

## 1.0 DESCRIPTION

Model 7520 is a stainless steel 4-port micro-scale sample injector. The internal sample chamber determines the sample injection size.

Figure 1 is a cut-away schematic view of the valve flow path. The sample loads through the needle port in the LOAD position. Rotation of the knob 45° switches the valve from LOAD to INJECT. In INJECT, the mobile phase flows through the sample chamber located in the rotor (see Figure 2).

The needle port is built into the inlet stator and includes a Teflon needle seal near the bottom of the port. This durable seal is not removable. A spring on the needle port tube assembly keeps proper tension on the built-in needle seal.

## 2.0 SUPPLIED WITH THE VALVE

Supplied with the valve in a separate bag are RheFlex® Stainless Steel Fittings sets for all ports and the items listed below. A 0.5 µL internal sample chamber is standard with the valve.

- Mounting Screws
- Vent Tube
- Wrench(es)
- Hex Key(s)
- Needle Port Cleaner
- Rotor Removal Tool

Attached to the column port is a 5 cm length of 0.13 mm (0.005") ID stainless steel tubing. The #22 gauge needle must be removed from the needle port before using the valve.

## 3.0 SPECIFICATIONS

- Wetted Surfaces: Stainless steel and an inert polymer
- Flow Passage Diameters: 0.13 mm (0.005")
- Maximum Operating Pressure: 48 MPa (483 bar, 7000 psi)
- Maximum Operating Temperature: 80°C
- Sample Injection Volumes: 0.2 µL, 0.5 µL (standard), 1.0 µL
- Accepts 10-32 male threaded fittings

## 4.0 IMPORTANT SAFETY NOTICES

**4.1 Caution:** Use the correct size syringe needle to prevent damage to the valve.

**4.2 Caution:** Rinse the valve after using buffer solutions to prevent the formation of crystals, which can scratch the sealing surfaces and/or block the small passageways.

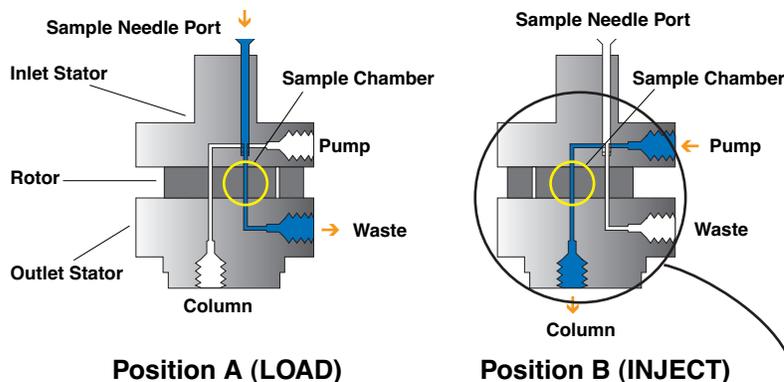


Fig. 1. Cut-away schematic view of valve flow path.

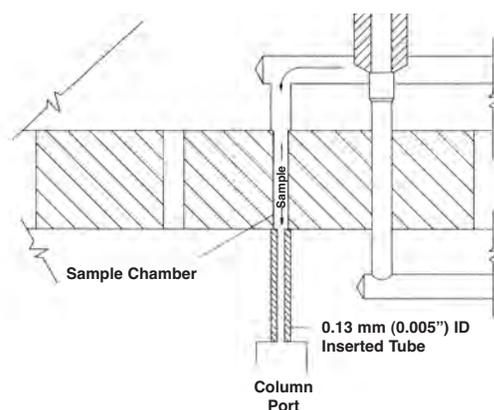


Fig. 2. Enlarged view of valve in INJECT position.

## 5.0 USING PROPER SYRINGES

Use syringes with #22 gauge, without electrotaper, and with 90° point style (square cut) needles. Using the incorrect needle size or style will damage the injector.

## 6.0 INSTALLATION

a) Model 7520 can be mounted on a panel. The mounting holes are located on either side of the Column Port in the outlet stator. Use the two screws supplied to fasten the valve to a panel.

b) Connect the vent tube (supplied) to the Waste Port in the Outlet Stator (see Figure 1). Place the outlet of the vent tube at the same horizontal level as that of the needle port to avoid siphoning (see Figure 3).

c) Connect the pump to the Pump Port in the Inlet Stator (see Figure 1).

d) Connect the column to the tubing (supplied) attached to the Column Port in the outlet stator. Leave the column disconnected from the valve during initial flushing.

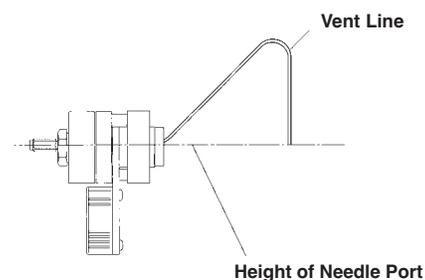


Fig. 3. Correct position of vent line.

