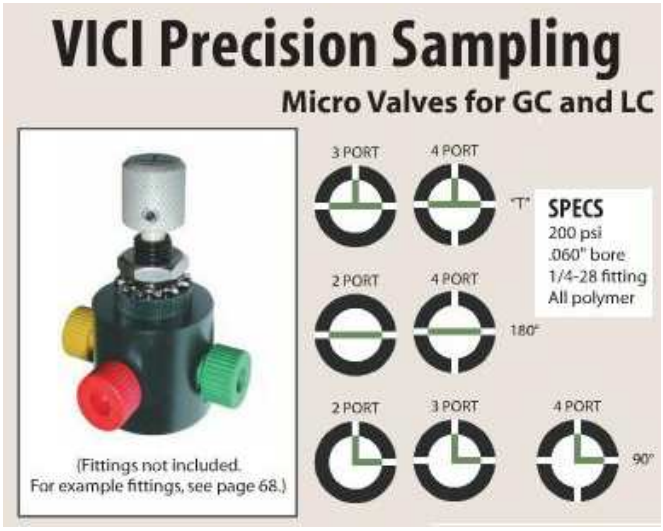
Instrumentation Valves

VICI-Valco
Cheminert

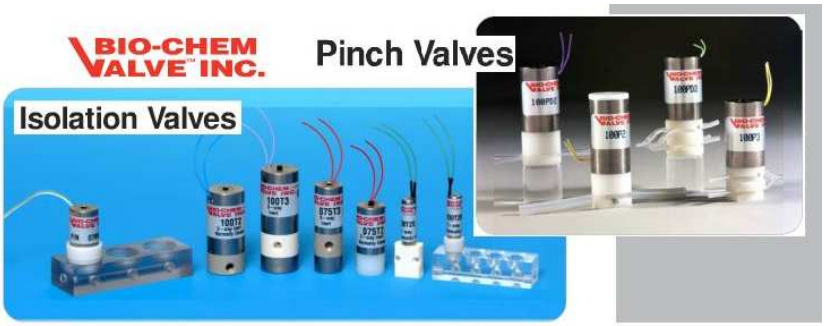
Check Valves

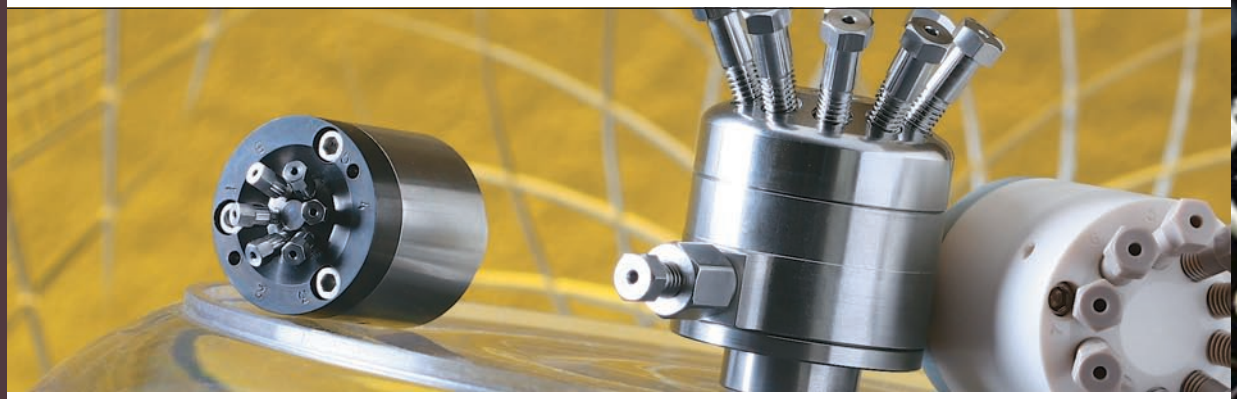
VALUE PLASTICS

Stopcocks



DISCONTINUED *2014+ ? some stock in Melbourne*





Valve Selection

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

Valco Injectors and Valves for GC

pages 96–99, 102–111

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

Valco Injectors and Valves for HPLC

pages 96–99, 112–116

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

Valco Selectors

pages 100–101, 122–133

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

Diaphragm Valves for GC

pages 140–143

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

Cheminert Injectors for Nanovolume® HPLC and UHPLC

pages 146, 152–155

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

Cheminert Injectors and Valves for HPLC and UHPLC

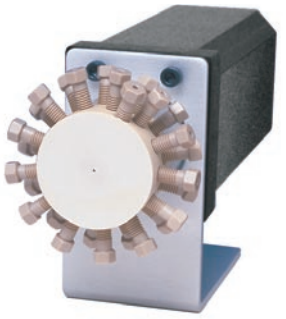
pages 147, 156–163

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

Cheminert Injectors and Valves for Low Pressure Applications

pages 148, 164–167

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



Cheminert Selectors

pages 150-151, 170–177

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

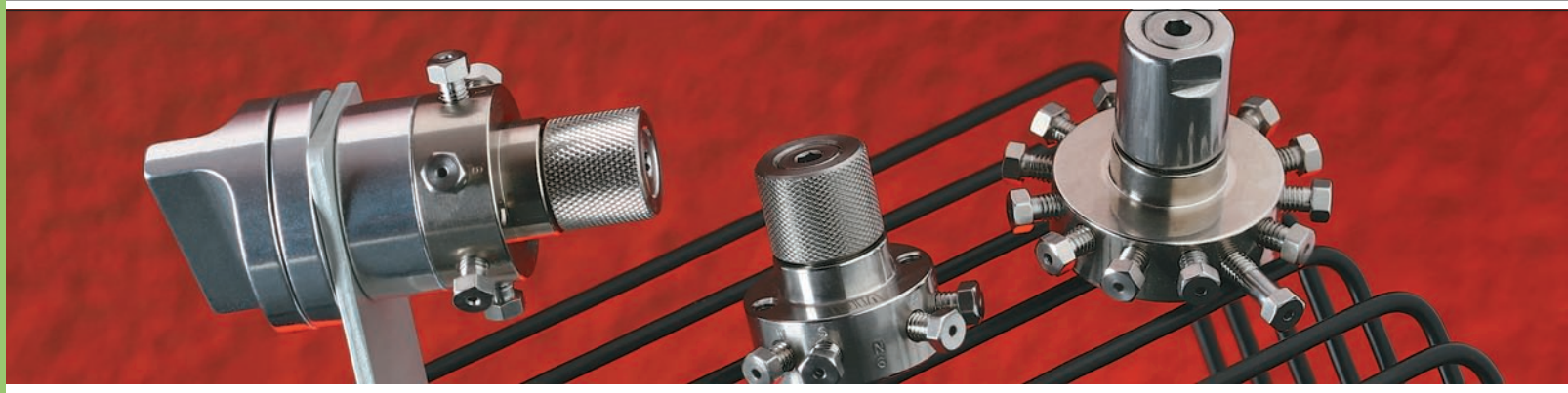
40,000 psi Ultra-High Pressure Injector System

page 84

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

FOR OEMs

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



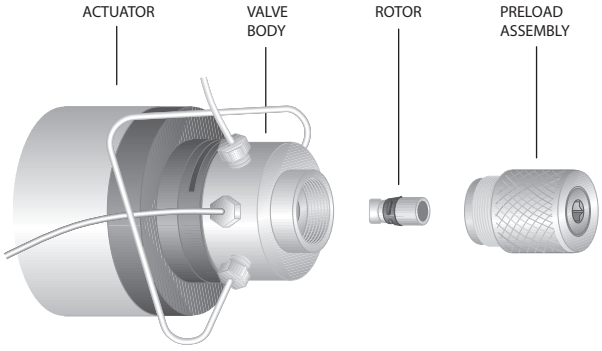
Valco Injectors and Valves

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

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

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

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



MORE INFORMATION

TECH TIP

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

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

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

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

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

SPECIAL BODY MATERIAL—CODES AND PRICES

TWO POSITION VALVES

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

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

MULTIPOSITION VALVES

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

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

Specifying a Special Body Material

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

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

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

MORE INFORMATION
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Leak Testing

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

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

Leak Rates for Gas Sampling Valves

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

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

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

Test Method for Liquid Sampling Valves

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

RANGES FOR ACCEPTABLE LEAK RATES

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

OPTIONAL LEAK TESTING with Helium Mass Spectrometer

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

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

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

About Two Position Injectors and Switching Valves

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

Sample Injectors

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

Sample Loops

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

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

SPECIFICATIONS

VALCO TWO POSITION VALVES

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

VALVE TYPES

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

For special port diameters, please consult the factory.

OPTIONAL ROTORS

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

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

MORE INFORMATION

About Selectors

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

Flowpath Configurations

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

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

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

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

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

PORT DIAMETERS—
Low pressure (MW)

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

PORT DIAMETERS—
High pressure (UW)

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

MORE INFORMATION

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

For special port diameters, please consult the factory.

Low Pressure Selectors

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

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

SPECIFICATIONS

VALCO SELECTORS – Low pressure (MW)

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

High Pressure Selectors

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

SPECIFICATIONS

VALCO SELECTORS – High pressure (UW)

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

GC

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

W Type

Med temp
Internal sample
1/32" 0.25 mm

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

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

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

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

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

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

W Type

Med temp
Internal sample
1/16" 0.40 mm

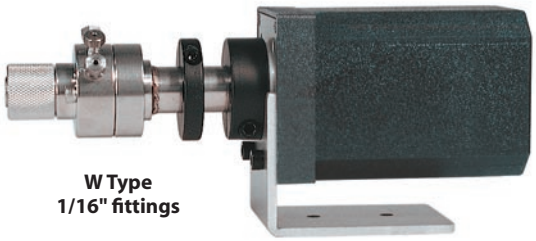
Includes 2" standoff. Manual version has no standoff.

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

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

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

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



W Type
1/16" fittings

MORE INFORMATION

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

UW Type

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

Includes 2" standoff.
Manual version has no standoff.

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

Med temp
Internal sample
1/16" 0.75 mm

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

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

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

UW Type

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

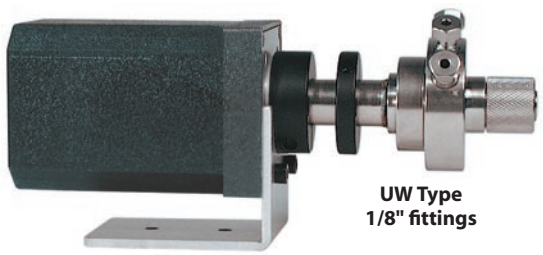
Includes 2" standoff.
Manual version has no standoff.

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

Med temp
Internal sample
1/8" 0.75 mm

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

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



UW Type
1/8" fittings

Capillary GC

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

W Type

Med temp

1/32" **0.25 mm**

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

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

Microelectric actuator:
- 24 VDC, with 110/230 VAC to 24 VDC power supply

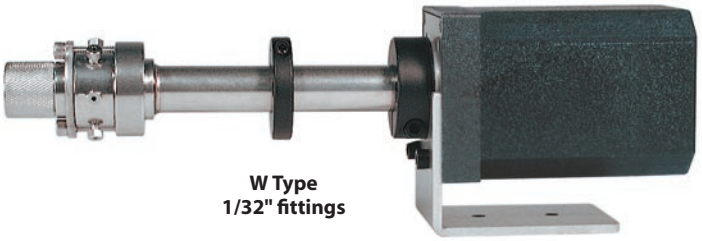
Sample loops are not included with valves. Order separately.

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

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

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

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



W Type
1/32" fittings

1/32" Stainless steel loops

for W Type valves

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

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

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

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

W Type

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

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

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

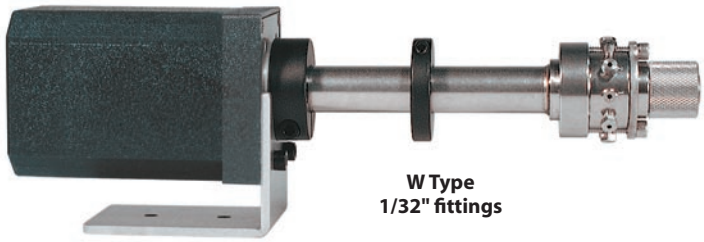
Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Sample loops are not included with valves. Order separately.

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

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

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



W Type
1/32" fittings

1/32" Stainless steel loops

for W Type valves

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

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

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

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

W Type

Med temp

1/16" **0.40 mm**

Includes 4" standoff
Manual version has no standoff

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

Sample loops are not included with valves. Order separately.

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

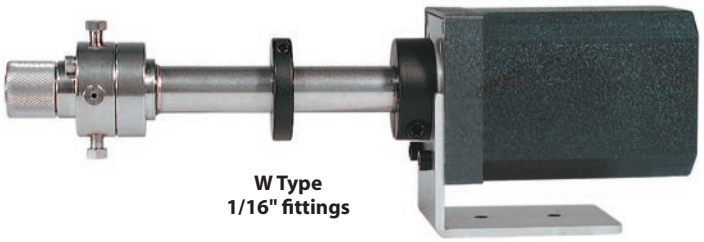
SPECS

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

For 300 psi, 350°C max, see page 108.

OPTIONS

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



W Type
1/16" fittings

MORE INFORMATION

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Materials
Metals..... 254-255
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Valve rotors.....257
Standoff
assemblies 205

1/16" Stainless steel loops

for W Type valves

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

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

ABOUT LOOPS

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

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

UW Type

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

For 300 psi, 330°C max, see page 109.

Includes 4" standoff.
Manual version has no standoff.

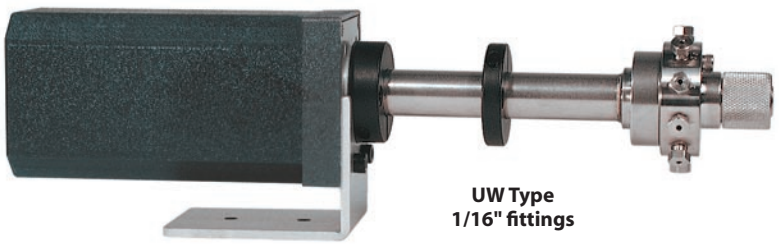
Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Sample loops are not included with valves. Order separately.

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

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

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

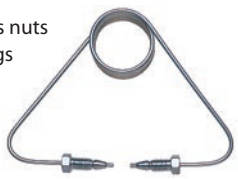


UW Type
1/16" fittings

1/16" Stainless steel loops

for UW Type valves

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



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

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

High Temperature GC

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

W Type

High temp

1/16" **0.40 mm**

Includes 4" standoff

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

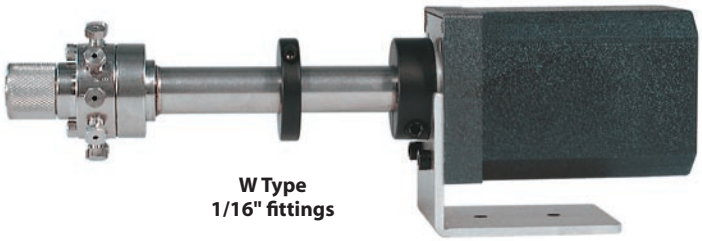
Sample loops are not included with valves. Order separately.

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

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

For 400 psi, 225°C max, see page 106.

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



W Type
1/16" fittings

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Standoff assemblies 205

1/16" Stainless steel loops

for W Type valves

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

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

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

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

UW Type

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

For 400 psi, 225°C max, see page 107.

Includes 4" standoff

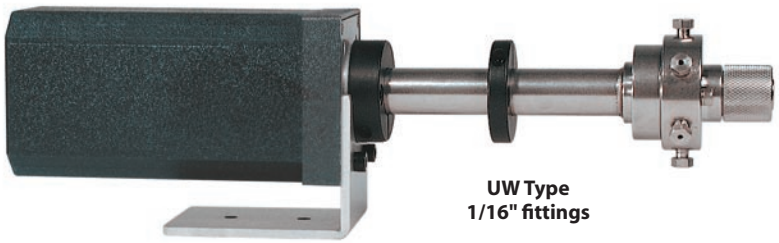
Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Sample loops are not included with valves. Order separately.

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

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

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



UW Type
1/16" fittings

1/16" Stainless steel loops

for UW Type valves

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

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

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

GC

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

UW Type

Med temp

1/8" **0.75 mm**

Includes 4" standoff. Manual version has no standoff.

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

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




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

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

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

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

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

MW Type

Low temp

1/4" **4.0 mm**

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

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

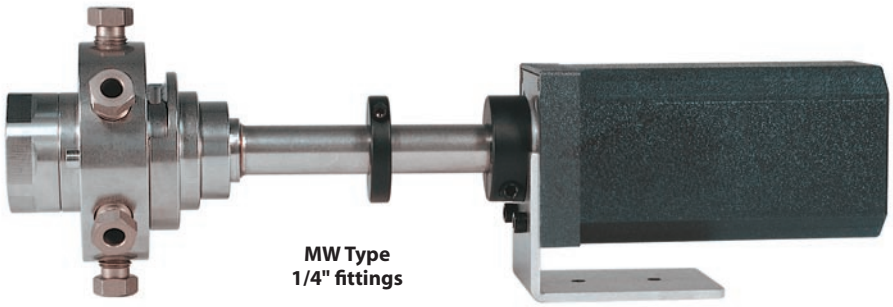
Sample loops are not available.



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

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

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



MW Type
1/4" fittings

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

UW Type

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

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

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

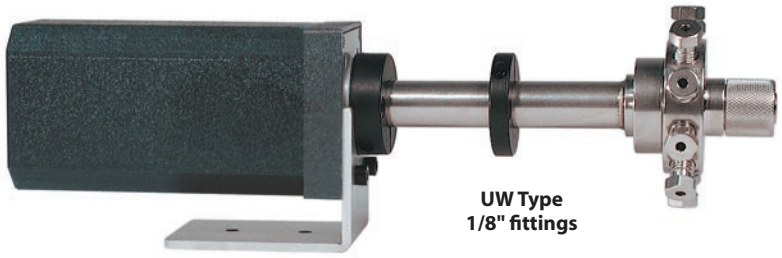
Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply

Sample loops are not included with valves. Order separately.

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

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

	4 Ports		6 Ports		8 Ports		10 Ports	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual with standoff	44UWT		46UWT		48UWT		410UWT	
With air actuator	A44UWT		A46UWT		A48UWT		A410UWT	
With standard electric actuator	E44UWT		E46UWT		E48UWT		E410UWT	
With microelectric actuator	ED44UWT		ED46UWT		ED48UWT		ED410UWT	
Replacement valve	D4UWT		D6UWT		D8UWT		D10UWT	
Replacement rotor	SSA4UWT		SSA6UWT		SSA8UWT		SSA10UWT	



UW Type
1/8" fittings

MORE INFORMATION

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

1/8" Stainless steel loops

for UW Type valves

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

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

HPLC Injectors

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

W Type

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

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

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

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

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

W Type
1/16" fittings

UW Type
1/16" fittings

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

UW Type

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

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

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

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

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

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

W Type

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

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

Sample loops are not included with valves. Order separately.

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

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

	4 Ports		6 Ports		8 Ports		10 Ports	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	C4W		C6W		C8W		C10W	
With air actuator	AC4W		AC6W		AC8W		AC10W	
With standard electric actuator	EC4W		EC6W		EC8W		EC10W	
With microelectric actuator	EPC4W		EPC6W		EPC8W		EPC10W	
Replacement valve	DC4W		DC6W		DC8W		DC10W	
Replacement rotor	SSAC4W		SSAC6W		SSAC8W		SSAC10W	

W Type
1/16" fittings

MORE INFORMATION

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

1/16" Stainless steel loops

for W Type valves

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

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

Semi-Preparative HPLC

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

UW Type

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

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

Sample loops are not included with valves. Order separately.

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

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

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

UW Type
1/16" fittings

1/16" Stainless steel loops

for UW Type valves

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

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

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

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

UW Type

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

Manual 10 port includes 2" standoff.

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

Sample loops are not included with valves. Order separately.

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

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

4 Ports

	Prod No	*Price*
Manual	4UW	
With air actuator	A4UW	
With standard electric actuator	E4UW	
With microelectric actuator	ED4UW	
Replacement valve	D4UW	
Replacement rotor	SSA4UW	

6 Ports

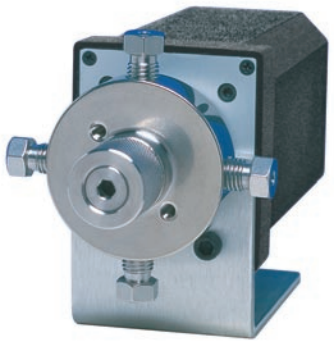
	Prod No	*Price*
Manual	6UW	
With air actuator	A6UW	
With standard electric actuator	E6UW	
With microelectric actuator	ED6UW	
Replacement valve	D6UW	
Replacement rotor	SSA6UW	

8 Ports

	Prod No	*Price*
Manual	8UW	
With air actuator	A8UW	
With standard electric actuator	E8UW	
With microelectric actuator	ED8UW	
Replacement valve	D8UW	
Replacement rotor	SSA8UW	

10 Ports

	Prod No	*Price*
Manual	210UW	$720
With air actuator	A10UW	
With standard electric actuator	E10UW	1200
With microelectric actuator	ED10UW	1430
Replacement valve	D10UW	
Replacement rotor	SSA10UW	



UW Type
1/8" fittings

MORE INFORMATION

Actuators
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Manual 204
Microelectric . . 188-189
Standard elec. 193
Materials
Metals. 254-255
Polymers 256
Valve rotors. 257
Standoff assemblies 205

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

1/8" Stainless steel loops

for UW Type valves

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

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

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

Preparative HPLC

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

UW Type

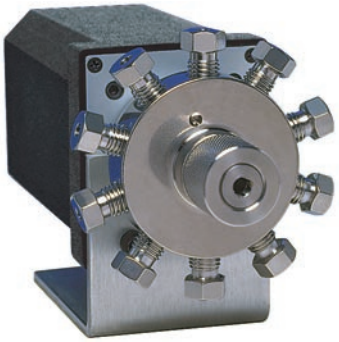
5,000 psi
Prep
1/8" **Large bore**

Manual 10 port includes 2" standoff.

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

Sample loops are not included with valves. Order separately.

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



UW Type
1/8" fittings

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

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

MORE INFORMATION
Actuators
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Manual 204
Microelectric . . 188-189
Standard elec. 193
Materials
Metals 254-255
Polymers 256
Valve rotors. 257
Standoff assemblies 205

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

1/8" Stainless steel loops

for UW Type valves

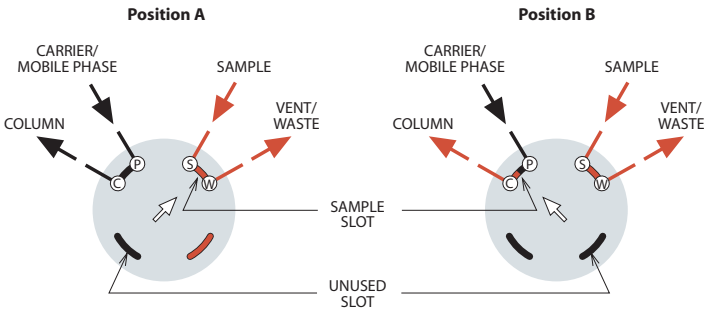
Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately.

