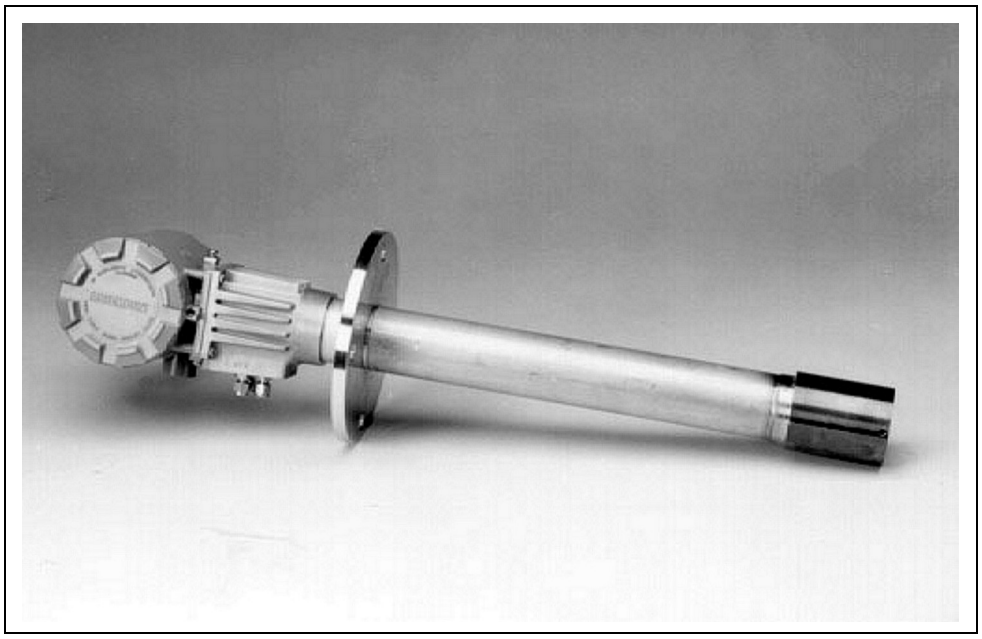
Instruction Manual
IB-106-340CDR Original Issue
January, 2002

Oxymitter DR

Hazardous Area In-Situ Oxygen Probe

Certified to: CENELEC EEXd IIB + H2 T3
CSA Class I, Division 1, Groups B, C, D



ROSEMOUNT® Analytical

EMERSON™ Process Management

http://www.processanalytic.com

ESSENTIAL INSTRUCTIONS
READ THIS PAGE BEFORE PROCEEDING!

Rosemount Analytical designs, manufactures and tests its products to meet many national and international standards. Because these instruments are sophisticated technical products, you **MUST properly install, use, and maintain them** to ensure they continue to operate within their normal specifications. The following instructions **MUST be adhered to** and integrated into your safety program when installing, using, and maintaining Rosemount Analytical products. Failure to follow the proper instructions may cause any one of the following situations to occur: Loss of life; personal injury; property damage; damage to this instrument; and warranty invalidation.

- **Read all instructions** prior to installing, operating, and servicing the product.
- If you do not understand any of the instructions, **contact your Rosemount Analytical representative** for clarification.
- **Follow all warnings, cautions, and instructions** marked on and supplied with the product.
- **Inform and educate your personnel in the proper installation, operation, and maintenance of the product**.
- **Install your equipment as specified in the Installation Instructions of the appropriate Instruction Manual and per applicable local and national codes**. Connect all products to the proper electrical and pressure sources.
- To ensure proper performance, **use qualified personnel** to install, operate, update, program, and maintain the product.
- When replacement parts are required, ensure that qualified people use replacement parts specified by Rosemount. Unauthorized parts and procedures can affect the product's performance, place the safe operation of your process at risk, **and VOID YOUR WARRANTY**. Look-alike substitutions may result in fire, electrical hazards, or improper operation.
- **Ensure that all equipment doors are closed and protective covers are in place, except when maintenance is being performed by qualified persons, to prevent electrical shock and personal injury**.

The information contained in this document is subject to change without notice.

Emerson Process Management

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PREFACE

The purpose of this manual is to provide information concerning the components, functions, installation and maintenance of the Hazardous Area Oxymitter DR.

Some sections may describe equipment not used in your configuration. The user should become thoroughly familiar with the operation of this module before operating it. Read this instruction manual completely.

DEFINITIONS

The following definitions apply to WARNINGS, CAUTIONS, and NOTES found throughout this publication.

WARNING

Highlights an operation or maintenance procedure, practice, condition, statement, etc. If not strictly observed, could result in injury, death, or long-term health hazards of personnel.

CAUTION

Highlights an operation or maintenance procedure, practice, condition, statement, etc. If not strictly observed, could result in damage to or destruction of equipment, or loss of effectiveness.

NOTE

Highlights an essential operating procedure, condition, or statement.

⏚ : EARTH (GROUND) TERMINAL

⏚ : PROTECTIVE CONDUCTOR TERMINAL

⚠ : RISK OF ELECTRICAL SHOCK

⚠ : WARNING: REFER TO INSTRUCTION BULLETIN

NOTE TO USERS

The number in the lower right corner of each illustration in this publication is a manual illustration number. It is not a part number, and is not related to the illustration in any technical manner.

IMPORTANT

SAFETY INSTRUCTIONS FOR THE WIRING AND INSTALLATION OF THIS APPARATUS

The following safety instructions apply specifically to all EU member states. They should be strictly adhered to in order to assure compliance with the Low Voltage Directive. Non-EU states should also comply with the following unless superseded by local or National Standards.

1. Adequate earth connections should be made to all earthing points, internal and external, where provided.

2. After installation or troubleshooting, all safety covers and safety grounds must be replaced. The integrity of all earth terminals must be maintained at all times.

3. Mains supply cords should comply with the requirements of IEC227 or IEC245.

4. All wiring shall be suitable for use in an ambient temperature of greater than 75°C.

5. All cable glands used should be of such internal dimensions as to provide adequate cable anchorage.

6. To ensure safe operation of this equipment, connection to the mains supply should only be made through a circuit breaker which will disconnect all circuits carrying conductors during a fault situation. The circuit breaker may also include a mechanically operated isolating switch. If not, then another means of disconnecting the equipment from the supply must be provided and clearly marked as such. Circuit breakers or switches must comply with a recognized standard such as IEC947. All wiring must conform with any local standards.

7. Where equipment or covers are marked with the symbol to the right, hazardous voltages are likely to be present beneath. These covers should only be removed when power is removed from the equipment — and then only by trained service personnel.

8. Where equipment or covers are marked with the symbol to the right, there is a danger from hot surfaces beneath. These covers should only be removed by trained service personnel when power is removed from the equipment. Certain surfaces may remain hot to the touch.

9. Where equipment or covers are marked with the symbol to the right, refer to the Operator Manual for instructions.

10. All graphical symbols used in this product are from one or more of the following standards: EN61010-1, IEC417, and ISO3864.

CERAMIC FIBER PRODUCTS
MATERIAL SAFETY DATA SHEET
JULY 1, 1996

SECTION I. IDENTIFICATION

PRODUCT NAME

Ceramic Fiber Heaters, Molded Insulation Modules and Ceramic Fiber Radiant Heater Panels.

CHEMICAL FAMILY

Vitreous Aluminosilicate Fibers with Silicon Dioxide.

CHEMICAL NAME

N.A.

CHEMICAL FORMULA

N.A.

MANUFACTURER'S NAME AND ADDRESS

Watlow Columbia
2101 Pennsylvania Drive
Columbia, MO 65202

573-474-9402
573-814-1300, ext. 5170

HEALTH HAZARD SUMMARY
WARNING

- Possible cancer hazard based on tests with laboratory animals.
- May be irritating to skin, eyes and respiratory tract.
- May be harmful if inhaled.
- Cristobalite (crystalline silica) formed at high temperatures (above 1800ºF) can cause severe respiratory disease.

SECTION II. PHYSICAL DATA

APPEARANCE AND ODOR

Cream to white colored fiber shapes. With or without optional white to gray granular surface coating and/or optional black surface coating.

SPECIFIC WEIGHT: 12-25 LB./CUBIC FOOT ***BOILING POINT: N.A.***

VOLATILES (% BY WT.): N.A. ***WATER SOLUBILITY: N.A.***

SECTION III. HAZARDOUS INGREDIENTS

MATERIAL, QUANTITY, AND THRESHOLD/EXPOSURE LIMIT VALUES

Aluminosilicate (vitreous) 99+ %	1 fiber/cc TWA
CAS. No. 142844-00-06	10 fibers/cc CL
Zirconium Silicate	0-10% 5 mg/cubic meter (TLV)
Black Surface Coating**	0 - 1% 5 mg/cubic meter (TLV)
Armorphous Silica/Silicon Dioxide	0-10% 20 mppcf (6 mg/cubic meter) PEL (OSHA 1978) 3 gm cubic meter (Respirable dust): 10 mg/cubic meter, Intended TLV (ACGIH 1984-85)

**Composition is a trade secret.

SECTION IV. FIRE AND EXPLOSION DATA

FLASH POINT: NONE ***FLAMMABILITY LIMITS: N.A.***

EXTINGUISHING MEDIA

Use extinguishing agent suitable for type of surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS / SPECIAL FIRE FIGHTING PROCEDURES

N.A.

SECTION V. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

(See Section III)

EFFECTS OF OVER EXPOSURE

EYE

Avoid contact with eyes. Slightly to moderately irritating. Abrasive action may cause damage to outer surface of eye.

INHALATION

May cause respiratory tract irritation. Repeated or prolonged breathing of particles of respirable size may cause inflammation of the lung leading to chest pain, difficult breathing, coughing and possible fibrotic change in the lung (Pneumoconiosis). Pre-existing medical conditions may be aggravated by exposure: specifically, bronchial hyper-reactivity and chronic bronchial or lung disease.

INGESTION

May cause gastrointestinal disturbances. Symptoms may include irritation and nausea, vomiting and diarrhea.

SKIN

Slightly to moderate irritating. May cause irritation and inflammation due to mechanical reaction to sharp, broken ends of fibers.

EXPOSURE TO USED CERAMIC FIBER PRODUCT

Product which has been in service at elevated temperatures (greater than 1800ºF/982ºC) may undergo partial conversion to cristobalite, a form of crystalline silica which can cause severe respiratory disease (Pneumoconiosis). The amount of cristobalite present will depend on the temperature and length of time in service. (See Section IX for permissible exposure levels).

SPECIAL TOXIC EFFECTS

The existing toxicology and epidemiology data bases for RCF's are still preliminary. Information will be updated as studies are completed and reviewed. The following is a review of the results to date:

EPIDEMIOLOGY

At this time there are no known published reports demonstrating negative health outcomes of workers exposed to refractory ceramic fiber (RCF). Epidemiologic investigations of RCF production workers are ongoing.

1) There is no evidence of any fibrotic lung disease (interstitial fibrosis) whatsoever on x-ray.
2) There is no evidence of any lung disease among those employees exposed to RCF that had never smoked.
3) A statistical "trend" was observed in the exposed population between the duration of exposure to RCF and a decrease in some measures of pulmonary function. These observations are clinically insignificant. In other words, if these observations were made on an individual employee, the results would be interpreted as being within the normal range.

4) Pleural plaques (thickening along the chest wall) have been observed in a small number of employees who had a long duration of employment. There are several occupational and non-occupational causes for pleural plaque. It should be noted that plaques are not "pre-cancer" nor are they associated with any measurable effect on lung function.

TOXICOLOGY

A number of studies on the health effects of inhalation exposure of rats and hamsters are available. Rats were exposed to RCF in a series of life-time nose-only inhalation studies. The animals were exposed to 30, 16, 9, and 3 mg/m^3, which corresponds with approximately 200, 150, 75, and 25 fibers/cc.

Animals exposed to 30 and 16 mg/m^3 were observed to have developed a pleural and parenchymal fibroses; animals exposed to 9 mg/m^3 had developed a mild parenchymal fibrosis; animals exposed to the lowest dose were found to have the response typically observed any time a material is inhaled into the deep lung. While a statistically significant increase in lung tumors was observed following exposure to the highest dose, there was no excess lung cancers at the other doses. Two rats exposed to 30 mg/m^3 and one rat exposed to 9 mg/m^3 developed masotheliomas.

The International Agency for Research on Cancer (IARC) reviewed the carcinogenicity data on man-made vitreous fibers (including ceramic fiber, glasswool, rockwool, and slagwool) in 1987. IARC classified ceramic fiber, fibrous glasswool and mineral wool (rockwool and slagwool) as possible human carcinogens (Group 2B).

EMERGENCY FIRST AID PROCEDURES

EYE CONTACT

Flush eyes immediately with large amounts of water for approximately 15 minutes. Eye lids should be held away from the eyeball to insure thorough rinsing. Do not rub eyes. Get medical attention if irritation persists.

INHALATION

Remove person from source of exposure and move to fresh air. Some people may be sensitive to fiber induced irritation of the respiratory tract. If symptoms such as shortness of breath, coughing, wheezing or chest pain develop, seek medical attention. If person experiences continued breathing difficulties, administer oxygen until medical assistance can be rendered.

INGESTION

Do not induce vomiting. Get medical attention if irritation persists.

SKIN CONTACT

Do not rub or scratch exposed skin. Wash area of contact thoroughly with soap and water. Using a skin cream or lotion after washing may be helpful. Get medical attention if irritation persists.

SECTION VI. REACTIVITY DATA

STABILITY/CONDITIONS TO AVOID

Stable under normal conditions of use.

HAZARDOUS POLYMERIZATION/CONDITIONS TO AVOID

N.A.

INCOMPATIBILITY/MATERIALS TO AVOID

Incompatible with hydrofluoric acid and concentrated alkali.

HAZARDOUS DECOMPOSITION PRODUCTS

N.A.

SECTION VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED

Where possible, use vacuum suction with HEPA filters to clean up spilled material. Use dust suppressant where sweeping if necessary. Avoid clean up procedure which may result in water pollution. (Observe Special Protection Information Section VIII.)

WASTE DISPOSAL METHODS

The transportation, treatment, and disposal of this waste material must be conducted in compliance with all applicable Federal, State, and Local regulations.

SECTION VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION

Use NIOSH or MSHA approved equipment when airborne exposure limits may be exceeded. NIOSH/MSHA approved breathing equipment may be required for non-routine and emergency use. (See Section IX for suitable equipment).

Pending the results of long term health effects studies, engineering control of airborne fibers to the lowest levels attainable is advised.

VENTILATION

Ventilation should be used whenever possible to control or reduce airborne concentrations of fiber and dust. Carbon monoxide, carbon dioxide, oxides of nitrogen, reactive hydrocarbons and a small amount of formaldehyde may accompany binder burn-off during first heat. Use adequate ventilation or other precautions to eliminate vapors resulting from binder burn-off. Exposure to burn-off fumes may cause respiratory tract irritation, bronchial hyper-reactivity and asthmatic response.

SKIN PROTECTION

Wear gloves, hats and full body clothing to prevent skin contact. Use separate lockers for work clothes to prevent fiber transfer to street clothes. Wash work clothes separately from other clothing and rinse washing machine thoroughly after use.

EYE PROTECTION

Wear safety glasses or chemical worker’s goggles to prevent eye contact. Do not wear contact lenses when working with this substance. Have eye baths readily available where eye contact can occur.

SECTION IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

General cleanliness should be followed.

The Toxicology data indicate that ceramic fiber should be handled with caution. The handling practices described in this MSDS must be strictly followed. In particular, when handling refractory ceramic fiber in any application, special caution should be taken to avoid unnecessary cutting and tearing of the material to minimize generation of airborne dust.

It is recommended that full body clothing be worn to reduce the potential for skin irritation. Washable or disposable clothing may be used. Do not take unwashed work clothing home. Work clothes should be washed separately from other clothing. Rinse washing machine thoroughly after use. If clothing is to be laundered by someone else, inform launderer of proper procedure. Work clothes and street clothes should be kept separate to prevent contamination.

Product which has been in service at elevated temperatures (greater than 1800ºF/982ºC) may undergo partial conversion to cristobalite, a form of crystalline silica. This reaction occurs at the furnace lining hot face. As a consequence, this material becomes more friable; special caution must be taken to minimize generation of airborne dust. The amount of cristobalite present will depend on the temperature and length in service.

IARC has recently reviewed the animal, human, and other relevant experimental data on silica in order to critically evaluate and classify the cancer causing potential. Based on its review, IARC classified crystalline silica as a group 2A carcinogen (probable human carcinogen).

The OSHA permissible exposure limit (PEL for cristobalite is 0.05 mg/m^3 (respirable dust). The ACGIH threshold limit value (TLV) for cristobalite is 0.05 mg/m^3 (respirable dust) (ACGIH 1991-92). Use NIOSH or MSHA approved equipment when airborne exposure limits may be exceeded. The minimum respiratory protection recommended for given airborne fiber or cristobalite concentrations are:

CONCENTRATION

0-1 fiber/cc or 0-0.05 mg/m^3 cristobalite (the OSHA PEL)	Optional disposable dust respirator (e.g. 3M 9970 or equivalent).
Up to 5 fibers/cc or up to 10 times the OSHA PEL for cristobalite	Half face, air-purifying respirator equipped with high efficiency particulate air (HEPA) filter cartridges (e.g. 3M 6000 series with 2040 filter or equivalent).
Up to 25 fibers/cc or 50 times the OSHA PEL for cristobalite (2.5 mg/m^3)	Full face, air-purifying respirator with high efficiency particulate air (HEPA) filter cartridges (e.g. 3M 7800S with 7255 filters or equivalent) or powered air -purifying respirator (PARR) equipped with HEPA filter cartridges (e.g. 3M W3265S with W3267 filters or equivalent).
Greater than 25 fibers/cc or 50 times the OSHA PEL for cristobalite (2.5 mg/m^3)	Full face, positive pressure supplied air respirator (e.g. 3M 7800S with W9435 hose & W3196 low pressure regulator kit connected to clean air supply or equivalent).

If airborne fiber or cristobalite concentrations are not known, as minimum protection, use NIOSH/MSHA approved half face, air-purifying respirator with HEPA filter cartridges.

Insulation surface should be lightly sprayed with water before removal to suppress airborne dust. As water evaporates during removal, additional water should be sprayed on surfaces as needed. Only enough water should be sprayed to suppress dust so that water does not run onto the floor of the work area. To aid the wetting process, a surfactant can be used.