## 7.0 OPERATION

### 7.1 FLUSHING THE INJECTOR

In INJECT flush the needle port with about 1 mL of mobile phase, using the needle port cleaner as shown in Figure 4. At this time, the pump flushes the sample chamber.

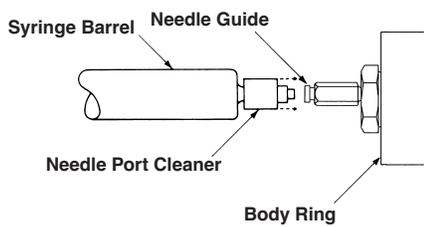


Fig. 4. Use of Needle Port Cleaner.

## 7.2 MANUAL LOOP LOADING

In manual operation, the tip of the syringe needle does not reach the rotor surface. There is approximately  $0.3 \mu\text{L}$  of hold-up volume. Therefore, it is necessary to load excess sample in the sample chamber to ensure reproducible sample loading. An excess of sample is needed because mobile phase near the wall of the sample chamber is displaced slowly due to the laminar flow effect shown in Figure 5.

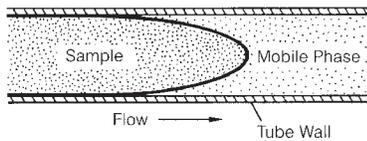


Fig. 5. Laminar flow effect.

The injected sample volume is determined by the size of the sample chamber. The standard model is supplied with a  $0.3 \text{ mm}$  ( $0.012''$ ) diameter sample chamber which gives a sample volume of approximately  $0.5 \mu\text{L}$ . This is a nominal size and can be expected to vary from rotor to rotor by  $\pm 20\%$ .

## To Load the Sample Chamber:

- Insert the syringe into the needle port. You will feel tightness during the last 2-3 mm of travel as the needle passes through the needle seal.
- Load the sample.
- Leave the syringe in and turn to INJECT.

## 8.0 ADJUSTING FOR LEAKAGE OR HIGHER PRESSURE OPERATION

Model 7520 is shipped from the factory set to hold  $34 \text{ MPa}$  ( $345 \text{ bar}$ ,  $5000 \text{ psi}$ ). There is a single pressure adjusting screw at the injection port end of the valve. It can be tightened (clockwise) to hold up to  $48 \text{ MPa}$  ( $483 \text{ bar}$ ,  $7000 \text{ psi}$ ).

## 9.0 MAINTENANCE

The only part that may need eventual replacement is the rotor. The main causes of early failure are:

- The wrong needle tip can damage the Teflon needle seal.
- Abrasive particles in the sample can scratch the rotor surface.

## 9.1 DISASSEMBLY

To disassemble Model 7520, refer to Figures 6 and 7, and proceed as follows:

- Remove the two hex screws located in the inlet stator.
- Pull the inlet stator off. The inlet stator, body ring, spacers, pressure adjusting nut, and needle port tube assembly will remain together.
- Remove the handle assembly. The rotor will remain in the assembly.
- Place the rotor removal tool (supplied) on the edge of a bench top.
- Slip the central pin located in the rotor into the removal tool with the small (inlet)

side of the rotor facing the removal tool. Position the black knob over the bench edge (see Figure 7).

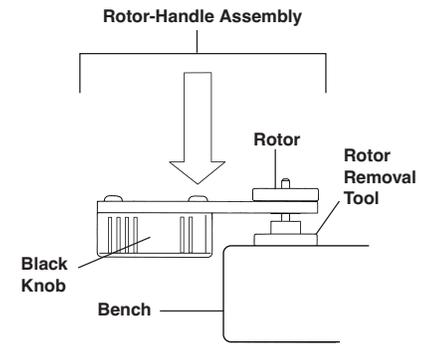


Fig. 7. Removal of rotor.

- Push down on the handle plate to push out the rotor.

## 9.2 REASSEMBLY OF MODEL 7520

To reassemble Model 7520, refer to Figures 6, 8 and 9, and proceed as follows:

- Confirm that the two  $1/16$  inch holes in the new rotor line up with the pins in the handle plate, and push the rotor down until the small side of the rotor pushes through the hole in the handle plate. The notch on the metal band around the rotor lines up with the knob screws (see Figure 8).
- Slip the central pin on the rotor-handle assembly into the center hole in the inlet stator. Mount the assembly so the black knob faces the LOAD/INJECT arrow on the body ring label and faces down towards the injection port (see Figure 9).
- Place the two spacers into the holes in the inlet stator. One spacer will slip through the handle plate.

