Ruelco

High Pressure
Sand Probe Relay
Model 1S04
Operation Manual
OMP # 1S04 6/09

I. PRINCIPLE OF OPERATION

The Ruelco High Pressure Sand Probe Relay Model 1S04 is an instrument supply relay which uses a thin wall probe installed directly into a flowline to indicate that excessive erosion and/ or corrosion has occurred. It utilizes a reliable 3-way, normally open valve that will bleed off an instrumentation signal and provide visual indication that the probe has lost pressure integrity. This alerts field personnel that inspection of the flowline and possible repair may be required. In the open position, pneumatic pressure coming into the “Inlet” port flows through the body to the “Outlet” port. The valve can be manually tested by pulling the knob outward, thus moving the shaft assembly upward, and closing the valve. When the relay is in the closed position, the middle o-ring blocks the pressure at the “Inlet” port from flowing through, and the ”Outlet” can now be vented causing the system to pressure down.

In the event of the thin-walled probe breaking due to excessive wear, the flowline pressure will push the shaft assembly upward. This will cause the relay to vent the “Outlet” pressure while blocking the “Inlet” pressure. At the same time a red indication band will become visible on the shaft to show loss of pressure integrity.

II. INSTALLATION

The Model 1S04 Sand Probe Relay can be mounted either vertically or horizontally. If it is supported with piping, care should be taken that the strength of the pipe fittings used is adequate to prevent the fitting from breaking off in the relay body should the relay be inadvertently struck.

Proper pipe thread sealant should be used on any pipe fittings threaded into the relay ports. If stainless steel fittings are used, a sealant that will prevent galling is required. Supply gas or hydraulic fluid flowing through the relay should be free of large dirt particles. If compressed air is used, it does not have to be lubricated. If natural gas is used, it should contain as little condensate as possible. This will extend the life of the seals.

III. DISASSEMBLY (REFER TO SPEC SHEET 1S04)

Tools required are as follows:

- 7/16” open end wrench or suitable adjustable wrench
- 1” open end wrench or suitable adjustable wrench
- 1-3/8” open end wrench or suitable adjustable wrench
- 7/8” open end wrench or suitable adjustable wrench
- Channel lock
- Pliers
- Small sharp pick

A. DISASSEMBLY

1. To replace the two (2) shaft o-rings (Item 4) and the piston seal (Item 11), the relay does not have to be completely disassembled.

2. Place the 7/16” wrench on the lock nut and rotate it clockwise while holding the knob (Item 1) until the knob is loose. Rotate the knob counterclockwise and remove it from the shaft (Item 5). Pull the snap ring off of the shaft using pliers.

3. Remove any piping connections from the body (Item 6) that would prevent it from being removed. The body should now be able to unscrew from the base (Item 9).

4. Push the shaft (Item 5) through the valve body. Then remove the piston (Item 7) and Sleeve (Item 8). Use the pick to remove the piston seal and backup ring.

5. The seals on the shaft may now be replaced.

IV. REPAIR AND ASSEMBLY

1. Remove the piston seal and shaft seals.

2. Using an appropriate safety solvent, clean all parts.

3. Inspect the shaft for any major damage such as burrs, nicks, etc. Also, inspect for straightness. Replace the shaft assembly if damaged.

4. Examine the relay body and head bores for any damage such as burrs, nicks, etc. Replace any damaged pieces.

5. Replacement seals from a Ruelco product repair kit are required for proper relay performance. It is recommended that all seals be lubricated before and after installation with a high quality silicone base grease.

6. Install the piston seal into the base. NOTE: This is a cup type seal. The inside of the cup should be facing down and toward the flowline as shown. Place the backup into the base after the piston seal.

7. Install the sleeve into the base, followed by the piston.

8. Lubricate the shaft o-rings (Item 4) and install on the shaft (Item 5).

9. Place the shaft into the relay body.

10. Screw the body/ shaft onto the base and tighten.

11. Now, replace the snap ring (Item 3).

12. Thread the lock nut over the shaft subassembly until it reaches the last thread. Do not tighten. Rotate the knob over the shaft thread until it touches the lock nut. Hold the knob and turn the lock nut counterclockwise with the 7/16” wrench until firmly tightened.

V. RECOMMENDED MAINTENANCE

PROCEDURE and INTERVAL

Operate Manually - Every 30 days

Disassemble, inspect and lubricate – Yearly or as required.

Replace all seals – Every two (2) years or as required.