Valve Selection

Following is an overview of the many types of valves available from VICI.

Valco Injectors and Valves for GC

pages 96–99, 102–111

For nearly 40 years Valco valves have been the industry standard in gas chromatography. Models are available with 3, 4, 6, 8, 10, 12, or 14 ports, with 1/32", 1/16", 1/8", or 1/4" fittings, and with bore sizes from 0.25 mm (.010") to 4 mm (.156"). In addition, Valco valves offer the widest range of rotor and body materials of any valve available, with alloys and polymer composites capable of meeting virtually any system requirement. All models can be ordered in manual, pneumatic, or electrically actuated versions.

Valco Injectors and Valves for HPLC

pages 96–99, 112–116

A pioneer and industry leader in products for HPLC, Valco continues to offer the market's most diverse line in terms of number of ports, fitting sizes, materials of construction, and actuation. 3, 4, 6, 8, 10, 12 port versions are offered, with 1/32", 1/16", or 1/8" fittings. As with the GC line, Valco valves offer the widest range of rotor and body materials of any valves available, with alloys and polymer composites capable of meeting virtually any system requirement. All models can be ordered in manual, pneumatic, or electrically actuated versions.

Valco Selectors

pages 100–101, 122–133

One inherent benefit of the Valco conical rotary design is that it allows multiple planes of ports, facilitating a variety of unique multiposition configurations useful for stream selection, column selection, or trapping. Versions are available for GC and HPLC applications, with 1/16", 1/8", or 1/4" fittings, with bore sizes from 0.40 to 4.0 mm (.016" to .156"). Selectors are available for up to 16 streams (34 ports), all with Valco's trademark flexibility in terms of actuation and material options.

Diaphragm Valves for GC

pages 140–143

A diaphragm valve consists of plungers and ports arranged in a circular pattern, with the plungers controlled by the reciprocating action of two air actuated pistons. Extremely long lifetime (typically 1,000,000 cycles at ambient temperature; approximately 500,000 cycles at elevated temperatures), very short actuation time (10 milliseconds), minimum internal dead volume, and reliability have made this type of valve very successful in process gas chromatography for both sample injection and column switching. Our miniature version features 1/16" or 1/32" zero dead volume fittings, and is the first to offer a 10 port configuration in addition to the 6 port and internal sample 4 port models.

Cheminert Injectors for Nanovolume® HPLC and UHPLC

pages 146, 152–155

New nanovolume® injectors feature a uniform flowpath as small as 100 microns, with specially designed fittings for 1/32" or 360 micron PEEK, fused silica, or Valco electroformed nickel tubing. Models are rated from 5,000 to 20,000 psi, with most having a proprietary coated stainless stator and high-strength PAEK rotor to ensure long periods of maintenance-free operation.

Cheminert Injectors and Valves for HPLC and UHPLC

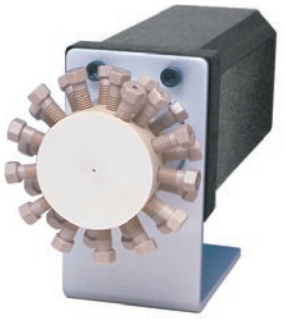
pages 147, 156–163

The Cheminert line includes 4, 6, 8, and 10 port versions. The submicroliter injector has an injection volume as small as 10 nanoliters. Valves feature 1/16" zero dead volume fittings, with bore sizes from 0.15 mm (.006") to 0.75 mm (.030"). Most models are available in manual, air, or electrically actuated versions, and some can be ordered with a proprietary coated stainless stator and high-strength PAEK rotor to ensure long periods of maintenance-free operation.

Cheminert Injectors and Valves for Low Pressure Applications

pages 148, 164–167

Cheminert's two position design offers 4, 6, 8, or 10 port configurations. The design features a choice of Valco 1/16" zero dead volume fittings or 1/4-28 Cheminert internal fittings for 1/16" or 1/8" OD tubing. All models are available in manual, air, or electrically actuated versions.



Cheminert Selectors

pages 150-151, 170–177

Choose among 4, 6, 8, 10, 14, 20, 24, or 26 position stream selection valves, in high pressure and low pressure models. A variety of configurations are available with bore sizes from 0.10 mm (.004") for HPLC column selection to 4.6 mm (.180") for applications requiring minimal restriction across the valve. Metal or all-polymeric valves can be ordered, with models available in manual, pneumatic, or electrically actuated versions.

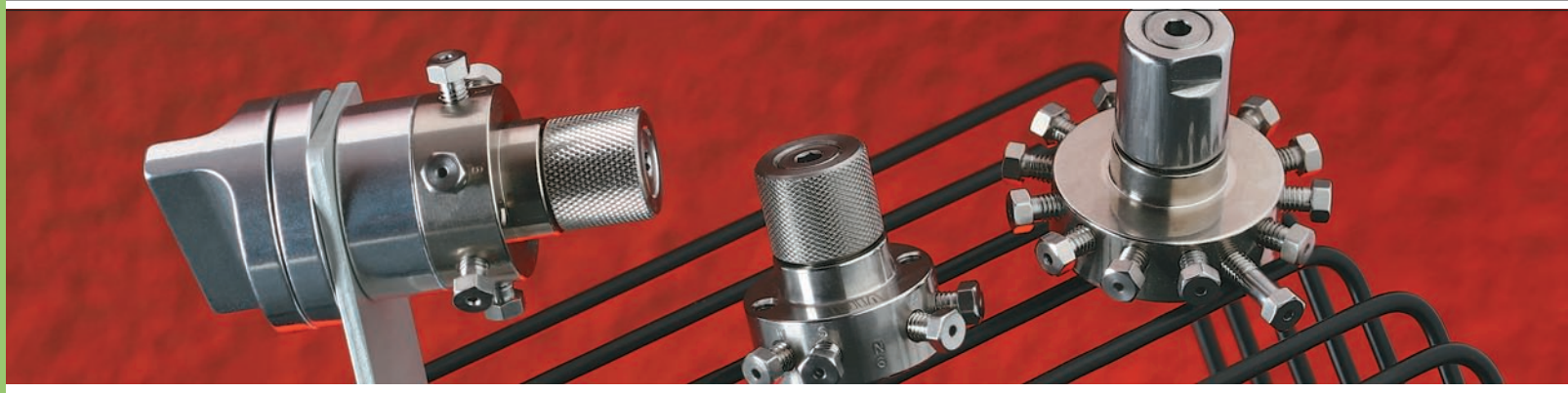
40,000 psi Ultra-High Pressure Injector System

page 84

The VICI 40K injector is comprised of six miniature air actuated needle valves, plumbed to simulate the flow path of a conventional rotor/stator injector. An integral controller sends the on/off positioning signals to each valve, coordinating them to perform load, inject, and flush functions.

FOR OEMs

See our injectors for autosamplers and our new low and high pressure integrated motor/injector and motor/selector assemblies designed specifically to be built into OEM systems.



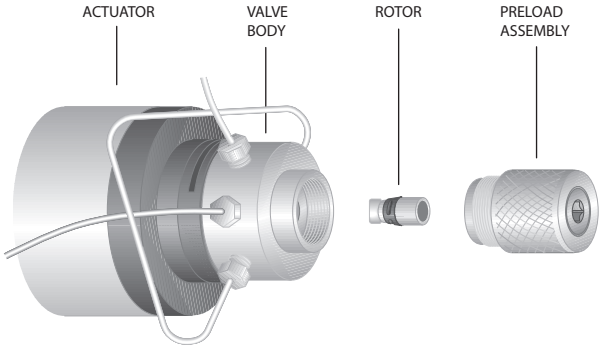
Valco Injectors and Valves

- 1/32", 1/16", 1/8", or 1/4" Valco ZDV fittings
- 3, 4, 6, 8, 10, 12, and 14 port and internal sample two position versions
- Five multiposition flowpath configurations with as many as 16 positions
- A variety of materials for hostile environments and continuous use at elevated temperature
- Can be configured for use at temperatures up to 350°C or pressures up to 10,000 psi

The Valco design lends itself to a unique variety of connecting slots and port arrangements. The rotor is held in place by a preload assembly, which allows rotor replacement without removing loops and tubing and without disengaging the valve from the actuator or mounting bracket.

In addition, the preload assembly ensures that the valve is always reassembled to the factory-set tension.

Two position injector and valve descriptions are on page 99; product numbers and prices begin on page 102. For information on **selectors**, refer to pages 100-101.



MORE INFORMATION

TECH TIP

For optimal zero dead volume connections, make sure your tubing meets the best industry standards. The OD tolerance should be nominal dimension ± .002".

Fractional dimension	Nominal dimension
1/32"	.031
1/16"	.062
1/8"	.125
1/4"	.250
3/8"	.375
1/2"	.500

The standard valve body material is Nitronic 60, a gall-resistant stainless steel which has proven superior to Type 316 or 303 in the majority of applications. Valves may also be ordered in Hastelloy C-22, Inconel 600, Type 316 stainless, Monel 400, Nickel 200, Nitronic 50, or Titanium.

Medium temperature GC valves have a rotor made of Valcon E, a polyaryletherketone/PTFE composite. The high temperature versions use a polyimide/PTFE/carbon composite designated Valcon T. Valcon H, a carbon-fiber-reinforced, PTFE-lubricated inert polymer, is standard in HPLC valves.

Appropriate fittings are supplied with all valves. Valves rated at 1000 psi or less have Type 303 stainless ferrules; those rated above 1000 psi have Type 316 stainless ferrules. A valve ordered with an optional body material is supplied with ferrules of the same material as the body, with Type 316 stainless nuts.

SPECIAL BODY MATERIAL—CODES AND PRICES

TWO POSITION VALVES

Body material	*Code*	**1/32" and 1/4" fittings**	**1/16" and 1/8" fittings**
HPLC grade Stainless steel	SS	Standard	Standard
Hastelloy C-22	HC		
Inconel 600	IN		
Monel 400	M4		
Nickel	NI		
Nitronic 50	N5		
Titanium *	TI		

* Not available for WT, UWT, or T series valves (high temperature) due to material temperature limit.

MULTIPOSITION VALVES

		1/16" and 1/8" fittings		**1/4" fittings**
Body material	*Code*	*SC and SD flowpaths*	*SF and ST flowpaths*	*SD, SC, SF flowpaths*
HPLC grade Stainless steel	SS	Standard, most versions	Standard, most versions	Standard
Hastelloy C-22	HC			
Inconel 600	IN			
Monel 400	M4			
Nickel	NI			
Nitronic 50	N5			
Titanium *	TI			

* Not available for WT, UWT, or T series valves (high temperature) due to material temperature limit.

Specifying a Special Body Material

To specify a special valve body material, add the material code to the end of the valve product number, and add the amount listed in charts opposite to the base price.

Example:
An A4C6WE (air actuated 1/16" 6 port WE valve with a 4" standoff) made of Hastelloy C-22 would be designated A4C6WEHC.
The cost is $830 + $170 = $1000.

Due to design requirements, several special grades of stainless steel may be used where "HPLC grade" is noted. The specific types include Nitronic 60, Type 316 stainless steel, and Type 316L stainless steel. VICI will select the material to be used based on availability and quality. HPLC grade stainless is the standard material for all Valco two position valves and high pressure multiposition valves.

MORE INFORMATION
Materials

Leak Testing

The standard test methods for cross-port and outport leakage insure valve performance at pressures and temperatures up to the specifications listed. For valves used on mass spectrometers or for ultra-trace fixed gas analysis, we recommend an optional test method utilizing a helium mass spectrometer, which provides data on mechanical leaks and on those due to seal porosity and permeability. With this method, we can certify leak rates as low as 10^{-10} cc-atm/sec.

Please consult the factory prior to ordering, since the minimum leak rate will vary widely depending on valve configuration.

Leak Rates for Gas Sampling Valves

The actual minimum leak rates attainable vary widely with seal material and valve type. In general, the acceptable leak rates fall into three ranges. (See chart below.)

In order to seal to less than 10^{-7}, the valve loading tension is increased, which somewhat lowers the maximum operating temperature and the valve lifetime. Currently, only select material can seal to 10^{-8} in most valve styles. Valcon M rotor material can seal to 10^{-10}, but has a temperature limit of 50°C.

Not all valves can achieve these leak rates. As a general rule, the larger the valve seal and port size, the higher the leak rate.

Test Method for Liquid Sampling Valves

The standard test method for liquid valves is a pressure drop over time for both crossport and outport leakage, using isopropanol at the specified test pressure. This test is designed to ensure proper performance at the specification limit.

RANGES FOR ACCEPTABLE LEAK RATES

10^{-4} to 10^{-5} cc-atm/sec	**Commercial use** Not normally sold by VICI
10^{-6} to 10^{-7} cc-atm/sec	**General GC use** Standard tension and components
10^{-8} to 10^{-10} cc-atm/sec	**Ultra trace gas analysis** (ppb range) Higher tension and specially processed stator and rotor material

OPTIONAL LEAK TESTING with Helium Mass Spectrometer

To order a valve certified to have helium leak rates less than 10^{-7} cc-atm/sec, add the suffix "Z" to the valve product number and $175 to the price.

Certified valves are supplied with gold-plated stainless steel ferrules.

We can generally tell you what leak rate is possible prior to manufacturing the valve.

About Two Position Injectors and Switching Valves

Two position injectors and switching valves have many applications, as shown in the section beginning on page 117. In this catalog, Valco two position valves are divided into GC and HPLC sections, with the GC section starting on page 102 and the HPLC section on page 112.

Sample Injectors

Since the most common method of sample injection utilizes a 6 port valve with an external sample loop, 6 port valves are often referred to as "injectors". However, as the Applications section shows, 6 port valves can do more than inject sample, and 8 and 10 port valves can be sample injectors at the same time they're also being backflushers or column switchers. One more variation is the 4 port internal sampling valve (pages 102–103 and 112), which is used when the sample size must be smaller than the smallest available loop. The internal sample "loop" is actually an engraved connecting slot on the rotor which is sized to contain a specified amount of sample.

Sample Loops

Loops are electrolytically cut and electrochemically polished to ensure square, burr-free ends, then cleaned with microfiltered steam from deionized water. Standard material is Type 316 stainless, but loops can be supplied in electroformed nickel, Hastelloy C, Nickel 200, titanium, or several polymers. Consult the factory for availability.

Valco sample loops are accurately sized for each valve type. The volume tolerance matches the ID tolerance of the tubing, which is typically ±0.001". This results in a variance ranging from 30% with tubing of 0.005" diameter to 5% for loops made from tubing 0.040" in diameter.

SPECIFICATIONS

VALCO TWO POSITION VALVES

Valve type	*Standard rotor material*	*Max pressure*	*Max temp*	*Max pressure*	*Max temp*
		Internal sample injectors		**Sampling and switching valves**	
GC					
W and UW	Valcon E	1000 psi liq	175°C	400 psi gas	225°C
	Valcon T	–	–	300 psi gas	330°C
MW	Valcon E2	–	–	100 psi gas	75°C
HPLC					
W and UW	Valcon H	5000 psi liq	75°C	5000 psi liq	75°C

VALVE TYPES

	Fitting size	*Standard port diameter*
W Type	1/32"	0.25 mm (.010")
	1/16"	0.40 mm (.016")
UW Type	1/16"	0.75 mm (.030")
	1/8"	0.75 mm (.030")
MW Type	1/4"	4.0 mm (.156")

For special port diameters, please consult the factory.

OPTIONAL ROTORS

Valcon M	400 psi	50°C
Valcon P	400 psi	175°C
Valcon R	400 psi	75°C
Valcon TF	200 psi	50°C

See page 257 for a discussion of these optional rotor materials.

MORE INFORMATION

About Selectors

Instead of the back and forth switching of two position valves, selectors (multiposition valves) step incrementally through continuous revolutions (bi-directionally with the microelectric actuator). While we can supply older models, all the valves in this catalog have a preload assembly. This design allows the rotor to be inspected or replaced without taking the valve off the actuator, and valves ordered with a microelectric actuator are permanently aligned.

Flowpath Configurations

SD (dead-ended) valves select one of 4 to 16 dead-ended streams, directing it through the valve outlet to a sample valve, pressure sensor, detector, column, etc. The same configuration can also direct one stream to a number of outlets for fraction collection.

SC (common outlet) selectors are similar to SDs, except that instead of being dead-ended the non-selected streams flow to a common outlet.

SF (flow-through) selectors are similar to SDs and SCs, selecting a stream and sending it to the outlet. However, SFs allow the non-selected streams to flow through individual outlets instead of a common outlet.

ST (trapping) selectors are used for multi-column, multi-sample, or multi-trap operations.

STF (trapping/flow-through) selectors are similar to STs, with the single difference being that the non-selected streams are returned to their own vents or sources rather that being dead-ended or trapped as they are in the standard ST configuration.

