Handling & Installation For Ring Seal Assembly

Principle of Operation

Obtaining accurate pressure readings on wastewater treatment and slurry lines is difficult because the solids present in the process media block pressure elements such as gauges, switches and transmitters.

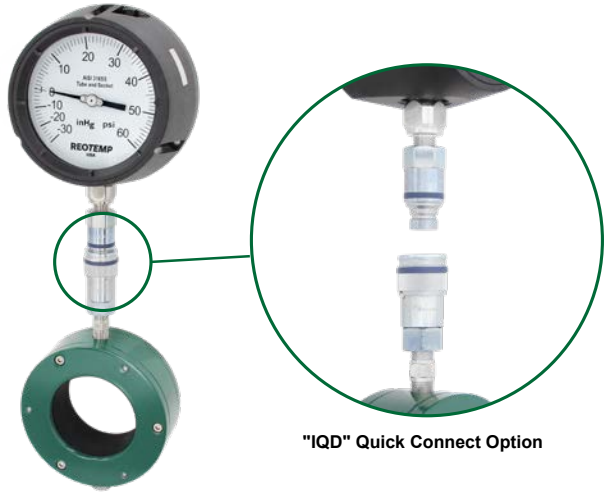
Isolation rings consist of an inner flexible liner installed inside two end plates and center section. The assembly is mounted between flanges within the process piping. The space between this rubber membrane, housing ring and pressure instrument is filled with silicone (or other fill fluids as per customer specification). As the process media flows through the isolation ring, it presses against the flexible liner causing it to expand or contract. The pressure which is exerted by the media is subsequently transferred via the fill fluid to the pressure instrument (gauge, switch or transmitter).

The inside diameter of the ring assembly is based on ASME B36.10 pipe specifications and is sized so that it matches the adjacent pipe. This enables the isolation ring to be continually cleaned by the motion of the process fluid without any resultant build-up caused by step changes in the pipe's inner diameter

Maintenance

The isolation ring is fitted with pressure instruments such as gauges, transmitters and switches. Please refer to Reotemp literature and pressure instruments Installation, Operation and Maintenance guide found on reotemp.com for these products and accessories.

The isolation ring also has a modular male-female IQD (Instrument Quick Disconnect) fitting which allows removal of the instrument assembly minimizing subsequent fill fluid leakage from the isolator ring. The pressure instrument assembly is fitted with the male adapter of the IQD fitting which is inserted into the female portion which is affixed to the isolation ring. Refer to picture below.



"IQD" Quick Connect Option

If removing the entire assembly of isolation ring and instrument(s), first turn off the process media supply into the pipe where the isolation ring is fitted. Once the system has been depressurized, the instrument(s) may be safely removed. If the isolation ring is to remain fitted, then it is possible to remove only the instruments through disconnecting the IQD, once the line is depressurized.

Press the collar down and in quick fashion, lift and remove the IQD and the instrument in an inverted and upright position. Now that the instrument has been removed, you can tend to calibrations or necessary repairs. The female IQD fitting is equipped with a spring actuated shut-off which allows the isolation ring to remain in-line and not interrupt the operation of the process. The system may now be turned on.

Note: Repeat the above process when installing a new instrument with a IQD fitting.

WARNING: The IQD should be connected or disconnected ONLY when the system is depressurized.

Storage

Correct storage of the isolation ring extends the service life. Flexible liners are perishable if the following precautions are not taken prior to installation.

1. Keep isolation rings cool. They can be stored in an unheated area but allow maximum ventilation in storage areas subject to high ambient temperatures. Trailers and storage sheds can become very hot during summer months. Avoid these locations where possible.

2. Avoid direct sunlight. UV light deteriorates some flexible liner materials. Leave the isolation ring in its box. Avoid ozone.

3. Do not store isolation rings near electrical equipment.

4. If the isolation ring already has instruments installed, carefully choose a storage location so these external devices are not physically damaged.

Installation

1. Safety Considerations
    a. Pressure isolation rings often handle chemically reactive (e.g., chlorine) and abrasive fluids. Applications such as these can result in the flexible liner wearing out over time.
    b. Make sure that the fitted pressure instruments (gauges, switches, transmitters) have pressure & temperature ratings suitable for actual operating conditions. Verify the lowest pressure rating of either the isolation ring or instrument exceeds the design pressure of the process. In addition, verify the flexible liner material's minimum and maximum operating temperature exceeds the process operating temperature range.
    c. The flexible liner must be chemically compatible and temperature compatible with the process fluid.

2. Inspect the isolation ring prior to installation. Do not install if damaged. The isolation ring should not exhibit any indication of leakage and the flexible liner should be free of cuts or punctures.

3. The isolation ring can be installed at any altitude with liquid flow in either direction. Install in a straight pipe run at least 5 pipe diameters from tees and elbows where possible.

4. To install, sandwich the isolation ring between two flanges in the process pipeline. Center as carefully as possible. Install gaskets on both sides of the isolation ring. Fastener torque and assembly sequence should be performed according to company or plant specifications.

Operating Instructions

1. Isolation rings are vacuum filled at the factory.
    a. Do not disassemble the isolation ring without Factory Authorized Approval.
    b. Do not remove the male or female portion of the IQD fitting from the isolation ring stem or instrument tree.

2. To attach a pressure instrument with the IQD fitting to the Ring seal, the isolation ring and instrument assembly must be pre-assembled, and vacuum filled prior to attaching it to the isolation ring.
    a. Instruments should not be attached to an isolation ring installed in a process pipe while the system is pressurized.
    b. Depress the male portion of the IQD into the female side until the parts mate, you'll hear a click once properly connected.
    c. The instrument assembly may be rotated 360 degrees to face any direction.

3. To remove pressure instruments from the isolation ring containing an IQD, it is not necessary to uninstall the isolation ring from the process piping.
    a. In order to minimize any slight fill fluid loss, stop the upstream process altogether by turning the system off to depressurize.

b. The interruption will be brief as the IQD and instrument removal is a very quick and straight forward procedure.
c. Depress the male portion of the IQD into the female side until the parts mate, you'll hear a click once properly connected.
d. Press the collar down and in quick fashion, lift and remove the IQD and the instrument in an inverted and upright position.
e. The female IQD fitting is equipped with a spring actuated shut-off which allows the isolation ring to remain in-line and not interrupt the operation of the process.
f. The system may now be turned back on.

4. Flexible liner and module seal replacement:
   a. Shut down the upstream process.
   b. Remove isolation ring from the process line.
   c. Remove screws from end plate.
   d. Remove end plates.
   e. Remove old liner.
   f. Clean all components thoroughly.
   g. Collapse new liner, push through the center section and work seal lips into housing grooves.
   h. Reinstall end plates.
   i. Replace end plate screws.
   j. Evacuation, filling, and calibration of the isolation ring assembly should be performed in combination with the instruments as a completed unit.

5. To attach the IQD fitting to pressure instruments:
   a. Attach the pressure gauge or other instrument to the IQD fitting.
   b. Connect the instrument assembly to the vacuum filling system.
   c. Evacuate all the air from the instrument assembly and fill with fill fluid.
   d. Detach the instrument assembly from the filling system.
   e. The instrument assembly can now be attached to an isolation ring or stored for future use.