

VALVE SELECTION



A QUICK OVERVIEW OF OUR LINE-UP

UHPLC

10K, 15K, AND 20K PSI INJECTORS AND SELECTORS

Cheminert UHPLC injectors, switching valves, and selectors with 360 micron, 1/32", or 1/16" fittings minimize internal volume and eliminate dead volume. Ideal for high speed, high throughput techniques.

NANOVOLUME® (100-150 µm)

InjectorsPAGES 127, 134-135
 Internal sample injectors..... 127, 135
 Selectors (150 µm)..... 127, 154



MICROBORE® (250 µm)

InjectorsPAGES 127, 136-137
 Internal sample injectors.....137
 Selectors155



40,000 PSI ULTRA-HIGH PRESSURE INJECTOR SYSTEM

The VICI 40K UHPLC injector is comprised of six miniature air actuated needle valves, plumbed to simulate the flowpath of a conventional 6 port injector.

Product information.....PAGE 64



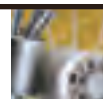
FOR OEMs

INTEGRATED MOTOR/VALVES

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

HPLC injectors..... PAGES 162, 164, 166
 Low pressure injectors..... 168-169
 Selectors..... 170-171





HPLC

INJECTORS AND SELECTORS

CHEMINERT

Cheminert valves for HPLC up to 5,000 psi include 4, 6, 8, and 10 port injectors, a through-the-handle front-loading injector, a continuous flow injector, and selectors with 4, 6, 8, and 10 positions. A submicroliter injector offers injection volume as small as 4 nanoliters. Valves feature 1/32" or 1/16" zero dead volume fittings with bore sizes from 0.10 mm (.004") to 0.75 mm (.030").

Injectors PAGES 138-147
Internal sample injectors..... 139, 141, 145
Selectors 156-157



VALCO

Valco offers a diverse line in terms of number of ports, fitting sizes, and materials of construction. 3, 4, 6, 8, 10, 12 port versions are offered, with 1/32", 1/16", or 1/8" fittings. Alloys and polymer composites for rotors and bodies can meet virtually any system requirement. However, longest lifetime is provided by our Cheminert coated-stator injectors.

Injectors PAGES 96-98
Internal sample injectors..... 95
Selectors 114-115



LC/FIA

LOW PRESSURE VALVES AND SELECTORS

The Cheminert line offers two position valves with 4, 6, 8, 10, 12, or 14 ports, and stream selectors that can choose from as many as 28 streams.

Two position valves are available with 1/16" Valco ZDV fittings or 1/4-28 fittings for 1/16" or 1/8" tubing. Selectors offer those options plus a model with 1/2-20 fittings for 1/4" tubing and 20-28 stream versions with 6-40 fittings for 1/16" tubing.

Valves PAGES 148-151
Internal sample injectors..... 150
Selectors 158-161



GC

VALCO INJECTORS AND SELECTORS

Valco GC valves have been in almost all commercially-produced gas chromatographs from the time that valves originally began to replace other injection methods. New designs are smaller and easier to service, but still exhibit the quality and value that made them the industry standard.

Valves PAGES 86-94
Internal sample injectors..... 88-89
Selectors 104-113



DIAPHRAGM VALVES

The VICI diaphragm valve is designed for trouble-free use in applications requiring minimal maintenance and maximum lifetime.

Product information PAGES 122-124



VALCO VALVES



FOR INJECTION, SWITCHING, AND STREAM SELECTION

- 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

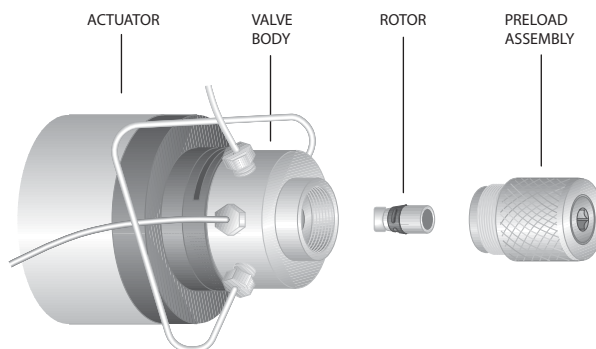
DESIGN

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 pages 82-83; product numbers and prices begin on page 87. For information on **SELECTORS**, refer to pages 84-85.

EXPLODED VIEW OF A VALCO VALVE





LEAK TESTING

The standard test methods for cross-port and outport leakage ensure 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. Call factory for additional cost.

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.



RELIABLY CLEAN

All finished valve bodies are ultrasonically cleaned with water soluble detergents and then rinsed with hot deionized water. Finally they are given a thorough cleaning with steam from deionized water.

During valve assembly each part is cleaned with isopropanol and dried with filtered and dehumidified air. The valves are then heated and switched prior to being leak tested.

PRECAUTIONS

After unpacking the valve, do not remove the protective tape from the valve ports until you are ready to install the valve. As supplied, all surfaces are clean and free of contaminants, and must be kept clean to prevent valve damage. Open ports and fittings cause unnecessary risk of particulate matter entering the valve and scratching the sealing surfaces, which is the most frequent cause of premature valve failure.

The most common source of contamination is particulates from tubing or unfiltered samples, or samples which leave a solid residue on drying (e.g. buffers). Care should be taken that particles do not enter the valve.

→ SEE ALSO

Materials

Metals... pages 246-247

Polymers 248

Valve rotors..... 249

Valco valve product numbers

GC 87-94

HPLC 95-98

Selector 104-115

t TECH TIP

See **Technical Note 201, "Operation Notes and Cleaning Instructions"** for more detailed information about unpacking and handling the valve. This and other technical tips may be found in the support section of vici.com.

t TECH TIP

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

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



MATERIALS OF CONSTRUCTION

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.

SPECIFYING A SPECIAL BODY MATERIAL

To specify a special valve body material, add the material code to the end of the valve product number.

Example:

An A4C6WE (air actuated 1/16" 6 port valve with a 4" standoff) made of Hastelloy C-22 would be designated A4C6WEHC.

Due to design requirements, several special grades of stainless steel may be used where "HPLC grade" is noted. The default material is Nitronic 60, but Type 316 stainless steel is also an option.



SPECIAL BODY MATERIAL CODES

Body material	Code
HPLC grade Stainless steel	S6
Hastelloy C-22	HC
Inconel 600	IN
Monel 400	M4
Nickel	NI
Nitronic 50	N5
Titanium *	TI

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



TWO POSITION INJECTORS AND SWITCHING VALVES

Two position injectors and switching valves have many applications, as shown in the section beginning on page 99. In this catalog, Valco two position valves are divided into GC and HPLC sections, with the GC section starting on page 86 and the HPLC section on page 95.

Valco GC valves have been in almost all commercially-produced gas chromatographs from the time that valves originally began to replace other injection methods. New designs are smaller and easier to service, but still exhibit the quality and value that made them the industry standard.

A pioneer in products for High Performance Liquid Chromatography, Valco continues to offer a diverse line in terms of number of ports, fitting sizes, and materials of construction. Valco valves offer a wide range of rotor and body materials, with alloys and polymer composites capable of meeting virtually any system requirement. However, longest life-time is provided by our Cheminert coated-stator injectors.



SPECIFICATIONS, VALCO TWO POSITION VALVES

	<i>Standard rotor material</i>	<i>Maximum pressure</i>	<i>Maximum temp</i>
Sampling and switching valves			
GC	Valcon E	400 psi gas	225°C
	Valcon T	300 psi gas	330°C
	Valcon E2	100 psi gas	75°C
HPLC	Valcon H	5000 psi liq	75°C
Internal sample injectors			
GC	Valcon E	1000 psi liq	175°C
HPLC	Valcon H	5000 psi liq	75°C

PORT DIAMETERS

<i>Fitting size</i>	<i>Standard port diameter</i>	
1/32"	0.25 mm	(.010")
1/16"	0.40 mm	(.016")
	0.75 mm	(.030")
1/8"	0.75 mm	(.030")
1/4"	4.0 mm	(.156")
For special port diameters, please consult 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 249 for a discussion of rotor materials.		



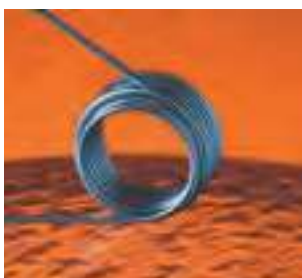
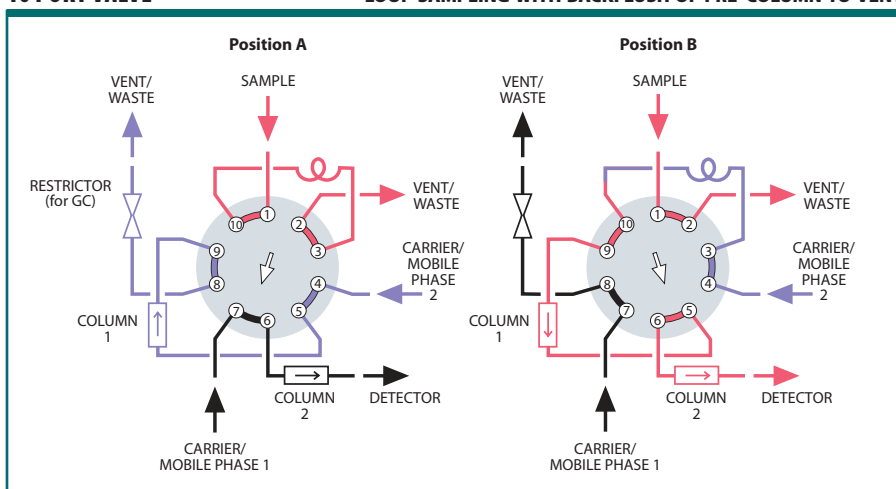
SAMPLE INJECTORS

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 sample injector (*pages 88-89 and 95*), 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.

10 PORT VALVE

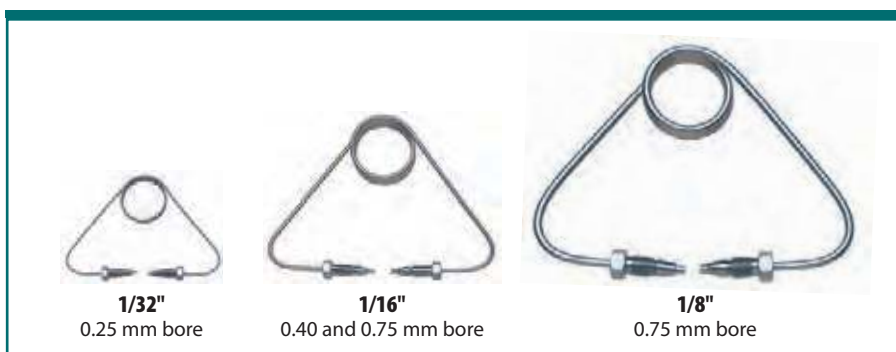
LOOP SAMPLING WITH BACKFLUSH OF PRE-COLUMN TO VENT



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. However, with small volume loops, the tolerance on the ID of the tubing (± 0.001 ") can have a significant effect on the volume. Therefore, loop volumes and loop appearance may differ from batch to batch.



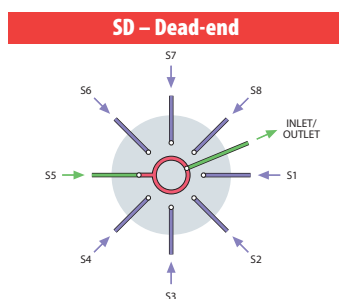


VALCO SELECTORS

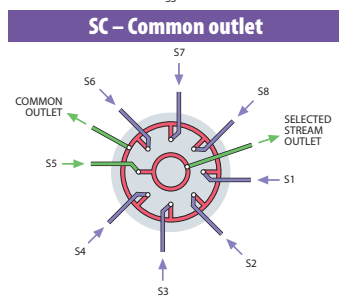
Instead of the back and forth switching of two position valves, selectors (multiposition valves) step incrementally through continuous revolutions (bi-directionally with universal and microelectric actuators). While we can supply older models, all the valves in this catalog have a preload assembly. This 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

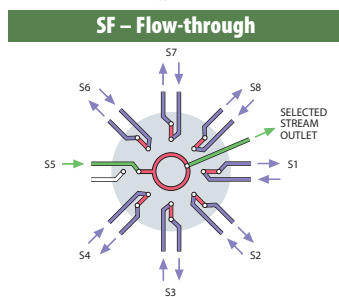
SD (DEAD-ENDED) valves select one of 4 to 16 dead-ended streams, directing it through the valve outlet to a sample valve, pressure sensor, detector, column, etc. The same configuration can also direct one stream to a number of outlets for fraction collection.



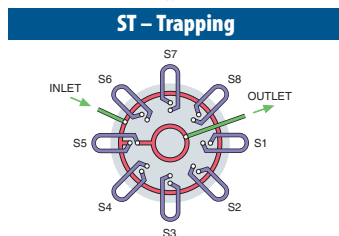
SC (COMMON OUTLET) selectors are similar to SDs, except that instead of being dead-ended the non-selected streams flow to a common outlet.



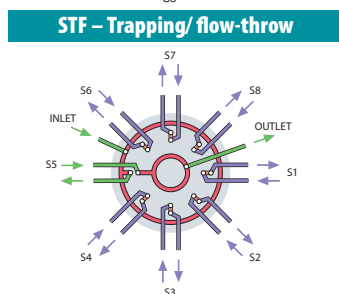
SF (FLOW-THROUGH) selectors are similar to SDs and SCs, selecting a stream and sending it to the outlet. However, SFs allow the non-selected streams to flow through individual outlets instead of a common outlet.



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 than being dead-ended or trapped as they are in the standard ST configuration.



PORT DIAMETERS

LOW PRESSURE

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

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")



LOW PRESSURE SELECTORS

Valco low pressure selectors are available with 1/16", 1/8", or 1/4" fittings. (For port diameters, refer to the chart on the facing 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 positions.

Although not shown in this catalog, these selectors are also available in a higher temperature version. While actual specifications vary with the configuration, typical specifications are 200 psi and 330°C. Optional internal purge is available for SD, SC, SF, and ST flowpaths with 1/16" or 1/8" fittings. Consult our technical staff for more information.



SPECIFICATIONS, VALCO SELECTORS

LOW PRESSURE

Fittings size	Number of positions	Standard rotor material	Maximum pressure	Maximum temp	Maximum pressure	Maximum temp
			SD		SC	
			Dead-end flowpath		Common outlet flowpath	
1/16"	4 - 16	Valcon E	400 psi gas	200°C	200 psi gas	200°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		ST	
			Flow-through flowpath		Trapping flowpath	
1/16"	4 - 16	Valcon E	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
1/4"	4 - 8	Valcon E2	100 psi gas	75°C		
			STF			
			Trapping/Flow-through flowpath			
1/16"	4 - 16	Valcon E	200 psi gas	200°C		
1/8"	4 - 16	Valcon E	200 psi gas	200°C		

Note: All low pressure 1/16" and 1/8" valves are also available in versions up to 330°C.

