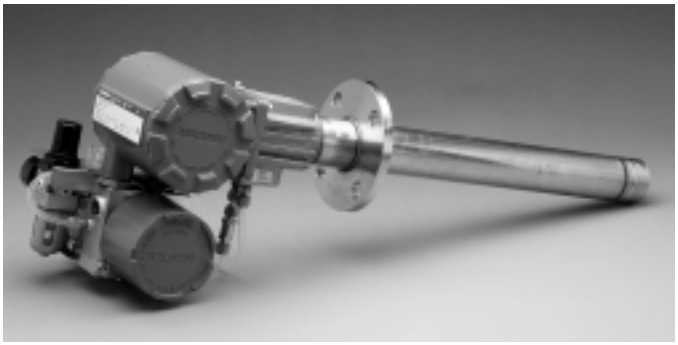
Product Data Sheet
PDS 106-350.A01
January, 2000

In Situ Oxygen Transmitter with FOUNDATION™ Fieldbus Communications

- Digital 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



Pictured with optional SPS Autocal Package

THE LATEST BREAKTHROUGH FOR COMBUSTION FLUE GAS ANALYSIS

Introducing the Oxymitter 5000 Fieldbus Oxygen Transmitter: the world's ONLY 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.

Fieldbus communications provides 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. And, a 400% increase in sensitivity and resolution has improved typical accuracy to ±.75% of reading or .05% O_2.

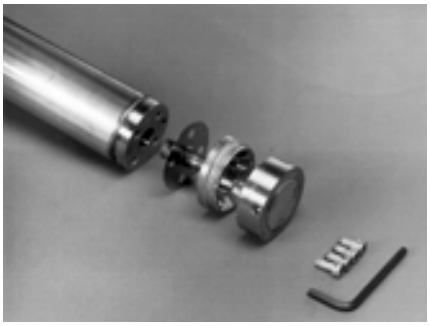
The Fieldbus protocol provides a link into Fisher-Rosemount's PlantWeb Field-Based Architecture. Instrument technicians can interface with the Oxymitter from the operator console in the control room. Service diagnostics and calibrations can be performed remotely.

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.

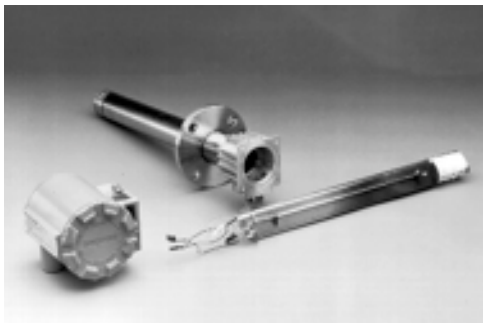
The Oxymitter 5000 Oxygen Transmitter operates at process temperatures up to 1300°F (700°C), providing a fast response with high accuracy and reliability. Available in lengths from 18 inches (457 mm) to 12 feet (3.66 m).

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 2400°F (1300°C)
- Flame Arrestor
- Abrasive Shield

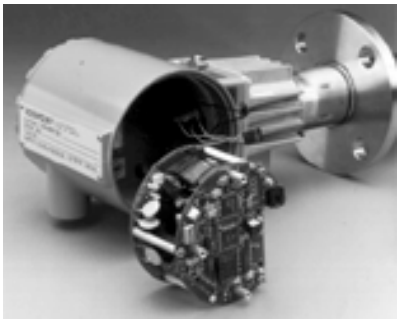
THE OXYMITTER 5000 OXYGEN TRANSMITTER IS COMPLETELY FIELD REPAIRABLE



Sensor Cell Assembly



Heater/Thermocouple Assembly

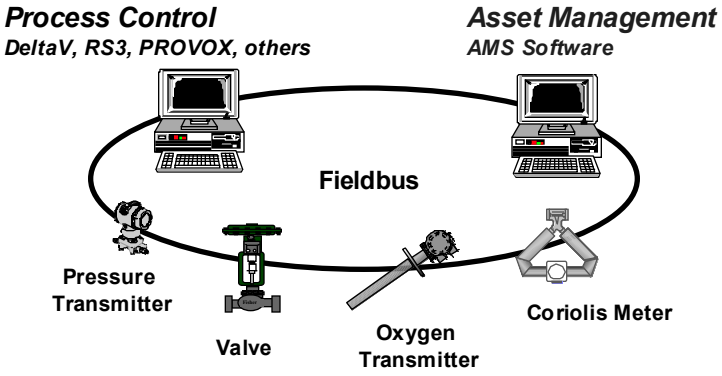


Plug-In Electronics Module, with Local Display/Keypad

OXYMITTER 5000 OXYGEN TRANSMITTER FEATURES AND BENEFITS

Features	Benefits
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 low 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 2400°F (1300°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.

