

# OPERATING INSTRUCTIONS - 2 POSITION SAMPLE INJECTORS

## MODELS DV-12 & DV-22 DIAPHRAGM VALVES

### Technical Note 605

#### INSTALLATION

Although valve mounting orientation doesn't affect performance, valves are usually installed vertically or horizontally. The 3/4" boss at the base of the valve fits our CR4 clamp ring, facilitating a surface mount.

Use a 3-way (on/off) solenoid (VICI prod no: 310-120VAC, -240VAC, -24 VAC, or -24VDC) to provide actuator air to the air inlet port on the side of the valve body. Actuating gas can be clean air or a pure gas. The 6 port and 4 port valves require 50 psig for actuation; the 10 port valve needs 60 psig.

The air inlet fitting provided (prod no: ZAOR11) is for 1/16" OD tubing. This fitting can be replaced with any fitting with 10-32 threads, such as a barbed fitting for 1/8" OD polymeric tubing (prod no: F-BF) or a compression fitting for 1/8" metal tubing (prod no: EAOR21).

Plumb the valve using any 1/16" OD tubing, with the nuts and ferrules provided. (Refer to Technical Note 503 for instructions on installing Valco zero dead volume fittings.) Make sure that the tube ends are clean, square cut, and burr-free. The sample loop, if required, goes at ports 3 and 6 on a 6 port valve, or 3 and 10 on a 10 port valve. Loops are available in volumes as small as 2 µl.

#### OPERATION

In the STANDBY mode (actuator air OFF), springs force the upper and lower pistons together. The plungers on the lower piston force the diaphragm against the cap, making a seal between ports 1 & 2, ports 3 & 4, and ports 5 & 6. In this mode, flow is permitted from port 2 to port 3, from 4 to 5, and from 6 to 1.

FIGURE 1: Surface mount with a CR4

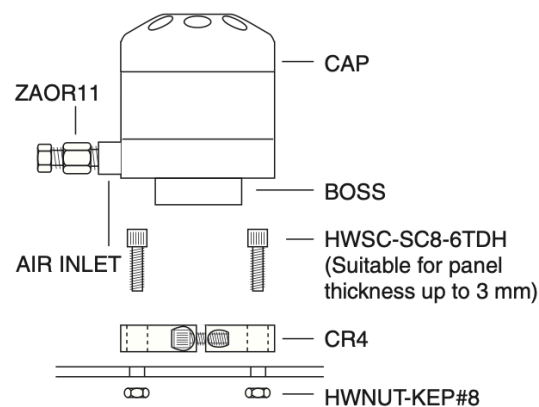
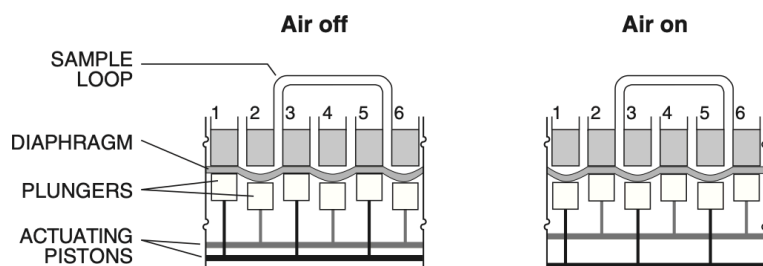


