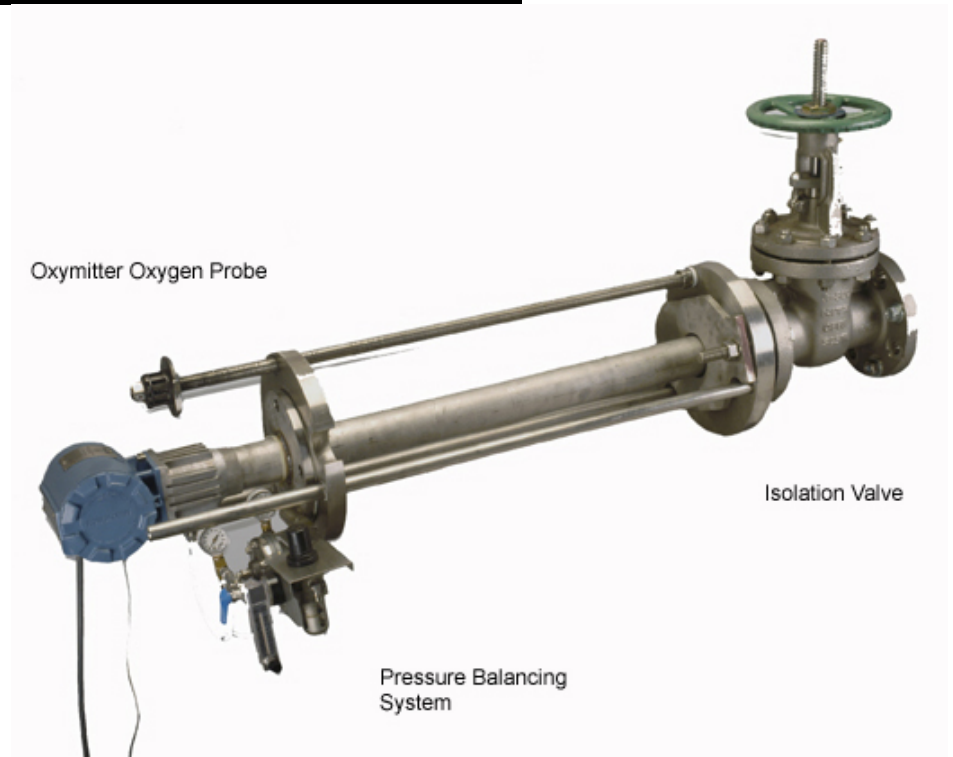


Optional Isolation Valving System Used With Rosemount Analytical In Situ Oxygen Probes

Instruction Bulletin Addendum IB – ISO1000
Rev. 3- June, 2005

Customer Support Center-in US 800-433-6076
International 440-914-1261

Oxymitter 4000	
Part no.	_____
Serial no.	_____
Order no.	_____



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ROSEMOUNT[®] ANALYTICAL

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Applicability:**Isolation Valving Option, Oxy-Iso 2000**

Utilized with Rosemount Analytical's Oxymitter 4000/5000 series of O₂ analyzers or with Rosemount Analytical's CENELEC World Class O₂ Analyzers. May be used with pressure-balancing option, p/n 3D39811Gxx

General

Rosemount Analytical's line of in situ oxygen analyzers utilize zirconium oxide (ZrO₂) sensing technology which is sensitive to pressure variations in the process.

Rosemount Analytical's Oxymitter and World Class probes place the sensing cell at the end of an in situ probe that inserts directly into the process gas stream. This arrangement provides fast response and is very resistant to pluggage from particulate material or the acids that frequently condense within normal flue gas.

The ZrO₂ sensing technology is sensitive to pressure changes in the process and an output change of approximately 1% of reading (not 1 % of full scale range, or 1% O₂) for every 4 inches of H₂O pressure or vacuum in the process can be expected. See the instruction bulletin for the separate "pressure balancing system" for a more complete description of the pressure effects, and our accommodation to nullify these effects.

Process pressures of more than 1 PSI also present the challenge of removing or inserting the probe for maintenance purposes while the process is on line. Hot, noxious combustion gases can make the removal and installation procedure hazardous, especially when the operation is conducted at elevation and on less than adequate catwalks.

This isolation valving system facilitates the insertion and withdrawal of the probe for service while the process is under pressure. This valving system is recommended if the process cannot be shut down for probe maintenance.

Unpacking

The Isolation Valving system will be shipped separately from the O₂ probe and other options, such as pressure balancing and automatic calibration gas sequencer. The isolation valving system is shipped as a compact assembly, but after unpacking, it's best to disassemble the guide bars and packing box so that many lighter components can be installed as opposed to one heavy assembly.

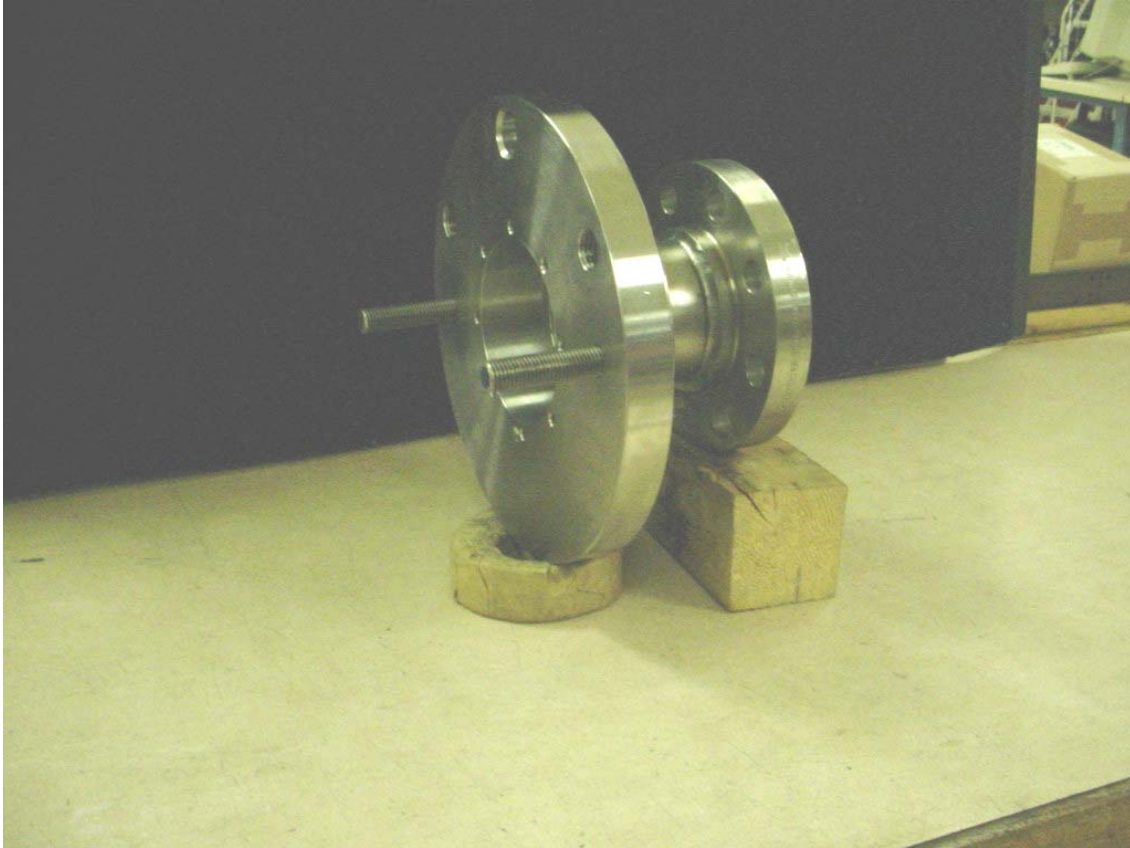
Mechanical/Pneumatic Installation- Isolation Valving System

The process must be off-line before conducting the installation and the temperatures at the installation point must have operating temperatures of less than 1,300⁰ F (705⁰ C).

Process ductwork must be prepared by mounting a 3-inch, 300-pound nozzle with a length no longer than 12 inches. A 3-inch, 300-pound ANSI flange is required at the end of this nozzle. Ensure that the installation will permit the probe to insert at least 6 inches into the process ductwork. (See insertion/removal envelope drawing at the end of this manual). Place the provided gasket onto the flange and bolt the isolation gate valve to the nozzle

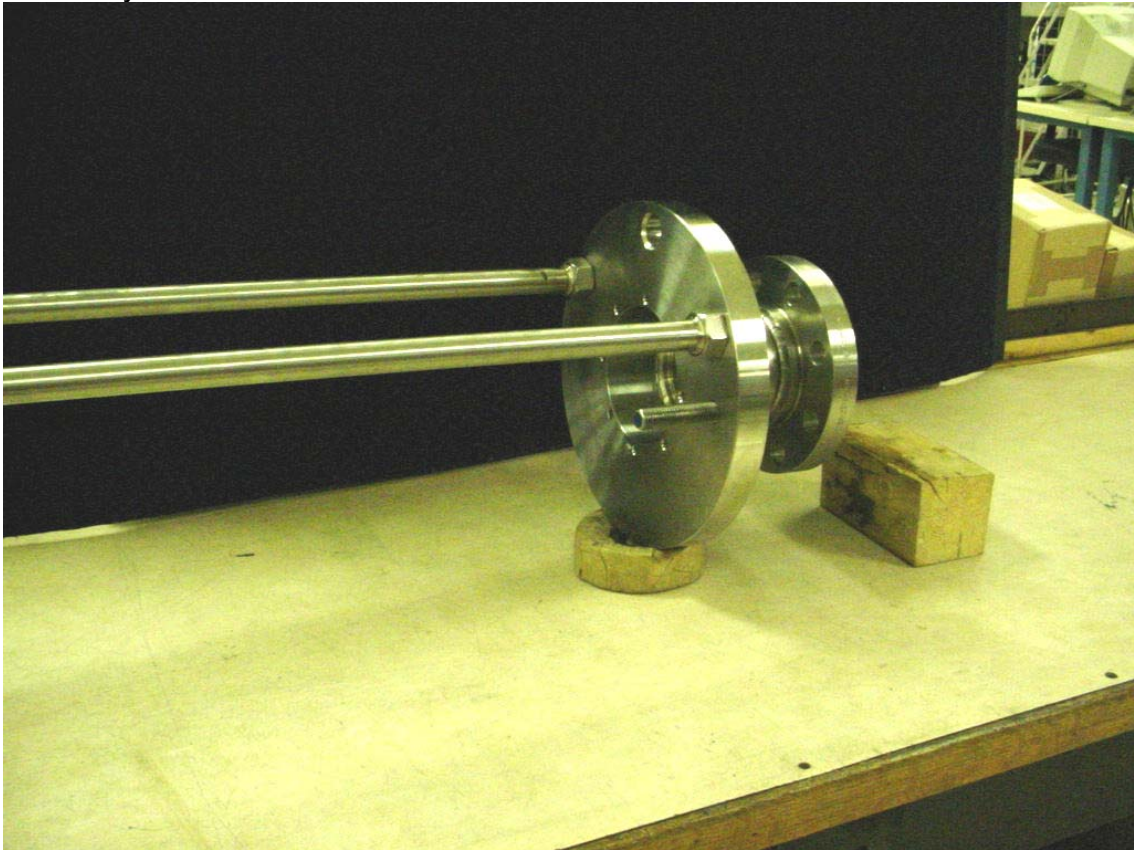
flange with the packing box assembly and O₂ probe removed. O₂ probe installation may be conducted with the process on-line once the Isolation Valve is installed and closed.

