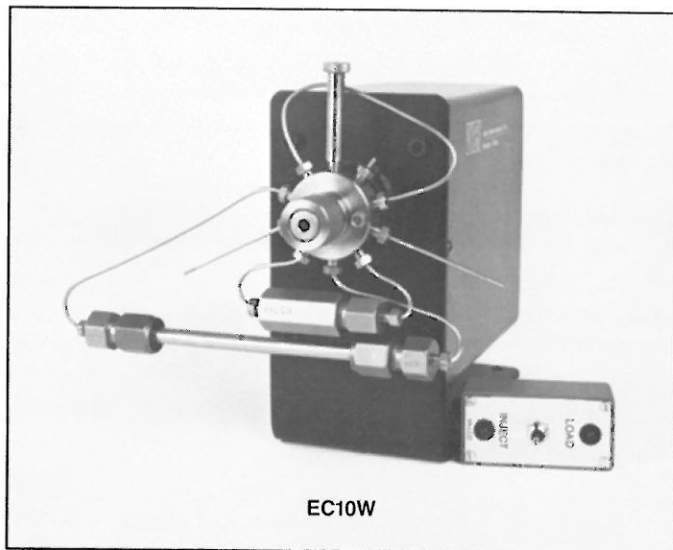
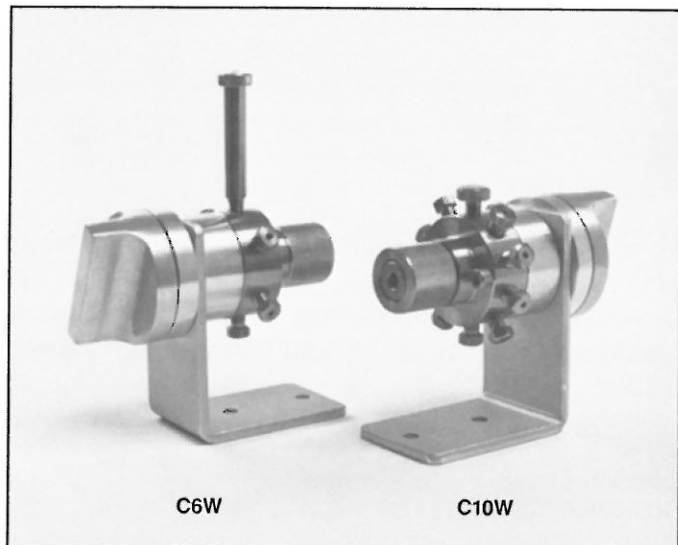


VICI

Valco Instruments Co. Inc.

HPLC External Sample Injectors and Switching Valves



Valco 6, 8, and 10 Port Sample Injectors

The Valco C6W, C8W, and C10W are sample loop injectors for HPLC that may be filled partially or completely using conventional microliter syringes. They are the easiest to turn of any HPLC manual injectors and are available with air or electric actuators for automation. The C6W is also an excellent column switching valve. Injection from two sample loops is possible with the C8W. The C10W may be used as a single or dual injector or a combination sample injector and column switching valve.

Injectors with larger ports are available for higher mobile phase flow rates. Product numbers for these are C6UW, C8UW, and C10UW. HPLC valves with 1/8" fittings are also available.

Introduction

The thorough evaluation that injection methods have received as a part of the overall development of HPLC instrumentation and column development has shown clearly the superiority of shear seal type sample valves. For sample injection with minimum bandspreading and with the reproducibility demanded by quantitative methods, a sample injection valve is the device of choice.

For most HPLC sample injection, a removable sample loop valve may be used. Partial loop loading methods allow $< 1 \mu\text{L}$ to mL's to be injected with typical syringe precision. Full sample loop loading may be used with

Valco HPLC valves from $2\mu\text{L}$ to mL's for the best precision. For smaller sample sizes, Valco submicroliter injector CI4W can inject full loop precision from 0.06 to $1.0\mu\text{L}$. For more information, request the Valco submicroliter injector bulletin.

External Sample Injectors

In an external sample loop design, the external sample loop determines the sample size.

