Product Data Sheet
PDS 106-350.A01
May, 2003

In Situ Oxygen Transmitter with FOUNDATION™ fieldbus Communications

- Digital FOUNDATION™ fieldbus communications
  - PlantWeb® compatible
  - AMS
- Unique architecture – electronics mounted in the probe head
- Outstanding accuracy
- Simplified installation
  - no electronics box, probe cable or conduit
  - universal power supply provides automatic line voltage selection
- Advanced sensor diagnostics
  - calibration recommended diagnostic
  - Asset Management Solutions permits diagnostics from DeltaV™ console
- Robust, highly integrated electronics
  - consumes 95% less power
  - surface-mount technology improves reliability and vibration resistance
- Optional explosion-proof rating
- Fully field-repairable

THE LATEST BREAKTHROUGH FOR COMBUSTION FLUE GAS ANALYSIS

The Oxymitter 5000 FOUNDATION fieldbus Oxygen Transmitter: the world's first in situ, zirconium oxide-based oxygen transmitter for flue gas measurement. 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. Ideal for:

- boilers
- process heaters
- kilns
- reheat furnaces

Rosemount Analytical is the leader in oxygen flue gas analyzer technology. The Oxymitter 5000 integrates an oxygen probe and field electronics into a single, compact package.

Pictured with optional SPS Autocal Package

FOUNDATION fieldbus communications provide operators with constant updates of all critical parameters and diagnostics with no additional wiring. The probe inserts directly into a flue gas duct to measure oxygen in combustion processes. No sampling system is required.

A NEMA 4X, IP66 Rosemount transmitter housing mounts directly to the probe and contains the transmitter's electronics, replacing common stand-alone field electronics. This integrated design minimizes the costs of installing separate probe cable, conduit, and electronics. The Oxymitter 5000's electronics also require 95% less power to operate. Therefore, its components last longer.

The FOUNDATION fieldbus protocol provides a link into Emerson Process Management's PlantWeb® field-based architecture. Instrument technicians can interface with the Oxymitter from the operator console in the control room. Service diagnostics and calibrations can be performed remotely.

The Oxymitter 5000 is fully field-repairable. The probe's design provides convenient access to internal probe components so technicians can service the unit in house. The cell and heater/thermocouple are fully field-replaceable. The Oxymitter 5000 contains no potentiometer adjustments or jumpers.

The Oxymitter 5000 Oxygen Transmitter operates at process temperatures up to 1300°F (700°C), providing a fast response with high accuracy and reliability. Available in lengths from 18 inches (457 mm) to 12 feet (3.66 m).

Optional accessories for the Oxymitter 5000 include:
- Auto calibration gas sequencer
- Remote, loop-powered LCD display of O_2 reading
- High temperature accessories for temperatures up to 1832°F (1000°C)
- Flame arrestor
- Abrasive shield