Install the packing box housing weldment onto the isolation valve.



(Isolation valve would be to the right, but is removed in this photo sequence for clarity.)

Next install the removable guide rods, and then the sliding probe carrier assembly.



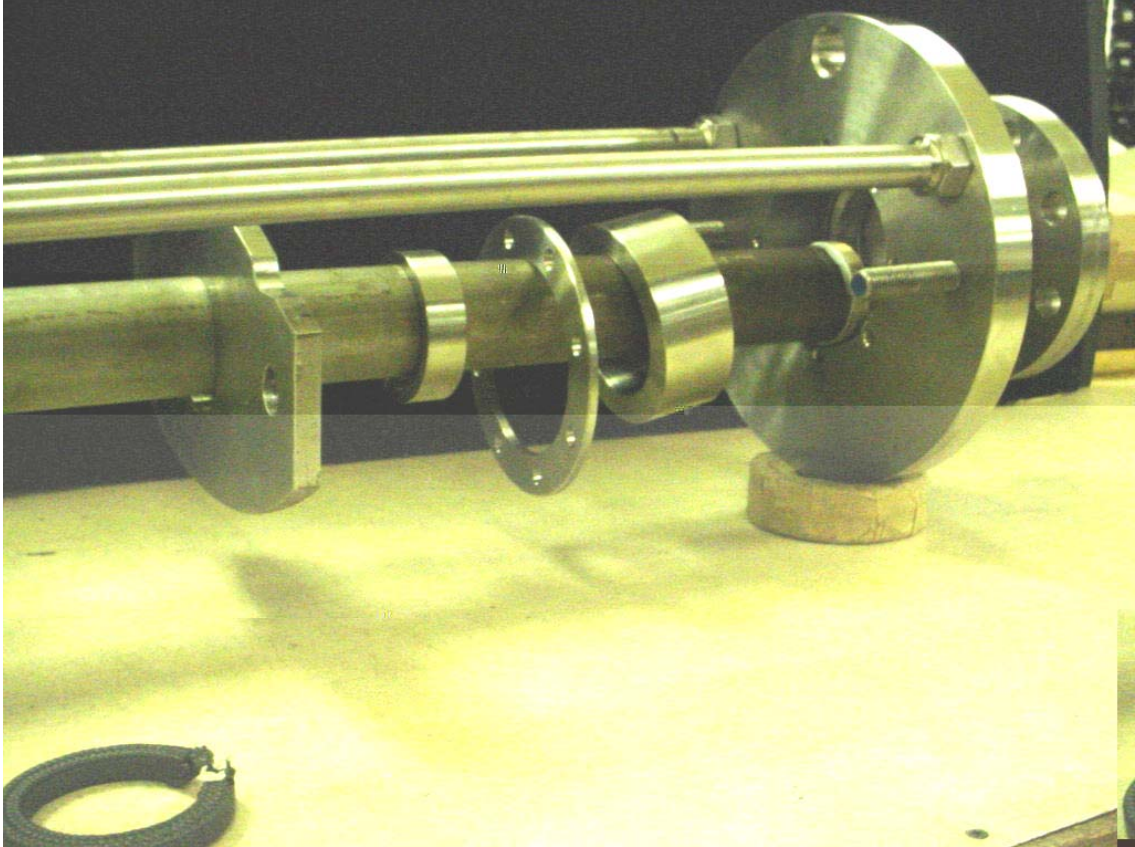


Probe carrier assembly.

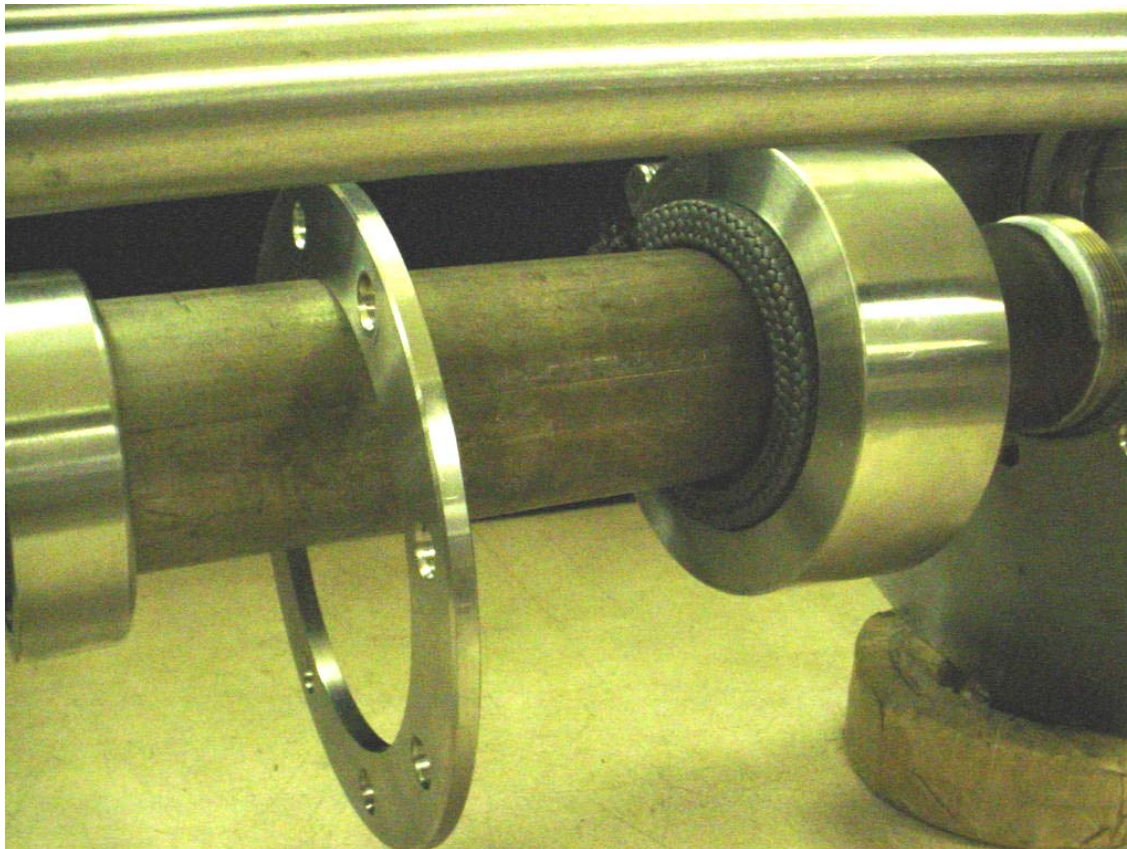
Remove the flame arrestor from the end of the Oxymitter O2 probe, and place the probe into the cradle of the sliding carrier assembly with the probe flange behind the carrier assembly, and lock the retaining bar up. Note that the L-shaped piece at the 12 o'clock position will contain the probe from sliding back under pressure, but also permit the probe to be rotated back and forth to assist removal.

String the following components onto the probe body:

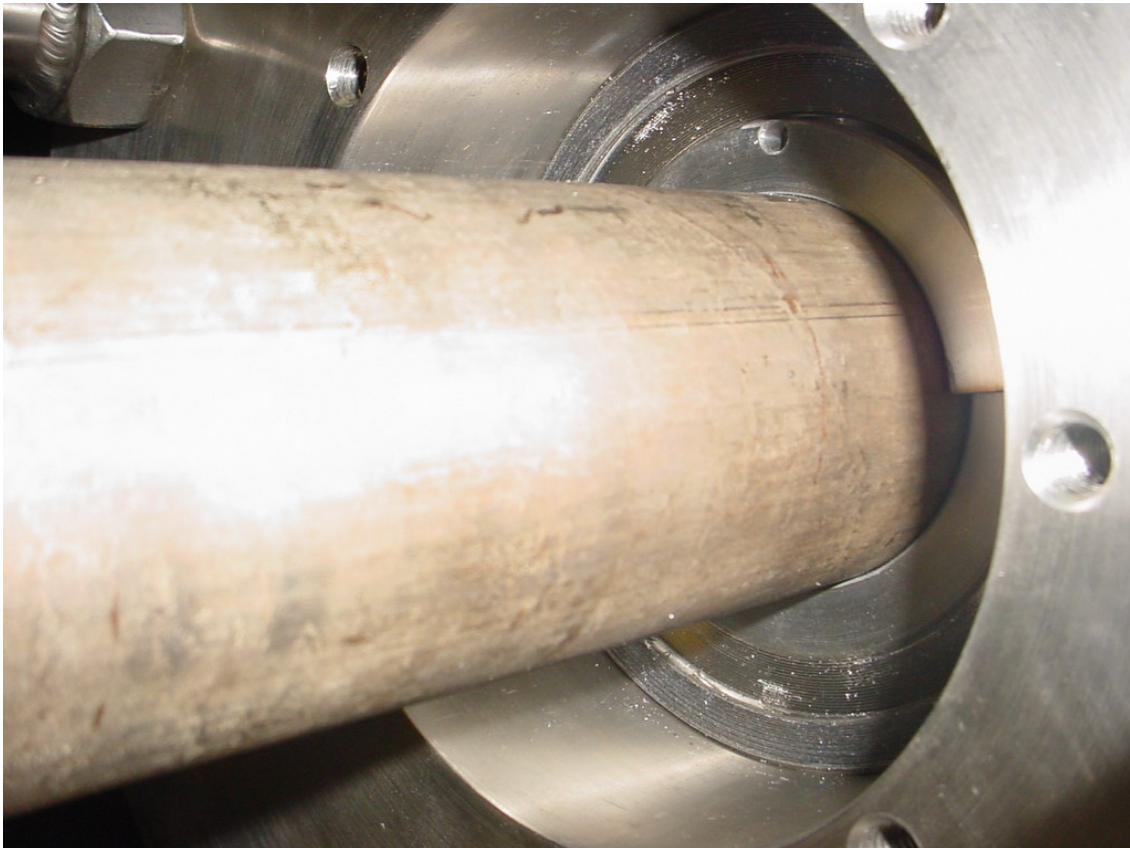
- adjustment plate for gasket compression ring
- 8-hole packing box retaining ring
- gasket compression ring
- packing box , without rope gaskets