HIGH PRESSURE SELECTORS

Valco 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 facing page.)

SPECIFICATIONS, VALCO SELECTORS

HIGH PRESSURE

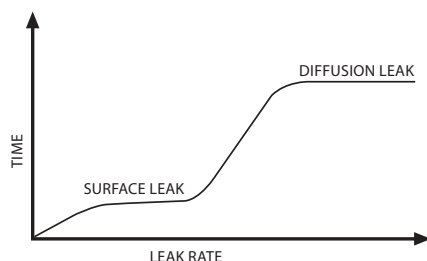
Fittings size	Number of positions	Standard rotor material	Maximum pressure	Maximum temp	Maximum pressure	Maximum temp
			SD		ST	
			Dead-end flowpath		Trapping flowpath	
1/16"	4 - 12	Valcon E	5000 psi liq	75°C	5000 psi liq	75°C
1/8"	4 - 8	Valcon E	5000 psi liq	75°C		



INTERNALLY PURGED INJECTORS AND SELECTORS

- Protect your work – block any possible diffusion from the atmosphere
- Protect your workplace – safely vent any fugitive emissions from the valve
- Available on 1/16" and 1/8" UW and MW type valves with E, P, or M rotor material

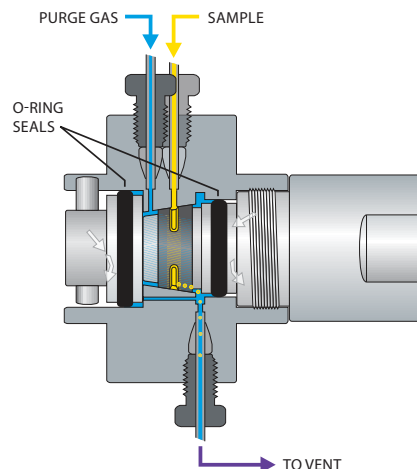
The measurement of low ppb gas concentrations may necessitate the purging of any leakage across the sealing surfaces and/or any diffusion through the sealing material. Designs which employ a "purging groove" on the rotor are successful at capturing surface leaks, but are ineffective at purging the air which diffuses through the polymeric rotor.



Valco offers two methods for capturing and purging both types of leakage – a built-in internal purge and an external purge housing. The built-in purge feature offers significant advantages over the older external purge housing, which must still be used on the smaller W type valves. Size and weight are dramatically reduced, and the valve rotor is easy to access. (A purge housing must be removed for rotor replacement.)

The purge feature can also serve as a safety measure, containing fugitive emissions when pyrophoric, toxic, or carcinogenic materials are present in the sample stream.

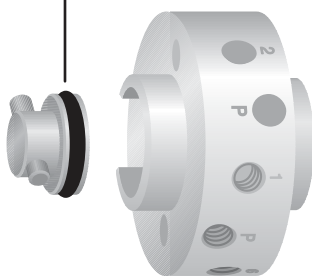
See product number charts on facing page. Contact the factory to inquire about internally purged selectors and other two position sizes.



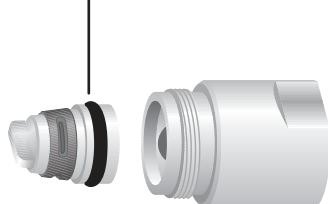
NOTE: ONLY ONE VALVE PORT IS INDICATED, SO THAT THE PURGE DESIGN MAY BE CLEARLY SEEN.

CROSS SECTION – INTERNALLY PURGED VALVE

O-RING SEAL
ON DRIVER



O-RING SEAL
ON ROTOR



i MASS SPEC LEAK RATE CERTIFICATION

We offer mass spec leak rate certification. Please contact the factory to discuss your application.



Internally purged Sampling and switching valves

1/16" FITTINGS, 0.75 MM PORTS (.030")

SPECIFICATIONS

400 psi gas**175°C max**Valve body: Nitronic 60
Rotor: Valcon E

Includes 2" standoff. Not available in manual version.

Universal actuator: 24 VDC, with autosensing 24 VDC power supply.

Includes RS232/485 serial interface. See page 174 for other interface options.

Sample loops are not included with valves. Order separately.

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

OPTIONS

- 3 and 12 port valves available
- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium
(See pages 246-247)

**4 Ports***Prod No***6 Ports***Prod No***8 Ports***Prod No***10 Ports***Prod No*

With air actuator	A2C4UWEPI	A2C6UWEPI	A2C8UWEPI	A2C10UWEPI
With universal act.	EUDA-2C4UWEPI	EUDA-2C6UWEPI	EUDA-2C8UWEPI	EUDA-2C10UWEPI
Replacement valve	DC4UWEPI	DC6UWEPI	DC8UWEPI	DC10UWEPI
Replacement rotor	SSAC4UWEPI	SSAC6UWEPI	SSAC8UWEPI	SSAC10UWEPI



INTERNALLY PURGED 10 PORT VALVE
1/16" fittings, 2" standoff



INTERNALLY PURGED INTERNAL SAMPLE INJECTOR
1/16" fittings, 2" standoff

Internally purged Internal sample injectors

1/16" FITTINGS, 0.75 MM PORTS (.030")

SPECIFICATIONS

1000 psi liq**175°C max**Valve body: Nitronic 60
Rotor: Valcon E

Includes 2" standoff. Not available in manual version.

Universal actuator: 24 VDC, with autosensing 24 VDC power supply.

Includes RS232/485 serial interface. See page 174 for other interface options.

**Internally purged****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
(see pages 246-247)

Sample volume	.2 µl <i>Prod No</i>	.5 µl <i>Prod No</i>	1 µl <i>Prod No</i>	2 µl <i>Prod No</i>
With air actuator	A2CI4UWE.2PI	A2CI4UWE.5PI	A2CI4UWE1PI	A2CI4UWE2PI
With universal act.	EUDA-2CI4UWE.2PI	EUDA-2CI4UWE.5PI	EUDA-2CI4UWE1PI	EUDA-2CI4UWE2PI
Replacement valve	DCI4UWE.2PI	DCI4UWE.5PI	DCI4UWE1PI	DCI4UWE2PI
Replacement rotor	SSACI4UWE.2PI	SSACI4UWE.5PI	SSACI4UWE1PI	SSACI4UWE2PI

GC • Internal sample injectors



VALCO VALVES

Internal sample injectors

1/32" FITTINGS, 0.25 MM PORTS (.010")

Med temp

Internal sample

1/32"

0.25 mm

Includes 2" standoff. Manual version is not available without standoff.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.



SPECIFICATIONS

1000 psi liq
175°C max

Valve body: Nitronic 60
Rotor: Valcon E

Sample volume	.06 µl Prod No	.1 µl Prod No	.2 µl Prod No	.5 µl Prod No
Manual w/ standoff	2NI4WE.06	2NI4WE.1	2NI4WE.2	2NI4WE.5
With air actuator	A2NI4WE.06	A2NI4WE.1	A2NI4WE.2	A2NI4WE.5
With universal act.	EUHA-2NI4WE.06	EUHA-2NI4WE.1	EUHA-2NI4WE.2	EUHA-2NI4WE.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
(see pages 246-247)

Internal sample injectors

1/16" FITTINGS, 0.40 MM PORTS (.016")

Med temp

Internal sample

1/16"

0.40 mm

Includes 2" standoff. Manual version has no standoff.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.



Sample volume	.06 µl Prod No	.1 µl Prod No	.2 µl Prod No	.5 µl Prod No
Manual	CI4WE.06	CI4WE.1	CI4WE.2	CI4WE.5
Manual w/ standoff	2CI4WE.06	2CI4WE.1	2CI4WE.2	2CI4WE.5
With air actuator	A2CI4WE.06	A2CI4WE.1	A2CI4WE.2	A2CI4WE.5
With universal act.	EUHA-2CI4WE.06	EUHA-2CI4WE.1	EUHA-2CI4WE.2	EUHA-2CI4WE.5
Replacement valve	DCI4WE.06	DCI4WE.1	DCI4WE.2	DCI4WE.5
Replacement rotor	SSACI4WE.06	SSACI4WE.1	SSACI4WE.2	SSACI4WE.5

SPECIFICATIONS

1000 psi liq
175°C max

Valve body: Nitronic 60
Rotor: Valcon E

OPTIONS

- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium
(see pages 246-247)
- Also available with 6 and 8 ports. See application illustration on page 99.



INTERNAL SAMPLE INJECTOR

1/16" fittings, air actuator
with 2" standoff



Internal sample injectors

1/16" FITTINGS, 0.75 MM PORTS (.030")

SPECIFICATIONS

1000 psi liq
175°C max

Valve body: Nitronic 60
Rotor: Valcon E

Includes 2" standoff. Manual version has no standoff.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.



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 (see pages 246-247)
- Available in an internally purged version for trace level analysis (pages 86-87)
- Also available with 6 and 8 ports. See application illustration on page 99.

Sample volume	.2 µl Prod No	.5 µl Prod No	1 µl Prod No	2 µl Prod No
Manual	CI4UWE.2	CI4UWE.5	CI4UWE1	CI4UWE2
Manual w/ standoff	2CI4UWE.2	2CI4UWE.5	2CI4UWE1	2CI4UWE2
With air actuator	A2CI4UWE.2	A2CI4UWE.5	A2CI4UWE1	A2CI4UWE2
With universal act.	EUDA-2CI4UWE.2	EUDA-2CI4UWE.5	EUDA-2CI4UWE1	EUDA-2CI4UWE2
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")

SPECIFICATIONS

1000 psi liq
175°C max

Valve body: Nitronic 60
Rotor: Valcon E

Includes 2" standoff. Manual version has no standoff.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.



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 (see pages 246-247)
- Available in an internally purged version for trace level analysis (pages 86-87)
- Also available with 6 and 8 ports. See application illustration on page 99.

Sample volume	.2 µl Prod No	.5 µl Prod No	1 µl Prod No	2 µl Prod No
Manual	I4UWE.2	I4UWE.5	I4UWE1	I4UWE2
Manual w/ standoff	2I4UWE.2	2I4UWE.5	2I4UWE1	2I4UWE2
With air actuator	A2I4UWE.2	A2I4UWE.5	A2I4UWE1	A2I4UWE2
With universal act.	EUDA-2I4UWE.2	EUDA-2I4UWE.5	EUDA-2I4UWE1	EUDA-2I4UWE2
Replacement valve	DI4UWE.2	DI4UWE.5	DI4UWE1	DI4UWE2
Replacement rotor	SSAI4UWE.2	SSAI4UWE.5	SSAI4UWE1	SSAI4UWE2



INTERNAL SAMPLE INJECTOR
1/8" fittings, universal actuator
with 2" standoff

t TECH TIP

For low ppb gas concentrations, we offer versions of the valves on this page with an internal purge feature to vent any leakage across the sealing surfaces and/or any diffusion through the sealing material. (see pages 86-87)



Sampling and switching valves

1/32" FITTINGS, 0.25 MM PORTS (.010")

Med temp

1/32"

0.25 mm

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

Universal actuator: 24 VDC, with autosensing 24 VDC power supply.

Includes RS232/485 serial interface. See page 174 for other interface options.

Sample loops are not included with valves. Order separately.



4 Ports

Prod No



6 Ports

Prod No



8 Ports

Prod No



10 Ports

Prod No

Manual with standoff	4N4WE	4N6WE	4N8WE	4N10WE
With air actuator	A4N4WE	A4N6WE	A4N8WE	A4N10WE
With universal actuator	EUHA-4N4WE	EUHA-4N6WE	EUHA-4N8WE	EUHA-4N10WE
Replacement valve	DN4WE	DN6WE	DN8WE	DN10WE
Replacement rotor	SSAN4WE	SSAN6WE	SSAN8WE	SSAN10WE

SPECIFICATIONS

400 psi gas

225°C max

Valve body: Nitronic 60

Rotor: Valcon E

OPTIONS

- 3 and 12 port valves available
- 2", 3", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium (see pages 246-247)

Sampling and switching valves

1/32" FITTINGS, 0.25 MM PORTS (.010")

High temp

1/32"

0.25 mm

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

Universal actuator: 24 VDC, with autosensing 24 VDC power supply.

Includes RS232/485 serial interface. See page 174 for other interface options.

Sample loops are not included with valves. Order separately.

4 Ports

Prod No

6 Ports

Prod No

8 Ports

Prod No

10 Ports

Prod No

Manual with standoff	4N4WT	4N6WT	4N8WT	4N10WT
With air actuator	A4N4WT	A4N6WT	A4N8WT	A4N10WT
With universal actuator	EUHA-4N4WT	EUHA-4N6WT	EUHA-4N8WT	EUHA-4N10WT
Replacement valve	DN4WT	DN6WT	DN8WT	DN10WT
Replacement rotor	SSAN4WT	SSAN6WT	SSAN8WT	SSAN10WT

SPECIFICATIONS

300 psi gas

350°C max

Valve body: Nitronic 60

Rotor: Valcon T

OPTIONS

- 3 and 12 port valves available
- 2", 3", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium (see pages 246-247)



6 PORT VALVE

1/32" fittings, universal actuator
with 4" standoff

1/32" Stainless steel loops

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

These loops are for use with valves on this page.

Volume	Prod No	Volume	Prod No
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



ABOUT LOOPS

- Other materials are available in many sizes: Electroformed Nickel, Nickel 200, PEEK, and PTFE
- Sample loop shape and dimensions may vary from batch to batch due to fluctuations in tubing ID. Loop volume is controlled as closely as possible, but is not calibrated.



Sampling and switching valves

1/16" FITTINGS, 0.40 MM PORTS (.016")

SPECIFICATIONS

400 psi gas
225°C max

Valve body: Nitronic 60
Rotor: Valcon E

Includes 4" standoff. Manual version has no standoff

Universal actuator: 24 VDC, with autosensing 24 VDC power supply.

Includes RS232/485 serial interface. See page 174 for other interface options.

Sample loops are not included with valves. Order separately.

Med temp

1/16"

0.40 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 (see pages 246-247)
- Smaller and larger bores available in most configurations.



4 Ports

Prod No



6 Ports

Prod No



8 Ports

Prod No



10 Ports

Prod No

	4 Ports Prod No	6 Ports Prod No	8 Ports Prod No	10 Ports Prod No
Manual	C4WE	C6WE	C8WE	C10WE
Manual with standoff	4C4WE	4C6WE	4C8WE	4C10WE
With air actuator	A4C4WE	A4C6WE	A4C8WE	A4C10WE
With universal actuator	EUHA-4C4WE	EUHA-4C6WE	EUHA-4C8WE	EUHA-4C10WE
Replacement valve	DC4WE	DC6WE	DC8WE	DC10WE
Replacement rotor	SSAC4WE	SSAC6WE	SSAC8WE	SSAC10WE

Sampling and switching valves

1/16" FITTINGS, 0.40 MM PORTS (.016")

SPECIFICATIONS

300 psi gas
350°C max

Valve body: Nitronic 60
Rotor: Valcon T

Includes 4" standoff

Universal actuator: 24 VDC, with autosensing 24 VDC power supply.