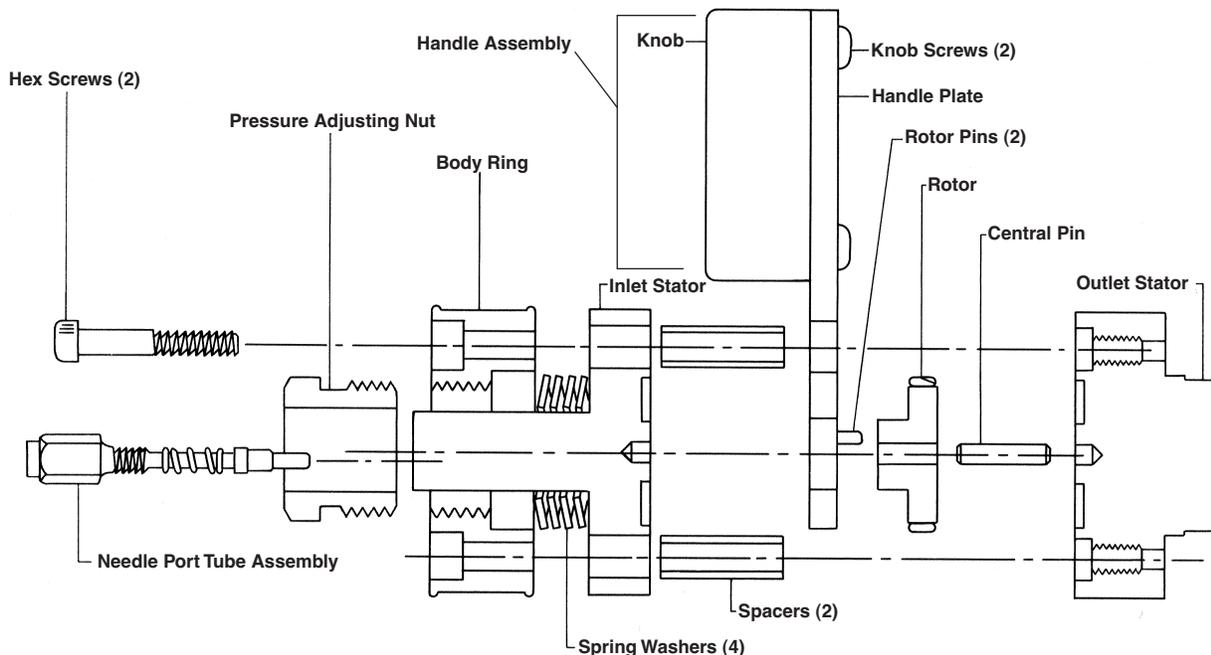


Fig. 6. Exploded view of Model 7520.

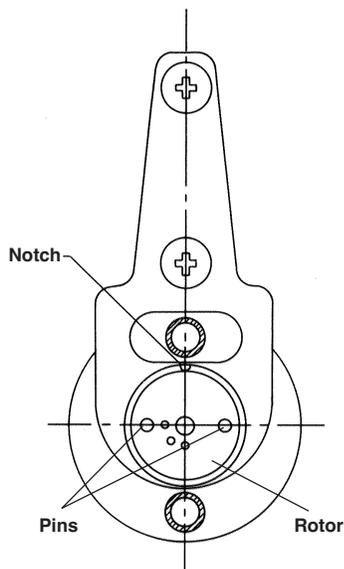


Fig. 8. Rotor orientation viewed from outlet end.

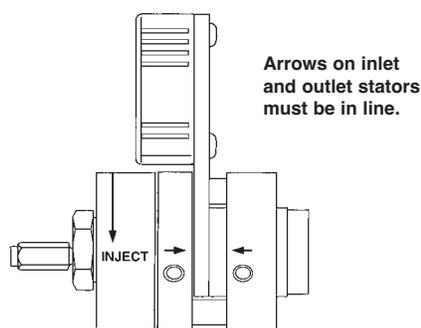


Fig. 9. Correct alignment of Rotor-Handle Assembly and Inlet/Outlet Stators.

d) Mount the outlet stator onto the two spacers. The arrows etched on the sides of the inlet and the outlet stators must line up (see Figure 9).

e) Replace the two hex screws. Tighten each screw a 1/2 turn past fingertight.

## 10.0 OPERATING SUGGESTIONS AND TROUBLESHOOTING

### 10.1 LEAKAGE

If there is liquid coming out of the injection port replace the rotor as described in Section 9.0. Before replacing parts confirm that the valve's maximum pressure has not been exceeded.

### 10.2 USE OF AQUEOUS BUFFERS OR SALT SOLUTIONS

To prevent the formation of salt crystals in the valve, flush out the flow passages with water after using salt solutions and/or buffers. If the Column Port passage in the Outlet Stator [0.13 mm (0.005") ID] becomes plugged, it can be cleaned with a [0.09 mm (0.004") OD] wire. This size wire is usually supplied with the microliter syringes.

## 11.0 RECOMMENDED SPARE PARTS

Rheodyne offers a RheBuild™ Kit for Model 7520. The kit includes all the necessary parts, tools, and instructions to maintain the quality performance of your valve without separate part ordering.

### 7520-999 RheBuild Kit for 7520/7526

## 12.0 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.