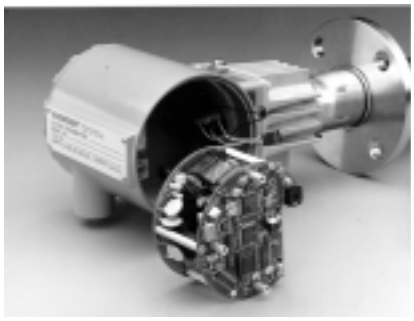
ROSEMOUNT® Analytical

EMERSON. Process Management

THE OXYMITTER 5000 OXYGEN TRANSMITTER IS COMPLETELY FIELD- REPAIRABLE

Sensor Cell Assembly

Heater/Thermocouple Assembly

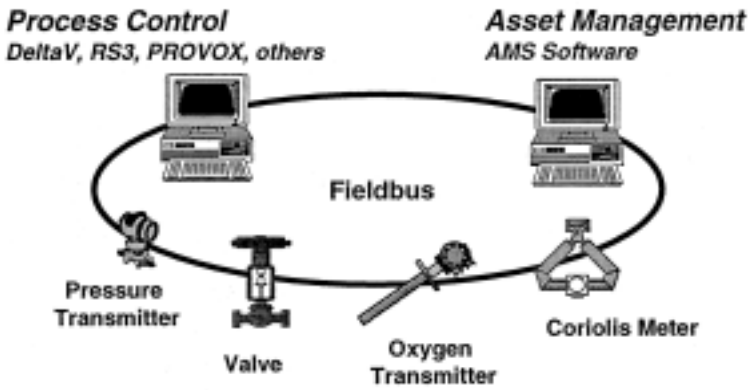


Plug-In Electronics Module, With Local Display/Keypad

OXYMITTER 5000 OXYGEN TRANSMITTER FEATURES AND BENEFITS

Features	Benefits
FOUNDATION fieldbus communications	All Information from analyzer is updated constantly, and provided to the operator or technician. Low cost to maintain.
Rapid, accurate 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 specification 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 maintenance costs.
Fast speed of response.	In situ design ideal for closed loop control.
"Calibration recommended" indication. Online electrical CAL check indicates need for calibration.	Optimizes plant resources; reduces maintenance and calibration costs.
Field-replaceable cell, 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 1832°F (1000°C).	Suitable for use in most combustion applications.
Material of construction 316 LSS (all wetted parts).	High resistance to corrosion.
Cell sensitivity increases logarithmically when oxygen decreases.	Very useful for low oxygen levels. Ideal for low excess air burners.
Automatic line voltage selections.	Automatically selects from 85 to 265 VAC and 50/60 Hz. without configuration or setup.

FOUNDATION fieldbus communications provides digital communications from field device to field device over a single pair of wires.



SPECIFICATIONS [1]

OXYMITTER 5000 OXYGEN TRANSMITTER

Net O_2 Range 0-40% O_2

Accuracy: ±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

T_{90} in less than 8 seconds

Temperature Limits:

Process: 32° to 1300°F (0° to 704°C) up to 1832°F (1000°C) with optional accessories

Electronics: -40° to 185°F (-40° to 85°C) Operating temperature of electronics inside of instrument housing, as measured via 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)
15 foot (4.6 m) package:	45 pounds (20.5 kg)
18 foot (5.5 m) package:	51 pounds (23 kg)

Mounting and Mounting Position:

Vertical or horizontal 12 inch (30 cm) spool pieces are available to offset transmitter housing from hot mounting surfaces (P/N 3D39761G02)

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% O_2, balance N_2

8% O_2, balance N_2

(Ref. test gas kit #6296A27G01)

Calibration Gas Flow: 5 scfh (2.5 l/m)

Reference Air: 2 scfh (1 l/m), clean, dry, instrument-quality air (20.95% O_2), regulated to 5 psi (34 kPa)

Electronics: NEMA 4X, IP 66 with fitting and pipe on reference exhaust port to clean dry atmosphere

Two 3/4" – 14 NPT conduit ports

Electrical Noise: Meets EN 50082-2 Electromagnetic Compatibility Generic Immunity Std., Part II

Includes ENG 1000 4-R for electro-static 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: NEC Class I, Div. 1, Groups B, C, D CENELEC EExd II B + H2T2/T6 (electronics)

The Oxymitter 5000 complies with the European Union PED 97/23/EC Directive by virtue SEP.
ATEX compliant

Line Voltage: Universal 90 to 250 VAC, 48 to 62 Hz. no switches or jumpers required 3/4" – 14 NPT conduit port

Isolated Output: Digital FOUNDATION fieldbus

Logic Signals: One logic I/O configured as a bi-directional calibration handshake signal optional calibration gas sequencer.

5V, self-powered, 5 mA maximum output

Fieldbus Logic:

Function Blocks: AI – execution time: 75 ms O_2
Heater temperature
Case temperature

Power Consumption Limits:

Power Consumption of Probe Heater:	175 W nominal maximum
Power Consumption of Electronics:	10 W nominal maximum
Fieldbus segment power consumption:	17.5 mA

The Oxymitter 5000's field electronics mount directly to the oxygen probe in a standard NEMA 4X, IP 66 housing.

Emerson Process Management has satisfied all obligations coming from the European legislation to harmonize the product requirements in Europe.