Includes RS232/485 serial interface. See page 174 for other interface options.

Sample loops are not included with valves. Order separately.

High temp

1/16"

0.40 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 (see pages 246-247)
- Smaller and larger bores available in most configurations.

4 Ports

Prod No

6 Ports

Prod No

8 Ports

Prod No

10 Ports

Prod No

	4 Ports Prod No	6 Ports Prod No	8 Ports Prod No	10 Ports Prod No
Manual with standoff	4C4WT	4C6WT	4C8WT	4C10WT
With air actuator	A4C4WT	A4C6WT	A4C8WT	A4C10WT
With universal actuator	EUHA-4C4WT	EUHA-4C6WT	EUHA-4C8WT	EUHA-4C10WT
Replacement valve	DC4WT	DC6WT	DC8WT	DC10WT
Replacement rotor	SSAC4WT	SSAC6WT	SSAC8WT	SSAC10WT



10 PORT VALVE

1/16" fittings, air actuator
with 4" standoff

1/16" Stainless steel loops

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

These loops are for use with valves on this page.

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



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 TIG welded 1/16" tube ends.
- Sample loop shape and dimensions may vary from batch to batch due to fluctuations in tubing ID. Loop volume is controlled as closely as possible, but is not calibrated.



Sampling and switching valves

1/16" FITTINGS, 0.75 MM PORTS (.030")

Med temp

1/16"

0.75 mm

Includes 4" standoff. Manual version has no standoff.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.
Sample loops are not included with valves. Order separately.



4 Ports

Prod No



6 Ports

Prod No



8 Ports

Prod No



10 Ports

Prod No

Manual	C4UWE	C6UWE	C8UWE	C10UWE
Manual with standoff	4C4UWE	4C6UWE	4C8UWE	4C10UWE
With air actuator	A4C4UWE	A4C6UWE	A4C8UWE	A4C10UWE
With universal act.	EUDA-4C4UWE	EUDA-4C6UWE	EUDA-4C8UWE	EUDA-4C10UWE
Replacement valve	DC4UWE	DC6UWE	DC8UWE	DC10UWE
Replacement rotor	SSAC4UWE	SSAC6UWE	SSAC8UWE	SSAC10UWE



4 PORT VALVE

1/16" fittings, air actuator
with 4" standoff

SPECIFICATIONS

400 psi gas
225°C max

Valve body: Nitronic 60
Rotor: Valcon E

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
(see pages 246-247)
- For trace analysis, we offer a version which purges any leakage across the sealing surfaces and/or any diffusion through the sealing material.
(see pages 86-87)
- Larger bore available

Sampling and switching valves

1/16" FITTINGS, 0.75 MM PORTS (.030")

High temp

1/16"

0.75 mm

Includes 4" standoff.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.
Sample loops are not included with valves. Order separately.

4 Ports

Prod No

6 Ports

Prod No

8 Ports

Prod No

10 Ports

Prod No

Manual with standoff	4C4UWT	4C6UWT	4C8UWT	4C10UWT
With air actuator	A4C4UWT	A4C6UWT	A4C8UWT	A4C10UWT
With universal act.	EUDA-4C4UWT	EUDA-4C6UWT	EUDA-4C8UWT	EUDA-4C10UWT
Replacement valve	DC4UWT	DC6UWT	DC8UWT	DC10UWT
Replacement rotor	SSAC4UWT	SSAC6UWT	SSAC8UWT	SSAC10UWT

SPECIFICATIONS

300 psi gas
350°C max

Valve body: Nitronic 60
Rotor: Valcon T

OPTIONS

- 3, 12 and 14 port valves available
- 2", 3", and 6" standoffs
- Materials as listed above
- Larger bore available

1/16" Stainless steel loops

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

These loops are for use with valves on this page.

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



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 TIG welded 1/16" ends or reducing unions.
- Sample loop shape and dimensions may vary from batch to batch due to fluctuations in tubing ID. Loop volume is controlled as closely as possible, but is not calibrated.



Sampling and switching valves

1/8" FITTINGS, 0.75 MM PORTS (.030")

SPECIFICATIONS

400 psi gas
225°C max

Valve body: Nitronic 60
Rotor: Valcon E

Includes 4" standoff. Manual version has no standoff.

Universal actuator: 24 VDC, with autosensing 24 VDC power supply.

Includes RS232/485 serial interface. See page 174 for other interface options.

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

Med 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 (*see pages 246-247*)
- For trace analysis, we offer a version which purges any leakage across the sealing surfaces and/or any diffusion through the sealing material. (*see pages 86-87*)
- Larger bore available



4 Ports

Prod No



6 Ports

Prod No



8 Ports

Prod No



10 Ports

Prod No

Manual	4UWE	6UWE	8UWE	n/a
Manual with standoff	44UWE	46UWE	48UWE	410UWE
With air actuator	A44UWE	A46UWE	A48UWE	A410UWE
With universal act.	EUDA-44UWE	EUDA-46UWE	EUDA-48UWE	EUDA-410UWE
Replacement valve	D4UWE	D6UWE	D8UWE	D10UWE
Replacement rotor	SSA4UWE	SSA6UWE	SSA8UWE	SSA10UWE



10 PORT VALVE

1/8" fittings, universal actuator
with 4" standoff

Sampling and switching valves

1/8" FITTINGS, 0.75 MM PORTS (.030")

SPECIFICATIONS

300 psi gas
350°C max

Valve body: Nitronic 60
Rotor: Valcon T

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

Universal actuator: 24 VDC, with autosensing 24 VDC power supply.

Includes RS232/485 serial interface. See page 174 for other interface options.

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 as listed above
- Larger bore available

4 Ports

Prod No

6 Ports

Prod No

8 Ports

Prod No

10 Ports

Prod No

Manual with standoff	44UWT	46UWT	48UWT	410UWT
With air actuator	A44UWT	A46UWT	A48UWT	A410UWT
With universal act.	EUDA-44UWT	EUDA-46UWT	EUDA-48UWT	EUDA-410UWT
Replacement valve	D4UWT	D6UWT	D8UWT	D10UWT
Replacement rotor	SSA4UWT	SSA6UWT	SSA8UWT	SSA10UWT

1/8" Stainless steel loops

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

These loops are for use with valves on this page.

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



ABOUT LOOPS

- Other materials are 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 TIG welded 1/8" tube ends.
- Sample loop shape and dimensions may vary from batch to batch due to fluctuations in tubing ID. Loop volume is controlled as closely as possible, but is not calibrated.



Sampling and switching valves

1/4" FITTINGS, 4.0 MM PORTS (.156")

Low temp

1/4"

4.0 mm

Includes 4" standoff. Manual version not available without standoff.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.
Sample loops are not available.

SPECIFICATIONS

100 psi gas
75°C max
Valve body: Nitronic 60
Rotor: Valcon E2

OPTIONS

- 2", 3", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium
(see pages 246-247)



4 Ports

Prod No



6 Ports

Prod No



8 Ports

Prod No

Manual with standoff	4VL4MWE2	4VL6MWE2	4VL8MWE2
With air actuator	A4VL4MWE2	A4VL6MWE2	A4VL8MWE2
With universal actuator	EUTA-4VL4MWE2	EUTA-4VL6MWE2	EUTA-4VL8MWE2
Replacement valve	DVL4MWE2	DVL6MWE2	DVL8MWE2
Replacement rotor	SSAVL4MWE2	SSAVL6MWE2	SSAVL8MWE2



6 PORT VALVE
1/4" fittings, universal
actuator with 4" standoff



Internal sample injectors

1/16" FITTINGS, 0.40 MM PORTS (.016") AND 0.25 MM COLUMN PORT DIAMETER (.010")

SPECIFICATIONS

5000 psi liq
50°C max

Valve body: Nitronic 60
Rotor: Valcon H

Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.



5,000 psi

Internal sample

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 246-247)
- 1/32" fittings with 0.25 mm bore (.010") also available. Consult factory for product number and pricing.

Sample volume

	.06 µl Prod No	.1 µl Prod No	.2 µl Prod No	.5 µl Prod No
Manual	CI4W.06	CI4W.1	CI4W.2	CI4W.5
With universal actuator	EUHA-CI4W.06	EUHA-CI4W.1	EUHA-CI4W.2	EUHA-CI4W.5
Replacement valve	DCI4W.06	DCI4W.1	DCI4W.2	DCI4W.5
Replacement rotor	SSACI4W.06	SSACI4W.1	SSACI4W.2	SSACI4W.5



INTERNAL SAMPLE INJECTOR

1/16" fittings, 0.40 mm ports
(0.25 mm column port)



INTERNAL SAMPLE INJECTOR

1/16" fittings, 0.75 mm ports,

Internal sample injectors

1/16" FITTINGS, 0.75 MM PORTS (.030")

SPECIFICATIONS

5000 psi liq
50°C max

Valve body: Nitronic 60
Rotor: Valcon H

Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.



5,000 psi

Internal sample

1/16"

0.75 mm

OPTIONS

- 2", 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium
(see pages 246-247)
- 1/32" fittings with 0.25 mm bore (.010") also available. Consult factory for product number and pricing.

Sample volume

	.2 µl Prod No	.5 µl Prod No	1 µl Prod No	2 µl Prod No
Manual	CI4UW.2	CI4UW.5	CI4UW1	CI4UW2
With universal actuator	EUDA-CI4UW.2	EUDA-CI4UW.5	EUDA-CI4UW1	EUDA-CI4UW2
Replacement valve	DCI4UW.2	DCI4UW.5	DCI4UW1	DCI4UW2
Replacement rotor	SSACI4UW.2	SSACI4UW.5	SSACI4UW1	SSACI4UW2



Injectors and switching valves

1/16" FITTINGS, 0.40 MM PORTS (.016")

5,000 psi

Analytical

1/16"

0.40 mm

Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.
Sample loops are not included with valves. Order separately.

SPECIFICATIONS

5000 psi liq
50°C max

Valve body: Nitronic 60
Rotor: Valcon H



4 Ports
Prod No



6 Ports
Prod No



8 Ports
Prod No



10 Ports
Prod No

Manual	C4W	C6W	C8W	C10W
With universal actuator	EUHA-C4W	EUHA-C6W	EUHA-C8W	EUHA-C10W
Replacement valve	DC4W	DC6W	DC8W	DC10W
Replacement rotor	SSAC4W	SSAC6W	SSAC8W	SSAC10W



6 PORT VALVE
1/16" fittings, 0.40 mm ports

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
(see pages 246-247)

1/16" Stainless steel loops

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

These loops are for use with valves on this page.

Volume	Prod No	Volume	Prod No
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 TIG welded 1/16" tube ends or reducing unions.
- Sample loop shape and dimensions may vary from batch to batch due to fluctuations in tubing ID. Loop volume is controlled as closely as possible, but is not calibrated.



Injectors and switching valves

1/16" FITTINGS, 0.75 MM PORTS (.030")

SPECIFICATIONS

**5000 psi liq
75°C max**

 Valve body: Nitronic 60
 Rotor: Valcon H

 Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
 Includes RS232/485 serial interface. See page 174 for other interface options.
 Sample loops are not included with valves. Order separately.

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

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
(see pages 246-247)


4 Ports
Prod No

6 Ports
Prod No

8 Ports
Prod No

10 Ports
Prod No

Manual *	C4UW	C6UW	C8UW	C10UW
With universal actuator	EUDA-C4UW	EUDA-C6UW	EUDA-C8UW	EUDA-C10UW
Replacement valve	DC4UW	DC6UW	DC8UW	DC10UW
Replacement rotor	SSAC4UW	SSAC6UW	SSAC8UW	SSAC10UW

* Manual version is not recommended.


8 PORT VALVE

1/16" fittings, 0.75 mm ports



1/16" Stainless steel loops

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

These loops are for use with valves on this page.

Volume	Prod No	Volume	Prod No
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 TIG welded 1/16" tube ends or reducing unions.
- Sample loop shape and dimensions may vary from batch to batch due to fluctuations in tubing ID. Loop volume is controlled as closely as possible, but is not calibrated.



Injectors and switching valves

1/8" FITTINGS, 0.75 MM PORTS (.030")

5,000 psi

Semi-prep

1/8"

0.75 mm

Manual 10 port includes 2" standoff.
 Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
 Includes RS232/485 serial interface. See page 174 for other interface options.
 Sample loops are not included with valves. Order separately.



4 Ports

Prod No



6 Ports

Prod No



8 Ports

Prod No



10 Ports

Prod No

Manual (not recommended)	4UW	6UW	8UW	210UW
With universal actuator	EUDA-4UW	EUDA-6UW	EUDA-8UW	EUDA-10UW
Replacement valve	D4UW	D6UW	D8UW	D10UW
Replacement rotor	SSA4UW	SSA6UW	SSA8UW	SSA10UW

SPECIFICATIONS

5000 psi liq
 75°C max

Valve body: Nitronic 60
 Rotor: Valcon H

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 (see pages 246-247)

Injectors and switching valves

1/8" FITTINGS, LARGE BORE

5,000 psi

Prep

1/8"

Large bore

Manual 10 port includes 2" standoff.
 Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
 Includes RS232/485 serial interface. See page 174 for other interface options.
 Sample loops are not included with valves. Order separately.

4 Ports 6 Ports 8 Ports 10 Ports
 1.7 mm (.067") 1.7 mm (.067") 1.3 mm (.050") 1.0 mm (.040")
 Prod No Prod No Prod No Prod No

Manual (not recommended)	L4UW	L6UW	L8UW	2L10UW
With universal actuator	EUDA-L4UW	EUDA-L6UW	EUDA-L8UW	EUDA-L10UW
Replacement valve	DL4UW	DL6UW	DL8UW	DL10UW
Replacement rotor	SSAL4UW	SSAL6UW	SSAL8UW	SSAL10UW



1/8" Stainless steel loops

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

These loops are for use with valves on the chart above.

Volume	Prod No	Volume	Prod No
For semi-prep valves (0.75 mm bore)		For semi-prep and prep valves (0.75 mm and large bore)	
10 µl	SL10UW	100 µl	SL100UW
15 µl	SL15UW	250 µl	SL250UW
20 µl	SL20UW	500 µl	SL500UW
25 µl	SL25UW	1 ml	SL1KUW
50 µl	SL50UW	2 ml	SL2KUW
		5 ml	SL5KUW
		10 ml	SL10KUW
		20 ml	SL20KUW



ABOUT LOOPS

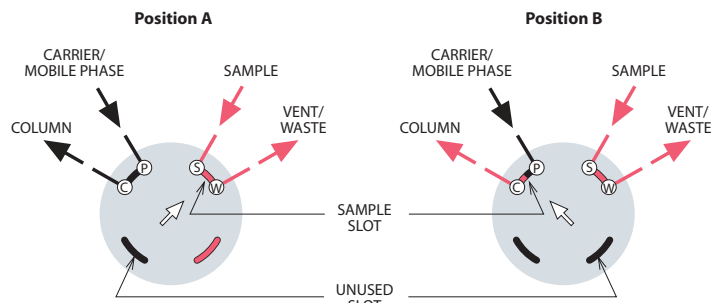
- Other materials are available in many sizes: Electroformed Nickel, Hastelloy C, Nickel 200, PEEK, PTFE, and Titanium
- Loops < 100 µl are made from 1/16" OD tubing with TIG welded 1/8" tube ends.
- Sample loop shape and dimensions may vary from batch to batch due to fluctuations in tubing ID. Loop volume is controlled as closely as possible, but is not calibrated.



