

Operating Instructions

Models 5020, 5011, 5012, 5031, 5032, 5041, and 5042

Low Pressure Teflon Rotary Valves

1.0 DESCRIPTION

Rheodyne Teflon Rotary Valves are used for low pressure applications. Model 5020 is a sample injector. Models 5011, 5031, and 5041 have 0.8 mm (0.032") bore ports, while Models 5012, 5032, and 5042 have 1.5 mm (0.060") bore ports.

Figure 1 shows a schematic flow diagram of each of the switching valves. The circles represent the ports in the valve stator. The dark grooves represent the connecting passages in the rotor seal.

60° rotation of the knob switches the valve from one position to another. The two-position valves have stops that restrict the rotation of the valve to 60° turns. The six-position valves have a spring loaded detent mechanism that allows 360° rotation and ensures that the shaft falls into each of the six positions.

To distinguish the various valves from each other:

- The 3-Way Rotary Valves are marked "3-WAY."
- The 4-Way Rotary Valves are marked "4-WAY."

c) The Sample Injectors are also marked "4-WAY" because the internal passages are identical to the 4-Way valve. The Sample Injector can convert to the 4-Way valve by changing the external connections such as adding a sample loop.

d) The Six-Position Rotary Valves are unmarked and can be recognized by the seven tubes instead of six.

2.0 SUPPLIED WITH THE VALVE

The 4-Way valve is supplied with a coupling that connects Ports 1 and 5 together. The Sample Injector is supplied with a 500 µL sample loop connected between Ports 1 and 4, female luer adapter connected to Port 6 and a vent line attached to Port 5.

3.0 SPECIFICATIONS

- Maximum operating pressure is 2.0 MPa (21 bar, 300 psi)
- Maximum operating temperature is 50°C
- Wetted surfaces are Teflon and Kel-F

- Available in 0.8 mm (0.030") and 1.5 mm (0.060") flow passages
- Tubes connecting to the valve ports match the passage ID
- The tubes are terminated in 1/8-28 Tube End Fittings (flanged tubing type)

4.0 INSTALLATION

To mount the valve on a panel, remove the knob by loosening the screw on the knob. The Teflon Rotary Valve Mounting Bracket (P/N 5060) includes two screws and two nuts used in mounting the valve to the bracket. Replace the knob by tightening the screw against the flat surface on the shaft.

5.0 OPERATION

The flow paths of Rheodyne low pressure rotary valves are shown in Figure 1.

Models 5031, 5032, 5041 and 5042 switch between two positions while Models 5011 and 5012 switch among six positions. Model 5020 Sample Injector has two positions: LOAD and INJECT. The sample injector uses a syringe that is inserted into the supplied female luer adapter connected to Port 6, to load the supplied sample loop.

6.0 MAINTENANCE

The main cause of early failure, which is seen as a leak in the valve, is abrasive particles in the sample and/or mobile phase which can scratch the rotor and stator. Mobile phase and samples should be filtered to reduce the risk of scratches on these two parts.

6.1 DISASSEMBLY

To disassemble the valve, refer to Figure 2 and proceed as follows:

- Remove the three cap screws.
- Pull the stator off the body.
- Pull the body off to gain access to rotor.
- Remove the rotor by pushing the rotor pin out (a paper clip is the correct diameter to push the pin).

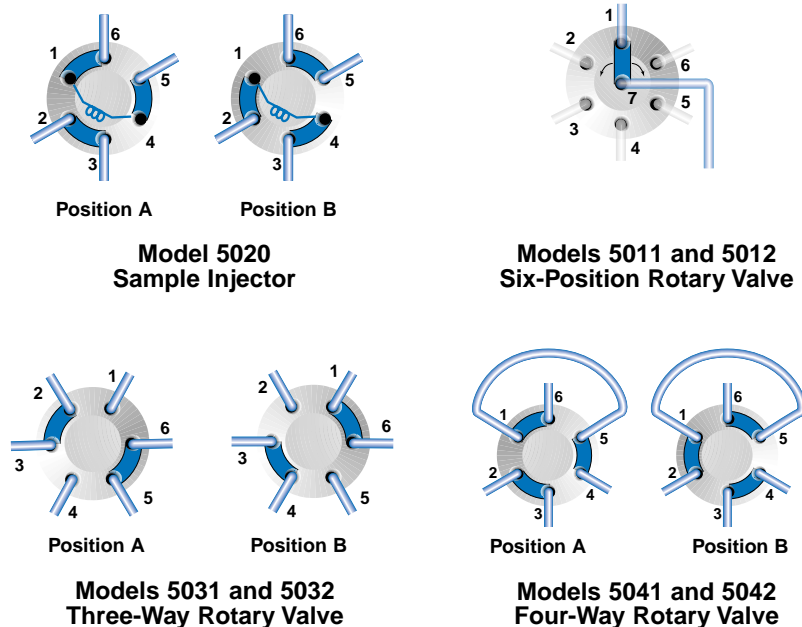


Fig. 1. Flow diagrams of Rheodyne low pressure rotary valves.