PORT DIAMETERS—
Low pressure (MW)

Fitting size	No. of Positions	Standard port diameter
SD		
1/16"	4 - 16	0.75 mm (.030")
1/8"	4 - 16	1.0 mm (.040")
1/4"	4 - 10	4.0 mm (.156")
SC		
1/16"	4 - 16	1.0 mm (.040")
1/8"	4 - 16	1.0 mm (.040")
1/4"	4 - 8	4.0 mm (.156")
SF		
1/16"	4 - 16	1.0 mm (.040")
1/8"	4 - 16	1.0 mm (.040")
1/4"	4 - 8	4.0 mm (.156")
ST		
1/16"	4 - 16	0.75 mm (.030")
1/8"	4 - 16	1.0 mm (.040")
STF		
1/16"	4 - 16	0.75 mm (.030")
1/8"	4 - 16	1.0 mm (.040")

PORT DIAMETERS—
High pressure (UW)

Fitting size	No. of Positions	Standard port diameter
SD		
1/16"	4 - 12	0.40 mm (.016")
1/8"	4, 6, 8	0.75 mm (.030")
ST		
1/16"	4,6	0.40 mm (.016")

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High pressure
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ST. 133

Loops, if required, are found on corresponding valve pages.

For special port diameters, please consult the factory.

Low Pressure Selectors

Valco **MW Type** selectors are available with 1/16", 1/8", or 1/4" fittings. (For port diameters, refer to the chart on the preceding page.) The 1/16" and 1/8" selectors can be ordered with 4, 6, 8, 10, 12, or 16 positions, in any of the five flowpath configurations. Selectors with 1/4" fittings are available in SD, SC, and SF flowpaths: SDs have 4, 6, 8, or 10 positions; SCs and SFs have 4, 6, or 8.

Although not shown in this catalog, MW selectors are also available in a higher temperature version. While actual specifications vary with the configuration, typical specifications are 200 psi and 330°C. Consult our technical staff for more information.

SPECIFICATIONS

VALCO SELECTORS – Low pressure (MW)

Fittings size	*Number of positions*	*Standard rotor material*	*Max pressure*	*Max temp*	*Max pressure*	*Max temp*	*Max pressure*	*Max temp*
			SD Dead-end flowpath		**SC Common outlet flowpath**			
1/16"	4 - 16	Valcon E	400 psi gas	200°C	200 psi gas	200°C	Note: All low pressure 1/16" and 1/8" valves are also available in versions up to 330°C.	
1/8"	4 - 8	Valcon E	400 psi gas	200°C	200 psi gas	200°C		
	10 - 16	Valcon E	200 psi gas	200°C	200 psi gas	200°C		
1/4"	4 - 8	Valcon E2	100 psi gas	75°C	100 psi gas	75°C		
			SF Flow-through flowpath		**ST Trapping flowpath**		**STF Trapping/Flow-through flowpath**	
1/16"	4 - 16	Valcon E	200 psi gas	200°C	200 psi gas	200°C	200 psi gas	200°C
1/8"	4 - 16	Valcon E	200 psi gas	200°C	200 psi gas	200°C	200 psi gas	200°C
1/4"	4 - 8	Valcon E2	100 psi gas	75°C	–	–	–	–

High Pressure Selectors

Valco **UW Type** high pressure selectors are available in SD and ST flowpaths. SD selectors with 1/16" fittings are available in 4, 6, 8, 10, or 12 positions, while 1/8" selectors can be ordered with 4, 6, 8, or 10 positions. ST flowpath UW selectors have 1/16" fittings, with either 4 or 6 positions. (For port diameters, refer to the chart on the preceding page.)

SPECIFICATIONS

VALCO SELECTORS – High pressure (UW)

Fittings size	*Number of positions*	*Standard rotor material*	*Max pressure*	*Max temp*	*Max pressure*	*Max temp*
			SD Dead-end flowpath		**ST Trapping flowpath**	
1/16"	4 - 12	Valcon E	5000 psi liq	75°C	5000 psi liq	75°C
1/8"	4 - 8	Valcon E	5000 psi liq	75°C	–	–

Internal sample injectors, 1/32" fittings, 0.25 mm ports (.010")

W Type

Med temp
Internal sample
1/32" **0.25 mm**

Includes 2" standoff. Manual version is not available without standoff.

Standard electric actuator:
110 VAC for USA;
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

SPECS
1000 psi liq
175°C max
Nitronic 60 valve body
Valcon E rotor

Sample volume	.06 µl		.1 µl		.2 µl		.5 µl	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual with standoff	2NI4WE.06	$775	2NI4WE.1		2NI4WE.2		2NI4WE.5	
With air actuator	A2NI4WE.06		A2NI4WE.1		A2NI4WE.2		A2NI4WE.5	
With standard electric actuator	E2NI4WE.06		E2NI4WE.1		E2NI4WE.2		E2NI4WE.5	
With microelectric actuator	EP2NI4WE.06		EP2NI4WE.1		EP2NI4WE.2		EP2NI4WE.5	
Replacement valve	DNI4WE.06		DNI4WE.1		DNI4WE.2		DNI4WE.5	
Replacement rotor	SSANI4WE.06		SSANI4WE.1		SSANI4WE.2		SSANI4WE.5	

OPTIONS
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*

Internal sample injectors, 1/16" fittings, 0.40 mm ports (.016")

W Type

Med temp
Internal sample
1/16" **0.40 mm**

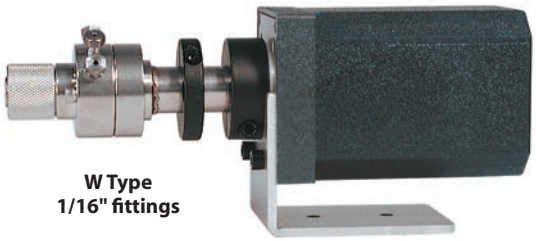
Includes 2" standoff. Manual version has no standoff.

Standard electric actuator:
110 VAC for USA;
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

SPECS
1000 psi liq
175°C max
Nitronic 60 valve body
Valcon E rotor

Sample volume	.06 µl		.1 µl		.2 µl		.5 µl	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	CI4WE.06		CI4WE.1		CI4WE.2		CI4WE.5	
Manual with standoff	2CI4WE.06		2CI4WE.1		2CI4WE.2		2CI4WE.5	
With air actuator	A2CI4WE.06		A2CI4WE.1		A2CI4WE.2		A2CI4WE.5	
With standard electric actuator	E2CI4WE.06		E2CI4WE.1		E2CI4WE.2		E2CI4WE.5	
With microelectric actuator	EP2CI4WE.06		EP2CI4WE.1		EP2CI4WE.2		EP2CI4WE.5	
Replacement valve	DCI4WE.06		DCI4WE.1		DCI4WE.2		DCI4WE.5	
Replacement rotor	SSACI4WE.06		SSACI4WE.1		SSACI4WE.2		SSACI4WE.5	

OPTIONS
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*



W Type
1/16" fittings

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Internal sample injectors, 1/16" fittings, 0.75 mm ports (.030")

UW Type

SPECS
1000 psi liq
175°C max
Nitronic 60 valve body
Valcon E rotor

Includes 2" standoff.
Manual version has no standoff.

Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Med temp
Internal sample
1/16" 0.75 mm

OPTIONS
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*

Sample volume	.2 µl		.5 µl		1 µl		2 µl	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	CI4UWE.2		CI4UWE.5		CI4UWE1		CI4UWE2	
Manual with standoff	2CI4UWE.2		2CI4UWE.5		2CI4UWE1		2CI4UWE2	
With air actuator	A2CI4UWE.2		A2CI4UWE.5		A2CI4UWE1		A2CI4UWE2	
With std electric actuator	E2CI4UWE.2		E2CI4UWE.5		E2CI4UWE1		E2CI4UWE2	
With microelectric actuator	ED2CI4UWE.2		ED2CI4UWE.5		ED2CI4UWE1		ED2CI4UWE2	
Replacement valve	DCI4UWE.2		DCI4UWE.5		DCI4UWE1		DCI4UWE2	
Replacement rotor	SSACI4UWE.2		SSACI4UWE.5		SSACI4UWE1		SSACI4UWE2	

Internal sample injectors, 1/8" fittings, 0.75 mm ports (.030")

UW Type

SPECS
1000 psi liq
175°C max
Nitronic 60 valve body
Valcon E rotor

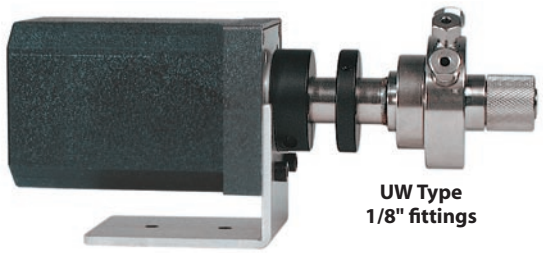
Includes 2" standoff.
Manual version has no standoff.

Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Med temp
Internal sample
1/8" 0.75 mm

OPTIONS
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*

Sample volume	.2 µl		.5 µl		1 µl		2 µl	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	I4UWE.2		I4UWE.5		I4UWE1		I4UWE2	
Manual with standoff	2I4UWE.2		2I4UWE.5		2I4UWE1		2I4UWE2	
With air actuator	A2I4UWE.2		A2I4UWE.5		A2I4UWE1		A2I4UWE2	
With std electric actuator	E2I4UWE.2		E2I4UWE.5		E2I4UWE1		E2I4UWE2	
With microelectric actuator	ED2I4UWE.2		ED2I4UWE.5		ED2I4UWE1		ED2I4UWE2	
Replacement valve	DI4UWE.2		DI4UWE.5		DI4UWE1		DI4UWE2	
Replacement rotor	SSAI4UWE.2		SSAI4UWE.5		SSAI4UWE1		SSAI4UWE2	



UW Type
1/8" fittings

Sampling and switching valves, 1/32" fittings, 0.25 mm ports (.010")

W Type

Med temp

1/32" **0.25 mm**

Includes 4" standoff. Manual version not available without standoff.

Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Sample loops are not included with valves. Order separately.

	4 Ports		6 Ports		8 Ports		10 Ports	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual with standoff	4N4WE		4N6WE		4N8WE		4N10WE	
With air actuator	A4N4WE		A4N6WE		A4N8WE		A4N10WE	
With standard electric actuator	E4N4WE		E4N6WE		E4N8WE		E4N10WE	
With microelectric actuator	EH4N4WE		EH4N6WE		EH4N8WE		EH4N10WE	
Replacement valve	DN4WE		DN6WE		DN8WE		DN10WE	
Replacement rotor	SSAN4WE		SSAN6WE		SSAN8WE		SSAN10WE	

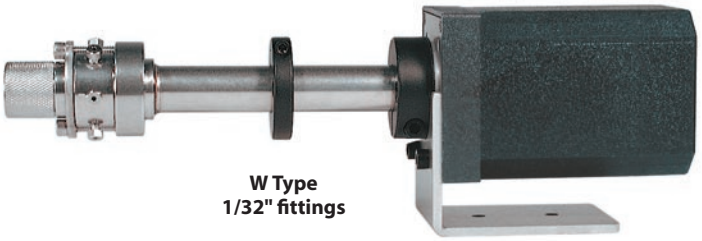
SPECS

400 psi gas
225°C max
Nitronic 60 valve body
Valcon E rotor

For 300 psi, 350°C max, see facing page.

OPTIONS

- 3 and 12 port valves available
- 2", 3", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*



W Type
1/32" fittings

1/32" Stainless steel loops

for W Type valves

Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately.

Volume	*Prod No*	*Price*	*Volume*	*Prod No*	*Price*
2 µl	SL2NW		25 µl	SL25NW	
5 µl	SL5NW		50 µl	SL50NW	
10 µl	SL10NW		100 µl	SL100NW	
15 µl	SL15NW		250 µl	SL250NW	
20 µl	SL20NW		500 µl	SL500NW	

MORE INFORMATION

ABOUT LOOPS

- Other materials available in many sizes: Electroformed Nickel, Nickel 200, PEEK, and PTFE

Sampling and switching valves, 1/32" fittings, 0.25 mm ports (.010")

W Type

SPECS
300 psi gas
350°C max
Nitronic 60 valve body
Valcon T rotor

For 400 psi, 225°C max, see facing page

Includes 4" standoff. Manual version not available without standoff.

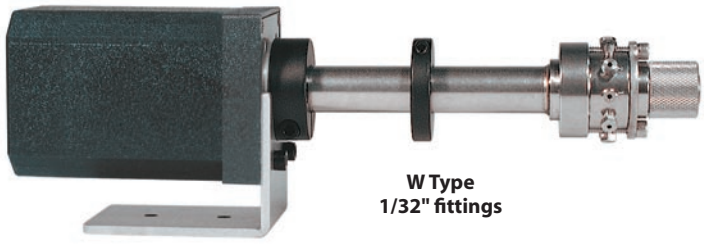
Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Sample loops are not included with valves. Order separately.

High temp
1/32" **0.25 mm**

OPTIONS
- 3 and 12 port valves available
- 2", 3", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*

	4 Ports		6 Ports		8 Ports		10 Ports	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual with standoff	4N4WT	$725	4N6WT	$780	4N8WT	$835	4N10WT	$835
With air actuator	A4N4WT	885	A4N6WT	940	A4N8WT	995	A4N10WT	995
With standard electric actuator	E4N4WT	1205	E4N6WT	1260	E4N8WT	1315	E4N10WT	1315
With microelectric actuator	EH4N4WT	1375	EH4N6WT	1430	EH4N8WT	1485	EH4N10WT	1485
Replacement valve	DN4WT	635	DN6WT	690	DN8WT	745	DN10WT	745
Replacement rotor	SSAN4WT	75	SSAN6WT	75	SSAN8WT	75	SSAN10WT	75



W Type
1/32" fittings

1/32" Stainless steel loops

for W Type valves

Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately.

Volume	*Prod No*	*Price*	*Volume*	*Prod No*	*Price*
2 µl	SL2NW	$25.00	25 µl	SL25NW	$25.00
5 µl	SL5NW	25.00	50 µl	SL50NW	27.50
10 µl	SL10NW	25.00	100 µl	SL100NW	27.50
15 µl	SL15NW	25.00	250 µl	SL250NW	31.25
20 µl	SL20NW	25.00	500 µl	SL500NW	37.50

ABOUT LOOPS
- Other materials available in many sizes: Electroformed Nickel, Nickel 200, PEEK, and PTFE

Sampling and switching valves, 1/16" fittings, 0.40 mm (.016")

W Type

Med temp

1/16" **0.40 mm**

Includes 4" standoff
Manual version has no standoff

Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Sample loops are not included with valves. Order separately.

	4 Ports		6 Ports		8 Ports		10 Ports	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	C4WE		C6WE		C8WE		C10WE	
Manual with standoff	4C4WE		4C6WE		4C8WE		4C10WE	
With air actuator	A4C4WE		A4C6WE		A4C8WE		A4C10WE	
With standard electric actuator	E4C4WE		E4C6WE		E4C8WE		E4C10WE	
With microelectric actuator	EH4C4WE		EH4C6WE		EH4C8WE		EH4C10WE	
Replacement valve	DC4WE		DC6WE		DC8WE		DC10WE	
Replacement rotor	SSAC4WE		SSAC6WE		SSAC8WE		SSAC10WE	

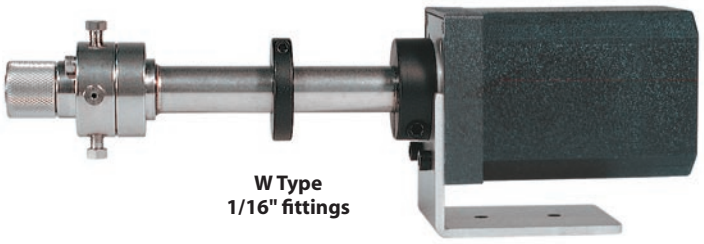
SPECS

400 psi gas
225°C max
Nitronic 60 valve body
Valcon E rotor

For 300 psi, 350°C max, see page 108.

OPTIONS

- 3 and 12 port valves available
- 2", 3", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*



W Type
1/16" fittings

MORE INFORMATION

Actuators
Air ..... page 195
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Microelectric .. 188-189
Standard elec.....193
Materials
Metals..... 254-255
Polymers 256
Valve rotors.....257
Standoff
assemblies 205

1/16" Stainless steel loops

for W Type valves

Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately.