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

OUTLINE DIMENSIONS FOR OXYMITTER 5000 OXYGEN TRANSMITTER

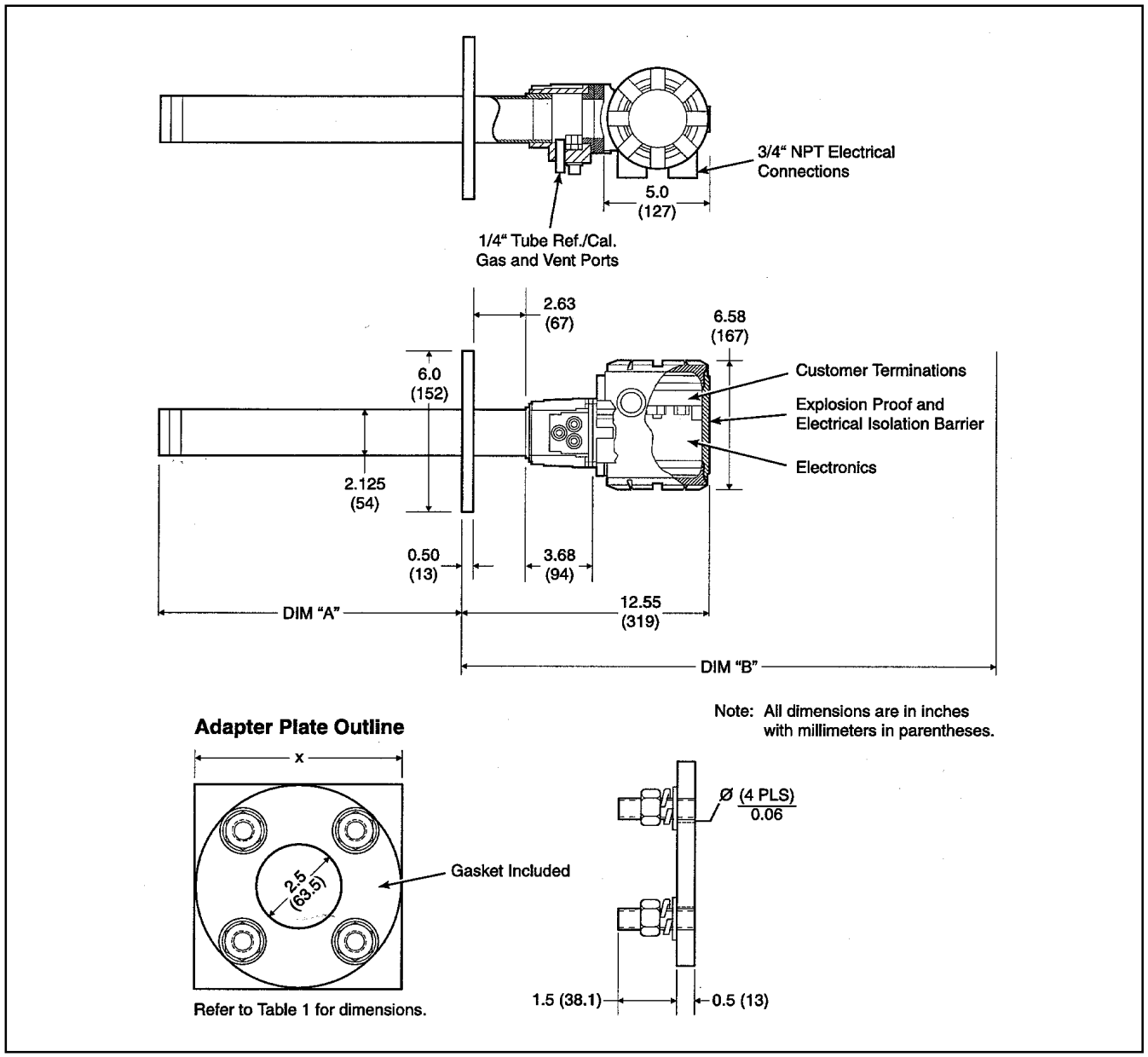


Table I. Mounting Plate

	Dimensions Dia. in. (mm)		
	ANSI	**DIN**	**JIS**
Flange (x)	6.00 (153)	7.5 (190)	6.5 (165)
Stud Size	5/8" – 11	M16 x 2	M12 x 1.75
4 Studs Eq. Sp. on BC	4.75 BC	5.71 BC	5.71 BC
Flange (Y)	6.0 (153)	7.3 (185)	6.1 (155)