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

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

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

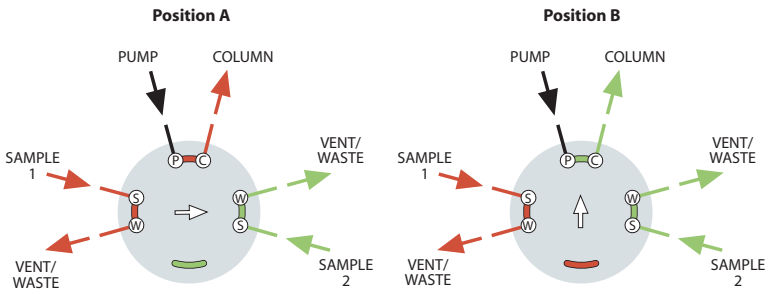
4 port internal sample injector



MICROVOLUME SAMPLE INJECTION

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

6 port internal sample injector



DUAL MICROVOLUME SAMPLE INJECTION

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

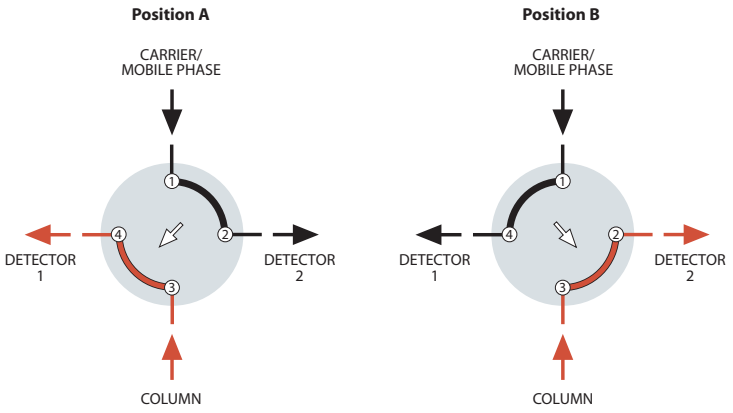
Note: This CI6 valve is not shown in this catalog. Call for details.

Two Position Applications

4 port switching valve

DETECTOR SELECTION FROM TWO COLUMNS OR ONE COLUMN AND AUXILIARY CARRIER

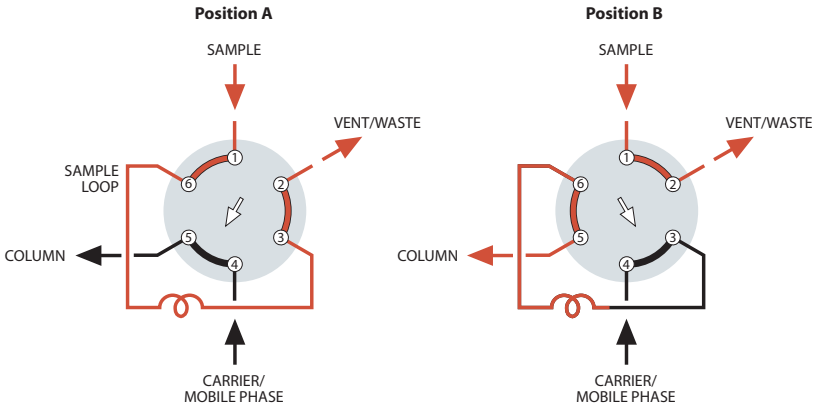
This unique configuration allows analyses of different parts of one analysis with two different detectors, without splitting or multiple injections. For example, fixed gases can be analyzed with a thermal conductivity detector, followed by the analysis of a hydrocarbon fraction with a flame ionization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



6 port external sample injector

SAMPLE INJECTION

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

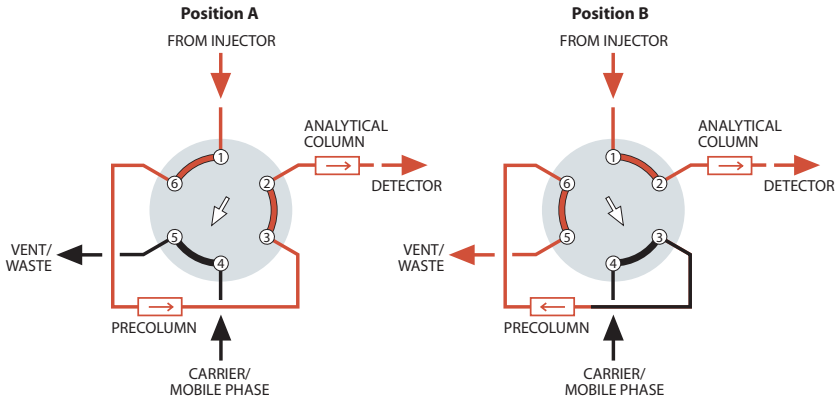


6 port column switching

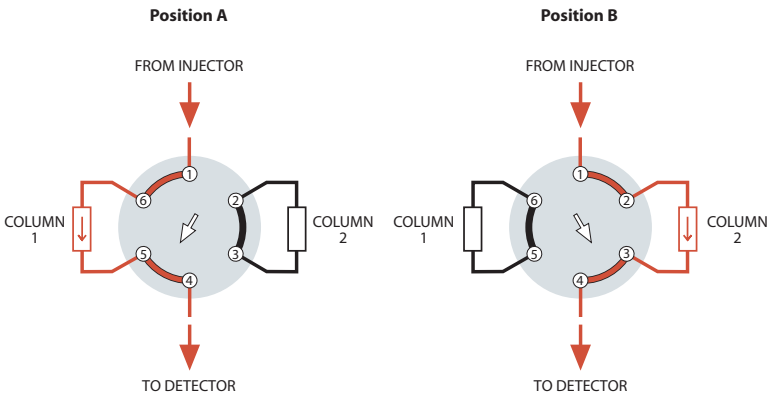
BACKFLUSH OF PRECOLUMN TO VENT

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

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



6 port column selection

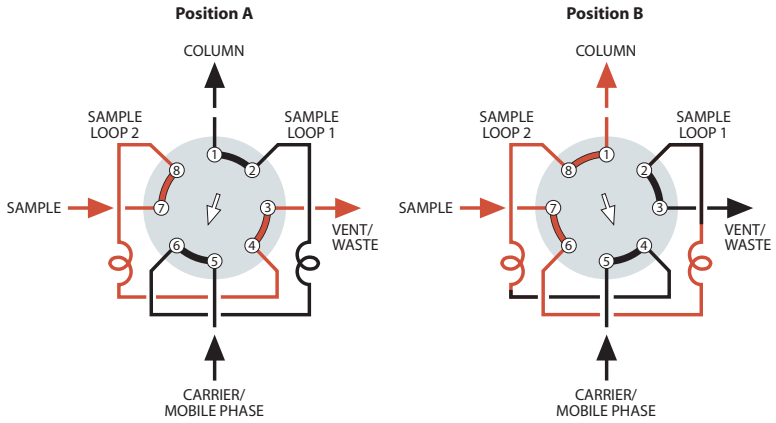


TWO COLUMN SELECTION

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

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

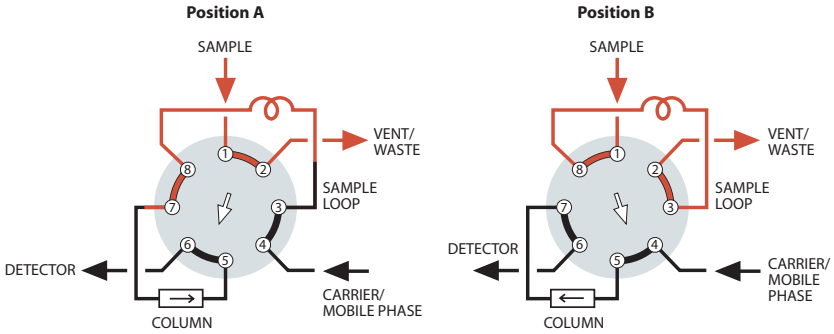
8 port dual external sample injector



SAME SAMPLE TO DIFFERENT LOOPS

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

8 port sampling/switching



LOOP SAMPLING WITH BACKFLUSH TO DETECTOR

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

Two Position Applications

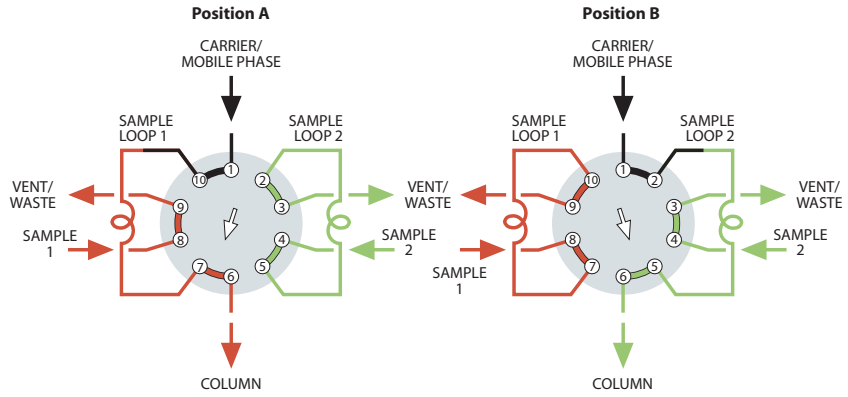
10 port dual external sampling

TWO DIFFERENT SAMPLES TO SAME COLUMN

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

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

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

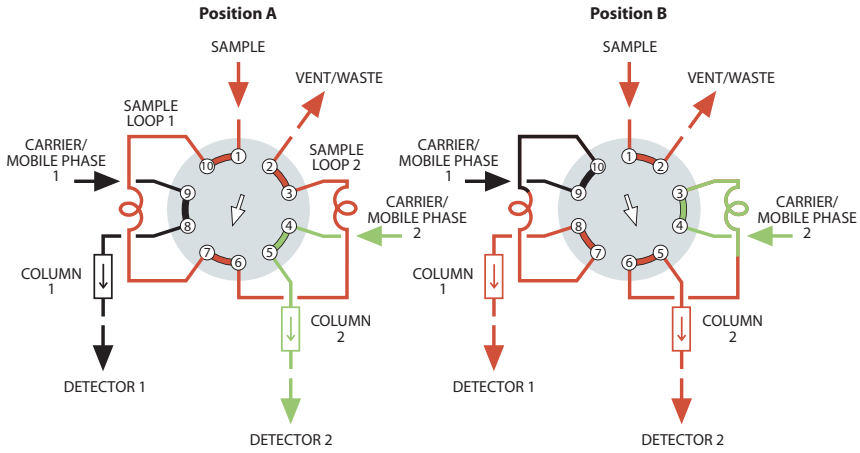


10 port dual external sampling

SIMULTANEOUS INJECTION OF THE SAME SAMPLE ONTO SEPARATE COLUMNS

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

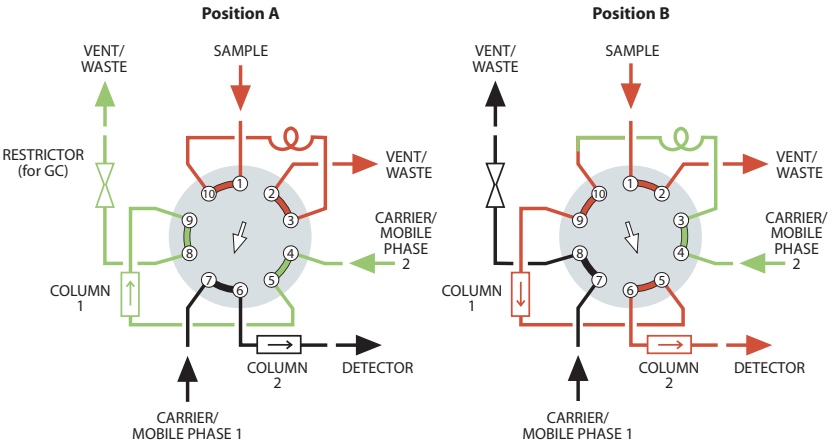
In an important non-chromatographic application, the roles of carrier and sample are reversed, permitting two different quantities of two different materials to be dispensed together, as in automatic dilution.



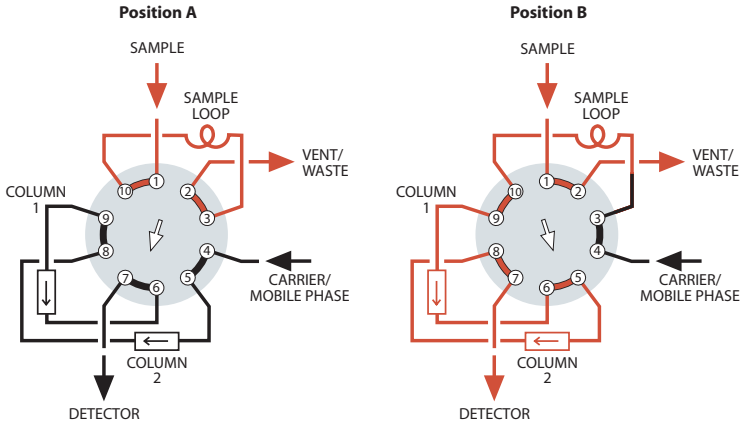
10 port sampling/switching

LOOP SAMPLING WITH BACKFLUSH OF PRE-COLUMN TO VENT

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



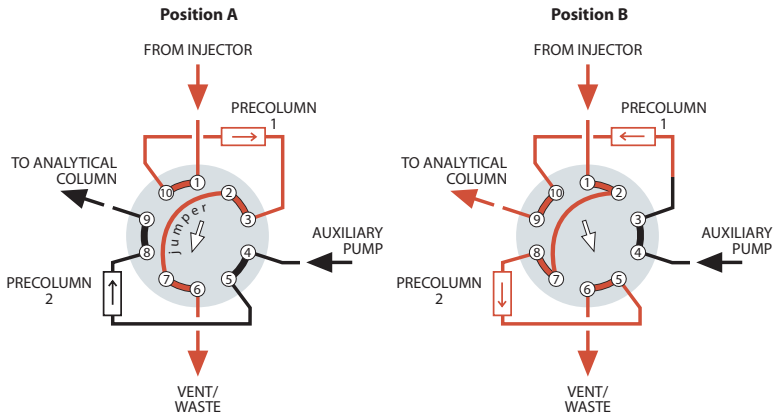
10 port sampling/switching



LOOP SAMPLING WITH TWO COLUMN SEQUENCE REVERSAL

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

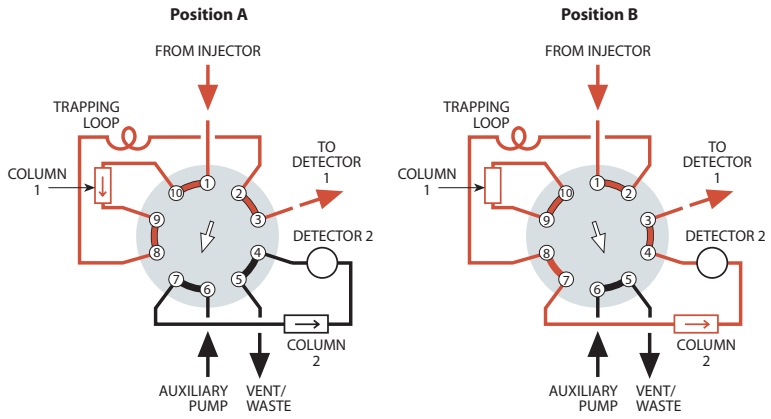
10 port column switching



SAMPLE ENRICHMENT (CLEANUP) USING DUAL PRECOLUMNS

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

10 port column switching



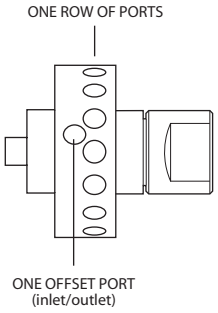
HEART CUT TRAPPED IN A LOOP AND INJECTED ONTO A SECOND COLUMN

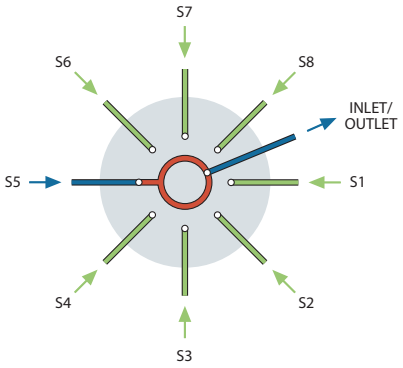
Sample is injected (using a separate injector) onto an analytical column. Early eluting components (front cut) pass through a trapping loop and are detected (at port 3). The valve is then switched, and the center (or heartcut) which was retained in the trapping loop is injected onto the second column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

Selectors – Low Pressure

Dead-end flowpath – SD configuration

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





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

MW Type

Low pressure

SD Dead-end

1/16" **0.75 mm**

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

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

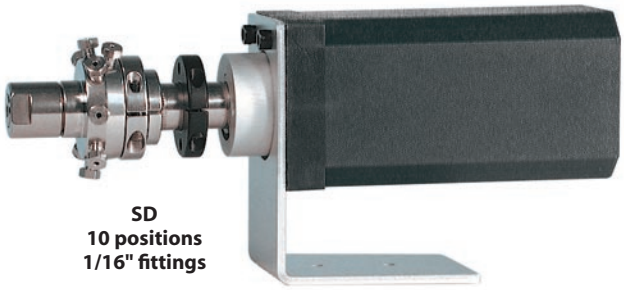
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

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

OPTIONS

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

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



SD
10 positions
1/16" fittings

MORE INFORMATION

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

MW Type

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

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

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

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

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

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

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

MW Type

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

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

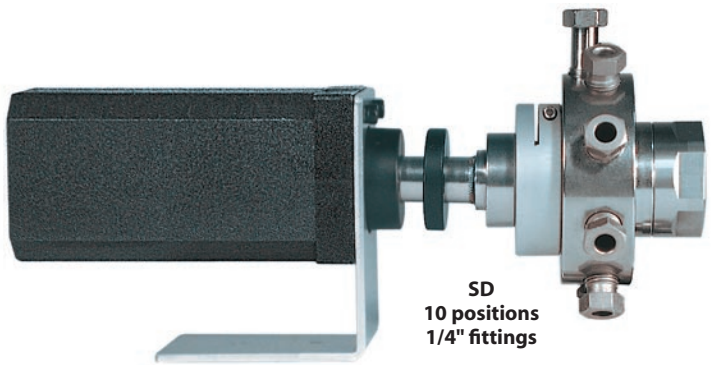
Manual version not available.

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

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

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

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

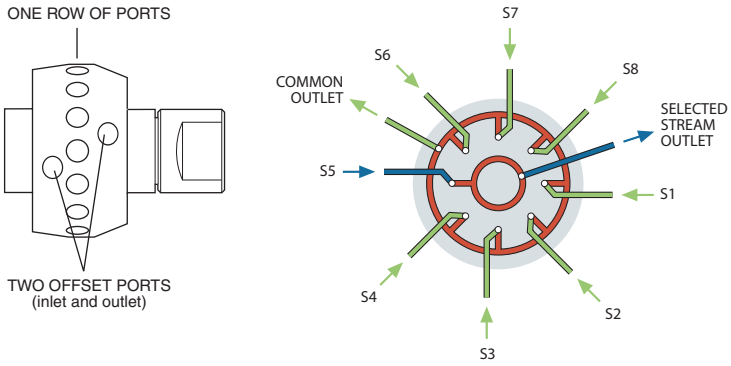


SD
10 positions
1/4" fittings

Selectors – Low Pressure

Common outlet flowpath – SC configuration

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



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

MW Type

Low pressure

SC Common outlet

1/16" **1.0 mm**

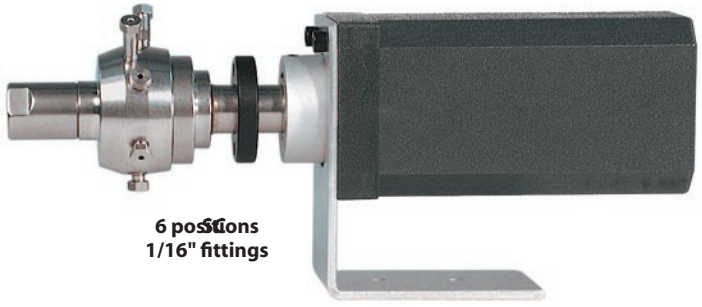
Includes 2" standoff. Ask about closemount assembly if valve will not be heated.

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

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

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

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



6 positions
1/16" fittings

MORE INFORMATION

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

MW Type

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

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

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

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

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

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

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

MW Type

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

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

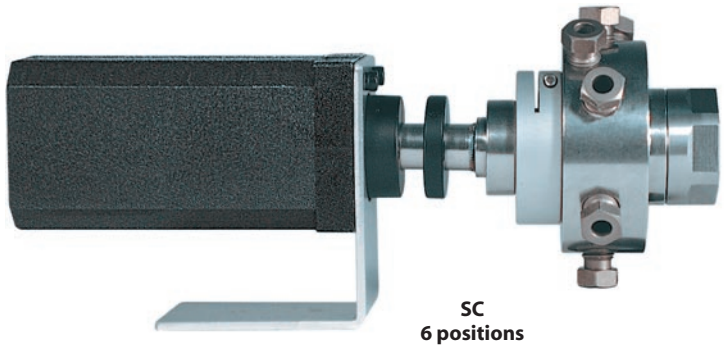
Manual version not available.

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

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

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

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

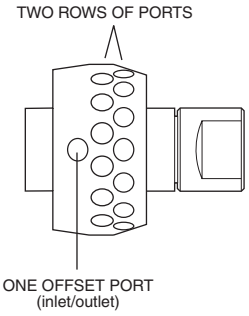


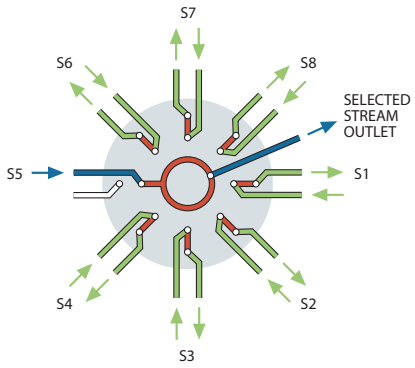
SC
6 positions
1/4" fittings

Selectors – Low Pressure

Flow-through flowpath – SF configuration

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





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

Low pressure
SF Flow-through
1/16" **1.0 mm**

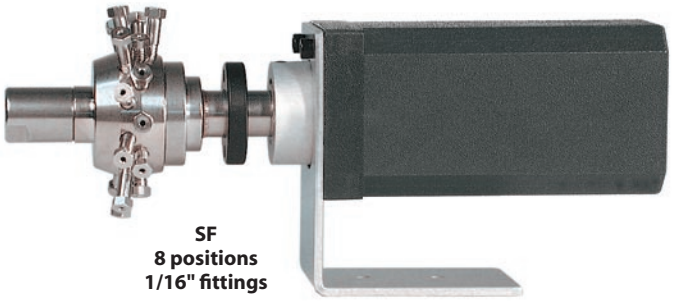
Includes 2" standoff.
Ask about closemount assembly if valve will not be heated.

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

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

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

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



SF
8 positions
1/16" fittings

MORE INFORMATION

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

MW Type

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

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

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

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

OPTIONS

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

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

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

MW Type

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

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

Manual version is not available.

