing compartment. This gas may be of any group B, C or D.

The analyzer consists of two enclosures mounted on a single back panel. The small round enclosure is explosion-proof and contains the electrical connections for the user - such as power, alarms and analog output. This explosion-proof enclosure also contains the power supply and safety components for the other enclosure. The larger square enclosure contains the analytical circuitry , the oxygen sensor and the oxygen sensor housing. This circuitry is designed for intrinsic safety requirements for Class 1 Division 1 Group B, C, D.

When installing a Class 1 Division 1 or Class 1 Division 2 device, please follow your local electrical code should the area need to be declassified prior to installation.

2.1 Receiving your New Oxygen Analyzer

As soon as you receive your new Oxygen Analyzer, carefully unpack the unit and accessories and inspect the electronics module, sensor housing for damage and also verify the oxygen sensor is present.

CAUTION: Do not open the oxygen sensor packaging at this time. It is packed in a Nitrogen purged bag and will be damaged if left exposed to ambient air for a prolonged period of time. It is recommended that you read through the instruction manual installation and operation sections before attempting to open the bag the oxygen sensor is packed in. For questions, please contact the factory.

If damage to any portion of the new analyzer is present, stop and report damage to the shipping company as well as the factory.

The analyzer is shipped with all materials needed to install and prepare the system for operation. In some instances, added sample system components are necessary to condition the gas sample before entering the sensor housing. Southland Sensing offers free application consultation, and we encourage you to take advantage of our engineers and their expertise.

If installing into a Class 1 Div 1 or Class 1 Div 2 area, additional seals are needed for the power and signal condulet. These will need to be sourced locally and should meet your local electrical authority.

It is also important to be mindful of EMI / RFI noise interference. Protection from EMI / RFI noise is important for accurate readings.

2.2 Mounting the Oxygen Analyzer

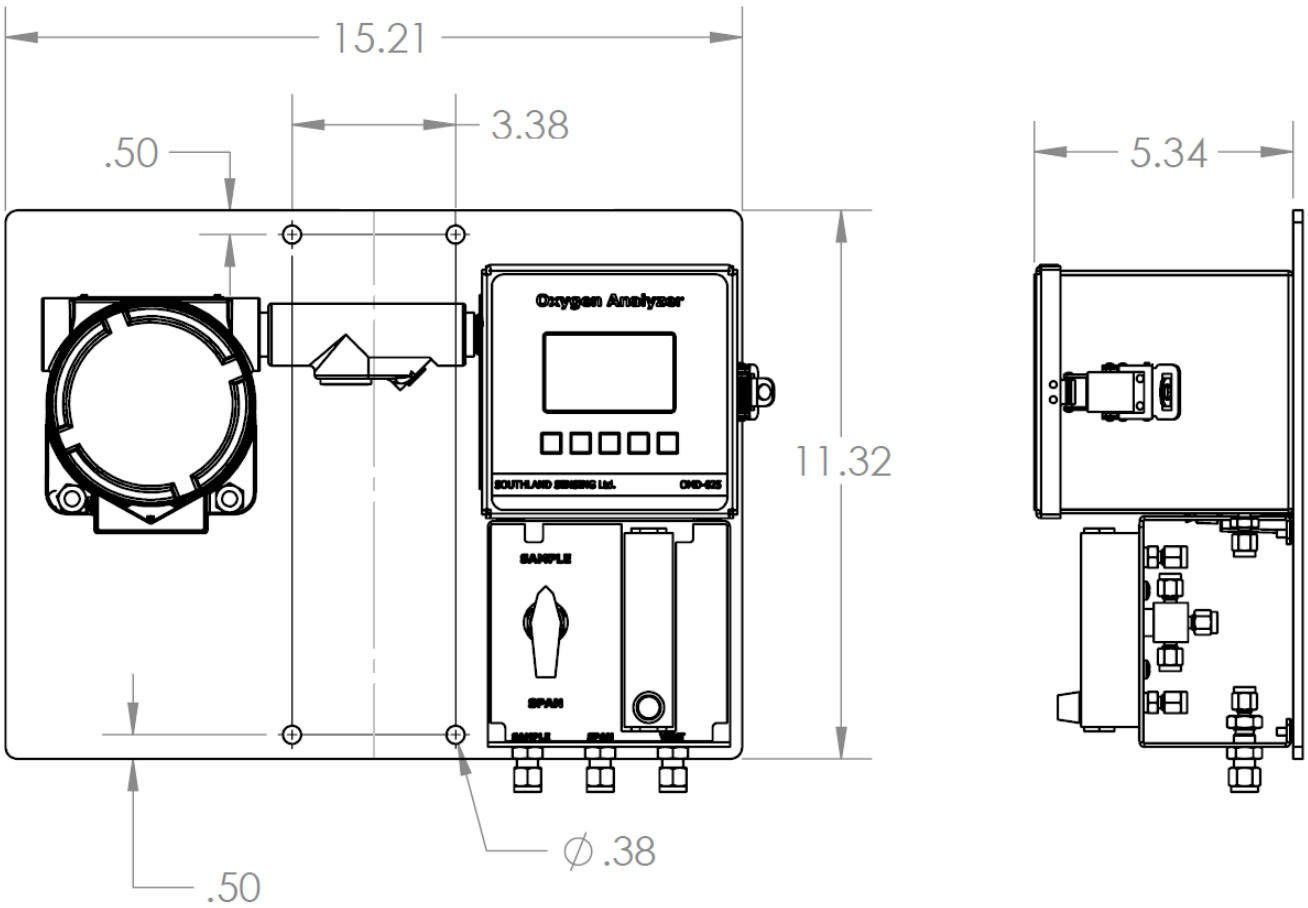
The OMD-625 is designed to be mounted on a wall or around a pipe. When installing outdoors in an extreme environment, consider an enclosure and heater if necessary. Consult the factory for recommendations.