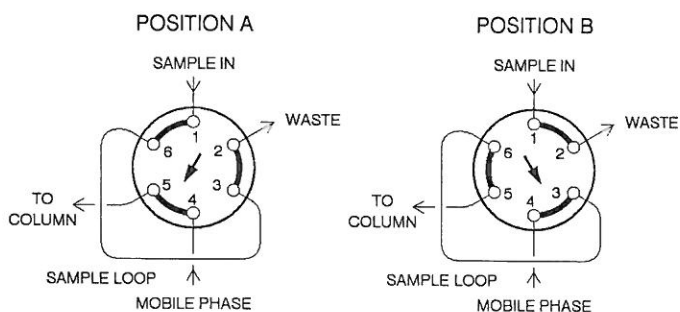


Figure 1

Figure 1 shows the configuration for a C6W 6 port valve with a sample loop. When the valve is in **Position A**, the sample flows through the external loop while the mobile phase flows through to the chromatographic column. When the valve is switched to **Position B**, the mobile phase flow is diverted through the loop, which displaces the sample contained in the sample loop and valve body, injecting it into the column. While the valve is in Position B, sample flow continues uninterrupted through

the shunt of the valve body. The valve is then returned to Position A to acquire the next sample and the injection cycle is repeated.

Materials of Construction

The injector body is constructed of Nitronic-60, the most resistant to galling of any stainless steel. Corrosion resistance is excellent for virtually all HPLC conditions; however, if exposure to materials that attack stainless steel is possible, the optional Hastelloy C model should be ordered. The valve rotor seal is a carbon filled PTFE compound which is non-porous, wear resistant and is not affected by any chemicals under HPLC conditions, even strong acids and bases.

Zero Volume Fittings

Valve connections are made by using 1/16" Valco zero volume fittings, an industry standard. These fittings maximize performance by eliminating dead volume and reducing internal volumes in the valve to a few tenths of a microliter. The Valco valve is uniquely manufactured to such close tolerances that fitting interchangeability between all ports is ensured.

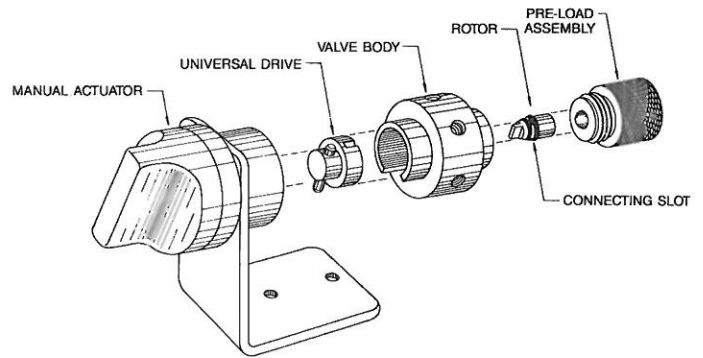


Figure 2

Pressure/Temperature

Each valve is tensioned and tested for 7000 psig service below 75°C. It is then retensioned for 5000 psig for maximum lifetime. Initial operating torque, which will decrease slightly with use, will be 6-8 lb-inch for W series valves. Filtered (<5µM) carrier and sample streams should always be used to prevent internal scratching between ports. Consult the factory for higher temperature and pressure applications.

Simplified Servicing

Valco has perfected a valve design which represents a major advance in HPLC sample introduction and flow switching devices. Lifetime is increased by a one-point seal loading design. Rotor replacement, if necessary, is as simple as replacing a fitting or changing a septum.

One of the advantages of this valve design is that it allows rotor replacement without removing loops and tubing and without disengaging the valve from the actuator or mounting bracket. Figure 2 shows the pre-load assembly that holds the rotor in the valve body. When a different rotor is put into the valve, this pre-load assembly places the new rotor back to the factory set tension.

Valve Repair

Damaged or worn rotors are easily field replaceable. Spare or replacement rotors may be ordered individually. If, however, the valve body is scratched between the ports, the valve should be returned to the factory for resurfacing and replacement of the rotor. A repaired valve's specifications are the same as for a new valve.

Interchangeable External Sample Loops

Sample loops are available from stock. They include less than 2 µL on certain models and 10, 15, 20, 50, 100, 250, 500 µL and 1, 2, 5, and 10 mL. Sample loops must be ordered for a specific valve.

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