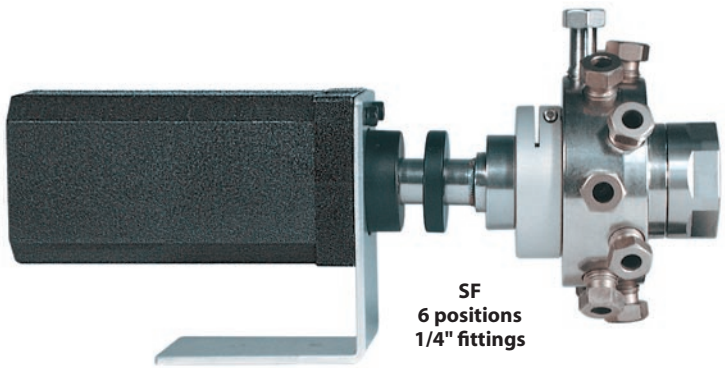
Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

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

OPTIONS

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

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

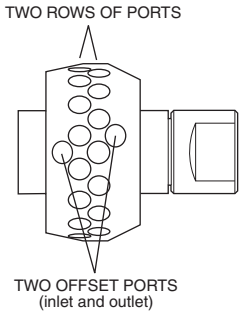


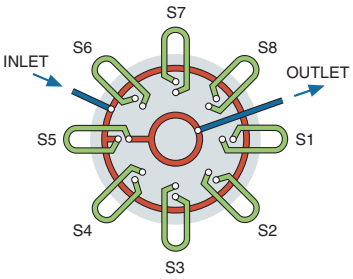
SF
6 positions
1/4" fittings

Selectors – Low Pressure

Trapping flowpath – ST configuration

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





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

MW Type

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

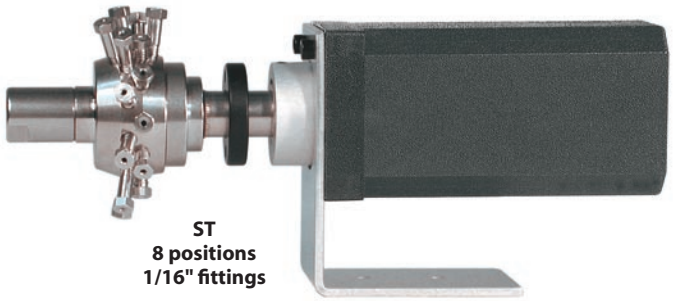
Includes 2" standoff. Ask about closemount assembly if valve will not be heated.

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

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

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

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



ST
8 positions
1/16" fittings

1/16" Stainless steel loops

for MW Type valves

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

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

MORE INFORMATION

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

MW Type

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

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

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

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

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

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

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

1/8" Stainless steel loops

for MW Type valves

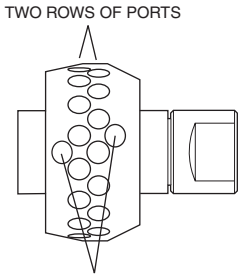
Each stainless steel loop includes two stainless nuts and two stainless ferrules. Order special fittings separately. When a set of loops is ordered, loops will be supplied from the same lot.

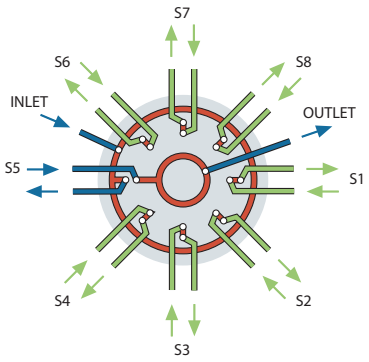
Volume	*Prod No*	*Price*	*Volume*	*Prod No*	*Price*
100 µl	SL100STP		1 ml	SL1KSTP	
250 µl	SL250STP		2 ml	SL2KSTP	
500 µl	SL500STP		5 ml	SL5KSTP	
			10 ml	SL10KSTP	

Selectors – Low Pressure

Trapping/flow-through flowpath – STF configuration

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





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

MW Type

Low pressure

STF Trap/ flow-throw

1/16" **0.75 mm**

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

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

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

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

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

MORE INFORMATION

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

MW Type

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

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

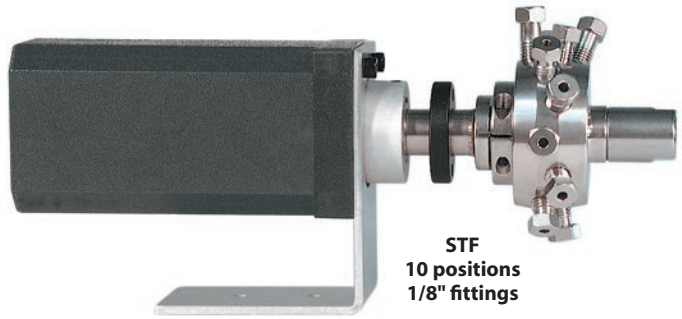
Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

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

OPTIONS

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

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

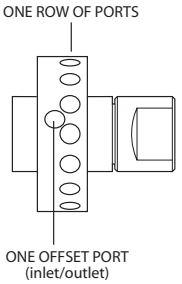


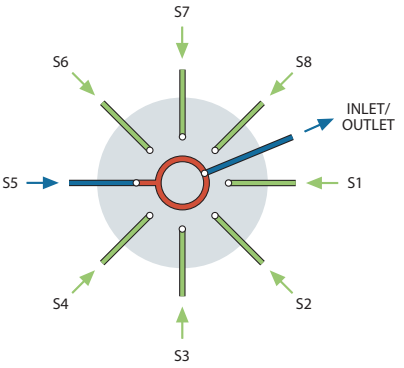
STF
10 positions
1/8" fittings

Selectors – High Pressure

Dead-end flowpath – SD configuration

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





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

UW Type

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

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

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

OPTIONS

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

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

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

UW Type

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

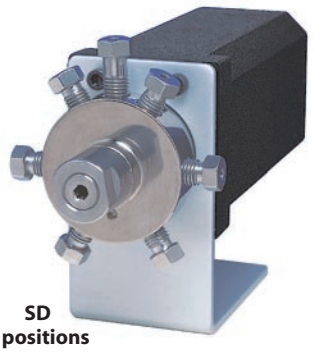
Standard electric actuators:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international
Microelectric actuators:
24 VDC (includes a 110/230 VAC to 24 VDC power supply)

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

OPTIONS

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

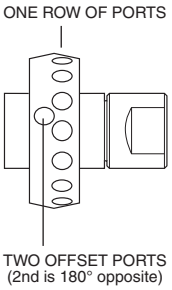
	4 Position		6 Position		8 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual (not recommended)	SD4UW		SD6UW		SD8UW	
With air actuator	ASD4UW		ASD6UW		ASD8UW	
With standard electric actuator	ESD4UW		ESD6UW		ESD8UW	
With microelectric actuator	EMTSD4UW		EMTSD6UW		EMTSD8UW	
Replacement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

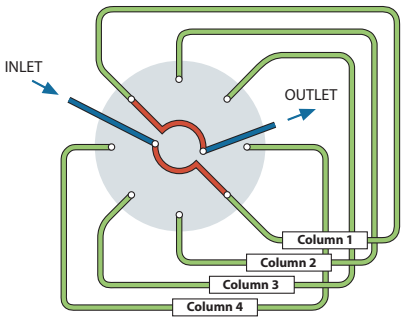


SD
6 positions
1/8" fittings

Both column ends selected – ST configuration

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





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

UW Type

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

Manual versions are not available.

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

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

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

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

ST
4 position
1/16" fittings

MORE INFORMATION

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

1/16" Stainless steel loops

for UW Type valves

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

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

Selector Applications

SD flowpath — low pressure

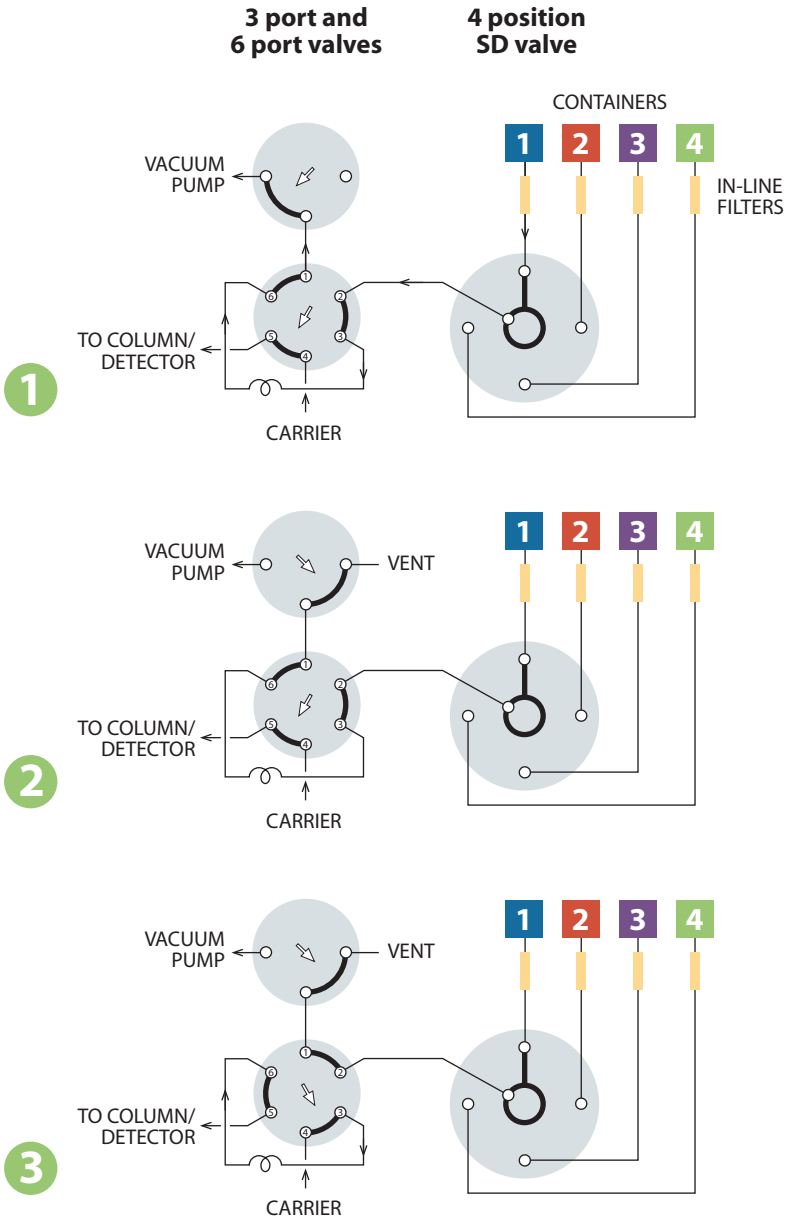
STREAM SELECTION WITH DEAD-ENDED STREAMS

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

This example illustrates automated sampling of non-pressurized containers.

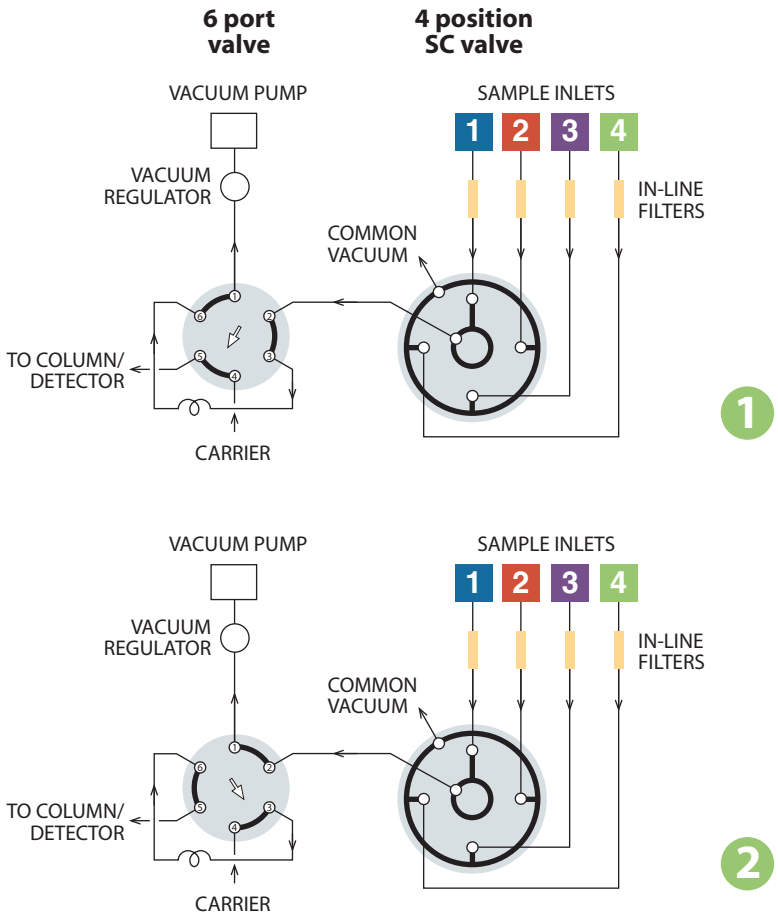
1 A vacuum pump is used to move sample from the containers to a 6 port sampling valve. 2 The 3 port valve is used to block the vacuum flow through the sampling valve to allow the sample within the loop to equilibrate at atmospheric pressure. 3 The 6 port valve is then switched, injecting the sample.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

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



MORE INFORMATION

SC flowpath



STREAM SELECTION WITH CONTINUOUS FLOW TO A COMMON OUTLET

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

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

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

TECH TIP

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

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

Filters ..... pages 52

MORE INFORMATION

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

Selector Applications

SF flowpath

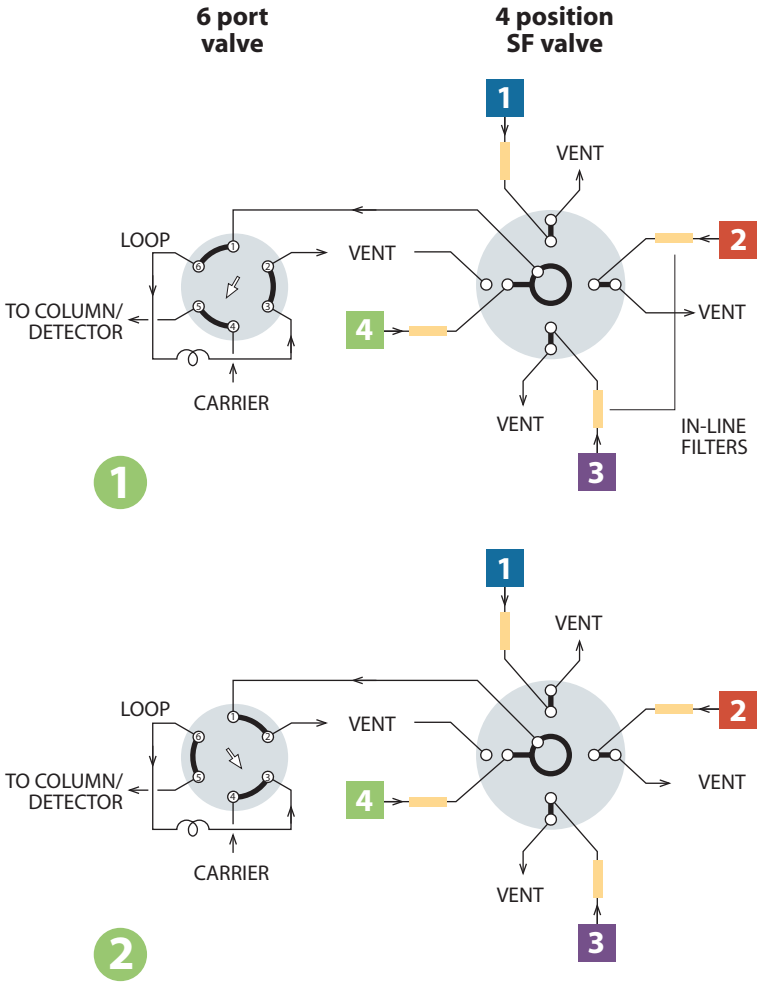
STREAM SELECTION WITH CONTINUOUS FLOW TO INDIVIDUAL OUTLETS

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

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

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

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

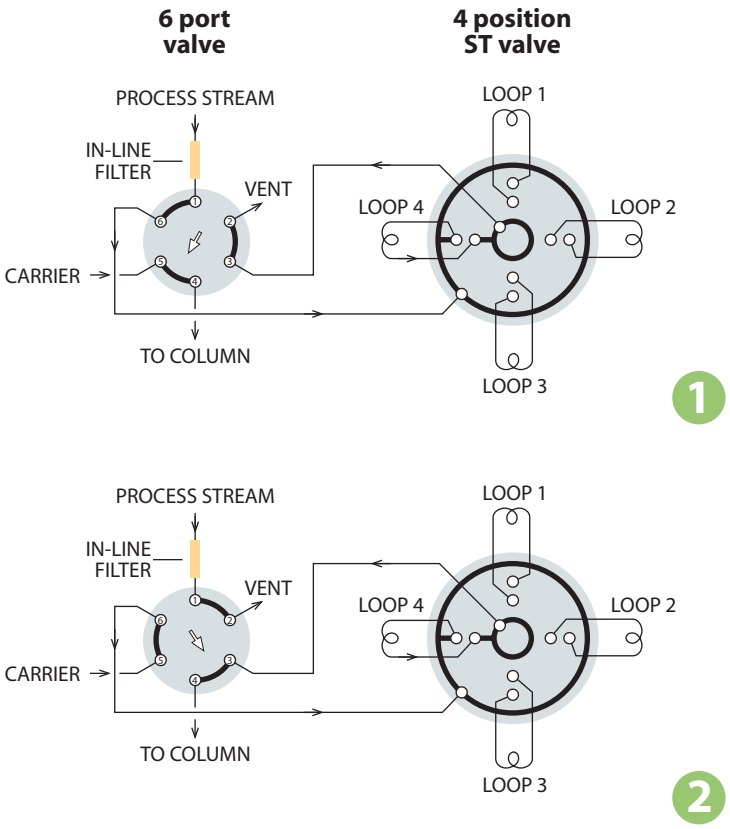


MORE INFORMATION

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

SF prices
..... 126-127

ST flowpath — low pressure



SAMPLE TRAPPING APPLICATIONS FOR 4 TO 16 STREAMS

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

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

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

MORE INFORMATION

ST prices
Low pressure .. 128-129
High pressure 133
Application
High pressure ST ...139

TECH TIP

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

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

Filters ..... page 52

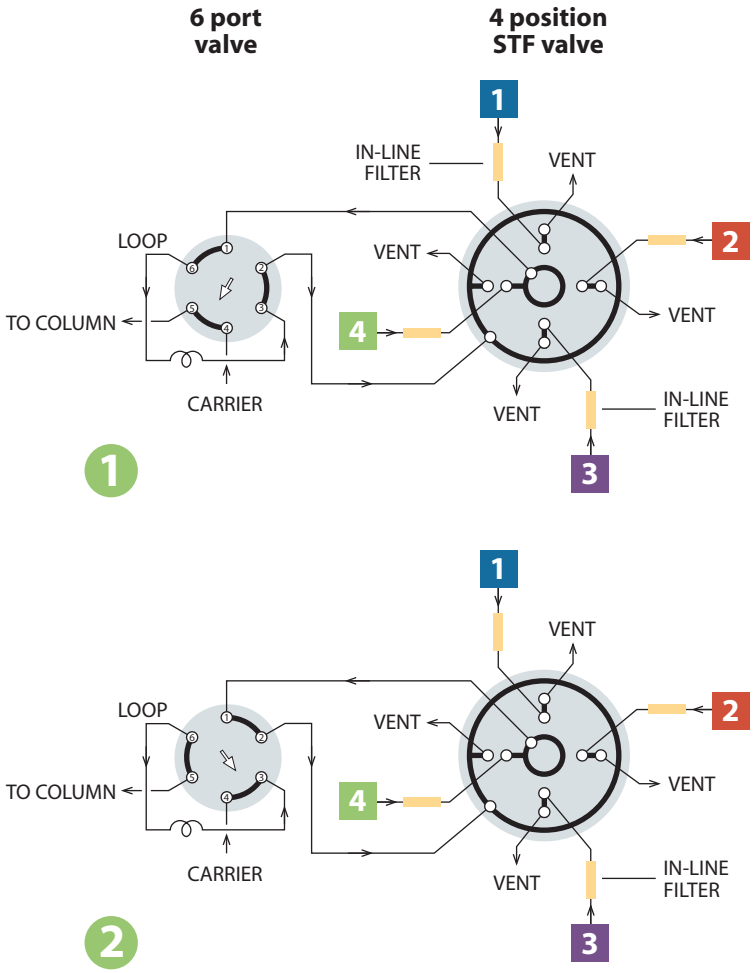
Selector Applications

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.



MORE INFORMATION

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

STF prices 130-131

TECH TIP

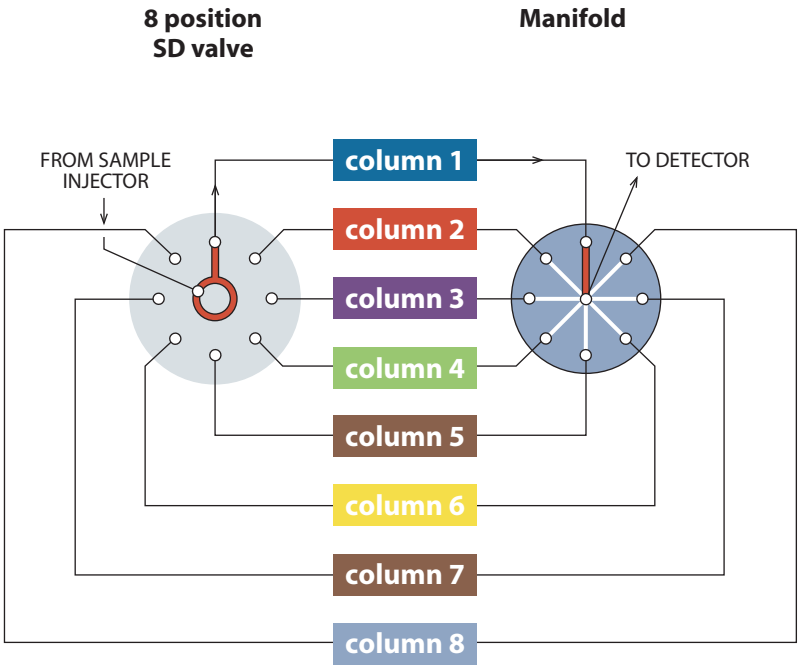
Because the most common cause of valve failure is stray particulates entering the valve, we strongly recommend the use of in-line filters at sample entry points.

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

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

Filters ..... page 52

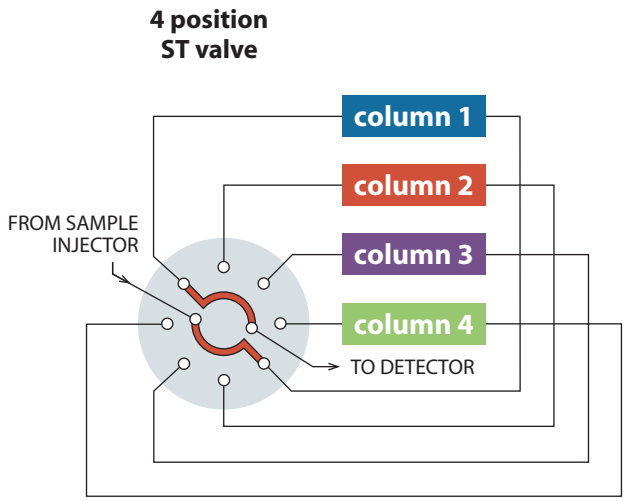
SD flowpath — high pressure



HPLC COLUMN SELECTION FOR UP TO 10 COLUMNS

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

ST flowpath — high pressure



HPLC COLUMN SELECTION FOR 4 OR 6 COLUMNS

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

MORE INFORMATION

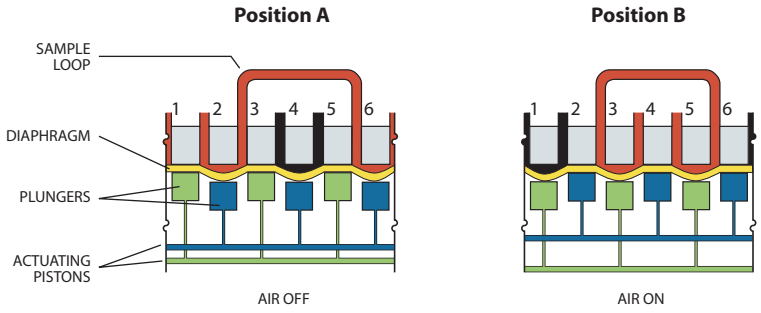
Diaphragm Valves

- 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.