Volume	*Prod No*	*Price*	*Volume*	*Prod No*	*Price*
2 µl	SL2CW		100 µl	SL100CW	
5 µl	SL5CW		250 µl	SL250CW	
10 µl	SL10CW		500 µl	SL500CW	
15 µl	SL15CW		1 ml	SL1KCW	
20 µl	SL20CW		2 ml	SL2KCW	
25 µl	SL25CW		5 ml	SL5KCW	
50 µl	SL50CW		10 ml	SL10KCW	

ABOUT LOOPS

- Other materials available in many sizes: Electroformed Nickel, Hastelloy C, Nickel 200, PEEK, PTFE, and Titanium
- Loops > 2 ml are made from 1/8" OD tubing with brazed or welded 1/16" tube ends or reducing unions.

Sampling and switching valves, 1/16" fittings, 0.75 mm ports (.030")

UW Type

SPECS
400 psi gas
225°C max
Nitronic 60 valve body
Valcon E rotor

For 300 psi, 330°C max, see page 109.

Includes 4" standoff.
Manual version has no standoff.

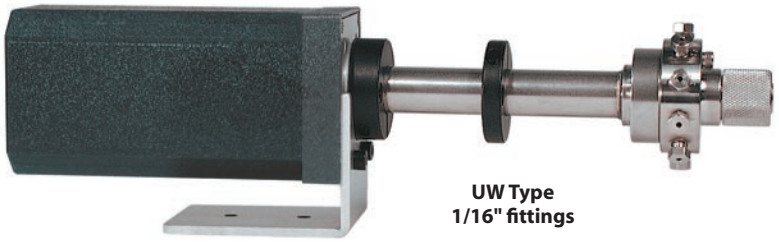
Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Sample loops are not included with valves. Order separately.

Med temp
1/16" **0.75 mm**

OPTIONS
- 3, 12 and 14 port valves available
- 2", 3", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*
- Larger bore available

	4 Ports		6 Ports		8 Ports		10 Ports	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	C4UWE		C6UWE	$570	C8UWE		C10UWE	
Manual with standoff	4C4UWE		4C6UWE	615	4C8UWE		4C10UWE	
With air actuator	A4C4UWE		A4C6UWE	775	A4C8UWE		A4C10UWE	
With standard electric actuator	E4C4UWE		E4C6UWE	1095	E4C8UWE		E4C10UWE	
With microelectric actuator	ED4C4UWE		ED4C6UWE	1325	ED4C8UWE		ED4C10UWE	
Replacement valve	DC4UWE		DC6UWE	525	DC8UWE		DC10UWE	
Replacement rotor	SSAC4UWE		SSAC6UWE	75	SSAC8UWE		SSAC10UWE	



UW Type
1/16" fittings

1/16" Stainless steel loops

for UW Type valves

Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately.

Volume	*Prod No*	*Price*	*Volume*	*Prod No*	*Price*
5 µl	SL5CUW		100 µl	SL100CUW	
10 µl	SL10CUW		250 µl	SL250CUW	
15 µl	SL15CUW		500 µl	SL500CUW	
20 µl	SL20CUW		1 ml	SL1KCUW	
25 µl	SL25CUW		2 ml	SL2KCUW	
50 µl	SL50CUW		5 ml	SL5KCUW	
			10 ml	SL10KCUW	

ABOUT LOOPS
- Other materials available in many sizes: Electroformed Nickel, Hastelloy C, Nickel 200, PEEK, PTFE, and Titanium
- Loops > 2 ml are made from 1/8" OD tubing with brazed or welded 1/16" tube ends or reducing unions.

Sampling and switching valves, 1/16" fittings, 0.40 mm ports (.016")

W Type

High temp

1/16" **0.40 mm**

Includes 4" standoff

Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Sample loops are not included with valves. Order separately.

	4 Ports		6 Ports		8 Ports		10 Ports	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual with standoff	4C4WT		4C6WT		4C8WT		4C10WT	
With air actuator	A4C4WT		A4C6WT		A4C8WT		A4C10WT	
With standard electric actuator	E4C4WT		E4C6WT		E4C8WT		E4C10WT	
With microelectric actuator	EH4C4WT		EH4C6WT		EH4C8WT		EH4C10WT	
Replacement valve	DC4WT		DC6WT		DC8WT		DC10WT	
Replacement rotor	SSAC4WT		SSAC6WT		SSAC8WT		SSAC10WT	

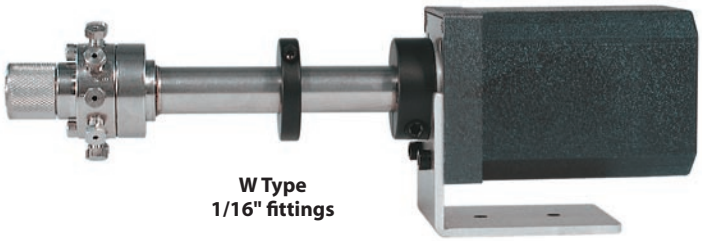
SPECS

300 psi gas
350°C max
Nitronic 60 valve body
Valcon T rotor

For 400 psi, 225°C max, see page 106.

OPTIONS

- 3 and 12 port valves available
  UW type: 3, 12, and 14 port valves available
- 2", 3", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*



W Type
1/16" fittings

MORE INFORMATION

1/16" Stainless steel loops

for W Type valves

Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately.

Volume	*Prod No*	*Price*	*Volume*	*Prod No*	*Price*
2 µl	SL2CW		100 µl	SL100CW	
5 µl	SL5CW		250 µl	SL250CW	
10 µl	SL10CW		500 µl	SL500CW	
15 µl	SL15CW		1 ml	SL1KCW	
20 µl	SL20CW		2 ml	SL2KCW	
25 µl	SL25CW		5 ml	SL5KCW	
50 µl	SL50CW		10 ml	SL10KCW	

ABOUT LOOPS

- Other materials available in many sizes: Electroformed Nickel, Hastelloy C, Nickel 200, PEEK, PTFE, and Titanium
- Loops > 2 ml are made from 1/8" OD tubing with brazed or welded 1/16" tube ends or reducing unions.

Sampling and switching valves, 1/16" fittings, 0.75 mm ports (.030")

UW Type

SPECS
300 psi gas
330°C max
Nitronic 60 valve body
Valcon T rotor

For 400 psi, 225°C max, see page 107.

Includes 4" standoff

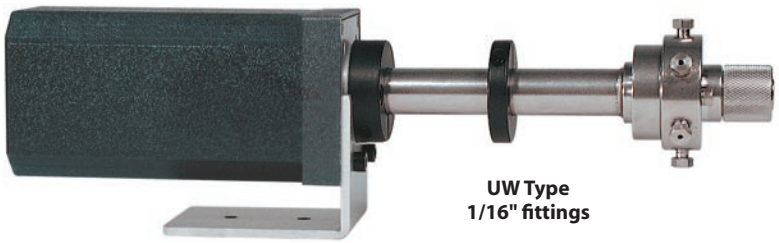
Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Sample loops are not included with valves. Order separately.

High temp
1/16" **0.75 mm**

OPTIONS
- 3, 12 and 14 port valves available
- 2", 3", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*
- Larger bore available

	4 Ports		6 Ports		8 Ports		10 Ports	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual with standoff	4C4UWT		4C6UWT		4C8UWT		4C10UWT	$670
With air actuator	A4C4UWT		A4C6UWT		A4C8UWT		A4C10UWT	
With standard electric actuator	E4C4UWT		E4C6UWT		E4C8UWT		E4C10UWT	
With microelectric actuator	ED4C4UWT		ED4C6UWT		ED4C8UWT		ED4C10UWT	
Replacement valve	DC4UWT		DC6UWT		DC8UWT		DC10UWT	
Replacement rotor	SSAC4UWT		SSAC6UWT		SSAC8UWT		SSAC10UWT	

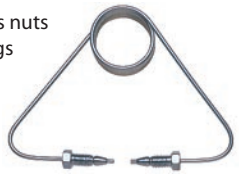


UW Type
1/16" fittings

1/16" Stainless steel loops

for UW Type valves

Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately.



Volume	*Prod No*	*Price*	*Volume*	*Prod No*	*Price*
5 µl	SL5CUW		100 µl	SL100CUW	
10 µl	SL10CUW		250 µl	SL250CUW	
15 µl	SL15CUW		500 µl	SL500CUW	
20 µl	SL20CUW		1 ml	SL1KCUW	
25 µl	SL25CUW		2 ml	SL2KCUW	
50 µl	SL50CUW		5 ml	SL5KCUW	
			10 ml	SL10KCUW	

ABOUT LOOPS
- Other materials available in many sizes: Electroformed Nickel, Hastelloy C, Nickel 200, PEEK, PTFE, and Titanium
- Loops > 2 ml are made from 1/8" OD tubing with brazed or welded 1/16" tube ends or reducing unions.

Sampling and switching valves, 1/8" fittings, 0.75 mm ports (.030")

UW Type

Med temp

1/8" **0.75 mm**

Includes 4" standoff. Manual version has no standoff.

Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Sample loops are not included with valves. Order separately (*see facing page*).

	4 Ports		6 Ports		8 Ports		10 Ports	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	4UWE		6UWE		8UWE		n/a	
Manual with standoff	44UWE		46UWE		48UWE		410UWE	
With air actuator	A44UWE		A46UWE		A48UWE		A410UWE	
With standard electric actuator	E44UWE		E46UWE		E48UWE		E410UWE	
With microelectric actuator	ED44UWE		ED46UWE		ED48UWE		ED410UWE	
Replacement valve	D4UWE		D6UWE		D8UWE		D10UWE	
Replacement rotor	SSA4UWE		SSA6UWE		SSA8UWE		SSA10UWE	

SPECS

400 psi gas
225°C max
Nitronic 60 valve body
Valcon E rotor

For 300 psi, 330°C max, see facing page.

OPTIONS

- 3, 12, and 14 port valves available
- 2", 3", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*
- Larger bore available

Sampling and switching valves, 1/4" fittings, 4.0 mm ports (.156")

MW Type

Low temp

1/4" **4.0 mm**

Includes 4" standoff. Manual version not available without standoff.

Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Sample loops are not available.

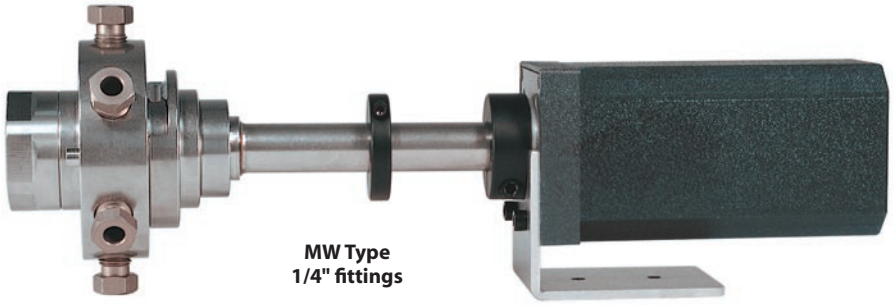
	4 Ports		6 Ports		8 Ports	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual with standoff	4VL4MWE2		4VL6MWE2		4VL8MWE2	
With air actuator	A4VL4MWE2		A4VL6MWE2		A4VL8MWE2	
With std electric actuator	E4VL4MWE2		E4VL6MWE2		E4VL8MWE2	
With microelectric actuator	ET4VL4MWE2		ET4VL6MWE2		ET4VL8MWE2	
Replacement valve	DVL4MWE2		DVL6MWE2		DVL8MWE2	
Replacement rotor	SSAVL4MWE2		SSAVL6MWE2		SSAVL8MWE2	

SPECS

100 psi gas
75°C max
Nitronic 60 valve body
Valcon E2 rotor

OPTIONS

- 2", 3", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*



MW Type
1/4" fittings

Sampling and switching valves, 1/8" fittings, 0.75 mm ports (.030")

UW Type

SPECS
300 psi gas
330°C max
Nitronic 60 valve body
Valcon T rotor

For 400 psi, 225°C max, see facing page.

Includes 4" standoff. Manual version not available without standoff.

Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Sample loops are not included with valves. Order separately.

High temp
1/8" **0.75 mm**

OPTIONS
- 3, 12, and 14 port valves available
- 2", 3", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*
- Larger bore available

4 Ports

	Prod No	*Price*
Manual with standoff	44UWT	
With air actuator	A44UWT	
With standard electric actuator	E44UWT	
With microelectric actuator	ED44UWT	
Replacement valve	D4UWT	
Replacement rotor	SSA4UWT	

6 Ports

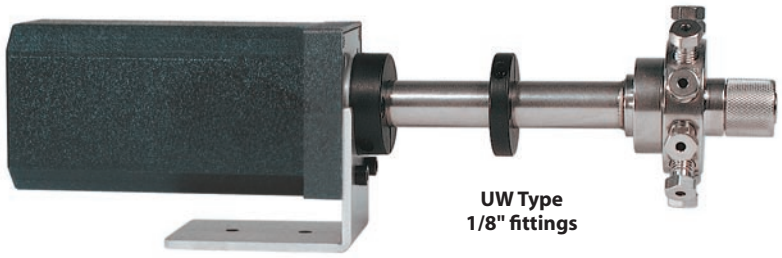
	Prod No	*Price*
Manual with standoff	46UWT	
With air actuator	A46UWT	
With standard electric actuator	E46UWT	
With microelectric actuator	ED46UWT	
Replacement valve	D6UWT	
Replacement rotor	SSA6UWT	

8 Ports

	Prod No	*Price*
Manual with standoff	48UWT	
With air actuator	A48UWT	
With standard electric actuator	E48UWT	
With microelectric actuator	ED48UWT	
Replacement valve	D8UWT	
Replacement rotor	SSA8UWT	

10 Ports

	Prod No	*Price*
Manual with standoff	410UWT	
With air actuator	A410UWT	
With standard electric actuator	E410UWT	
With microelectric actuator	ED410UWT	
Replacement valve	D10UWT	
Replacement rotor	SSA10UWT	



UW Type
1/8" fittings

MORE INFORMATION

ABOUT LOOPS
- Other materials available in many sizes: Electroformed Nickel, Hastelloy C, Nickel 200, PEEK, PTFE, and Titanium
- Loops <100 µl are made from 1/16" OD tubing with brazed or welded 1/8" tube ends.

1/8" Stainless steel loops

for UW Type valves

Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately.

Volume	*Prod No*	*Price*
10 µl	SL10UW	
15 µl	SL15UW	
20 µl	SL20UW	
25 µl	SL25UW	
50 µl	SL50UW	
100 µl	SL100UW	

Volume	*Prod No*	*Price*
250 µl	SL250UW	
500 µl	SL500UW	
1 ml	SL1KUW	
2 ml	SL2KUW	
5 ml	SL5KUW	
10 ml	SL10KUW	
20 ml	SL20KUW	

HPLC Injectors

Internal sample injectors, 1/16" fittings, 0.40 mm ports (.016") 0.25 mm column port diameter (.010")

W Type

5,000 psi
Internal sample
1/16" **0.40 mm**

Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply.

SPECS
5000 psi liq
75°C max
Nitronic 60 valve body
Valcon H rotor

Sample volume	.06 µl		.1 µl		.2 µl		.5 µl	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	CI4W.06		CI4W.1		CI4W.2		CI4W.5	
With air actuator	ACI4W.06		ACI4W.1		ACI4W.2		ACI4W.5	
With standard electric actuator	ECI4W.06		ECI4W.1		ECI4W.2		ECI4W.5	
With microelectric actuator	EPCI4W.06		EPCI4W.1		EPCI4W.2		EPCI4W.5	
Replacement valve	DCI4W.06		DCI4W.1		DCI4W.2		DCI4W.5	
Replacement rotor	SSACI4W.06		SSACI4W.1		SSACI4W.2		SSACI4W.5	

OPTIONS
- 2", 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*
- 1/32" fittings with 0.25 mm bore (.010") also available. Consult factory for product number and pricing.

W Type
1/16" fittings

UW Type
1/16" fittings

Internal sample injectors, 1/16" fittings, 0.75 mm ports (.030")

UW Type

5,000 psi
Internal sample
1/16" **0.75 mm**

Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply.

SPECS
5000 psi liq
75°C max
Nitronic 60 valve body
Valcon H rotor

Sample volume	.2 µl		.5 µl		1 µl		2 µl	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	CI4UW.2		CI4UW.5		CI4UW1		CI4UW2	
With air actuator	ACI4UW.2		ACI4UW.5		ACI4UW1		ACI4UW2	
With standard electric actuator	ECI4UW.2		ECI4UW.5		ECI4UW1		ECI4UW2	
With microelectric actuator	EDCI4UW.2		EDCI4UW.5		EDCI4UW1		EDCI4UW2	
Replacement valve	DCI4UW.2		DCI4UW.5		DCI4UW1		DCI4UW2	
Replacement rotor	SSACI4UW.2		SSACI4UW.5		SSACI4UW1		SSACI4UW2	

OPTIONS
- 2", 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*
- 1/32" fittings with 0.25 mm bore (.010") also available. Consult factory for product number and pricing.