4 PORT VALVE
 1/8" fittings



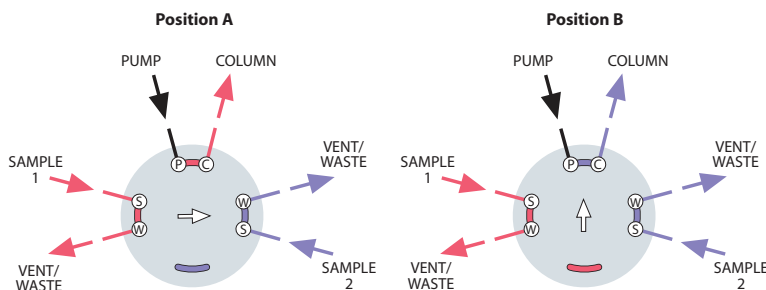
4 PORT – INTERNAL SAMPLE INJECTOR



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 (MODEL CI6)

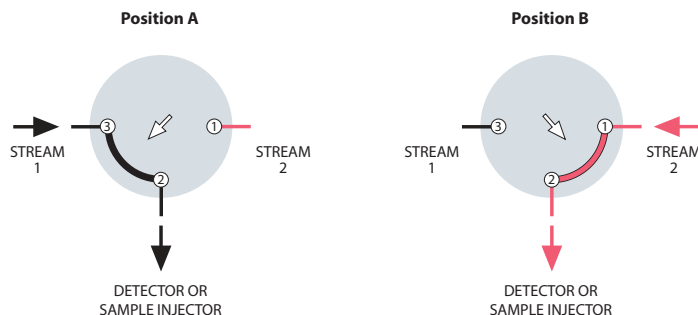


DUAL MICROVOLUME SAMPLE INJECTION

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 maximize valve lifetime. 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.

3 PORT – SWITCHING VALVE



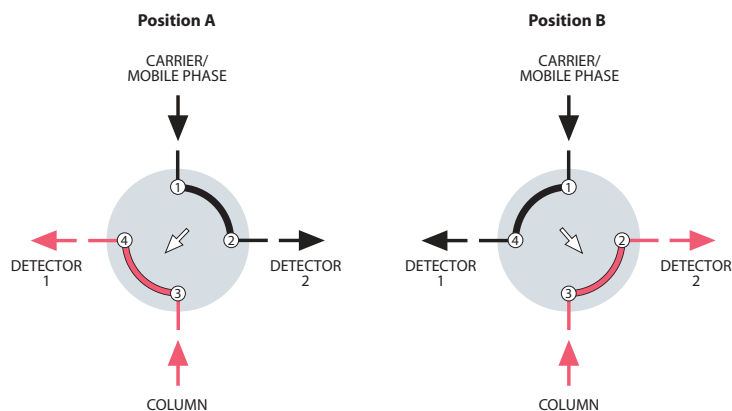
STREAM SELECTION WITHOUT MAINTAINED FLOW

This arrangement allows one of two sample points to flow to a sample injector or detector while blocking the other sample point's flow.

Availability of 3 port valves is limited, and a 4 port valve can be substituted in most applications by using a plug in the unused port. The 4 port valve also permits the non-selected inlet to flow, which may be preferable in some cases.

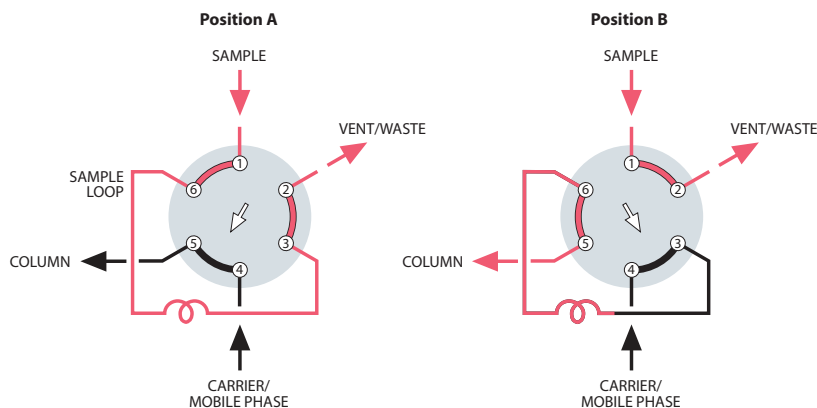


4 PORT – SWITCHING VALVE

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

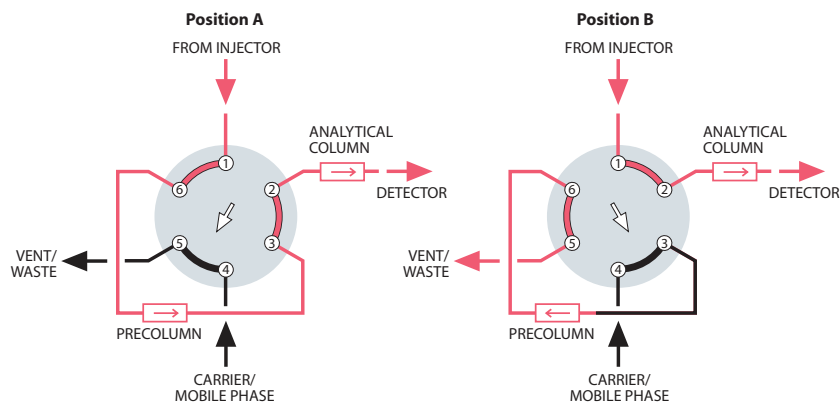


SAMPLE INJECTION

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



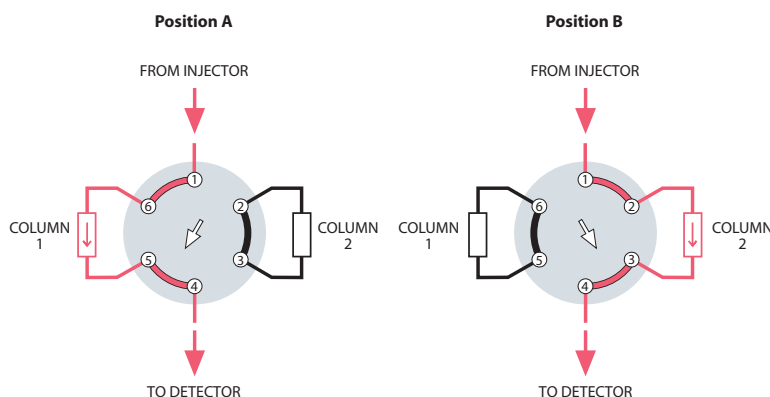
BACKFLUSH OF PRECOLUMN TO VENT

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

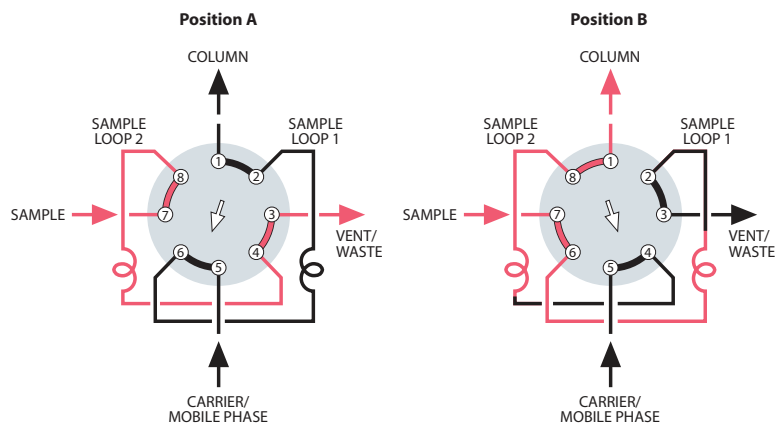


TWO COLUMN SELECTION

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.

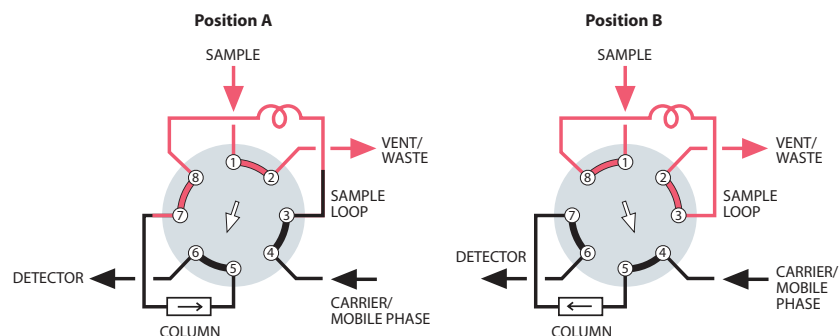
8 PORT – DUAL EXTERNAL SAMPLE INJECTOR



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

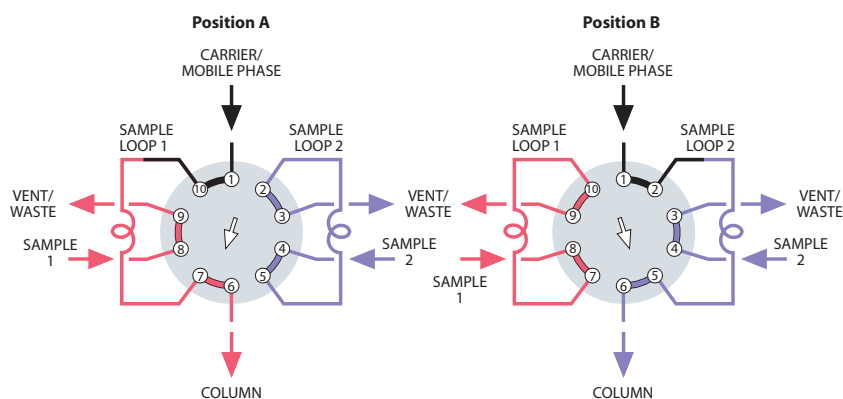


LOOP SAMPLING WITH BACKFLUSH TO DETECTOR

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.



10 PORT – DUAL EXTERNAL SAMPLING



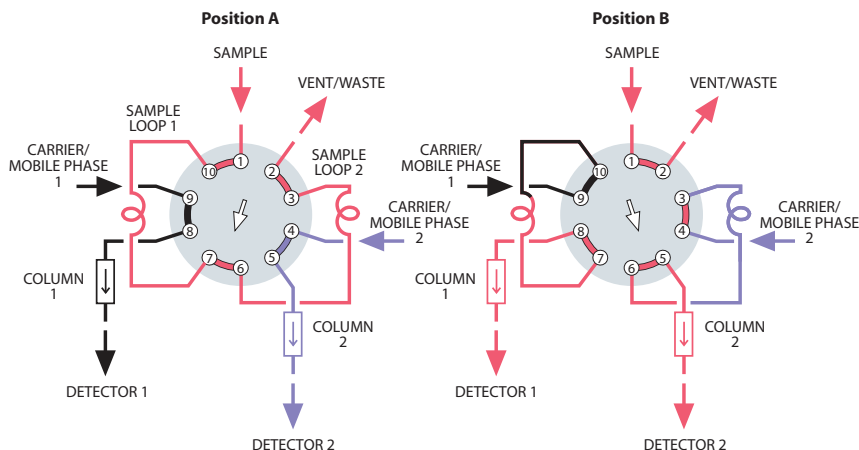
TWO DIFFERENT SAMPLES TO SAME COLUMN

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

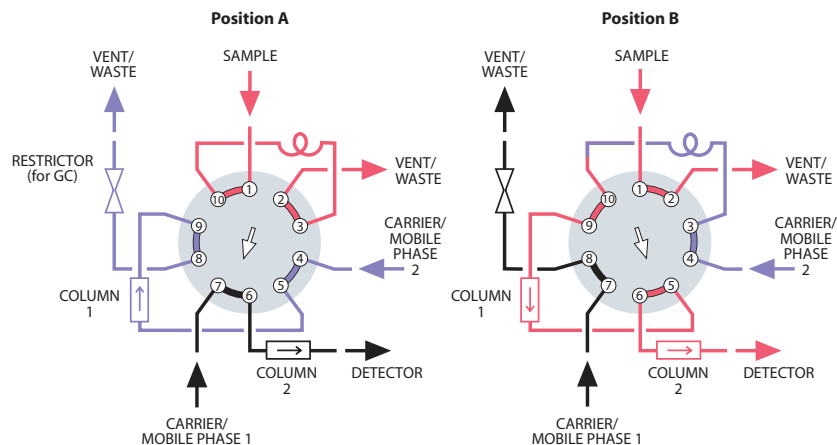


SIMULTANEOUS INJECTION OF THE SAME SAMPLE ONTO SEPARATE COLUMNS

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

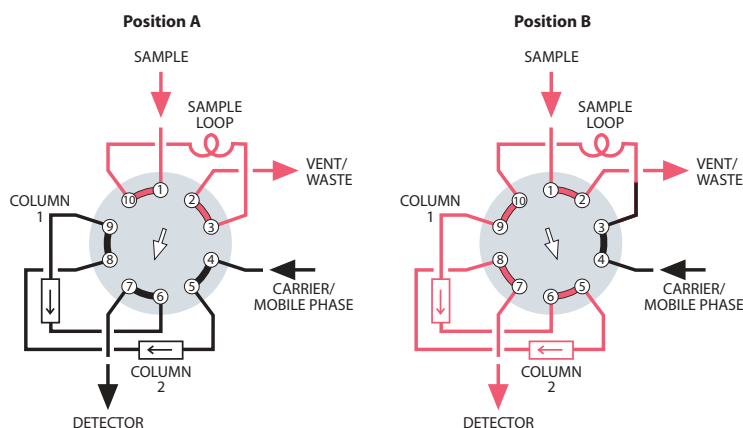


LOOP SAMPLING WITH BACKFLUSH OF PRE-COLUMN TO VENT

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.



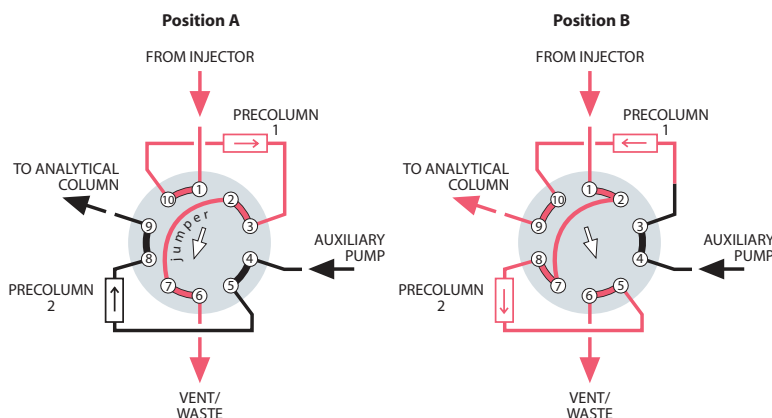
10 PORT – SAMPLING/SWITCHING



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 molecular sieve and pass through the porous polymer column to the detector.