Insert the three rings of packing material into the packing box, pushing each ring to the back of the box. Ensure that the point where the gasket ends meet is indexed from gasket to gasket. For instance, it would be good for the ends of gasket #1 to meet at a 12 o'clock orientation, gasket # 2 ends to meet at 4 o'clock, and gasket # 3 ends to meet at 8 o'clock.

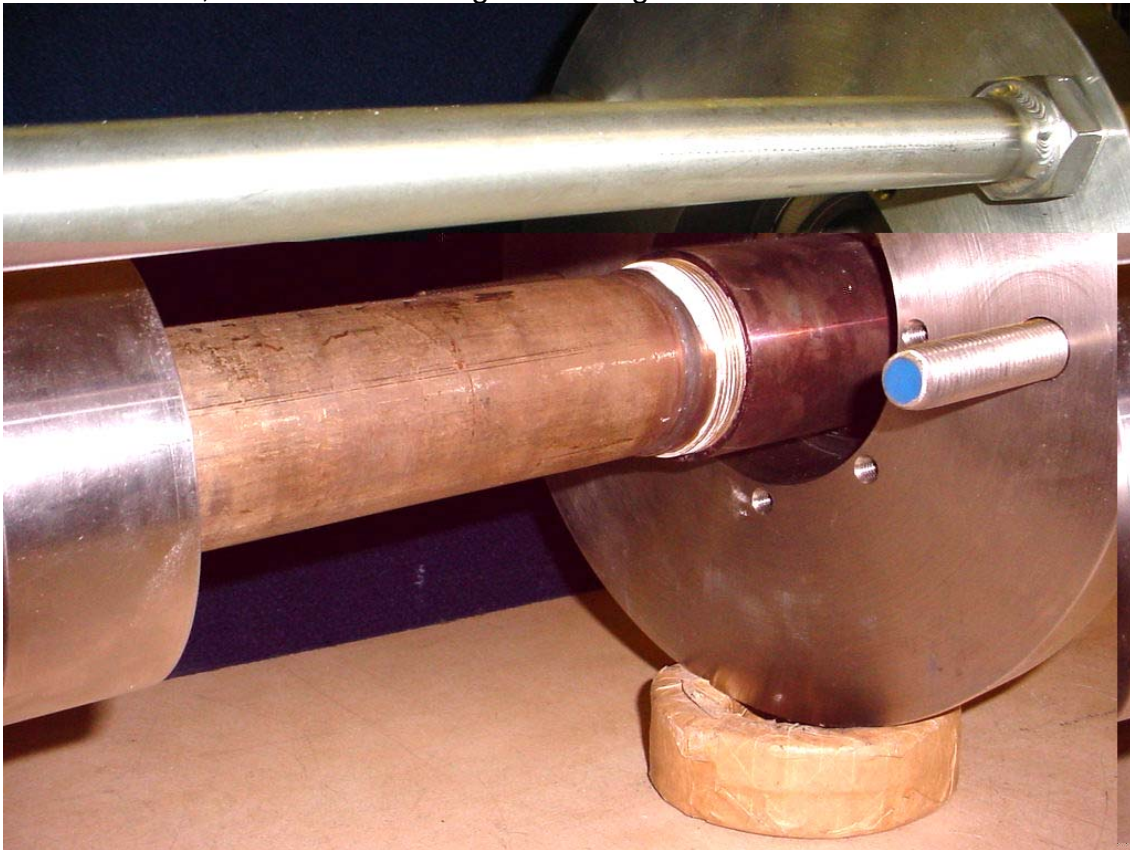


Before inserting the probe into the packing box housing, ensure that the face gasket at the back of the housing is in place. Also shown is the split ring with knurled teeth. This is depicted for clarity, but must be removed for probe insertion, and reassembled around the probe body.

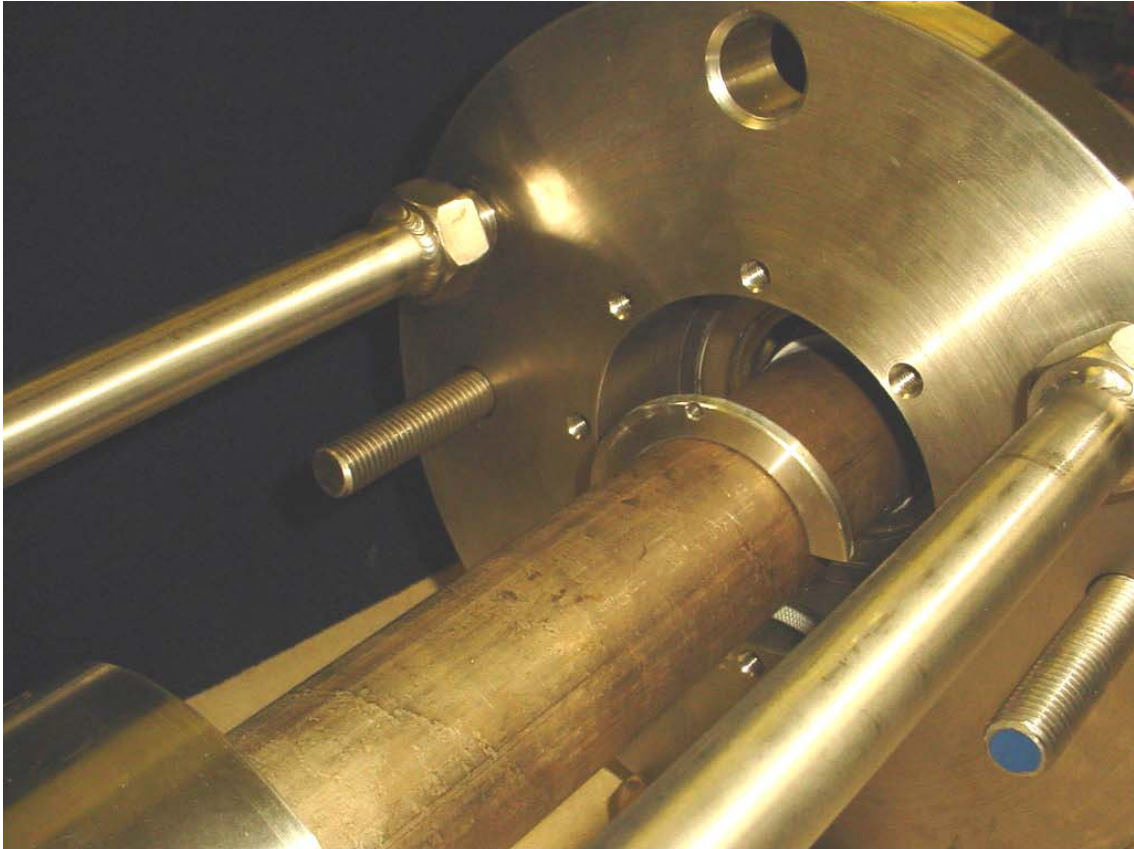


Reinstall the flame arrestor/ diffusion element assembly onto the end of the probe. Make sure to use Rosemount's white mineral antisieze compound on the threads. Do not use any petroleum based antisieze. Remember to orient the V-deflector shield (if using a ceramic diffusion element) into the direction of the process flow.

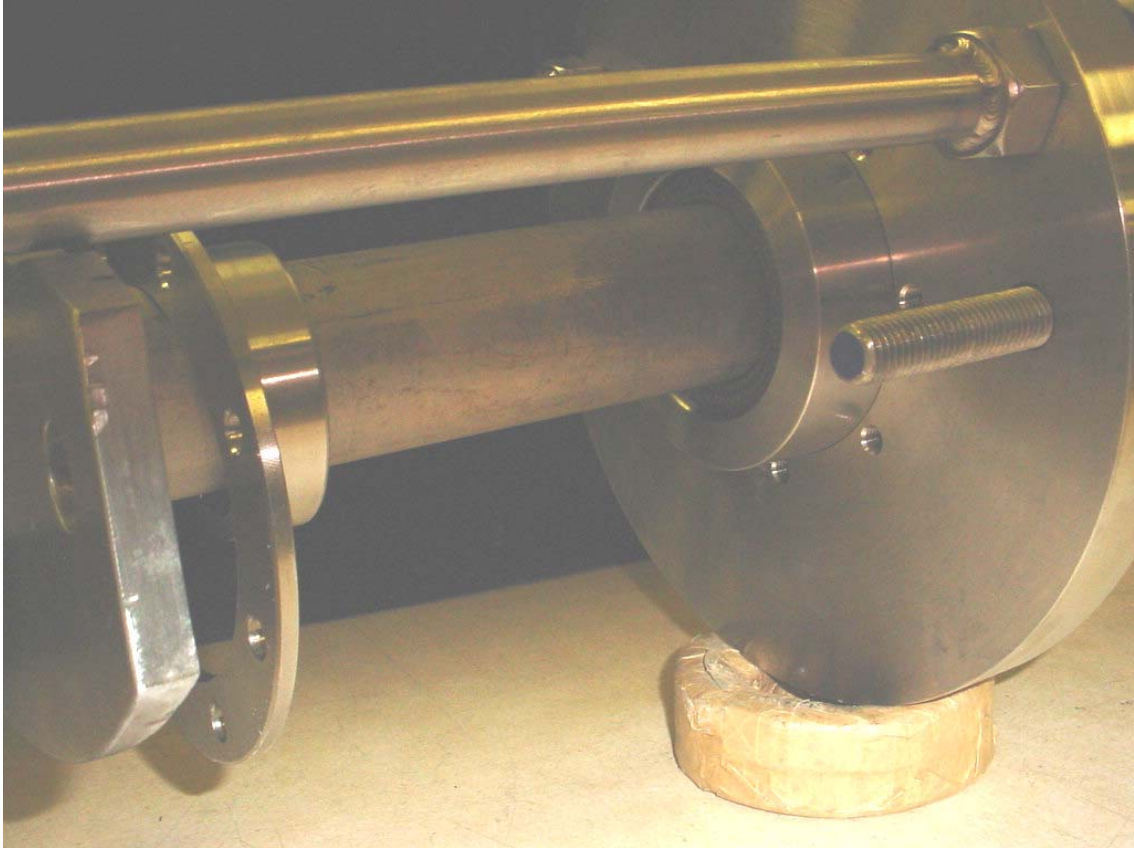
Slide the carrier assembly forward so that the probe inserts through the packing box weldment, and to the closed gate of the gate valve.