Injectors and switching valves, 1/16" fittings, 0.40 mm ports (.016")

W Type

SPECS
5000 psi liq
75°C max
Nitronic 60 valve body
Valcon H rotor

Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Sample loops are not included with valves. Order separately.

5,000 psi | **Analytical** | **1/16"** | **0.40 mm**

OPTIONS
- 3 and 12 port valves available
- 2", 3", 4", and 6" standoffs
- 1/32" and 1/16" versions available with 0.25 mm (.010") bore
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*

4 Ports

	Prod No	*Price*
Manual	C4W	
With air actuator	AC4W	
With standard electric actuator	EC4W	
With microelectric actuator	EPC4W	
Replacement valve	DC4W	
Replacement rotor	SSAC4W	

6 Ports

	Prod No	*Price*
Manual	C6W	
With air actuator	AC6W	
With standard electric actuator	EC6W	
With microelectric actuator	EPC6W	
Replacement valve	DC6W	
Replacement rotor	SSAC6W	

8 Ports

	Prod No	*Price*
Manual	C8W	
With air actuator	AC8W	
With standard electric actuator	EC8W	
With microelectric actuator	EPC8W	
Replacement valve	DC8W	
Replacement rotor	SSAC8W	

10 Ports

	Prod No	*Price*
Manual	C10W	
With air actuator	AC10W	
With standard electric actuator	EC10W	
With microelectric actuator	EPC10W	
Replacement valve	DC10W	
Replacement rotor	SSAC10W	

W Type
1/16" fittings

MORE INFORMATION

ABOUT LOOPS
- Other materials available in many sizes: Electroformed Nickel, Hastelloy C, Nickel 200, PEEK, PTFE, and Titanium
- Loops > 2 ml are made from 1/8" OD tubing with brazed or welded 1/16" tube ends or reducing unions.

1/16" Stainless steel loops

for W Type valves

Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately.

Volume	*Prod No*	*Price*	*Volume*	*Prod No*	*Price*
2 µl	SL2CW		100 µl	SL100CW	
5 µl	SL5CW		250 µl	SL250CW	
10 µl	SL10CW		500 µl	SL500CW	
15 µl	SL15CW		1 ml	SL1KCW	
20 µl	SL20CW		2 ml	SL2KCW	
25 µl	SL25CW		5 ml	SL5KCW	
50 µl	SL50CW		10 ml	SL10KCW	

Injectors and switching valves, 1/16" fittings, 0.75 mm ports (.030")

UW Type

5,000 psi
Semi-prep
1/16" **0.75 mm**

Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Sample loops are not included with valves. Order separately.

SPECS

5000 psi liq
75°C max
Nitronic 60 valve body
Valcon H rotor

	4 Ports		6 Ports		8 Ports		10 Ports	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	C4UW		C6UW		C8UW		C10UW	
With air actuator	AC4UW		AC6UW		AC8UW		AC10UW	
With standard electric actuator	EC4UW		EC6UW		EC8UW		EC10UW	
With microelectric actuator	EDC4UW		EDC6UW		EDC8UW		EDC10UW	
Replacement valve	DC4UW		DC6UW		DC8UW		DC10UW	
Replacement rotor	SSAC4UW		SSAC6UW		SSAC8UW		SSAC10UW	

OPTIONS

- 3, 12, and 14 port valves available
- 2", 3", 4", and 6" standoffs
- 1/32" and 1/16" versions available with 0.25 mm (.010") bore
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*
- Larger bore available.

UW Type
1/16" fittings

1/16" Stainless steel loops

for UW Type valves

Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately.

Volume	*Prod No*	*Price*	*Volume*	*Prod No*	*Price*
3 µl	SL3CUW		100 µl	SL100CUW	
5 µl	SL5CUW		250 µl	SL250CUW	
10 µl	SL10CUW		500 µl	SL500CUW	
15 µl	SL15CUW		1 ml	SL1KCUW	
20 µl	SL20CUW		2 ml	SL2KCUW	
25 µl	SL25CUW		5 ml	SL5KCUW	
50 µl	SL50CUW		10 ml	SL10KCUW	

ABOUT LOOPS

- Other materials available in many sizes: Electroformed Nickel, Hastelloy C, Nickel 200, PEEK, PTFE, and Titanium
- Loops > 2 ml are made from 1/8" OD tubing with brazed or welded 1/16" tube ends or reducing unions.

Injectors and switching valves, 1/8" fittings, 0.75 mm (.030")

UW Type

SPECS
5000 psi liq
75°C max
Nitronic 60 valve body
Valcon H rotor

Manual 10 port includes 2" standoff.

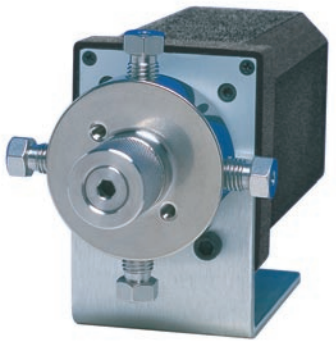
Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Sample loops are not included with valves. Order separately.

5,000 psi
Semi-prep
1/8" **0.75 mm**

OPTIONS
- 3 and 12 port valves available
- 2", 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*
- Larger bore available. *(see page 116)*

	4 Ports		6 Ports		8 Ports		10 Ports	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	4UW		6UW		8UW		210UW	$720
With air actuator	A4UW		A6UW		A8UW		A10UW	
With standard electric actuator	E4UW		E6UW		E8UW		E10UW	1200
With microelectric actuator	ED4UW		ED6UW		ED8UW		ED10UW	1430
Replacement valve	D4UW		D6UW		D8UW		D10UW	
Replacement rotor	SSA4UW		SSA6UW		SSA8UW		SSA10UW	



UW Type
1/8" fittings

MORE INFORMATION

ABOUT LOOPS
- Other materials available in many sizes: Electroformed Nickel, Hastelloy C, Nickel 200, PEEK, PTFE, and Titanium
- Loops < 100 µl are made from 1/16" OD tubing with brazed or welded 1/8" tube ends.

1/8" Stainless steel loops

for UW Type valves

Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately.

Volume	*Prod No*	*Price*	*Volume*	*Prod No*	*Price*
10 µl	SL10UW		250 µl	SL250UW	
15 µl	SL15UW		500 µl	SL500UW	
20 µl	SL20UW		1 ml	SL1KUW	
25 µl	SL25UW		2 ml	SL2KUW	
50 µl	SL50UW		5 ml	SL5KUW	
100 µl	SL100UW		10 ml	SL10KUW	
			20 ml	SL20KUW	

Injectors and switching valves, 1/8" fittings, large bore

UW Type

5,000 psi
Prep
1/8" **Large bore**

Manual 10 port includes 2" standoff.

Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international.
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply.

Sample loops are not included with valves. Order separately.

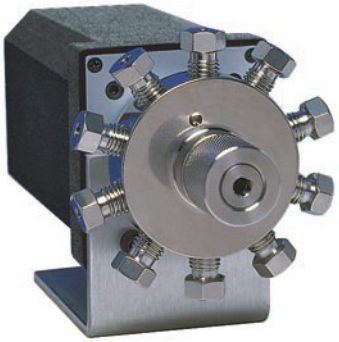
	4 Ports 1.7 mm (.067")		6 Ports 1.7 mm (.067")		8 Ports 1.3 mm (.050")		10 Ports 1.0 mm (.040")	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	L4UW		L6UW		L8UW		2L10UW	
With air actuator	AL4UW		AL6UW		AL8UW		AL10UW	
With standard electric actuator	EL4UW		EL6UW		EL8UW		EL10UW	
With microelectric actuator	EDL4UW		EDL6UW		EDL8UW		EDL10UW	
Replacement valve	DL4UW		DL6UW		DL8UW		DL10UW	
Replacement rotor	SSAL4UW		SSAL6UW		SSAL8UW		SSAL10UW	

SPECS

5000 psi liq
75°C max
Nitronic 60 valve body
Valcon H rotor

OPTIONS

- 3 port valve available
- 2", 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium, Zirconium *(see pages 254-255)*
- Smaller bore available. *(see page 115)*



UW Type
1/8" fittings

MORE INFORMATION

1/8" Stainless steel loops

for UW Type valves

Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately.

Volume	*Prod No*	*Price*	*Volume*	*Prod No*	*Price*
100 µl	SL100UW		2 ml	SL2KUW	
250 µl	SL250UW		5 ml	SL5KUW	
500 µl	SL500UW		10 ml	SL10KUW	
1 ml	SL1KUW		20 ml	SL20KUW	

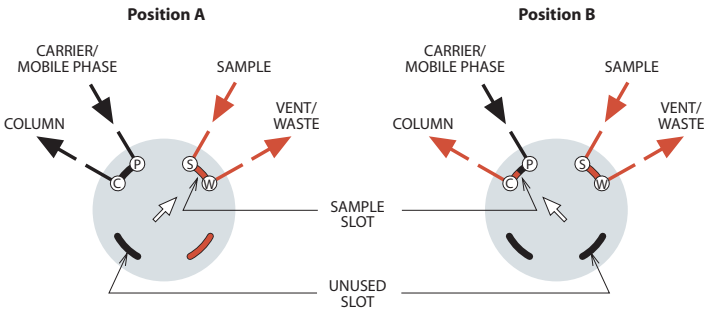
ABOUT LOOPS

- Other materials available in many sizes: Electroformed Nickel, Hastelloy C, Nickel 200, PEEK, PTFE, and Titanium
- Loops < 100 µl are made from 1/16" OD tubing with brazed or welded 1/8" tube ends..

These illustrations show basic sample injection techniques using Valco two position valves. With rare exceptions, there is no difference between switching valves and external volume sampling valves, so the same valve can be used for either function.

The unique advantage of 8 and 10 port valves is that they reduce extra column volume by combining sampling and switching functions in a single valve. This minimizes expense, maintenance, service, and risk of leaks as compared to multiple 6 port valve systems.

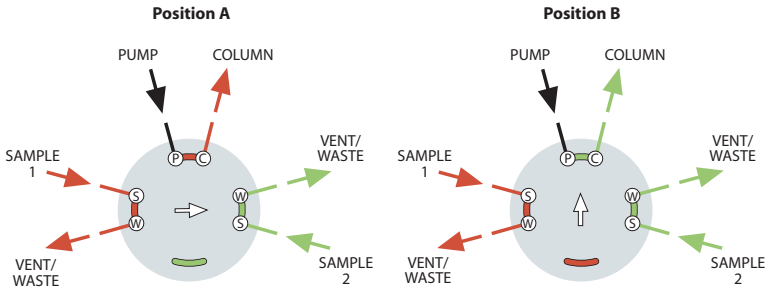
4 port internal sample injector



MICROVOLUME SAMPLE INJECTION

The internal sample (fixed volume) flowpath is used when very small sample volumes are required. The sample size is determined by a passage engraved on the valve rotor, allowing precise, repeatable injections. In Position A, the sample flows through the sample passage while the mobile phase flows through to the column. The third passage is inactive. In Position B, the sample passage is in line with the column and the mobile phase injects the contents of the sample passage onto the column. The passage which was inactive in Position A allows the sample to continue flowing without interruption.

6 port internal sample injector



DUAL MICROVOLUME SAMPLE INJECTION

This microvolume injector can be used to alternate between two different samples. Each time the valve is switched, a sample is injected. By connecting the two sample inlets in series, the valve injects the sample each time the valve switches. This is particularly useful in heavy duty cycle operations to minimize valve wear. The valve can also be used to make alternating injections of the same sample onto two different columns by swapping sample/waste and pump/column connections.

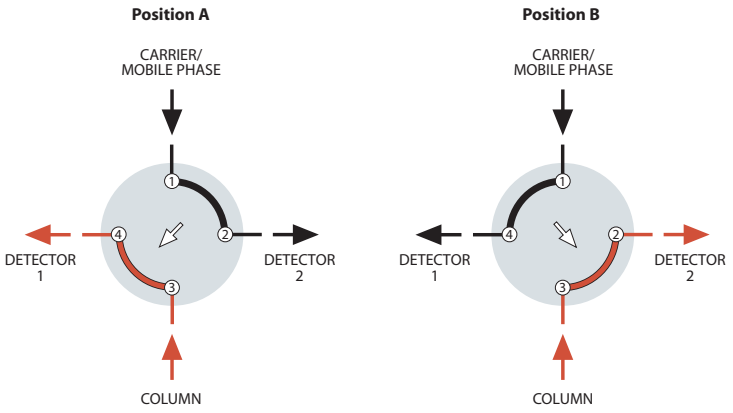
Note: This CI6 valve is not shown in this catalog. Call for details.

Two Position Applications

4 port switching valve

DETECTOR SELECTION FROM TWO COLUMNS OR ONE COLUMN AND AUXILIARY CARRIER

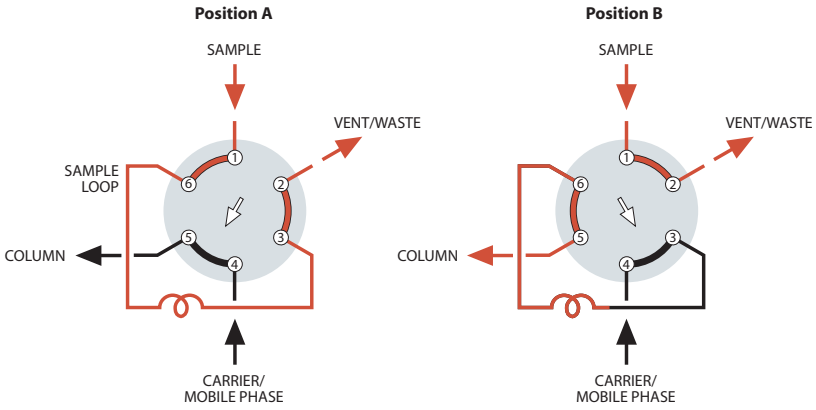
This unique configuration allows analyses of different parts of one analysis with two different detectors, without splitting or multiple injections. For example, fixed gases can be analyzed with a thermal conductivity detector, followed by the analysis of a hydrocarbon fraction with a flame ionization detector.



6 port external sample injector

SAMPLE INJECTION

With the valve in Position A, sample flows through the external loop while the mobile phase flows directly through to the chromatographic column. When the valve is switched to Position B, the sample contained in the sample loop and valve flow passage is displaced by the mobile phase and is carried onto the column.
Note: This is especially critical for partially-filled loops. The flow direction of the mobile phase through the loop should be opposite (backflush) to the flow direction during the loading of the loop.

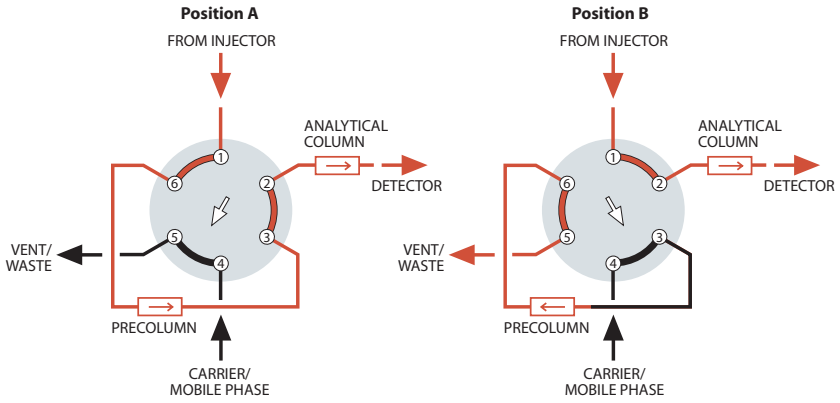


6 port column switching

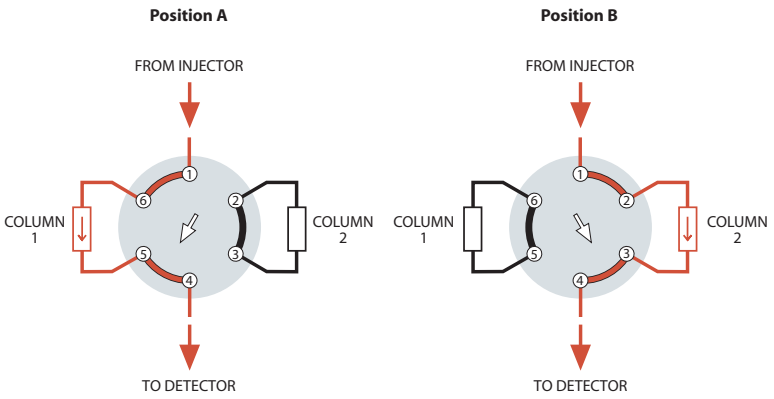
BACKFLUSH OF PRECOLUMN TO VENT

This plumbing scheme allows slower eluting components (end cut) which are not of interest to be backflushed to vent. Often a shorter version of the analytical column is used as the precolumn. Once all the components of interest have entered the main column (at port 2), the valve switches, backflushing the precolumn to vent and reducing analysis time.