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

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

Dimensions

Valve diameter is 35 mm (1.375"), height is 42 mm (1.625"), and weight is less than 255 g (9 oz).

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.

Temperature/Pressure Specifications

The standard valve can be operated at temperatures up to 175°C, at 300 psi. The specially-formed diaphragm also permits sampling at subambient pressures.

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.

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 information box below.

MORE INFORMATION

Materials
Metals..... pp 254-255

Valve descriptions
Cheminert injectors and valves 144-149
Cheminert selectors ..144, 150-151
Valco injectors and valves 96-99
Valco selectors .. 100-101

Valve prices
Cheminert HPLC. 152-163
Cheminert low pressure..... 164-167
Cheminert selectors 170-177
Valco GC 102-111
Valco HPLC..... 112-116
Valco selectors .. 122-133

ACTUATION
A 3-way solenoid is required for actuation.

31E1-120VAC	$120
31E1-220VAC	120

Ordering Information

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.

4 port
.5 µl internal sample

Prod No	*Price*
DV12-1114-.5	

4 port
1 µl internal sample

Prod No	*Price*
DV12-1114-1	

6 port
sampling/switching

Prod No	*Price*
DV12-1116	

10 port
multifunctional

Prod No	*Price*
DV12-1110	

SPECS
Internal sar
750 psi liq
50°C max
Sampling/switching:
300 psi gas
175°C max
Nitronic 60 valve body
Polyimide diaphragm

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

4 port
.5 µl internal sample

Prod No	*Price*
DV22-2114-.5	

4 port
1 µl internal sample

Prod No	*Price*
DV22-2114-1	

6 port
sampling/switching

Prod No	*Price*
DV22-2116	

10 port
multifunctional

Prod No	*Price*
DV22-2110	

SPECS
Internal sample:
750 psi liq
50°C max
Sampling/switching:
300 psi gas
175°C max
Nitronic 60 valve body
Polyimide diaphragm

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.

4 port
.5 µl internal sample

Prod No	*Price*
DV22-3114-.5	

4 port
1 µl internal sample

Prod No	*Price*
DV22-3114-1	

6 port
sampling/switching

Prod No	*Price*
DV22-3116	

10 port
multifunctional

Prod No	*Price*
DV22-3110	

SPECS
Internal sample:
750 psi liq
50°C max
Sampling/switching:
300 psi gas
175°C max
Nitronic 60 valve body
Polyimide diaphragm

6 port
1/16" fittings

1/16" Stainless steel loops *for DV valves*

Each loop includes two stainless steel nuts and ferrules.
Order special fittings separately.
For 1/32" loops, use NW loops *(page 104)*.

Volume	*Prod No*	*Price*
2 µl	CSL2	
5 µl	CSL5	
10 µl	CSL10	
20 µl	CSL20	
50 µl	CSL50	
100 µl	CSL100	

Volume	*Prod No*	*Price*
250 µl	CSL250	
500 µl	CSL500	
1 ml	CSL1K	
2 ml	CSL2K	
5 ml	CSL5K	
10 ml	CSL10K	

Replacement diaphragms

Description	*Prod No*	*Price*
Polyimide diaphragm		
for .010" or .016"	DV22-21D	
for .030"	DV22-31D	
PTFE diaphragm	DV22-22D	

MORE INFORMATION
More applications . . pp 117-121

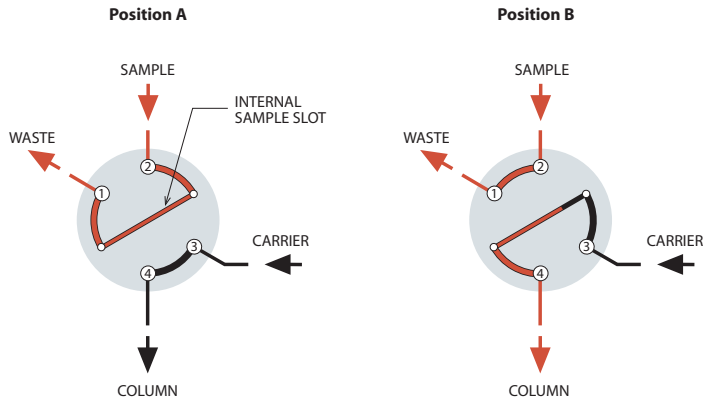
OPTIONS
- Mounting kit
  Use this ring to attach diaphragm valves to a surface.

Prod No	*Price*
DVBRKIT	$20

- Materials:
  Hastelloy C
  Type 316 stainless

For more information, refer to the metals discussion on pages 254-255 .

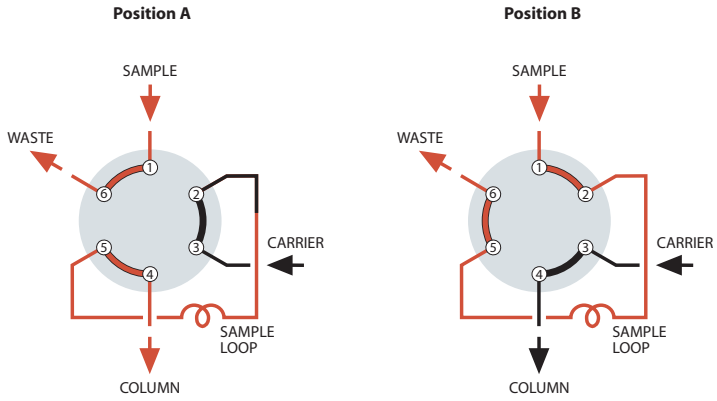
4 port sample injector



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



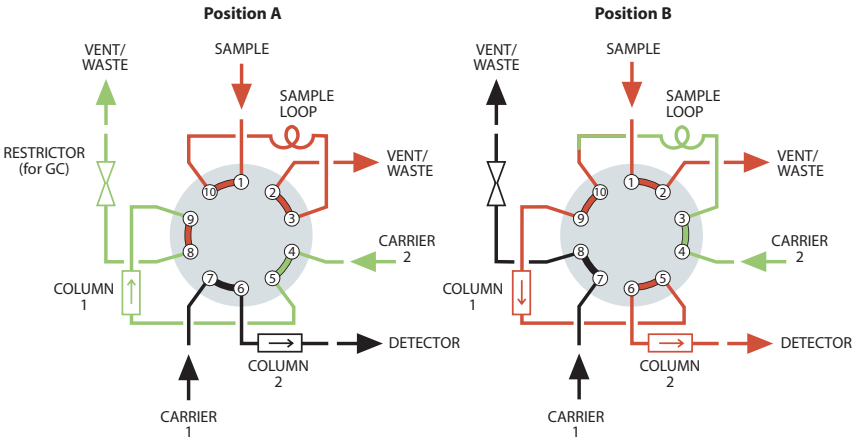
SAMPLE INJECTION

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 INFORMATION

More applications .....pages 118-119

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 INFORMATION

More applications .....pages 120-121

Cheminert® Injectors and Valves

- Pressure ratings from 100 psi to 20,000 psi
- Inert, biocompatible construction
- Easy field service
- Automated operation – pneumatic or electric
- 4, 6, 8, and 10 port and internal sample two position models
- Multiposition stream selection versions with up to 26 positions

Design

The basic Cheminert design involves a flat rotor which is engraved with slots which connect the ports. A stator is held at a constant, preset force against the rotor. When repairs are required, all that is necessary for rotor access is the removal of two or three screws. Remove the old rotor and replace it, put the screws back in and tighten them, and the valve is ready for use at the factory-set pressure specification. No adjustments are possible, much less required. Other advantages of the design include easy panel mounting, low actuating torque, and compact size. The flat plate design offers flow paths for basic flow switching, sample injection, and stream selection up to 10 positions (26 positions in some models).

Two position valve descriptions, product numbers, and prices begin on page 146.

Selector (multiposition valve) information may be found on pages 150-151.

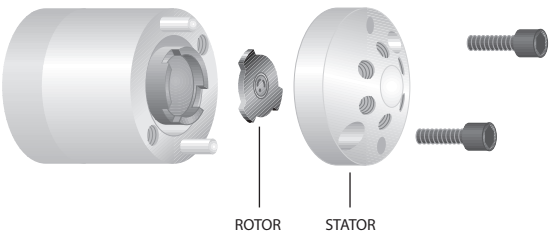
OEM injectors and selectors are on pages 178-185.

Materials of Construction

UHPLC models have stators of specially coated stainless steel, with PAEK rotors. **HPLC** models have stators of Nitronic 60 stainless steel, PAEK, Hastelloy C, or titanium, all of which are compatible with common HPLC solvents. Many are available with a proprietary long-life coating. Valcon H rotors are used with metal stators, and Valcon E with PAEK. **Low pressure** models have PPS stators and rotors of Valcon E2, a proprietary reinforced PTFE composite.

Metal valves are supplied with stainless nuts, with ferrules of the same material as the stator. Fittings for polymeric valves vary with the valve design. The valve price lists contain more detailed information.

Sample injection loops are available in a variety of materials, and are found on the pages with their corresponding valves.



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

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

Injectors and Switching Valves

The applications section beginning on pages 168-169 gives an overview of the many functions which can be performed by two position valves. 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 illustrates, 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 used for backflushing or column switching.

One more variation is the 4 port internal sample injector, 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, sized to contain a specified amount of sample.

All these valves (except manual Models C1 and C1CF) are compatible with all VICI actuation options, with position feedback available for manual valves.

Stream Selectors (Multiposition Valves)

Selectors move in continuous revolutions by incremental steps, unlike the back and forth switching of two position valves. Each step selects one of 4 to 26 streams, directing it through the valve outlet to a sample valve, pressure sensor, detector, column, etc. The same valve can also direct one stream to a number of outlets for fraction collection.

In the standard models, the non-selected streams are dead-ended. However, some valves can be ordered with an optional rotor that returns each stream to its source. Consult the factory for more information.

MORE INFORMATION

Nanovolume® HPLC Injectors and Switching Valves

Cheminert nanovolume injectors and switching valves are ideal for high speed, high throughput techniques which demand a valve and fitting system that minimize internal volume and eliminate dead volume. A proprietary rotor material and stator coating achieve pressures to 20,000 psi, suitable for the most demanding analytical techniques. All models are compatible with any VICI actuation option.

NEW Injectors with 360 micron fittings, 100 or 150 micron bore

Models C72MU and C72MX p. 152

- 360 µm Cheminert fittings
- Choice of 100 or 150 µm flowpath
- 10,000, 15,000, and 20,000 psi versions
- 4, 6, 8, or 10 ports (4 or 6 in 20,000 psi versions)
- Coated stator

These injectors incorporate our unique fittings which permit direct connection of 360 micron OD fused silica, PEEK, stainless, or electroformed nickel tubing.

Injectors with 1/32" Cheminert fittings, 100 micron bore

Models CN2 and CN4 pp. 154-155

- 1/32" Cheminert fittings
- 100 or 150 µm flowpath
- 5,000 psi rating
- 6 or 10 ports
- Internal sample version with sample size of 4, 10, or 20 nanoliters
- Uncoated PAEK stator

Injectors with 1/32" Valco fittings, 100 or 150 micron bore

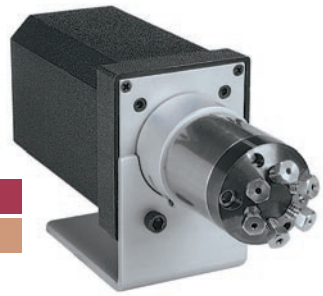
Models C72NX and C74NX p. 153

- 1/32" Valco fittings
- Choice of 100 or 150 µm flowpath
- 10,000, 15,000, and 20,000 psi versions
- 4, 6, 8, or 10 ports (4 or 6 in 20,000 psi versions)
- Internal sample version with sample size of 4, 10, or 20 nanoliters
- Coated stator

Selectors with 1/32" or 1/16" Valco fittings, 100 - 250 micron bore

Model C75NX p. 170
Model C75H p. 171

- 1/32" or 1/16" Valco fittings
- 150 or 250 µm flowpath
- 10,000, 15,000, and 20,000 psi versions
- 4, 6, 8, or 10 ports (4 or 6 in 20,000 psi versions)
- Coated stator



Model C72
page 156
15,000 psi
10,000 psi

NEW UHPLC Injectors and Switching Valves

New this year from VICI are UHPLC **Models C72X** and **C72H** valves, with pressure ratings of 15,000 psi and 10,000 psi, respectively. They can be used as injectors or switching valves.

Microbore **Models C74X** and **C74H** are equivalent internal volume sample injectors, with sample sizes ranging from 4 nanoliters to 50 nanoliters.

HPLC Injectors and Switching Valves

Model C2
Microbore, page 158
Analytical, page 161
5,000 psi

Microbore

Model C2 valves can be used as injectors or switching valves.

Model C4 is an internal volume sample injector with sample sizes ranging from 10 nl to 50 nl.

Model C6 continuous flow injector is designed to maintain pump flow during most of the switching cycle, virtually eliminating pressure spikes.

Model C1 is a through-the-handle (front-loading) injector designed for direct replacement of existing competitive models. All Model C1 injectors are manual, with position feedback standard.

Model C1CF is a 6 port through-the-handle continuous flow injector. An engraving on the stator maintains pump flow between ports 5 and 4 during most of the switching cycle, virtually eliminating pressure spikes. Because the handle is integral to the design, all Model C1CF valves are manual, with position feedback standard.

Analytical

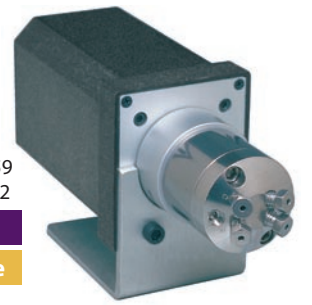
Models C2, C6, and **C1** are also available for analytical injection and switching, with port sizes of 0.40 mm (.016"). **Model C4** offers internal volume sample sizes ranging from 0.1 to 0.5 µl.

Semi-Preparative HPLC

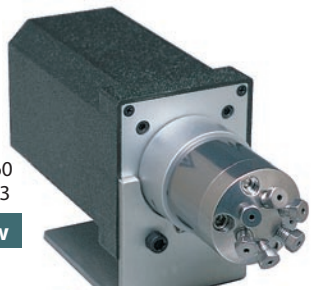
Model C2 valves are available with flow passages optimized for semi-preparative HPLC. Choose from 4, 6, 8, or 10 port versions. Contact our sales or technical support departments for more information.

Autosampler Replacements

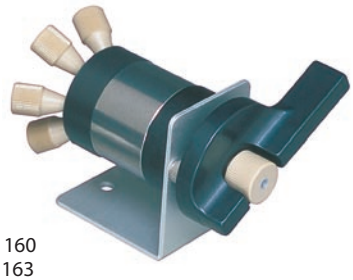
We supply direct replacements for injectors in many popular autosamplers. Call technical support to determine which replacement is best for your application.



Model C4
Microbore, page 159
Analytical, page 162
5,000 psi
Internal sample



Model C6
Microbore, page 160
Analytical, page 163
Continuous flow



Model C1
Microbore, page 160
Analytical, page 163
Through-handle

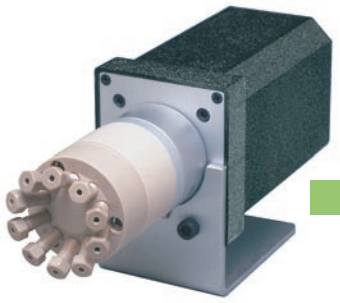
Low Pressure Injectors and Switching Valves

With Valco Zero Dead Volume (ZDV) Fittings

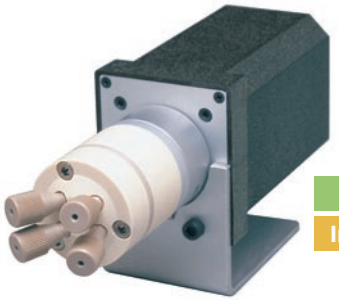
C20Z valves with zero dead volume fittings (10-32 thread) are shipped with standard PEEK nuts and ferrules. Zero dead volume fingertight fittings and nuts and ferrules of other materials may be ordered separately. Standard specifications are 100 psi gas/250 psi liquid at 75°C. On request, the pressure rating can be as high as 600 psi liquid. ***Caution:*** Metal fittings will damage the threads and details of C20Z series valves. Use of metal fittings in a C20Z valve voids the warranty.

The **Model C22Z** is a conventional two position sample injector and switching valve, with 4, 6, 8, or 10 ports. Sample injection requires a loop, ordered separately.

The **Model C24Z** is an internal sample injector, for applications in which the sample size is smaller than that of any available external loop. Sample sizes available are 0.2, 0.5, and 1 µl.



Model C22Z
page 164
10-32 ZDV



Model C24Z
page 166
10-32 ZDV
Internal sample

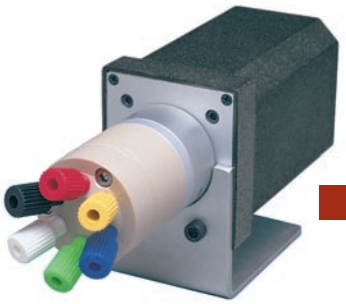
With Cheminert 1/4-28 Fittings

C20 Series valve caps have female threads for direct connection of lines – no couplings are required. C20 Series valves are available in 4, 6, 8, and 10 port versions. Standard specifications are 100 psi gas/250 psi liquid at 75°C.

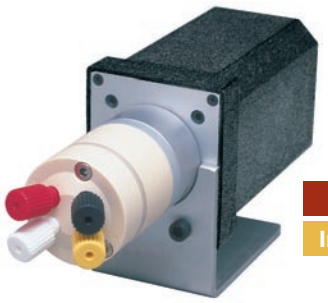
Multicolored Cheminert 1/4-28 flangeless fittings for 1/16" or 1/8" OD tubing (depending on the valve model) are included.

Model C22 valves are used for sample injection or switching. (Functionally equivalent to Model C22Z) Sample injection requires a loop, ordered separately.

The **Model C24** is an internal sample injector like the C24Z, available with 0.5, 1.0, or 2.0 µl sample size.



Model C22
page 165
1/4-28 Int.

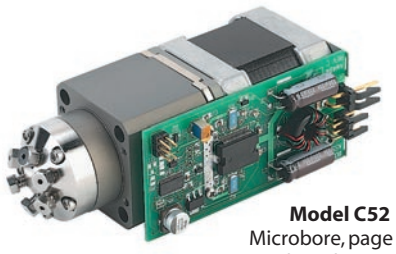


Model C24
page 167
1/4-28 Int.
Internal sample

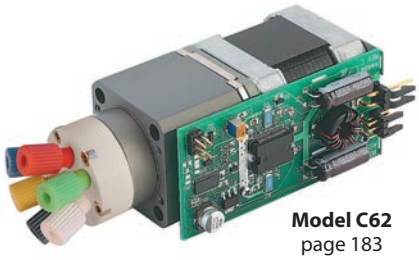
CAUTION
Metal fittings will damage the threads and details of C20Z series valves (models C22Z, C24Z, C25Z). Use of metal fittings in a C20Z valve voids the warranty.

TECH TIP
Our life tests indicate that these valves will typically give more than 100,000 cycles before requiring any service. This assumes that the fluid used is free of particulates and not reactive toward the valve components. If the stream may contain particulates, or if it has high salt content which could precipitate within the sample lines, use an in-line filter.
Note: Valves with purge ports are available on request.

Injectors for OEM Applications



Model C52
Microbore, page 178
Analytical, page 180
5,000 psi



Model C62
page 183
Low pressure

NEW Integrated Motor/Injector Assemblies for OEMs

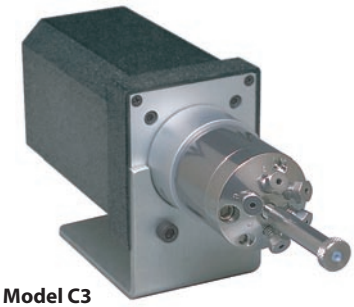
Cheminert's new **Model C52** (HPLC) and **Model C62** (low pressure) injectors are integrated motor/valve assemblies designed specifically to be built into an OEM system. Using the well-proven Cheminert injector designs and the 24 volt motor from our popular microelectric actuators, the C52 and C62 need only to be connected to the instrument's power supply.

Control is simplified to require a single contact closure; the injector's position is determined by whether the closure is held high or low. There's even an easy way for the instrument to confirm the valve's position by sensing the output from a built-in sensor.

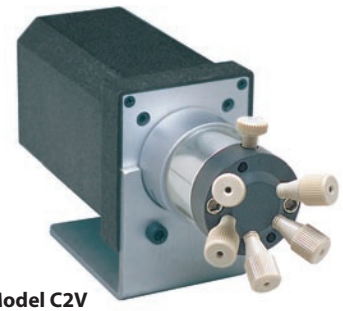
In the default control mode, a contact closure moves the injector from load to inject, where it remains until the contact is broken and the injector reverts to the load position. A simple jumper change shifts the mode to dual contact closure, in which one contact closure shifts the injector to inject and a second is required to shift it back to load. Jumper settings can also be modified to change the motor's degree of rotation so it can be used with any of the valve models available.

All these features are built into a compact and lightweight package and are available in 4, 6, 8, and 10 port configurations.

Autosampler and Other OEM Injectors



Model C3
Microbore, page 179
Analytical, page 181
Centered port

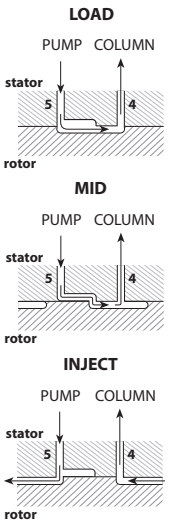


Model C2V
Microbore, page 179
Analytical, page 181
Vertical port

Model C3 is a unique injector with a syringe injection port centered on the rear face of the valve (opposite the handle or actuator), allowing convenient syringe insertion when the valve is mounted on an actuator inside an instrument.

Model C2V is designed specifically for use in an autosampler. It is like the standard C2 except that the sample port is perpendicular to the valve axis. This permits the valve and actuator to be installed horizontally, while the syringe loads the injector vertically.

MODEL C1CF FLOWPATH



OEM SELECTOR VALVES
See pages 151, 184-185 for selector (multiposition) valves for OEMs.

UNIVERSAL ACTUATOR
The new universal actuator for OEMs operates virtually any Valco or Cheminert rotary valve – two position and selector alike – greatly simplifying the electronic aspect of instrument design.
See page 192.

Stream Selectors

UHPLC and High Pressure Selectors

NEW **Model C75** selectors offer presure ratings of 15,000 psi and 10,000 psi with 1/32" and 1/16" fittings.

The **Model C5**, with Valco ZDV fitting details, is available with 4, 6, 8, or 10 positions. Stators are available in Nitronic 60 stainless, titanium, and Hastelloy C-22, with rotors of Valcon H, all of which are compatible with common HPLC solvents. PAEK stators are used in combination with Valcon E rotors.

The C5 valve is the backbone of the Cheminert **HPLC column selector system**, which includes two stream selection valves mounted on a single microelectric actuator. Columns are not included.