After RCF removal is completed, dust-suppressing cleaning methods, such as wet sweeping or vacuuming, should be used to clean the work area. If dry vacuuming is used, the vacuum must be equipped with HEPA filter. Air blowing or dry sweeping should not be used. Dust-suppressing components can be used to clean up light dust.

Product packaging may contain product residue. Do not reuse except to reship or return Ceramic Fiber products to the factory.

Technical Support Hotline:

For assistance with technical problems, please call the Customer Support Center (CSC). The CSC is staffed 24 hours a day, 7 days a week.

Phone: 1-800-433-6076

In addition to the CSC, you may also contact Field Watch. Field Watch coordinates Rosemount's field service throughout the U.S. and abroad.

Phone: 1-800-654-RSMT (1-800-654-7768)

Rosemount may also be reached via the Internet through e-mail and the World Wide Web:

e-mail: GAS.CSC@frco.com
World Wide Web: www.processanalytic.com

SECTION 1
DESCRIPTION AND SPECIFICATIONS

1-1 COMPONENT CHECKLIST OF TYPICAL SYSTEM (PACKAGE CONTENTS)

A typical Rosemount Hazardous Area Oxymitter DR In-Situ Oxygen Probe should contain the items shown in Figure 1-1. Record the part number, serial number, and order number for each component of your system in the table located on the back cover of this manual.

WARNING

The Oxymitter DR is offered in both hazardous and general purpose configurations. The hazardous area version has the "EX" and CSA symbols on the apparatus approval label. The general purpose version does not have an approval label. If you received the general purpose version, ensure you do not install it in a potentially explosive atmosphere.

Also, use the product matrix in Table 1-1 at the end of this section to compare your order number against your unit. The first part of the matrix defines the model. The last part defines the various options and features of the Hazardous Area Oxymitter DR. Ensure the features and options specified by your order number are on or included with the unit.

1-2 SYSTEM OVERVIEW

a. Scope

This Instruction Bulletin is designed to supply details needed to install, start up, operate, and maintain the Hazardous Area Oxymitter DR. The Hazardous Area Direct Replacement Oxymitter can be interfaced to a number of different earlier model electronics packages. These electronic packages are not covered in this manual. For specification information concerning calibration and operation of the system, refer to the Instruction Bulletin applicable to your electronics.

b. System Description

The Hazardous Area Oxymitter DR is designed to measure the net concentration of oxygen in an industrial combustion process; i.e., the oxygen remaining after all fuels have been oxidized. The probe is permanently positioned within an exhaust duct or stack and performs its task without the use of a sampling system.

The equipment measures oxygen percentage by reading the voltage developed across a heated electrochemical cell, which consists of a small yttria-stabilized, zirconia disc. Both sides of the disc are coated with porous metal electrodes. When operated at the proper temperature, the millivolt output voltage of the cell is given by the following Nernst equation:

$$EMF = KT \log_{10}(P_1/P_2) + C$$

Where:

1. P_2 is the partial pressure of the oxygen in the measured gas on one side of the cell.
2. P_1 is the partial pressure of the oxygen in the reference air on the opposite side of the cell.
3. T is the absolute temperature.
4. C is the cell constant.
5. K is an arithmetic constant.

When the cell is at operating temperature and there are unequal oxygen concentrations across the cell, oxygen ions will travel from the high oxygen partial pressure side to the low oxygen partial pressure side of the cell. The resulting logarithmic output voltage is approximately 50 mV per decade. The output is proportional to the inverse logarithm of the oxygen concentration. Therefore, the output signal increases as the oxygen concentration of the sample gas decreases. This characteristic enables the Hazardous Area Oxymitter DR to provide exceptional sensitivity at low oxygen concentrations.

The Hazardous Area Oxymitter DR measures net oxygen concentration in the presence of all the products of combustion, including water vapor. Therefore, it may be considered an analysis on a “wet” basis. In comparison with older methods, such as the portable apparatus, which provides an analysis on a “dry” gas basis, the “wet” analysis will, in general, indicate a lower percentage of oxygen. The difference will be proportional to the water content of the sampled gas stream.

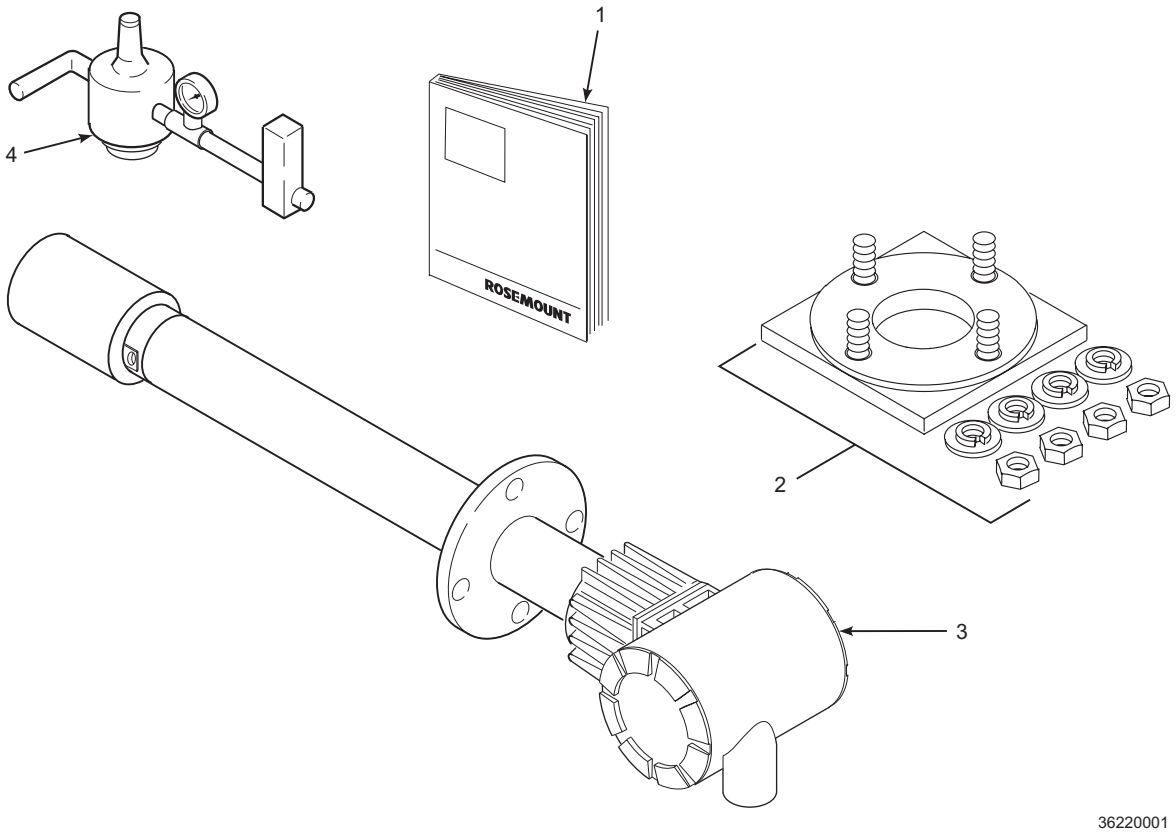
c. System Configuration

Hazardous Area Oxymitter DR units are available in three length options, giving the user the flexibility to use an in situ penetration appropriate to the size of the stack or duct. The options on length are 457 mm (18 in.), 0.91 m (3 ft), 1.83 m (6 ft).

Abrasive shields are offered for applications where abrasive particulates are present. Acid resistant cells are available for SO_2 and HCl environments. Bypass and probe mounting jacket options are available for process temperatures above 1300°F (705°C).

d. System Features

1. The cell output voltage and sensitivity increase as the oxygen concentration decreases.
2. Field replaceable cell, heater, thermocouple, and diffusion element.
3. The Hazardous Area Oxymitter DR is constructed of rugged 316L stainless steel for all wetted parts.



1. Instruction Bulletin
2. Adapter Plate with Mounting Hardware and Gasket
3. Hazardous Area Oxymitter DR
4. Reference Air Set

Figure 1-1. Typical System Package

e. Handling the Hazardous Area Oxymitter DR

CAUTION

The Hazardous Area Oxymitter DR is designed for industrial applications. Treat each component of the system with care to avoid physical damage. Some probe components are made from ceramics, which are susceptible to shock when mishandled.

f. System Considerations

Prior to installing your Hazardous Area Oxymitter DR, make sure you have all the components necessary to make the system installation. Ensure all the components are properly integrated to make the system functional.

NOTE

Retain the packaging in which the Hazardous Area Oxymitter DR arrived from the factory in case any components are to be shipped to another site. This packaging has been designed to protect the product.

After verifying that you have all the components, select mounting locations and determine how each component will be placed in terms of available line voltage, ambient temperatures, environmental considerations, convenience, and serviceability. A typical system installation is illustrated in Figure 1-2.

Instrument air for reference is optional for most applications. Ambient air will passively diffuse into the inside of the probe in sufficient quantity for an accurate measurement. Instrument air is required for applications where the ambient air at the probe location may not contain the typical 20.95% O_2. An example would be an installation into a positive pressure flue gas duct which has many leaks into the surrounding air.

If the calibration gas bottles will be permanently connected, a blocking valve or check valve is required next to the calibration fittings on the termination housing.

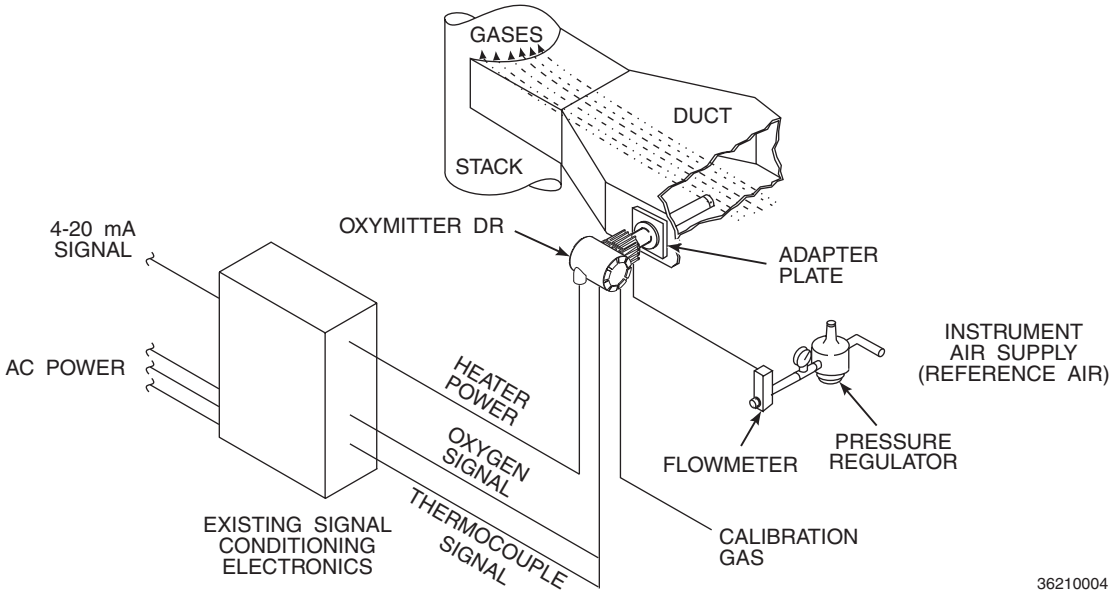


Figure 1-2. Typical System Installation

This check valve or blocking valve is to prevent breathing of the calibration gas line and subsequent flue gas condensation and corrosion.

g. Upgrading the Hazardous Area Oxymitter DR

The Hazardous Area Oxymitter DR can be easily upgraded to a full Oxymitter 4000 or 5000. This provides an economical upgrade path for users looking to preserve their probe investment upon the eventual failure of the signal conditioning electronics. Upgrading the Hazardous Area Oxymitter DR to a full Oxymitter 4000 or 5000 requires only the addition of a small electronics package to the existing termination housing of the Hazardous Area Oxymitter DR probe. The converted unit will be a full Oxymitter 4000 or 5000 Oxygen Transmitter with the capability of providing a 4-20 mA oxygen signal without the need for an external signal conditioning electronics package. HART or Fieldbus communications are provided with the Oxymitter electronics. See Appendix A for upgrade information.

1-3 PROBE OPTIONS

a. Abrasive Shield Assembly

The abrasive shield assembly, Figure 1-5, is a stainless-steel tube that surrounds the probe assembly. The shield protects against particle abrasion and condensations, provides a guide for ease of insertion, and acts as a position support, especially for longer probes. The abrasive shield assembly uses a modified diffusor and vee deflector assembly, fitted with dual dust seal packing.

b. Flame Arrestor Ceramic Diffusion Assembly

The flame arrestor ceramic diffusion assembly, Figure 1-3, includes a set of baffles between the cell and the stack gases. This keeps 816°C (1500°F) cell temperatures from igniting unburned fuel in the stack. The ceramic diffusion assembly is also available with a dust seal for use with the abrasive shield assembly.

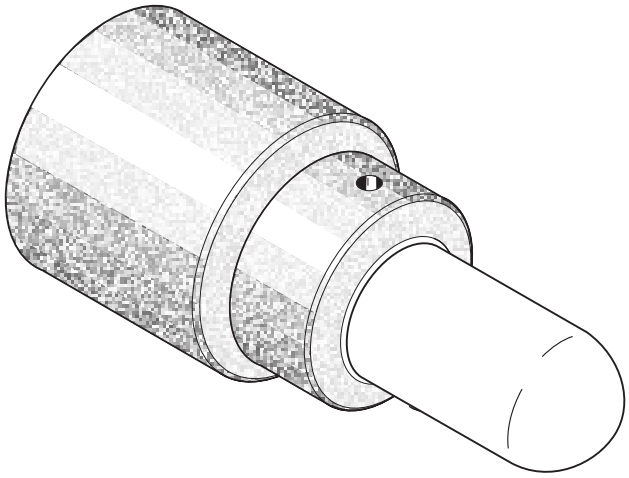


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Figure 1-3. Flame Arrestor Diffusion Assembly

c. Flame Arrestor Snubber Diffusion Assembly

The snubber diffusion assembly, Figure 1-4, is satisfactory for most applications. This element is also available with a dust seal for use with an abrasive shield.

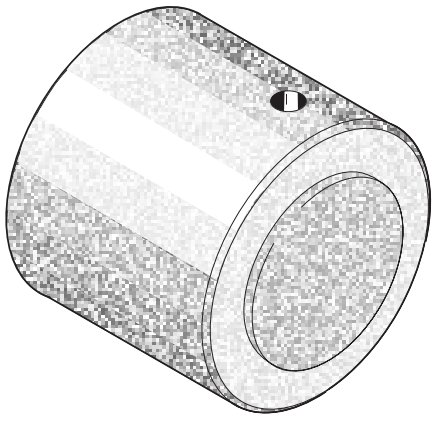

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Figure 1-4. Flame Arrestor Snubber Diffusion Assembly

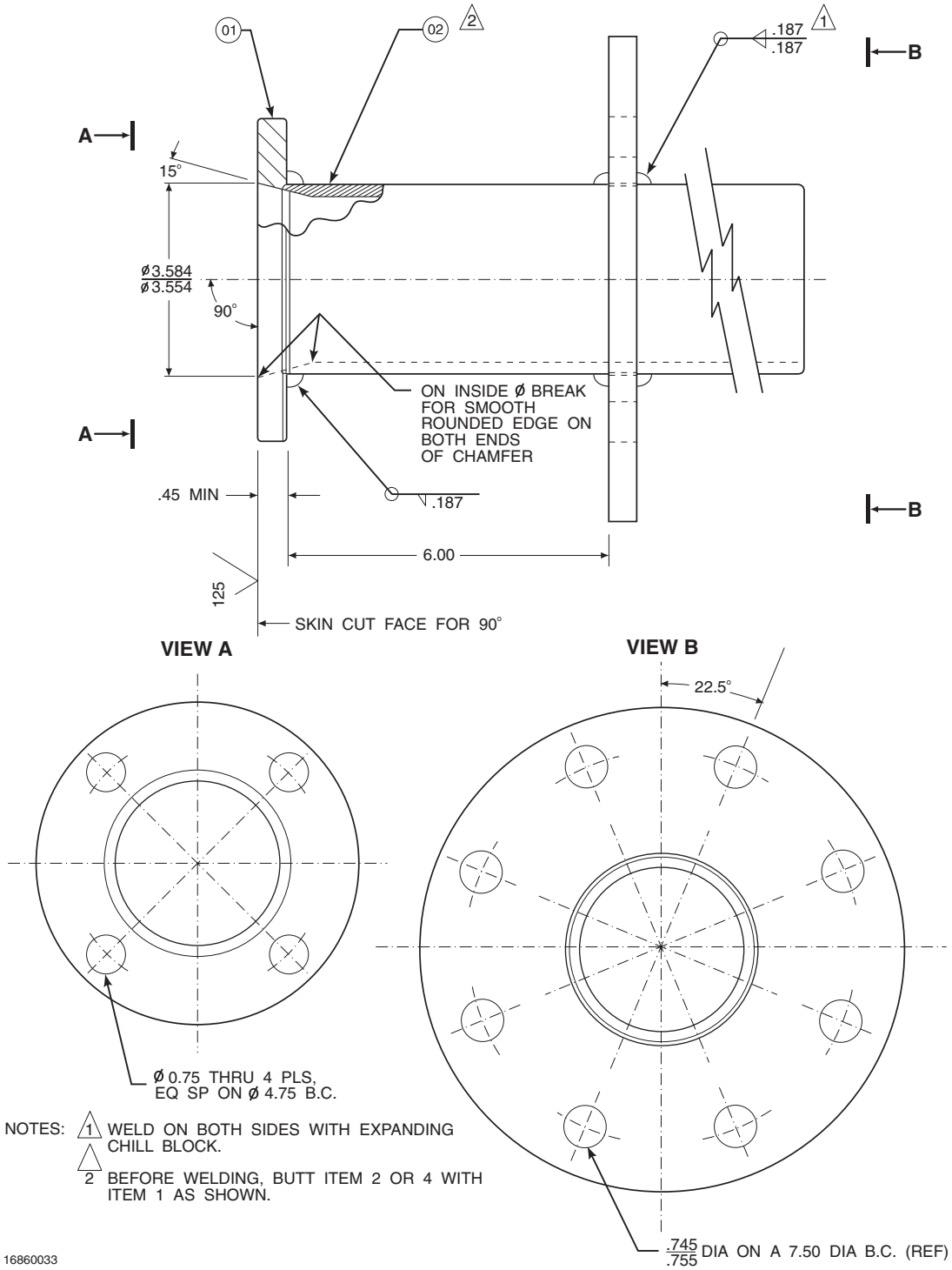


Figure 1-5. Abrasive Shield Assembly

NOTE

In highly abrasive applications, rotate the shield 90 degrees at normal service intervals to present a new wear surface to the abrasive flow stream.

