

In Situ Oxygen Transmitter For High Sulfur Environments

- Zirconium oxide-based cell is resistant to sulfur in the flue gas
- Unique architecture - Electronics mounted in the probe head
- Outstanding accuracy - resolution and sensitivity increased by 400%
- Simplified installation
 - no electronics box, probe cable or conduit
 - intelligent power supply provides automatic line voltage selection
- Advanced sensor diagnostics
 - alarm indicates when calibration is recommended
- Robust, highly integrated electronics
 - consumes 95% less power
 - surface mount technology improves reliability and vibration resistance
- CENELEC hazardous area and general purpose models
- Digital HART® communications
 - AMS/PlantWeb® compatible
- Fully field repairable

THE LATEST BREAKTHROUGH FOR COMBUSTION FLUE GAS ANALYSIS IN HIGH SULFUR ENVIRONMENTS

Introducing the Sulfur Resistant Oxymitter Oxygen Transmitter, the world's ONLY in situ, zirconium oxide-based oxygen transmitter for flue gas measurement that can last significantly longer in sulfur-rich environments. These oxygen measurements can be used in a control system or by a boiler operator to fine tune burner fuel/air ratios for maximum efficiency. The Sulfur Resistant Oxymitter is ideal for recovery boilers, process heaters and spent acid furnaces.

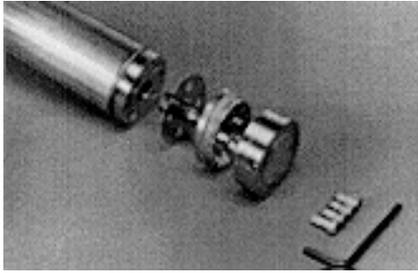


Combustion applications with high sulfur contents in the flue gases cause many problems for oxygen analyzers, the worst of which is the deterioration of the zirconium oxide cell used to measure the excess oxygen in the combustion process. This zirconium oxide cell typically uses platinum as an electrode material to conduct the signal to its electronics. In this environment, the sulfur reacts with the platinum within the zirconium oxide cell to create platinum sulfide, quickly rendering the cell useless. The environment is especially damaging to the zirconium oxide cell when oxygen levels are low and sulfur levels are high. Historically, zirconium oxide cells have survived only several weeks in such conditions. Now, there is a solution to the problem.

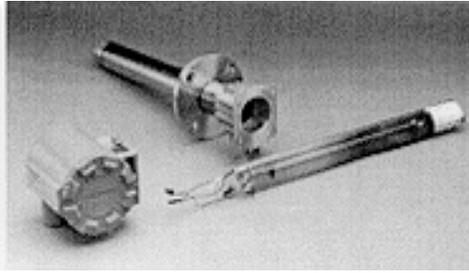
Applications where these environments are typically found include recovery boilers in pulp and paper mills, industrial boilers and municipal utilities burning high sulfur coal or heavy fuel oil, process heaters and furnaces that use waste gases that contain large amounts of sulfur, and spent acid furnaces.

Using a revolutionary and patented cell design, Rosemount Analytical can offer a zirconium oxide-based, in situ oxygen analyzer that can withstand the attack of sulfur in the flue gas. These new zirconium oxide cells still deliver the same stable, reliable oxygen measurement that you get from the standard Oxymitter, but last ten times longer in these harsh environments. Also, these cells will still offer Rosemount Analytical's patented calibration recommended feature that alerts you when the instrument should be calibrated.

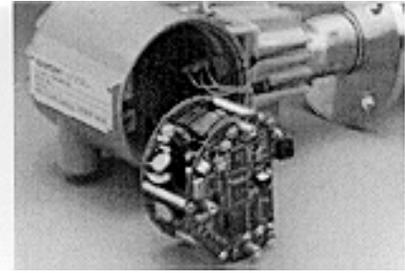
THE SULFUR RESISTANT OXYMITTER OXYGEN TRANSMITTER IS COMPLETELY FIELD REPAIRABLE