10 PORT – COLUMN SWITCHING

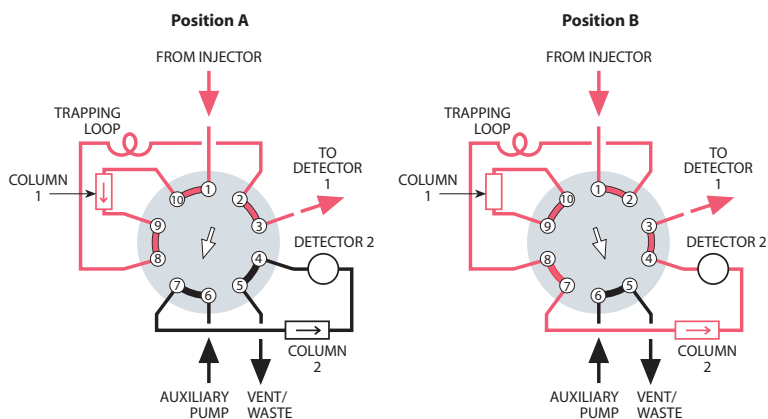


SAMPLE ENRICHMENT (CLEANUP) USING DUAL PRECOLUMNS

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.

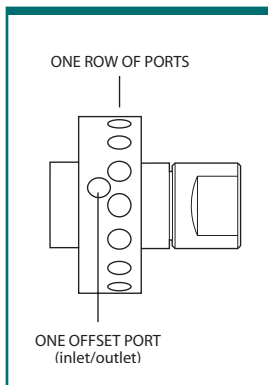


DEAD-END FLOWPATH SD configuration

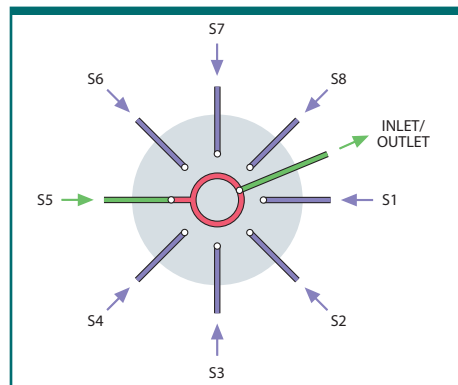
SD valves select one of 4 to 16 dead-ended streams. The selected stream flows from the outlet to a sample valve, pressure sensor, detector, column, etc. The same flowpath can also be used to direct one stream to a number of outlets in applications such as fraction collection.

For an application suggestion, see page 116.

SIDE VIEW



SCHEMATIC OF SD FLOWPATH



SD selectors, low pressure

1/16" FITTINGS, 0.75 MM PORTS (.030")

Low pressure

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

Universal actuator: 24 VDC, with autosensing 24 VDC power supply.

Includes RS232/485 serial interface. See page 174 for other interface options.

SD
Dead-end

1/16"

0.75 mm

SPECIFICATIONS

400 psi gas
200°C max

Valve body: Nitronic 60
Rotor: Valcon E

	6 Position <i>Prod No</i>	10 Position <i>Prod No</i>	12 Position <i>Prod No</i>	16 Position <i>Prod No</i>
Manual *	2CSD6MWE	2CSD10MWE	2CSD12MWE	2CSD16MWE
With air actuator	A2CSD6MWE	A2CSD10MWE	A2CSD12MWE	A2CSD16MWE
With universal act.	EUTA-2CSD6MWE	EUTA-2CSD10MWE	EUTA-2CSD12MWE	EUTA-2CSD16MWE
Replacement valve	DCSD6MWE	DCSD10MWE	DCSD12MWE	DCSD16MWE
Replacement rotor	SSACSD6MWE	SSACSD10MWE	SSACSD12MWE	SSACSD16MWE

* Manual version is not recommended.



10 POSITION SD SELECTOR
1/16" fittings, 2" standoff

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 246-247)
- Larger bore available except 16 position
- Internally purged version

TECH TIP

For low ppb gas concentrations, we offer versions of the valves on this page with an internal purge feature to vent any leakage across the sealing surfaces and/or any diffusion through the sealing material. Available with 1/16" or 1/8" fittings; not available with 1/4" fittings. (see page 86)



SD selectors, low pressure

1/8" FITTINGS, 1.0 MM PORTS (.040")

SPECIFICATIONS

4-8 Positions:
400 psi gas
200°C max

10-16 Positions:
200 psi gas
200°C max

Valve body: Nitronic 60
Rotor: Valcon E

Includes 2" standoff. Ask about closemount assembly if valve will not be heated.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.

Low pressure

SD
Dead-end

1/8"

1.0 mm

	6 Position <i>Prod No</i>	10 Position <i>Prod No</i>	12 Position <i>Prod No</i>	16 Position <i>Prod No</i>
Manual (not recommended)	2SD6MWE	2SD10MWE	2SD12MWE	2SD16MWE
With air actuator	A2SD6MWE	A2SD10MWE	A2SD12MWE	A2SD16MWE
With universal actuator	EUTA-2SD6MWE	EUTA-2SD10MWE	EUTA-2SD12MWE	EUTA-2SD16MWE
Replacement valve	DSD6MWE	DSD10MWE	DSD12MWE	DSD16MWE
Replacement rotor	SSASD6MWE	SSASD10MWE	SSASD12MWE	SSASD16MWE

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 246-247*)
- Internally purged version

SD selectors, low pressure

1/4" FITTINGS, 4.0 MM PORTS (.156")

SPECIFICATIONS

100 psi gas
75°C max

Valve body: Nitronic 60
Rotor: Valcon E2

Includes 2" standoff. Ask about closemount assembly if valve will not be heated.
Manual version not available.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.

Low pressure

SD
Dead-end

1/4"

4.0 mm

	4 Position <i>Prod No</i>	6 Position <i>Prod No</i>	8 Position <i>Prod No</i>	10 Position <i>Prod No</i>
With air actuator	AH2VLS4MWE2	AH2VLS6MWE2	AH2VLS8MWE2	AH2VLS10MWE2
With universal actuator	EUTA-2VLS4MWE2	EUTA-2VLS6MWE2	EUTA-2VLS8MWE2	EUTA-2VLS10MWE2
Replacement valve	DVLS4MWE2	DVLS6MWE2	DVLS8MWE2	DVLS10MWE2
Replacement rotor	SSAVLS4MWE2	SSAVLS6MWE2	SSAVLS8MWE2	SSAVLS10MWE2

OPTIONS

- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium (*see pages 246-247*)



10 POSITION SD SELECTOR
1/4" fittings, 2" standoff

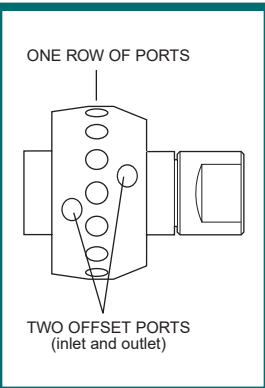


COMMON OUTLET FLOWPATH
SC configuration

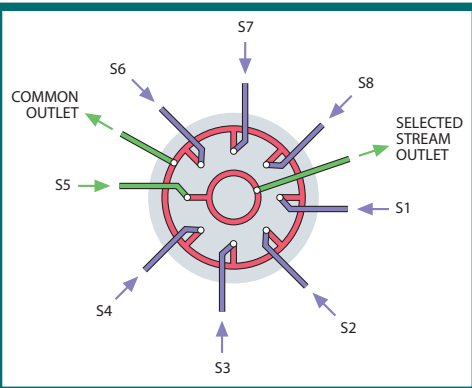
SC selectors are similar to the SD configuration, except that instead of being dead-ended the non-selected streams flow to a common outlet.

For an application suggestion, see page 117.

SIDE VIEW



SCHEMATIC OF SC FLOWPATH



SC selectors

1/16" FITTINGS, 1.0 MM PORTS (.040")

Low pressure

SC
Common outlet

1/16"1.0 mm

Includes 2" standoff. Ask about closemount assembly if valve will not be heated.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.

SPECIFICATIONS

200 psi gas
200°C max
Valve body: Nitronic 60
Rotor: Valcon E

	6 Position Prod No	10 Position Prod No	12 Position Prod No	16 Position Prod No
Manual *	2CSC6MWE	2CSC10MWE	2CSC12MWE	2CSC16MWE
With air actuator	A2CSC6MWE	A2CSC10MWE	A2CSC12MWE	A2CSC16MWE
With universal actuator	EUTA-2CSC6MWE	EUTA-2CSC10MWE	EUTA-2CSC12MWE	EUTA-2CSC16MWE
Replacement valve	DCSC6MWE	DCSC10MWE	DCSC12MWE	DCSC16MWE
Replacement rotor	SSACSC6MWE	SSACSC10MWE	SSACSC12MWE	SSACSC16MWE

* Manual version is not recommended.



6 POSITION SC SELECTOR
1/16" fittings, 2" standoff

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 246-247)
- Internally purged version

TECH TIP

For low ppb gas concentrations, we offer versions of the valves on this page with an internal purge feature to vent any leakage across the sealing surfaces and/or any diffusion through the sealing material. Available with 1/16" or 1/8" fittings; not available with 1/4" fittings. (see page 86)



SC selectors

1/8" FITTINGS, 1.0 MM PORTS (.040")

SPECIFICATIONS

200 psi gas
200°C max

Valve body: Nitronic 60
Rotor: Valcon E

Includes 2" standoff. Ask about closemount assembly if valve will not be heated.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.

Low pressure

SC
Common outlet

1/8"

1.0 mm

	6 Position <i>Prod No</i>	10 Position <i>Prod No</i>	12 Position <i>Prod No</i>	16 Position <i>Prod No</i>
Manual (not recommended)	2SC6MWE	2SC10MWE	2SC12MWE	2SC16MWE
With air actuator	A2SC6MWE	A2SC10MWE	A2SC12MWE	A2SC16MWE
With universal actuator	EUTA-2SC6MWE	EUTA-2SC10MWE	EUTA-2SC12MWE	EUTA-2SC16MWE
Replacement valve	DSC6MWE	DSC10MWE	DSC12MWE	DSC16MWE
Replacement rotor	SSASC6MWE	SSASC10MWE	SSASC12MWE	SSASC16MWE

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 246-247)
- Larger bore available except 16 position
- Internally purged version

SC selectors

1/4" FITTINGS, 4.0 MM PORTS (.156")

SPECIFICATIONS

100 psi gas
75°C max

Valve body: Nitronic 60
Rotor: Valcon E2

Includes 2" standoff. Ask about closemount assembly if valve will not be heated.
Manual version not available.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.

Low pressure

SC
Common outlet

1/4"

4.0 mm

	4 Position <i>Prod No</i>	6 Position <i>Prod No</i>	8 Position <i>Prod No</i>
With air actuator	AH2VLSC4MWE2	AH2VLSC6MWE2	AH2VLSC8MWE2
With universal actuator	EUTA-2VLSC4MWE2	EUTA-2VLSC6MWE2	EUTA-2VLSC8MWE2
Replacement valve	DVLSC4MWE2	DVLSC6MWE2	DVLSC8MWE2
Replacement rotor	SSAVLSC4MWE2	SSAVLSC6MWE2	SSAVLSC8MWE2

OPTIONS

- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium (see pages 246-247)



6 POSITION SC SELECTOR
1/4" fittings, 2" standoff

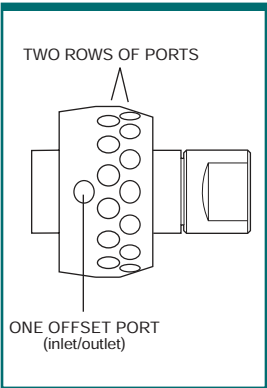


FLOW-THROUGH FLOWPATH
SF configuration

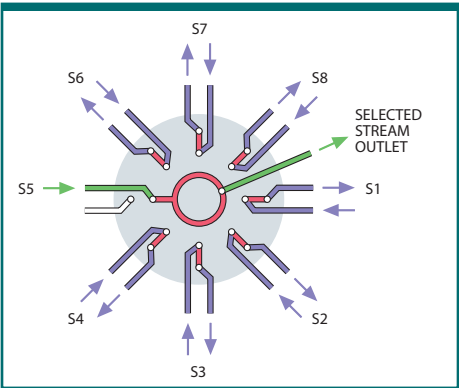
SD and SC valves select and isolate one of 4 to 16 streams, with the remainder dead-ended in the SD and flowing to a common outlet in the SC. The SF selector is similar, but carries the evolution a step further with the non-selected streams flowing through individual outlets.

For an application suggestion, see page 118.

SIDE VIEW



SCHEMATIC OF SF FLOWPATH



SF selectors

1/16" FITTINGS, 1.0 MM PORTS (.040")

Low pressure

SF
Flow-through

1/16"1.0 mm

Includes 2" standoff. Ask about closemount assembly if valve will not be heated.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.

SPECIFICATIONS

200 psi gas
200°C max
Valve body: Nitronic 60
Rotor: Valcon E

	6 Position Prod No	10 Position Prod No	12 Position Prod No	16 Position Prod No
Manual *	2CSF6MWE	2CSF10MWE	2CSF12MWE	2CSF16MWE
With air actuator	A2CSF6MWE	A2CSF10MWE	A2CSF12MWE	A2CSF16MWE
With universal actuator	EUTA-2CSF6MWE	EUTA-2CSF10MWE	EUTA-2CSF12MWE	EUTA-2CSF16MWE
Replacement valve	DCSF6MWE	DCSF10MWE	DCSF12MWE	DCSF16MWE
Replacement rotor	SSACSF6MWE	SSACSF10MWE	SSACSF12MWE	SSACSF16MWE

* Manual version is not recommended.



8 POSITION SF SELECTOR
1/16" fittings, 2" standoff

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 246-247)
- Internally purged version

TECH TIP

For low ppb gas concentrations, we offer versions of the valves on this page with an internal purge feature to vent any leakage across the sealing surfaces and/or any diffusion through the sealing material. Available with 1/16" or 1/8" fittings; not available with 1/4" fittings. (see page 86)



SF selectors

1/8" FITTINGS, 1.0 MM PORTS (.040")

SPECIFICATIONS

200 psi gas
200°C max

Valve body: Nitronic 60
Rotor: Valcon E

Includes 2" standoff. Ask about closemount assembly if valve will not be heated.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.