1-4 SPECIFICATIONS

Hazardous Area Certifications	CENELEC EEXd IIB + H2 T3 CSA Class I, Division 1, Groups B, C, D
Probe Lengths	18 in. (457 mm) 3 ft (0.91 m) 6 ft (1.83 m)
Temperature Limits in Process Measurement Area	0° to 704°C (32° to 1300°F) up to 1300°C (2400°F) with optional accessories
Resolution Sensitivity	0.01% O_2 transmitted signal
Sensing Cell Repeatability	±0.75% of O_2 reading, or 0.05% O_2
System Response to Calibration Gas	Initial response in less than 3 seconds T90 in less than 8 seconds
Resolution Sensitivity	0.01% of O_2 value
Mounting and Mounting Position	Vertical or horizontal
Materials:	
Probe	Wetted or welded parts - 316L stainless steel Non-wetted parts - 304 stainless steel, low-copper aluminum
Termination Housing	Low-copper aluminum
Calibration Gas Mixtures Recommended	0.4% O_2, Balance N_2 8% O_2, Balance N_2
Calibration Gas Flow	2.5 l/m (5 scfh)
Optional Reference Air	1 l/m (2 scfh), clean, dry, instrument-quality air (20.95% O_2), regulated to 34 kPa (5 psi), Optional
Heater Voltage	115 ±10% VAC, 50/60 Hz., 200VA
Thermocouple	Type K
Power Requirements:	
Nominal	175 W
Maximum	500 W
Ambient Operating Temperature (Junction Box)	93°C (200°F) [71°C (160°F) max for YEW replacement]

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

Table 1-1. Product Matrix

OXT4ACDR	Explosion Proof Oxymitter DR In Situ Oxygen Transmitter

Explosion Proof Exchange Probe - Instruction Book

Code	Sensing Probe Type
1	Ceramic Diffusion Element Probe (ANSI 3 in. 150 lbs)
2	Snubber Diffusion Element Probe (ANSI 3 in. 150 lbs)
3	Ceramic Diffusion Element Probe (DIN 2572) - 1/4 in. Tube Fittings
4	Snubber Diffusion Element Probe (DIN 2572) - 1/4 in. Tube Fittings
5	Ceramic Diffusion Element Probe (JIS)
6	Snubber Diffusion Element Probe (JIS)

Code	Probe Assembly
0	18 in. (457 mm) Probe
1	18 in. (457 mm) Probe with 3 ft (0.91 m) Bypass
2	18 in. (457 mm) Probe with Abrasive Shield(1)
3	3 ft (0.91 m) Probe
4	3 ft (0.91 m) Probe with Abrasive Shield(1)
5	6 ft (1.83 m) Probe
6	6 ft (1.83 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	Competitor’s Mount(2)

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

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

OXT4ADR	3	2	1	1	11	Example

HIGH SULFUR SERVICE
For high sulfur applications, please add an additional line item to your purchase order requesting high sulfur cell part number 4847B63G02 in lieu of the standard ZrO_2 cell.

Cell replacement kits for high sulfur service are also available.

NOTES:
(1) Recommended usages: High velocity particulates in flue stream, installation within 11.5 ft (3.5 m) of soot blowers or heavy salt cake buildup. Applications: Pulverized coal, recovery boilers, lime kiln.

(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.

Table 1-2. Calibration Components

Part Number	Description
1A99119G01	Two disposable calibration gas bottles — 0.4% and 8% O_2, balance nitrogen — 550 liters each*
1A99119G02	Two flow regulators for calibration gas bottles
1A99119G03	Bottle rack

*Calibration gas bottles cannot be shipped via airfreight.

SECTION 2
INSTALLATION

WARNING

The Hazardous Area Oxymitter DR and probe abrasive shield are heavy. Use proper lifting and carrying procedures to avoid personal injury.

WARNING

Before installing this equipment, read the "Safety instructions for the wiring and installation of this apparatus" at the front of this Instruction Bulletin. Failure to follow safety instructions could result in serious injury or death.

2-1 MECHANICAL INSTALLATION

If the probe will be installed into an existing location, proceed to paragraph 2-1b.

a. Selecting Location

1. The location of the Hazardous Area Oxymitter DR in the stack or flue is most important for maximum accuracy in the oxygen analyzing process. The Hazardous Area Oxymitter DR must be positioned so the gas it measures is representative of the process. Best results are normally obtained if the Hazardous Area Oxymitter DR is positioned near the center of the duct (40-60% insertion).

2. Longer ducts may require several Hazardous Area Oxymitter DR units since the O_2 can vary due to stratification.

3. A point too near the wall of the duct, or the inside radius of a bend, may not provide a representative sample because of the very low flow conditions.

4. The sensing point should be selected so the process gas temperature falls within a range of 0° to 704°C (32° to 1300°F). Figure 2-1 through Figure 2-4 provide mechanical installation references. The ambient temperature of the termination housing must not exceed 65°C (149°F).

5. Ducts and stacks that operate under negative pressure will draw air in through any holes or torn seals, substantially affecting the oxygen reading. Therefore, either make the necessary repairs or install the Hazardous Area Oxymitter DR upstream of any leakage.

6. Ensure the area is clear of internal and external obstructions that will interfere with installation and maintenance. Allow adequate clearance for removal of the Hazardous Area Oxymitter DR (Figure 2-1).

b. Installation

1. Ensure all components are available to install the Hazardous Area Oxymitter DR. If equipped with the optional ceramic diffusion element, ensure it is not damaged.

2. The Hazardous Area Oxymitter DR may be installed intact as it is received.

NOTE

An abrasive shield is recommended for high velocity particulate in the flue stream (such as those in coal-fired boilers, kilns, and recovery boilers).

3. Weld or bolt adapter plate (Figure 2-4) onto the duct.

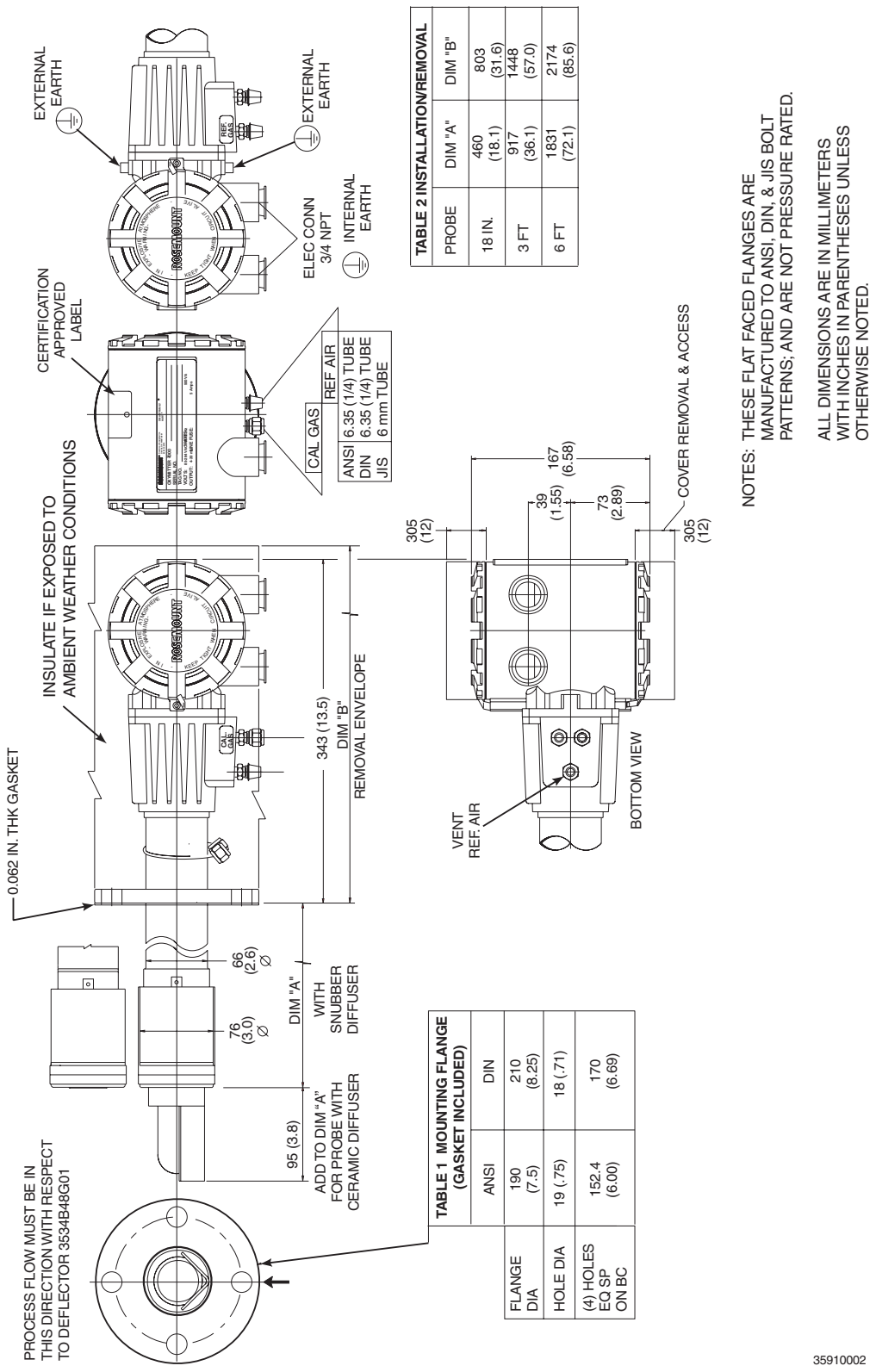


TABLE 2 INSTALLATION/REMOVAL

PROBE	DIM "A"	DIM "B"
18 IN.	460 (18.1)	803 (31.6)
3 FT	917 (36.1)	1448 (57.0)
6 FT	1831 (72.1)	2174 (85.6)

TABLE 1 MOUNTING FLANGE (GASKET INCLUDED)

	ANSI	DIN
FLANGE DIA	190 (7.5)	210 (8.25)
HOLE DIA	19 (.75)	18 (.71)
(4) HOLES EQ SP ON BC	152.4 (6.00)	170 (6.69)

Figure 2-1. Hazardous Area Oxymitter DR Installation

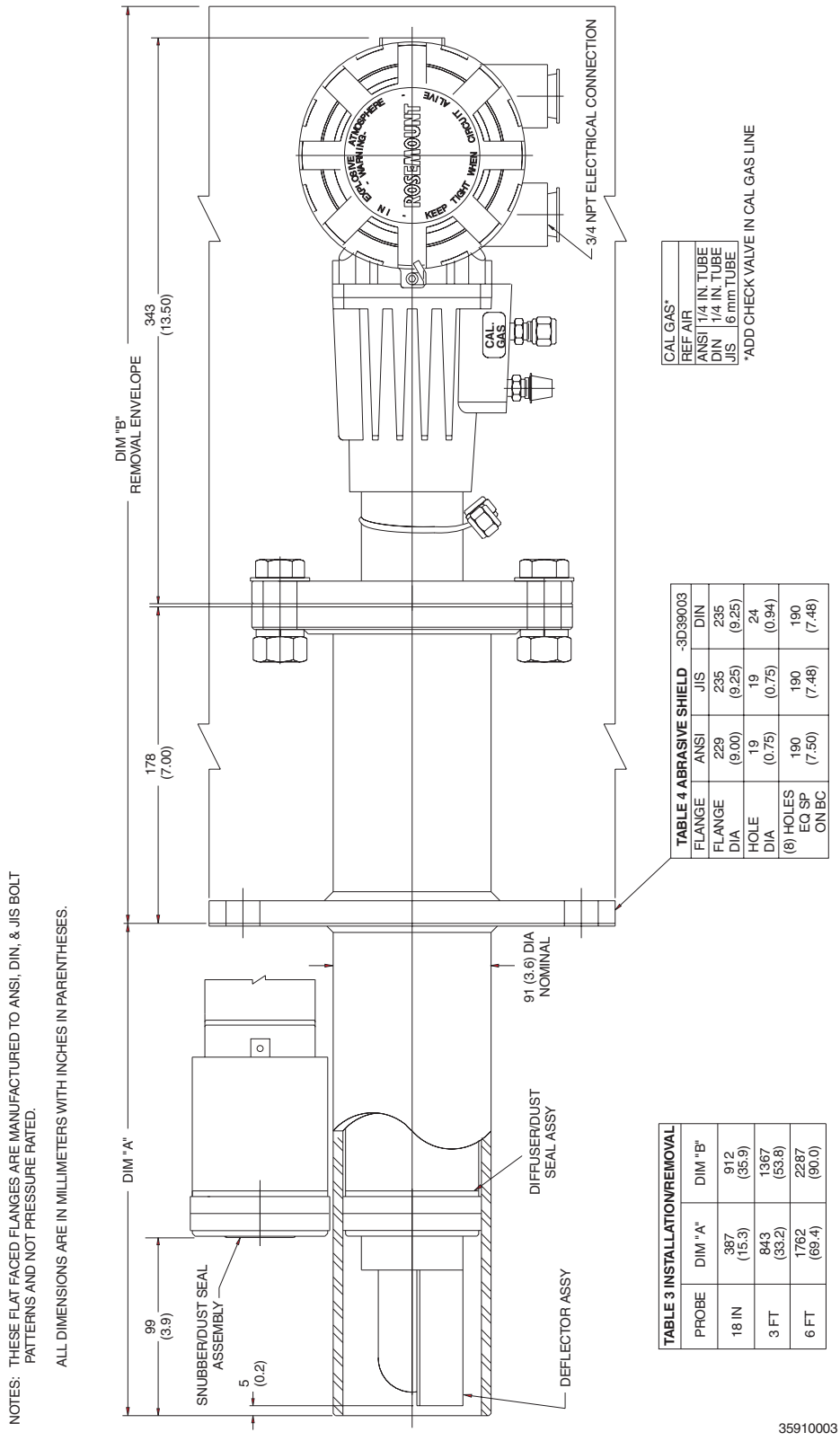


TABLE 4 ABRASIVE SHIELD -3D39003			
FLANGE	ANSI	JIS	DIN
FLANGE DIA	229 (9.00)	235 (9.25)	235 (9.25)
HOLE DIA	19 (0.75)	19 (0.75)	24 (0.94)
(8) HOLES EQ SP ON BC	190 (7.50)	190 (7.48)	190 (7.48)

TABLE 3 INSTALLATION/REMOVAL		
PROBE	DIM "A"	DIM "B"
18 IN	387 (15.3)	912 (35.9)
3 FT	843 (33.2)	1367 (53.8)
6 FT	1762 (69.4)	2287 (90.0)

NOTES: THESE FLAT FACED FLANGES ARE MANUFACTURED TO ANSI, DIN, & JIS BOLT PATTERNS AND NOT PRESSURE RATED.
ALL DIMENSIONS ARE IN MILLIMETERS WITH INCHES IN PARENTHESES.

Figure 2-2. Hazardous Area Oxymitter DR with Abrasive Shield

MOUNTING PLATE OUTLINE

TABLE V. MOUNTING PLATE DIMENSIONS FOR HAZARDOUS AREA OXYMITTER DR		
DIMENSIONS MM (in.)	ANSI	DIN
"A"	197 (7.75)	216 (8.50)
"B" STUD SIZE	0.625-11	M16 x 2
"C" DIA B.C.	152.4 (6.00)	170.0 (6.69)

TABLE VI. MOUNTING PLATE DIMENSIONS FOR HAZARDOUS AREA OXYMITTER 4000 WITH ABRASIVE SHIELD			
DIMENSIONS MM (in.)	ANSI	DIN	JIS
"A"	229 (9.00)	235 (9.25)	235 (9.25)
"B" DIA	121 (4.75)	100 (3.94)	125 (4.92)
"C" THREAD	0.625-11	M20 x 2.5	M16 x 2
"D" DIA B.C.	191 (7.50)	190 (7.48)	200 (7.89)