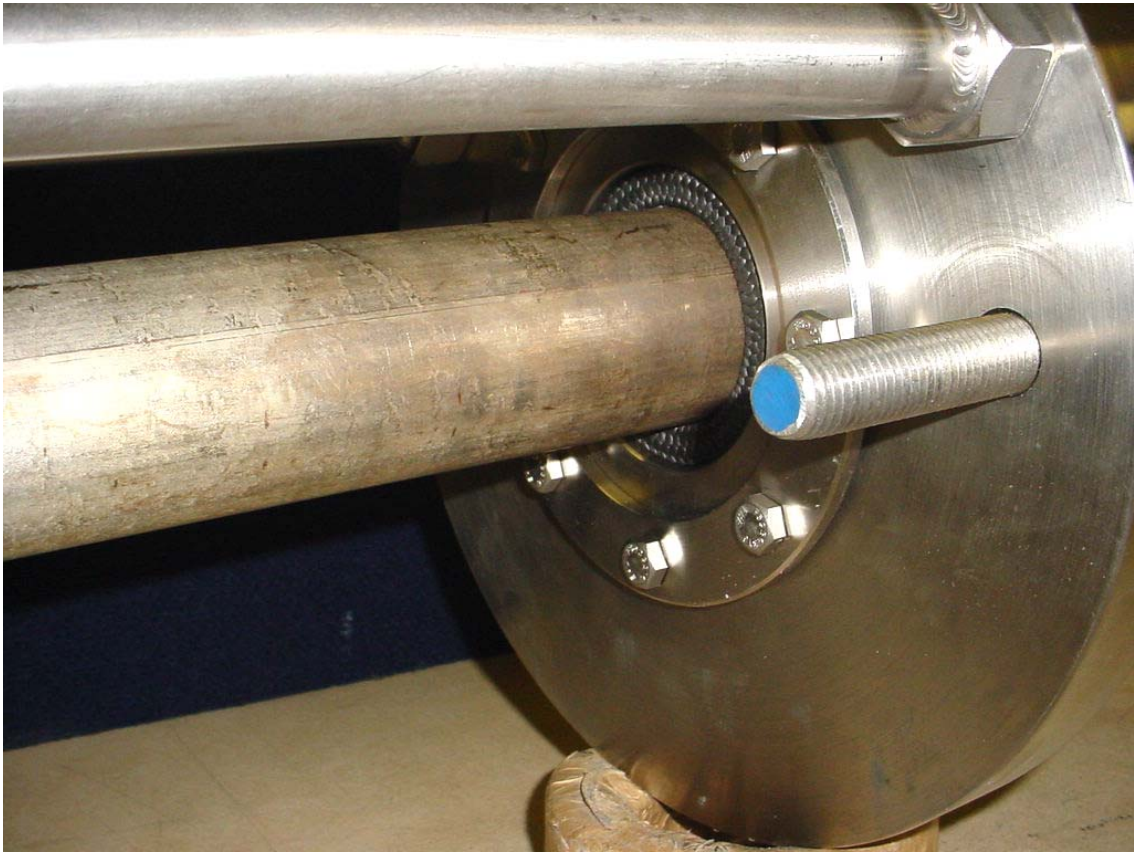
A split knurled ring is provided to scrape off cemented catalyst material that may be deposited onto the probe body during subsequent removal. Insert the split ring into the back of the packing box housing around the probe body. Ensure that the small hole in the top half of the split ring fits over the pin in the back of the weldment.



Slide the packing box assembly with 3 rope gaskets into the packing box weldment.



Bolt the 8-hole packing box retaining ring into place.



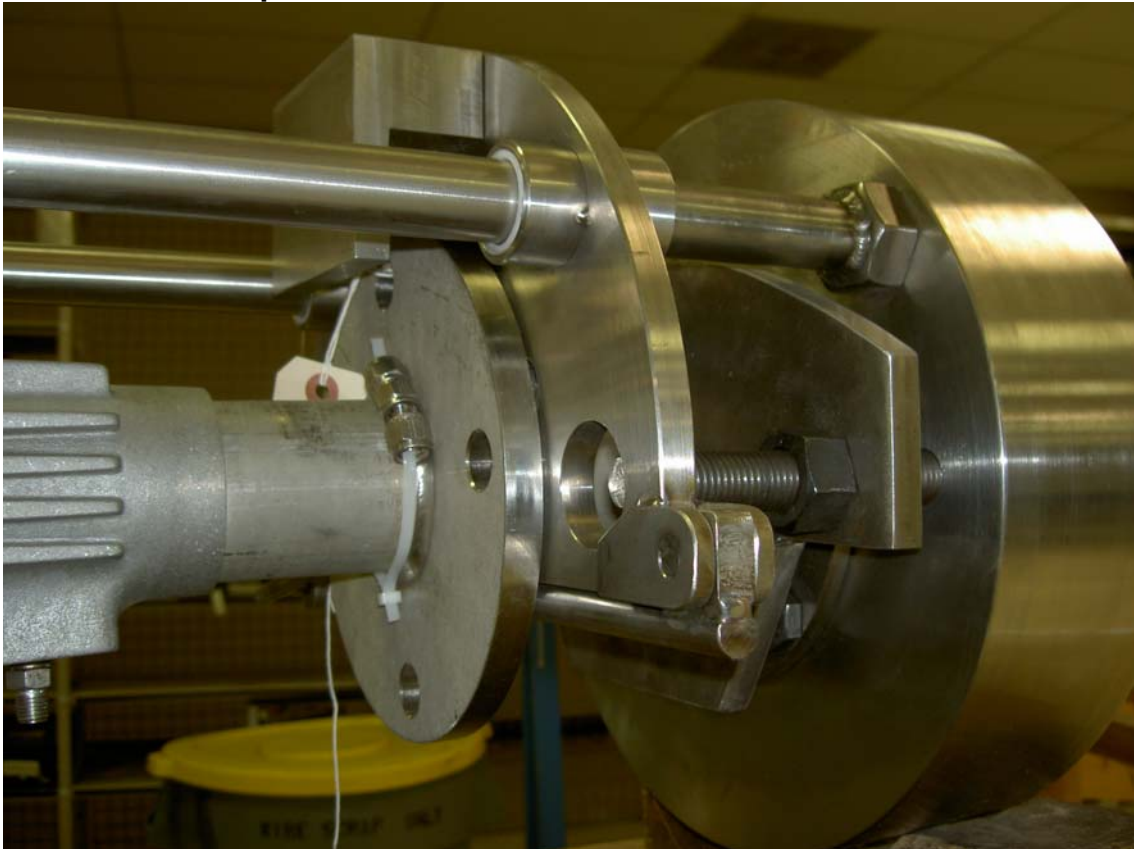
Center the packing compression ring onto the packing material, and slide the adjustment plate forward to the compression ring. Install two adjustment nuts, and tighten slightly.

Adjust the packing adjustment nuts tight enough to minimize the escape of pressurized process gas, but loose enough to let the probe slide back and forth.

Install the two stop collars onto the two guide bars behind the carrier assembly.

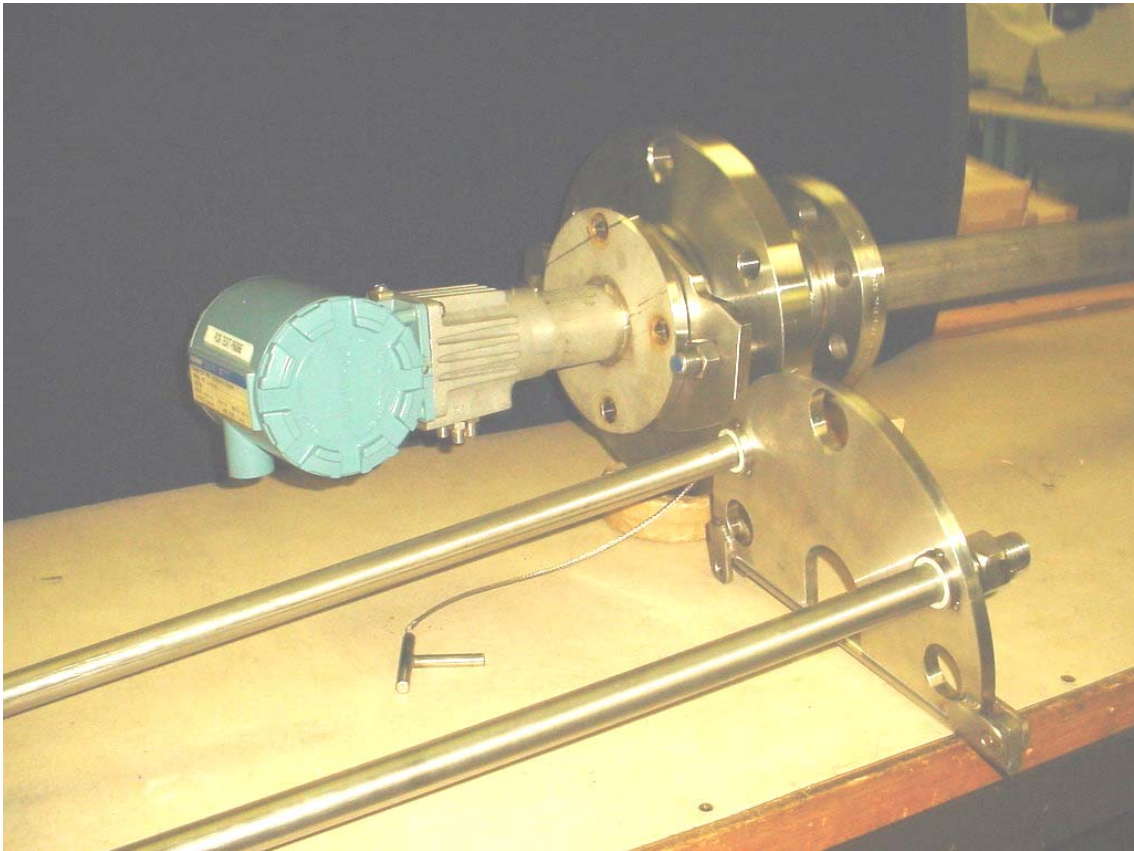
Open the gate valve fully.