Low pressure

SF
Flow-through

1/8"

1.0 mm

	6 Position <i>Prod No</i>	10 Position <i>Prod No</i>	12 Position <i>Prod No</i>	16 Position <i>Prod No</i>
Manual (not recommended)	2SF6MWE	2SF10MWE	2SF12MWE	2SF16MWE
With air actuator	A2SF6MWE	A2SF10MWE	A2SF12MWE	A2SF16MWE
With universal actuator	EUTA-2SF6MWE	EUTA-2SF10MWE	EUTA-2SF12MWE	EUTA-2SF16MWE
Replacement valve	DSF6MWE	DSF10MWE	DSF12MWE	DSF16MWE
Replacement rotor	SSASF6MWE	SSASF10MWE	SSASF12MWE	SSASF16MWE

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 246-247)
- Larger bore available except 16 position
- Internally purged version

SF selectors

1/4" FITTINGS, 4.0 MM PORTS (.156")

SPECIFICATIONS

100 psi gas
75°C max

Valve body: Nitronic 60
Rotor: Valcon E2

Includes 2" standoff. Ask about closemount assembly if valve will not be heated.
Manual version is not available.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.

Low pressure

SF
Flow-through

1/4"

4.0 mm

	4 Position <i>Prod No</i>	6 Position <i>Prod No</i>	8 Position <i>Prod No</i>
With air actuator	AH2VLSF4MWE2	AH2VLSF6MWE2	AH2VLSF8MWE2
With universal actuator	EUTA-2VLSF4MWE2	EUTA-2VLSF6MWE2	EUTA-2VLSF8MWE2
Replacement valve	DVLSF4MWE2	DVLSF6MWE2	DVLSF8MWE2
Replacement rotor	SSAVLSF4MWE2	SSAVLSF6MWE2	SSAVLSF8MWE2

OPTIONS

- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium (see pages 246-247)



6 POSITION SF SELECTOR
1/4" fittings, 2" standoff

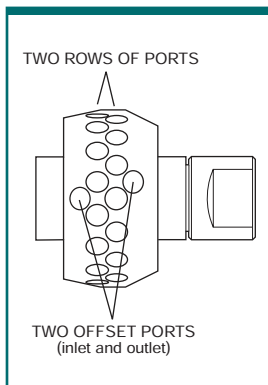


TRAPPING FLOWPATH ST configuration

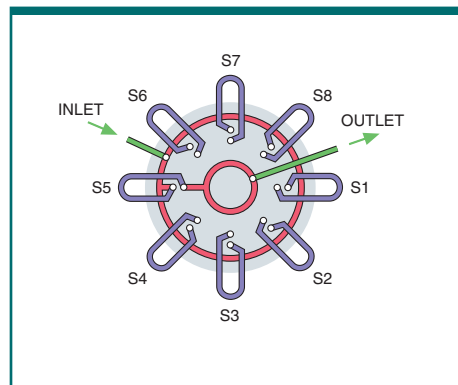
ST selectors are used for multi-column, multi-sample, or multi-trap operations. Each of the 4 to 16 positions is associated with a pair of ports to connect devices such as columns, loops, spargers in purge and trap systems, sample vessels, adsorption tubes, collection vials, etc.

For an application suggestion, see page 119.

SIDE VIEW



SCHEMATIC OF ST FLOWPATH



ST selectors, low pressure

1/16" FITTINGS, 0.75 MM PORTS (.030")

Low pressure

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

Universal actuator: 24 VDC, with autosensing 24 VDC power supply.

Includes RS232/485 serial interface. See page 174 for other interface options.

ST
Trapping

1/16"

0.75 mm

SPECIFICATIONS

200 psi gas

200°C max

Valve body: Nitronic 60

Rotor: Valcon E

	6 Position Prod No	10 Position Prod No	12 Position Prod No	16 Position Prod No
Manual *	2CST6MWE	2CST10MWE	2CST12MWE	2CST16MWE
With air actuator	A2CST6MWE	A2CST10MWE	A2CST12MWE	A2CST16MWE
With universal actuator	EUTA-2CST6MWE	EUTA-2CST10MWE	EUTA-2CST12MWE	EUTA-2CST16MWE
Replacement valve	DCST6MWE	DCST10MWE	DCST12MWE	DCST16MWE
Replacement rotor	SSACST6MWE	SSACST10MWE	SSACST12MWE	SSACST16MWE

* Manual version is not recommended.



8 POSITION ST SELECTOR
1/16" fittings, 2" standoff

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 246-247)
- Internally purged version

1/16" Stainless steel loops

Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately. **Request matched loops when loops will be installed on a single valve.**

These loops are for use with valves on this page.

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

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 TIG welded 1/16" tube ends or reducing unions.
- Sample loop shape and dimensions may vary from batch to batch due to fluctuations in tubing ID. Loop volume is controlled as closely as possible, but is not calibrated.



ST selectors, low pressure

1/8" FITTINGS, 1.0 MM PORTS (.040")

SPECIFICATIONS

200 psi gas
200°C max

Valve body: Nitronic 60
Rotor: Valcon E

Includes 2" standoff. Ask about closemount assembly if valve will not be heated.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.

Low pressure

ST
Trapping

1/8"

1.0 mm

	6 Position <i>Prod No</i>	10 Position <i>Prod No</i>	12 Position <i>Prod No</i>	16 Position <i>Prod No</i>
Manual (not recommended)	2ST6MWE	2ST10MWE	2ST12MWE	2ST16MWE
With air actuator	A2ST6MWE	A2ST10MWE	A2ST12MWE	A2ST16MWE
With universal actuator	EUTA-2ST6MWE	EUTA-2ST10MWE	EUTA-2ST12MWE	EUTA-2ST16MWE
Replacement valve	DST6MWE	DST10MWE	DST12MWE	DST16MWE
Replacement rotor	SSAST6MWE	SSAST10MWE	SSAST12MWE	SSAST16MWE

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 246-247*)
- Larger bore available except 16 position
- Internally purged version



10 POSITION ST SELECTOR
1/8" fittings, 2" standoff



1/8" Stainless steel loops

Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately. **Request matched loops when loops will be installed on a single valve.**

These loops are for use with valves on this page.

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

TECH TIP

Standard ST type valves are not suitable for trace gas analysis applications. For low ppb gas concentrations, we offer versions of these valves with an internal purge feature to vent any leakage across the sealing surfaces and/or any diffusion through the sealing material. Consult the factory.

ABOUT LOOPS

- Other materials are available in many sizes: Electroformed Nickel, Hastelloy C, Nickel 200, PEEK, PTFE, and Titanium
- 1/8" loops < 100 µl are made from 1/16" OD tubing with TIG welded 1/8" tube ends.
- Sample loop shape and dimensions may vary from batch to batch due to fluctuations in tubing ID. Loop volume is controlled as closely as possible, but is not calibrated.

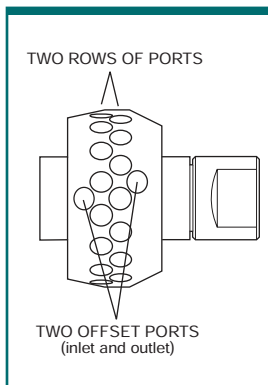


TRAPPING/FLOW-THROUGH FLOWPATH STF configuration

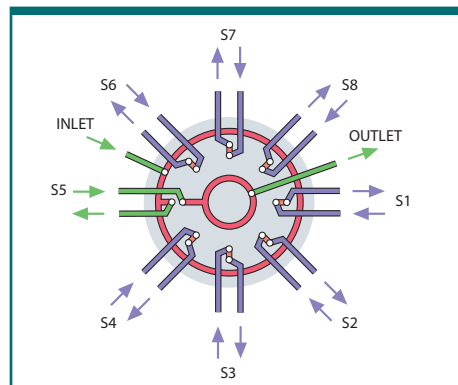
The STF selector is a variation of the ST flowpath, with the single difference that the non-selected streams are returned to their own vents or sources rather than being dead-ended or trapped as they are in the standard ST configuration.

For an application suggestion, see page 120.

SIDE VIEW



SCHEMATIC OF STF FLOWPATH



STF selectors

1/16" FITTINGS, 0.75 MM PORTS (.030")

Low pressure

STF
Trap/flow-throw

1/16"

0.75 mm

Includes 2" standoff. Ask about closemount assembly if valve will not be heated.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.

SPECIFICATIONS

200 psi gas
200°C max
Valve body: Nitronic 60
Rotor: Valcon E

	6 Position <i>Prod No</i>	10 Position <i>Prod No</i>	12 Position <i>Prod No</i>	16 Position <i>Prod No</i>
Manual *	2CSTF6MWE	2CSTF10MWE	2CSTF12MWE	2CSTF16MWE
With air actuator	A2CSTF6MWE	A2CSTF10MWE	A2CSTF12MWE	A2CSTF16MWE
With universal actuator	EUTA-2CSTF6MWE	EUTA-2CSTF10MWE	EUTA-2CSTF12MWE	EUTA-2CSTF16MWE
Replacement valve	DCSTF6MWE	DCSTF10MWE	DCSTF12MWE	DCSTF16MWE
Replacement rotor	SSACSTF6MWE	SSACSTF10MWE	SSACSTF12MWE	SSACSTF16MWE

* Manual version is not recommended.



8 POSITION STF SELECTOR
1/16" fittings, 2" standoff

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 246-247)
- Internally purged version

TECH TIP

For low ppb gas concentrations, we offer versions of the valves on this page with an internal purge feature to vent any leakage across the sealing surfaces and/or any diffusion through the sealing material. Available with 1/16" or 1/8" fittings; not available with 1/4" fittings. (see page 86)



STF selectors

1/8" FITTINGS, 1.0 MM PORTS (.040")

SPECIFICATIONS

200 psi gas
200°C max
Valve body: Nitronic 60
Rotor: Valcon E

Includes 2" standoff. Ask about closemount assembly if valve will not be heated.
Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.

Low pressure

STF
Trap/ flow-throw

1/8"

1.0 mm

	6 Position <i>Prod No</i>	10 Position <i>Prod No</i>	12 Position <i>Prod No</i>	16 Position <i>Prod No</i>
Manual (not recommended)	2STF6MWE	2STF10MWE	2STF12MWE	2STF16MWE
With air actuator	A2STF6MWE	A2STF10MWE	A2STF12MWE	A2STF16MWE
With universal actuator	EUTA-2STF6MWE	EUTA-2STF10MWE	EUTA-2STF12MWE	EUTA-2STF16MWE
Replacement valve	DSTF6MWE	DSTF10MWE	DSTF12MWE	DSTF16MWE
Replacement rotor	SSASTF6MWE	SSASTF10MWE	SSASTF12MWE	SSASTF16MWE

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 246-247*)
- Larger bore available except 16 position
- Internally purged version



10 POSITION STF SELECTOR
1/8" fittings, 2" standoff

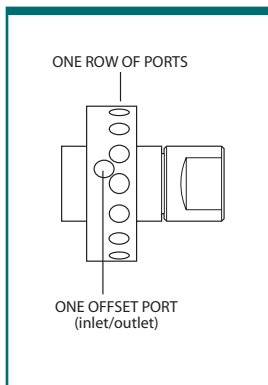


DEAD-END FLOWPATH SD configuration

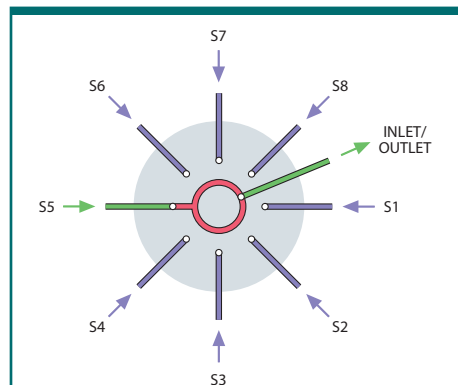
SD valves select one of 4 to 12 dead-ended streams. The selected stream flows from the valve outlet to a sample valve, pressure sensor, detector, column, etc. This configuration may also be used to direct one stream to a number of outlets for applications such as fraction collection.

For an application suggestion, see page 121.

SIDE VIEW



SCHEMATIC OF SD FLOWPATH



SD selectors, high pressure

1/16" FITTINGS, 0.4 MM PORTS (.016")

5,000 psi

**SD
Dead-end**

1/16" **0.40 mm**

Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.

SPECIFICATIONS

5000 psi liq
75°C max
Valve body: Nitronic 60
Rotor: Valcon E

	4 Position <i>Prod No</i>	6 Position <i>Prod No</i>	10 Position <i>Prod No</i>
Manual *	CSD4UW	CSD6UW	CSD10UW
With universal act.	EUTA-CSD4UW	EUTA-CSD6UW	EUTA-CSD10UW
Replacement valve	DCSD4UW	DCSD6UW	DCSD10UW
Replacement rotor	SSACSD4UW	SSACSD6UW	SSACSD10UW

* Manual version is not recommended.

SD selectors, high pressure

1/8" FITTINGS, 0.75 MM PORTS (.030")

5,000 psi

**SD
Dead-end**

1/8" **0.75 mm**

Universal actuator: 24 VDC, with autosensing 24 VDC power supply.
Includes RS232/485 serial interface. See page 174 for other interface options.

SPECIFICATIONS

5000 psi liq
75°C max
Valve body: Nitronic 60
Rotor: Valcon E

	4 Position <i>Prod No</i>	6 Position <i>Prod No</i>	8 Position <i>Prod No</i>
Manual *	SD4UW	SD6UW	SD8UW
With universal act.	EUTA-SD4UW	EUTA-SD6UW	EUTA-SD8UW
Replacement valve	DSD4UW	DSD6UW	DSD8UW
Replacement rotor	SSASD4UW	SSASD6UW	SSASD8UW

* Manual version is not recommended.



6 POSITION SD SELECTOR
1/8" fittings

OPTIONS

- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium (see pages 246-247)
- **1/16" VERSION:**
 - 4 and 8 positions available
 - Larger bore available except 10 and 12 positions
- **1/8" VERSION:**
 - Larger bore available except 8 positions

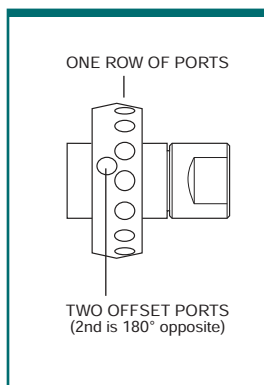


BOTH COLUMN ENDS SELECTED ST configuration

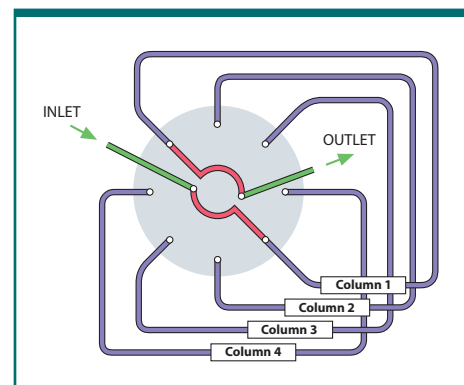
ST selectors are used for multi-column, multi-sample, or multi-trap operations. This valve can be used between an injector and detector to permit manual or automated HPLC column selection.