Sensor Cell Assembly



Heater/Thermocouple Assembly

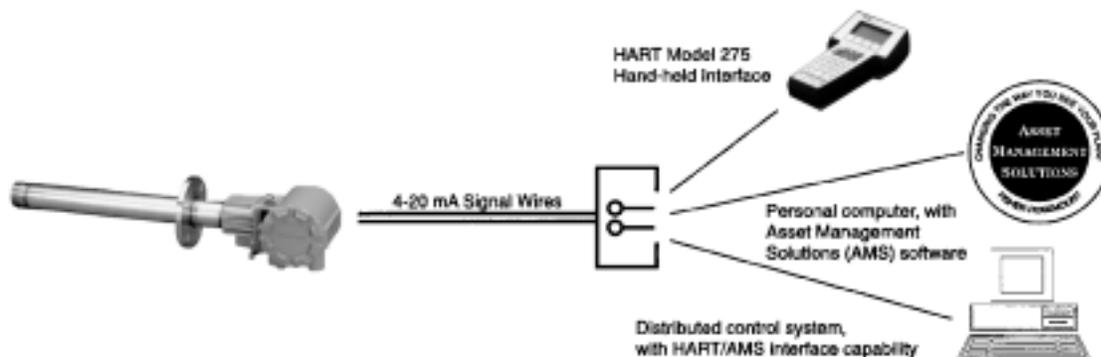


Plug-in Electronics Module

SULFUR RESISTANT OXYMITTER FEATURES AND BENEFITS

Features	Benefits
Revolutionary and patented cell design lasts ten times longer, in high sulfur environments, than traditional oxygen analyzers.	Lowers maintenance costs and optimizes plant operations.
Rapid, accurate (typically ± 0.75 percent), and reliable measurement of excess oxygen with a single, in situ transmitter.	Provides inputs for significant fuel savings which normally pay for the analyzer in less than one year; best accuracy specifications in the industry!
Integrated oxygen probe and electronics simplifies installation.	Eliminates costs of mounting separate electronics. Eliminates cabling and conduit between probe and electronics.
In situ design. No sample system, sample probes, scrubbers, or pumps are necessary; test gas calibration check without disturbing the probe.	Low installation and low maintenance costs.
"Calibration recommended" indication. On-line electrical CAL check indicates need for calibration with gas standard.	Optimizes plant resources; reduces maintenance and calibration costs.
Field replaceable cell and heater/thermocouple assembly and plug-in electronics module.	Ease of maintenance.
Suitable for use in process temperatures up to 1300°F (700°C). Optionally up to 2400°F (1300°C).	Suitable for use in most combustion applications.
Material of construction 316 LSS (all wetted parts)	High resistance to corrosion.
Automatic line voltage selections.	Automatically selects from 90 to 250 VAC and 50/60 Hz without configuration or setup.

Communicate with the Sulfur Resistant Oxymitter from almost anywhere via the HART Protocol



SPECIFICATIONS ^①

SULFUR RESISTANT OXYMITTER

Net O₂ Range	0-40% selectable via HART
Accuracy:	typically $\pm 0.75\%$ of reading or 0.05% O ₂ , whichever is greater Lowest detectable limit - .05% O ₂
System Response to Test Gas:	Initial response in less than 3 seconds T90 in less than 8 seconds
Temperature Limits:	
Process:	32° to 1300°F (0° to 704°C) up to 2400°F (1300°C) with optional accessories
Electronics:	-40° to 185°F (-40° to 85°C) Operating temperature of electronics inside of instrument housing, as measured via Rosemount Asset Management Solutions software.

Probe Lengths, Nominal and Approximate Shipping Weights:

18 in. (457 mm) package:	16 pounds (7.3 kg)
3 foot (0.91 m) package:	21 pounds (9.5 kg)
6 foot (1.83 m) package:	27 pounds (12.2 kg)
9 foot (2.74 m) package:	33 pounds (15.0 kg)
12 foot (3.66 m) package:	39 pounds (17.7 kg)

Mounting and Mounting Position:

Vertical or Horizontal
Spool pieces are available to offset transmitter housing from ambient temperatures above 149°F(65°C)

Materials:

Probe:	Wetted or welded parts - 316L stainless steel Non-wetted parts - 304 stainless steel, low-copper aluminum
---------------	--

Electronics Enclosure:	Low-copper aluminum
-------------------------------	---------------------

Calibration: Semi-automatic or automatic

Calibration Gas Mixtures

Recommended: 0.4% O₂, Balance N₂
8% O₂, Balance N₂
(Ref. test gas kit #6296A27G01)

Calibration Gas Flow:

5 scfh (2.5 l/m)

Reference Air (optional): 2 scfh (1 l/m), clean, dry, instrument-quality air (20.95% O₂), regulated to 5 psi (34 kPa)

Electronics:	NEMA 4X, IP66 with fitting and pipe on reference exhaust port to clean dry atmosphere
Electrical Noise:	Meets EN 50082-2 Electromagnetic Compatibility Generic Immunity Std., Part II Includes ENG 1000 4-R for Electrostatic Discharge 4 Kv contact, 8 Kv in air Optionally ENG 1000 4-R "Namur-Increased" 8 Kv contact, 16 Kv in air Includes IEC 801-4 fast transients-2 Kv on power supply and control lines