Model C75
pages 170 and 171
15,000 psi
10,000 psi

Model C5
page 172
5,000 psi

HPLC column selector system
page 173
5,000 psi
Column selector system

Low Pressure Selectors

With Valco Zero Dead Volume Fittings

Model C25Z valves have Valco ZDV fitting details, and are available in 4, 6, 8, 10, 12, and 14 position models.

Model C35Z valves have 1/16" Valco ZDV details, and are available in 20, 24, and 26 position models. This is a tapered rotor valve limited to 100 psi liquid. Rotors are made from Valcon E2, with valve body made from PPS.

With Cheminert 1/4-28 Fittings

The **Model C25** has female 1/4-28 threaded fitting details for direct connection of lines – no couplings are required. The C25 is available in 4, 6, 8, and 10 position models. Multicolored Cheminert 1/16" or 1/8" flangeless fittings are included. Order other fittings separately as required. Rotors are made of Valcon E2, a proprietary reinforced PTFE composite, with stators of PPS.

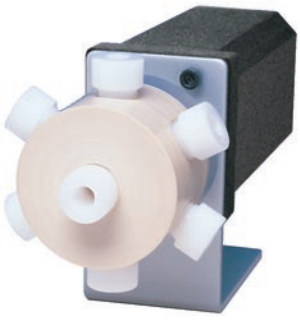
With Cheminert 1/2-20 Fittings

Model C45 valves feature 1/2-20 threaded fitting details for use with 1/4" OD tubing. This is a tapered rotor valve with large bore for high flow applications. Rotors are made from Valcon E2, with valve body made from PPS. Available in 4 and 6 port configurations.

Model C25Z
page 174
Low pressure
10-32 ZDV

Model C25
page 175
Low pressure
1/4-28 Internal

Model C35Z
page 176
Low pressure
10-32 ZDV



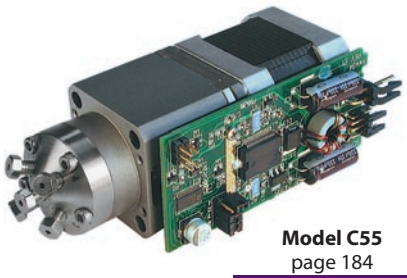
Model C45
page 177
Low pressure
1/2-20 Int.

NEW Integrated Motor/Stream Selectors for OEMs

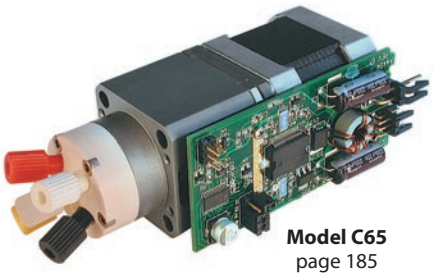
Cheminert's new **Model C55** (HPLC) and **Model C65** (low pressure) stream selectors are integrated motor/valve assemblies designed specifically to be built into an OEM system. The compact, lightweight package is available in 4, 6, 8, and 10 position configurations.

Using the well-proven Cheminert stream selector design and the 24 volt motor from our popular microelectric actuators, the Models C55, C65, and C65Z need only to be connected to an instrument's power supply. A single momentary contact closure steps the valve to the next position; a separate contact closure moves the valve to position 1 (Home).

See how our stream selectors can simplify your instrument design and minimize time to market – all while trimming your costs.



Model C55
page 184
5,000 psi



Model C65
page 185
Low pressure

UNIVERSAL ACTUATOR
The new universal actuator for OEMs operates virtually any Valco or Cheminert rotary valve – two position and selector alike – greatly simplifying the electronic aspect of instrument design.
See page 192.

MORE INFORMATION

TECH TIP
Caution:

Metal fittings will damage the threads and details of C25Z, C35Z, and C65Z series valves.

Use of metal fittings in these valves voids the warranty.

SPECIFICATIONS

CHEMINERT MULTIPOSITION VALVES

Model	*Stator material*	*Std rotor material*	*Max pressure*	*Max temp*	*Number of positions*
High Pressure					
C5	Metal	Valcon H	5000 psi liq	75°C	4, 6, 8, 10
	PAEK	Valcon E	5000 psi liq	50°C	4, 6, 8, 10
Low Pressure					
C25Z	PPS	Valcon E2	100 psi gas/ 250 psi liq	75°C	4, 6, 8, 10, 12, 14
C25	PPS	Valcon E2	100 psi gas/ 250 psi liq	75°C	4, 6, 8, 10
C35Z	PPS	Valcon E2	100 psi liq	50°C	20, 24, 26
C45	PPS	Valcon TF	100 psi liq	50°C	4, 6, 8
OEM – High Pressure					
C55	Metal	Valcon H	5000 psi liq	50°C	4, 6, 8, 10
	PAEK	Valcon E	5000 psi liq	50°C	4, 6, 8, 10
OEM – Low Pressure					
C65Z	PPS	Valcon E2	100 psi gas/ 250 psi liq	50°C	4, 6, 8, 10
C65	PPS	Valcon E2	100 psi gas/ 250 psi liq	50°C	4, 6, 8, 10

PORT DIAMETERS

Model	*Fitting size*	*Standard port diameter*	
High Pressure			(.006")
C5	1/16" ZDV	0.15 mm	
		0.25 mm	(.010")
		0.40 mm	(.016")
		0.75 mm	(.030")
Low Pressure			
C25Z	1/16" ZDV	0.75 mm	(.030")
C25	1/4-28 for 1/16" tubing	0.75 mm	(.030")
	1/4-28 for 1/8" tubing	1.50 mm	(.060")
C35Z	1/16" ZDV	0.75 mm	(.030")
C45	1/2-20 for 1/4" tubing	4.6 mm	(.180")
OEM – High Pressure			
C55	1/16" ZDV	0.25 mm	(.010")
		0.40 mm	(.016")
		0.75 mm	(.030")
OEM – Low Pressure			
C65Z	1/16" ZDV	0.75 mm	(.030")
C65	1/4-28 for 1/16" tubing	0.75 mm	(.030")
	1/4-28 for 1/8" tubing	1.50 mm	(.060")

NEW UHPLC Nanovolume Injectors with 360 µm fittings

NEW 20,000 psi UHPLC Nanovolume valves
360 micron fittings, 100 micron bore (.004")

Model C72MU

20,000 psi
360µm **100 µm**

Includes stainless 360 micron fittings.

Microelectric actuator: 24 VDC, with 110/230 VAC to 24 VDC power supply.

4 Port

6 Port

	Prod No	*Price*	*Prod No*	*Price*
Coated stainless stator				
Manual	C72MU-4694		C72MU-4696	
With pneumatic actuator	C72MU-4694A		C72MU-4696A	
With standard electric actuator	C72MU-4694E		C72MU-4696E	
With microelectric actuator	C72MU-4694EH		C72MU-4696EH	
Replacement valve	C72MU-4694D		C72MU-4696D	
Replacement rotor	C72M-46R4		C72M-46R6	
Replacement stator	C72M-4C94		C72M-4C96	

SPECS
20,000 psi liq
50°C max
Stainless w/ inert coating stator
Valcon E3 rotor

OPTIONS
- 150 micron (.006") bore
- Internal sample injector (4 - 20 nl)
- 10,000 and 15,000 psi versions available

Model C72MU
360 micron fittings
(Model C72MX is similar)

NEW 15,000 psi UHPLC Nanovolume valves
360 micron fittings, 150 micron bore (.006")

Model C72MX

15,000 psi
360µm **150 µm**

Includes stainless 360 micron fittings.

Microelectric actuator: 24 VDC, with 110/230 VAC to 24 VDC power supply.

6 Port

10 Port

	Prod No	*Price*	*Prod No*	*Price*
Coated stainless stator				
Manual	C72MX-6696		C72MX-6690	
With pneumatic actuator	C72MX-6696A		C72MX-6690A	
With standard electric actuator	C72MX-6696E		C72MX-6690E	
With microelectric actuator	C72MX-6696EH		C72MX-6690ED	
Replacement valve	C72MX-6696D		C72MX-6690D	
Replacement rotor	C72M-66R6		C72M-66R0	
Replacement stator	C72M-6C96		C72M-6C90	

SPECS
15,000 psi liq
50°C max
Stainless w/ inert coating stator
Valcon E3 rotor

OPTIONS
- 100 micron (.004") bore
- Internal sample injector (4 - 20 nl)
- 10,000 psi version available
- 4 and 8 port versions available

MORE INFORMATION
360 micron nanovolume fittings ..... page 58

UHPLC Nanovolume Injectors with 1/32" Valco stainless fittings *NEW*

NEW 15,000 psi UHPLC Nanovolume valves
1/32" Valco stainless fittings, 150 micron bore (.006")

Model C72NX

SPECS
15,000 psi liq
50°C max
Stainless w/ inert coating stator
Valcon E3 rotor

Includes 1/32" Valco stainless steel fittings.

Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply.

* The 6 port valve includes a 5 µl loop of the stator material.

15,000 psi
1/32" **150 µm**

OPTIONS
- 100 micron (.004") bore
- 250 micron (.010") bore
- 10,000 psi version available
- 4 and 8 port versions available

6 Port *

10 Port

	6 Port *		10 Port	
	Prod No	*Price*	*Prod No*	*Price*
Coated stainless stator				
Manual	C72NX-6696		C72NX-6690	
With pneumatic actuator	C72NX-6696A		C72NX-6690A	
With standard electric actuator	C72NX-6696E		C72NX-6690E	
With microelectric actuator	C72NX-6696EH		C72NX-6690ED	
Replacement valve	C72NX-6696D		C72NX-6690D	
Replacement rotor	C72N-66R6		C72N-66R0	
Replacement stator	C72N-6C96		C72N-6C90	

Model C72NX
1/32" Valco stainless fittings

Sample loops *for C72NX valves*

Each stainless loop includes two stainless 1/32" Cheminert nanovolume fittings.

	Stainless	
Volume	*Prod No*	*Price*
1 µl	CSLN1K	$35.00
2 µl	CSLN2K	45.00
5 µl	CSLN5K	52.50

Model C74NX
1/32" Valco stainless fittings

NEW 15,000 psi UHPLC Nanovolume internal sample injectors
1/32" Valco stainless fittings, 150 micron bore (.006")

Model C74NX

SPECS
15,000 psi liq
50°C max
Stainless w/ inert coating stator
Valcon E3 rotor

Includes 1/32" Valco stainless steel fittings.

Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply.

15,000 psi
Internal sample
1/32" **150 µm**

OPTIONS
- 250 micron (.010") bore
- 10,000 and 20,000 psi versions available

	4 nanoliters		10 nanoliters		20 nanoliters	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Coated stainless stator						
Manual	C74NX-6694-.004		C74NX-6694-.01		C74NX-6694-.02	
With pneumatic actuator	C74NX-6694-.004A		C74NX-6694-.01A		C74NX-6694-.02A	
With standard electric actuator	C74NX-6694-.004E		C74NX-6694-.01E		C74NX-6694-.02E	
With microelectric actuator	C74NX-6694-.004EH		C74NX-6694-.01EH		C74NX-6694-.02EH	
Replacement valve	C74NX-6694-.004D		C74NX-6694-.01D		C74NX-6694-.02D	
Replacement rotor	C74N-66R-.004		C74N-66R-.01		C74N-66R-.02	
Replacement stator	C74N-6C9		C74N-6C9		C74N-6C9	

MORE INFORMATION

1/32" Valco fittings .... pages 10, 12
1/16" nanovolume injectors
C72X 156
C74X 157

Nanovolume Injectors with 1/32" Cheminert Fittings

5,000 psi Nanovolume valves, 1/32"Cheminert fittings, 100 micron ports (.004")

Model CN2

5,000 psi

1/32" **100 µm**

Includes 1/32" PEEK Cheminert nanovolume fittings.

Microelectric actuator: 24 VDC, with 110/230 VAC to 24 VDC power supply.

* The 6 port valve includes a 250 nl PEEK loop.

	6 Port*		10 Port	
	Prod No	*Price*	*Prod No*	*Price*
PAEK stator				
Manual	CN2-4346		CN2-4340	
With microelectric actuator	CN2-4346EH		CN2-4340EH	
Replacement valve	CN2-4346D		CN2-4340D	
Replacement rotor	CN2-43R6		CN2-43R0	
Replacement stator	CN2-4C46I		CN2-4C40I	

SPECS
5000 psi liq
50°C max
PAEK stator
Valcon E rotor

OPTIONS
- 150 micron (.006") bore

Model CN2 1/32" Cheminert fittings

Sample loops *for CN2 valves*

Each PEEK loop includes two PEEK Cheminert nanovolume fittings.

	PEEK	
Volume	*Prod No*	*Price*
250 nl	CNSL250PK	
500 nl	CNSL500PK	
1 µl	CNSL1KPK	
2 µl	CNSL2KPK	
5 µl	CNSL5KPK	

MORE INFORMATION
1/32" PEEK Cheminert fitting (nut with collapsible ferrule) p. 59

5,000 psi Nanovolume internal sample injector, 1/32"Cheminert fittings, 100 micron ports (.004")

Model CN4

SPECS
5000 psi liq
50°C max
PAEK stator
Valcon E rotor

Includes 1/32" PEEK Cheminert nanovolume fittings.

Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply.

5,000 psi
Internal sample
1/32" **100 µm**

OPTIONS
- 150 micron (.006") bore

Sample volume	4 nanoliters		10 nanoliters		20 nanoliters	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
PAEK stator						
Manual	CN4-4344-.004		CN4-4344-.01		CN4-4344-.02	
With microelectric actuator	CN4-4344-.004EH		CN4-4344-.01EH		CN4-4344-.02EH	
Replacement valve	CN4-4344-.004D		CN4-4344-.01D		CN4-4344-.02D	
Replacement rotor	CN4-43R-.004		CN4-43R-.01		CN4-43R-.02	
Replacement stator	CN4-4C4I		CN4-4C4I		CN4-4C4I	

Model CN4
1/32" Cheminer fittings

MORE INFORMATION
1/32" PEEK Cheminert fitting (nut with collapsible ferrule) p. 59

Microbore UHPLC

NEW 15,000 psi UHPLC microbore valves, 1/16" Valco fittings, 0.25 mm ports (.010")

Model C72X

15,000 psi | Microbore | 1/16" | 0.25 mm

Includes stainless steel nuts and ferrules.

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

Microelectric actuator:
- 24 VDC, with 110/230 VAC to 24 VDC power supply.

* The 6 port valve includes a 5 µl stainless steel sample loop.

SPECS
15,000 psi liq
50°C max
Stainless stator with inert coating
Valcon E3 rotor

OPTIONS
0.15 mm ports (.006")

	4 Port		6 Port*		8 Port		10 Port	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	C72X-1694		C72X-1696		C72X-1698		C72X-1690	
With pneumatic actuator	C72X-1694A		C72X-1696A		C72X-1698A		C72X-1690A	
With standard electric actuator	C72X-1694E		C72X-1696E		C72X-1698E		C72X-1690E	
With microelectric actuator	C72X-1694EH		C72X-1696EH		C72X-1698ED		C72X-1690ED	
Replacement valve	C72X-1694D		C72X-1696D		C72X-1698D		C72X-1690D	
Replacement rotor	C72-16R4		C72-16R6		C72-16R8		C72-16R0	
Replacement stator	C72-1C94		C72-1C96		C72-1C98		C72-1C90	

NEW 10,000 psi UHPLC microbore valves, 1/16" Valco fittings, 0.25 mm ports (.010")

Model C72H

10,000 psi | Microbore | 1/16" | 0.25 mm

Includes stainless steel nuts and ferrules.

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

Microelectric actuator:
- 24 VDC, with 110/230 VAC to 24 VDC power supply.

* The 6 port valve includes a 5 µl stainless steel sample loop.

SPECS
10,000 psi liq
50°C max
Stainless stator with inert coating
Valcon E3 rotor

OPTIONS
0.15 mm ports (.006")

	4 Port		6 Port*		8 Port		10 Port	
	Prod No	*Price*	*Prod No*	*Pr ice*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	C72H-1694		C72H-1696		C72H-1698		C72H-1690	
With pneumatic actuator	C72H-1694A		C72H-1696A		C72H-1698A		C72H-1690A	
With standard electric actuator	C72H-1694E		C72H-1696E		C72H-1698E		C72H-1690E	
With microelectric actuator	C72H-1694EH		C72H-1696EH		C72H-1698ED		C72H-1690ED	
Replacement valve	C72H-1694D		C72H-1696D		C72H-1698D		C72H-1690D	
Replacement rotor	C72-16R4		C72-16R6		C72-16R8		C72-16R0	
Replacement stator	C72-1C94		C72-1C96		C72-1C98		C72-1C90	

Model C72H (C72X similar) 1/16" ZDV fittings

Stainless steel sample loops

for C72X and C72H valves

Each loop includes two stainless steel nuts and ferrules.
Metal loops > 2 ml are made from 1/8" OD tubing with brazed or welded 1/16" tube ends or reducing unions.

Volume	*Prod No*	*Price*	*Volume*	*Prod No*	*Price*	*Volume*	*Prod No*	*Price*
2 µl	CSL2		50 µl	CSL50		1 ml	CSL1K	
5 µl	CSL5		100 µl	CSL100		2 ml	CSL2K	
10 µl	CSL10		250 µl	CSL250		5 ml	CSL5K	
20 µl	CSL20		500 µl	CSL500		10 ml	CSL10K	

NEW 15,000 psi UHPLC microbore internal sample injectors, 1/16" Valco fittings, 0.25 mm ports (.010")

Model C74X

SPECS
15,000 psi liq
50°C max
Stainless stator with inert coating
Valcon E3 rotor

Includes stainless steel nuts and ferrules.

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

15,000 psi
Microbore
Internal sample
1/16" 0.25 mm

OPTIONS
0.15 mm ports (.006")

	10 nanoliters		20 nanoliters		50 nanoliters	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	C74X-1694-.01		C74X-1694-.02		C74X-1694-.05	
With pneumatic actuator	C74X-1694-.01A		C74X-1694-.02A		C74X-1694-.05A	
With standard electric actuator	C74X-1694-.01E		C74X-1694-.02E		C74X-1694-.05E	
With microelectric actuator	C74X-1694-.01EH		C74X-1694-.02EH		C74X-1694-.05EH	
Replacement valve	C74X-1694-.01D		C74X-1694-.02D		C74X-1694-.05D	
Replacement rotor	C74-16R-.01		C74-16R-.02		C74-16R-.05	
Replacement stator	C74-1C9		C74-1C9		C74-1C9	

NEW 10,000 psi UHPLC microbore internal sample injectors, 1/16" Valco fittings, 0.25 mm ports (.010")

Model C74H

SPECS
10,000 psi liq
50°C max
Stainless stator with inert coating
Valcon E3 rotor

Includes stainless steel nuts and ferrules.

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

10,000 psi
Microbore
Internal sample
1/16" 0.25 mm

OPTIONS
0.15 mm ports (.006")

	10 nanoliters		20 nanoliters		50 nanoliters	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	C74H-1694-.01		C74H-1694-.02		C74H-1694-.05	
With pneumatic actuator	C74H-1694-.01A		C74H-1694-.02A		C74H-1694-.05A	
With standard electric actuator	C74H-1694-.01E		C74H-1694-.02E		C74H-1694-.05E	
With microelectric actuator	C74H-1694-.01EH		C74H-1694-.02EH		C74H-1694-.05EH	
Replacement valve	C74H-1694-.01D		C74H-1694-.02D		C74H-1694-.05D	
Replacement rotor	C74-16R-.01		C74-16R-.02		C74-16R-.05	
Replacement stator	C74-1C9		C74-1C9		C74-1C9	

Model C74H (C74X similar) 1/16" ZDV fittings

MORE INFORMATION

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Microbore HPLC

Microbore valves, 1/16" Valco fittings, 0.25 mm ports (.010")

Model C2

5,000 psi
Microbore
1/16" **0.25 mm**

Includes stainless steel nuts and ferrules of the stator material. Valves with PAEK stators have PEEK nuts and ferrules.

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

* The 6 port valve includes a 5 µl loop of the stator material.

	4 Port		6 Port*		8 Port		10 Port	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
N60 stainless stator								
Manual	C2-1004		C2-1006		C2H-1008		C2H-1000	
With pneumatic actuator	C2-1004A		C2-1006A		C2H- 1008A		C2H-1000A	
With standard electric actuator	C2-1004E		C2-1006E		C2H-1008E		C2H-1000E	
With microelectric actuator	C2-1004EH		C2-1006EH		C2H-1008EH		C2H-1000EH	
Replacement valve	C2-1004D		C2-1006D		C2H-1008D		C2H-1000D	
Replacement rotor	C2-10R4		C2-10R6		C2-10R8H		C2-10R0H	
Replacement stator	C-1C04		C-1C06		C-1C08H		C-1C00H	
PAEK stator								
Manual	C2-1344		C2-1346		C2H-1348		C2H-1340	
With pneumatic actuator	C2-1344A		C2-1346A		C2H-1348A		C2H-1340A	
With standard electric actuator	C2-1344E		C2-1346E		C2H-1348E		C2H-1340E	
With microelectric actuator	C2-1344EH		C2-1346EH		C2H-1348EH		C2H-1340EH	
Replacement valve	C2-1344D		C2-1346D		C2H-1348D		C2H-1340D	
Replacement rotor	C2-13R4		C2-13R6		C2-13R8H		C2-13R0H	
Replacement stator	C-1C44		C-1C46		C-1C48H		C-1C40H	
Titanium stator								
Manual	C2-1034		C2-1036		C2H-1038		C2H-1030	
With pneumatic actuator	C2-1034A		C2-1036A		C2H-1038A		C2H-1030A	
With standard electric actuator	C2-1034E		C2-1036E		C2H-1038E		C2H-1030E	
With microelectric actuator	C2-1034EH		C2-1036EH		C2H-1038EH		C2H-1030EH	
Replacement valve	C2-1034D		C2-1036D		C2H-1038D		C2H-1030D	
Replacement rotor	C2-10R4		C2-10R6		C2-10R8H		C2-10R0H	
Replacement stator	C-1C34		C-1C36		C-1C38H		C-1C30H	

SPECS

5000 psi liq
75°C max
Metal stator
Valcon H rotor

5000 psi liq
50°C max
PAEK stator
Valcon E rotor

OPTIONS

- Continuous flow version is available as Model C6. *See page 160.*
- Hastelloy C stators
- Loop fill port assembly for injection from front of the valve. *See page 41.*
- 0.15 mm (0.006") bore

Order loops from page 159.

Model C2
1/16" ZDV fittings

MORE INFORMATION

Microbore nanoliter sample injector, 1/16" Valco fittings, 0.15 mm ports (.006")

Model C4

SPECS

5000 psi liq
75°C max
Metal stator
Valcon H rotor

5000 psi liq
50°C max
PAEK stator
Valcon E rotor

Includes stainless steel nuts and ferrules of the stator material. Valves with PAEK stators have PEEK nuts and ferrules.

