



**“PR-4” MANUAL RELAY
MODEL 1902
OPERATION MANUAL
MANUAL # OMP –1902-02-98
(SEE SPEC. SHEET 1902)**

I. PRINCIPLE OF OPERATION

The Ruelco “PR-4” relay is a pilot operated manual relay. It is a three (3) way normally closed valve with a palm knob for relay position indication and manual operation. In the closed position, pneumatic or hydraulic pressure coming into the “Inlet” port is blocked from the “Outlet” port by the second shaft O-ring from the top. The spring keeps the spool in the up or closed position. The valve is opened by manually pushing the palm knob inward, thus moving the shaft assembly inward. The detent pin is then pushed “In” to lock the relay open until a pneumatic signal is applied to the pilot cap of the relay. This pneumatic pressure acting on the piston causes the detent pin to drop “Out” of the locked position. When the relay is in the open position, it causes the lower shaft O-ring to disengage the body seal bore and the second shaft O-ring from the top to go below the “Inlet” port respectively. Also the top shaft O-ring goes below the vent holes. Supply pressure at the “Inlet” port may then flow through the body to the “Outlet” port.

When the pneumatic signal is removed from the pilot cap, the spring moves the shaft assembly upward. This causes the second shaft O-ring from the top to go above the “Inlet” port and the lower shaft O-ring to engage the body seal bore respectively. Also, the top shaft O-ring goes above the vent holes. With the supply pressure blocked, pressure will flow from the “Outlet” port and exit through the “Vent” holes. The relay may also be closed manually by pulling the palm knob outward.

II. INSTALLATION

The “PR-4” can be mounted either vertically, horizontally, panel mounted (with optional

panel mount nut), or supported by piping from any of its ports. If it is supported by 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 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.

If the relay is going to be installed in a location where the stem will be exposed to excessive paint, sand, drilling fluids, etc., the use of the optional stem protector is recommended. The stem protector does not affect the operation of the relay and will prevent the relay from jamming should the exposed portion of the shaft accumulate excessive trash or debris.

III. DISASSEMBLY (REFER TO SPEC. SHEET 1902)

- 7/16” open end wrench or suitable adjustable wrench.
- 1” open end wrench or suitable adjustable wrench.
- 7/8” open end wrench or suitable adjustable wrench and flat blade screw driver (for removal of optional stem protector).

1. To replace the three (4) shaft O-rings (Item 6), the relay has to be completely disassembled. The body seal (Item 10) may not have to be replaced as often as the other moving seals.
2. Place the 7/16" wrench on the lock nut (Item 2) 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 subassembly (Item 8). If the optional stem protector is installed, use the 7/8" wrench on the flat on the seal washer (Item 13) to rotate the seal washer clockwise until the knob is loose. Remove the knob and seal washer simultaneously (rotate counterclockwise).
3. Use the 1" open end wrench or suitable adjustable wrench to remove the base.
4. Remove the spring (Item 9) and pull the shaft subassembly through the valve body.
5. The seals on the shaft may now be replaced as per instructions given in the repair section of this manual.
6. If the relay is panel mounted, it is not necessary to remove the relay from the panel, but it is recommended so that adequate inspection and cleaning of all parts may be performed.
7. To remove the stem protector housing (Item 12) if installed, use the flat blade screwdriver and rotate the screws (Item 4) counterclockwise.
8. The relay is now ready to be cleaned and repaired.

IV. REPAIR AND ASSEMBLY

1. Remove the shaft seals from the shaft and the body seal from the body.
2. Using an appropriate safety solvent, clean all parts.
3. Inspect the shaft assembly for any major damage such as burrs, nicks, etc. Also inspect if for straightness. Replace the shaft assembly if damaged.
4. Examine the relay body for any damage such as burrs, nicks, etc. Replace if damaged.
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. Lubricate the shaft O-rings and install on the shaft subassembly.
7. Lightly lubricate the large and the small bores in the relay body.
8. Lubricate the body O-ring (Item 10) and install into the valve body.
9. Slide the shaft subassembly (Item 8) into the relay body.
10. Insert the spring over the piston (Item 9) and then screw the base (Item 11) in the body (Item 7).
11. If a stem protector is to be used, locate the holes in the protector body over the threaded holes in the detent body. (The holes in the detent body are located over the holes in the relay body.) Insert the two (2) screws (Item 4) and rotate them clockwise to tighten.

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.

13. To install the stem protector washer and the knob, thread the washer as far down onto the shaft as possible. Screw the knob onto the exposed threads above the washer, but do not tighten. **NOTE:** The protector seal should be completely inside the protector housing. Rotate the knob clockwise until it stops. Use the 7/8" wrench to turn the protector washer counterclockwise until tight.

V. RECOMMENDED MAINTENANCE

<u>PROCEDURE</u>	<u>INTERVAL</u>
Operate Manually	Every 30 days
Disassemble, inspect and lubricate	Yearly or as required
Replace all seals	Every two (2) Years or as required