Hazardous Area Certifications: (OXT 400 Version only)

Class I, Div. 1, Groups C and D, CENELEC EExd II B+H2T2/T6

Line Voltage:

Universal 90 to 250 VAC, 48 to 62 Hz. No switches or jumpers required 3/4"-14 NPT conduit port

I/O Signals:

One 4-20mA dc, 950 ohm max
Isolated with HART capability
One logic I/O contact
I/O is configurable as either an alarm output or as a bi-directional calibration handshake signal to intelligent multiprobe calibration gas sequencer.
5V, Self-powered, 5 mA maximum output
3/4"-14 NPT conduit port

Power Consumption Limits:

Power Consumption of Probe Heater:	175 W nominal max
Power Consumption of Electronics:	10 W nominal max



The Oxymitter 's field electronics mount directly to the oxygen probe in a standard NEMA 4X, IP66 housing.

CE Fisher-Rosemount has satisfied all obligations coming from the European legislation to harmonize the product requirements in Europe.

^①All static performance characteristics are with operating variables constant. Specifications subject to change without notice.

ORDERING INFORMATION – General Purpose Sulfur Resistant Oxymitter for Hazardous Area or FOUNDATION® Fieldbus Models, Consult Your Local Rosemount Analytical Sales Person or the Factory

OXT4AS	Sulfur Resistant Oxymitter 4000 In Situ Oxygen Transmitter
---------------	---

Oxymitter Transmitter - Instruction Book

Code	Sensing Probe Type
1	Ceramic Diffusion Element Probe (ANSI) (N. American Std.)
2	Flame Arrestor Probe (ANSI) – CSA approved package (N. American Std.)
3	Snubber Diffusion Element (ANSI) (N. American Std.)
4	Ceramic Diffusion Element Probe (DIN) (European Std.)
5	Flame Arrestor Probe (DIN) - CSA approved package (snubber diffusion element) (European Std.)
6	Snubber Diffusion Element (DIN) (European Std.)
7	Ceramic Diffusion Element Probe (JIS) (Japanese Std.)
8	Flame Arrestor Probe (JIS) - CSA approved package (ceramic diffusion element) (Japanese Std.)
9	Snubber Diffusion Element (JIS) (Japanese Std.)

Code	Probe Assembly
0	18" (457 mm) Probe
1	18" (457 mm) Probe with Abrasive Shield ⁽¹⁾
2	3' (0.91m) Probe
3	3' (0.91m) Probe with Abrasive Shield ⁽¹⁾
4	6' (1.83m) Probe
5	6' (1.83m) Probe with Abrasive Shield ⁽¹⁾
6	9' (2.74 m) Probe
7	9' (2.74 m) Probe with Abrasive Shield ⁽¹⁾
8	12' (3.66 m) Probe ⁽¹⁾
9	12' (3.66 m) Probe with Abrasive Shield ⁽¹⁾

Code	Mounting Hardware - Stack Side
0	No Mounting Hardware ("0" must be chosen under "Mounting Hardware - Probe Side" below)
1	New Installation - Square weld plate with studs
2	Mounting to Model 218 Mounting Plate (with Model 218 Shield Removed)
3	Mounting to Existing Model 218 Support Shield
4	Competitor's Mounting ⁽²⁾
5	Mounting to Model 132 Adaptor Plate

Code	Mounting Hardware - Probe Side
0	No Adaptor Plate/No Mounting Hardware
1	Probe Only (ANSI) (N. American Std.)
2	New Bypass or Abrasive Shield (ANSI) (N. American Std.)
4	Probe Only (DIN) (European Std.)
5	New Bypass or Abrasive Shield (DIN) (European Std.)
7	Probe Only (JIS) (Japanese Std.)
8	New Bypass or Abrasive Shield (JIS) (Japanese Std.)