Refer to part 3 operation section of this instruction manual for more information on how to operate the controls of this oxygen analyzer

Refer to part 4 maintenance section for an overview on how to calibrate the device using a certified span gas or ambient air.

A precision electrochemical oxygen sensor is included as a separate item and must be installed prior to instrument use.

CAUTION: Do not open the N2 filled oxygen sensor bag until you have thoroughly read the instruction manual and have made all gas and electrical connections. Please refer to section 2.4



2.3 Electrical Connections

For the OMD-625 Oxygen Analyzer, power, alarms and analog output is housed in the round explosion proof enclosure on the left side of the panel. To access the circuit board, first determine if your area needs to be declassified and second remove the round enclosure top. Once removed you will have access to the J1 and J2 connectors which are the Power (J1) and Alarms / Analog output (J2).

Incoming power/signal output connections are made to the orange terminal block located on the right side of the connectors, labeled J1

Do no supply voltage more than specified in this manual and noted on the analyzer label inside of the unit.

Shielded cable is recommended when connecting power and signal output.

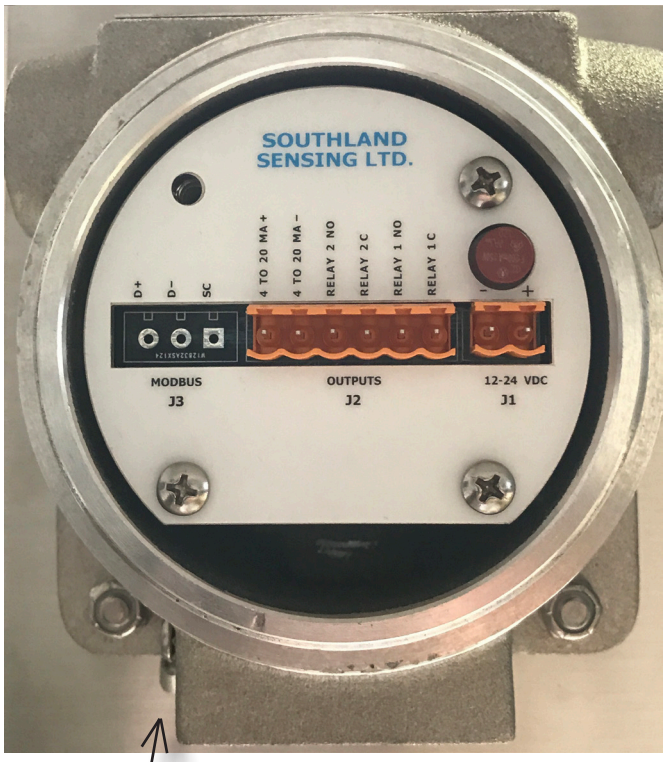
Proper seals area recommended for the condulet when bringing power into or signal out of the explosion-proof portion of the analyzer.

Voltage: 12 - 24 VDC (Direct Current)
Max Current: 100mA

Avoid electrostatic discharge

If the analyzer is being installed into a class 1 division 1 or class 1 division 2 area, the area will most likely need to be declassified prior to removing the round cap on the explo-sion proof portion of the analyzer. Follow your local electrical authority for proper procedure.

It is also recommended to make sure you have the proper seals for your condulet to meet your required area classification. Check with your local electrical authority.



Analyzer ground terminal must be connected to a ground.

2.4 Gas Connections

Gas Connections are made via 1/4" Swagelok Tube Fittings. The gas connections are located below the sample system on the bottom right. Sample Connection is designed for your process gas. Span connection is designed if you are using a certified bottle of calibration gas (optional). Vent is the outlet, typically designed to vent to atmosphere, a flare stack or per your local regulations.

2.5 Installing the Oxygen Sensor in the Flow Through Sensor Housing

CAUTION: Prior to installing the oxygen sensor. Read section 4.1 on performing a span calibration.