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: ±.75% of reading or .05% O_2, whichever is greater

Lowest detectable limit - .05% 0_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

12 inch (30 cm) spool pieces are available to offset transmitterhousing from ambient temperatures above 149°F(65°C) (P/N3D39761G02)

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, IP66 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 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: NEC Class I, Div. 1, Groups B,C, D CENELEC EExd II B+hT1/T6 (electronics)

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 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 max
Power Consumption of Electronics:	10 W nominal max
Fieldbus segment power consumption:	17.5 mA

The Oxymitter 5000’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.

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

OUTLINE DIMENSIONS FOR OXYMITTER 5000 OXYGEN TRANSMITTER

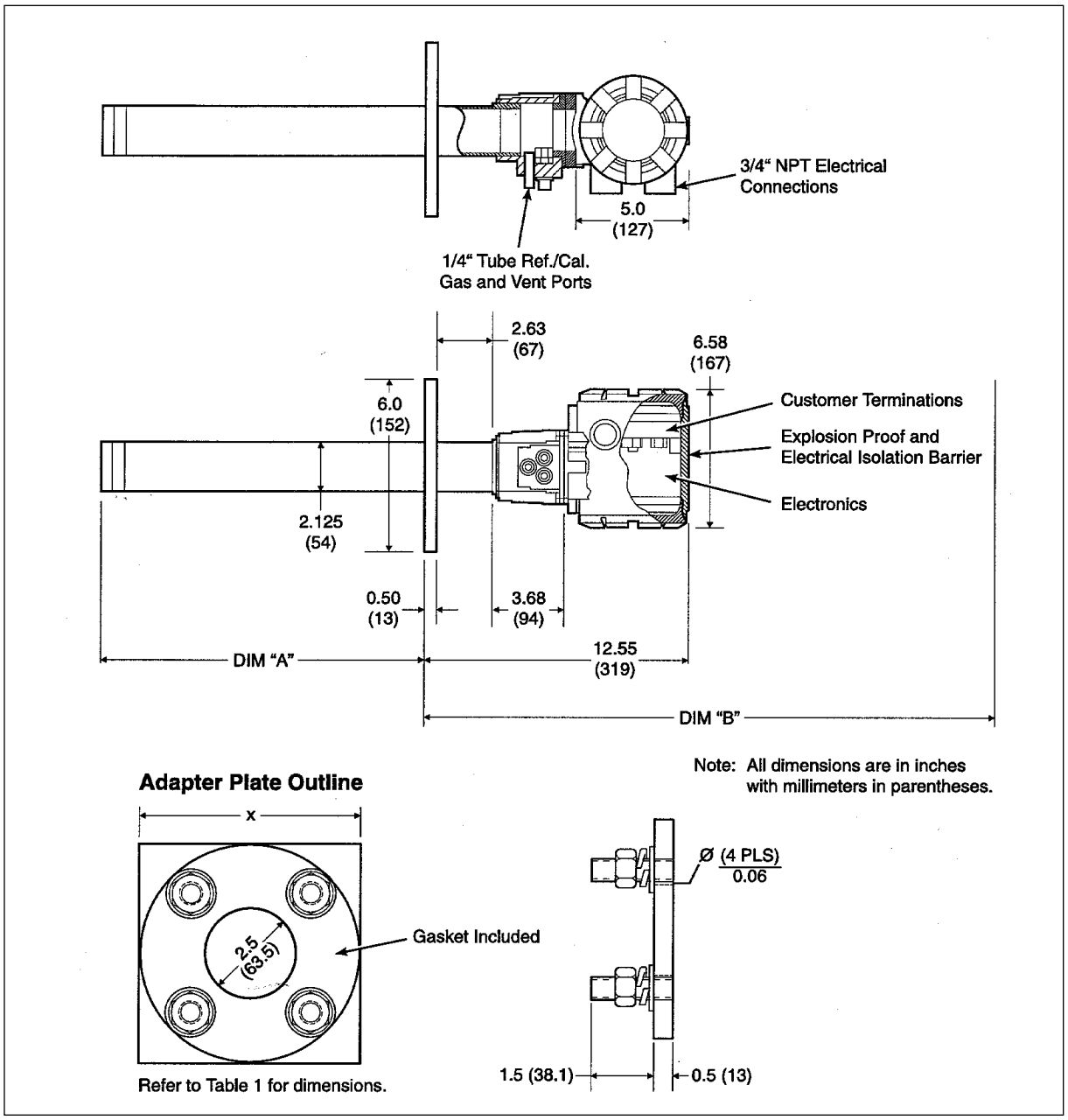


Table I. Mounting Plate

	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 2.00	M12 x 1.75
4 Studs Eq. Sp. on B.C.	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
9	12 Ft (3.66 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 Adaptor 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, IP66
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 3.5m (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 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.