OXT4AS	3	2	1	1	(Continued)	EXAMPLE
--------	---	---	---	---	-------------	---------

(Cont'd)

Code	Electronic Housing - NEMA 4X, IP66
11	Standard Filtered Termination
12	Transient Protected Filtered Termination

Code	Operator Interface ⁽³⁾
1	Membrane Keypad – HART Capable

Code	Language
1	English
2	German
3	French
4	Spanish
5	Italian

Code	Termination Filtering
00	No Option – Specified as part of Electronic Housing

Code	Calibration Accessories	
00	No Hardware	
01	Cal. Gas Rotometer & Ref. Gas Set	
02	Intelligent Multiprobe Sequencer	Refer to Table 2
xx	Single Probe Sequencer, mounted to Oxymitter	Refer to Table 1

(Cont'd)	11	1	1	00	01
----------	----	---	---	----	----

NOTES:

- (1) Recommended usages: High velocity particulates in flue stream, installation within 3.5m (10 ft.) of soot blowers or heavy salt cake build up. Applications: Pulverized coal, recovery boilers, lime kiln. Regardless of application, abrasive shields with support brackets are recommended for 9' (2.74 m) and 12' (3.66 m) probe installations, particularly horizontal installations.
- (2) Where possible specify SPS number, otherwise provide details of the existing mounting plate as follows:

Plate with studs	Bolt circle diameter, number and arrangement of studs, stud thread, stud height above mounting plate
Plate without studs	Bolt circle diameter, number and arrangement of holes, thread, depth of stud mounting plate with accessories

- (3) Startup, calibration and operation can be implemented using the standard membrane keypad. Remote access and additional functionality available via Hart Communications (Model 275 Handheld Communicator, or AMS with Oxymitter device descriptor (DD) required.)

TABLE 1

INSERT THE CODE BELOW IN THE ORDERING MATRIX.

Code	Ref. Air Set		Fittings/Tubing		Oxymitter Mounting	
	No	Yes	Brass/Teflon	St. Steel	Horizontal	Vertical
03	X		X		X	
04		X	X		X	
05	X			X	X	
06		X		X	X	
07	X		X			X
08		X	X			X
09	X			X		X
10		X		X		X

TABLE 2

LIST PART NUMBERS AS SEPARATE LINE ITEMS:

The Intelligent Multiprobe Sequencer (IMPS) will automatically calibrate up to 4 probes.

Part Number	Description
3D39695G01	Intelligent Multiprobe Sequencer (IMPS)
3D39695G02	Intelligent Multiprobe Sequencer (IMPS)
3D39695G03	Intelligent Multiprobe Sequencer (IMPS)
3D39695G04	Intelligent Multiprobe Sequencer (IMPS)
3D39695G05	Intelligent Multiprobe Sequencer (IMPS) w/115V heater
3D39695G06	Intelligent Multiprobe Sequencer (IMPS) w/115V heater
3D39695G07	Intelligent Multiprobe Sequencer (IMPS) w/115V heater
3D39695G08	Intelligent Multiprobe Sequencer (IMPS) w/115V heater
3D39695G09	Intelligent Multiprobe Sequencer (IMPS) w/220V heater
3D39695G10	Intelligent Multiprobe Sequencer (IMPS) w/220V heater
3D39695G11	Intelligent Multiprobe Sequencer (IMPS) w/220V heater
3D39695G12	Intelligent Multiprobe Sequencer (IMPS) w/220V heater

Rosemount Analytical no longer offers integral Z-Purge option for its oxygen (O₂) analyzers. However, the IFT, MPS and IMPS enclosures are still capable of Z or X purge by the customer.

CALIBRATION GAS BOTTLES⁽¹⁾

Part Number	Description	Units
1A99119G01	Two disposable calibration gas bottles – 4% and 8% O ₂ balance nitrogen 550 liters each, with bottle rack	Consult spare Parts List 100-005A UOM
1A99119G02	Two Pressure regulators for cal. gas bottles	Consult Spare Parts List 100-005A UOM
1A99119G03	Gas Bottle Rack	Consult Spare Parts List 100-005A UOM

⁽¹⁾ Bottles cannot be shipped via airfreight.

⁽²⁾ When used with “calibration recommended” feature, bottles should provide 2 to 3 years of calibrations in normal service.

SPOOL PIECE OPTIONS

Part Number	Description	Units
3D39761G01	8" spool piece - probe mounts 8" back from duct wall	Consult spare Parts List 100-005A UOM
3D39761G02	12" spool piece - probe mounts 12" back from duct wall	Consult Spare Parts List 100-005A UOM

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available on request. We reserve the right to modify or improve the designs or specifications of our products at any time without notice.

Rosemount Analytical Inc. Process Analytic Division

1201 North Main Street
P. O. Box 901
Orrville, OH 44667-0901 USA
Phone 330-682-9010
Toll Free in US and Canada 1-800-433-6076
Fax 330-684-4434
e-mail: GAS.CSC@frco.com

© Rosemount Analytical Inc., 2000. All rights reserved.

Printed in U.S.A. on recycled paper. ♻️

ROSEMOUNT® ANALYTICAL
FISHER-ROSEMOUNT™