Table II. Removal/Installation

Probe Length	**Dim "A" Insertion Depth**	**Dim. "B" Removal Envelope**
18 in. (457 mm) Probes	16.00 (407)	32.38 (822)
3 ft. (0.91 m) Probes	34.00 (864)	50.38 (1280)
6 ft. (1.83 m) Probes	70.00 (1778)	86.38 (2194)
9 ft. (2.74 m) Probes	106.00 (2692)	122.38 (3108)
12 ft. (3.66 m) Probes	143.00 (3607)	158.38 (4023)

ORDERING INFORMATION

OXT5A	OXYMITTER 5000 IN SITU OXYGEN TRANSMITTER WITH FOUNDATION™ FIELDBUS COMMUNICATIONS

Oxygen Transmitter – Instruction Book

Code	Sensing Probe Type
1	Ceramic diffusion element probe (ANSI) (N. American Std.)
2	Ceramic diffusion element flame arrestor probe (ANSI) (N. American Std.)
3	Snubber diffusion element (ANSI) (N. American Std.)
4	Ceramic diffusion element probe (DIN) (European Std.)
5	Snubber diffusion element flame arrestor probe (DIN) (European Std.)
6	Snubber diffusion element (DIN) (European Std.)
7	Ceramic diffusion element probe (JIS) (Japanese Std.)
8	Ceramic diffusion element probe flame arrestor probe (JIS) (Japanese Std.)
9	Snubber diffusion element (JIS) (Japanese Std.)

Code	Probe Assembly
0	18 in. (457 mm) Probe
1	18 in. (457 mm) Probe with abrasive shield [1]
2	3 ft. (0.91 m) Probe
3	3 ft. (0.91 m) Probe with abrasive shield [1]
4	6 ft. (1.83 m) Probe
5	6 ft. (1.83 m) Probe with abrasive shield [1]
6	9 ft. (2.74 m) Probe
7	9 ft. (2.74 m) Probe with abrasive shield [1]
8	12 ft. (3.66 m) Probe [1]
9	12 ft. (3.66 m) Probe with abrasive shield [1]
A	15 ft. (4.6m) Probe with abrasive shield [1]
B	18 ft. (5.5 m) Probe with abrasive shield [1]

Code	Mounting Hardware – Stack Side
0	No adaptor plate (“0” must also 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 adapter plate

Code	Mounting Hardware – Probe Side
0	No mounting hardware/no adaptor plate
1	Probe only (ANSI) (N. American Std.)
2	New bypass or new abrasive shield (ANSI) (N. American Std.)
4	Probe only (DIN) (European Std.)
5	New bypass or new abrasive shield (DIN) (European Std.)
7	Probe only (JIS) (Japanese Std.)
8	New bypass or new abrasive shield (JIS) (Japanese Std.)

Code	Electronic Housing – NEMA 4X, IP 66
11	Standard filtered termination
12	Transient protected filtered termination

OXT5A	3	2	1	1	12	Cont’d	Example

Note:

[1] Recommended usages: high velocity particulates in flue stream, installation within 3.5 m (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 ft. (2.74 m) and 12 ft. (3.66 m) probe installations, particularly horizontal installations.

[2] Where possible, specify SPS number; otherwise provide details of 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.

ORDERING INFORMATION (Continued)

Cont'd	Code	Communications/Operator Interface [3]
	1	Membrane keypad – fieldbus

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 and reference gas set	
02	Intelligent multiprobe sequencer	Refer to Table 2
XX	Single probe sequencer, mounted to Oxymitter	Refer to Table 1

Code	Basic Control Suite Functionality
00	Basic control suite
01	Deduct basic control suite

Cont'd	1	1	00	02	00

[3] Start-up, calibration and operation can be implemented using the standard membrane keypad. Remote access and additional functionality available via fieldbus communications (DeltaV™)