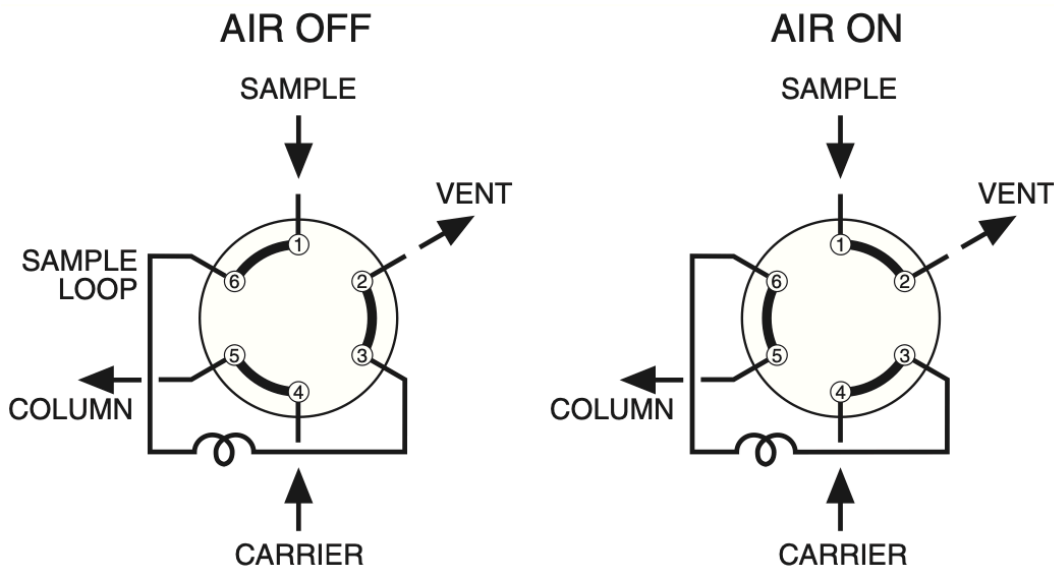
FIGURE 2: Diaphragm valve schematic



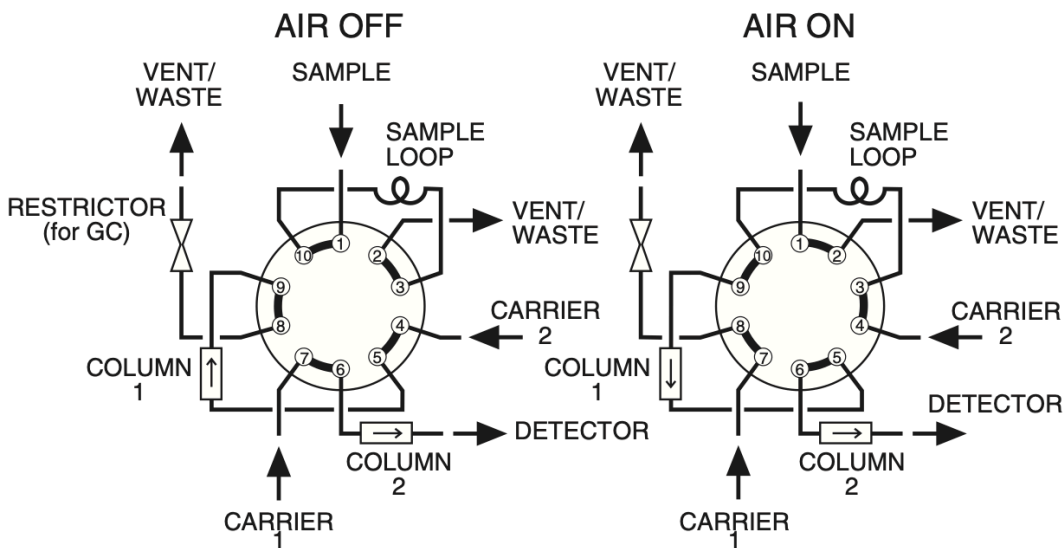
In the ACTUATED mode, (actuator air ON), air pressure from the air inlet port forces the upper and lower pistons apart. Plungers on the lower piston retract from the cap, permitting flow between ports 1 & 2, ports 3 & 4, and ports 5 & 6. At the same time, the upper piston is pushed up, forcing these plungers against the cap and effecting a seal between ports 2 & 3, ports 4 & 5, and ports 6 & 1.

In most situations, the valve should be in the OFF position most of the time, meaning that the pilot solenoid valve will be OFF most of the time. OFF is also the default position, to which the valve will return in a power outage.

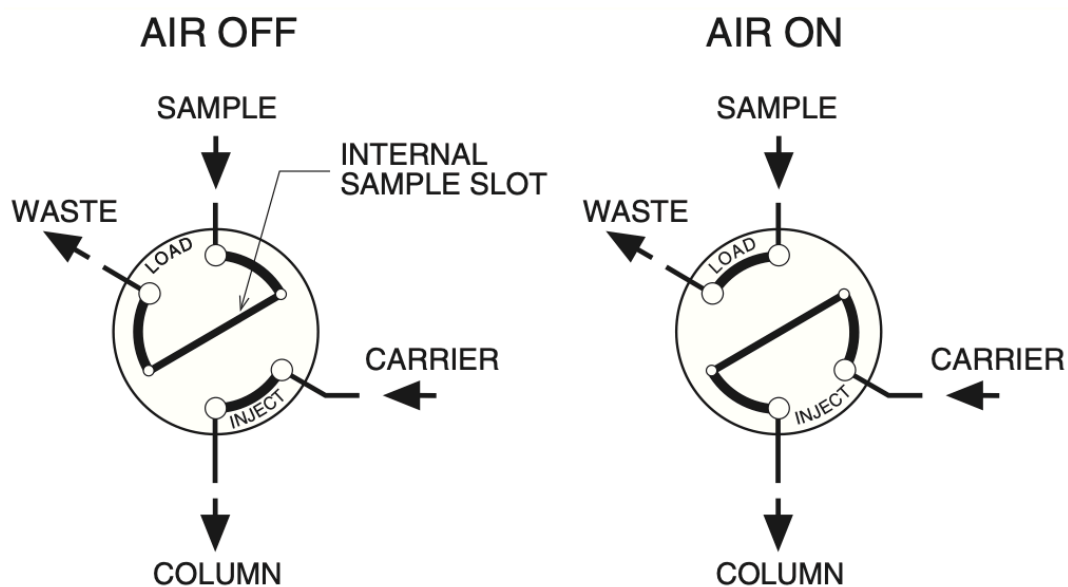
**FIGURE 3: Sample injection with a 6 port**



**FIGURE 4: Typical 10 port application: loop sampling with precolumn backflushed to vent**



**FIGURE 5: Sample injection with a 4 port**



**Note about 4 port internal sample injectors:** Constant sample pressure is recommended, as fluctuations could have an effect on delivered sample volume.