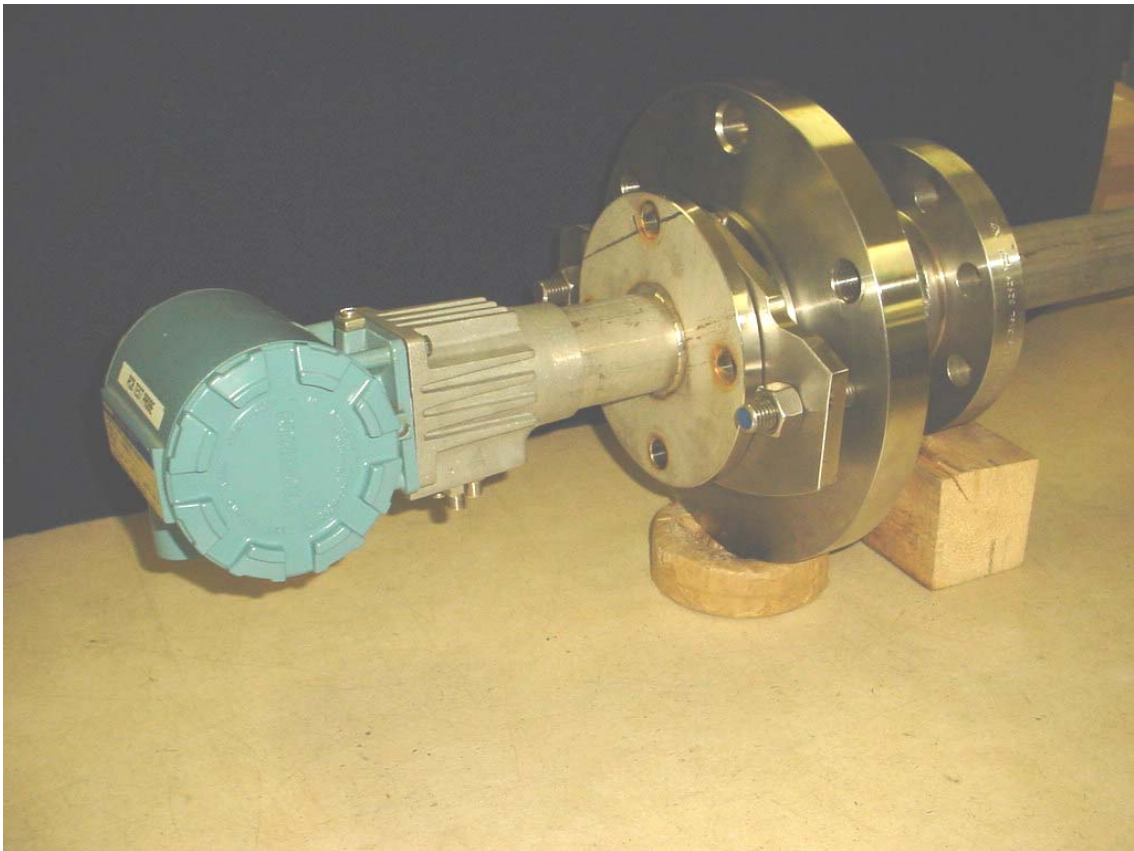
Slide the probe all the way forward into the process, alternately locking one stop collar or the other on the guide bars to prevent the probe from sliding back under the process pressure. The probe may be rotated back and forth as it is pushed in.



Once the probe is fully inserted, tighten the packing adjustment plate. The packing is now the main process barrier, and no leakage should be permitted.

Entire guide bar/probe carrier assembly can now be removed if clearance is desired around the installation.



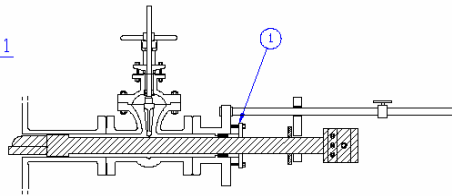


The entire valve/ packing box/ Probe assembly should be insulated to prevent the condensation of process gases in the valve and also in the calibration gas line inside the O₂ probe.

REMOVAL PROCEDURE OF HAZARDOUS AREA OXYGEN PROBE

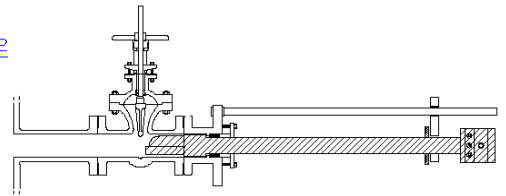
MODEL PR-2000

STEP 1



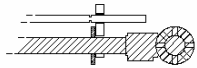
- LOOSEN PACKING GLAND ①
- ROTATE PROBE "BACK & FORTH" AS WITHDRAWING
SCRAPER WILL REMOVE SCALE BUILDUP ON PROBE

STEP 2

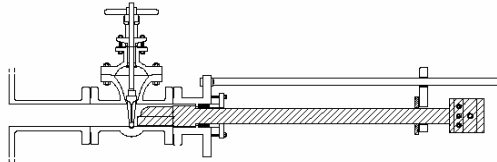


WITHDRAW PROBE TO HAVE SENSOR JUST TO PACKING GLAND
INSIDE OF PROBE FLANGE WILL BE AT GROOVE ON GUIDE RODS (See 2a)

STEP 2a

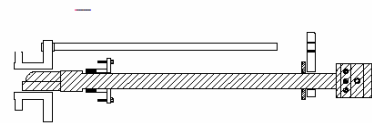


STEP 3



CLOSE VALVE & THEN DISCONNECT MODULE

STEP 4



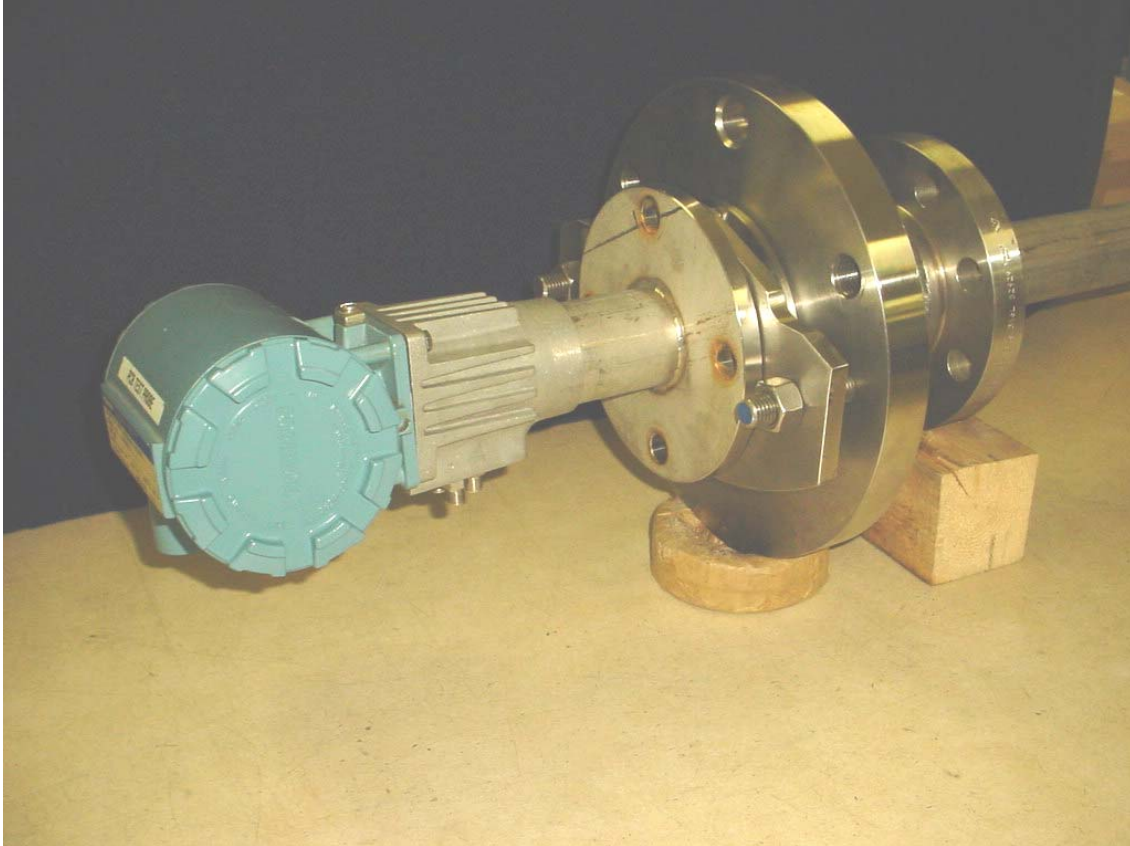
WITHDRAW PROBE COMPLETELY C/W SCRAPER & PACKING MODULE

Note: Suitable for oxymitter & world class hazardous area probe.