TABLE 1

	REFERENCE AIR SET		FITTINGS/TUBING		OXYMITTER MOUNTING	
ENTRY CODE	NO	YES	BRASS/TEFLON	STAINLESS 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	Number of Probes
3D39695G01	Intelligent Multiprobe Sequencer (IMPS)	1
3D39695G02	Intelligent Multiprobe Sequencer (IMPS)	2
3D39695G03	Intelligent Multiprobe Sequencer (IMPS)	3
3D39695G04	Intelligent Multiprobe Sequencer (IMPS)	4
3D39695G05	Intelligent Multiprobe Sequencer (IMPS) w/115 V heater	1
3D39695G06	Intelligent Multiprobe Sequencer (IMPS) w/115 V heater	2
3D39695G07	Intelligent Multiprobe Sequencer (IMPS) w/115 V heater	3
3D39695G08	Intelligent Multiprobe Sequencer (IMPS) w/115V heater	4
3D39695G09	Intelligent Multiprobe Sequencer (IMPS) w/220 V heater	1
3D39695G10	Intelligent Multiprobe Sequencer (IMPS) w/220 V heater	2
3D39695G11	Intelligent Multiprobe Sequencer (IMPS) w/220 V heater	3
3D39695G12	Intelligent Multiprobe Sequencer (IMPS) w/220 V heater	4

Rosemount Analytical no longer offers an integral Z-purge option for its oxygen (O_2) 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
1A99119G01	Two disposable calibration gas bottles – .4% and 8% O_2 balance nitrogen 550 liters each
1A99119G02	Two flow regulators for cal. gas bottles
1A99119G03	Bottle rack

[1] Bottles cannot be shipped via airfreight.

* When used with "calibration recommended" feature, bottles should provide 2 to 3 years of calibrations in normal service.