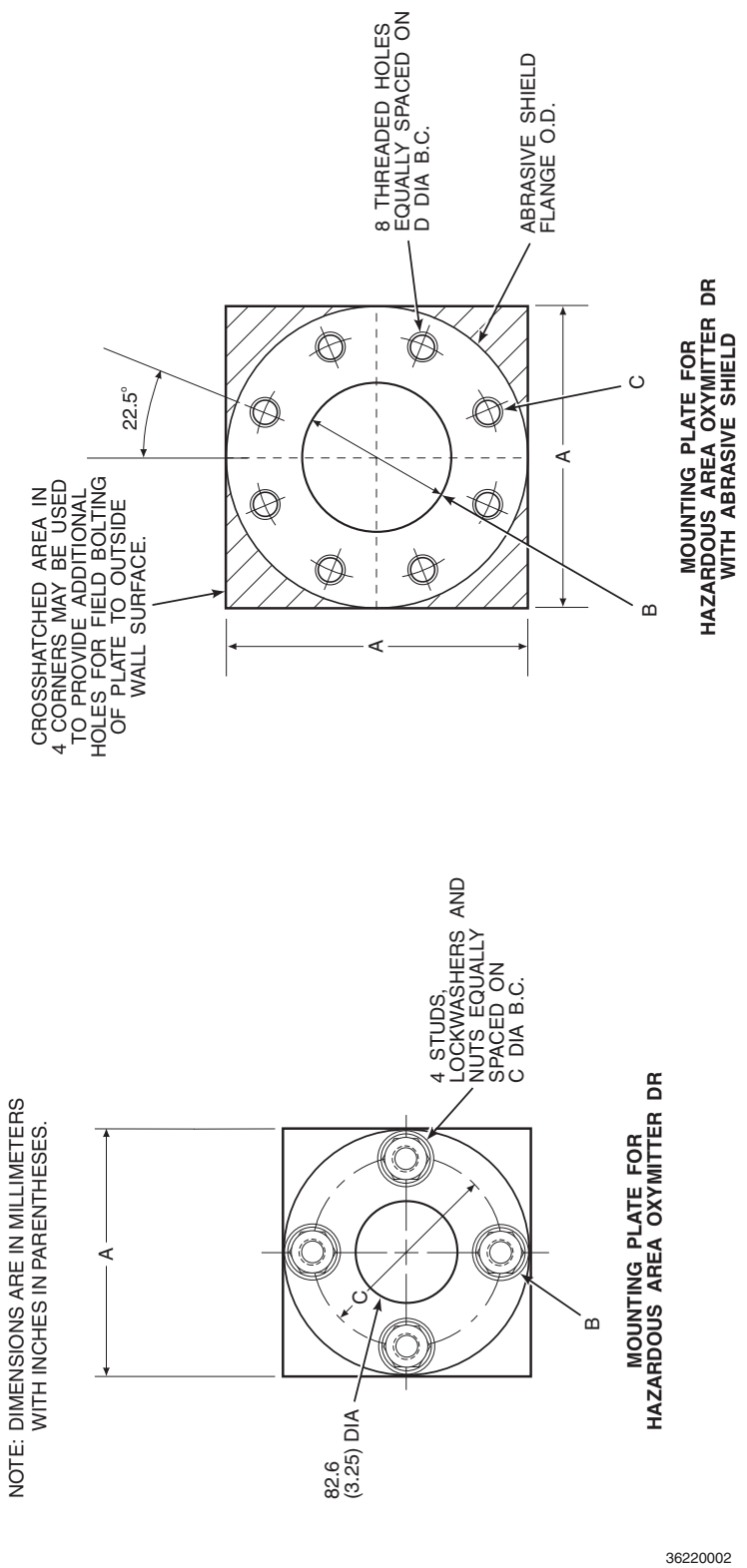
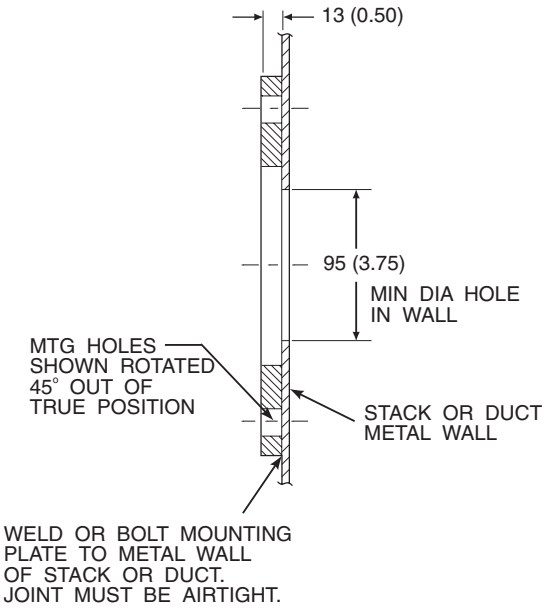


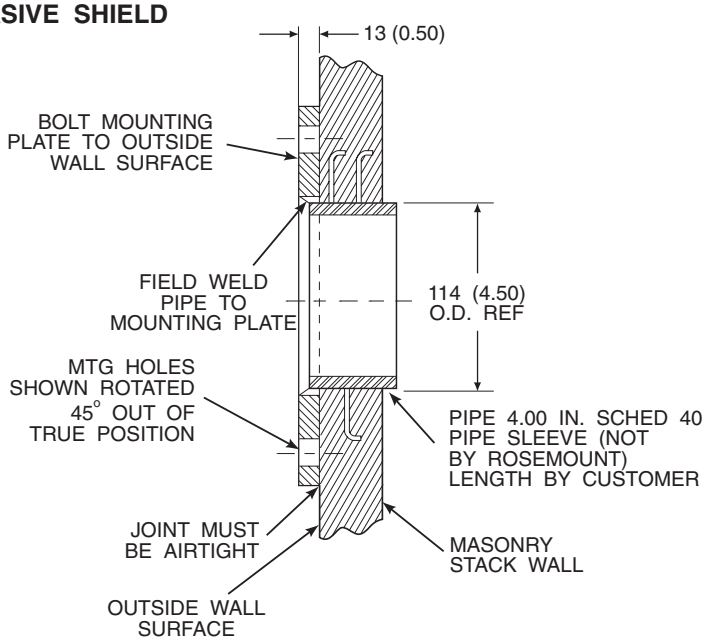
Figure 2-3. Hazardous Area Oxymitter DR Adapter Plate Dimensions

INSTALLATION FOR METAL WALL STACK OR DUCT CONSTRUCTION

INSTALLATION FOR MASONRY WALL STACK CONSTRUCTION

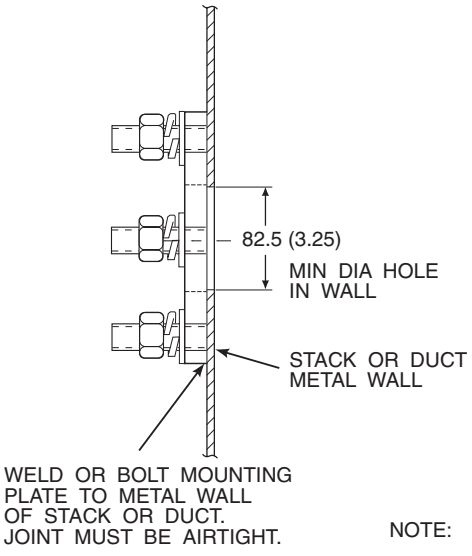
WITH ABRASIVE SHIELD

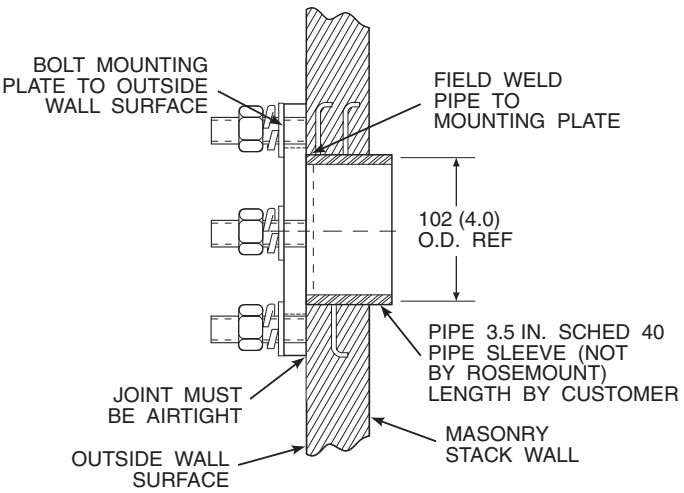




NOTE: ALL MASONRY STACK WORK AND JOINTS EXCEPT ADAPTOR PLATE NOT FURNISHED BY ROSEMOUNT.

WITHOUT ABRASIVE SHIELD





NOTE: DIMENSIONS IN MILLIMETERS WITH INCHES IN PARENTHESES.

36220007

Figure 2-4. Hazardous Area Oxymitter DR Adapter Plate Installation

4. If using the optional ceramic diffusion element, the vee deflector must be correctly oriented. Before inserting the Hazardous Area Oxymitter DR, check the direction of gas flow in the duct. Orient the vee deflector so the apex points upstream toward the flow (Figure 2-5). This may be done by loosening the setscrews and rotating the vee deflector to the desired position. Retighten the setscrews.

5. In vertical installations, ensure the system cable drops vertically from the Hazardous Area Oxymitter DR and the conduit is routed below the level of the termination housing. This drip loop minimizes the possibility that moisture will damage the electrical connections (Figure 2-6).

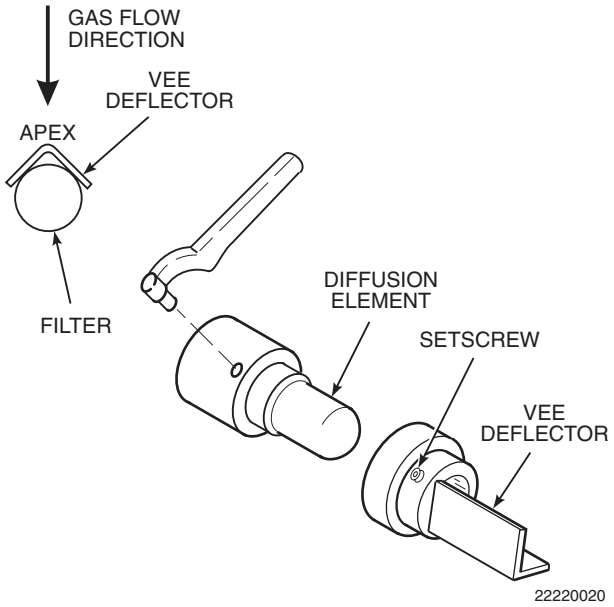


Figure 2-5. Orienting the Optional Vee Deflector

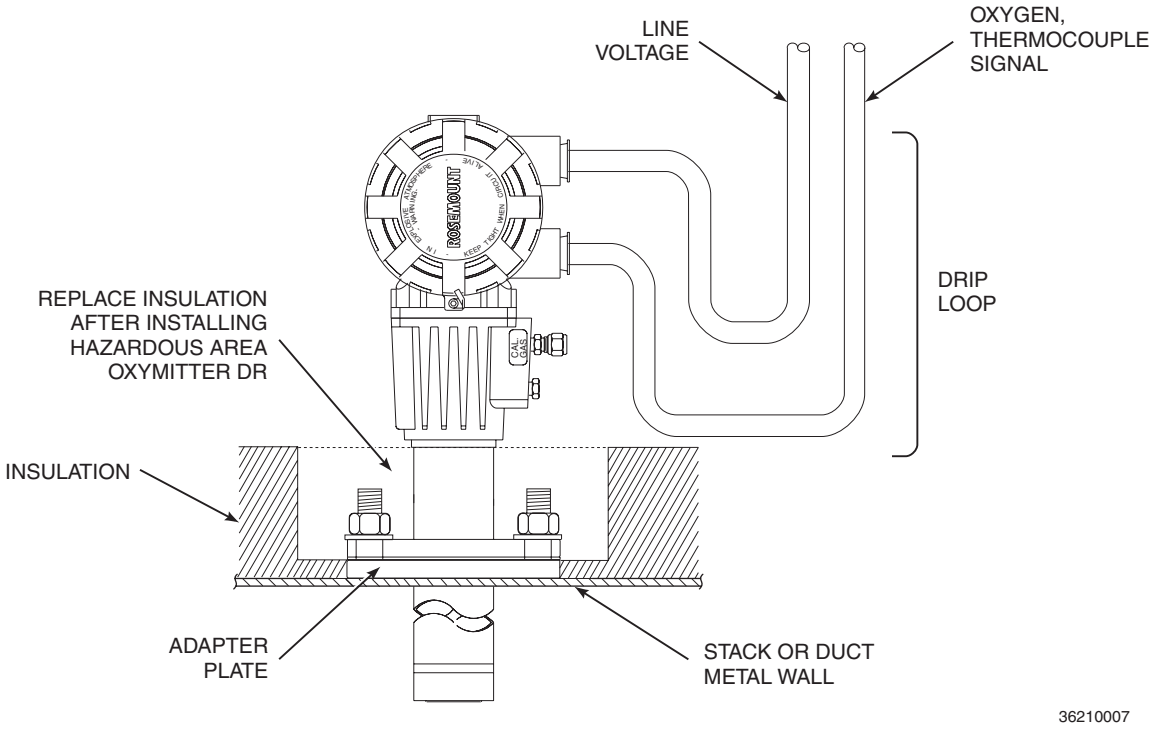


Figure 2-6. Installation with Drip Loop and Insulation Removal

6. If the system has an abrasive shield, check the dust seal gaskets. The joints in the two gaskets must be staggered 180°. Also, make sure the gaskets are in the hub grooves as the Hazardous Area Oxymitter DR slides into the 15° chamfer in the abrasive shield.

NOTE

If process temperatures will exceed 200°C (392°F), use anti-seize compound on stud threads to ease future removal of Oxymitter DR.

7. Insert probe through the opening in the mounting flange and bolt the unit to the flange.

NOTE

To maintain CE compliance, ensure a good connection exists between the mounting plate studs or earthing screws on termination housing and earth.

8. Ensure the Hazardous Area Oxymitter DR is properly earthed by way of both internal and external points.

9. If insulation is being removed to access the duct work for Hazardous Area Oxymitter DR mounting, make sure the insulation is replaced afterward (Figure 2-6).

10. Ensure the installation does not obscure the messages on either housing cover.

2-2 ELECTRICAL INSTALLATION

All wiring must conform to local and national codes.

WARNING

Disconnect and lock out power before connecting the unit to the power supply.

WARNING

Install all protective equipment covers and safety ground leads after installation. Failure to install covers and ground leads could result in serious injury or death.

WARNING

To meet the Safety Requirements of IEC 1010 (EC requirement), and ensure safe operation of this equipment, connection to the main electrical power supply must be made through a circuit breaker (min 10 A) which will disconnect all current-carrying conductors during a fault situation. This circuit breaker should also include a mechanically operated isolating switch. If not, then another external means of disconnecting the supply from the equipment should be located close by. Circuit breakers or switches must comply with a recognized standard such as IEC 947.

WARNING

The Hazardous Area Oxymitter DR and probe abrasive shield are heavy. Use proper lifting and carrying procedures to avoid personal injury.

a. Remove screw (11, Figure 4-1), captive washer (13), and cover lock (12). Remove left housing cover (10).

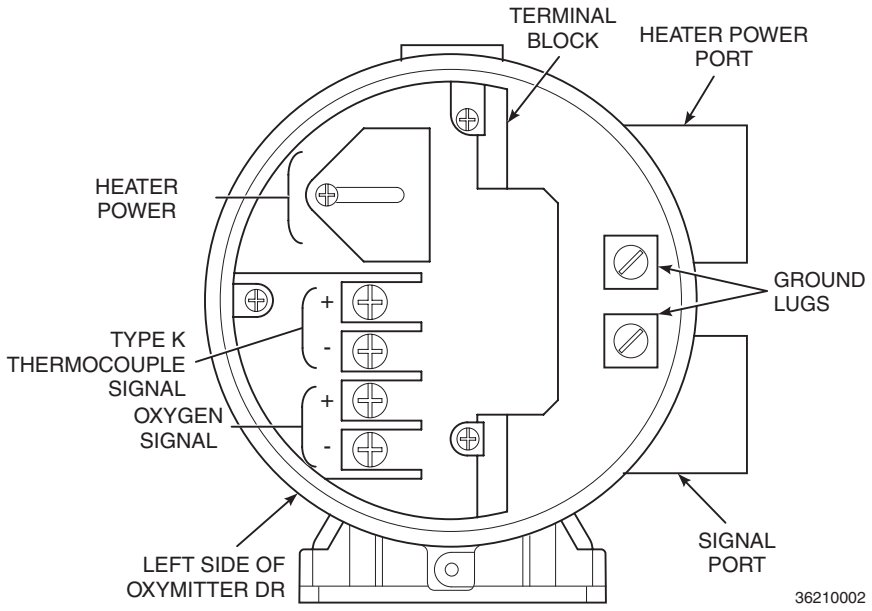


Figure 2-7. Terminal Block

b. Connect Heater Power

Connect the heater power lines to the two terminals indicated in (Figure 2-7).

c. Connect O_2 and Heater Thermocouple Signals

1. Oxygen Signal. Connect the oxygen signal lines from the signal conditioning electronics to the terminals shown in Figure 2-7.

2. Heater Thermocouple Signal. Connect the type K thermocouple signal lines from the signal conditioning electronics to the terminals indicated in Figure 2-7.

d. Install left housing cover (10, Figure 4-1) and secure with cover lock (12), captive washer (13), and screw (11).

2-3 PNEUMATIC INSTALLATION

If instrument air will be used as reference air (see System Considerations, paragraph 1-2f), connect the reference air set to the Hazardous Area Oxymitter DR. The reference air set should be installed in accordance with Figure 2-8.

Instrument Air (Reference Air): 68.95 kPag (10 psig) minimum, 1551.38 kPag (225 psig) maximum at 56.6 L/hr (2 scfh) maximum; less than 40 parts-per-million total hydrocarbons. Regulator outlet pressure should be set at 35 kPa (5 psi).

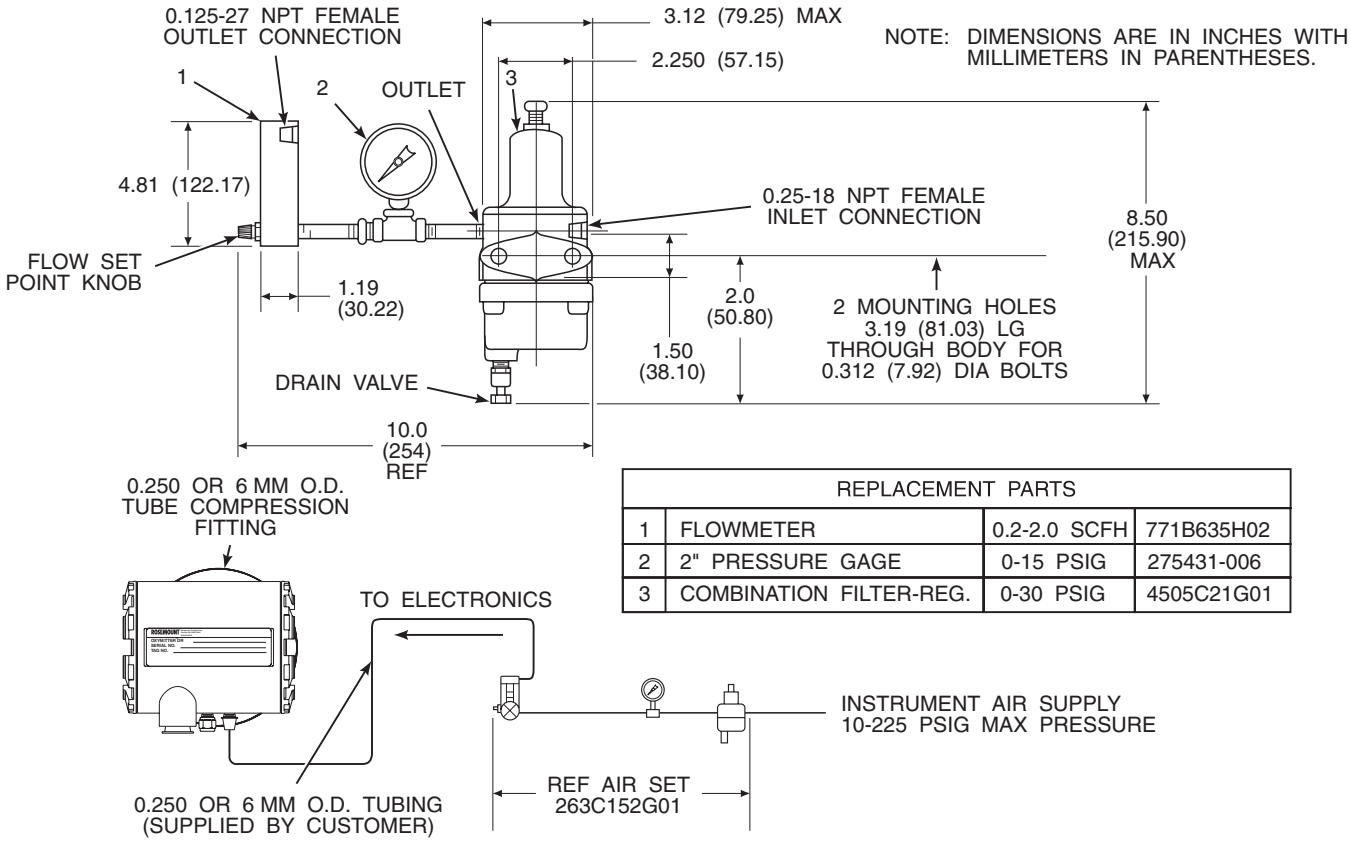
NOTE

Upon completing installation, make sure that the Hazardous Area Oxymitter DR is turned on and operating prior to firing up the combustion process. Damage can result from having a cold Hazardous Area Oxymitter DR exposed to the process gases.