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES		MODEL PR-2000	
DECIMALS	ANGULAR	ROSEMOUNT O ₂ PROBE MOUNTING FOR POSITIVE PRESSURE STAG FOR HAZARDOUS AREA PROBE	
X.XX ± .02	° ± 0.51		
XXX ± .010			
DO NOT SCALE DRAWING			
CERTIFIED FOR			
DRAWN	DATE	SIZE	PO CUST. REF CUST.
BL	Jan 4, 05	B	
CHECKED		SCALE	DWG NO. OXYRMHPR1 SHEET 1 OF
		NTS	

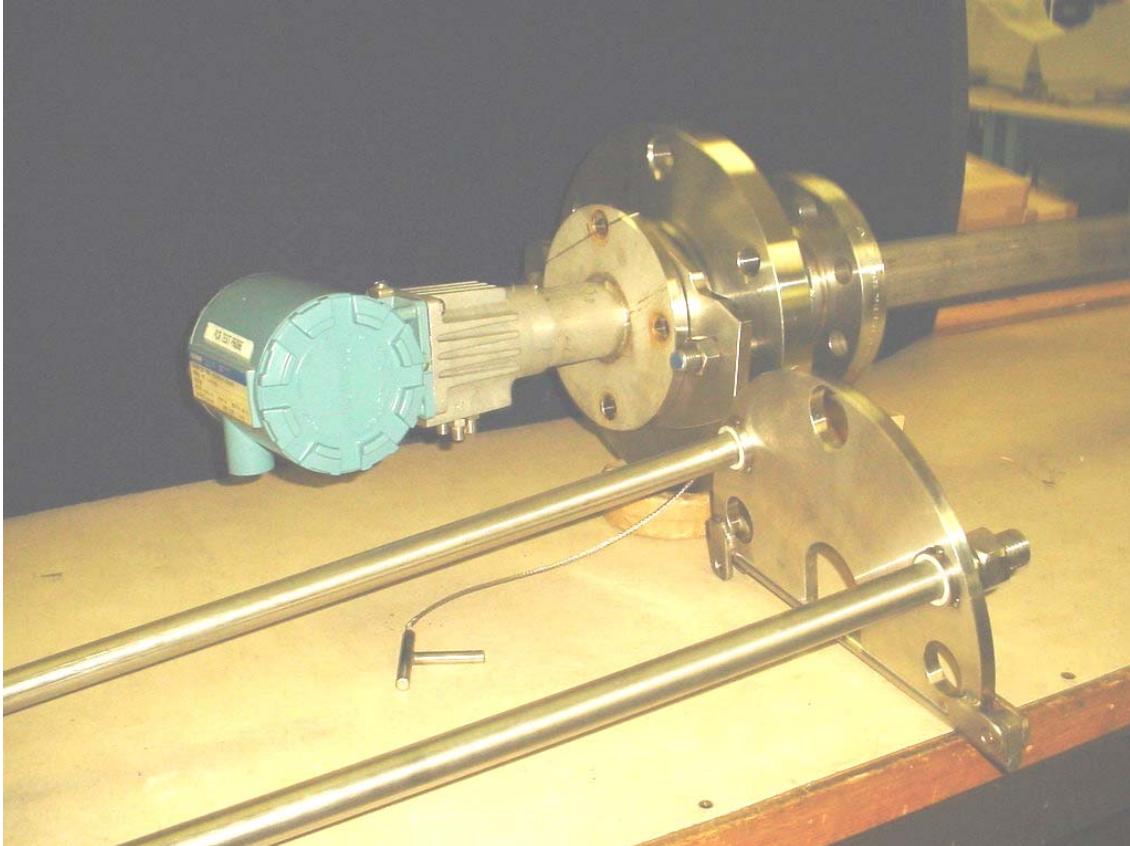
Probe removal is the reverse of the installation procedure:

- 1) If a pressure balancing system is being utilized, the inside (reference side) of the probe must remain pressured up during the removal process.
- 2) Remove insulation from the entire assembly, exposing the packing box assembly and probe.



Remove power from probe at an external breaker. If a World Class CENELEC probe is used with rigid conduit, break the wire and conduit connections at the separate close-coupled junction box. If an Oxymitter 4000/5000 is utilized, wiring can be removed from the terminations side of the probe electronics housing prior to retracting probe. **Note: do not remove the end cap from the electronics side of the Oxymitter electronics housing until probe is isolated from the process and the balancing reference air is removed.**

Re-install the probe guide rods and carrier plate. Probe flange must be outboard of the carrier plate.



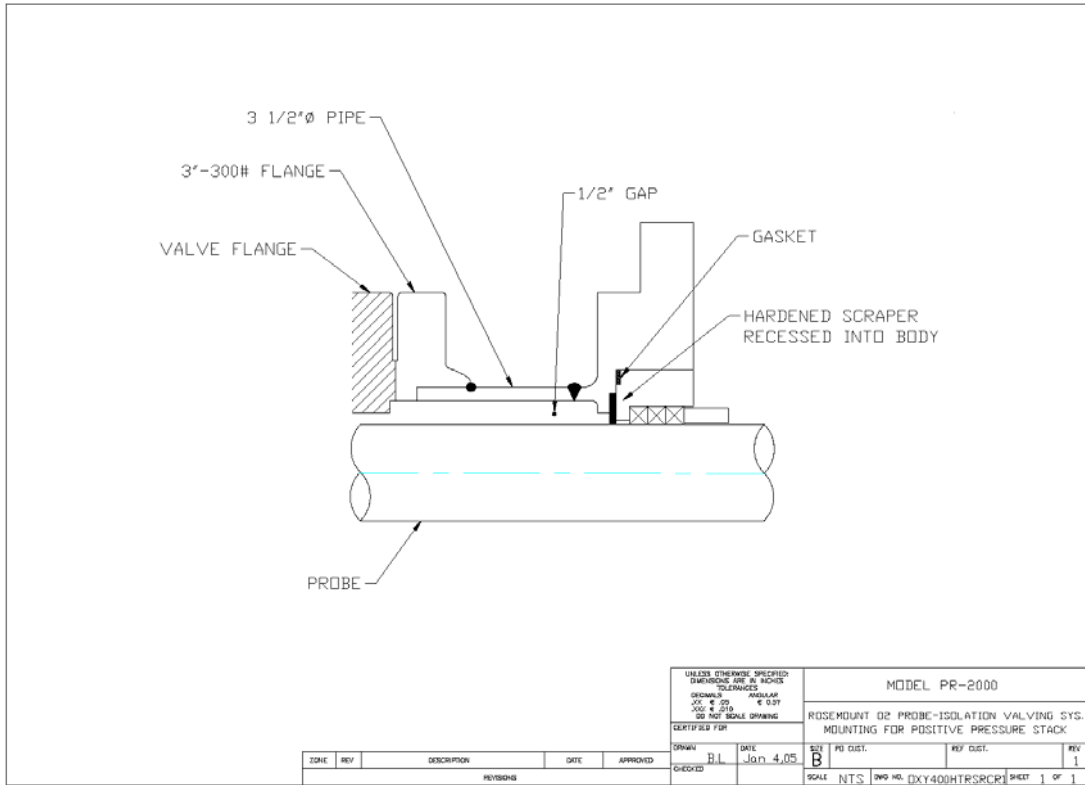
Attach retaining bar under the probe body.

- 3) Loosen the two packing adjustment nuts enough to permit the probe to slide out, but still maintain a minimum of process leakage.



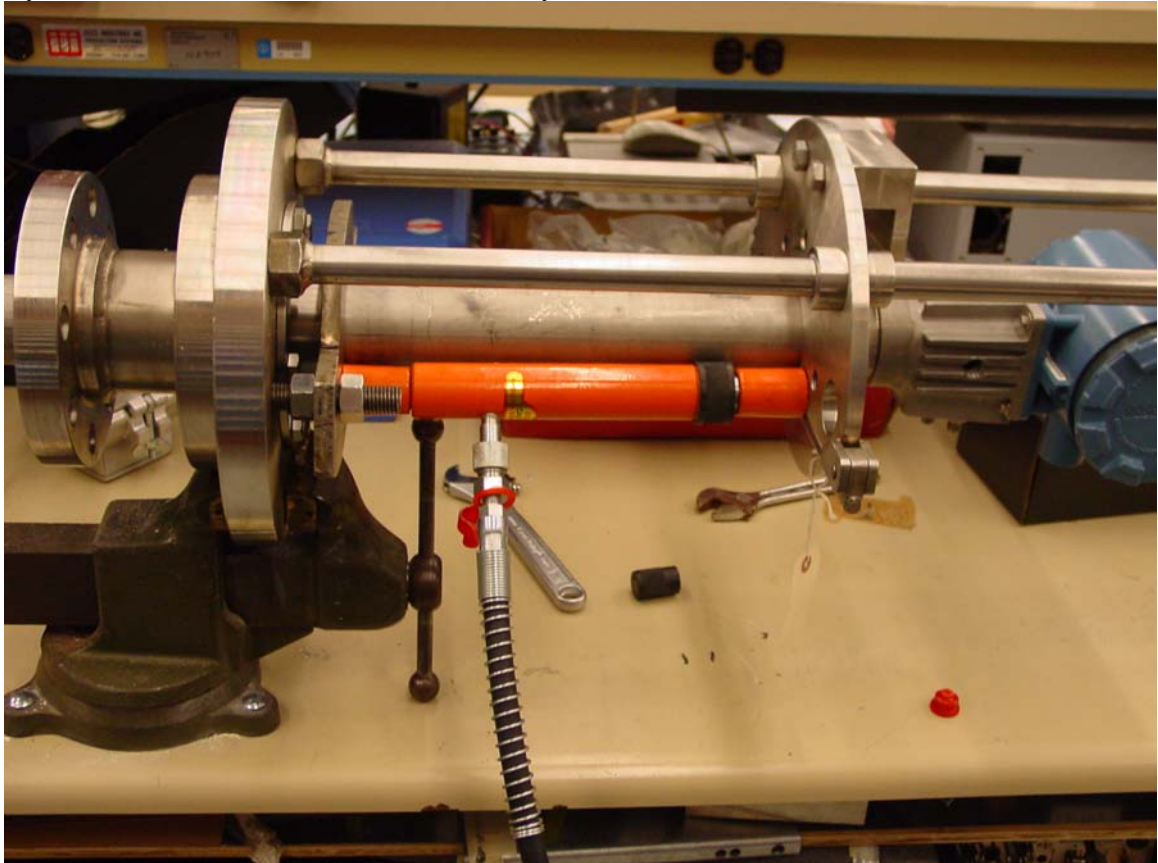
- 4) Use the two safety stop collars on the guide bars, alternately locking them into place to limit the distance the probe can slide if the process pressure overcomes the packing friction.