For an application suggestion, see page 121.

SIDE VIEW



SCHEMATIC OF ST FLOWPATH



ST selectors, high pressure

1/16" FITTINGS, 0.4 MM PORTS (.016")

SPECIFICATIONS

5000 psi liq
75°C max

Valve body: Nitronic 60
Rotor: Valcon E

Manual versions are not available.

Universal actuator: 24 VDC, with autosensing 24 VDC power supply.

Includes RS232/485 serial interface. See page 174 for other interface options.

5,000 psi

ST
Trapping

1/16"

0.40 mm

OPTIONS

- 3", 4", and 6" standoffs
- Materials: Hastelloy C, Inconel 600, Monel 400, Nickel 200, Nitronic 50, Titanium (see pages 246-247)
- Low pressure, high temperature versions available. (Consult factory.)

4 Columns or Loops 6 Columns or Loops

	Prod No	Prod No
With universal actuator	EUTA-CST4UW	EUTA-CST6UW
Replacement valve	DCST4UW	DCST6UW
Replacement rotor	SSACST4UW	SSACST6UW



4 POSITION ST SELECTOR
1/16" fittings



1/16" Stainless steel loops

Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately. **Request matched loops when loops will be installed on a single valve.**

These loops are for use with valves on this page.

Volume	Prod No	Volume	Prod No
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

MORE INFO

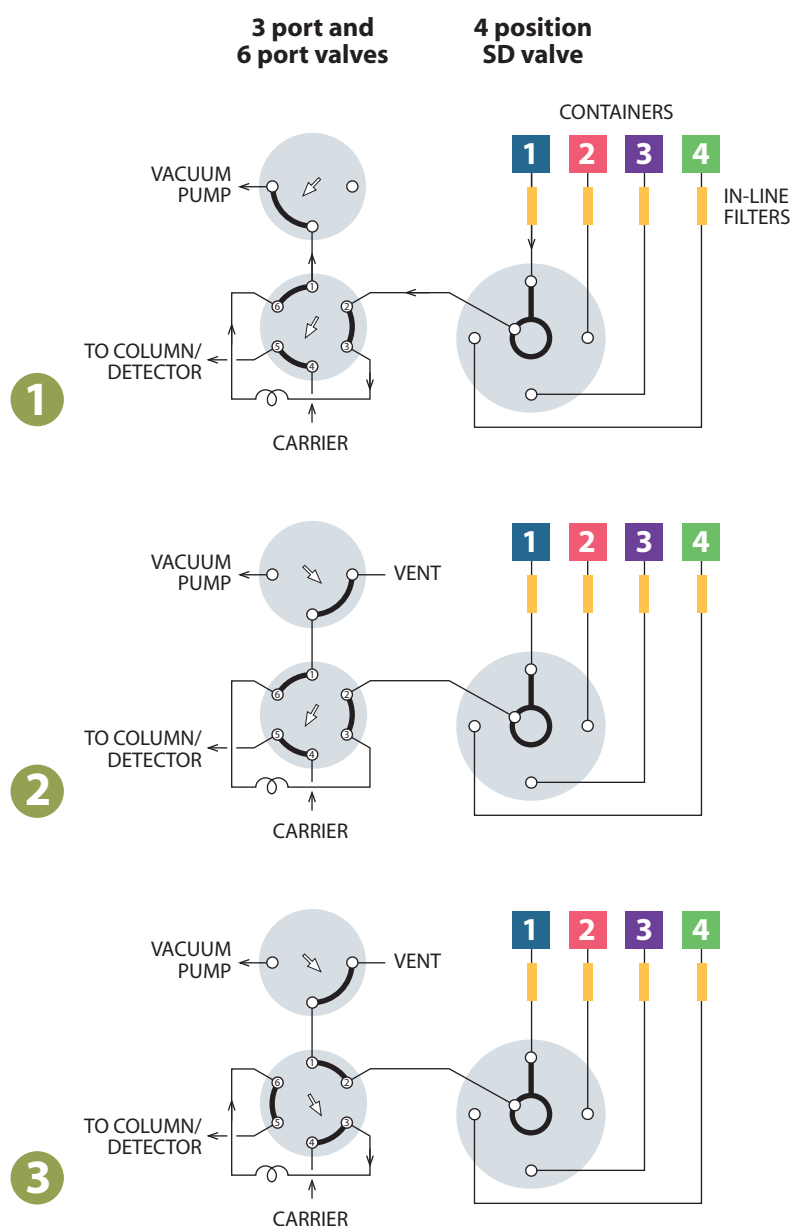
Application. . . . page 121
Actuators
Air 178
Microelectric 176
Universal 174-175
Materials
Metals. 246-247
Polymers 248
Valve rotors. 249
Mounting hardware
Closemount 190
Standoff. 187

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 TIG welded 1/16" tube ends or reducing unions.
- Sample loop shape and dimensions may vary from batch to batch due to fluctuations in tubing ID. Loop volume is controlled as closely as possible, but is not calibrated.



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.

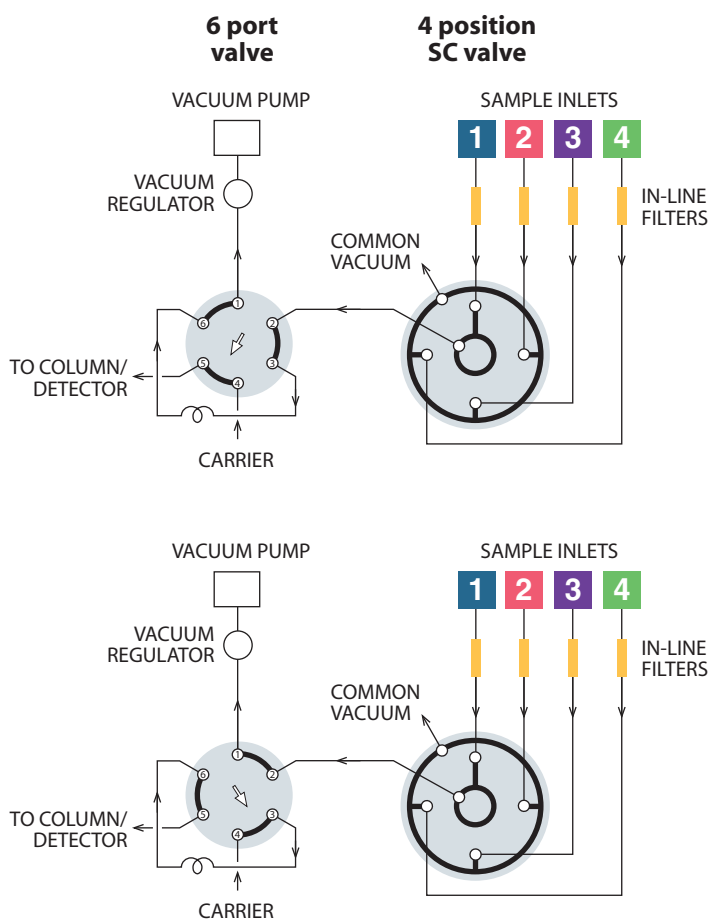
This example illustrates automated sampling of non-pressurized containers.

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.



SC FLOWPATH



STREAM SELECTION WITH CONTINUOUS FLOW TO A COMMON OUTLET

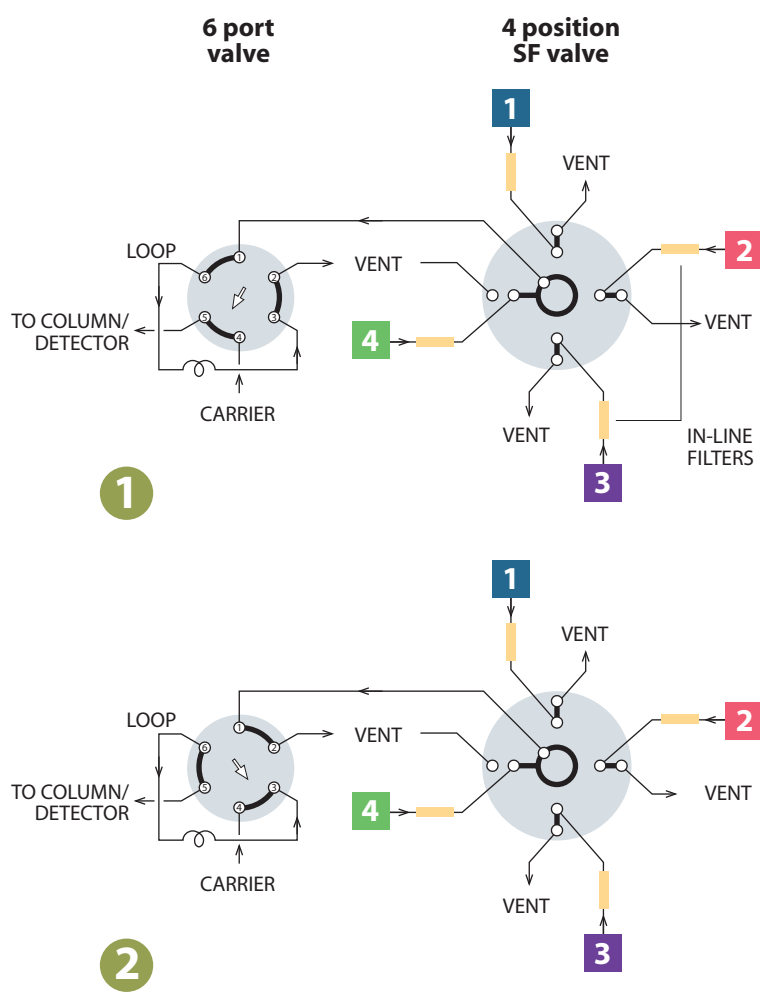
SC selectors are similar to the SD configuration, except that instead of being dead-ended the non-selected streams flow to a common outlet. They are also available in 4, 6, 8, 10, 12, or 16 position versions.

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.



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.

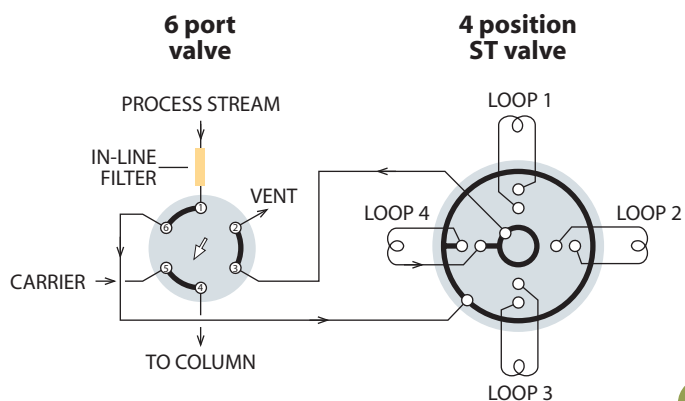
This is the ideal solution when reactions or process streams with differing upstream pressures must be analyzed, and can also provide independent containment of toxic or noxious streams. An SF selector together with a 6 port sampling valve and pneumatic or electric actuators comprise a complete sampling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

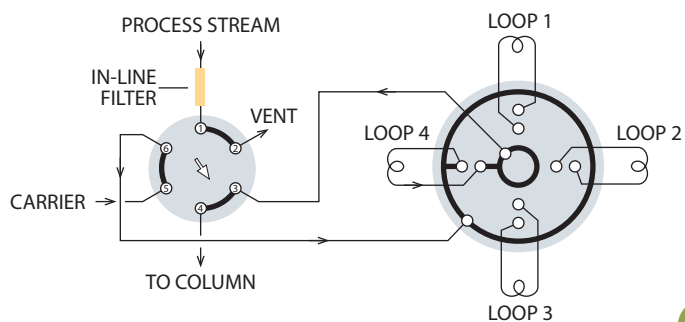
Mode 1 shows sample loading from stream 4, while mode 2 shows sample injected onto the analytical column.



ST FLOWPATH – LOW PRESSURE



1



2

SAMPLE TRAPPING APPLICATIONS FOR 4 TO 16 STREAMS

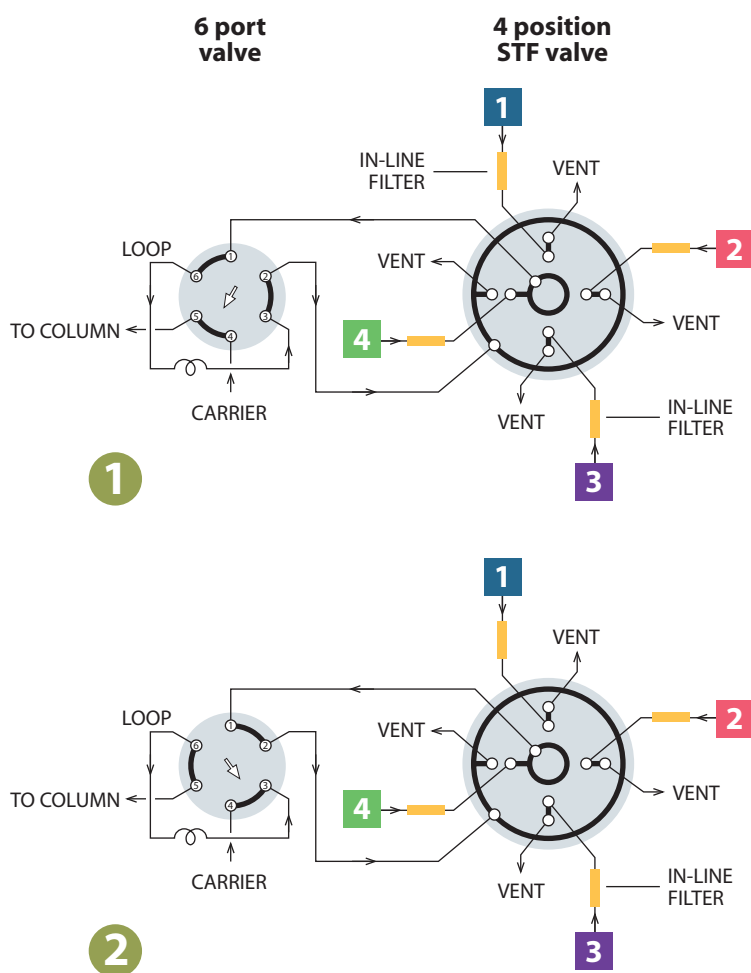
ST selectors are used for multi-column, multi-sample, or multi-trap operations. The ST configuration is available in both MW and UW type designs.

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.