The OMD-625 can accept either a TO2-133 or TO2-233 (CO2 Applications - Natural Gas) oxygen sensor for trace oxygen analysis. For help selecting a sensor, contact your local sales rep or the factory.

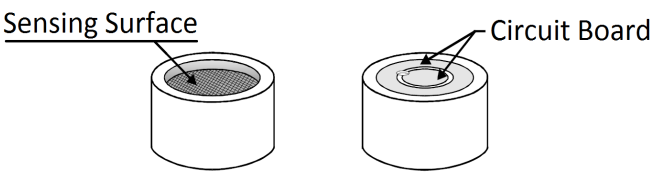
Prior to installing the sensor, it is important to make sure that the analyzer gas lines are hooked up and the unit is ready to purge with a zero or process gas. Connect the zero gas line and set your flow between 0.25 - 2.0 SCFH.

To Install the Sensor:

- Open up the square enclosure which will give you access to the sensor housing.
- Remove the cell holder cap by unscrewing the stainless steel collar.
- Lift up on the top of the sensor housing and set to the side.
- Inspect O'ring for cracking, replace if necessary. Always lube your Orings!
- Remove the sensor from its box. With scissors, open nitrogen purged packaging and remove the sensor.
- Visually inspect sensor for damage, if damaged notify the factory immediately.
- Remove the shorting tab across the back of the sensor circuit board (Copper Tape).
- Place the sensor inside the housing with the metal screen mesh facing down and the circuit board contacts facing up.
- Return upper portion of the sensor housing to the stainless steel bottom. Tighten collar. Hand tight is acceptable to create an airtight seal.
- Immediately start purge of zero gas.
- If the analyzer has not been calibrating, refer to section 4.1 for more information.

** Sensor should be exposed to ambient air for no more than 2 minutes. Extended periods of exposure can damage the sensor.

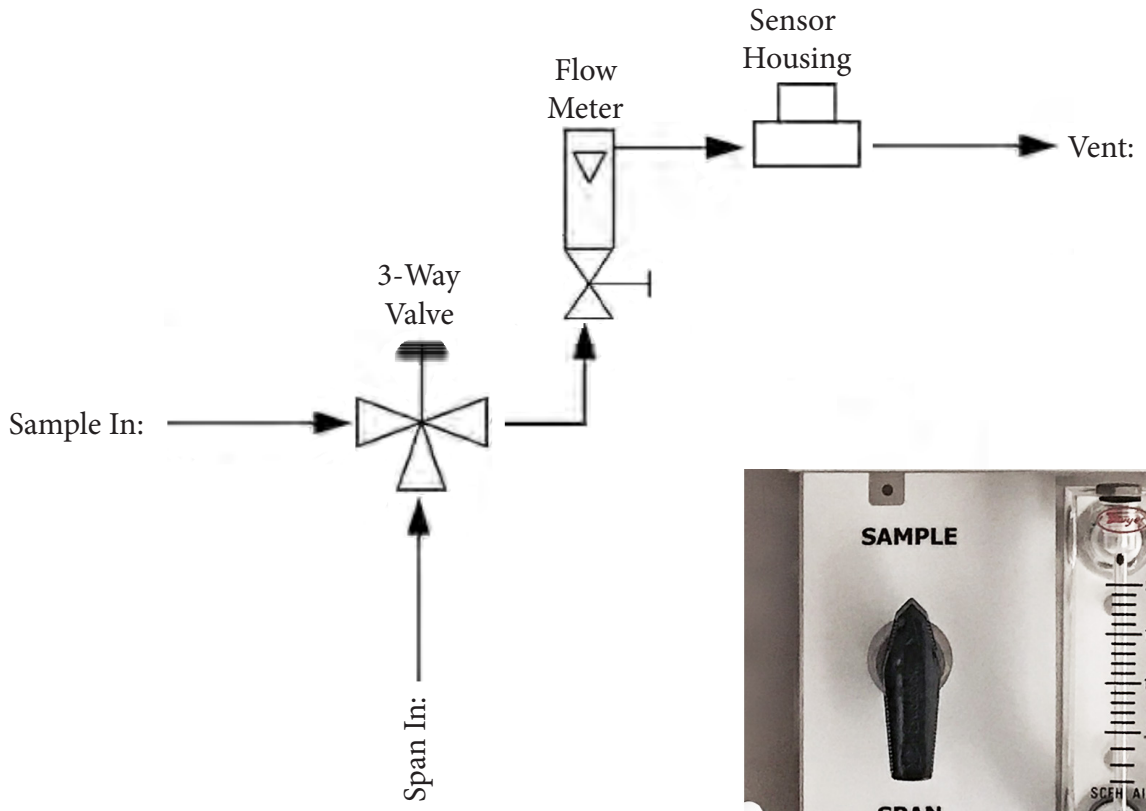
Oxygen Sensor Front and Rear View



2.6 Integral Sample System Flow Diagram

Southland Sensing Ltd. strives to select the highest quality sample system components in the market. All gas connections are made via Swagelok branded compression tube fittings. Our valves are also sourced from Swagelok which again is one of the highest quality needle valve / bypass valve on the market. Our flow indicators / flow meters are from Dwyer, an industry recognized leader in flow control When dealing with critical applications such as petrochemical processing and natural gas extraction, we want to make sure we can deliver a high quality sample system and we do so by partnering with some of the best brands in the market.