Rotate the probe back and forth to assist its withdrawal. Note that catalyst cement may have accumulated onto the probe body (particularly if the installation has not been well insulated), and repeated rotation back and forth may be required to saw off this material.

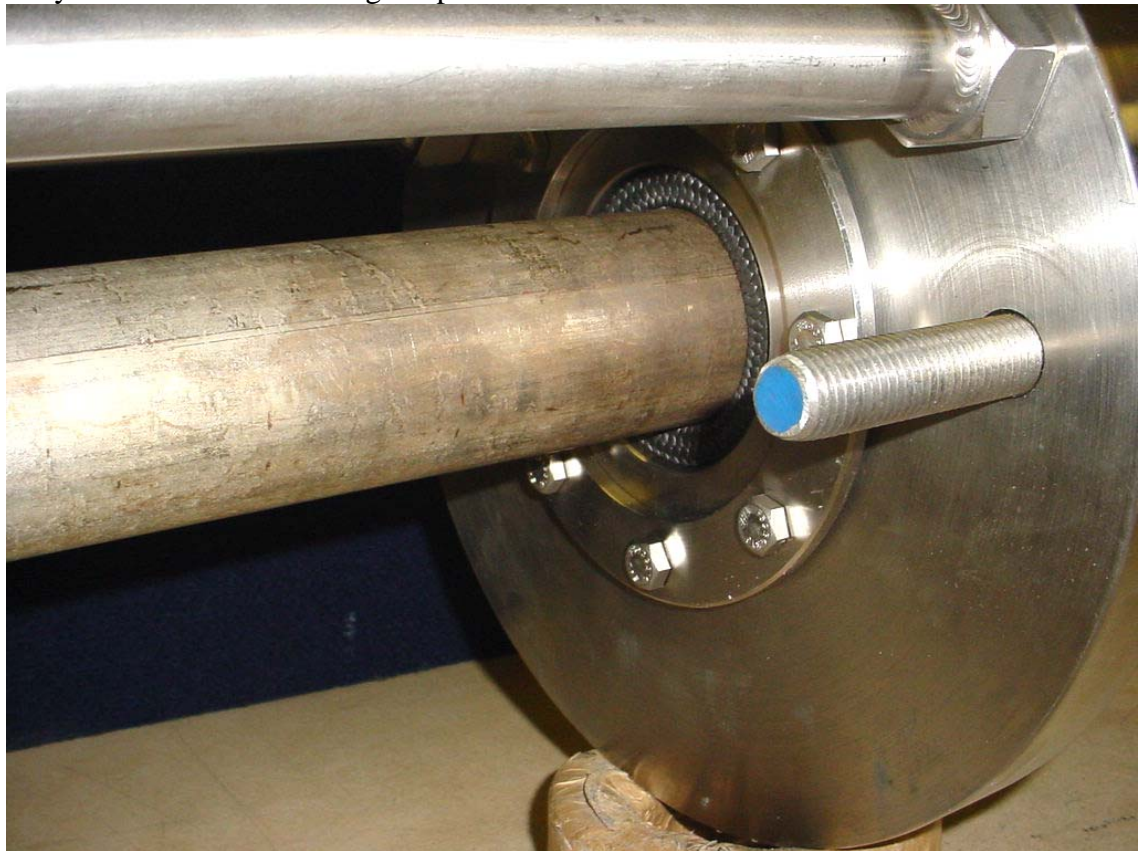


Installations that have been poorly insulated or heat traced well may have a significant buildup of catalyst cement or other deposits due to condensation on the probe body. A hydraulic cylinder can be utilized to assist in the withdrawal as depicted below. Note that the cylinder pushes against the packing adjustment plate. An extra nut is provided on the two threaded rods to prevent this pushing from over-tightening the packing.

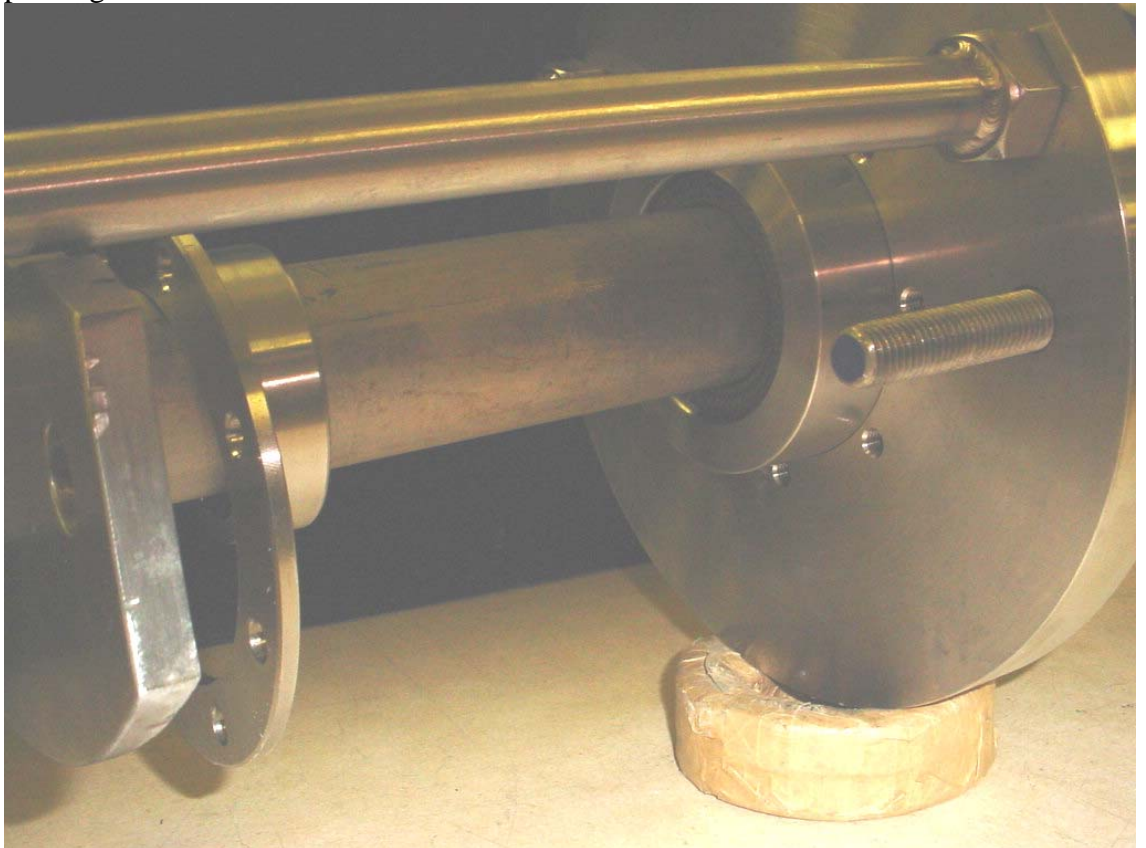
Cylinder kits are available from the factory – call 800-433-6076



When the probe flange reaches the grooves in the guide rods, the probe is beyond the gate, and the valve can be closed fully, isolating the process. If the probe is not withdrawn completely, the gate of the valve will hit the diffusion element, possibly causing breakage. Carefully loosen the packing adjustment nuts further to ensure that the gate valve has successfully isolated the process. Remove the nuts completely, and slide the packing adjustment plate and the packing adjustment ring back onto the probe body. Remove the 8 packing box retaining bolts and the retainer plate, and string them back onto the probe body. Continue withdrawing the probe.

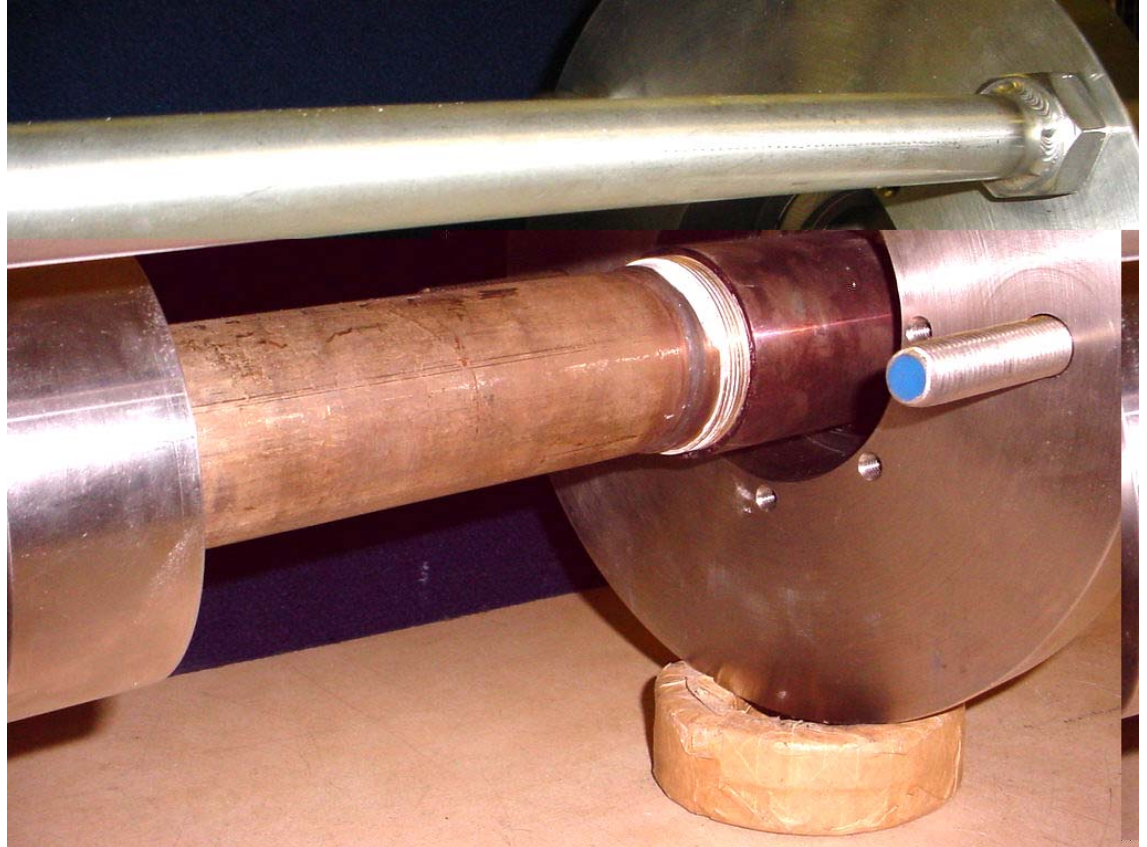


The large flame arrestor on the end of the probe will be close to the back of the packing box. As the probe withdrawal continues, the flame arrestor should push the entire packing box assembly back out of the packing box weldment.