Note: An auxiliary source of carrier or mobile phase is required for this application.



6 port column selection

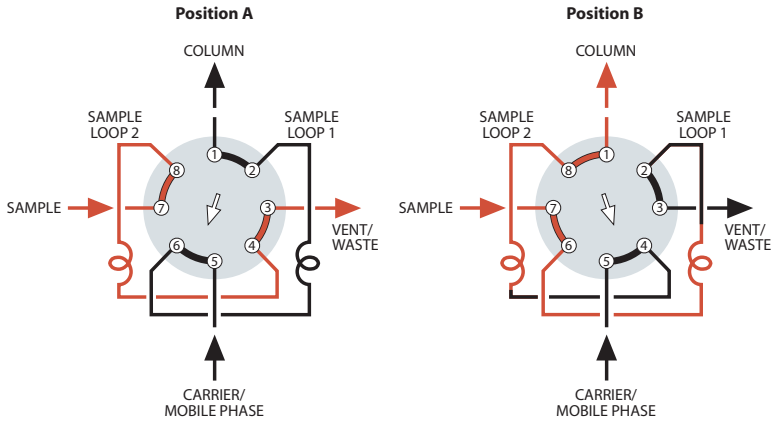


TWO COLUMN SELECTION

When two different columns are required at frequent intervals at similar oven temperatures, a 6 port valve can provide rapid selection of the one to be used. The column not in use is protected by a blanket of inert mobile phase and may be rapidly brought to equilibrium when required.

Note: If flow must be maintained to the non-selected column, an 8 or 10 port valve is required.

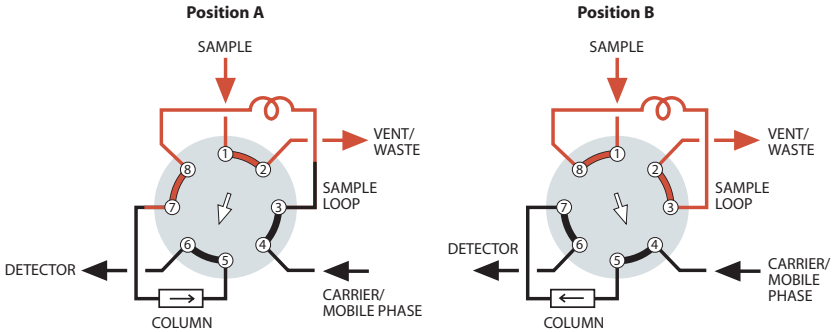
8 port dual external sample injector



SAME SAMPLE TO DIFFERENT LOOPS

In a dual external sample loop configuration, sample is injected in both positions. In Position A, Loop 2 is loaded while the mobile phase flows through Loop 1 and onto the column. In Position B, the Loop 2 sample is injected into the column and another sample is loaded into Loop 1. When the valve is returned to Position A, the Loop 1 sample is injected onto the column and Loop 2 is reloaded.

8 port sampling/switching



LOOP SAMPLING WITH BACKFLUSH TO DETECTOR

One valve functions as both a sampling and a backflush valve, simplifying operation and reducing cost. When components of interest are detected, the strongly retained components are backflushed and removed from the column without temperature programming.

Two Position Applications

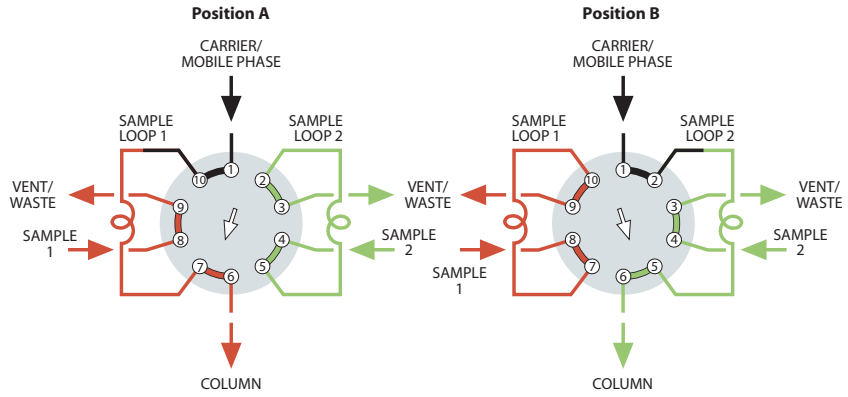
10 port dual external sampling

TWO DIFFERENT SAMPLES TO SAME COLUMN

A 10 port valve permits alternate injections from the two loops, which may be identical or of different sizes. This technique replaces a 4 port sample selector and a 6 port sample injector.

In Position A, Loop 2 is loaded with sample 2 while the mobile phase flows through Loop 1 and onto the column.

In Position B, the Loop 2 sample is injected onto the column and Loop 1 is loaded with sample 1. When the valve is returned to Position A, the Loop 1 sample is injected onto the column and Loop 2 is reloaded with sample 2.

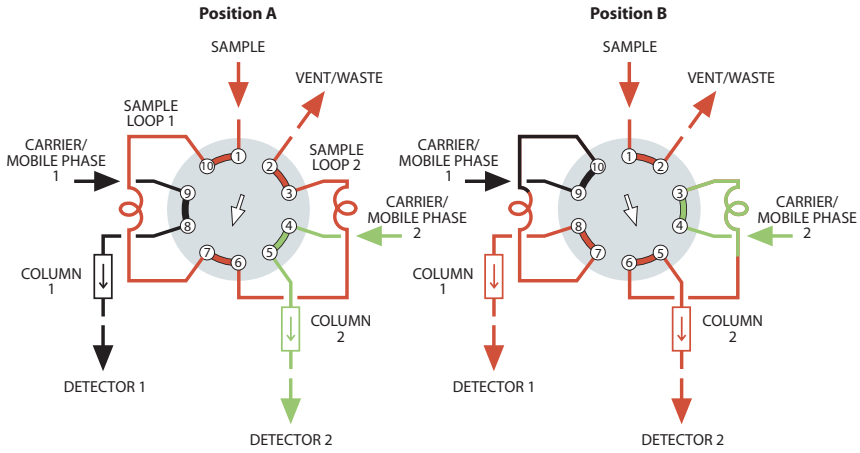


10 port dual external sampling

SIMULTANEOUS INJECTION OF THE SAME SAMPLE ONTO SEPARATE COLUMNS

In Position A, sample fills the two loops in series. In Position B, the sample is simultaneously injected into two separate flow systems. A single autosampler used with this flowpath can automate two analytical procedures for the same sample.

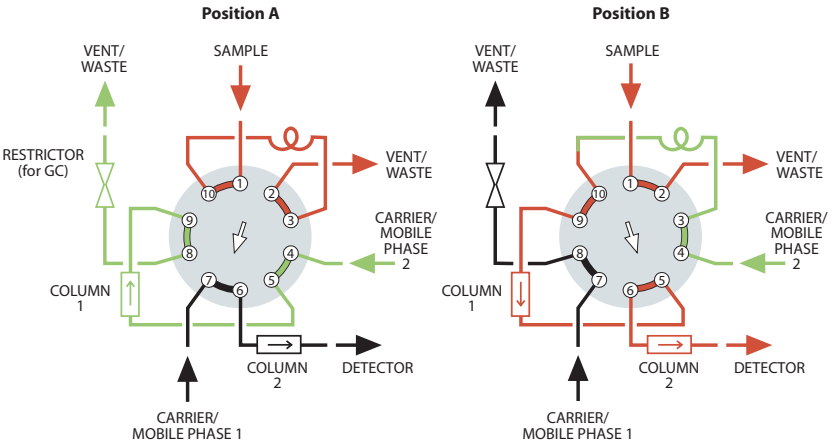
In an important non-chromatographic application, the roles of carrier and sample are reversed, permitting two different quantities of two different materials to be dispensed together, as in automatic dilution.



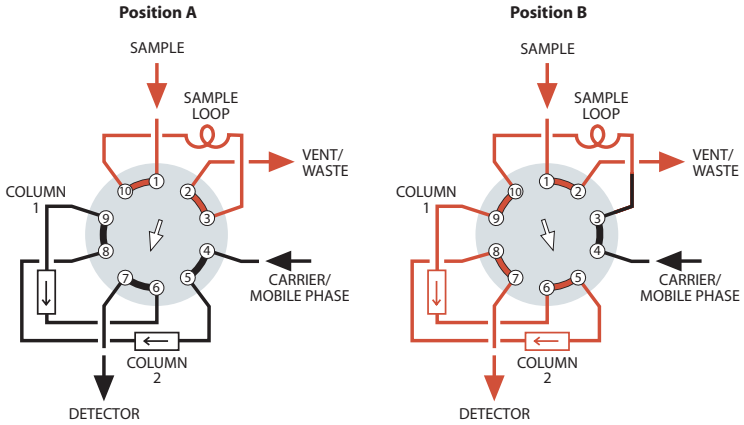
10 port sampling/switching

LOOP SAMPLING WITH BACKFLUSH OF PRE-COLUMN TO VENT

When components of interest have low boiling points, this plumbing scheme allows "heavy" components with long retention times to be backflushed to waste. After the sample loop is loaded in Position A, the valve is switched to Position B to inject the sample onto column 1. As soon as all components of interest have entered column 2, the valve is switched back to Position A. Column 1 is backflushed to vent during the analysis, reducing the total analysis time.



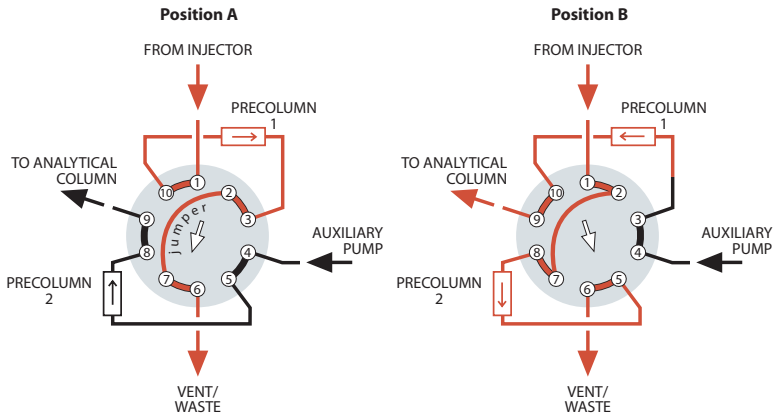
10 port sampling/switching



LOOP SAMPLING WITH TWO COLUMN SEQUENCE REVERSAL

This is ideal for fixed-gas-from-CO_2 analysis where no "high boilers" are present. Column 1 is packed with a porous polymer and Column 2 with molecular sieve. The sample loop is loaded in Position A. When the valve is switched, the loop contents are sent onto Column 1. As the inorganic gases and methane leave Column 1 and enter Column 2, the valve is returned to Position A, reversing the column sequence. CO_2 now leaves Column 1, becoming the first peak. The inorganics and methane are separated by the molesieve and pass through the porous polymer column to the detector.

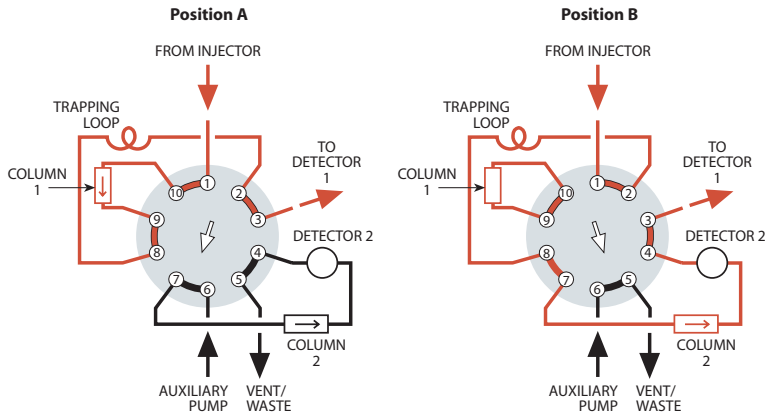
10 port column switching



SAMPLE ENRICHMENT (CLEANUP) USING DUAL PRECOLUMNS

Sample is injected by a separate injector onto one of two precolumns (stripper). Early eluting components vent at port 6 while components of interest are retained on the stripper. When the valve is switched, a new injection is made onto the second stripper while components retained on the first stripper are backflushed onto the analytical column at port 9.
Note: This application requires an auxiliary pump at port 4.

10 port column switching

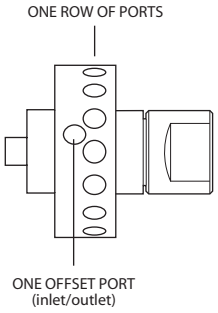


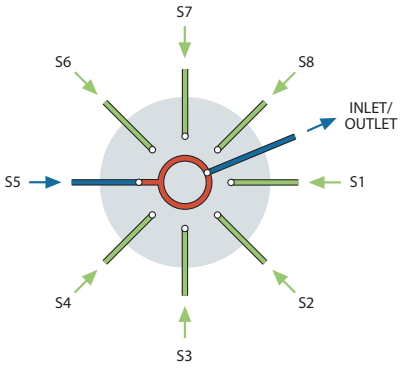
HEART CUT TRAPPED IN A LOOP AND INJECTED ONTO A SECOND COLUMN

Sample is injected (using a separate injector) onto an analytical column. Early eluting components (front cut) pass through a trapping loop and are detected (at port 3). The valve is then switched, and the center (or heartcut) which was retained in the trapping loop is injected onto the second column to the detector (at port 4). Late eluting components (end cut) are trapped on the first column. When the valve is switched again, the end cut passes through the trapping loop to the first detector, completing the analysis.

Dead-end flowpath – SD configuration

SD valves select one of 4 to 16 dead-ended streams. The selected stream flows from the outlet to a sample valve, pressure sensor, detector, column, etc. The same flowpath can also be used to direct one stream to a number of outlets in applications such as fraction collection. For an application suggestion, see page 134.





1/16" fittings, 0.75 mm ports (.030")

MW Type

Low pressure

SD Dead-end

1/16" **0.75 mm**

Includes 2" standoff. Ask about closemount assembly if valve will not be heated.

Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international

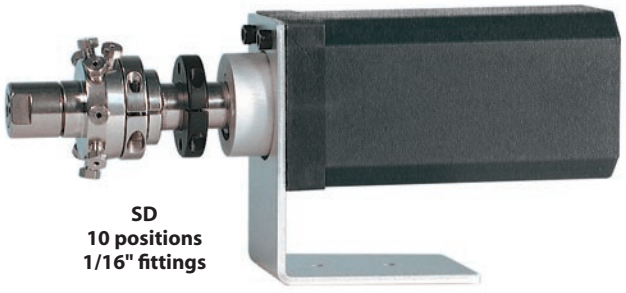
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

SPECS
400 psi gas
200°C max
Nitronic 60 body
Valcon E rotor

OPTIONS

- 4 and 8 positions available
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium *(see pages 254-255)*
- Larger bore available except 16 position

	6 Position		10 Position		12 Position		16 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual (not recommended)	2CSD6MWE		2CSD10MWE		2CSD12MWE		2CSD16MWE	
With air actuator	A2CSD6MWE		A2CSD10MWE		A2CSD12MWE		A2CSD16MWE	
With standard electric actuator	E2CSD6MWE		E2CSD10MWE		E2CSD12MWE		E2CSD16MWE	
With microelectric actuator	EMT2CSD6MWE		EMT2CSD10MWE		EMT2CSD12MWE		EMT2CSD16MWE	
Replacement valve	DCSD6MWE		DCSD10MWE		DCSD12MWE		DCSD16MWE	
Replacement rotor	SSACSD6MWE		SSACSD10MWE		SSACSD12MWE		SSACSD16MWE	



SD
10 positions
1/16" fittings

MORE INFORMATION

1/8" fittings, 1.0 mm ports (.040")

MW Type

SPECS
4-8 Positions:
400 psi gas
200°C max
10-16 Positions:
200 psi gas
200°C max
Nitronic 60 body
Valcon E rotor

Includes 2" standoff. Ask about closemount assembly if valve will not be heated.

Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

Low pressure
SD Dead-end
1/8" **1.0 mm**

OPTIONS
- 4 and 8 positions available
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium *(see pages 254-255)*
- Larger bore available

	6 Position		10 Position		12 Position		16 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual (not recommended)	2SD6MWE		2SD10MWE		2SD12MWE		2SD16MWE	
With air actuator	A2SD6MWE		A2SD10MWE		A2SD12MWE		A2SD16MWE	
With standard electric actuator	E2SD6MWE		E2SD10MWE		E2SD12MWE		E2SD16MWE	
With microelectric actuator	EMT2SD6MWE		EMT2SD10MWE		EMT2SD12MWE		EMT2SD16MWE	
Replacement valve	DSD6MWE		DSD10MWE		DSD12MWE		DSD16MWE	
Replacement rotor	SSASD6MWE		SSASD10MWE		SSASD12MWE		SSASD16MWE	

1/4" fittings, 4.0 mm ports (.156")

MW Type

SPECS
100 psi gas
75°C max
Nitronic 60 body
Valcon E2 rotor

Includes 2" standoff. Ask about closemount assembly if valve will not be heated.