OUTLINE DIMENSIONS FOR OXYMITTER 5000 HAZARDOUS AREA OXYGEN TRANSMITTER

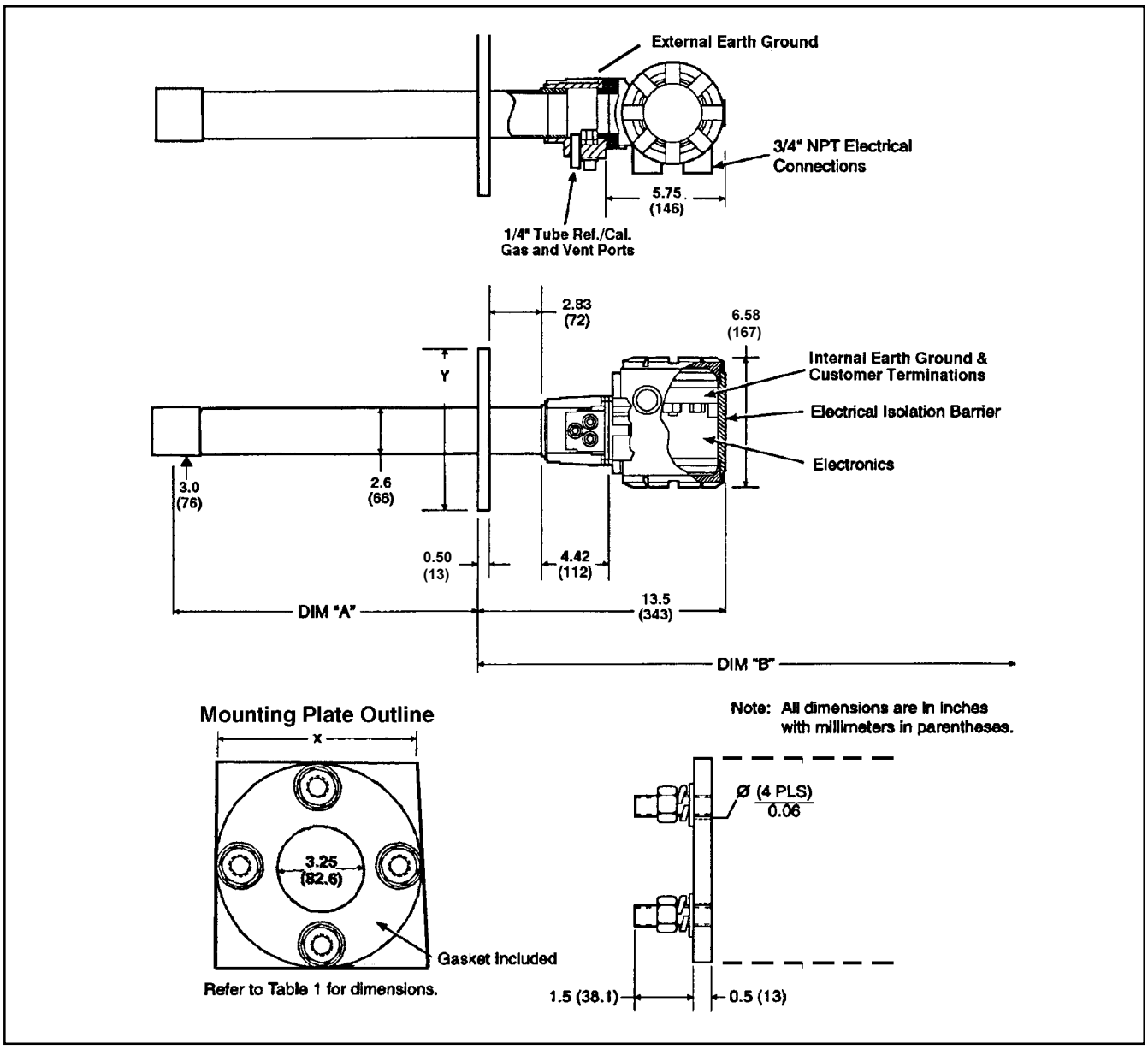


Table I. Mounting Plate		
	Dimensions Dia. in. (mm)	
	ANSI	DIN
Mtg. Plate (x)	7.75 (197)	8.5 (215)
Stud Size	5/8" – 11	M16 x 2
4 Studs Eq. Sp. on BC	6.00 BC (152.4) BC	6.69 BC (170) BC
Flange (Y)	7.5 (190)	6.7 (170)

Table II. Removal/Installation		
Probe Length	Dim "A" Insertion Depth	Dim. "B" Removal Envelope
18 in. (457 mm) Probes	18.1 (460)	31.6 (803)
3 ft. (0.91 m) Probes	36.1 (917)	57.0 (1448)
6 ft. (1.83 m) Probes	72.1 (1831)	85.6 (2174)

ORDERING INFORMATION

OXT5C	**OXYMITTER 5000 EXPLOSION PROOF – IN SITU OXYGEN TRANSMITTER**

Explosion Proof Oxygen Transmitter – Instruction Book

Code	Sensing Probe Type with Flame Arrester
1	Ceramic diffusion element probe (ANSI 3 inch 150 lb.)
2	Snubber diffusion element (ANSI 3 inch 150 lb.)
3	Ceramic diffusion element probe (DIN 2527) – 1/4" tube fittings
4	Snubber diffusion element (DIN 2527) – 1/4" tube fittings
5	Ceramic diffusion element probe (JIS)
6	Snubber diffusion element (JIS)
7	Ceramic diffusion element probe (ANSI 3 inch 300 lb. flange)

Code	Probe Assembly
0	18 in. probe
1	18 in. probe with 3 ft. bypass
2	18 in. probe with abrasive shield [1]
3	3 ft. probe
4	3 ft. probe with abrasive shield [1]
5	6 ft. probe
6	6 ft. probe with abrasive shield [1]

Code	Mounting Adapter – Stack Side
0	No adapter plate ("0" must also be chosen under "Mounting adapter – probe side" below)
1	New installation – square weld plate with studs
2	Model 218 mounting plate (with Model 218 shield removed)
3	Competitor's mount [2]

Code	Mounting Adapter – Probe Side
0	No adapter plate
1	Probe only (ANSI)
2	New bypass or new abrasive shield (ANSI)
4	Probe only (DIN)
5	New bypass or new abrasive shield (DIN)
7	Probe only (JIS)
8	New bypass or new abrasive shield (JIS)

Code	Electronic Housing – NEMA 4X, IP 66
11	Standard filtered termination
12	Transient protected filtered termination

Code	Operator Interface [3]
1	Membrane keypad – FOUNDATION fieldbus

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

OXT5C	**3**	**3**	**1**	**1**	**11**	**1**	**1**	**(Cont'd)**	**EXAMPLE**

ORDERING INFORMATION (Continued)

(Cont'd)	Code	Termination Filtering
	00	No option – specified as part of electronic housing

Code	Calibration Accessories	
00	No hardware	
01	Cal./ref. flowmeters and reference pressure regulator	
02	IMPS 4000 (safe area only)	Refer to Table 1
03	SPS 4000 remote mounted (safe area only)	Refer to SPS matrix

Code	Hazardous Area Approval
10	CENELEC – EEx d II B + H2T2/T6 (electronics)
20	CSA – Class I, Div. 1, Groups B, C and D Code T2/T6 (electronics)

Code	Basic Control Suite Functionality
00	Basic control suite
01	Deduct basic control suite

Cont'd	00	01	10	00

NOTES:

[1] Recommended usages: high velocity particulates in flue stream, installation within 3.5 m (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 ft. (2.74 m) and 12 ft. (3.66 m) probe installations, particularly horizontal installations.