During outages, and if possible, leave all Hazardous Area Oxymitter DR units running to prevent condensation and premature aging from thermal cycling.

CAUTION

If the ducts will be washed down during outage, MAKE SURE to power down the Hazardous Area Oxymitter DR units and remove them from the wash area.



REPLACEMENT PARTS			
1	FLOWMETER	0.2-2.0 SCFH	771B635H02
2	2" PRESSURE GAGE	0-15 PSIG	275431-006
3	COMBINATION FILTER-REG.	0-30 PSIG	4505C21G01

SCHEMATIC HOOKUP FOR REFERENCE AIR SUPPLY ON OXYMITTER DR PROBE HEAD.

36210008

Figure 2-8. Air Set, Plant Air Connection

WARNING

Install all protective equipment covers and safety ground leads before equipment startup. Failure to install covers and ground leads could result in serious injury or death.

2-4 SYSTEM SETUP

a. Overview

This section covers the setup procedures for the Oxymitter DR In-Situ Oxygen Probe. The DR probe can be used with several electronics packages including: Models 218, 218A, 225, 132 (analog and digital), TC200, and ZA8C.

For Westinghouse Models 218, 225, and 132 (analog), refer to paragraph 2-4b. Additional information can be found in IB-106-101.

For Westinghouse Model 218A, refer to paragraph 2-4c. Additional information can be found in IB-106-101A.

For Westinghouse Model TC200, refer to paragraph 2-4d. Additional information can be found in IB-107-020.

For Westinghouse Model 132 (digital), refer to paragraph 2-4e. Additional information can be found in IB-106-106A.

For Rosemount World Class 3000, refer to paragraph 2-4f. Additional information can be found in IB-106-300NFX.

For Yokogawa Model ZA8C, refer to paragraph 2-4g.

b. WESTINGHOUSE MODELS 218, 225, AND 132 (ANALOG) ELECTRONICS SETUP

Before beginning operation, it is important that the probe heater setpoint of the existing electronics be changed to support the Hazardous Area Oxymitter DR In-Situ Oxygen Probe. The setpoint adjustment procedure required for Models 218, 225, and 132 analog electronics is as follows:

1. Open electronics enclosure.
2. On temperature controller card, Figure 2-9, connect jumper wire from TP3 to either Pin 2 or Pin 7.
3. Set voltmeter to read DC millivolts (MV).
4. Attach voltmeter with positive (+) lead on TP1 and negative (-) on either Pin 2 or 7.

NOTE

The voltage given above is for an ambient (machinery space) temperature of 25°C (77°F). For each degree of ambient temperature above or below 25°C (77°F), add or subtract 0.242 mV from the nominal. Example: at 31°C (87°F), the nominal voltage of -322.3 Mv should be increased (made less negative) by 10 x 0.242 or 2.42 mV, making the adjusted nominal -319.9 Mv.

5. Adjust potentiometer M110-1 to read -322.3 millivolts nominal.
6. Remove voltmeter leads.
7. Remove jumper wire.

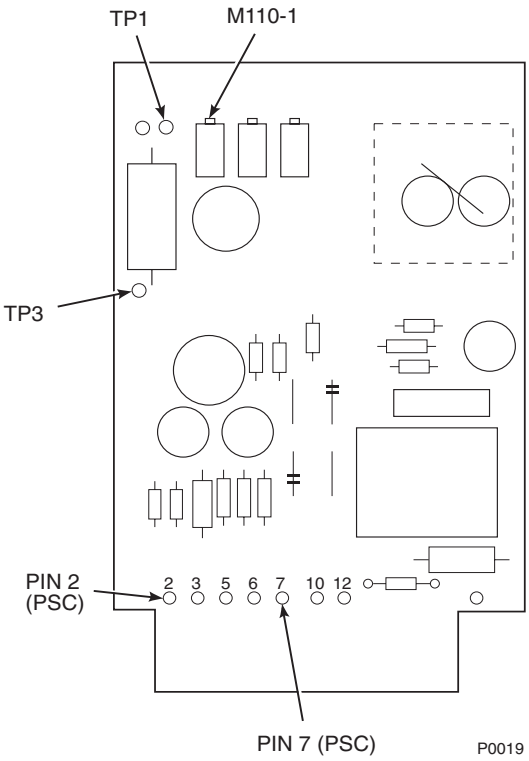


Figure 2-9. Temperature Controller Card Calibration Points

c. WESTINGHOUSE MODEL 218A ELECTRONICS SETUP

Before beginning operation, it is important that the probe heater setpoint of the existing electronics be changed to support the Hazardous Area Oxymitter DR probe. To convert the Model 218A Digital Electronics Package for use with the DR probe, an EPROM change is necessary. Remove Main PCB and check back of board to identify unit as G02 or G04. The replacement EPROM needed is as identified below:

	G02	G04
United States	1M03192G01	1M02982G01
United Kingdom	1M03192G02	1M02982G02
Germany	1M03192G03	1M02982G03
France	1M03192G04	1M02982G04
Italy	1M03192G05	1M02982G05

NOTE

The replacement EPROM when using a multiprobe averager unit is 1M02982G10.

To replace the EPROM, proceed as follows:

1. Shut off and lock out power to the electronics package.
2. Open electronics enclosure.
3. On the Main PCB, Figure 2-10, locate and remove old EPROM.
4. Replace with new EPROM.
5. Close electronics enclosure and power up system.

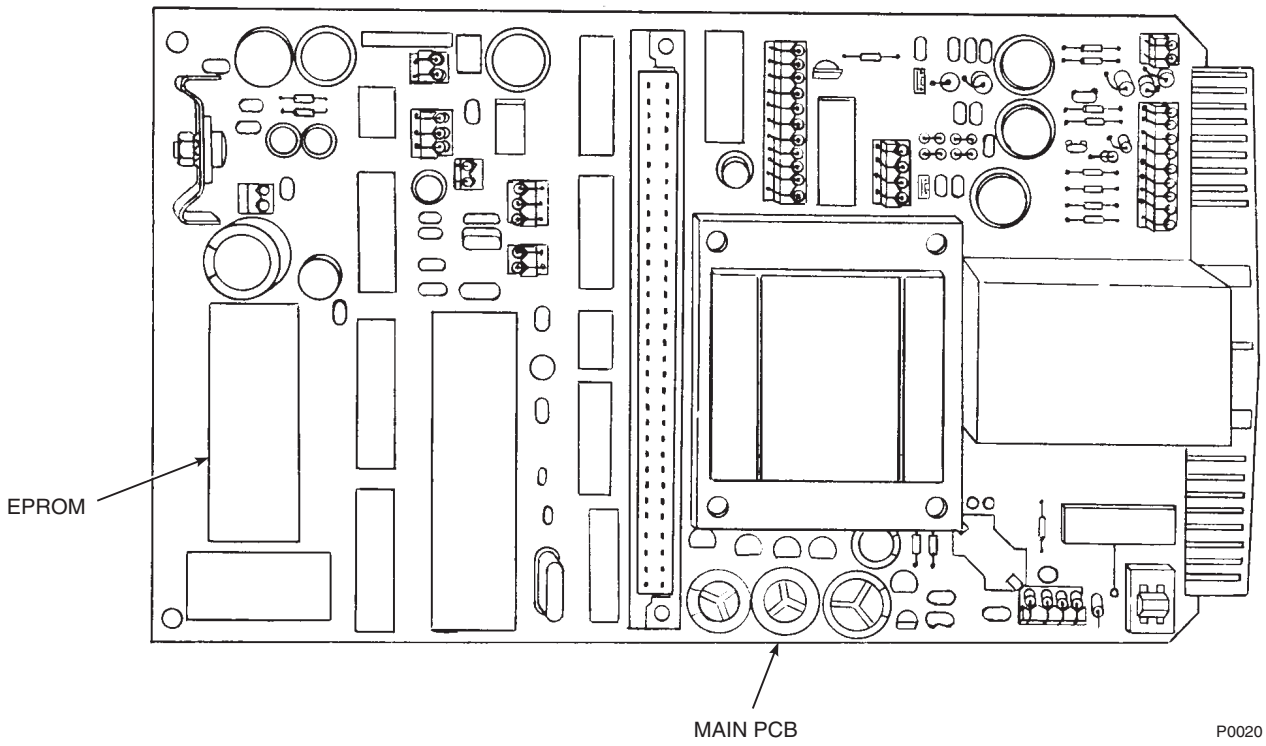


Figure 2-10. Main PCB (Model 218A) EPROM Replacement

d. WESTINGHOUSE MODEL TC200 VERI-TRIM ELECTRONICS SETUP

Before beginning operation, it is important that the probe heater setpoint of the existing electronics be changed to support the Hazardous Area Oxymitter DR In-Situ Oxygen Probe. To convert the Model TC200 Electronics Package for use with the DR probe, an EPROM change is necessary. The replacement EPROM needed is part number 1M03154G02.

1. EPROM replacement. To replace the EPROM, proceed as follows:

   (a) Shut off and lock out power to the electronics package.

   (b) Open electronics enclosure.

   (c) On the main PCB, Figure 2-11, locate and remove old EPROMs U11 and U12.

   (d) Replace with new EPROMs (part number 1M03154G02) being careful to install U11 and U12 in their proper locations.

   (e) Close electronics enclosure and power up system.

2. Heater Setpoint Adjustment. The adjustment procedure required for the Model TC200 Electronics Package is as follows:

   (a) Open keylocked enclosure to access membrane keyboard.

   (b) Put controller in PAR (parameter) mode by depressing "LOCK" "▲" "%O2" "INC" "ACK" in sequence.

   (c) Depress "ACK" pushbutton to clear display.

   (d) Press "NUM" pushbutton.

   (e) Using "INC", "DEC" buttons, display parameter 125.

   (f) Press "VAL" button.

   (g) Using "INC", "DEC" buttons, change parameter 125 value to 15.4.

   (h) Press "ENT" to save new value.

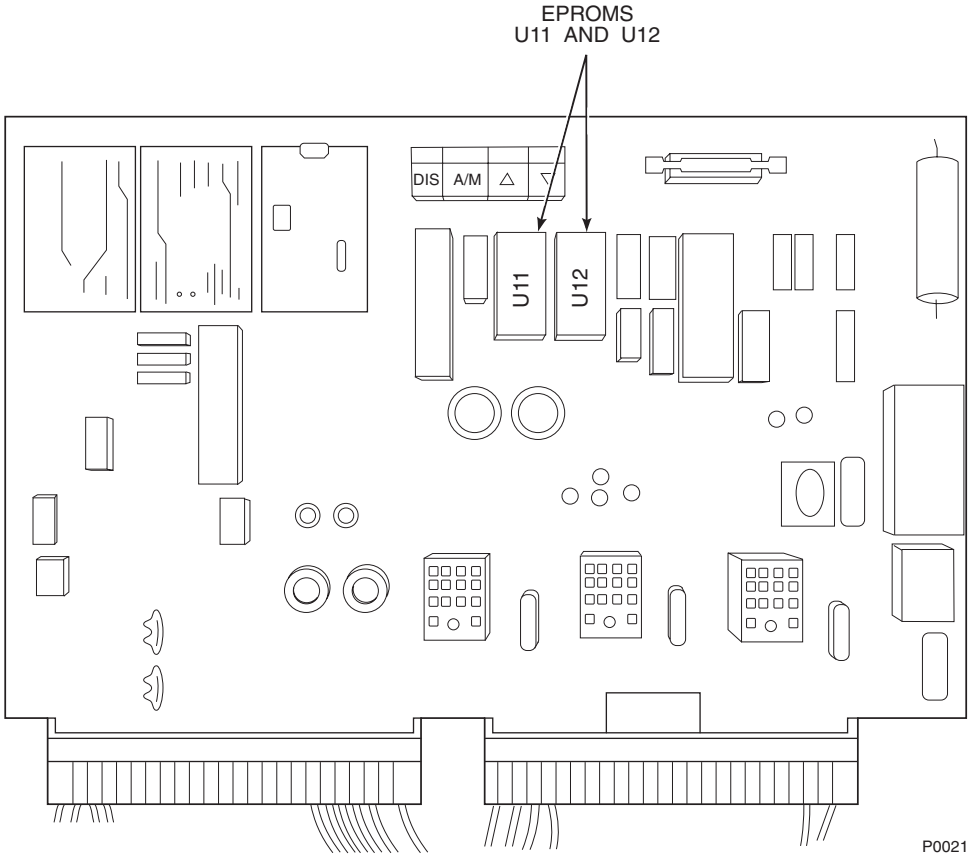


Figure 2-11. Main PCB (Model TC200) EPROM Replacement

e. WESTINGHOUSE MODEL 132 DIGITAL ELECTRONICS SETUP

Before beginning operation, it is important that the probe heater setpoint of the existing electronics be changed to support the Hazardous Area Oxymitter DR In-Situ Oxygen Probe. To convert the Model 132 Digital Electronics Package for use with the DR probe, an EPROM change is necessary. The replacement EPROM needed is as identified below:

United States	IM03222G01

To replace the EPROM, proceed as follows:

1. Shut off and lock out power to the electronics package.
2. Open electronics enclosure.
3. On the Main PCB, Figure 2-12, locate and remove old EPROM.
4. Replace with new EPROM.
5. Close electronics enclosure and power up system.

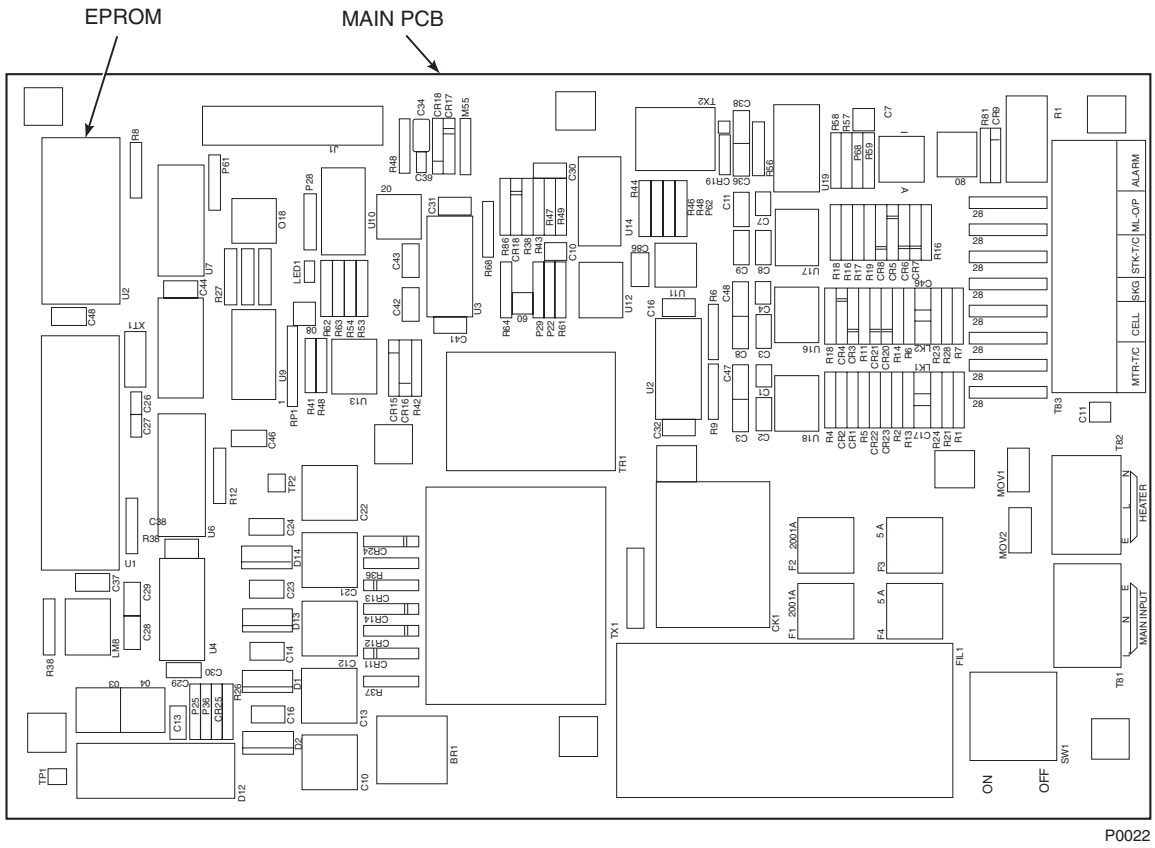
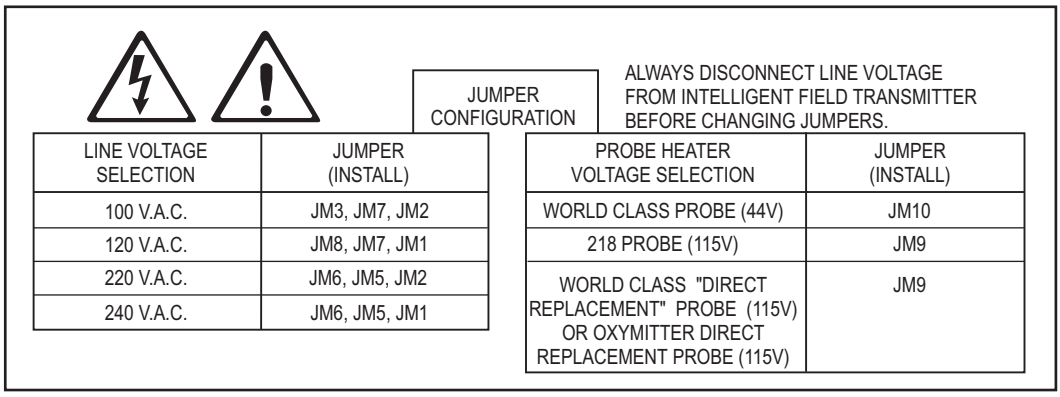


Figure 2-12. Main PCB (Model 132) EPROM Replacement

f. WORLD CLASS 3000 INTELLIGENT FIELD TRANSMITTER SETUP

The DR probe operates with a 115 VAC heater. Ensure that the voltage selection jumpers in the IFT or HPS, if used, are set properly. Refer to Figure 2-13 for IFT jumper selection, and Figure 2-14 for HPS jumper selection. For additional setup and configuration information, refer to IB-106-300NFX.