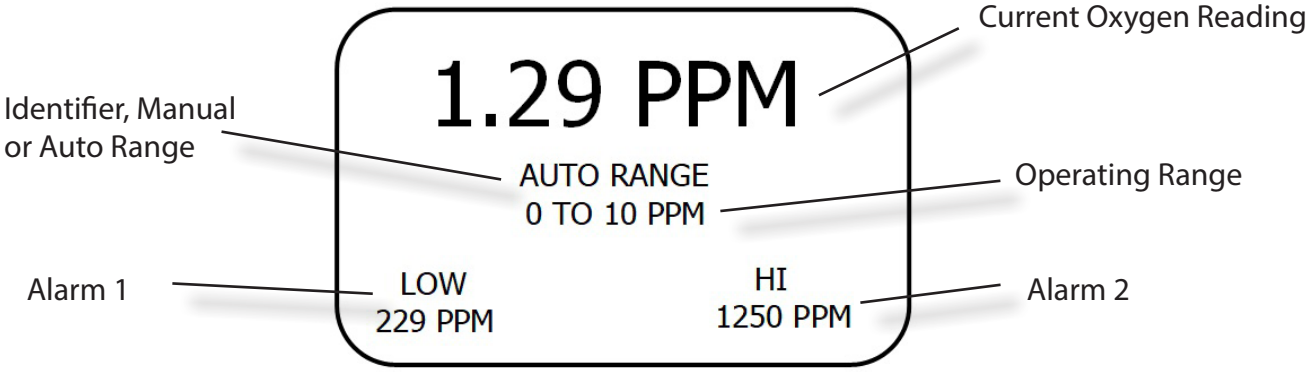
Along with our standard sample system as shown below, we can also custom design sample systems to meet unique applications including the addition of Moisture Filters, Pressure Regulators, H2S Scrubbers. For more information on a custom solution for your application, please contact your local distributor or the factory.



3.1 Understanding the Controls and their Operation

The OMD-625 Oxygen Analyzer is a feature packed unit with an easy to use menu interface. The key attributes within the menu are the ability to select a measurement range, both manually or set it to the auto-range mode. To calibrate the unit with a known gas, also referred to as a SPAN Calibration or SPAN CAL., to perform a zero calibration (If Necessary, most applications it is not required) and to set the alarm relays and their functionality.

All features are programmable / selectable through the MENU botton. The UP / DOWN arrows will allow you to select your setpoints and the enter button saves the data. If you want to cancel your selection, or return to the previous screen the escape key ESC will allow you to do this. Once the unit starts up, the following HOME Screen will appear:



3.2 Measurement Range Overview

The OMD-625 Oxygen Analyzer allows the user to field select 5 available ranges - custom ranges are available upon request. These ranges can be selected in manual mode meaning they are locked into that range by the user - which locks in the analog output, or they can be set to auto-range so the analyzer will adjust to give you the best full scale resolution.

One feature to highlight when using the Manual-Range mode, while selecting the Manual Range, this is locking the 4 - 20mA output to a single range. The display will continue to operate in auto-range mode giving the user the full spectrum of analysis ranges. Other manufactures lock the display as well, the problem is if you over-range and the display is locked, you have no idea what your O2 value is. With the OMD-625, it answers this issue with a display that auto-ranges and the ability to manually lock the analog outputs.

To select Auto-Range or Manual-Range Mode, From the HOME screen, press the MENU key and the display will indicate:

MAIN MENU

AUTO RANGE
MANUAL RANGE
SPAN CAL
ZERO CAL
ALARM 1
ALARM 2

Use the UP / DOWN keys to move the cursor to allow the user select AUTO-RANGE which will allow the unit to cycle through all five ranges or MANUAL RANGE which will allow the user to select a key range.

Decide which option will work best for your application. Move the cursor button over the selection and press the ENTER key. If you have selected the AUTO RANGE option, it will blink for a second indicating this was selected. If you selected the MANUAL RANGE option, the following screen will be brought up:

MANUAL RANGE

0 — 25 %
0 — 1000 PPM
0 — 100 PPM
0 — 10 PPM
0 — 1 PPM

Ranges: 0 - 1ppm, 0 - 10ppm, 0 - 100ppm, 0 - 1000ppm and 0 - 25%

Use the UP / DOWN keys and bring the * beside the range to be selected and press the ENTER key. The selected range will blink for a second indicating the range has been selected.