6.2 REASSEMBLY

To reassemble the valve, refer to Figure 2 and proceed as follows:

- Place the new rotor on the shaft and slip the rotor pin in place. See Figure 3 for the correct orientation of the rotor.
- The body is replaced by lining up the cap screw holes in the body with the three threaded ports in the mounting flange.
- Confirm that the stator pins in the body are in line with the two open holes in the mounting flange.
- Place the stator on the stator pins, confirming that the set screw holes line up. The face of the stator with the raised area faces the rotor.
- Replace the cap assembly. There is only one way all the holes will line up.
- Tighten the three cap screws uniformly, just enough to pull the body, stator, and cap together with only a small uniform gap between the cap and stator. Tightening the screws too tight will make the knob difficult to turn.

7.0 LEAKAGE

If there is leakage between the stator and body confirm that the 2.0 MPa (21 bar, 300 psi) pressure limit has not been exceeded. If the stator or rotor seal become scratched so that the valve leaks, replace both of these parts.

8.0 USE OF AQUEOUS BUFFERS OR SALT SOLUTIONS

To prevent the formation of salt crystals in the valve, flush out the flow passages and the vent line with water after using salt solutions.

9.0 WARRANTY

All Rheodyne products are warranted against defects in materials and workmanship for a period of one-year following the date of shipment by Rheodyne. Rheodyne will repair or replace any Rheodyne product that fails during the warranty period due to a defect in materials or workmanship at no charge to the customer. The product must be returned to Rheodyne's factory in original packaging or equivalent, transportation prepaid. Damage occurring in transit is not covered by the warranty. This limited warranty is Rheodyne's sole warranty of its products, and all other warranties of merchantability or fitness for any particular purpose are hereby disclaimed.

Under no circumstances will Rheodyne be liable for any consequential or incidental damages attributable to a claimed failure of a Rheodyne product, even if Rheodyne has been placed on notice of possibility of such damages.

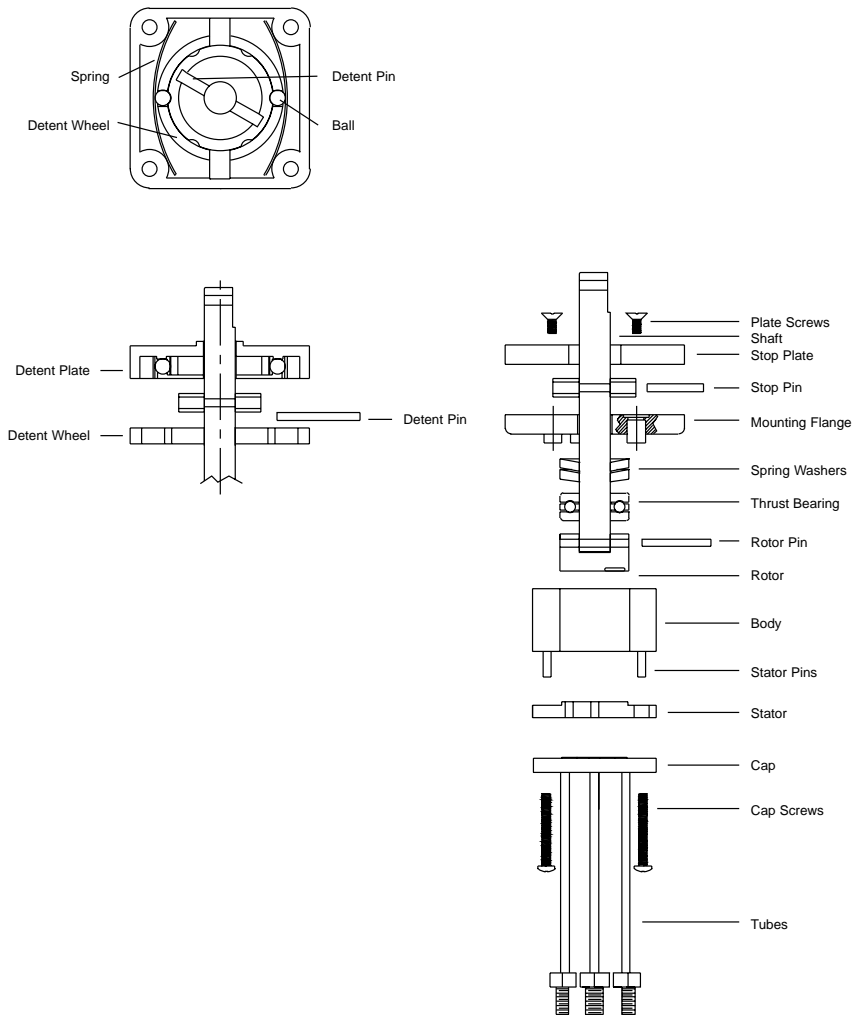


Fig. 2. Exploded views of manual low pressure rotary valves.

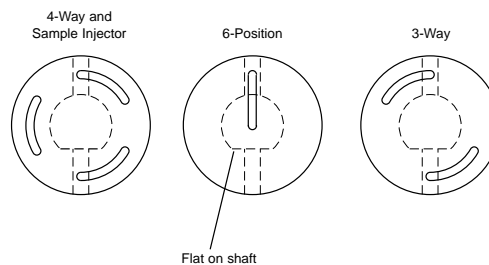


Fig. 3. Orientation of rotor on shaft as viewed from rotor face.