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

5,000 psi
Microbore
Internal sample
1/16" 0.15 mm

OPTIONS

- 100, 200, and 500 nl sample volumes are also available in 0.25 mm bore. *See page 162.*
- Loop fill port assembly for injection from front of the valve. *See page 41.*
- 0.25 mm (0.010") bore

Sample volume	10 nanoliters		20 nanoliters		50 nanoliters	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
N60 stainless stator						
Manual	C4-0004-.01		C4-0004-.02		C4-0004-.05	
With pneumatic actuator	C4-0004-.01A		C4-0004-.02A		C4-0004-.05A	
With standard electric actuator	C4-0004-.01E		C4-0004-.02E		C4-0004-.05E	
With microelectric actuator	C4-0004-.01EH		C4-0004-.02EH		C4-0004-.05EH	
Replacement valve	C4-0004-.01D		C4-0004-.02D		C4-0004-.05D	
Replacement rotor	C4-00R-.01		C4-00R-.02		C4-00R-.05	
Replacement stator	C4-0C0		C4-0C0		C4-0C0	
PAEK stator						
Manual	C4-0344-.01		C4-0344-.02		C4-0344-.05	
With pneumatic actuator	C4-0344-.01A		C4-0344-.02A		C4-0344-.05A	
With standard electric actuator	C4-0344-.01E		C4-0344-.02E		C4-0344-.05E	
With microelectric actuator	C4-0344-.01EH		C4-0344-.02EH		C4-0344-.05EH	
Replacement valve	C4-0344-.01D		C4-0344-.02D		C4-0344-.05D	
Replacement rotor	C4-03R-.01		C4-03R-.02		C4-03R-.05	
Replacement stator	C4-0C4		C4-0C4		C4-0C4	

Model C4
1/16" ZDV fittings

Sample loops *for C1, C2, C2V, C3, and C6 valves*

Each metal loop includes two stainless steel nuts and ferrules.
Each PEEK loop includes two PEEK nuts and ferrules.

	Stainless Steel		PEEK (for PAEK stators)		Titanium	
Volume	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
2 µl	CSL2		CZSL2PK		–	
5 µl	CSL5		CZSL5PK		–	
10 µl	CSL10		CZSL10PK		CSL10TI	
20 µl	CSL20		CZSL20PK		CSL20TI	
50 µl	CSL50		CZSL50PK		CSL50TI	
100 µl	CSL100		CZSL100PK		CSL100TI	
250 µl	CSL250		CZSL250PK		CSL250TI	
500 µl	CSL500		CZSL500PK		CSL500TI	
1 ml	CSL1K		CZSL1KPK		CSL1KTI	
2 ml	CSL2K		CZSL2KPK		–	
5 ml	CSL5K		CZSL5KPK		–	
10 ml	CSL10K		–		–	

ABOUT LOOPS

- Other materials are available in many sizes: Electroformed Nickel, Hastelloy C, Nickel 200, and PTFE *(see pages 254-256).*
- Metal loops > 2 ml are made from 1/8" OD tubing with brazed or welded 1/16" tube ends or reducing unions.

Microbore HPLC

Microbore through-the-handle injector, 1/16" Valco fittings, 0.25 mm ports (.010")

Model C1

5,000 psi | Microbore | Through-handle | 1/16" | 0.25 mm

Available only in manual version. Position feedback included.

Includes stainless steel nuts and ferrules. Valves with PAEK stators have PEEK nuts and ferrules.

Includes one 5 µl loop of the stator material.

Model C1 and C1CF 1/16" ZDV fittings

	N60 stainless stator		PAEK stator	
	Prod No	*Price*	*Prod No*	*Price*
6 port injector	C1-1006		C1-1346	
Replacement rotor	C1-10R6		C1-13R6	
Replacement stator	C-1C06		C-1C46	
	Prod No	*Price*		
Replacement injector fitting	C-261			

SPECS
5000 psi liq
75°C max
Metal stator
Valcon H rotor

5000 psi liq
50°C max
PAEK stator
Valcon E rotor

OPTIONS
- Titanium and Hastelloy stators available.
- 0.40 mm bore (.016") on page 163.

Microbore continuous flow through-the-handle injector, 1/16" Valco fittings, 0.25 mm ports (.010")

Model C1CF

5,000 psi | Microbore | Continuous flow | Through-handle | 1/16" | 0.25 mm

Available only in manual version. Position feedback included.

Includes stainless steel nuts and ferrules. Valves with PAEK stators have PEEK nuts and ferrules.

Includes one 5 µl loop of the stator material.

	N60 stainless stator		PAEK stator	
	Prod No	*Price*	*Prod No*	*Price*
6 port injector	C1CF-1006		C1CF-1346	
Replacement rotor	C1-10R6		C1-13R6	
Replacement stator	C6-1C06		C6-1C46	
	Prod No	*Price*		
Replacement injector fitting	C-261			

SPECS
5000 psi liq
75°C max
Metal stator
Valcon H rotor

5000 psi liq
50°C max
PAEK stator
Valcon E rotor

OPTIONS
- 0.40 mm bore (.016") on page 163.

Microbore continuous flow injector, 1/16" Valco fittings, 0.25 mm ports (.010")

Model C6

5,000 psi | Microbore | Continuous flow | 1/16" | 0.25 mm

Includes stainless steel nuts and ferrules.

* Includes a 5 µl loop of the stator material.

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

Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply.

Model C6 1/16" ZDV fittings

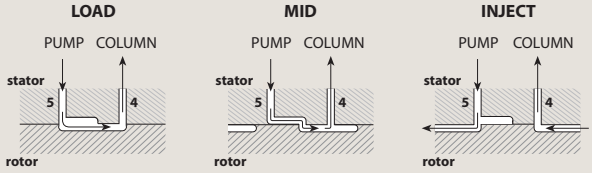
	N60 stainless stator		PAEK stator	
	Prod No	*Price*	*Prod No*	*Price*
Manual	C6-1006		C6-1346	
With pneumatic actuator	C6-1006A		C6-1346A	
With standard electric actuator	C6-1006E		C6-1346E	
With microelectric actuator	C6-1006EH		C6-1346EH	
Replacement valve	C6-1006D		C6-1346D	
Replacement rotor	C2-10R6		C2-13R6	
Replacement stator	C6-1C06		C6-1C46	

SPECS
5000 psi liq
75°C max
Metal stator
Valcon H rotor

5000 psi liq
50°C max
PAEK stator
Valcon E rotor

Order loops from page 159.

C1CF and C6 CONTINUOUS FLOWPATH
An engraving on the stator maintains pump flow between ports 5 and 4 during most of the switching cycle, virtually eliminating pressure spikes.



Analytical valves, 1/16" Valco fittings, 0.40 mm ports (.016")

Model C2

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

SPECS

5000 psi liq
75°C max
Metal stator
Valcon H rotor

5000 psi liq
50°C max
PAEK stator
Valcon E rotor

Includes stainless steel nuts and ferrules of the stator material. Valves with PAEK stators have PEEK nuts and ferrules.

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

* The 6 port valve includes a 20 µl loop of the stator material.

OPTIONS

- Continuous flow version is available as Model C6. *See page 163.*
- Hastelloy C stators
- Semi-prep version with 0.75 mm ports (.030") available
- Loop fill port assembly for injection from front of the valve. *See page 41.*

Order loops from page 159.

OPTIONAL FLOWPATH

Model C2 6 port valves can also be ordered with a dual 3-way rotor, as described in EPA Method 555.

To specify this flowpath, substitute "6X" for "6" in the valve or rotor product number.

	 4 Port		 6 Port*		 8 Port		 10 Port	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
N60 stainless stator								
Manual	C2-2004		C2-2006		C2H-2008		C2H-2000	
With pneumatic actuator	C2-2004A		C2-2006A		C2H-2008A		C2H-2000A	
With standard electric actuator	C2-2004E		C2-2006E		C2H-2008E		C2H-2000E	
With microelectric actuator	C2-2004EH		C2-2006EH		C2H-2008EH		C2H-2000EH	
Replacement valve	C2-2004D		C2-2006D		C2H-2008D		C2H-2000D	
Replacement rotor	C2-20R4		C2-20R6		C2-20R8H		C2-20R0H	
Replacement stator	C-2C04		C-2C06		C-2C08H		C-2C00H	
PAEK stator								
Manual	C2-2344		C2-2346		C2H-2348		C2H-2340	
With pneumatic actuator	C2-2344A		C2-2346A		C2H-2348A		C2H-2340A	
With standard electric actuator	C2-2344E		C2-2346E		C2H-2348E		C2H-2340E	
With microelectric actuator	C2-2344EH		C2-2346EH		C2H-2348EH		C2H-2340EH	
Replacement valve	C2-2344D		C2-2346D		C2H-2348D		C2H-2340D	
Replacement rotor	C2-23R4		C2-23R6		C2-23R8H		C2-23R0H	
Replacement stator	C-2C44		C-2C46		C-2C48H		C-2C40H	
Titanium stator								
Manual	C2-2034		C2-2036		C2H-2038		C2H-2030	
With pneumatic actuator	C2-2034A		C2-2036A		C2H-2038A		C2H-2030A	
With standard electric actuator	C2-2034E		C2-2036E		C2H-2038E		C2H-2030E	
With microelectric actuator	C2-2034EH		C2-2036EH		C2H-2038EH		C2H-2030EH	
Replacement valve	C2-2034D		C2-2036D		C2H-2038D		C2H-2030D	
Replacement rotor	C2-20R4		C2-20R6		C2-20R8H		C2-20R0H	
Replacement stator	C-2C34		C-2C36		C-2C38H		C-2C30H	

Model C2
1/16" ZDV fittings

AUTOSAMPLER REPLACEMENT VALVES

The Cheminert Model C2 6 port valve is an excellent replacement for the valve originally supplied in many autosamplers, including autosamplers manufactured by Beckman, Gilson, Spark-Holland, CTC, Thermo Fisher, and Varian.

Call technical support to determine which replacement is best for your application.

Analytical HPLC

Analytical internal sample injector, 1/16" Valco fittings, 0.25 mm ports (.010")

Model C4

5,000 psi
Analytical
Internal sample
1/16" 0.25 mm

Includes stainless steel nuts and ferrules of the stator material. Valves with PAEK stators have PEEK nuts and ferrules.

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

Sample volume	0.1 µl		0.2 µl		0.5 µl	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
N60 stainless stator						
Manual	C4-1004-.1		C4-1004-.2		C4-1004-.5	
With pneumatic actuator	C4-1004-.1A		C4-1004-.2A		C4-1004-.5A	
With standard electric actuator	C4-1004-.1E		C4-1004-.2E		C4-1004-.5E	
With microelectric actuator	C4-1004-.1EH		C4-1004-.2EH		C4-1004-.5EH	
Replacement valve	C4-1004-.1D		C4-1004-.2D		C4-1004-.5D	
Replacement rotor	C4-10R-.1		C4-10R-.2		C4-10R-.5	
Replacement stator	C4-1C0		C4-1C0		C4-1C0	
PAEK stator						
Manual	C4-1344-.1		C4-1344-.2		C4-1344-.5	
With pneumatic actuator	C4-1344-.1A		C4-1344-.2A		C4-1344-.5A	
With standard electric actuator	C4-1344-.1E		C4-1344-.2E		C4-1344-.5E	
With microelectric actuator	C4-1344-.1EH		C4-1344-.2EH		C4-1344-.5EH	
Replacement valve	C4-1344-.1D		C4-1344-.2D		C4-1344-.5D	
Replacement rotor	C4-13R-.1		C4-13R-.2		C4-13R-.5	
Replacement stator	C4-1C4		C4-1C4		C4-1C4	
Titanium stator						
Manual	C4-1034-.1		C4-1034-.2		C4-1034-.5	
With pneumatic actuator	C4-1034-.1A		C4-1034-.2A		C4-1034-.5A	
With standard electric actuator	C4-1034-.1E		C4-1034-.2E		C4-1034-.5E	
With microelectric actuator	C4-1034-.1EH		C4-1034-.2EH		C4-1034-.5EH	
Replacement valve	C4-1034-.1D		C4-1034-.2D		C4-1034-.5D	
Replacement rotor	C4-10R-.1		C4-10R-.2		C4-10R-.5	
Replacement stator	C4-1C3		C4-1C3		C4-1C3	

SPECS

5000 psi liq
75°C max
Metal stator
Valcon H rotor

5000 psi liq
50°C max
PAEK stator
Valcon E rotor

OPTIONS

- .05 µl sample volumes are also available.
- Loop fill port assembly for injection from front of the valve. *See page 41.*

Model C4
1/16" ZDV fittings

MORE INFORMATION

Analytical through-the-handle injector, 1/16" Valco fittings, 0.40 mm ports (.016")

Model C1

SPECS
5000 psi liq
75°C max
Metal stator
Valcon H rotor

5000 psi liq
50°C max
PAEK stator
Valcon E rotor

OPTIONS
- Titanium stator available.
- 0.25 mm bore (.010") on page 160.

Available only in manual version. Position feedback included.

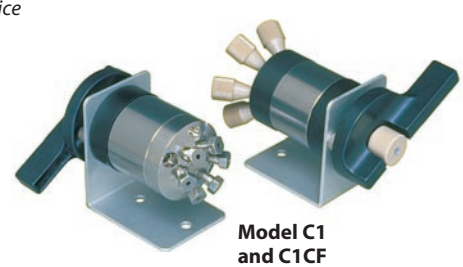
Includes stainless steel nuts and ferrules. Valves with PAEK stators have PEEK nuts and ferrules.

Includes one 20 µl loop of the stator material.

5,000 psi
Analytical
Through-handle
1/16" 0.40 mm

	N60 stainless stator		PAEK stator	
	Prod No	*Price*	*Prod No*	*Price*
6 port injector	C1-2006		C1-2346	
Replacement rotor	C1-20R6		C1-23R6	
Replacement stator	C-2C06		C-2C46	

	Prod No	*Price*
Replacement injector fitting	C-261	



Model C1 and C1CF 1/16" ZDV fittings

Analytical continuous flow through-the-handle injector, 1/16" Valco fittings, 0.40 mm ports (.016")

Model C1CF

SPECS
5000 psi liq
75°C max
Metal stator
Valcon H rotor

5000 psi liq
50°C max
PAEK stator
Valcon E rotor

OPTIONS
- 0.25 mm bore (.010") on page 160.

Available only in manual version. Position feedback included.

Includes stainless steel nuts and ferrules. Valves with PAEK stators have PEEK nuts and ferrules.

Includes one 20 µl loop of the stator material.

5,000 psi
Analytical
Continuous flow
Through-handle
1/16" 0.40 mm

	N60 stainless stator		PAEK stator	
	Prod No	*Price*	*Prod No*	*Price*
6 port injector	C1CF-2006		C1CF-2346	
Replacement rotor	C1-20R6		C1-23R6	
Replacement stator	C6-2C06		C6-2C46	
Prod No	*Price*			

Replacement injector fitting	C-261

Analytical continuous flow injector, 1/16" Valco fittings, 0.40 mm ports (.016")

Model C6

SPECS
5000 psi liq
75°C max
Metal stator
Valcon H rotor

5000 psi liq
50°C max
PAEK stator
Valcon E rotor

Order loops from page 159.

Includes stainless steel nuts and ferrules.

Includes a 20 µl loop of the stator material.

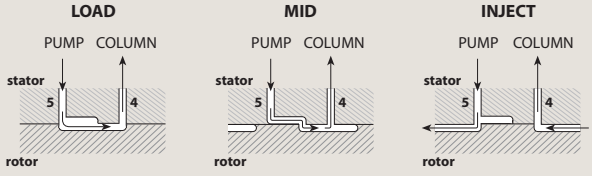
Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international.

Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply.

5,000 psi
Analytical
Continuous flow
1/16" 0.40 mm

	N60 stainless stator		PAEK stator	
	Prod No	*Price*	*Prod No*	*Price*
Manual	C6-2006		C6-2346	
With pneumatic actuator	C6-2006A		C6-2346A	
With standard electric actuator	C6-2006E		C6-2346E	
With microelectric actuator	C6-2006EH		C6-2346EH	
Replacement valve	C6-2006D		C6-2346D	
Replacement rotor	C2-20R6		C2-23R6	
Replacement stator	C6-2C06		C6-2C46	

C1CF and C6 CONTINUOUS FLOWPATH
An engraving on the stator maintains pump flow between ports 5 and 4 during most of the switching cycle, virtually eliminating pressure spikes.



Model C6 1/16" ZDV fittings

Low Pressure

Valves with 1/16" Valco ZDV fittings, 0.75 mm ports (.030")

Model C22Z

Low pressure
10-32 ZDV
1/16" **0.75 mm**

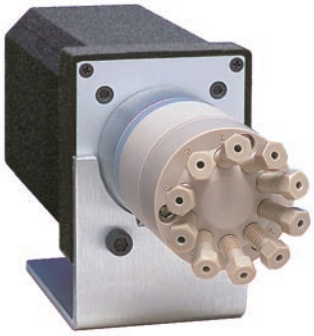
Includes Valco ZDV PEEK nuts and ferrules.

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

Sample loops are not included with valves. Order separately.




	4 Port		6 Port		8 Port		10 Port	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	C22Z-3184		C22Z-3186		C22Z-3188		C22Z-3180	
With pneumatic actuator	C22Z-3184A		C22Z-3186A		C22Z-3188A		C22Z-3180A	
With standard electric actuator	C22Z-3184E		C22Z-3186E		C22Z-3188E		C22Z-3180E	
With microelectric actuator	C22Z-3184EH		C22Z-3186EH		C22Z-3188EH		C22Z-3180EH	
Replacement valve	C22Z-3184D		C22Z-3186D		C22Z-3188D		C22Z-3180D	
Replacement rotor	C12-314		C12-316		C12-318		C12-310	
Replacement stator	C22Z-384		C22Z-386		C22Z-388		C22Z-380	



Model C22Z
1/16" ZDV fittings

SPECS

100 psi gas/ 250 psi liq
75°C max
PPS stator
Valcon E2 rotor

OPTIONS

- Purge option
- Other polymeric rotors and stators are available.

  Consult the factory for prices and information.

PURGE OPTION

The purge option permits a flow of liquid or gas to flush the valve interior of potentially toxic or corrosive components. We recommend this option for applications using materials (such as salt solutions) that could damage the metal parts of the valve.

Consult our technical staff for details.

Sample loops

for Model C22Z

Loops include PEEK nuts and ferrules. Loops smaller than 500 µl are made from 1/16" OD tubing; loops 500 µl or bigger are made from 1/8" OD tubing with polymeric unions and 1/16" ends.

	FEP		PTFE		PEEK	
Volume	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
5 µl	CZSL5FEP		CZSL5TF		CZSL5PK	
10 µl	CZSL10FEP		CZSL10TF		CZSL10PK	
20 µl	CZSL20FEP		CZSL20TF		CZSL20PK	
50 µl	CZSL50FEP		CZSL50TF		CZSL50PK	
100 µl	CZSL100FEP		CZSL100TF		CZSL100PK	
250 µl	CZSL250FEP		CZSL250TF		CZSL250PK	
500 µl	CZSL500FEP		CZSL500TF		CZSL500PK	
1 ml	CZSL1KFEP		CZSL1KTF		CZSL1KPK	
2 ml	CZSL2KFEP		CZSL2KTF		CZSL2KPK	

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Valves with 1/4-28 fitting details for 1/16" tubing, 0.75 mm ports (.030")

Model C22

SPECS
100 psi gas/ 250 psi liq
75°C max
PPS stator
Valcon E2 rotor

Includes multicolored Cheminert 1/4-28 flangeless fittings for 1/16" tubing.

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

Sample loops are not included with valves. Order separately.

Low pressure
1/4-28 Internal
1/16" **0.75 mm**




	4 Port		6 Port		8 Port		10 Port	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	C22-3184		C22-3186		C22-3188		C22-3180	
With pneumatic actuator	C22-3184A		C22-3186A		C22-3188A		C22-3180A	
With standard electric actuator	C22-3184E		C22-3186E		C22-3188E		C22-3180E	
With microelectric actuator	C22-3184EH		C22-3186EH		C22-3188EH		C22-3180EH	
Replacement valve	C22-3184D		C22-3186D		C22-3188D		C22-3180D	
Replacement rotor	C22-314		C22-316		C22-318		C22-310	
Replacement stator	C22-384		C22-386		C22-388		C22-380	

Valves with 1/4-28 fitting details for 1/8" tubing, 1.50 mm ports (.060")

Model

SPECS
100 psi gas/ 250 psi liq
75°C max
PPS stator
Valcon E2 rotor

Includes multicolored Cheminert 1/4-28 flangeless fittings for 1/8" tubing.

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

Sample loops are not included with valves. Order separately.

Low pressure
1/4-28 Internal
1/8" **1.50 mm**

	4 Port		6 Port		8 Port		10 Port	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	C22-6184		C22-6186		C22-6188		C22-6180	
With pneumatic actuator	C22-6184A		C22-6186A		C22-6188A		C22-6180A	
With standard electric actuator	C22-6184E		C22-6186E		C22-6188E		C22-6180E	
With microelectric actuator	C22-6184EH		C22-6186EH		C22-6188EH		C22-6180EH	
Replacement valve	C22-6184D		C22-6186D		C22-6188D		C22-6180D	
Replacement rotor	C22-614		C22-616		C22-618		C22-610	
Replacement stator	C22-684		C22-686		C22-688		C22-680	

Sample loops

for Model C22

Loops include flangeless fittings with white color nuts. Loops smaller than 500 µl are made from 1/16" OD tubing; loops 500 µl or bigger are made from 1/8" OD tubing.

	FEP		PTFE		PEEK	
Volume	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
20 µl	CFSL20FEP		CFSL20TF	$17.50	CFSL20PK	
50 µl	CFSL50FEP		CFSL50TF		CFSL50PK	
100 µl	CFSL100FEP		CFSL100TF		CFSL100PK	
250 µl	CFSL250FEP		CFSL250TF		CFSL250PK	
500 µl	CFSL500FEP		CFSL500TF		CFSL500PK	
1 ml	CFSL1KFEP		CFSL1KTF		CFSL1KPK	
2 ml	CFSL2KFEP		CFSL2KTF		CFSL2KPK	

Model C22
1/4-28 fittings

Low Pressure

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

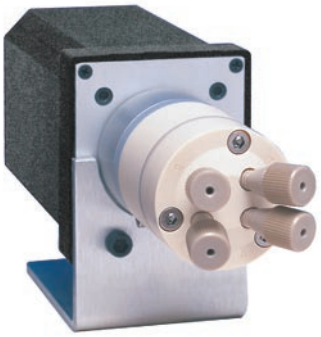
Model C24Z

Low pressure
Internal sample
10-32 ZDV
1/16" **0.40 mm**

Includes Valco ZDV PEEK nuts and ferrules.

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

Sample volume	**0.2 µl**		**0.5 µl**		**1 µl**	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	C24Z-2184-.2		C24Z-2184-.5		C24Z-2184-1	
With pneumatic actuator	C24Z-2184-.2A		C24Z-2184-.5A		C24Z-2184-1A	
With standard electric actuator	C24Z-2184-.2E		C24Z-2184-.5E		C24Z-2184-1E	
With microelectric actuator	C24Z-2184-.2EH		C24Z-2184-.5EH		C24Z-2184-1EH	
Replacement valve	C24Z-2184-.2D		C24Z-2184-.5D		C24Z-2184-1D	
Replacement rotor	C24-10R-.2		C24-10R-.5		C24-10R-1	
Replacement stator	C24Z-1C8		C24Z-1C8		C24Z-1C8	



Model C24Z
1/16" ZDV fittings

SPECS

100 psi gas/ 250 psi liq
75°C max
PPS stator
Valcon E2 rotor

OPTIONS

- 2.0 µl sample volumes are also available.
- Purge option. *See more information below.*
- Other polymeric rotors and stators are available. Consult the factory for prices and information.

PURGE OPTION

The purge option permits a flow of liquid or gas to flush the valve interior of potentially toxic or corrosive components. We recommend this option for applications using materials (such as salt solutions) that could damage the metal parts of the valve.

Consult our technical staff for details.