Press the ESC key to move back to the previous screen.

3.3 Analog Output 4 - 20mA

** Caution: Integral 4 - 20mA converters are internally powered and do not require external power. DO NOT supply any voltage across these terminals as the 4 - 20mA output will be damaged. It is also important to assure proper grounding of the external recording device such as a PLC, DCS prior to connecting the 4 - 20mA.

The OMD-625 uses an Isolated 4 - 20mA analog output.

When connecting the 4 - 20mA output, refer to the circuit board pinout in section 2.3

To verify the signal output of the 4 - 20mA circuit is working properly, connect an ammeter across the (+) and (-) Pins. With no oxygen sensor connector, it should read approximately 4mA. If a sensor is installed you can verify the signal matches with the following formula:

Signal Output (mA) = [(Reading / Full Scale Range) x 16] + 4

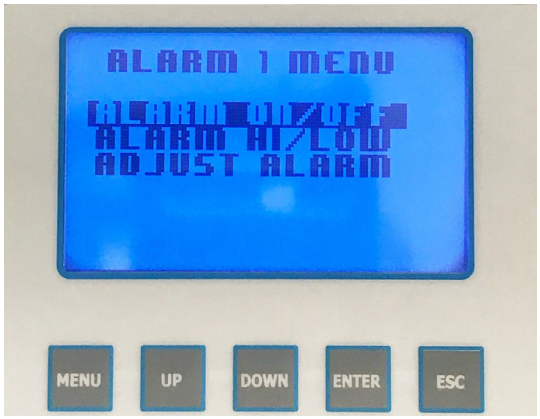
For example, if we are reading 500ppm on the 1000 ppm range:
Signal Output (mA) = [(500/1000) x 16] + 4

3.4 Alarm Configuration

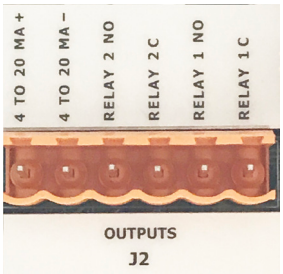
The OMD-625 is equipped with two programmable alarm relays, labeled as ALARM 1 and ALARM 2 in the menu. The two alarms set points are user adjustable and can be set either as Hi or Low, and can also be disabled through the menu.

To set the Alarm as on/off, Alarm Hi or Low simply select the Menu button on the overlay and scroll down to the feature you want to change. Hit the enter button and use the up / down arrows to make your next selection until the alarm is configured how you want it.

To set the alarm value; enter the menu and select adjust alarm. Use the Up / Down arrows until your set point is displayed. If the display is showing Percent values (%) simply use the Down button until the drop into the PPM Values.



To wire the alarms, open the Explosion Proof enclosure (Declassifing the area if necessary) and look at pin J2. Alarm Relay 1 and Alarm Relay 2 are labeled as no (normally open) and c (closed)



4.1 Span Calibration using Ambient Air

Calibration involves using a known span gas to match and adjust the oxygen sensor / analyzer combo to a known value. This can be as simple as using ambient air that tends to be a constant 20.9% which is what we will focus on for section 4.1. For calibrating with a certified SPAN Gas, please proceed to section 4.2. For a decision on which type of calibration is good for your process consult the factory for a recommendation.

Calibration using Ambient Air:

If using ambient air to calibrate the sensor, it is recommended to read through the calibration procedure prior to performing an air calibration to make sure all instructions are understood. Consult the factory if any questions arise.

MAIN MENU

AUTO RANGE
MANUAL RANGE
SPAN CAL
ZERO CAL
ALARM 1
ALARM 2

If the sensor is already installed in the sensor housing, you will need to connect the gas sample line as noted in section 2.4 or expose the sensor to ambient air which is typically 20.9%. With the flow through sensor housing, you can open up the housing and with two fingers, hold the sensor to the top portion of the housing, making sure the sensor contacts are firmly touching the gold pogo pins on the housing.

Let the reading stabilize for about 30 - 45 seconds and then proceed to the following steps in the OMD-625 menu:

SPAN CALIBRATION: To calibrate the transmitter, press MENU key Use UP/DOWN keys to bring cursor beside the option SPAN CALIBRATION and press the ENTER key.

20.5%

UP - INCREASE
DOWN - DECREASE
ENTER TO CAL
ESC TO EXIT

Use the UP / DOWN key until the reading on the display matches the value of your SPAN Gas. For example if your SPAN gas is 20.9% adjust the display UP or DOWN until it reads 20.9%.

Once ENTER has been pressed, the display will show “PASSED” or “FAILED”. If passed, promptly put the sensor in a zero or low oxygen gas. This will help extend the life of the sensor and speed of response. If failed, repeat calibration steps or consult the factory.