STF FLOWPATH

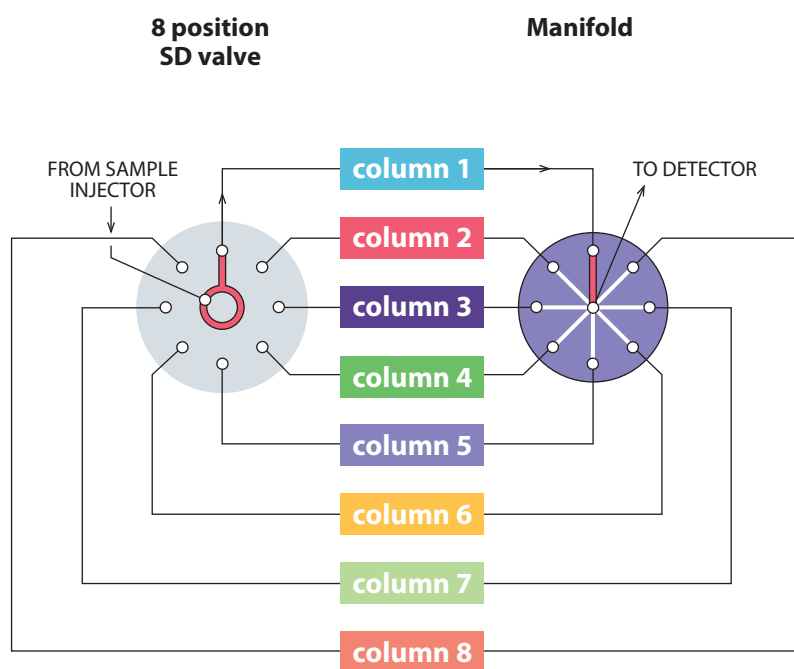
**SAMPLE TRAPPING WITH CONTINUOUS FLOW TO INDIVIDUAL OUTLETS**

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.



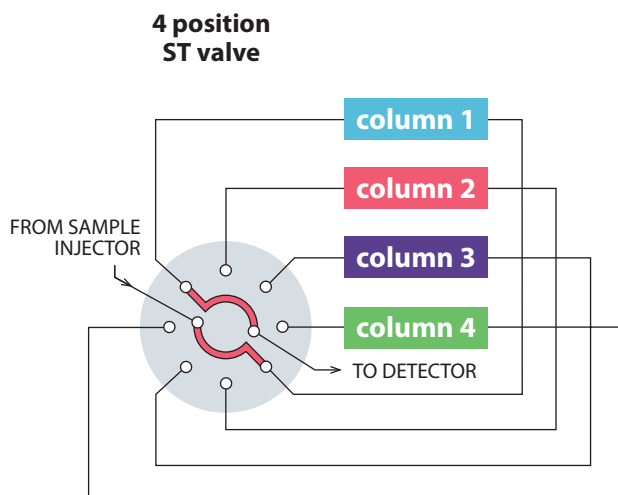
SD FLOWPATH – HIGH PRESSURE



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.

DIAPHRAGM VALVES



FOR CONTINUOUS AUTOMATED OPERATION

- Only 35 mm (1.375") in diameter
- >1,000,000 cycle lifetime
- Three configurations – 6 port, 10 port, and 4 port internal sample
- Built in actuator
- 1/16" or 1/32" Valco zero dead volume fittings

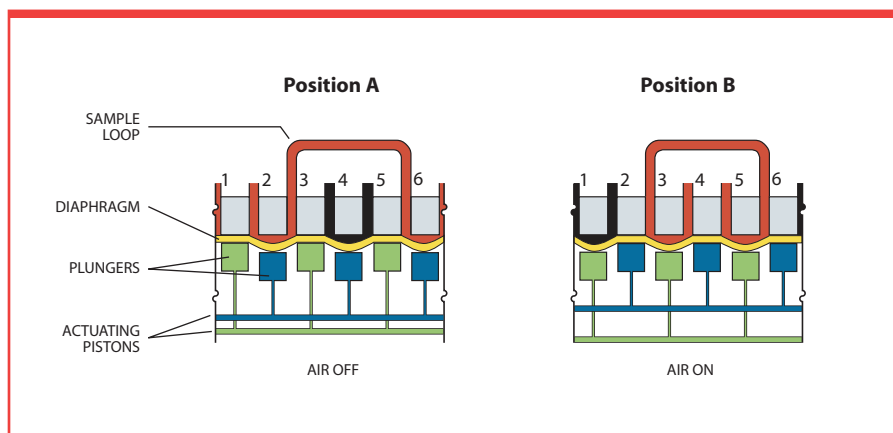
The VICI mini diaphragm valve is designed for trouble-free use in applications requiring minimal maintenance and maximum lifetime, making it an ideal choice for the process industry, automated lab analyzers, or continuous-monitoring environmental analyses.

DESIGN

The mini diaphragm valve consists of plungers and ports arranged in a circular pattern, with the plungers controlled by the reciprocation action of two air actuated pistons. Maintenance procedures are greatly simplified, since a single screw holds the valve together and locating pins

ensure proper alignment. Extremely long lifetime, 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.

CROSS SECTION VIEW OF A DIAPHRAGM VALVE



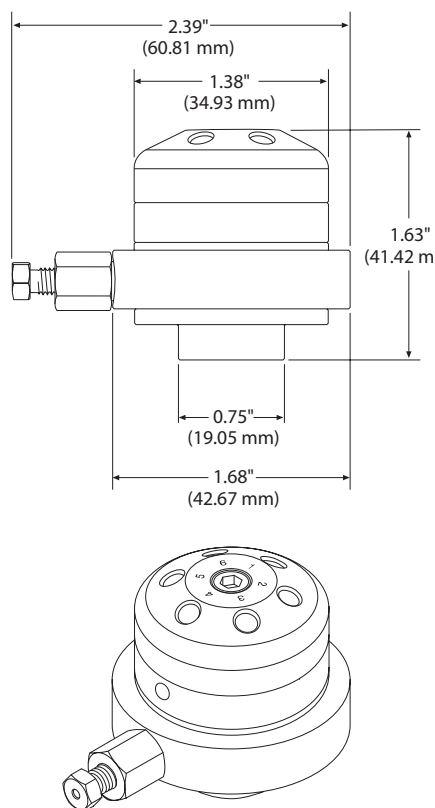
t TECH TIP

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

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



DIAPHRAGM VALVE DIMENSIONS



DIMENSIONS

As shown in the drawing at left, the VICI diaphragm valve with built-in actuator comprises a very compact package. The valve and fittings (without purge ring) weigh only 240 grams.

VALVE FITTINGS

The valve cap has Valco 1/32" or 1/16" ZDV fitting details – a rugged design which allows easy replacement of tubing or of the valve itself.

Standard bore size is 0.40 mm (.016"). Optional bore sizes are 0.25 mm (.010") and 0.75 mm (.030").

LIFETIME

Diaphragm valve lifetime can exceed 1,000,000 cycles at ambient temperature or 500,000 cycles at 175°C.

ACTUATION

Actuator air (50-60 psi) is supplied to a side port with 10-32 female threads, permitting use of a variety of compression or barbed fittings. A 3-way solenoid is required for actuation. (See page 180.)

OPTIONAL MOUNTING KIT

The mounting kit consists of a ring which is mounted on a flat surface. A slot allows the ring to be tightened around the collar of the valve.

TEMPERATURE/PRESSURE SPECIFICATIONS

Diaphragm valves can be operated at temperatures up to 200°C, at 300 psi. The standard valve is for applications in which the sample is above ambient pressure. An optional version works with subambient pressures, such as when the sample is "pulled" through the valve by a vacuum pump.

MATERIALS OF CONSTRUCTION

The cap is Nitronic 60 stainless (optional Hastelloy C or Type 316 stainless), with remaining metal parts of 300 series stainless. The diaphragm is formed from a specialized polyimide.

PURGE OPTION

Purging improves sensitivity when a diaphragm valve is used in conjunction with a VICI Pulsed Discharge Detector, for example, since air cannot diffuse into the flow path.

The optional purge ring, easy to install on any VICI diaphragm valve, is equipped with two 1/16" ports for the purge gas inlet and outlet.

Switching/sampling valves with a purge ring have a maximum temperature of 175°C.



Purge ring

Ordering information



DIAPHRAGM VALVES

Diaphragm valves

1/32" FITTINGS, 0.25 MM PORTS (.010")

Process GC

1/32"

0.25 mm

Includes stainless steel nuts and ferrules.

A 3-way solenoid is required for actuation. Order separately on page 180.



4 port

.5 µl internal sample

Prod No

DV13-1114-.5



4 port

1 µl internal sample

Prod No

DV13-1114-1



6 port

sampling/switching

Prod No

DV13-1116



10 port

multifunctional

Prod No

DV13-1110

SPECIFICATIONS

Internal sample:

750 psi liq

50°C max

Sampling/switching:

300 psi gas

175°C max

Sample:

Above ambient pressure*

Nitronic 60 valve body

Polyimide diaphragm

* For vacuum applications, contact the factory.

Diaphragm valves

1/16" FITTINGS, 0.40 MM PORTS (.016")

Process GC

1/16"

0.40 mm

Includes stainless steel nuts and ferrules.

A 3-way solenoid is required for actuation. Order separately on page 180.

4 port

.5 µl internal sample

Prod No

DV23-2114-.5

4 port

1 µl internal sample

Prod No

DV23-2114-1

6 port

sampling/switching

Prod No

DV23-2116

10 port

multifunctional

Prod No

DV23-2110

SPECIFICATIONS

Internal sample:

750 psi liq

50°C max

Sampling/switching:

300 psi gas

175°C max

Sample:

Above ambient pressure*

Nitronic 60 valve body

Polyimide diaphragm

* For vacuum applications, contact the factory.

Diaphragm valves

1/16" FITTINGS, 0.75 MM PORTS (.030")

Process GC

1/16"

0.75 mm

Includes stainless steel nuts and ferrules.

A 3-way solenoid is required for actuation. Order separately on page 180.

4 port

.5 µl internal sample

Prod No

DV23-3114-.5

4 port

1 µl internal sample

Prod No

DV23-3114-1

6 port

sampling/switching

Prod No

DV23-3116

10 port

multifunctional

Prod No

DV23-3110

SPECIFICATIONS

Internal sample:

750 psi liq

50°C max

Sampling/switching:

300 psi gas

175°C max

Sample:

Above ambient pressure*

Nitronic 60 valve body

Polyimide diaphragm

* For vacuum applications, contact the factory.



6 PORT DIAPHRAGM VALVE

1/16" fittings

Parts and accessories

	Prod No
Purge ring	DV22-PURGE
Mounting kit	DVBRKIT
Replacement diaphragms	
Polyimide	.010" bore DV22-21D
	.016" bore DV22-21D
	.030" bore DV22-31D
PTFE	DV22-22D

Sample loops

Each stainless steel loop includes two stainless nuts and ferrules.

Volume	Prod No	Volume	Prod No
1/16"			
2 µl	CSL2	250 µl	CSL250
5 µl	CSL5	500 µl	CSL500
10 µl	CSL10	1 ml	CSL1K
20 µl	CSL20	2 ml	CSL2K
50 µl	CSL50	5 ml	CSL5K
100 µl	CSL100	10 ml	CSL10K
1/32"			
1 µl	CSLN1K		
2 µl	CSLN2K		
5 µl	CSLN5K		
10 µl	CSLN10K		



OPTIONS

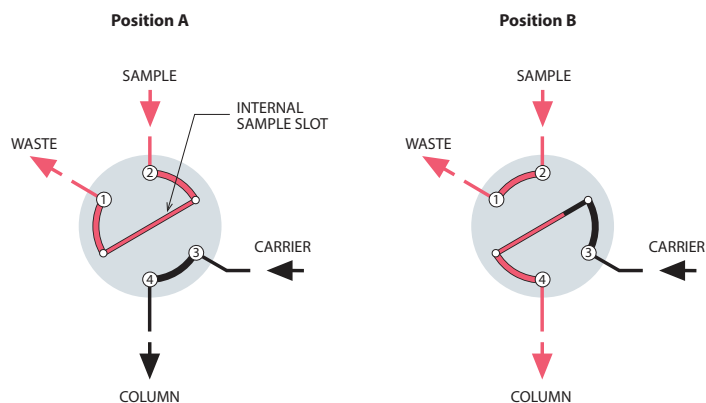
- High temperature version is available for range of 250-300 °C

- Materials:
Hastelloy C
Type 316 stainless

For more information, refer to the metals info on pages 246-247.



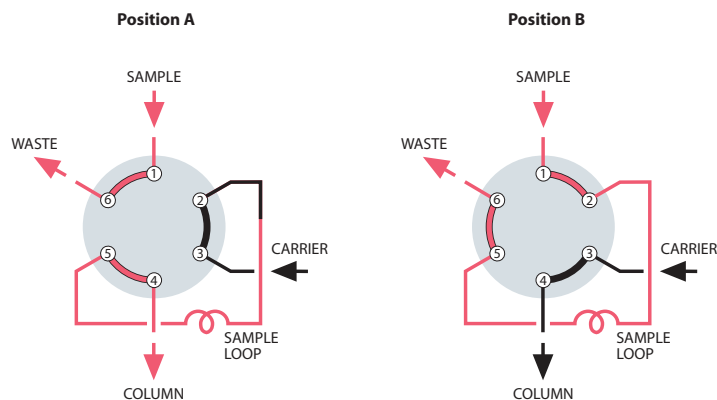
4 PORT – SAMPLE INJECTOR



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 cap, allowing precise, repeatable injections. In Position A, the sample flows through the sample passage while the carrier flows through to the column. In Position B, the sample passage is in line with the column and the carrier injects the contents of the sample passage into the column.

6 PORT – SAMPLE INJECTOR



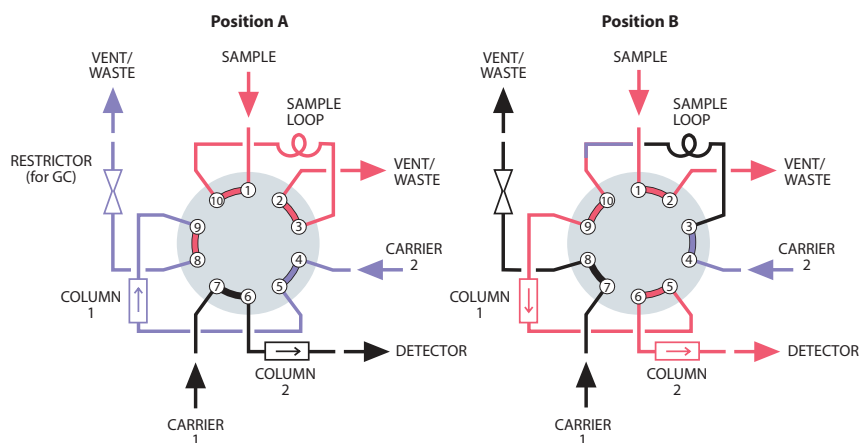
SAMPLE INJECTION

With the valve in Position A, sample flows through the external loop while the carrier flows directly through to the column. When the valve is switched to Position B, the sample contained in the sample loop and valve flow passage is injected into the column.

➔ MORE INFO

More applicationspages 100-101

10 PORT – SAMPLE INJECTOR



LOOP SAMPLING WITH BACKFLUSH OF PRE-COLUMN TO VENT

When components of interest are low boiling, 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 into 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.

➔ MORE INFO

More applicationspages 102-103