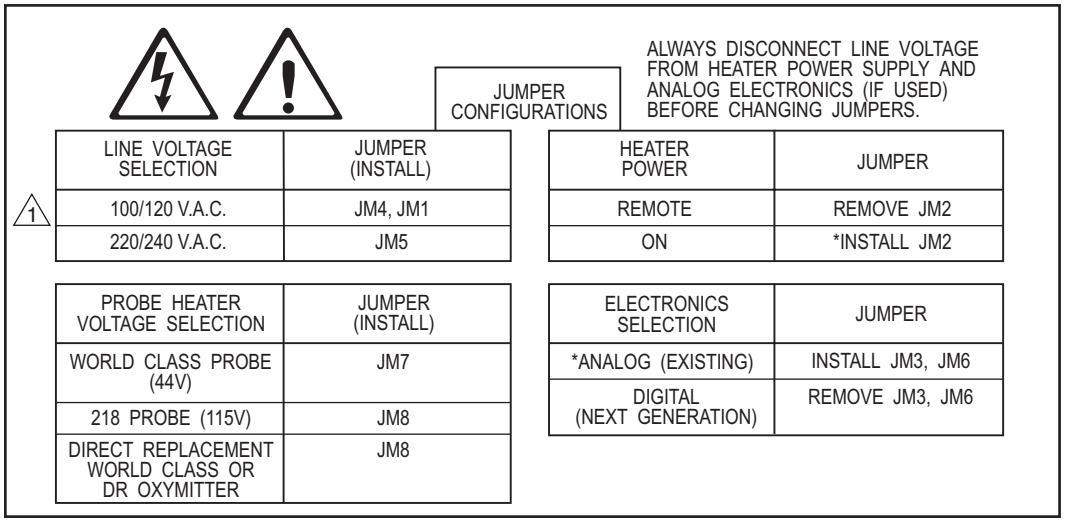
LINE VOLTAGE SELECTION	JUMPER (INSTALL)
100 V.A.C.	JM3, JM7, JM2
120 V.A.C.	JM8, JM7, JM1
220 V.A.C.	JM6, JM5, JM2
240 V.A.C.	JM6, JM5, JM1

PROBE HEATER VOLTAGE SELECTION	JUMPER (INSTALL)
WORLD CLASS PROBE (44V)	JM10
218 PROBE (115V)	JM9
WORLD CLASS "DIRECT REPLACEMENT" PROBE (115V) OR OXYMITTER DIRECT REPLACEMENT PROBE (115V)	JM9

Figure 2-13. IFT 3000 Power Supply Board Jumper Configuration

CAUTION

If incorrect heater voltage is selected, damage to the Oxymitter DR may occur. Refer to IB-106-300NFX for additional configuration information. Always update the relevant labeling to reflect the set voltage.



LINE VOLTAGE SELECTION	JUMPER (INSTALL)
1 100/120 V.A.C.	JM4, JM1
220/240 V.A.C.	JM5

HEATER POWER	JUMPER
REMOTE	REMOVE JM2
ON	*INSTALL JM2

PROBE HEATER VOLTAGE SELECTION	JUMPER (INSTALL)
WORLD CLASS PROBE (44V)	JM7
218 PROBE (115V)	JM8
DIRECT REPLACEMENT WORLD CLASS OR DR OXYMITTER	JM8

ELECTRONICS SELECTION	JUMPER
*ANALOG (EXISTING)	INSTALL JM3, JM6
DIGITAL (NEXT GENERATION)	REMOVE JM3, JM6

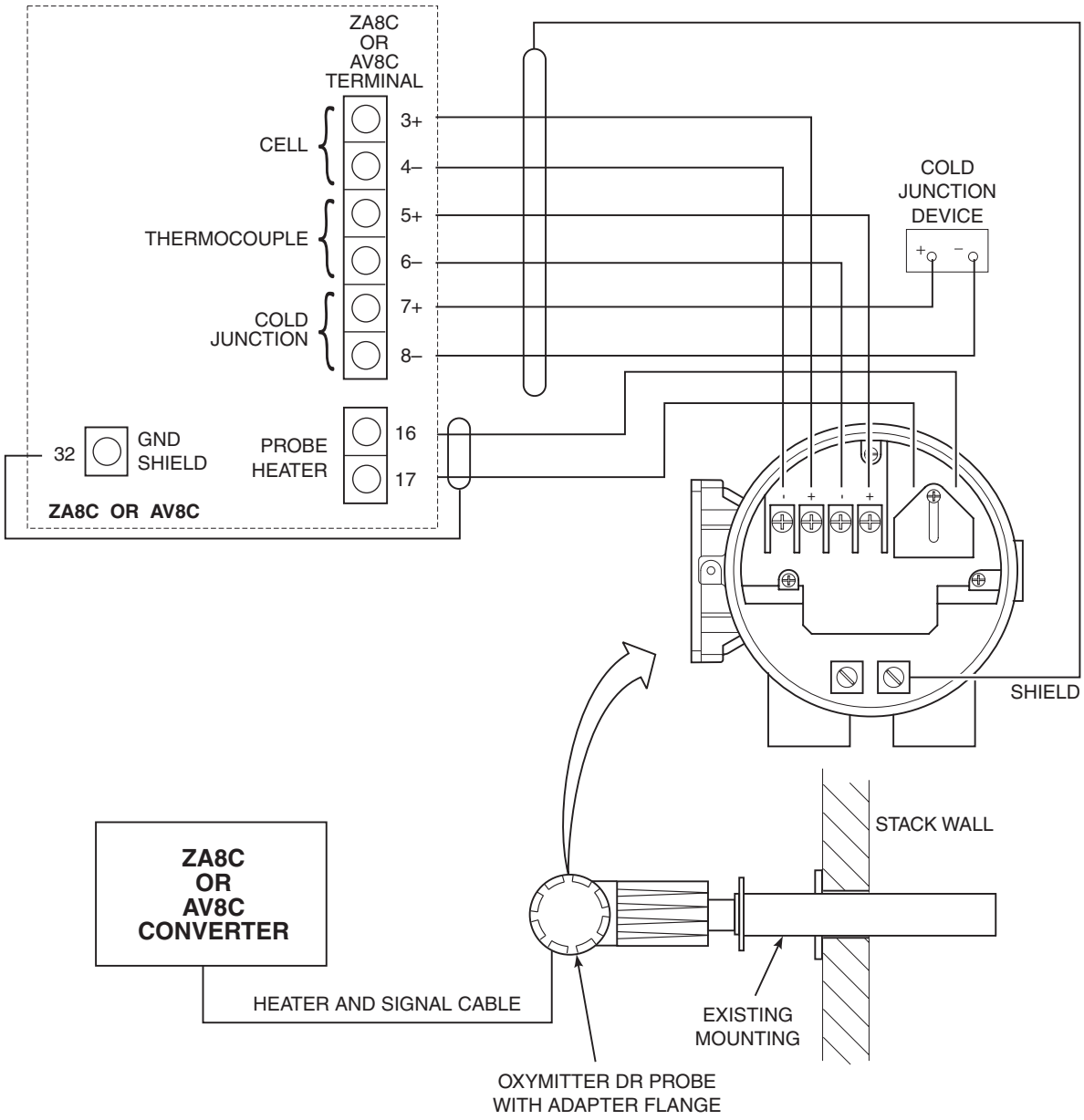
NOTES:

1 100 V.A.C. OPERATION REQUIRES TRANSFORMER PART NUMBER 1M02961G02.

Figure 2-14. Heater Power Supply (HPS 3000) Jumper Configuration

g. THE YOKOGAWA ZA8C AND AV8C CONVERTER ELECTRONICS SETUP

The Hazardous Area Oxymitter DR probe can be wired to work with the Yokogawa® ZA8C and AV8C Converters. Connect the cabling from the ZA8C or AV8C terminal to the probe terminal in the junction box as shown in Figure 2-15.



NOTES: 1. HEATER TEMPERATURE SET TO 1380°F (750°C)

2. THE GREATER MASS OF THE OXYMITTER DIRECT REPLACEMENT PROBE REQUIRES LONGER TIME TO HEAT UP. UPON STARTUP, THE YOKOGAWA ELECTRONICS MAY INDICATE AN ERROR BECAUSE THE PROBE HAS NOT REACHED TEMPERATURE SETPOINT IN THE NORMAL TIME. REMOVE POWER FROM THE YOKOGAWA ELECTRONICS OR PROBE MODULE TO CLEAR THE ERROR, AND RESTORE POWER. THIS PROCEDURE MAY HAVE TO BE REPEATED A COUPLE OF TIMES BEFORE PROBE OPERATING TEMPERATURE IS REACHED.

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Figure 2-15. DR Probe Wired to the ZA8C or A V8C Converter

SECTION 3
STARTUP AND OPERATION

WARNING

Install all protective equipment covers and safety ground leads before equipment startup. Failure to install covers and ground leads could result in serious injury or death.

3-1 GENERAL

For startup and operation instructions, refer to the Instruction Bulletin provided with your electronics package.

SECTION 4
MAINTENANCE AND SERVICE

WARNING

When working on this equipment on the laboratory bench, be aware that the probe, probe tube, and flame arrestor hub can be hot [up to 370°C (698°F)] in the region of the probe heater.

WARNING

Install all protective equipment covers and safety ground leads after equipment repair or service. Failure to install covers and ground leads could result in serious injury or death.

4-1 OVERVIEW

This section identifies the calibration methods available and provides the procedures to maintain and service the Hazardous Area Oxymitter DR.

4-2 CALIBRATION

The Hazardous Area Oxymitter DR should be calibrated when commissioned. Under normal circumstances the probe will not require frequent calibration. When calibration is required, follow the procedure described in the Instruction Bulletin applicable to your electronics package.

WARNING

It is recommended that the Hazardous Area Oxymitter DR be removed from the stack for all service activities. Wear heat resistant gloves and clothing to remove probe from stack. Normal operating temperature of diffusor and vee deflector are approximately 316 to 472°C (600 to 800°F). The unit should be allowed to cool and be taken to a clean work area. Failure to comply may cause severe burns.

WARNING

Disconnect and lock out power before working on any electrical components. There is voltage up to 115 VAC.

4-3 HAZARDOUS AREA OXYMITTER DR REPLACEMENT

a. Remove.

1. Turn off power to the system.
2. Shut off the calibration gases at the cylinders and the instrument air.
3. Disconnect the calibration gas and instrument air lines from the Hazardous Area Oxymitter DR.
4. While facing the Hazardous Area Oxymitter DR and looking at the Rosemount label, remove screw (11, Figure 4-1), captive washer (13) and cover lock (12) securing left housing cover (10). Remove the cover to expose the terminal block (Figure 4-2).
5. Loosen the screw on the heater terminal cover and slide the cover back to access the heater terminals. Loosen the heater terminal screws and remove the leads. Loosen the ground lug screws and remove the leads. Slide the heater power leads out of the heater power port.
6. Loosen the oxygen and heater thermocouple signal terminal screws. Remove the leads from the terminals and slide the wires out of the signal port.
7. Remove insulation to access the mounting bolts. Unbolt the Hazardous Area Oxymitter DR from the stack and take it to a clean work area.

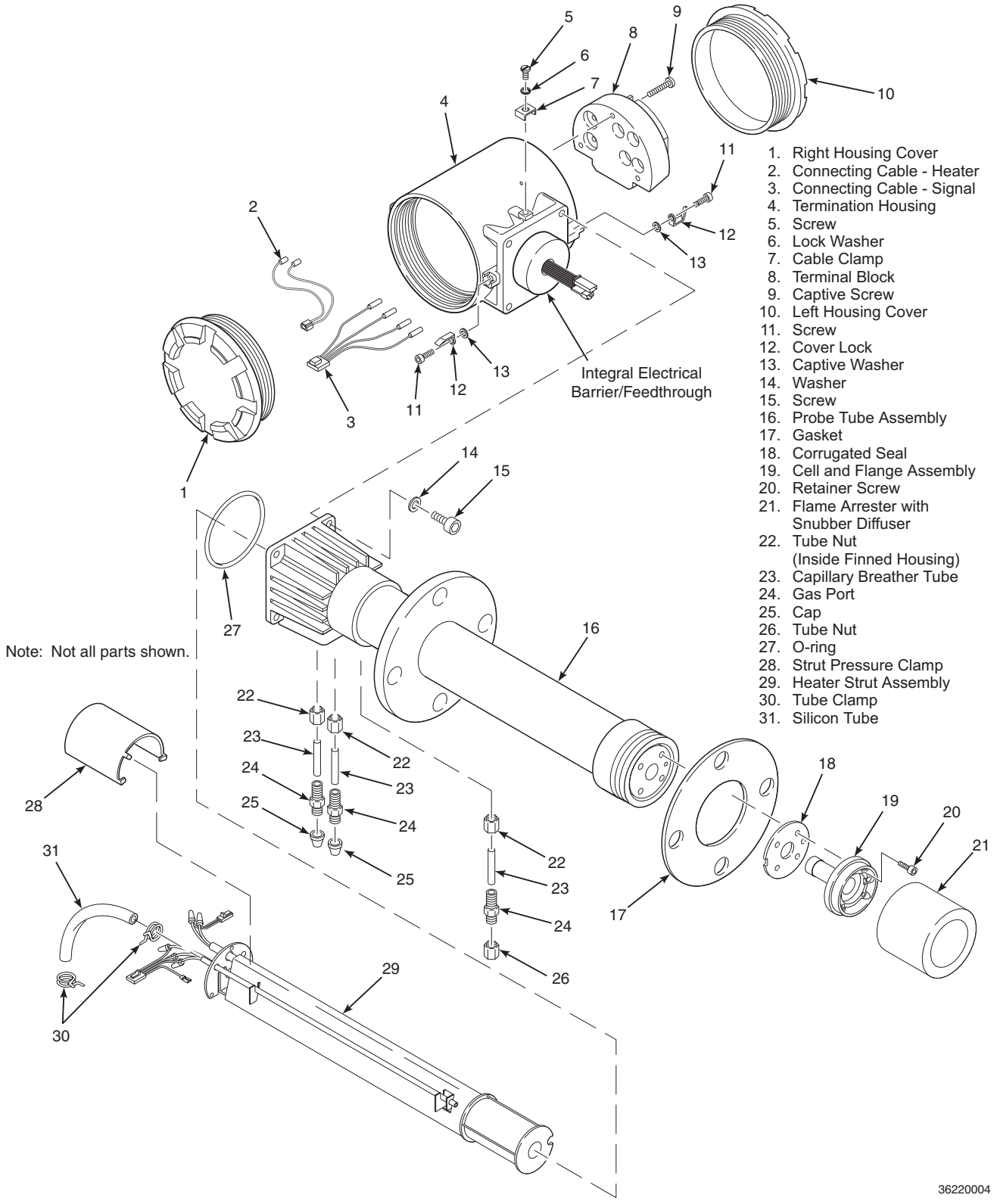


Figure 4-1. Hazardous Area Oxymitter DR Exploded View

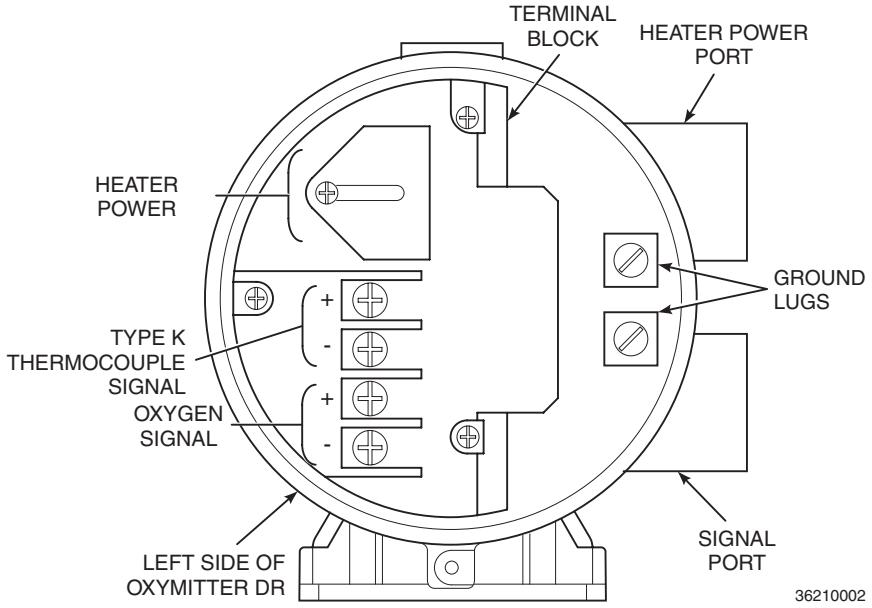


Figure 4-2. Terminal Block

8. Allow the unit to cool to a comfortable working temperature.

b. Install.

1. Bolt the Hazardous Area Oxymitter DR to the stack and install insulation.

2. Insert the oxygen and heater thermocouple signal leads in the signal port and connect to the oxygen and heater thermocouple screw terminals (Figure 4-2).

3. Insert the heater power leads in the heater power port and connect to the heater screw terminals. Slide the heater terminal cover over the terminal connection and tighten the cover screw.

4. Install left housing cover (10, Figure 4-1) and ensure it is tight. Secure the cover using cover lock (11), captive washer (13), and screw (12).

5. Connect the calibration gas and instrument air lines to the Hazardous Area Oxymitter DR.

6. Turn on the calibration gases at the cylinders and turn on instrument air.

7. Restore power to the system.

WARNING

Opening the termination housing will cause the loss of ALL hazardous permits. Opening the termination housing in hazardous areas may cause an explosion resulting in loss of property, severe personal injury, or death. It may be required to get a hot work permit from your company safety officer before opening the electronic housing.