Trace Oxygen Sensor Caution: The sensor should be exposed to ambient air for less than 2 minutes. This will help speed of response, sensor life and low end sensitivity.

4.2 Span Calibration using a Certified Span Gas

Calibration involves using a known span gas to match and adjust the oxygen sensor / analyzer combo to a known value. This can be as simple as using ambient air that tends to be a constant 20.9% or a bottle of certified span gas from your local air separation company. For this section, we will focus on using a certified span gas from your local air separation company. When using a certified bottle, it is recommended to get a span gas equal to 90% of the range you want to use. If you are measuring in the 0 - 1000ppm range, a 900 ppm N2 / balance O2 would be idea.

For a decision on which type of calibration is good for your process, consult the factory for a recommendation.

Calibration using Certified Span Gas:

It is recommended to read through the calibration prior to performing an air calibration to ensure all instructions are understood. Consult the factory if any questions arise.

Note: For a new trace oxygen sensor (TO2-133 or TO2-233), purging with a zero gas for 4 - 6 hours will help the low end stability and response. This is not necessary on a percent or purity sensor.

Connect the gas sample line and set the pressure / flow per section 2.4 of the users manual.

Once the gas is flowing, let the reading stabilize for about 2 - 5 minutes and then proceed (Consider longer if sensor is still trending).

SPAN CALIBRATION: To calibrate the indicator, press MENU key Use UP/DOWN keys to bring cursor beside the option SPAN CALIBRATION and press the ENTER key.

MAIN MENU

AUTO RANGE
MANUAL RANGE
SPAN CAL
ZERO CAL
ALARM 1
ALARM 2

Use the UP / DOWN key until the reading on the display matches the value of your SPAN Gas. For example if your SPAN gas is 80.2ppm adjust the display UP or DOWN until it reads 80.2ppm.

20.5%

UP - INCREASE
DOWN - DECREASE
ENTER TO CAL
ESC TO EXIT

Once ENTER has been pressed, the display will show “PASSED” or “FAILED”. If passed, promptly put the sensor in a zero or low oxygen gas. This will help extend the life of the sensor and speed of response. If failed, repeat calibration steps or consult the factory.

Trace Oxygen Sensor Caution: The sensor should be exposed to ambient air for less than 2 minutes. This will help speed of response, sensor life and low end sensitivity.

4.3 Procedure for Replacing the Oxygen Sensor

Oxygen Sensor Replacement:

The characteristics of a precision electrochemical fuel cell are similar to those of a battery. They both provide an output that is nearly constant throughout their useful life and simply fall of sharply towards zero at the end.

If the process sample that is being analyzed is in the low range (0 - 10ppm) of oxygen concentration, cell failure will be indicated by the inability to properly calibrate the analyzer. The user will also find that very little adjustment of the span calibration feature will be necessary to keep the analyzer in calibration during the sensors useful life. If a large adjustment is needed to calibrate the unit, or calibration cannot be reached, the sensor should immediately be replaced.

** Note, make sure to read section 2.5 “Installing the Oxygen Sensor” before replacing the sensor.

No tools are required to replace the sensor. Simply unscrew (Counter-Clockwise) the collar (flow through sensor housing). Once free, open the top portion of the sensor housing (electronics module) exposing the old oxygen sensor. Remove the old oxygen sensor, disposing like you would a lead-acid battery in accordance with your local regulations.

Remove the new sensor from its package and remove the shorting strips. Place the sensor screen side down in the sensor housing with the copper circuit board pointed up. Proceed to re-connect the collar (H3 flow through sensor housing).

After the sensor has been replaced, proceed to the Span Calibration section and purge with inert gas.

** Trace oxygen sensor should not be exposed to ambient air for more than a few minutes or their response time and expected life will be adversely affected.

4.4 Troubleshooting

For troubleshooting and advanced maintenance techniques, please contact your factory representative for assistance.

Email: sales@sso2.com
Ph: 1-949-398-2879

4.5 Zero Calibration

In theory, the oxygen sensor is linear over its measurement range and has no signal output when exposed to an oxygen free environment. However, in reality expect the analyzer to generate a small signal in an oxygen free environment due to one or more of the following:

- Minor leakage in the sample gas connections
- Contamination or quality of zero gas
- Small amounts of dissolved oxygen in the sensor electrolyte
- Tolerance of electronic components in the analyzer

When is a ZERO Calibration Recommended:

A zero calibration is recommended for online and portable oxygen analyzers in applications where a continuous and precise measurement of oxygen is required below 5% of the lowest 2 ranges (i.e. when measuring 0.5ppm or below on the 0 - 10ppm range and 5ppm or below on the 0 - 100ppm range). A zero calibration is only recommended when these conditions are met and when the user is installing a new oxygen sensor.

For most applications a ZERO calibration is not necessary, if you are unsure if a ZERO calibration is required for your installation, contact the factory and consult with our application specialists for a recommendation.