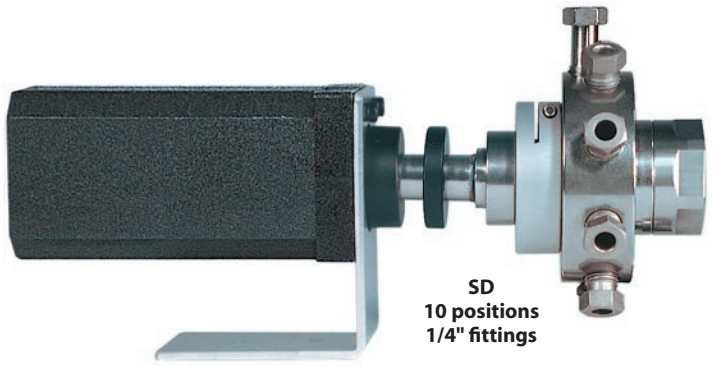
Manual version not available.

Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

Low pressure
SD Dead-end
1/4" **4.0 mm**

OPTIONS
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium *(see pages 254-255)*

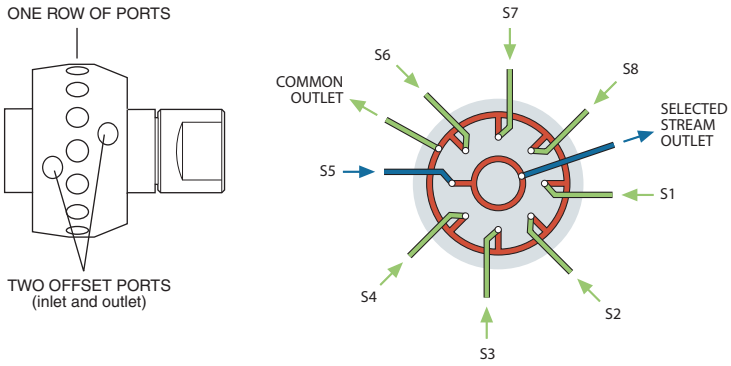
	4 Position		6 Position		8 Position		10 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
With air actuator	AH2VLSD4MWE2		AH2VLSD6MWE2		AH2VLSD8MWE2		AH2VLSD10MWE2	
With std electric actuator	E2VLSD4MWE2		E2VLSD6MWE2		E2VLSD8MWE2		E2VLSD10MWE2	
With microelectric actuator	EMT2VLSD4MWE2		EMT2VLSD6MWE2		EMT2VLSD8MWE2		EMT2VLSD10MWE2	
Replacement valve	DVLSD4MWE2		DVLSD6MWE2		DVLSD8MWE2		DVLSD10MWE2	
Replacement rotor	SSAVLSD4MWE2		SSAVLSD6MWE2		SSAVLSD8MWE2		SSAVLSD10MWE2	



SD
10 positions
1/4" fittings

Common outlet flowpath – SC configuration

SC selectors are similar to the SD configuration, except that instead of being dead-ended the non-selected streams flow to a common outlet. For an application suggestion, see page 135.



1/16" fittings, 1.0 mm ports (.040")

MW Type

Low pressure

SC Common outlet

1/16" **1.0 mm**

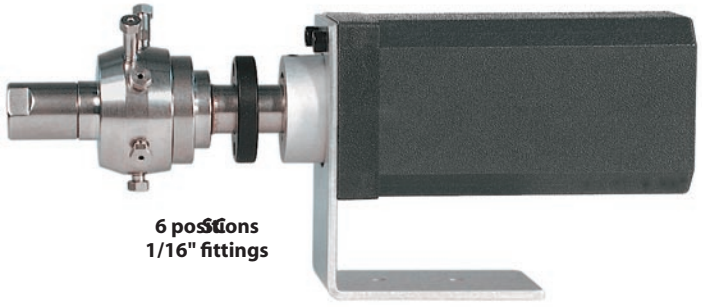
Includes 2" standoff. Ask about closemount assembly if valve will not be heated.

Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

SPECS
200 psi gas
200°C max
Nitronic 60 body
Valcon E rotor

OPTIONS
- 4 and 8 positions available
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium *(see pages 254-255)*

	6 Position		10 Position		12 Position		16 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual (not recommended)	2CSC6MWE		2CSC10MWE		2CSC12MWE		2CSC16MWE	
With air actuator	A2CSC6MWE		A2CSC10MWE		A2CSC12MWE		A2CSC16MWE	
With standard electric actuator	E2CSC6MWE		E2CSC10MWE		E2CSC12MWE		E2CSC16MWE	
With microelectric actuator	EMT2CSC6MWE		EMT2CSC10MWE		EMT2CSC12MWE		EMT2CSC16MWE	
Replacement valve	DCSC6MWE		DCSC10MWE		DCSC12MWE		DCSC16MWE	
Replacement rotor	SSACSC6MWE		SSACSC10MWE		SSACSC12MWE		SSACSC16MWE	



6 positions
1/16" fittings

MORE INFORMATION

1/8" fittings, 1.0 mm ports (.040")

MW Type

SPECS
200 psi gas
200°C max
Nitronic 60 body
Valcon E rotor

Includes 2" standoff.
Ask about closemount assembly if valve will not be heated.

Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

Low pressure
SC Common outlet
1/8" **1.0 mm**

OPTIONS
- 4 and 8 positions available
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium *(see pages 254-255)*
- Larger bore available except 16 position

	6 Position		10 Position		12 Position		16 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual (not recommended)	2SC6MWE		2SC10MWE		2SC12MWE		2SC16MWE	
With air actuator	A2SC6MWE		A2SC10MWE		A2SC12MWE		A2SC16MWE	
With standard electric actuator	E2SC6MWE		E2SC10MWE		E2SC12MWE		E2SC16MWE	
With microelectric actuator	EMT2SC6MWE		EMT2SC10MWE		EMT2SC12MWE		EMT2SC16MWE	
Replacement valve	DSC6MWE		DSC10MWE		DSC12MWE		DSC16MWE	
Replacement rotor	SSASC6MWE		SSASC10MWE		SSASC12MWE		SSASC16MWE	

1/4" fittings, 4.0 mm ports (.156")

MW Type

SPECS
100 psi gas
75°C max
Nitronic 60 body
Valcon E2 rotor

Includes 2" standoff.
Ask about closemount assembly if valve will not be heated.

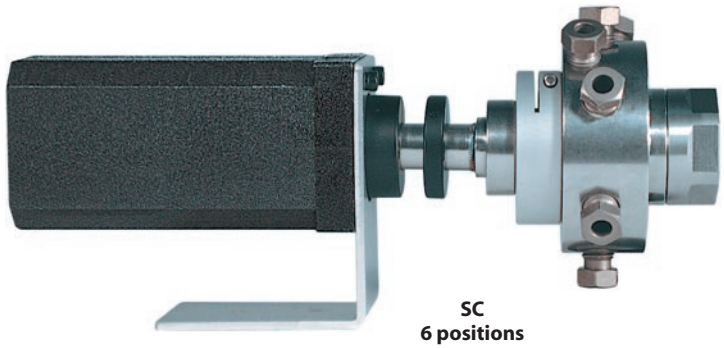
Manual version not available.

Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

Low pressure
SC Common outlet
1/4" **4.0 mm**

OPTIONS
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium *(see pages 254-255)*

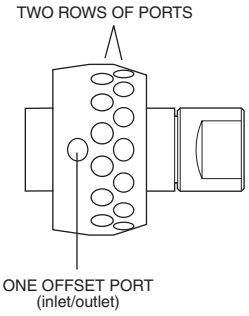
	4 Position		6 Position		8 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
With air actuator	AH2VLSC4MWE2		AH2VLSC6MWE2		AH2VLSC8MWE2	
With std electric actuator	E2VLSC4MWE2		E2VLSC6MWE2		E2VLSC8MWE2	
With microelectric actuator	EMT2VLSC4MWE2		EMT2VLSC6MWE2		EMT2VLSC8MWE2	
Replacement valve	DVLSC4MWE2		DVLSC6MWE2		DVLSC8MWE2	
Replacement rotor	SSAVLSC4MWE2		SSAVLSC6MWE2		SSAVLSC8MWE2	

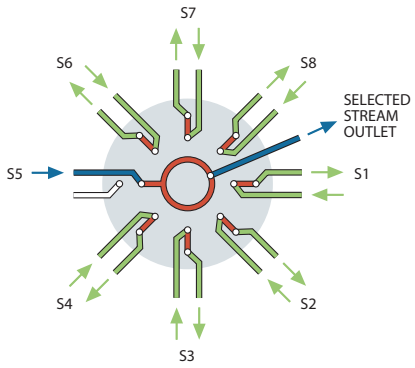


SC
6 positions
1/4" fittings

Flow-through flowpath – SF configuration

SD and SC valves select and isolate one of 4 to 16 streams, with the remainder dead-ended in the SD and flowing to a common outlet in the SC. The SF selector is similar, but carries the evolution a step further with the non-selected streams flowing through individual outlets. For an application suggestion, see page 136.





1/16" fittings, 1.0 mm ports (.040")

MW Type

Low pressure

SF Flow-through

1/16" **1.0 mm**

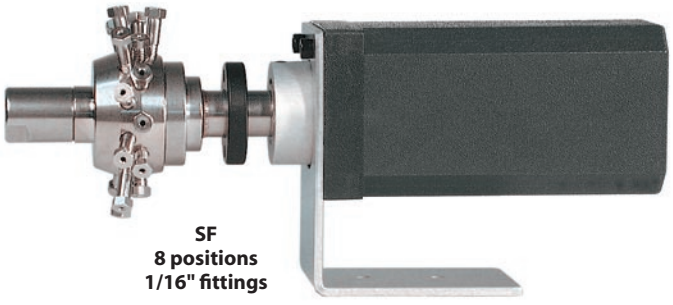
Includes 2" standoff. Ask about closemount assembly if valve will not be heated.

Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

SPECS
200 psi gas
200°C max
Nitronic 60 body
Valcon E rotor

OPTIONS
- 4 and 8 positions available
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium *(see pages 254-255)*

	6 Position		10 Position		12 Position		16 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual (not recommended)	2CSF6MWE		2CSF10MWE		2CSF12MWE		2CSF16MWE	
With air actuator	A2CSF6MWE		A2CSF10MWE		A2CSF12MWE		A2CSF16MWE	
With standard electric actuator	E2CSF6MWE		E2CSF10MWE		E2CSF12MWE		E2CSF16MWE	
With microelectric actuator	EMT2CSF6MWE		EMT2CSF10MWE		EMT2CSF12MWE		EMT2CSF16MWE	
Replacement valve	DCSF6MWE		DCSF10MWE		DCSF12MWE		DCSF16MWE	
Replacement rotor	SSACSF6MWE		SSACSF10MWE		SSACSF12MWE		SSACSF16MWE	



SF
8 positions
1/16" fittings

MORE INFORMATION

1/8" fittings, 1.0 mm ports (.040")

MW Type

SPECS
200 psi gas
200°C max
Nitronic 60 body
Valcon E rotor

Includes 2" standoff.
Ask about closemount assembly if valve will not be heated.

Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

Low pressure
SF Flow-through
1/8" **1.0 mm**

OPTIONS
- 4 and 8 positions available
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium *(see pages 254-255)*
- Larger bore available except 16 position

	6 Position		10 Position		12 Position		16 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual (not recommended)	2SF6MWE		2SF10MWE		2SF12MWE		2SF16MWE	
With air actuator	A2SF6MWE		A2SF10MWE		A2SF12MWE		A2SF16MWE	
With standard electric actuator	E2SF6MWE		E2SF10MWE		E2SF12MWE		E2SF16MWE	
With microelectric actuator	EMT2SF6MWE		EMT2SF10MWE		EMT2SF12MWE		EMT2SF16MWE	
Replacement valve	DSF6MWE		DSF10MWE		DSF12MWE		DSF16MWE	
Replacement rotor	SSASF6MWE		SSASF10MWE		SSASF12MWE		SSASF16MWE	

1/4" fittings, 4.0 mm ports (.156")

MW Type

SPECS
100 psi gas
75°C max
Nitronic 60 body
Valcon E2 rotor

Includes 2" standoff.
Ask about closemount assembly if valve will not be heated.

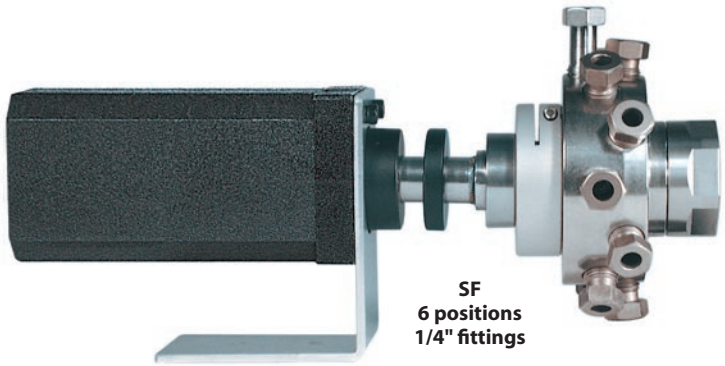
Manual version is not available.

Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

Low pressure
SF Flow-through
1/4" **4.0 mm**

OPTIONS
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium *(see pages 254-255)*

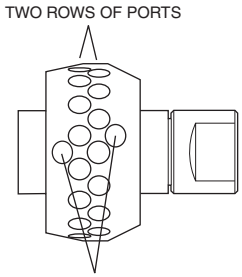
	4 Position		6 Position		8 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
With air actuator	AH2VLSF4MWE2		AH2VLSF6MWE2		AH2VLSF8MWE2	
With std electric actuator	E2VLSF4MWE2		E2VLSF6MWE2		E2VLSF8MWE2	
With microelectric actuator	EMT2VLSF4MWE2		EMT2VLSF6MWE2		EMT2VLSF8MWE2	
Replacement valve	DVLSF4MWE2		DVLSF6MWE2		DVLSF8MWE2	
Replacement rotor	SSAVLSF4MWE2		SSAVLSF6MWE2		SSAVLSF8MWE2	

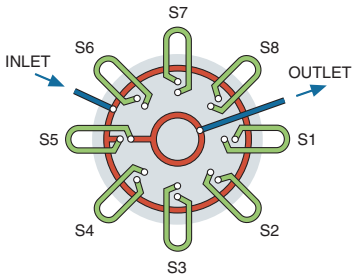


SF
6 positions
1/4" fittings

Trapping flowpath – ST configuration

ST selectors are used for multi-column, multi-sample, or multi-trap operations, and are available for use with 4 to 16 loops, or positions. For an application suggestion, see page 137.





1/16" fittings, 0.75 mm ports (.030")

MW Type

Low pressure
ST Trapping
1/16" **0.75 mm**

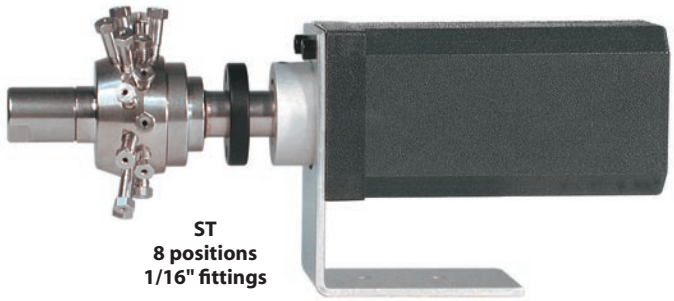
Includes 2" standoff. Ask about closemount assembly if valve will not be heated.

Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

SPECS
200 psi gas
200°C max
Nitronic 60 body
Valcon E rotor

OPTIONS
- 4 and 8 positions available
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium *(see pages 254-255)*

	6 Position		10 Position		12 Position		16 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual (not recommended)	2CST6MWE		2CST10MWE		2CST12MWE		2CST16MWE	
With air actuator	A2CST6MWE		A2CST10MWE		A2CST12MWE		A2CST16MWE	
With standard electric actuator	E2CST6MWE		E2CST10MWE		E2CST12MWE		E2CST16MWE	
With microelectric actuator	EMT2CST6MWE		EMT2CST10MWE		EMT2CST12MWE		EMT2CST16MWE	
Replacement valve	DCST6MWE		DCST10MWE		DCST12MWE		DCST16MWE	
Replacement rotor	SSACST6MWE		SSACST10MWE		SSACST12MWE		SSACST16MWE	



ST
8 positions
1/16" fittings

1/16" Stainless steel loops

for MW Type valves

Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately. When a set of loops is ordered, loops will be supplied from the same lot.