4-4 TERMINAL BLOCK REPLACEMENT

Refer to Figure 4-2 and perform the following procedure to replace the terminal block.

a. Loosen the mounting screws on the terminal block and carefully lift the block out of the housing.

b. Carefully align the new terminal block on the pins so that it sits flat in the housing. The round end of the terminal block should be on the opposite side of the housing conduit ports and should not be able to rotate.

c. Tighten the three mounting screws and ensure the terminal block is secure in the housing.

WARNING

Opening the termination housing will cause the loss of ALL hazardous permits. Opening the termination housing in hazardous areas may cause an explosion resulting in loss of property, severe personal injury, or death. It may be required to get a hot work permit from your company safety officer before opening the electronic housing.

4-5 ENTIRE PROBE REPLACEMENT

Do not attempt to replace the probe until all other possibilities for poor performance have been considered. If probe replacement is needed, see Table 7-1 for part numbers.

a. Follow the instructions in paragraph 4-3a to remove the Hazardous Area Oxymitter DR from the stack or duct.

b. Remove four screws (15, Figure 4-1) and washers (14). Separate the electrical connectors between the heater strut assembly and the electrical barriers on the termination housing. The probe and termination housing can now be separated.

c. When installing the new probe, make sure that o-ring (27) is in good condition. Connect the two electrical connectors between the heater strut and the electrical barrier on the termination housing. Make sure the conduit port of the termination housing is on the same side as the CAL and REF gas ports.

d. Install the four washers (14) and screws (15) and tighten.

e. Replace the housing cover (20) and ensure it is tight.

f. Follow the instructions in paragraph 4-3b to install the Hazardous Area Oxymitter DR into the stack or duct.

4-6 HEATER STRUT REPLACEMENT

This paragraph covers heater strut replacement. Do not attempt to replace the heater strut until all other possibilities for poor performance have been considered. If heater strut replacement is needed, order a replacement heater strut (Table 7-1).

WARNING

Use heat resistant gloves and clothing when removing probe. Do not attempt to work on the probe until it has cooled to room temperature. The probe can be as hot as 800°F (427°C). This can cause severe burns.

a. Follow the instructions in paragraph 4-3a to remove the Hazardous Area Oxymitter DR from the stack or duct.

b. Remove four screws (15, Figure 4-1) and washers (14). Separate the electrical connectors between the heater strut assembly and the electrical barriers on the termination housing. The probe and termination housing can now be separated.

c. Once the probe and termination housing are separated, spring tension releases and the heater strut moves up. Carefully remove the CAL and REF gas silicon tubes by pulling them off the CAL and REF gas ports. Pull the silicon tubes off the CAL and REF gas lines.

d. Remove pressure clamp (28).

e. Remove tube nuts (26), and capillary breather tubes (23) from the CAL, REF, and VENT ports.

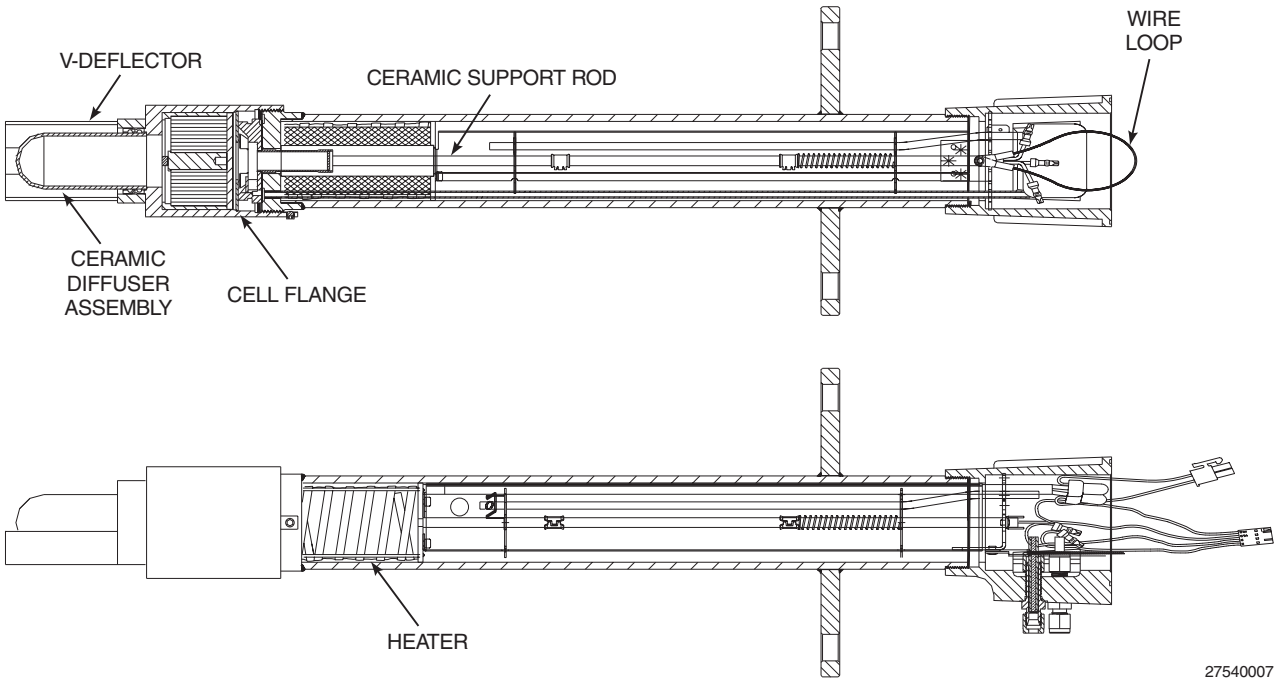


Figure 4-3. Heater Strut Assembly

f. Grasp the wire loop and carefully slide the strut out of the probe tube (Figure 4-3).

g. When replacing the strut, align the slot on the heater plate with the calibration gas line in the probe tube. Slide the strut into the probe tube. It will turn to align the hole on the back plate of the strut with the calibration gas line. When the hole and the calibration gas line are aligned correctly, the strut will slide in the rest of the way.

h. Push down on the back plate of the strut to make sure you have spring tension and then install the pressure clamp (28) on the back plate.

i. Install capillary breather tubes (23) and tube nuts (26) on the CAL, REF, and VENT ports.

j. Replace the CAL and REF gas silicon tubes.

k. Install the termination housing per the instructions in paragraph 4-5 steps c through e.

l. Follow the instructions in paragraph 4-3b to install the Hazardous Area Oxymitter DR into the stack or duct.

4-7 CELL REPLACEMENT

This paragraph covers oxygen sensing cell replacement. Do not attempt to replace the cell until all other possibilities for poor performance have been considered. If cell replacement is needed, order the cell replacement kit (Table 7-1).

The cell replacement kit (Figure 4-4) contains a cell and flange assembly, corrugated seal, setscrews, socket head cap screws, and anti-seize compound. The items are carefully packaged to preserve precise surface finishes. Do not remove items from the packaging until they are ready to be used. Spanner wrenches and hex wrenches needed for this procedure are part of an available special tools kit (Table 7-1).

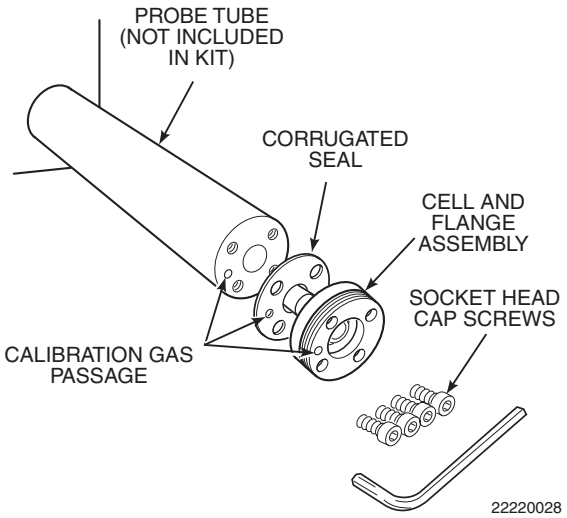


Figure 4-4. Cell Replacement Kit

WARNING

Use heat-resistant gloves and clothing when removing the probe. Do not attempt to work on these components until they have cooled to room temperature. Probe components can be as hot as 427°C (800°F). This can cause severe burns.

Disconnect and lock out power before working on any electrical components. There is voltage of up to 115 VAC.

CAUTION

Do not remove the cell unless certain it needs to be replaced. Removal may damage the cell and platinum pad. Go through the complete troubleshooting procedure to make sure the cell needs to be replaced before removing it.

a. Follow the instructions in paragraph 4-3a to remove the Hazardous Area Oxymitter DR from the stack or duct.

CAUTION

The flame arrestor and flame arrestor hub are among the critical components of this type of protection.

b. If the probe uses the standard diffusion element, use a spanner wrench to remove the diffusion element.

NOTE

To determine if the diffusion element needs to be replaced, refer to paragraph 4-1.

c. If equipped with the optional ceramic diffusion assembly, remove and discard the setscrews and remove the vee deflector (Figure 4-5). Use spanner wrenches from the probe disassembly kit (Table 7-1), to turn the hub free from the retainer. Inspect the diffusion element. If damaged, replace the element.

d. Loosen the four socket head cap screws from the cell and flange assembly and remove the assembly and the corrugated seal. The cell flange has a notch that may be used to gently pry the flange away from the probe. Note that the contact pad inside of the probe will sometimes fuse to the oxygen sensing cell. If the cell is fused to the contact pad, push the cell assembly back into the probe (against spring pressure) and quickly twist the cell assembly. The cell and contact pad should separate**. If the contact pad stays fused to the cell**, a new contact/thermocouple assembly must be installed. Disconnect the cell and the thermocouple wires at the probe electronics and withdraw the cell with the wires still attached.

e. Remove four screws (15, Figure 4-1) and washers (14).

f. Separate the electrical connectors between the heater strut and the termination housing.

g. If the contact assembly is damaged, replace the strut or the contact pad. Instructions for replacing the contact pad are in the cell replacement kit.

h. Remove and discard the corrugated seal. Clean the mating faces of the probe tube and retainer. Remove burrs and raised surfaces with a block of wood and crocus cloth. Clean the threads on the retainer and hub.

i. Rub a small amount of anti-seize compound on both sides of the new corrugated seal.

j. Assemble the cell and flange assembly, corrugated seal, and probe tube. Make sure the calibration tube lines up with the calibration gas passage in each component. Apply a small amount of anti-seize compound to the screw threads and use the screws to secure assembly. Torque to 4 N·m (35 in-lbs).

k. Install the termination housing per the instructions in paragraph 4-5 steps c through e.

l. Apply anti-seize compound to the threads of the cell assembly, hub, and setscrews. Reinstall the hub on the cell assembly. Using pin spanner wrenches, torque to 14 N·m (10 ft-lbs). If applicable, reinstall the vee deflector, orienting apex toward gas flow. Secure with the setscrews and anti-seize compound. Torque to 2.8 N·m (25 in-lbs).

m. On systems equipped with an abrasive shield, install the dust seal gaskets, with joints 180° apart.

n. Reinstall the probe and gasket on the stack flange.

o. Follow the instructions in paragraph 4-3b to install the Hazardous Area Oxymitter DR into the stack or duct. If there is an abrasive shield in the stack, make sure the dust seal gaskets are in place as they enter the 15° reducing cone.

p. Turn on power and monitor thermocouple output. It should stabilize at 29.3+0.2 mV. Set reference air flow at 56.6 l/hr (2 scfh). After the Hazardous Area Oxymitter DR stabilizes, calibrate the unit. If new components have been installed, repeat calibration after 24 hours of operation.

4-8 CERAMIC DIFFUSION ELEMENT REPLACEMENT

NOTE

This refers to the ceramic diffusion element only.

a. General

The diffusion element protects the cell from particles in process gases. Normally, it does not need to be replaced because the vee deflector protects it from particulate erosion. In severe environments, the filter may be broken or subject to excessive erosion. Examine the ceramic diffusion element whenever removing the probe for any purpose. Replace if damaged.

Damage to the ceramic diffusion element may become apparent during calibration. Compare probe response with previous response. A broken diffusion element will cause a slower response to calibration gas.

Hex wrenches needed to remove setscrews and socket head screws in the following procedure are available as part of a Probe Disassembly Kit, Table 7-1.

b. Replacement Procedure

1. Follow the instructions in paragraph 4-3a to remove the Hazardous Area Oxymitter DR from the stack or duct.

2. Loosen setscrews, Figure 4-5, using hex wrench from Probe Disassembly Kit, Table 7-1, and remove vee deflector. Inspect setscrews. If damaged, replace with stainless setscrews coated with anti-seize compound.

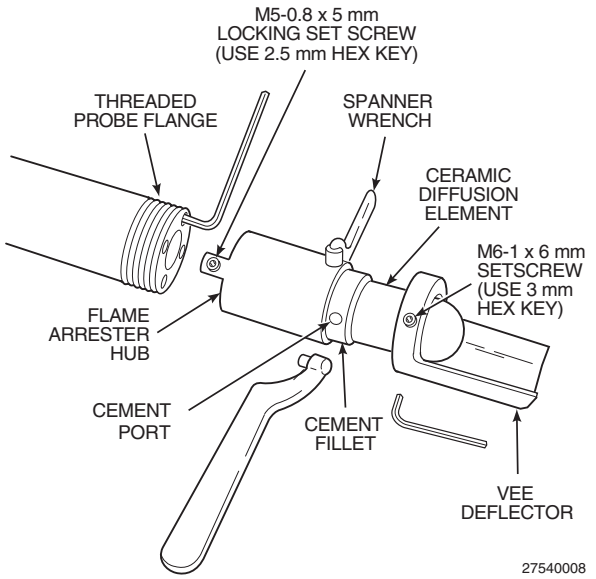


Figure 4-5. Ceramic Diffusion Element Replacement

3. On systems equipped with abrasive shield, remove dual dust seal gaskets.

4. Use spanner wrenches from Probe Disassembly Kit, Table 7-1, to turn hub free from retainer.

5. Put hub in vise. Break out old ceramic diffusion element with chisel along cement line. Use a 9.5 mm (3/8 in.) pin punch and clean fillet from the cement port.

6. Break out remaining ceramic diffusion element by tapping lightly around hub with hammer. Clean grooves with pointed tool if necessary.

7. Replace ceramic diffusion element using the ceramic diffusion element replacement kit in Table 7-1. This consists of a diffusion element, cement, setscrews, anti-seize compound, and instructions.

8. Test fit replacement ceramic diffusion element to be sure seat is clean.

CAUTION

Do not get cement on ceramic diffusion element except where it touches the hub. Any cement on ceramic diffusion element blocks airflow through element. Wiping wet cement off of ceramic only forces cement into pores. Also, do not get any cement onto the flame arrestor element.

9. Thoroughly mix cement and insert tip of squeeze bottle into cement port. Tilt bottle and squeeze while simultaneously turning ceramic diffusion element into seat. Do not get any cement on upper part of ceramic diffusion element. Ensure complete penetration of cement around 3 grooves in hub. Cement should extrude from opposite hole. Wipe excess material back into holes and wipe top fillet of cement to form a uniform fillet. (A cotton swab is useful for this.) Clean any excess cement from hub with water.

10. Allow filter to dry at room temperature overnight or 1 to 2 hours at 93°C (200°F).

11. Wipe a heavy layer of anti-seize compound onto the threads and mating surfaces of the flame arrestor, diffusion hub, and probe tube.

12. Assemble flame arrestor and diffusion hub with two pin spanner wrenches. Torque to 14 N·m (10 ft-lbs). Secure with hub retaining setscrew.

13. On systems equipped with abrasive shield, install dust seal gaskets with joints 180° apart.

14. Reinstall vee deflector, orienting apex toward gas flow. Apply anti-seize compound to setscrews and tighten with hex wrench.

15. Reinstall probe on stack flange.

4-9 TERMINATION HOUSING WIRING

Under normal circumstances, the right termination housing should not need to be removed. This side of the housing contains only two jumper wires that connect the connectors from the integral electrical barrier to pins in the housing wall. If these jumpers should become disconnected or need to be replaced, use the diagram in Figure 4-6 to connect the jumpers.

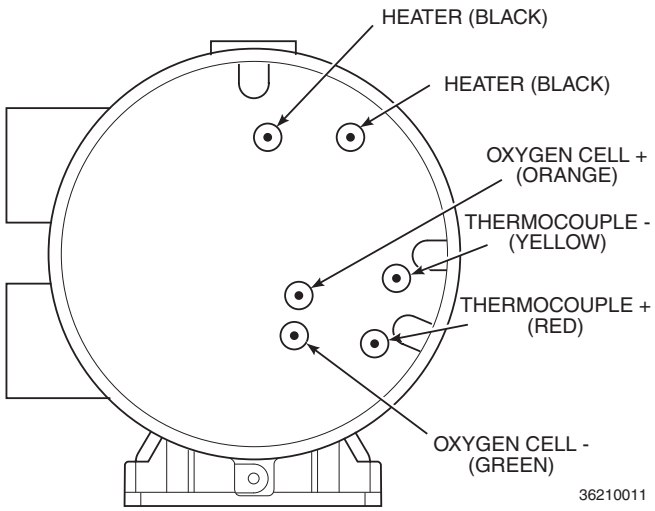


Figure 4-6. Termination Housing Connections

SECTION 5
TROUBLESHOOTING

WARNING

Install all protective equipment covers and safety ground leads after troubleshooting. Failure to install covers and ground leads could result in serious injury or death.

5-1 OVERVIEW

Troubleshooting for the oxygen analyzer system is broken down to the main component level. In addition to the information in this section, instruction bulletins for individual models also discuss troubleshooting.

For Models 218, 225, and 132 (analog), refer to IB-106-101.

For Model 218A, refer to IB-106-101A.

For Model TC200, refer to IB-107-020.

For Model 132 (digital), refer to IB-106-106A.

For Yokogawa (YEW) ZA8C Converter, refer to original converter documentation.

5-2 PROBE TROUBLESHOOTING

a. Probe Faults

Listed below are the five symptoms of probe failure.

1. The system does not respond to changes in the oxygen concentration.
2. The system responds to oxygen changes but does not give the correct indication.
3. The system does not give an acceptable indication of the value of the oxygen test gas being applied during calibration.
4. The probe takes a long time to return to flue gas value after the calibration gas is turned off.
5. The probe heater temperature is unstable.

b. Symptoms

Table 5-1 provides a guide to fault finding for the above symptoms.