CAUTION: Prematurely Zeroing the analyzer can cause erroneously low readings and extra caution should be taken to make sure a zero is performed accurately.

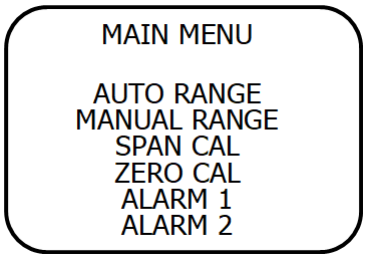
Determining the zero point is met: the user should allow the analyzer to be purged on zero gas for approximately 24 hours to stabilize the flowing gas. There should be no downward trend of the reading.

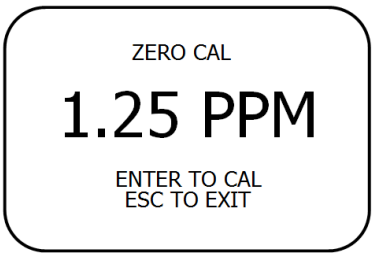
Zero Calibration Procedure:

Zero Calibration should proceed the span calibration and once performed should not have to be repeated with subsequent span calibrations. The zero calibration should only be performed once and when a new sensor is installed or if changes are made to the sample system connections.

The maximum zero calibration adjustment permitted is 45% of the lowest full scale range availability (roughly 4.5ppm). As such, the analyzer ZERO has not been performed at the factory prior to shipment as the factory gas connections and application conditions are different than the user's installation.

Allow the analyzer to be purged with a zero gas for 24 hours, verify that the oxygen reading is not trending. Once Confirmed, and the reading is below 4.5ppm, proceed to the menu to perform a zero calibration:





Once the ZERO Calibration procedure is complete, the display will show "PASSED" or "FAILED". If Failed, your reading was most likely above the 4.5ppm threshold or the 24 hour purge on zero gas was not complete. Check your connections and zero gas and verify the unit is stable and not still trending down. Contact the factory for additional troubleshooting techniques.

5.1 Spare Parts List

Spare Parts List - OMD-625

Replacement Oxygen Sensors:

TO2-133	PPM Oxygen Sensor (inert gas)
TO2-233	PPM Oxygen Sensor (CO2 background gas)

Replacement Parts:

PCB-625-DC-Main	Circuit Board for OMD-625 12 - 24 VDC
PCB-625-PWR	Power Board, DC OMD-625
DISP-625	Display for OMD-625
ORING-1001	Sensor Housing O'ring
FUSE-1001	Replacement Fuse OMD-625

For additional troubleshooting or replacement parts, please contact the factory:
sales@sso2.com; Ph: 1-949-398-2879

5.2 Warranty

Oxygen Analyzer / Sensor Warranty

The design and manufacture of our analyzers and precision electrochemical oxygen sensors conforms to established standards and incorporates state of the art materials and components for superior performance while still maintaining minimal cost of ownership. Prior to shipment, every analyzer / sensor is thoroughly tested by the manufacturer. When operated and maintained in accordance with the Owner's Manual, the units will provide many months of reliable service.

Coverage

Under normal operating conditions the analyzer / sensor's are warranted to be free of defects in materials and workmanship for the period specified in accordance with the most recent published specifications, said period begins with the date of shipment by the manufacturer. The manufacturer information and serial number of this analyzer / sensor are located visibly on the unit. Southland Sensing Ltd. reserves the right in its sole discretion to invalidate this warranty if the serial number does not appear.

Limitations

Southland Sensing Ltd. will not pay for: loss of time, inconvenience, loss of use, or property damage caused by the oxygen analyzer / sensor or its failure to work.

Exclusions

This warranty does not cover installation, defects resulting from accidents, damage while in transit to our service location, damage resulting from alterations, misuse or abuse, lack of proper maintenance, unauthorized repair or modification of the analyzer, affixing of any label or attachment not provided with the analyzer, fire or flood.

Service

Call Southland Sensing Ltd. at 1-949-398-2879 (or e-mail sales@sso2.com). Trained technicians will assist you in diagnosing the problem.

5.3 Material Safety Data Sheet (MSDS)

Product Identification

Product Name	Oxygen Sensor Series – PO2, TO2 series
Synonyms	Precision Electrochemical Sensor
Manufacturer	Southland Sensing Ltd, 848 North Rainbow Blvd. Las Vegas, NV 89107 USA
Emergency Phone Number	1-949-398-2879
Preparation / Revision Date	April 23rd, 2012
Notes	Oxygen sensors are sealed, contain protective coverings and, in normal conditions, do not present a health hazard. Information applies to electrolyte unless otherwise noted.