Volume	*Prod No*	*Price*	*Volume*	*Prod No*	*Price*
50 µl	SL50CSTP		1 ml	SL1KCSTP	
100 µl	SL100CSTP		2 ml	SL2KCSTP	
250 µl	SL250CSTP		5 ml	SL5KCSTP	
500 µl	SL500CSTP		10 ml	SL10KCSTP	

MORE INFORMATION

1/8" fittings, 1.0 mm ports (.040")

MW Type

SPECS
200 psi gas
200°C max
Nitronic 60 body
Valcon E rotor

Includes 2" standoff.
Ask about closemount assembly if valve will not be heated.

Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

Low pressure
ST Trapping
1/8" **1.0 mm**

OPTIONS
- 4 and 8 positions available
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium *(see pages 254-255)*
- Larger bore available except 16 position

	6 Position		10 Position		12 Position		16 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual (not recommended)	2ST6MWE		2ST10MWE		2ST12MWE		2ST16MWE	
With air actuator	A2ST6MWE		A2ST10MWE		A2ST12MWE		A2ST16MWE	
With standard electric actuator	E2ST6MWE		E2ST10MWE		E2ST12MWE		E2ST16MWE	
With microelectric actuator	EMT2ST6MWE		EMT2ST10MWE		EMT2ST12MWE		EMT2ST16MWE	
Replacement valve	DST6MWE		DST10MWE		DST12MWE		DST16MWE	
Replacement rotor	SSAST6MWE		SSAST10MWE		SSAST12MWE		SSAST16MWE	

ABOUT LOOPS
- Other materials are available in many sizes: Electroformed Nickel, Hastelloy C, Nickel 200, PEEK, PTFE, and Titanium
- 1/16" loops > 2 ml are made from 1/8" OD tubing with brazed or welded 1/16" tube ends or reducing unions.
- 1/8" loops < 100 µl are made from 1/16" OD tubing with brazed or welded 1/8" tube ends.

1/8" Stainless steel loops

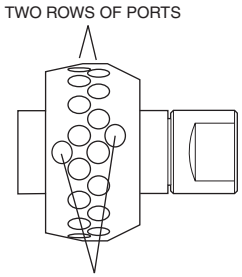
for MW Type valves

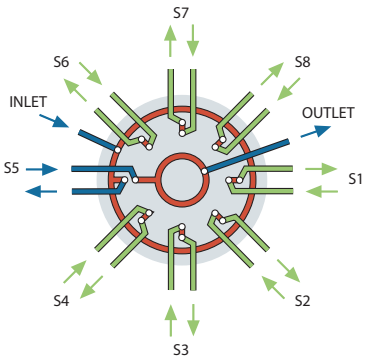
Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately. When a set of loops is ordered, loops will be supplied from the same lot.

Volume	*Prod No*	*Price*	*Volume*	*Prod No*	*Price*
100 µl	SL100STP		1 ml	SL1KSTP	
250 µl	SL250STP		2 ml	SL2KSTP	
500 µl	SL500STP		5 ml	SL5KSTP	
			10 ml	SL10KSTP	

Trapping/flow-through flowpath – STF configuration

The STF selector is a variation of the ST flowpath, with the single difference that the non-selected streams are returned to their own vents or sources rather than being dead-ended or trapped as they are in the standard ST configuration. For an application suggestion, see page 138.





1/16" fittings, 0.75 mm ports (.030")

MW Type

Low pressure

STF Trap/ flow-throw

1/16" **0.75 mm**

Includes 2" standoff. Ask about closemount assembly if valve will not be heated.

Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

SPECS
200 psi gas
200°C max
Nitronic 60 body
Valcon E rotor

OPTIONS
- 4 and 8 positions available
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium *(see pages 254-255)*

	6 Position		10 Position		12 Position		16 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual (not recommended)	2CSTF6MWE		2CSTF10MWE		2CSTF12MWE		2CSTF16MWE	
With air actuator	A2CSTF6MWE		A2CSTF10MWE		A2CSTF12MWE		A2CSTF16MWE	
With standard elec actuator	E2CSTF6MWE		E2CSTF10MWE		E2CSTF12MWE		E2CSTF16MWE	
With microelectric actuator	EMT2CSTF6MWE		EMT2CSTF10MWE		EMT2CSTF12MWE		EMT2CSTF16MWE	
Replacement valve	DCSTF6MWE		DCSTF10MWE		DCSTF12MWE		DCSTF16MWE	
Replacement rotor	SSACSTF6MWE		SSACSTF10MWE		SSACSTF12MWE		SSACSTF16MWE	

MORE INFORMATION

1/8" fittings, 1.0 mm ports (.040")

MW Type

SPECS
200 psi gas
200°C max
Nitronic 60 body
Valcon E rotor

Includes 2" standoff.
Ask about closemount assembly if valve will not be heated.

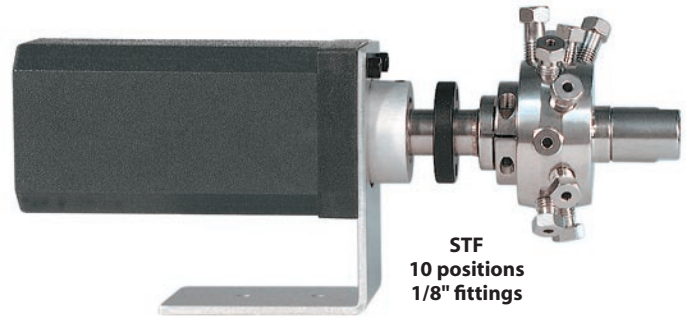
Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

Low pressure
STF Trap/ flow-throw
1/8" **1.0 mm**

OPTIONS

- 4 and 8 positions available
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium *(see pages 254-255)*
- Larger bore available except 16 position

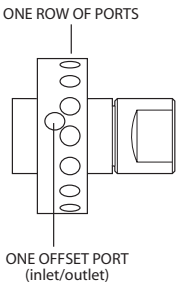
	6 Position		10 Position		12 Position		16 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual (not recommended)	2STF6MWE		2STF10MWE		2STF12MWE		2STF16MWE	
With air actuator	A2STF6MWE		A2STF10MWE		A2STF12MWE		A2STF16MWE	
With standard elec actuator	E2STF6MWE		E2STF10MWE		E2STF12MWE		E2STF16MWE	
With microelectric actuator	EMT2STF6MWE		EMT2STF10MWE		EMT2STF12MWE		EMT2STF16MWE	
Replacement valve	DSTF6MWE		DSTF10MWE		DSTF12MWE		DSTF16MWE	
Replacement rotor	SSASTF6MWE		SSASTF10MWE		SSASTF12MWE		SSASTF16MWE	

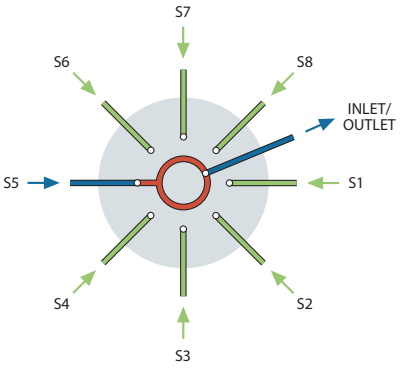


STF
10 positions
1/8" fittings

Dead-end flowpath – SD configuration

SD valves select one of 4 to 16 dead-ended streams. The selected stream flows from the valve outlet to a sample valve, pressure sensor, detector, column, etc. This configuration may also be used to direct one stream to a number of outlets for applications such as fraction collection. For an application suggestion, see page 139.





1/16" fittings, 0.4 mm ports (.016")

UW Type

5,000 psi
SD Dead-end
1/16" **0.40 mm**

Standard electric actuators:
110 VAC for USA;
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

OPTIONS

- 8 and 12 positions available
- 2", 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium *(see pages 254-255)*
- Low pressure, high temperature versions available
- Larger bore available except 10 and 12 positions

SPECS
5000 psi
75°C max
Nitronic 60 body
Valcon E rotor

	4 Position		6 Position		10 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual (not recommended)	CSD4UW		CSD6UW		CSD10UW	
With air actuator	ACSD4UW		ACSD6UW		ACSD10UW	
With standard electric actuator	ECSD4UW		ECSD6UW		ECSD10UW	
With microelectric actuator	EMTCSD4UW		EMTCSD6UW		EMTCSD10UW	
Replacement valve	DCSD4UW		DCSD6UW		DCSD10UW	
Replacement rotor	SSACSD4UW		SSACSD6UW		SSACSD10UW	

1/8" fittings, 0.75 mm ports (.030")

UW Type

5,000 psi
SD Dead-end
1/8" **0.75 mm**

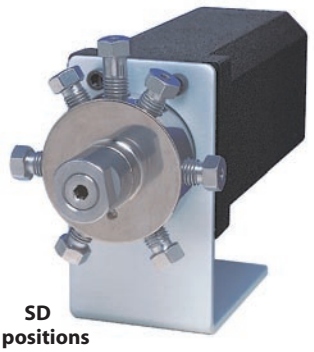
Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

OPTIONS

- 2", 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium *(see page 254-255)*
- Low pressure, high temperature versions available
- Larger bore available except 8 position

SPECS
5000 psi liq
75°C max
Nitronic 60 body
Valcon E rotor

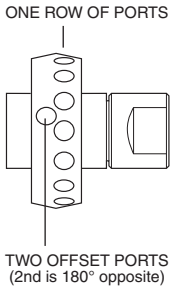
	4 Position		6 Position		8 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual (not recommended)	SD4UW		SD6UW		SD8UW	
With air actuator	ASD4UW		ASD6UW		ASD8UW	
With standard electric actuator	ESD4UW		ESD6UW		ESD8UW	
With microelectric actuator	EMTSD4UW		EMTSD6UW		EMTSD8UW	
Replacement valve	DSD4UW		DSD6UW		DSD8UW	
Replacement rotor	SSASD4UW		SSASD6UW		SSASD8UW	

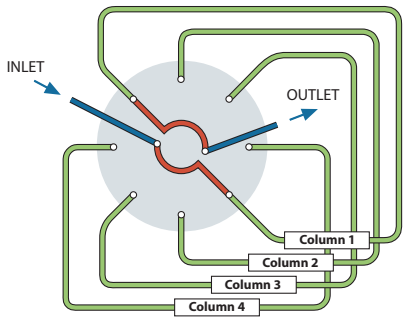


SD
6 positions
1/8" fittings

Both column ends selected – ST configuration

ST selectors are used for multi-column, multi-sample, or multi-trap operations. This valve can be used between an injector and detector to permit manual or automated HPLC column selection. For an application suggestion, see page 139.





1/16" fittings, 0.4 mm ports (.016")

UW Type

SPECS
5000 psi liq
75°C max
Nitronic 60 body
Valcon E rotor

Manual versions are not available.

Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply).

5,000 psi
ST Trapping
1/16" **0.40 mm**

OPTIONS
- 2", 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium *(see pages 254-255)*
- Low pressure, high temperature versions available. (Consult factory.)

	4 Columns or Loops		6 Columns or Loops	
	Prod No	*Price*	*Prod No*	*Price*
With air actuator	ACST4UW		ACST6UW	
With standard electric actuator	ECST4UW		ECST6UW	
With microelectric actuator	EMTCST4UW		EMTCST6UW	
Replacement valve	DCST4UW		DCST6UW	
Replacement rotor	SSACST4UW		SSACST6UW	

ST
4 position
1/16" fittings

MORE INFORMATION

ABOUT LOOPS
- Other materials are available in many sizes: Electroformed Nickel, Hastelloy C, Nickel 200, PEEK, PTFE, and Titanium
- Loops > 2 ml are made from 1/8" OD tubing with brazed or welded 1/16" tube ends or reducing unions.

1/16" Stainless steel loops

for UW Type valves

Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately.
When a set of loops is ordered, loops will be supplied from the same lot.

Volume	*Prod No*	*Price*	*Volume*	*Prod No*	*Price*
10 µl	SL10CSTUW		250 µl	SL250CSTUW	
15 µl	SL15CSTUW		500 µl	SL500CSTUW	
20 µl	SL20CSTUW		1 ml	SL1KCSTUW	
25 µl	SL25CSTUW		2 ml	SL2KCSTUW	
50 µl	SL50CSTUW		5 ml	SL5KCSTUW	
100 µl	SL100CSTUW		10 ml	SL10KCSTUW	

Selector Applications

SD flowpath — low pressure

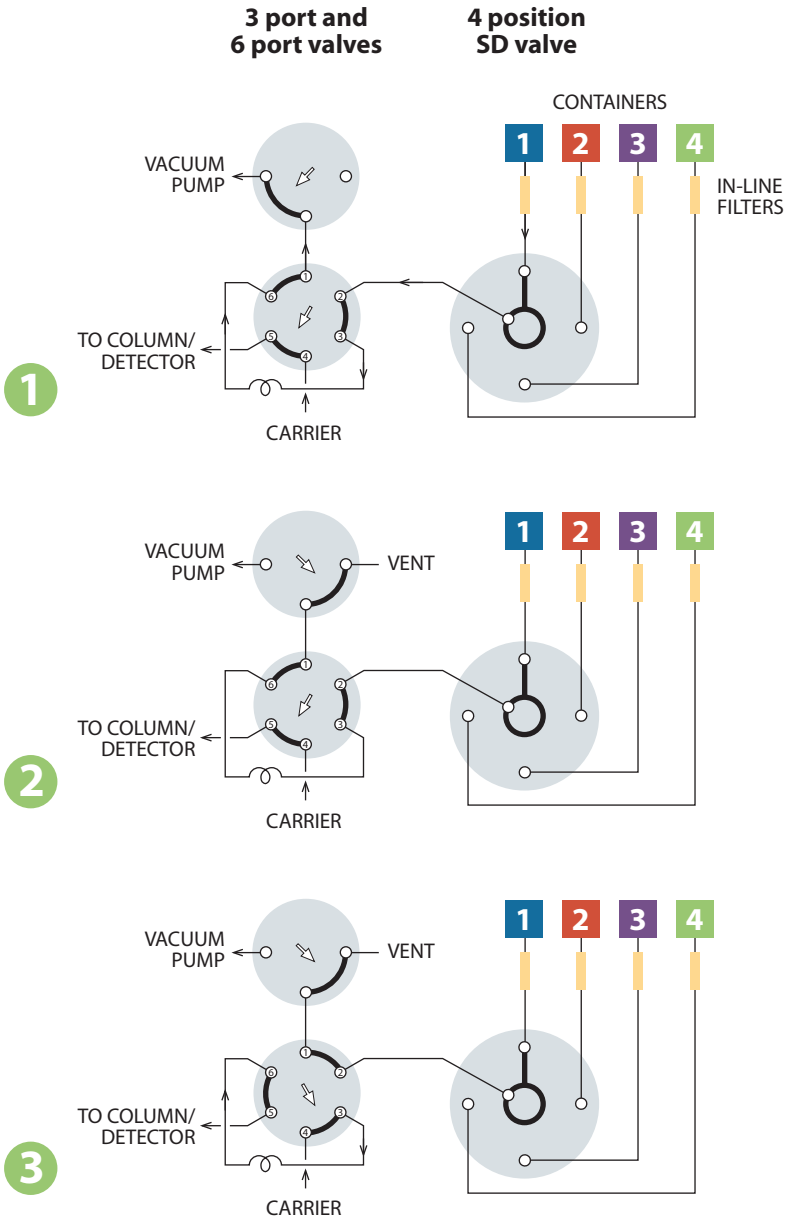
STREAM SELECTION WITH DEAD-ENDED STREAMS

SD valves select one of 4 to 16 dead-ended streams. The selected stream flows from the valve outlet to a sample valve, pressure sensor, detector, column, etc. The same configuration may also be used to direct one stream to a number of outlets for applications such as fraction collection.

This example illustrates automated sampling of non-pressurized containers.