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

Cont'd	1	1	00	02

[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	
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
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 an 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
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

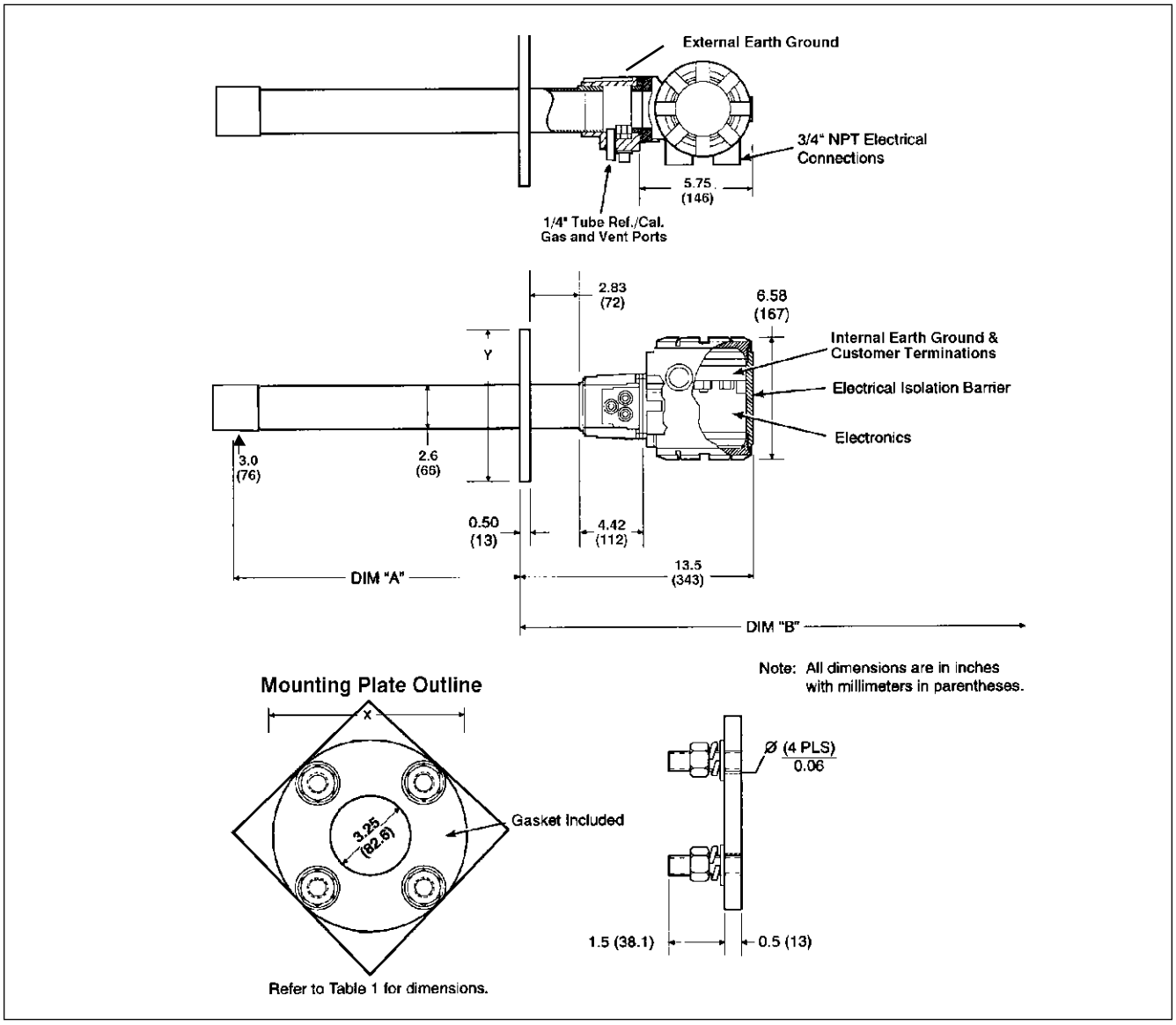


Table I. Mounting Plate		
	Dimensions Dia. in. (mm)	
	ANSI	DIN
Mtg. Plate (x)	7.75 (197)	8.5 (215)
Stud Size	5/8" -11	M16 x 2
4 Studs Eq. Sp. on B.C.	6.00 BC (152.4)BC	6.69 BC (170)BC
Flange (Y)	7.5 (190)	6.7 (170)

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)

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 Adaptor - Stack Side
0	No Adaptor Plate ("0" must also be chosen under "Mounting Adaptor - 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 Adaptor - Probe Side
0	No Adaptor 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, IP66
11	Standard Filtered Termination
12	Transient Protected Filtered Termination

Code	Operator Interface(3)
1	Membrane Keypad - Fieldbus

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

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

Cont'd)	Code	Termination Filtering
	00	No option - Specified as part of Electronic Housing

Code	Calibration Accessories	
00	No Hardware	
01	Cal/Ref Flowmeters & Ref 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 IIB + H2 T2/T6 (electronics)
20	CSA - Class I, Div. 1, Groups B, C & D T2/T6 (electronics)

Cont'd	00	01	10

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 ft. (2.74m) and 12 ft. (3.66m) 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
Fieldbus Communications (DeltaV).

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
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 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

FISHER-ROSEMOUNT™