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Internal sample injectors, 1/4-28 for 1/16" tubing, 0.50 mm ports (.020")

Model C24

SPECS
100 psi gas/ 250 psi liq
75°C max
PPS stator
Valcon E2 rotor

Includes multicolored Cheminert 1/4-28 flangeless fittings for 1/16" tubing.

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

Low pressure
Internal sample
1/4-28 Internal
1/16" 0.50 mm

OPTIONS
- 0.2 µl sample volumes are also available.
- Purge option
- Other polymeric rotors and stators are available. Consult the factory for prices and information.

Sample volume	0.5 µl		1 µl		2 µl	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	C24-2184-.5		C24-2184-1		C24-2184-2	
With pneumatic actuator	C24-2184-.5A		C24-2184-1A		C24-2184-2A	
With standard electric actuator	C24-2184-.5E		C24-2184-1E		C24-2184-2E	
With microelectric actuator	C24-2184-.5EH		C24-2184-1EH		C24-2184-2EH	
Replacement valve	C24-2184-.5D		C24-2184-1D		C24-2184-2D	
Replacement rotor	C24-10R-.5		C24-10R-1		C24-10R-2	
Replacement stator	C24-1C8		C24-1C8		C24-1C8	

Model C24
1/4-28 fittings

Injector and Switching Valve Applications

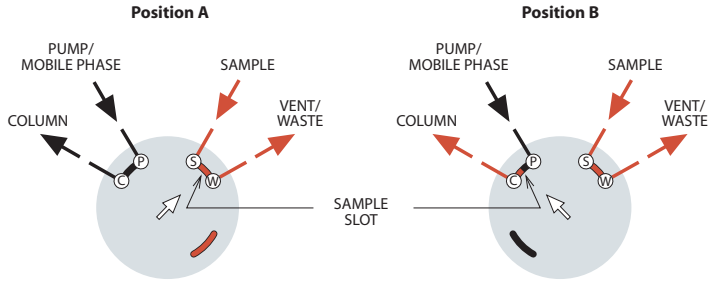
These illustrations show basic sample injection techniques using Valco two position valves. With rare exceptions, there is no difference between switching valves and external volume sampling valves, so the same valve can be used for either function.

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

4 port internal sample injector

MICROVOLUME SAMPLE INJECTION

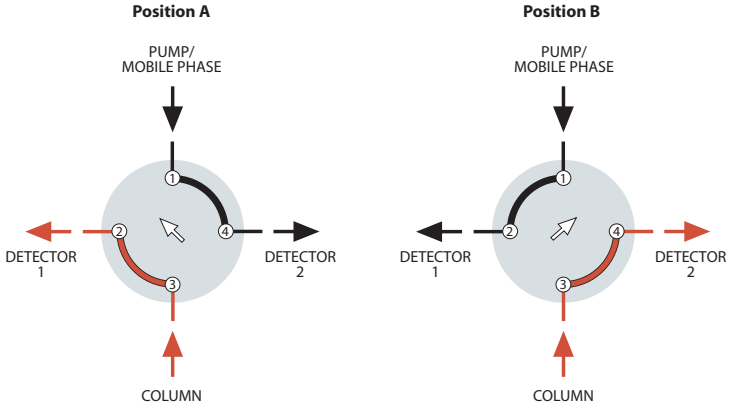
The internal sample (fixed volume) flowpath is used when very small sample volumes are required. The sample size is determined by a passage engraved on the valve rotor, allowing precise, repeatable injections. In Position A, the sample flows through the sample passage while the mobile phase flows through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



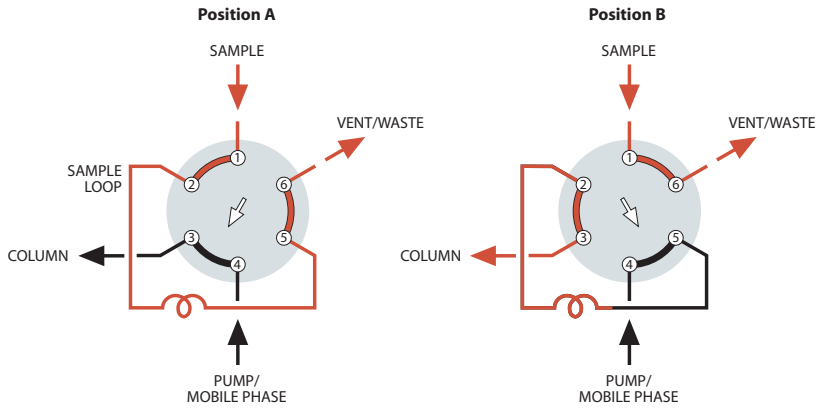
4 port switching valve

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.



6 port external sample injector

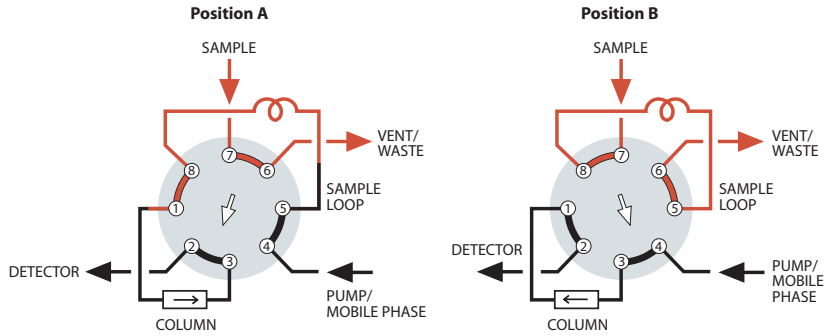


SAMPLE INJECTION

With the valve in Position A, sample flows through the external loop while the mobile phase flows directly through to the 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 into the column.
Note: Especially for partial-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.

More applications .....pages 118-119

8 port sampling/switching

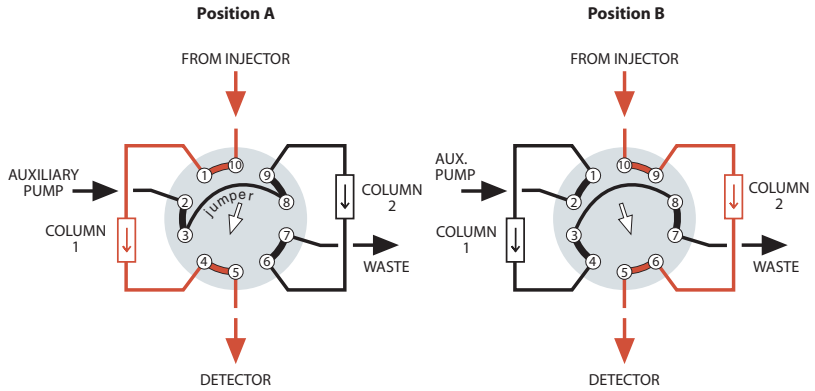


LOOP SAMPLING WITH BACKFLUSH TO DETECTOR

One valve performs the functions of sampling and backflush valves, 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.

More applications ..... page 119

10 port sampling/switching



ALTERNATE COLUMN REGENERATION

When columns must be regenerated following each analysis, this technique permits automation of the process. While one column performs the analysis, the second column undergoes regeneration through use of an auxiliary pump. Once the first analysis is complete, the valve is switched and the regenerated column is ready for analytical use.

More applications .....pages 120-121

NEW Selectors – Nanovolume UHPLC

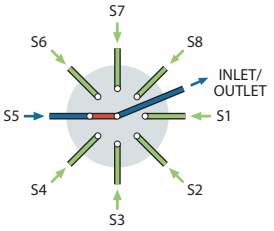
NEW 15,000 psi UHPLC Nanovolume selectors, 1/32" Valco fittings, 150 micron ports (.006")

Model C75NX

15,000 psi
Stream selector
1/32" **150 µm**

Includes 1/32" Valco stainless steel fittings.

Manual version not available.
Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international.
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply.



SPECS
15,000 psi liq
50°C max
Stainless stator with inert coating
Valcon E3 rotor

OPTIONS
- 100 micron (.004") bore
- 250 micron (.010") bore
- 10,000 and 20,000 psi versions available
- 4 positions

	6 Position		8 Position		10 Position	
	Prod No	*Pric e*	*Prod No*	*Price*	*Prod No*	*Price*
Coated stainless stator						
With pneumatic actuator	C75NX-6696A		C75NX-6698A		C75NX-6690A	
With standard electric actuator	C75NX-6696E		C75NX-6698E		C75NX-6690E	
With microelectric actuator	C75NX-6696EMH		C75NX-6698EMT		C75NX-6690EMT	
Replacement valve	C75NX-6696D		C75NX-6698D		C75NX-6690D	
Replacement rotor	C75N-66R6		C75N-66R8		C75N-66R0	
Replacement stator	C75N-6C96		C75N-6C98		C75N-6C90	

Model C75NX 1/32" Valco stainless fittings

NEW 10,000 psi UHPLC microbore selectors, 1/16" Valco fittings, 250 micron ports (.010")

Model C75H

SPECS
10,000 psi liq
50°C max
Stainless stator with inert coating
Valcon E3 rotor

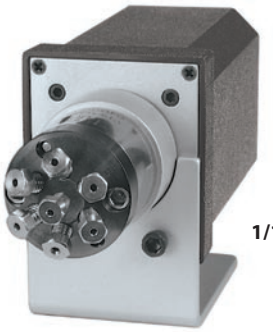
OPTIONS
- 150 micron (.006") bore
- 15,000 psi version available
- 4 positions

Includes 1/16" Valco stainless steel fittings.

Manual version not available.
Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international.
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply.

10,000 psi
Stream selector
1/16" **250 µm**

	6 Position		8 Position		10 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Coated stainless stator						
With pneumatic actuator	C75H-1696A		C75H-1698A		C75H-1690A	
With standard electric actuator	C75H-1696E		C75H-1698E		C75H-1690E	
With microelectric actuator	C75H-1696EMH		C75H-1698EMT		C75H-1690EMT	
Replacement valve	C75H-1696D		C75H-1698D		C75H-1690D	
Replacement rotor	C75-16R6		C75-16R8		C75-16R0	
Replacement stator	C75-1C96		C75-1C98		C75-1C90	



Model C75H 1/16" Valco stainless fittings

Selectors – High Pressure

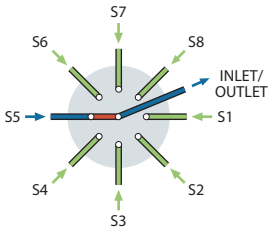
HPLC stream selector, 1/16" Valco ZDV fittings, 0.40 mm ports (.016")

Model C5

5,000 psi
Stream selector
10-32 ZDV
1/16" **0.40 mm**

Includes stainless steel nuts and ferrules of the stator material. Valves with PAEK stators have PEEK nuts and ferrules.

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



	4 Position		6 Position		8 Position		10 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
N60 stainless stator								
Manual	C5-2004		C5-2006		C5H-2008		C5H-2000	
With pneumatic actuator	C5-2004A		C5-2006A		C5H-2008A		C5H-2000A	
With standard electric actuator	C5-2004E		C5-2006E		C5H-2008E		C5H-2000E	
With microelectric actuator	C5-2004EMH		C5-2006EMH		C5H-2008EMT		C5H-2000EMT	
Replacement valve	C5-2004D		C5-2006D		C5H-2008D		C5H-2000D	
Replacement rotor	C5-20R4		C5-20R6		C5-20R8H		C5-20R0H	
Replacement stator	C5-2C04		C5-2C06		C5-2C08H		C5-2C00H	
PAEK stator								
Manual	C5-2344		C5-2346		C5H-2348		C5H-2340	
With pneumatic actuator	C5-2344A		C5-2346A		C5H-2348A		C5H-2340A	
With standard electric actuator	C5-2344E		C5-2346E		C5H-2348E		C5H-2340E	
With microelectric actuator	C5-2344EMH		C5-2346EMH		C5H-2348EMT		C5H-2340EMT	
Replacement valve	C5-2344D		C5-2346D		C5H-2348D		C5H-2340D	
Replacement rotor	C5-23R4		C5-23R6		C5-23R8H		C5-23R0H	
Replacement stator	C5-2C44		C5-2C46		C5-2C48H		C5-2C40H	
Titanium stator								
Manual	C5-2034		C5-2036		C5H-2038		C5H-2030	
With pneumatic actuator	C5-2034A		C5-2036A		C5H-2038A		C5H-2030A	
With standard electric actuator	C5-2034E		C5-2036E		C5H-2038E		C5H-2030E	
With microelectric actuator	C5-2034EMH		C5-2036EMH		C5H-2038EMT		C5H-2030EMT	
Replacement valve	C5-2034D		C5-2036D		C5H-2038D		C5H-2030D	
Replacement rotor	C5-20R4		C5-20R6		C5-20R8H		C5-20R0H	
Replacement stator	C5-2C34		C5-2C36		C5-2C38H		C5-2C30H	

Model C5
6 positions
1/16" ZDV fittings

SPECS

5000 psi liq
75°C max
Metal stator
Valcon H rotor

5000 psi liq
50°C max
PAEK stator
Valcon E rotor

OPTIONS

- 2", 3", 4", and 6" standoffs
- Hastelloy C stator
- Optional 0.15 mm (.006") and 0.25 mm (.010") bores available
- Optional 0.75 mm (.030") bore for Prep HPLC available

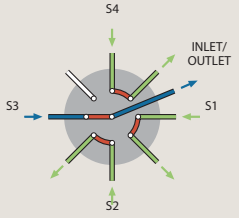
MORE INFORMATION

Manifolds . . . . . page 33

OPTIONAL FLOWPATH

Model C5F, the flow-through version, is similar to the C5 but its non-selected streams continue flowing through individual outlets.
3, 4, and 5 positions are available.

Consult the factory for C5F prices and information.



Model C5F
schematic diagram

HPLC column selector system with 1/16" Valco ZDV fittings, 0.40 mm ports (.016")

Model C5

SPECS

5000 psi liq
75°C max
Metal stator
Valcon H rotor

5000 psi liq
50°C max
PAEK stator
Valcon E rotor

The system comprises two stream selection valves mounted on a single microelectric actuator, which can be controlled manually, via remote logic level signal, or by RS-232 interface (RS-485 optional). See plumbing diagram below.

Includes stainless steel nuts and ferrules of the stator material.

Valves with PAEK stators have PEEK nuts and ferrules.

Includes microelectric actuator: 24 VDC, with 110/230 VAC to 24 VDC power supply.

5,000 psi
Column selector system
10-32 ZDV
1/16" **0.40 mm**

OPTIONS

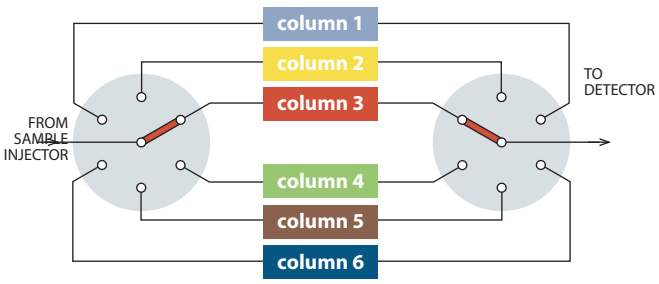
- 2", 3", 4", and 6" standoffs
- Hastelloy C stator
- Optional 0.25 mm (.010") bore available
- Optional 0.75 mm (.030") bore for Prep HPLC available

	6 Column		8 Column		10 Column	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
N60 stainless stator						
System	C5-2006EMTD		C5H-2008EMTD		C5H-2000EMTD	
Replacement valve	C5-2006D		C5H-2008D		C5H-2000D	
Replacement rotor	C5-20R6		C5-20R8H		C5-20R0H	
Replacement stator*	C5-2C06		C5-2C08H		C5-2C00H	
PAEK stator						
System	C5-2346EMTD		C5H-2348EMTD		C5H-2340EMTD	
Replacement valve	C5-2346D		C5H-2348D		C5H-2340D	
Replacement rotor	C5-23R6		C5-23R8H		C5-23R0H	
Replacement stator*	C5-2C46		C5-2C48H		C5-2C40H	

** See note on ordering stators, below.*

RS-232 interface cable

Prod No	*Price*
I-22697	



Model C5 system

Columns not included

MORE INFORMATION

ORDERING STATORS

Valves for dual drive assemblies have mirror image stators. Consult Technical Support for correct product number before ordering.

Both valves use the same rotor.

Selectors – Low Pressure

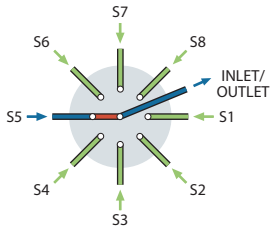
Stream selector, 1/16" Valco ZDV fittings, 0.75 mm ports (.030")

Model C25Z

Low pressure
Stream selector
10-32 ZDV
1/16" **0.75 mm**

Includes Valco ZDV PEEK nuts and ferrules.

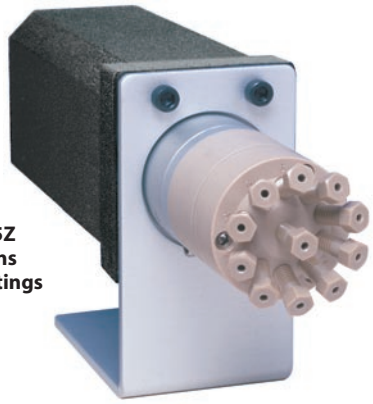
Standard electric actuator:
110 VAC for USA
110/230 VAC to 24 VDC power supply for international.
Microelectric actuator:
24 VDC, with 110/230 VAC to 24 VDC power supply.



	6 Position		8 Position		10 Position		14 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	C25Z-3186		C25Z-3188		C25Z-3180		C25Z-31814	
With pneumatic act.	C25Z-3186A		C25Z-3188A		C25Z-3180A		C25Z-31814A	
With std electric act.	C25Z-3186E		C25Z-3188E		C25Z-3180E		C25Z-31814E	
With microelectric act.	C25Z-3186EMH		C25Z-3188EMH		C25Z-3180EMH		C25Z-31814EMH	
Replacement valve	C25Z-3186D		C25Z-3188D		C25Z-3180D		C25Z-31814D	
Replacement rotor	C15-310		C15-310		C15-310		C25Z-325	
Replacement stator	C25Z-386		C25Z-388		C25Z-380		C25Z-38-14	

SPECS
100 psi gas/ 250 psi liq
75°C max
PPS stator
Valcon E2 rotor

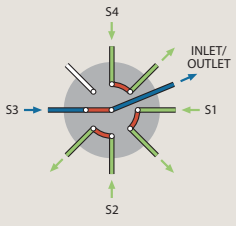
OPTIONS
- 4 and 12 positions available
- 2", 3", 4", and 6" standoffs
- Other polymeric materials are available. Consult the factory.



Model C25Z
10 positions
1/16" ZDV fittings

OPTIONAL FLOWPATH
Model C25ZF, the flow-through version, is similar to the C25Z but its non-selected streams continue flowing through individual outlets, instead of being dead-ended. 3, 4, 5, 6, and 7 positions are available.

Consult the factory for C25ZF prices and information.



Stream selector, 1/4-28 fittings for 1/16" tubing, 0.75 mm ports (.030")

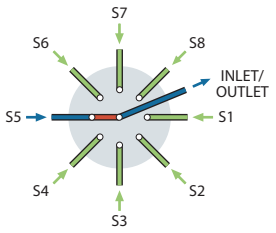
Model C25

SPECS
100 psi gas/ 250 psi liq
75°C max
PPS stator
Valcon E2 rotor

OPTIONS
- 2", 3", 4", and 6" standoffs
- CTFE stator

Includes multicolored Cheminert 1/4-28 flangeless fittings for 1/16" tubing.

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



Low pressure
Stream selector
1/4-28 Internal
1/16" **0.75 mm**

	4 Position		6 Position		8 Position		10 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	C25-3184		C25-3186		C25-3188		C25-3180	
With pneumatic act.	C25-3184A		C25-3186A		C25-3188A		C25-3180A	
With std electric act.	C25-3184E		C25-3186E		C25-3188E		C25-3180E	
With microelec act.	C25-3184EMH		C25-3186EMH		C25-3188EMH		C25-3180EMH	
Replacement valve	C25-3184D		C25-3186D		C25-3188D		C25-3180D	
Replacement rotor	C25-314		C25-316		C25-318		C25-310	
Replacement stator	C25-384		C25-386		C25-388		C25-380	

Stream selector, 1/4-28 fittings for 1/8" tubing, 1.50 mm ports (.060")

Model C25

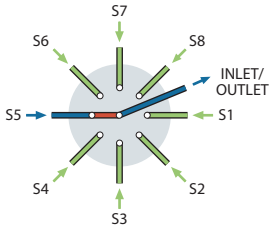
SPECS
100 psi gas/ 250 psi liq
75°C max
PPS stator
Valcon E2 rotor

OPTIONS
- 2", 3", 4", and 6" standoffs
- CTFE stator

MORE INFORMATION

Includes multicolored Cheminert 1/4-28 flangeless fittings for 1/8" tubing.

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



Low pressure
Stream selector
1/4-28 Internal
1/8" **1.50 mm**

	4 Position		6 Position		8 Position		10 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
Manual	C25-6184		C25-6186		C25-6188		C25-6180	
With pneumatic act.	C25-6184A		C25-6186A		C25-6188A		C25-6180A	
With std electric act.	C25-6184E		C25-6186E		C25-6188E		C25-6180E	
With microelec act.	C25-6184EMH		C25-6186EMH		C25-6188EMH		C25-6180EMH	
Replacement valve	C25-6184D		C25-6186D		C25-6188D		C25-6180D	
Replacement rotor	C25-614		C25-616		C25-618		C25-610	
Replacement stator	C25-684		C25-686		C25-688		C25-680	

OPTIONAL FLOWPATH
Model C25F is the flow-through versionof C25. (See discussion on facing page.) 3, 4, 5, 6, and 7 positions are available.

Consult the factory for C25F prices and information.

Model C25
10 position
1/4-28 fittings

Selectors – Low Pressure

Stream selector, 1/16" Valco ZDV fittings, 0.75 mm ports (.030")

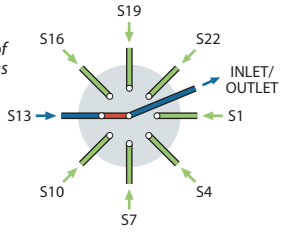
Model C35Z

Low pressure
Stream selector
10-32 ZDV
1/16" **0.75 mm**

Includes Valco ZDV PEEK nuts and ferrules.

Available only with microelectric actuator: 24 VDC, with 110/230 VAC to 24 VDC power supply.

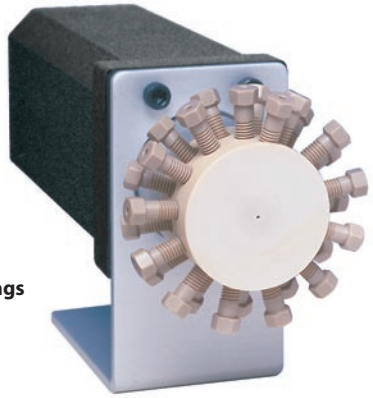
(For clarity, only eight of the twenty-four streams are illustrated.)



SPECS
100 psi liq
50°C max
PPS stator
Valcon E2 rotor

OPTIONS
- Optional bore: 0.5 mm (.020") 1.0 mm (.040")
- 2", 3", 4", and 6" standoffs
- Consult the factory for optional materials.