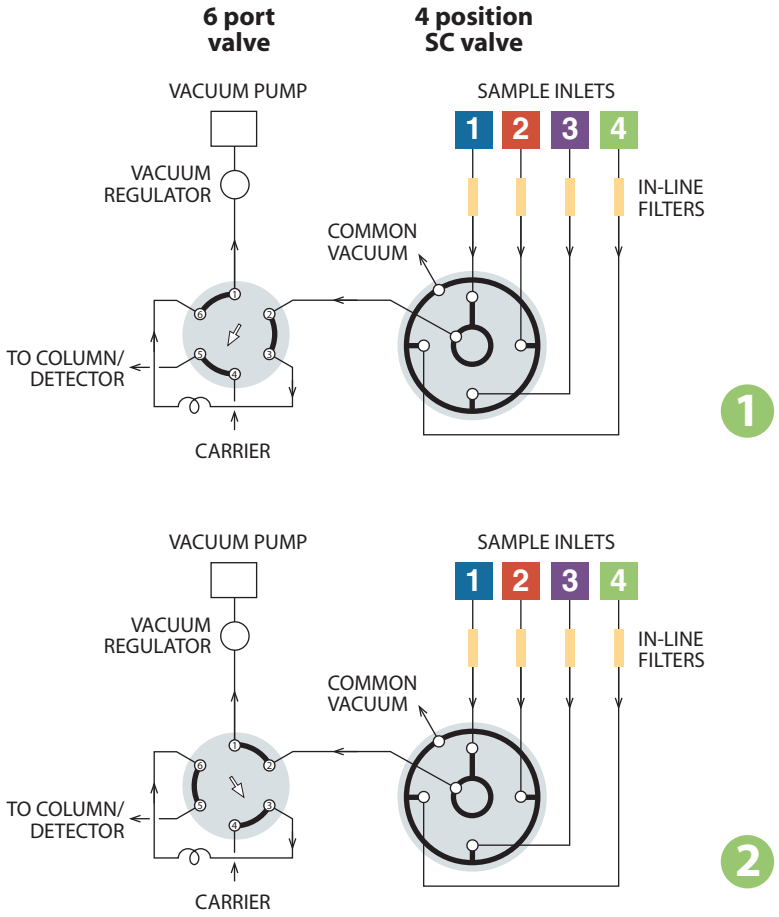
1 A vacuum pump is used to move sample from the containers to a 6 port sampling valve. 2 The 3 port valve is used to block the vacuum flow through the sampling valve to allow the sample within the loop to equilibrate at atmospheric pressure. 3 The 6 port valve is then switched, injecting the sample. This method eliminates any possible effect from pressure differences among the containers, providing accurate and repeatable results. All three valves can be automated with air or electric actuators for unattended operation.

The SD flowpath isolates the unselected sample streams, but the potential exists for extraneous sample or contaminants to be in the lines when containers are first connected. To avoid problems, either prepurge each line or allow sufficient sampling time for the line to purge prior to injection.



MORE INFORMATION
SD prices
Low pressure . . 122-123
High pressure 132
Application
High pressure SD . . . 139

SC flowpath



STREAM SELECTION WITH CONTINUOUS FLOW TO A COMMON OUTLET

SC selectors are similar to the SD configuration, except that instead of being dead-ended the non-selected streams flow to a common outlet. They are also available in 4, 6, 8, 10, 12, or 16 position versions.

The SC configuration is ideal for air quality monitoring, illustrated in this example.

The application is essentially the same as the one shown for the SD selectors on the previous page, except that the non-selected streams are continuously pulled through the valve, insuring that the most current sample will be provided as each point is selected for analysis. (1) The sample loop on the 6 port valve is loaded from Stream 1. (2) The 6 port valve is switched, injecting the sample. Both valves can be automated with air or electric actuators for unattended operation.

TECH TIP

Because the most common cause of valve failure is stray particulates entering the valve, we strongly recommend the use of in-line filters at sample entry points.

Our ZUFR filters feature inexpensive and easily replaceable low pressure drop filter screens (2 or 10 micron). The filters are available in 1/16", 1/8", and 1/4" standard, reducing, and bulkhead versions.

Filters ..... pages 52

MORE INFORMATION

Actuators
Air ..... page 194
Microelectric .. 190-191
Standard elec.....
SC prices..... 124-125

Selector Applications

SF flowpath

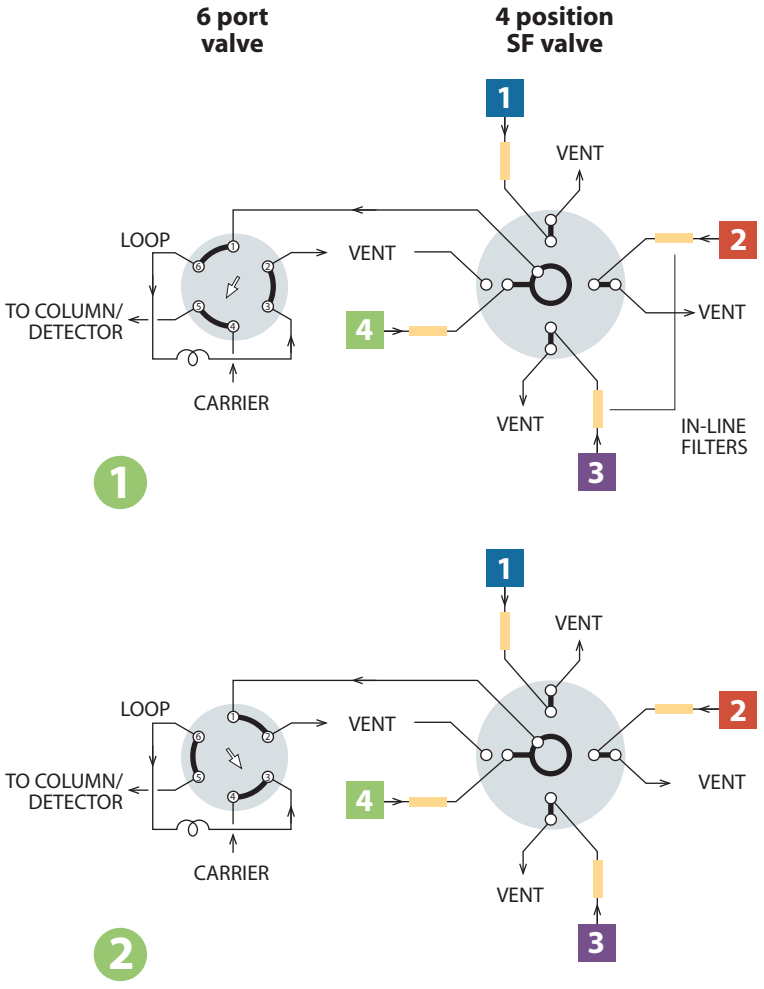
STREAM SELECTION WITH CONTINUOUS FLOW TO INDIVIDUAL OUTLETS

SD and SC valves select and isolate one of 4 to 16 streams, with the remainder dead-ended in the SD and flowing to a common outlet in the SC. The SF selector is similar, but carries the evolution a step further with the non-selected streams flowing through individual outlets.

This is the ideal solution when reactions or process streams with differing upstream pressures must be analyzed, and can also provide independent containment of toxic or noxious streams. An SF selector together with a 6 port sampling valve and pneumatic or electric actuators comprise a complete sampling system for the automated analysis of up to 16 sample points.

Note that streams 1 and 4 are vented while streams 2 and 3 are returned to their sources in this example.

Mode 1 shows sample loading from stream 4, while mode 2 shows sample injected onto the analytical column.

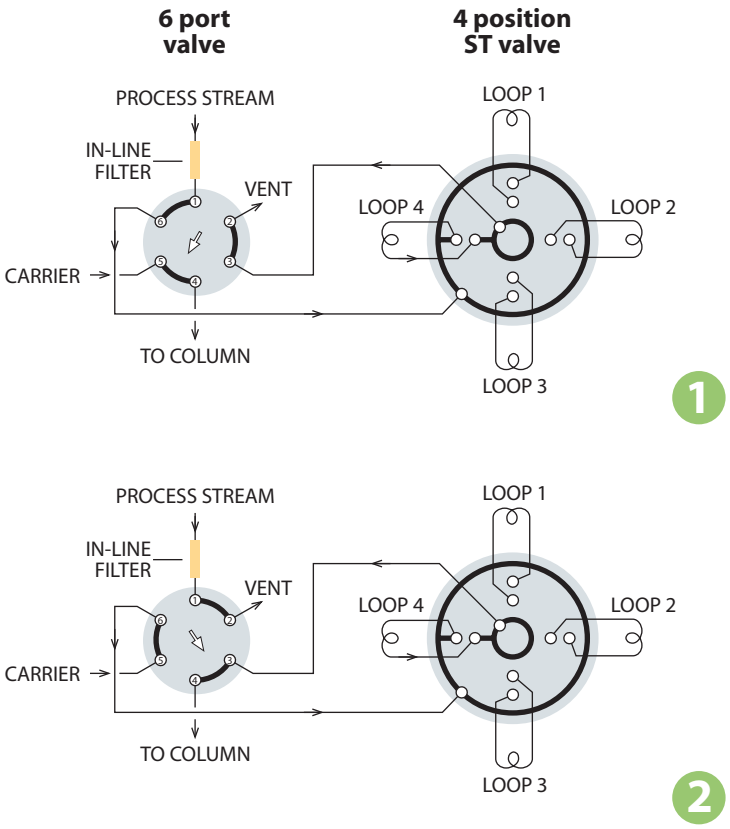


MORE INFORMATION

Actuators
- Air ..... page 194
- Microelectric .. 190-191
- Standard elec.....193

SF prices
..... 126-127

ST flowpath — low pressure



SAMPLE TRAPPING APPLICATIONS FOR 4 TO 16 STREAMS

ST selectors are used for multi-column, multi-sample, or multi-trap operations. The ST configuration is available in both MW and UW type designs.

A typical application, shown here, is the collection of fractions at timed intervals for analysis at a later time. Valves can be ordered with matched loops already installed.

In this example, the 6 port valve shown is used to select between 1 collection/trapping and 2 analysis/desorption. Both valves can be supplied with pneumatic or electric actuators to automate these functions.

MORE INFORMATION

TECH TIP

Because the most common cause of valve failure is stray particulates entering the valve, we strongly recommend the use of in-line filters at sample entry points.

Our ZUFR filters feature inexpensive and easily replaceable low pressure drop filter screens (2 or 10 micron). The filters are available in 1/16", 1/8", and 1/4" standard, reducing, and bulkhead versions.

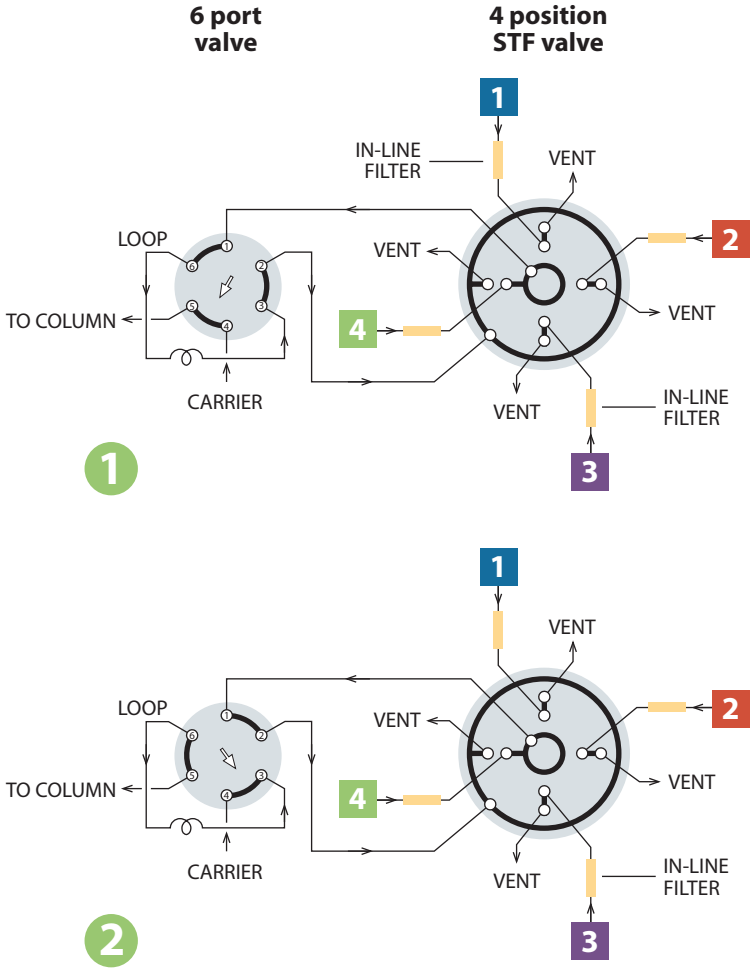
Filters ..... page 52

STF flowpath

SAMPLE TRAPPING WITH CONTINUOUS FLOW TO INDIVIDUAL OUTLETS

The STF selector is a variation of the ST flowpath, with the single difference that the non-selected streams are returned to their own vents or sources rather than being dead-ended or trapped as they are in the standard ST configuration. This is ideal for reactor processes in which removal of substantial amounts of sample would upset the equilibrium within the reactor, or if the stream is toxic or noxious and must be isolated.

An STF selector on an air or electric actuator along with a similarly equipped 6 port valve comprise a complete sampling system for the automated analysis of up to 16 sampling points.



TECH TIP

Because the most common cause of valve failure is stray particulates entering the valve, we strongly recommend the use of in-line filters at sample entry points.

Our ZUFR filters feature inexpensive and easily replaceable low pressure drop filter screens (2 or 10 micron).

The filters are available in 1/16", 1/8", and 1/4" standard, reducing, and bulkhead versions.

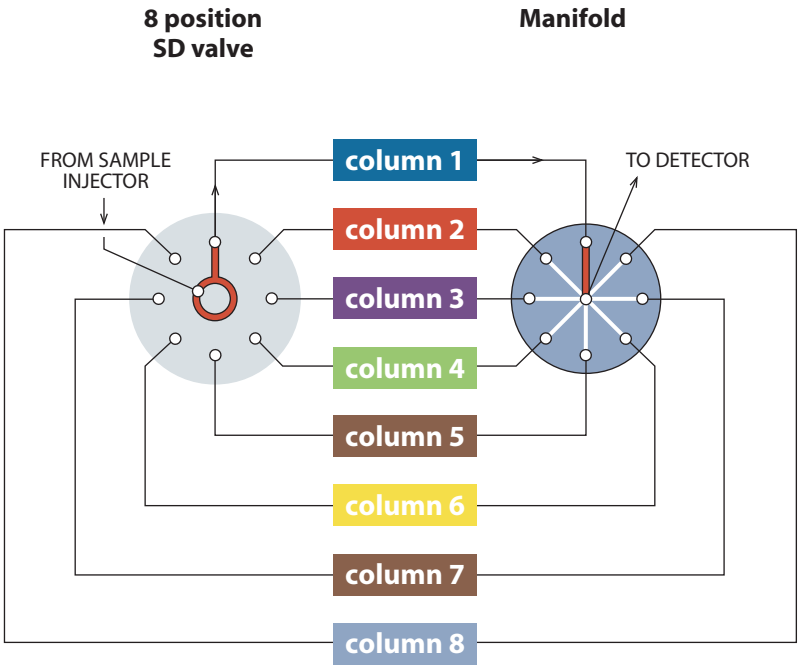
Filters ..... page 52

MORE INFORMATION

Actuators
Air .....page 194-195
Microelectric .. 188-191
Standard elec.....193

STF prices 130-131

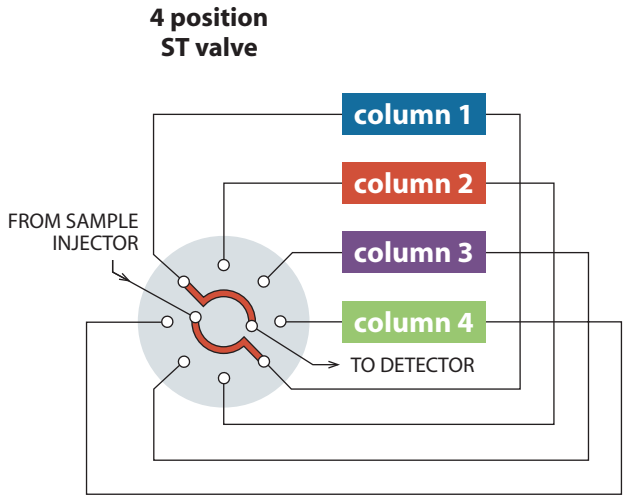
SD flowpath — high pressure



HPLC COLUMN SELECTION FOR UP TO 10 COLUMNS

This example illustrates an SD (UW type) selector used for HPLC column selection. This allows multiple columns to be installed permanently in the system, eliminating instrument downtime and leakage potential resulting from having to change columns repeatedly. The SDUW valve selects only column inlets – the column outlets are connected to the detector via a low-volume manifold. The manifold is sold separately.

ST flowpath — high pressure



HPLC COLUMN SELECTION FOR 4 OR 6 COLUMNS

Up to 6 HPLC columns can be rapidly accessed by column selection valves, eliminating the instrument downtime involved in exchanging columns and the leakage due to repeated changing of tubing fittings. The columns are installed as a part of the loop system, as shown in this drawing. A 6 position valve can support 6 columns.

MORE INFORMATION