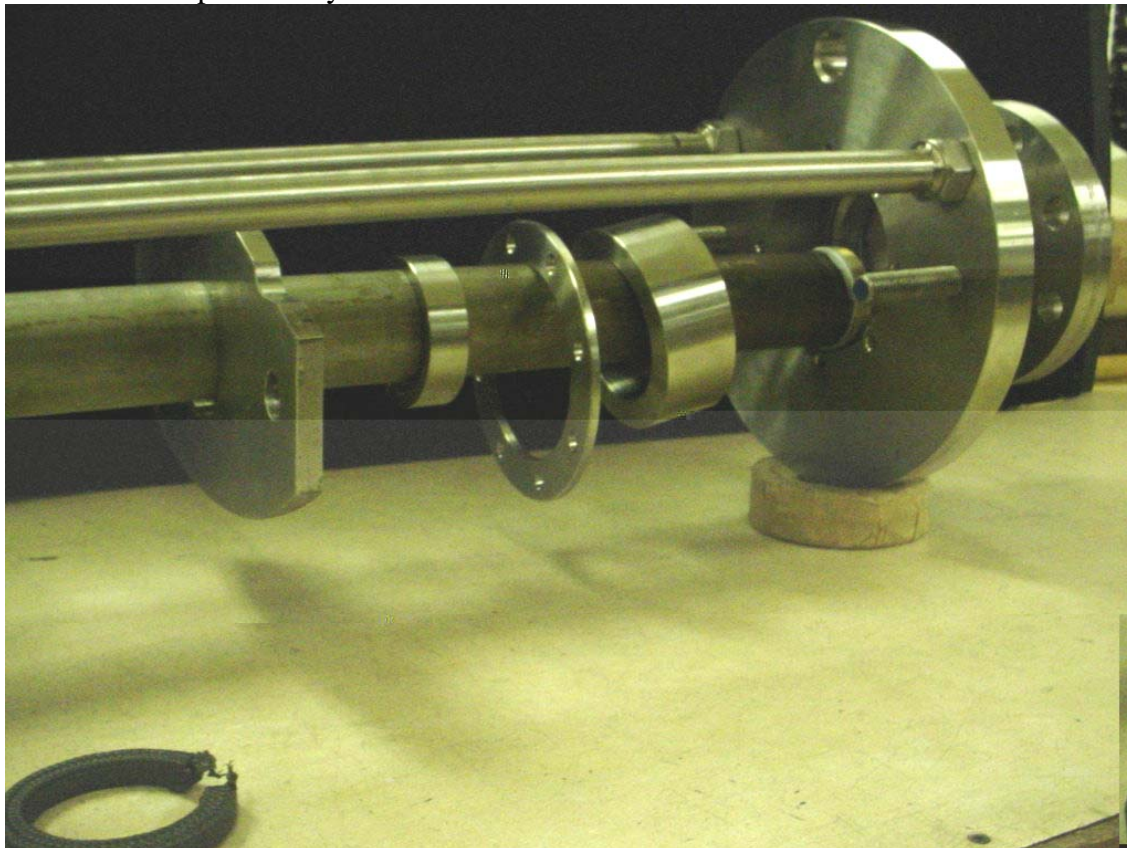


String the packing box back onto the probe body. Recover the knurled split ring, which should fall out behind the packing box. Inspect the face gasket, and leave it in place if it appears to be in good condition.

- 5) Withdraw the probe until the end of the diffuser just rests inside the packing box weldment.
- 6) Drop the retaining bar that holds the probe into the carrier assembly, and completely remove the probe.



Unscrew the large flame arrestor/diffuser from the end of the probe, and slide the packing box off. The gasket material should be pushed out, and should be inspected. Slide the packing adjusting ring, the 8-hole packing box retaining ring, and the packing adjustment plate off of the probe body.



Catalyst fines may have accumulated inside the packing box weldment. Remove this by vacuuming, or blowing with an air hose.

Pneumatic

Follow instructions in the instruction bulletin for the probe system. Applications where process pressures are greater than a few PSI will require a pressure balancing system, p/n 3D39811Gxx. This system operates by pressurizing the inside of the O₂ probe with instrument reference air at the same pressure as the process. The instrument air lines will have to remain connected as the probe is inserted into and withdrawn from the process. This will require an extra length of flexible reference air tubing. See IB 3D39811 for pressure balancing system.

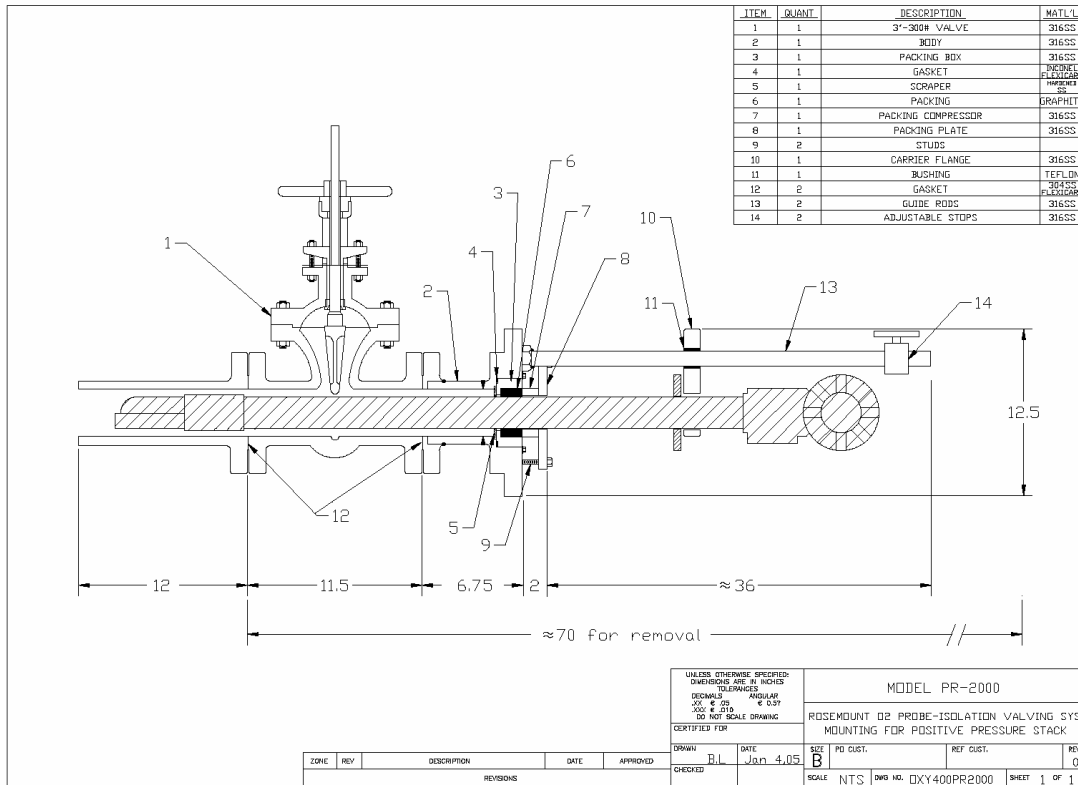
Electrical Installation

Follow instructions in the instruction bulletin for the probe system. If a CENELEC World Class probe is being installed, utilize procedures to ensure that an air-tight seal is made at the cable entry point. This will consist of a good cable seal on the outside diameter of the cable, as well as potting or sealing where the individual wires exit the overall cable sheath. This will prevent the migration of high pressure balancing instrument air down the electrical cables. The probe will be required to slide approximately 3 feet into and out of the process. An extra length of power and signal cable may be provided to accommodate this installation/removal procedure.

If rigid conduit is required, place an air-tight junction box close to the probe with terminations inside. Prior to retraction, the terminations and conduit can be removed at the junction box and the remaining length of cable/conduit and junction box can ride with the probe as it retracts.

If an Oxymitter probe is being installed, the electrical connections are isolated from the pressure balancing instrument air by a cast bulkhead. The cover from the terminations side (only) can be removed and electrical connections can be removed at the probe prior to retraction while the inside of probe is still

balanced. Do not attempt to remove the cover from the electronics side of the probe until the pressure inside is at ambient as noted by the gauges provided. Insulate the junction box (World Class) or electronics (Oxymitter) at the rear of the probe to prevent condensation of process gases in the calibration gas line, which runs the length of the probe. If an Oxymitter is used, monitor the electronics temperature with a Model 275 HART communicator to ensure that the temperature is not above 85°C (185°F)



Isolation Valving System Designations

Oxylso PR 2000 Material
1 316 Stainless Steel
2 Other

Valve

1 3" 300 # Gate Valve- 316 SS
2 Other

Probe

1 Rosemount General Purpose, 36"
2 Rosemount Hazardous Area, 36"

Probe Flange

1 ANSI Gen Purpose 6.00" OD, 4.75" BC
2 DIN Gen Purpose 7.50" OD, 5.71" BC
3 JIS Gen.Purpose 6.50" OD, 5.12" BC
4 ANSI Haz. Area 7.75" OD, 6.00" BC
5 DIN Haz. Area 8.50" OD, 6.70" BC
6 Other
7 ANSI Haz. Area 3" 300 #

Nozzle for Welding to Process

1 None- customer provided
2 3" 300# x 12" long 316 SS
3 Other

Spare Parts

Item #6 Packing

1A99624H01

Item #4- Gasket

1A99624H02

Item #12 Gasket

1A99624H03