Table 5-1. Fault Finding

SYMPTOM	CHECK	FAULT	REMEDY
1. No response to oxygen concentration change when:			
Heater is cold and TC mV output is less than setpoint	Thermocouple continuity	Thermocouple failure	Replace thermocouple or return probe to Rosemount.
	Cold heater resistance should be 67 ohm to 77 ohm	Heater failure	Replace heater or return probe to Rosemount.
	Triac O/P to heater	Failure of electronics	Check electronics package.

Table 5-1. Fault Finding (Continued)

SYMPTOM	CHECK	FAULT	REMEDY
Heater is hot and T/C mV output is at setpoint ±0.2 mV	Recorder chart	Recorder failure	See Recorder Instruction Manual.
	Cell mV input to electronics and cell mV at probe head	No cell mV at probe when test gas applied	Replace cell or return probe to Rosemount.
		Probe cell mV OK but no input to electronics	Check out cable connection.
		Cell mV satisfactory both at junction box and input to electronics - failure of electronics	Check electronics package.
2. System responds to oxygen concentration changes but has incorrect indication			
Good response, with incorrect indication	Recorder or remote indicator	Calibration error	Recalibrate recorder or indicator. Reference Recorder Instruction Manual.
	System calibration	Calibration error	Recalibrate system. Replace cell if necessary.
	Probe mounting and condition of duct	Air ingress into duct	Stop air leaks or resite probe.
	Cell mV input to electronics	Failure of electronics	Check electronics package.
3. Probe does not give accurate indication of applied test gas	Test gas input port	Blocked port	Clean port. If the flue gas is condensing in the test gas line, insulate the back of the probe. Make sure that the test gas line is capped between calibrations, or a check valve is installed.
	Ceramic diffusion element broken	Diffusion element cracked, broken, or missing	Replace diffusion element.
4. Probe takes a long time to return to flue gas value after calibration gas is turned off	Plugged diffusion element	Plugged diffusion element	Change diffusion element or snubber diffusion element.
5. Probe heater temperature unstable	Proper voltage heater is installed	Wrong heater	Change heater to proper voltage.

SECTION 6
RETURN OF MATERIAL

6-1 EQUIPMENT RETURN

If factory repair of defective equipment is required, proceed as follows:

a. Secure a return authorization number from a Rosemount Analytical Sales Office or representative before returning the equipment. Equipment must be returned with complete identification in accordance with Rosemount instructions or it will not be accepted.

In no event will Rosemount be responsible for equipment returned without proper authorization and identification.

b. Carefully pack defective unit in a sturdy box with sufficient shock absorbing material to ensure that no additional damage will occur during shipping.

c. In a cover letter, describe completely:

1. The symptoms from which it was determined that the equipment is faulty.
2. The environment in which the equipment has been operating (housing, weather, vibration, dust, etc.).
3. Site from which equipment was removed.
4. Whether warranty or nonwarranty service is requested.
5. Complete shipping instructions for return of equipment.
6. Reference the return authorization number.

d. Enclose a cover letter and purchase order and ship the defective equipment according to instructions provided in Rosemount Return Authorization, prepaid, to:

Rosemount Analytical Inc.
RMR Department
1201 N. Main Street
Orrville, Ohio 44667

If warranty service is requested, the defective unit will be carefully inspected and tested at the factory. If failure was due to conditions listed in the standard Rosemount warranty, the defective unit will be repaired or replaced at Rosemount's option, and an operating unit will be returned to the customer in accordance with shipping instructions furnished in the cover letter.

For equipment no longer under warranty, the equipment will be repaired at the factory and returned as directed by the purchase order and shipping instructions.

SECTION 7
REPLACEMENT PARTS

Table 7-1. Replacement Parts for Probe

Figure and Index No.	Part Number	Description
	3D39496G06[1]	V-Strut Assembly (18 in.)
	3D39496G07[1]	V-Strut Assembly (3 ft)
	3D39496G08[1]	V-Strut Assembly (6 ft.)
	3534B56G04[2]	Contact and Thermocouple Assembly (18 in.)
	3534B56G05[2]	Contact and Thermocouple Assembly (3 ft)
	3534B56G06[2]	Contact and Thermocouple Assembly (6 ft)
7-1	3535B44G01[3]	Cell Replacement Kit (18 in.)
7-1	3535B44G02[3]	Cell Replacement Kit (3 ft)
7-1	3535B44G03[3]	Cell Replacement Kit (6 ft)
7-1	3535B44G04	Cell Replacement Kit (No Inconel and Platinum Pad Assembly)
7-2	1L03825G01	Probe Disassembly Kit
	1U05677G04	F/A Diffuser Hub Assembly (Snubber Diffusor)
	1U05677G06	F/A Diffuser Hub Assembly (For use with Abrasive Shield)
	6292A74G02	Ceramic Diffusion Element Replacement Kit
	1N04966H02	Abrasive Shield Assembly (3 ft)
	1N04966H03	Abrasive Shield Assembly (6 ft)
	1M03241H01	90° Elbow for Bypass
	4507C26G07	Bypass Gas Pickup Tube (3 ft)
	4507C26G08	Bypass Gas Pickup Tube (6 ft)
	4507C26G09	Bypass Gas Pickup Tube (9 ft)
	263C152G01	Reference Gas Set
	771B635H01	Calibration Gas Rotometer
	1L03650H01	F/A Diffusion Hub Setscrew

[1] V-Strut assembly includes contact and thermocouple assembly.

[2] Contact and thermocouple assembly includes platinum pad and inconel wire

[3] Cell replacement kit includes platinum pad and inconel wire.

NOTE

The replacement parts listed above must be obtained only from the manufacturer or his agent.

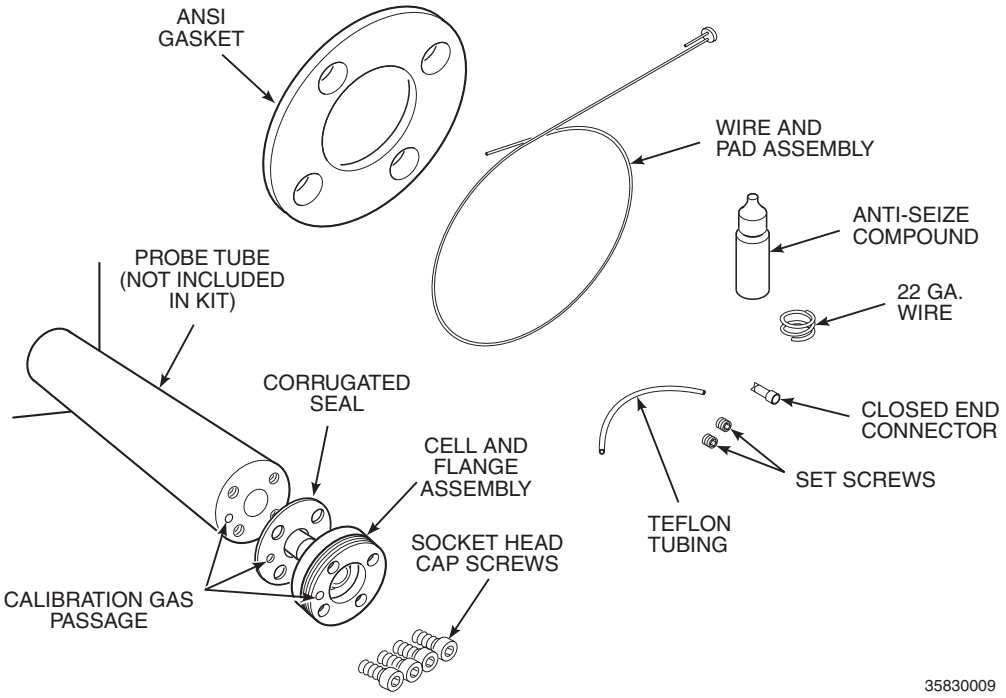


Figure 7-1. Cell Replacement Kit

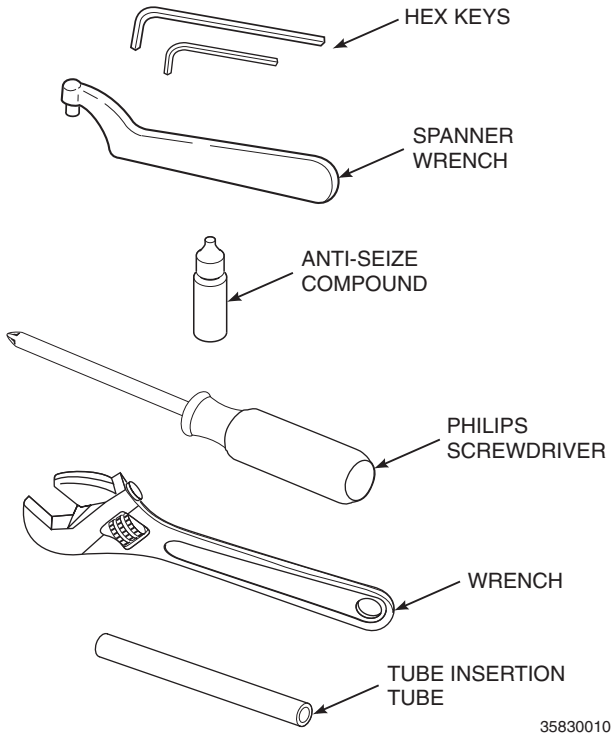


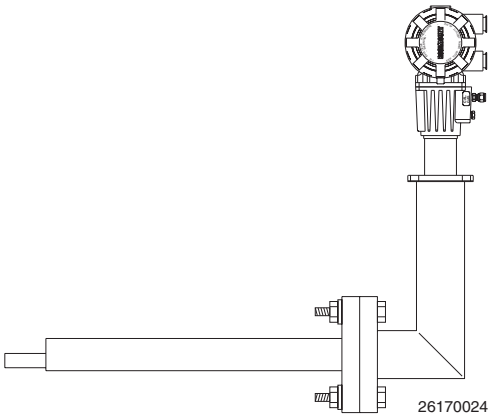
Figure 7-2. Probe Disassembly Kit

SECTION 8
OPTIONAL ACCESSORIES

BY-PASS PACKAGES

The specially designed Rosemount Analytical By-Pass 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 or Kanthal steel tubes provide effective resistance to corrosion, and the package uses no moving parts, air pumps, or other components common to other sampling systems.

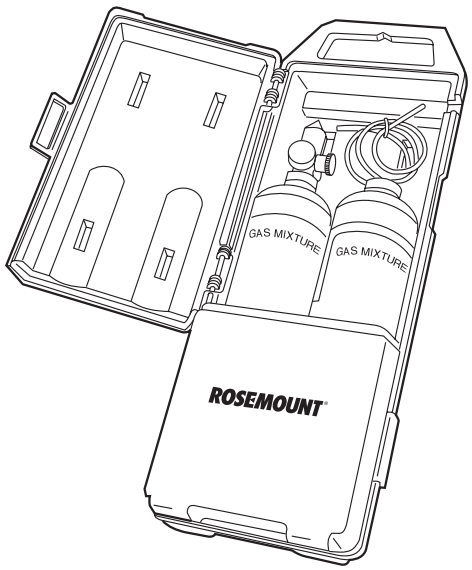
For more information, call Rosemount Analytical at 1-800-433-6076.



O_2 CALIBRATION GAS SEQUENCER

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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SECTION 9
APPENDICES

APPENDIX A. UPDATING DR OXYMITTER TO FULL OXYMITTER

APPENDIX A
UPGRADING HAZARDOUS AREA OXYMITTER DR TO FULL HAZARDOUS AREA OXYMITTER

A-1 UPGRADE PROCEDURE

Perform the following procedure to upgrade the Hazardous Area Oxymitter DR to a full Hazardous Area Oxymitter.

a. Remove power from the Oxymitter DR.

b. Remove the left and right covers from the Oxymitter termination housing.

c. Remove and discard the two cable assemblies (1 and 2, Figure A-1) from the right side of the termination housing.

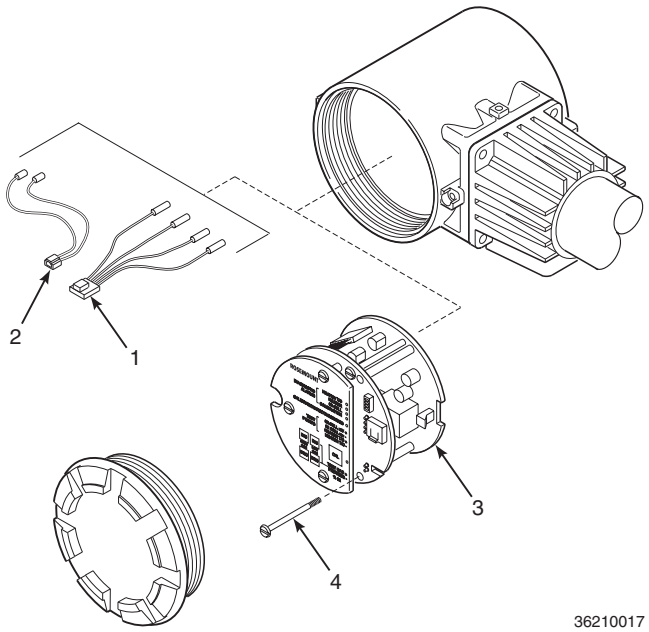
d. Place the new Oxymitter electronic assembly (3) near the right side of the termination housing.

e. Plug the white connector with the two black wires into the white socket on the bottom power supply card.

f. Insert the electronics assembly into the termination housing. Ensure the black 4-wire connector remains outside the housing and in the slot provided in the top card of the electronics assembly. The electronics assembly should seat on the bulkhead pins easily. Do not force the assembly into place.

g. Plug the black 4-wire connector into the black socket on the microprocessor card.

h. Tighten three screws (4) securing the electronics assembly into the termination housing.



1. Signal connecting cable
2. Heater connecting cable
3. Electronic assembly
4. Screw

Figure A-1. Component Replacement

i. In the left side of the termination housing, place the new termination designation labels over the labels on the existing terminal block. After placing the new labels, the terminal block should appear as shown in Figure A-2.

j. The existing wiring from the Oxymitter to the electronics may be reused. However, the wires will be carrying new signals as noted by the new labels. The 4-20 mA wires must be removed from the old electronics and re-terminated to the wires carrying the 4-20 mA O_2 signal to the control room.

k. The wires carrying the heater power must be converted to carry AC power (90-250 VAC, 50/60 Hz) for the Oxymitter. The re-terminations may be inside the old electronics housing, which will function as a simple junction box. Alternatively, the old electronics may be removed and replaced with a smaller junction box.

l. Place the round error blink code and calibration instructions label on the inside of the right housing cover.

m. Install both housing covers.

n. Refer to the instruction bulletin provided with your upgrade kit, IB-106-340C, for startup and diagnostic information.

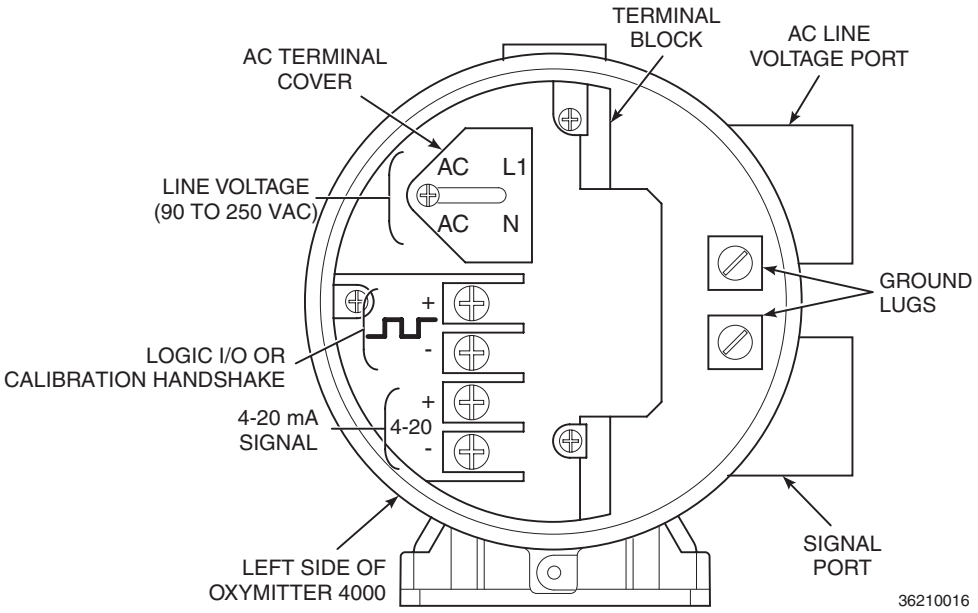


Figure A-2. Terminal Block and Wiring

SECTION 10
INDEX

This index is an alphabetized listing of parts, terms, and procedures having to do with the Oxymitter DR In-Situ Oxygen Probe. Every item listed in this index refers to a location in the manual by one or more page numbers.

WARRANTY

Rosemount warrants that the equipment manufactured and sold by it will, upon shipment, be free of defects in workmanship or material. Should any failure to conform to this warranty become apparent during a period of one year after the date of shipment, Rosemount shall, upon prompt written notice from the purchaser, correct such nonconformity by repair or replacement, F.O.B. factory of the defective part or parts. Correction in the manner provided above shall constitute a fulfillment of all liabilities of Rosemount with respect to the quality of the equipment.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF QUALITY WHETHER WRITTEN, ORAL, OR IMPLIED (INCLUDING ANY WARRANTY OF MERCHANTABILITY OF FITNESS FOR PURPOSE).

The remedy(ies) provided above shall be purchaser's sole remedy(ies) for any failure of Rosemount to comply with the warranty provisions, whether claims by the purchaser are based in contract or in tort (including negligence).

Rosemount does not warrant equipment against normal deterioration due to environment. Factors such as corrosive gases and solid particulates can be detrimental and can create the need for repair or replacement as part of normal wear and tear during the warranty period.

Equipment supplied by Rosemount Analytical Inc. but not manufactured by it will be subject to the same warranty as is extended to Rosemount by the original manufacturer.

At the time of installation it is important that the required services are supplied to the system and that the electronic controller is set up at least to the point where it is controlling the sensor heater. This will ensure, that should there be a delay between installation and full commissioning that the sensor being supplied with ac power and reference air will not be subjected to component deterioration.

Instruction Manual
IB-106-340CDR Original Issue
January, 2002

Hazardous Area Oxymitter DR

Hazardous Area Oxymitter DR

Part no. _____

Serial no. _____

Order no. _____

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