Specific Generic Ingredients

Carcinogens at levels > 0.1%	None
Others at levels > 1.0%	Potassium Hydroxide or Acetic Acid, Lead
CAS Number	Potassium Hydroxide = KOH 1310-58-3 or Acetic Acid = 64-19-7, Lead = Pb 7439-92-1

General Requirements

Use	Potassium Hydroxide or Acetic Acid - electrolyte, Lead - anode
Handling	Rubber or latex gloves, safety glasses
Storage	Indefinitely

Physical Properties

Boiling Point Range	KOH = 100 to 115 C or Acetic Acid = 100 to 117 C
Melting Point Range	KOH -10 to 0 C or Acetic Acid – NA, Lead 327 C
Freezing Point	KOH = -40 to -10 C or Acetic Acid = -40 to -10 C
Molecular Weight	KOH = 56 or Acetic Acid – NA, Lead = 207
Specific Gravity	KOH = 1.09 @ 20 C, Acetic Acid = 1.05 @ 20 C
Vapor Pressure	KOH = NA or Acetic Acid = 11.4 @ 20 C
Vapor Density	KOH – NA or Acetic Acid = 2.07
pH	KOH > 14 or Acetic Acid = 2-3
Solubility in H2O	Complete
% Volatiles by Volume	None
Evaporation Rate	Similar to water
Appearance and Odor	Aqueous solutions: KOH = Colorless, odorless or Acetic Acid = Colorless, vinegar-like odor

Fire and Explosion Data

Flash and Fire Points	Not applicable
Flammable Limits	Not flammable
Extinguishing Method	Not applicable
Special Fire Fighting Procedures	Not applicable
Unusual Fire and Explosion Hazards	Not applicable

5.3 Cont. Material Safety Data Sheet (MSDS)

Reactivity Data

Stability	Stable
Conditions Contributing to Instability	None
Incompatibility	KOH = Avoid contact with strong acids or Acetic Acid = Avoid contact with strong bases
Hazardous Decomposition Products	KOH = None or Acetic Acid = Emits toxic fumes when heated
Conditions to Avoid	KOH = None or Acetic Acid = Heat

Spill or Leak

Steps if material is released	Sensor is packaged in a sealed plastic bag, check the sensor inside for electrolyte leakage. If the sensor leaks inside the plastic bag or inside an analyzer sensor housing, do not remove it without rubber or latex gloves and safety glasses and a source of water. Flush or wipe all surfaces repeatedly with water or wet paper towel (fresh each time).
Disposal	In accordance with federal, state and local regulations.

Health Hazard Information

Primary Route(s) of Entry	Ingestion, eye and skin contact
Exposure Limits	Potassium Hydroxide - ACGIH TLV 2 mg/cubic meter or Acetic Acid - ACGIH TLV / OSHA PEL 10 ppm (TWA), Lead - OSHA PEL .05 mg/cubic meter
Ingestion	Electrolyte could be harmful or fatal if swallowed. KOH = Oral LD50 (RAT) = 2433 mg/kg or Acetic Acid = Oral LD50 (RAT) = 6620 mg/kg
Eye	Electrolyte is corrosive and eye contact could result in permanent loss of vision.
Skin	Electrolyte is corrosive and skin contact could result in a chemical burn.
Inhalation	Liquid inhalation is unlikely.
Symptoms	Eye contact - burning sensation. Skin contact - soapy slick feeling.
Medical Conditions Aggravated	None
Carcinogenic Reference Data	KOH and Acetic Acid = NTP Annual Report on Carcinogens - not listed; LARC Monographs - not listed; OSHA - not listed
Other	Lead is listed as a chemical known to the State of California to cause birth defects or other reproductive harm.

Special Protection

Ventilation Requirements	None
Eye	Safety glasses
Hand	Rubber or latex gloves
Respirator Type	Not applicable
Other Special Protection	None

Special Precautions

Precautions	Do not remove the sensor's protective Teflon and PCB coverings. Do not probe the sensor with sharp objects. Wash hands thoroughly after handling. Avoid con tact with eyes, skin and clothing. Empty sensor body may contain hazardous residue.
Transportation	Not applicable

5.4 Certificate of Conformance

Model Number: OMD-625 Oxygen Analyzer

Serial Number: _____

Sensor Selection: ( ) TO2-133 Trace Oxygen Sensor

( ) TO2-233 Trace Oxygen Sensor CO2 > 0.1%

Serial Number: _____

Sensor Housing Selection: ( ) H3 Flow Through Sensor Housing 1/8" Swagelok

Configuration:

Ranges: ( ) 0 - 10ppm, 0 - 100ppm, 0 - 1000ppm, 0 - 1%, 0 - 25%

Power: ( ) 12 - 24 V DC

Analog Output: 4 - 20mA Isolated

Display: Backlight

Enclosures: General Purpose, Explosion Proof

We certify that the parts shipped to you are manufactured in the USA and conform to all requirements of the Purchase Order. These parts have been manufactured and tested to the highest quality standards and in accordance with all required specifications, instructions and technical drawings.

Date: _____ Signature: _____