[2] Where possible specify SPS number; otherwise provide details of 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] Start-up, calibration and operation can be implemented using the standard membrane keypad. Remote access and additional functionality available via FOUNDATION fieldbus communications (DeltaV™)

High Sulfur Service

For high sulfur applications, please add note to your purchase order requesting high sulfur cell part number 4847B63G02 in lieu of the standard ZrO_2 cell. Price adder is required.

Cell replacement kits for high sulfur service are also available. Consult part number 4849B94GXX in the Combustion Solutions Center Spare Parts list.

TABLE 1
IMPS – Safe Area Only

LIST PART NUMBERS AS SEPARATE LINE ITEMS:

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

Part Number	Description	Number of Probes
3D39695G01	Intelligent multiprobe sequencer (IMPS)	1
3D39695G02	Intelligent multiprobe sequencer (IMPS)	2
3D39695G03	Intelligent multiprobe sequencer (IMPS)	3
3D39695G04	Intelligent multiprobe sequencer (IMPS)	4
3D39695G05	Intelligent multiprobe sequencer (IMPS) w/115 V heater	1
3D39695G06	Intelligent multiprobe sequencer (IMPS) w/115 V heater	2
3D39695G07	Intelligent multiprobe sequencer (IMPS) w/115 V heater	3
3D39695G08	Intelligent multiprobe sequencer (IMPS) w/115V heater	4
3D39695G09	Intelligent multiprobe sequencer (IMPS) w/220 V heater	1
3D39695G10	Intelligent multiprobe sequencer (IMPS) w/220 V heater	2
3D39695G11	Intelligent multiprobe sequencer (IMPS) w/220 V heater	3
3D39695G12	Intelligent multiprobe sequencer (IMPS) w/220 V heater	4

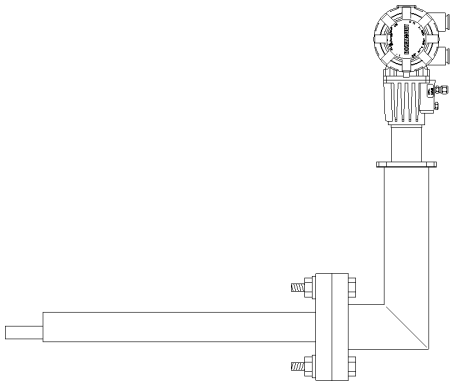
OXYMITTER 4000 ACCESSORIES

HART® Handheld 275 Communicator

The HART® 275 Communicator is an interface device that provides a common communication link to HART® compatible instruments, such as the Sulfur-Resistant Oxymitter 4000. HART® Communications Protocol permits all the information available from the Sulfur-Resistant Oxymitter 4000's electronics to be transmitted over standard 4-20 mA signal wires. By attaching the HART handheld communicator at a termination point along the 4-20 mA signal line, a technician can diagnose problems and configure and calibrate the Sulfur-Resistant Oxymitter 4000 as if he or she were standing in front of the instrument.

For more information, call Rosemount Analytical at 1-800-433-6076.

Bypass Packages



The specially designed Rosemount Analytical Bypass Package for oxygen analyzers has proven to withstand the high temperatures in process heaters while providing the same advantages offered by the in situ sensor. Inconel tubes provide effective resistance to corrosion, and the other components common to other sampling systems.

For more information, call Rosemount Analytical at 1-800-433-6076.

O_2 Calibration Gas Kits

Rosemount Analytical's O_2 Calibration Gas and Service Kits have been carefully designed to provide a more convenient and fully portable means of testing, calibrating, and servicing Rosemount Analytical's oxygen analyzers. These lightweight, disposable gas cylinders eliminate the need to rent gas bottles.

For more information, call Rosemount Analytical at 1-800-433-6076.

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