	20 Position		24 Position		26 Position	
	Prod No	*Price*	*Prod No*	*Price*	*Prod No*	*Price*
With microelectric actuator	C35Z-31820EMT		C35Z-31824EMT		C35Z-31826EMT	
Replacement valve	C35Z-31820D		C35Z-31824D		C35Z-31826D	
Replacement rotor	C35Z-31R20		C35Z-31R20		C35Z-31R20	



Model C35Z
26 positions
1/16" ZDV fittings

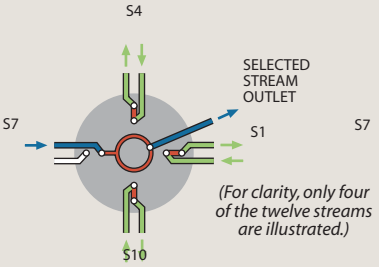
OPTIONAL FLOWPATHS

Model C35Z valves select and isolate one of 20-26 streams, with the remainder dead-ended.

Model C35ZF, the flow-through version, is similar to the C35Z but its non-selected streams continue flowing through individual outlets. 10, 12, and 13 positions are available.

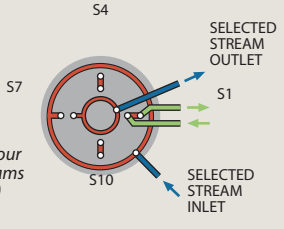
Model C35ZT, the trapping version, is similar to the C35ZF but has a second selected port. Non-selected streams continue flowing. 10, 12, and 13 positions are available.

Call for pricing and information.



(For clarity, only four of the twelve streams are illustrated.)

Model C35ZF schematic



Model C35ZT schematic

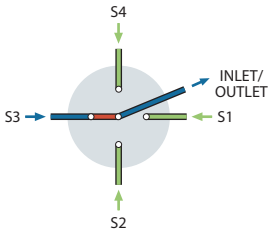
Stream selector, 1/2-20 fittings for 1/4" tubing, 4.6 mm ports (.180")

Model C45

SPECS
100 psi liq
50°C max
PPS stator
Valcon TF rotor

Manual version not available.
Includes Cheminert 1/2-20 flangeless fittings for 1/4" tubing, Delrin nuts and CTFE ferrules.

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



Low pressure
Stream selector
1/2-20 Internal
1/4" 4.6 mm

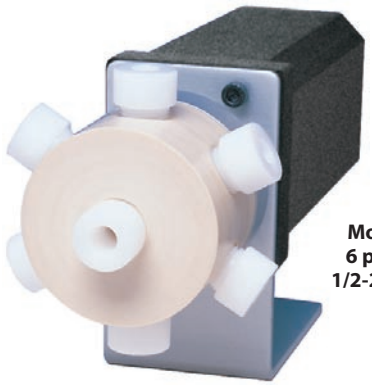
OPTIONS
- 2", 3", 4", and 6" standoffs
- Consult the factory for optional materials.
- 8 position selectors are available with 3 mm (.120") ports

	4 Position		6 Position	
	Prod No	*Price*	*Prod No*	*Price*
With pneumatic actuator	C45-9784A		C45-9786A	
With std electric actuator	C45-9784E		C45-9786E	
With microelectric actuator	C45-9784EMT		C45-9786EMT	
Replacement valve	C45-9784D		C45-9786D	
Replacement rotor	C45-97R4		C45-97R6	

Fittings for C45 valves

For additional 1/2-20 fittings and adapters, see page 72.

	Prod No	*Price*
Delrin nut	CFL-4D	
CTFE nut	CFL-4KF	
PPS nut	CFL-4PPS	
CTFE ferrule	CFL-CB4KF-S	



Model C45
6 positions
1/2-20 fittings

MORE INFORMATION

Actuators and Accessories

Two position valves switch back and forth between Load and Inject, or Position A and Position B. Selectors operate in continuous revolutions by incremental steps. There are several ways to actuate each type of valve, along with a number of supporting controllers and devices to interface the actuators with computer-controlled systems.

With the exception of low pressure Cheminert selectors, we recommend that selectors be purchased with air or electric actuators. While a manual detent assembly is available, the higher turning torque of our other selector designs makes them more difficult to position accurately by hand.

Manual Actuation

Simplicity and low cost are the main advantages of manual actuation. Some models can be ordered with position feedback, an option which sends a signal to start a data system when the valve is switched.

Knobs
page 204

Air Actuation

Air actuators are useful in situations where any spark could be disastrous or where there is no electricity available. They are small, relatively inexpensive, very rugged and dependable, and field-serviceable. Low gas consumption and lightweight, compact construction make the air actuator suitable for aerospace flight hardware applications as well as laboratory or process applications.

With the addition of a DVI (digital valve interface) to translate the timed event signals into the necessary air pulses, air actuators can be automatically switched by a data system, integrator, or controller such as our DVSP (digital valve sequence programmer) or SVI (serial valve interface).

Air actuator
Two position, page 195
Selector, page 194

MORE INFORMATION

Actuators

Controllers and Accessories

Mounting Hardware

Electric Actuation

The **microelectric actuator** features automatic valve alignment, high-speed switching, compact size, 24 VDC power input, and reversible direction (in the selector model).

If lower cost outranks those factors in your consideration, our **standard electric actuator** (110/230 VAC) offers a dependable, economical solution.

Both types of electric actuators can be operated manually with a controller assembly that features position-indicating LEDs and a toggle switch, but can be easily connected to an external data system for fully automated control. The microelectric actuator has built-in multidrop RS-232 (RS-485 optional) for bidirectional communications. The SVI (serial valve interface) was designed specifically to interface our standard electric actuators with RS-232 compatible systems, allowing control of up to six actuators via modem, BASIC program, or Valco-supplied PC software.

The new **universal actuator** operates virtually any Valco or Cheminert rotary valve – two position and selector alike – greatly simplying the electronic aspect of instrument design.

Microelectric actuator
Two position, page 189
For selectors (multiposition), page 190

Standard electric actuator
Two position and selector, page 193

Universal actuator
page 192

Standoff Assemblies

Standoff assemblies
page 205

All valves, no matter what their actuation mode, can be ordered with a standoff assembly. The standoff is an extension shaft mounted between the handle or actuator and the valve, allowing the valve to be installed within a heated zone while the actuator or handle remains outside at ambient temperature. The standoff extends through the oven wall, and is secured by a clamp ring supplied with the assembly. Standard standoff assembly lengths are 2", 3", 4", and 6". Other lengths can be special-ordered at additional cost.

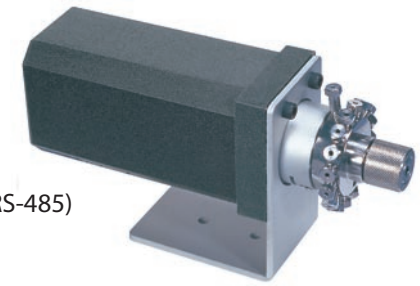
Right Angle Drive

Some installations don't allow the valve and actuator to be installed in a typical in-line configuration. The RAD (right angle drive) is a 90° gearbox which permits the actuator or handle to be installed at a right angle to the valve. The RAD fits all VICI electric and air actuators.

ight angle drive
Rpage 204

Microelectric Actuators

- CE certified
- Automatic alignment
- Manual control with position indication
- Remote control by contact closures or TTL logic level signals
- RS-232 bidirectional communication (optional RS-485)
- Two position and selector versions
- Universal power supply, 110/230 VAC to 24 VDC



The microelectric actuator offers Valco dependability in a unit which is less than half the size of our standard model. The actuator consists of a control module, a stepper motor/gearbox assembly, a manual remote control, interconnecting cables, and a 110/230 VAC to 24 VDC power supply. The composite version combines the stepper motor/gearbox assembly with the control module. The RS-232 interface cable, if required, must be ordered separately.

Since different valve models have varying actuation torque requirements, there are five microelectric actuator models for two position valves – EQ, EH, EP, ED, and ET – and two versions for multiposition – EMH and EMT. Consult the chart on the respective ordering information page to determine which model meets your requirements. When a valve and actuator are ordered at the same time, the proper actuator is supplied automatically.

An actuator can be specified with closemount hardware, with a standoff, or with just the standoff mounting hardware, if your valve already has a standoff. The microelectric actuator is designed for room temperature use. Valves which will be mounted in ovens require a standoff assembly, which locates the actuator out of the heated zone.

MORE INFORMATION

Microelectric actuators
For two position 189
For selectors . . . 190-191

Mounting Hardware

Closemount hardware . . . . . page 208
Right angle drive 204
Standoff assembly 205
Standoff mounting hardware 205

TECH TIP

Electric actuators can be directly controlled by signals from microprocessor-based instruments, data systems, or valve programmers, unlike air actuators, which require an interface to convert the signal to an air pulse.

ORDER TIP

To purchase a ***valve with a microelectric actuator installed***, see valve ordering information.

Valco

Injectors and valves . . . . pp 102-116
Selectors 122-133

Cheminert

Injectors and valves 152-167
Selectors 170-177

- CE certified
- Stall-sensing circuitry – no mechanical microswitches
- High speed switching – <100 ms in EQ model
- A model for every valve we sell

The two position microelectric actuator features exclusive stall-sensing circuitry which eliminates problems associated with valve/actuator misalignment. Power to the actuator motor is switched off when the driver pin goes against the stop of the valve cutout – no sooner, no later – and it's all done without any mechanical microswitches. Not only does this mean that alignment problems are a thing of the past, it means that you can stock one actuator for valves that turn 30°, 36°, 45°, 60°, 90°, or anything in between.

During initialization, the valve rotates at moderate speed while the actuator waits to sense the stall. Once the rotation angle has been measured and confirmed by repetition, the angle is memorized and actuation takes place at maximum speed. Valve position memory is maintained even in the event of a power failure. There is nothing more to do unless you wish to install a valve with a different angle of rotation. In that event, cycling the actuator with no valve mounted sets up reinitialization.

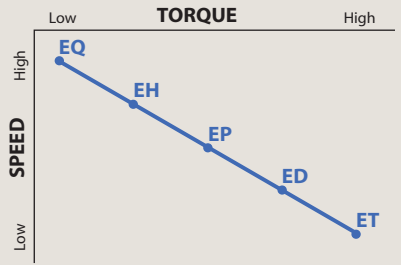
WHICH MODEL FOR WHICH TWO POSITION VALVE?

Fitting size	Valve type	Actuator model	Valve type	Actuator model
	Valco GC		Valco HPLC	
1/32"	W	EH	W	EP
1/16"	W	EH	W	EP
1/16"	UW	ED	UW	ED
1/8"	UW	ED	UW	ED
1/4"	MW	ET	—	—

Cheminert HPLC & Low Pressure

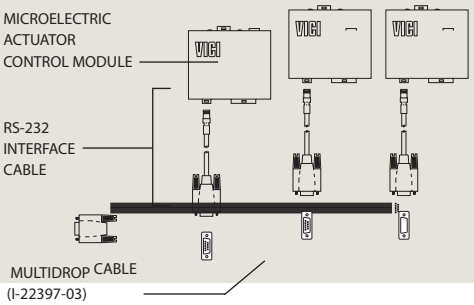
All valves	EH

SPEED AND TORQUE: Inversely proportional



TECH TIP

Multi-drop cables permit a single serial port (RS-232) to control multiple microelectric actuators.



Microelectric actuators *for two position valves*

Standard voltage 24 VDC. Includes autosensing 24 VDC power supply.
Standoff version includes a 2" standoff. 3", 4", and 6" standoffs are also available.
Consult the chart below to determine which actuator model is best suited for your valve.

Description	With closemount assembly *Prod No*	With 2" standoff assembly *Prod No*	For use with existing standoff *Prod No*
Highest speed actuator	EQ	EQ2	EQS
High speed actuator	EH	EH2	EHS
Medium torque actuator	EP	EP2	EPS
High torque actuator	ED	ED2	EDS
Highest torque actuator	ET	ET2	ETS

RS-232 interface cable

Description	*Prod No*
RS-232 interface cable	I-22697

Multi-drop cables *for multiple microelectric actuators*

Multi-drop cables permit a single serial port (RS-232) to control multiple microelectric two position and multiposition actuators. Cables have one female DB9 and 2 to 8 male DB9 connectors – approximately 6" long.
Note: The RS-232 interface cable (I-22697), above, is required for ***each*** actuator.

No. of actuators to be controlled	*Prod No*
2	I-22897-02
3	I-22897-03
4	I-22897-04
5	I-22897-05
6	I-22897-06
8	I-22897-08

Microelectric Actuators for Selectors

- CE certified
- Direction reversal
- Position indication
  - LED display
  - RS-232 output
  - BCD 5V negative true output
- Manual control
  - Step and home functions
  - Clockwise and counterclockwise functions
- Remote control
  - Step and home functions with contact closure
  - Direct position access with BCD 5V negative true input
  - Direct position access with RS-232 input (RS-485 optional)
- Automatic self-alignment with keyed valves and standoffs

One actuator can be used on any selector, from 2 to 96 positions – you tell the actuator how many stops to make through its 360° of rotation. So you can stock only one type of actuator even if you have 4, 6, 8, 10, 12, and 16 position valves. Valve position memory is maintained even in the event of a power failure.

The direction reversal feature means that if a 6 position stream selection valve is on stream 1 and you select stream 6, you have the option of stepping "backwards" to stream 6 instead of passing through 2, 3, 4, and 5. The RS-232 input offers various commands like position access, direction control, shortest route, etc. (The RS-232 cable must be ordered separately.)

MORE INFORMATION

Microelectric actuators
For two position 189

Mounting Hardware

Closemount hardware . . . . . page 208
Right angle drive 204
Standoff assembly 205
Standoff mounting hardware 205

ORDER TIP

To purchase a ***valve with a microelectric actuator installed***, see valve ordering information.

Valco

Injectors and valves . . . . pp 102-116
Selectors 122-133

Cheminert

Injectors and valves 152-167
Selectors 170-177

Microelectric actuators *for selectors*

Standard voltage 24 VDC. Includes autosensing 24 VDC power supply.
Standoff version includes a 2" standoff. 3", 4", and 6" standoffs are also available.
Consult the chart below to determine which actuator model is best suited for your valve.

Description	**With keyed closemount assembly** *Prod No*	**With keyed 2" standoff assembly** *Prod No*	**For use with existing standoff** *Prod No*
High speed actuator	EMH	EMH2	EMHS
High torque actuator	EMT	EMT2	EMTS

RS-232 interface cable

Description	*Prod No*
RS-232 interface cable	I-22697

Multi-drop cables *for multiple microelectric actuators*

Multi-drop cables permit a single serial port (RS-232) to control multiple microelectric two position and selector actuators. Cables have one female DB9 and 2 to 8 male DB9 connectors – approximately 6" long.
Note: The RS-232 interface cable (I-22697), above, is required for ***each*** actuator.

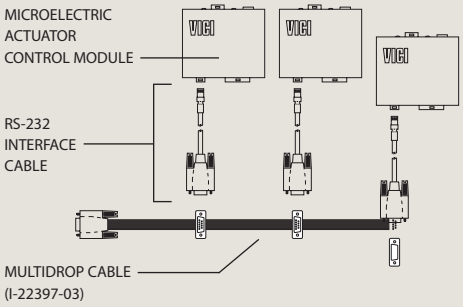
No. of actuators to be controlled	*Prod No*
2	I-22897-02
3	I-22897-03
4	I-22897-04
5	I-22897-05
6	I-22897-06
8	I-22897-08

WHICH MODEL FOR WHICH SELECTOR?

Valve model		Actuator model
Valco		
All valves		EMT
Cheminert high pressure		
C5	4, 6 positions	EMH
	8, 10 positions	EMT
C75NX		EMH
C75H		EMH
Cheminert low pressure		
C25Z		EMH
C25		EMH
C35Z		EMH
C45		EMT

TECH TIP

Multi-drop cables permit a single serial port (RS-232) to control multiple microelectric actuators.



ABOUT STANDOFFS

Keyed standoff assemblies are used with selector (multiposition) microelectric actuators, to key the valve body to the actuator and standoff so that the actuators can self-align and operate valves with any number of positions.

Valco selectors are not keyed unless ordered with a microelectric actuator. To install a microelectric actuator on an existing Valco selector, the key (pin) must be removed from the actuator clamp ring assembly. This can be done easily with a pair of pliers.

See page 207, top and bottom illustrations, for drawings of keyed standoff assemblies with multiposition microelectric actuators.

NEW OEM – Universal Actuators

- One actuator works with two position valves *and* selectors
- Simplified, universal communication protocol
- Variety of interfaces
- Three versions for various valve torque requirements

Shown with BCD option

The universal actuator allows instrument manufacturers to use a single motor and control software to operate virtually any Valco or Cheminert rotary valve. This simplifies the electronic aspect of instrument design and streamlines the development process.

All our Valco and Cheminert valves and selectors, with their wide range of turning torques, are covered by three actuator versions: high speed, medium speed/medium torque, and high torque. *(See charts below)*

Actuators listed below include universal 24 volt DC power supply and manual interface. An OEM version that excludes these items is also available. Current interface options include RS232/485, USB, and BCD.

While the actuators listed on this page are universal, the valve mounting hardware is not. The product numbers shown below do not include the hardware required for mounting a valve, since the necessary hardware depends on the valve type. If you are ordering the actuator for use with an *existing* valve, call our sales or technical staff to determine the correct hardware needed. If you want to order the universal actuator with a *new* valve, simply substitute the actuator product number in place of a different actuator and we'll provide the correct hardware. For example, to order the universal actuator in place of the air actuator in A4C6UWE, order p/n EUD4C6UWE, or to order C2-2006EH with a universal actuator, order C2-2006EUH.

NEW Universal actuators

	High speed (EUH)	Medium torque (EUD)	High torque (EUT)
Description	*Prod no*	*Prod no*	*Prod no*
Without interface	EUH	EUD	EUT
With RS-232/485	EUHA	EUDA	EUTA
With USB	EUHB	EUDB	EUTB
With BCD	EUHC	EUDC	EUTC

Refer to these charts to determine which of the three versions best suits the valves you use, or simply ask our sales or technical staff.

WHICH MODEL FOR WHICH SELECTOR?

Valco

	Actuator model
All valves	EUT

Cheminert

	Actuator model HPLC	*Actuator model* UHPLC
4 and 6 position *	EUH	EUH
8 and 10 position	EUD	EUD
	Low pressure	
Model C25 and C25Z	EUH	
Model C35Z	EUD	
Model C45	EUT	

* 20,000 psi versions use EUD.

WHICH MODEL FOR WHICH INJECTOR / TWO POSITION VALVE?

Valco

Fitting size	*Valve type*	*Actuator model* GC	*Actuator model* HPLC
1/32"	W	EUH	EUD
1/16"	W	EUH	EUD
1/16"	UW	EUD	EUD
1/8"	UW	EUD	EUD
1/4"	MW	EUT	—

Cheminert

	Actuator model HPLC	*Actuator model* UHPLC
4 and 6 ports *	EUH	EUH
8 and 10 ports	EUH	EUD
	Low pressure	
All valves	EUH	

*20,000 psi versions use EUD.

Cheminert HPLC selector on universal actuator

Cheminert LC injector on universal actuator

Valco GC selector on universal actuator

Two position standard electric actuators may be operated manually by a toggle switch or automatically by any data system with momentary contact closures or 5 VDC negative true logic outputs. A complete system, the actuator includes interface cable, power cord, and manual controller assembly with position indication.

Multiposition (selector) models work with any of our multiposition valves. The manual controller with LED display allows the user to step sequentially from one position to the next or to return to Position 1 (Home). A data system with momentary contact closures can direct the step and home functions; 5 VDC negative true logic outputs provide direct position access. A 20-conductor interface cable permits the system to step the actuator sequentially, move the actuator directly to any position, and read the actual valve position.

Standard electric actuators can be ordered with closemount hardware, a standoff, or just the standoff mounting hardware, if your valve already has a standoff. Valves which will be mounted in ovens require a standoff assembly so that the actuator is located out of the heated zone.

The actuator's rotation (two position) or number of positions (multiposition) must be properly matched to the valve's. If you are converting a manual valve to electric actuation and have any doubts about which actuator and hardware you need, call our sales or technical staff for assistance.

ORDER TIP

To purchase a ***valve with a standard electric actuator installed***, see valve ordering information.

Valco

Injectors and valves .... pp 102-116
Multiposition valves 122-133

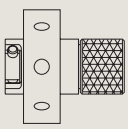
Cheminert

Injectors and valves 152-167
Multiposition valves 170-177

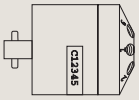
TECH TIP

Valco two position W and UW type valves and Cheminert valves have the following angles of rotation:

3 port	90°
4 port	90°
6 port	60°
8 port	45°
10 port	36°
12 port	30°
14 port	26°



Valco



Cheminert

MORE INFORMATION

Controllers

DVSP.....page 196
Digital valve sequence programmer
SVI 197
Serial valve interface

Mounting Hardware

Closemount hardware..... 208
Right angle drive . 204
Standoff assembly 205
Standoff mounting hardware..... 205

Standard electric actuators *for two position valves*

Standard voltage: 110 VAC. (230 VAC and 24 volt CE versions optional. Consult factory for product numbers and pricing.)
Standoff version includes a 2" standoff. 3", 4", and 6" standoffs are also available.

No. of ports in valve	*Description*	With closemount assembly *Prod No*	With 2" standoff assembly *Prod No*	For use with existing standoff *Prod No*
3, 4	90° rotation	E90	E902	E90S
6	60° rotation	E60	E602	E60S
8	45° rotation	E45	E452	E45S
10	36° rotation	E36	E362	E36S
12	30° rotation	E30	E302	E30S

Standard electric actuators *for selectors*

Standard voltage: 110 VAC. (230 VAC optional. Consult factory for product numbers and pricing.)
Standoff version includes a 2" standoff. 3", 4", and 6" standoffs are also available.

Description	With closemount assembly *Prod No*	With 2" standoff assembly *Prod No*	For use with existing standoff *Prod No*
4 position	E4	E42	E4S
4 x 2*	E4X2	E4X22	E4X2S
6 position	E6	E62	E6S
6 x 2**	E6X2	E6X22	E6X2S
8 position	E8	E82	E8S
10 position	E10	E102	E10S
12 position	E12	E122	E12S
16 position	E16	E162	E16S

* The 4 column selection valve, CST4UW, is an 8 position valve and needs a 4 x 2 actuator.
** The 6 column selection valve, CST6UW, is a 12 position valve and needs a 6 x 2 actuator.

Air Actuators

Air actuators offer reliable performance under the most stringent conditions. Low gas consumption and lightweight, compact construction make the air actuator suitable for aerospace flight hardware applications as well as laboratory or process applications.

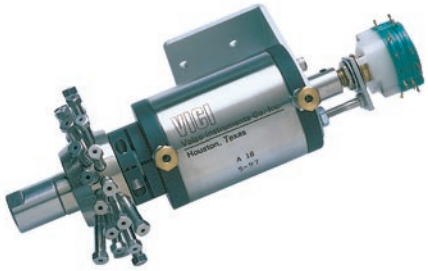
The standard air actuator is rated for up to 80 psig at temperatures up to 70°C. Generally speaking, valves which will be heated require a standoff assembly, which locates the air actuator out of the heated zone and supports both the valve and actuator. A high temperature model permits both valve and actuator to be mounted within an oven (175°C maximum), but it is not recommended for use below 50°C.

Air Actuators for Selectors

The recommended method for implementing a selector (multi-position) air actuator requires only a single 4-way solenoid. Up to 80 psig may be used without damaging the valve or actuator. Bottled instrument air or nitrogen is recommended.

If plant air from compressors must be used, an oil separator and water dryer are required.

Multiposition air actuators include a rotary switch which may be connected to a digital readout or your own design.



Standard air actuators *for selectors*

Temperature range 0-70°C
Standoff version includes a 2" standoff. 3", 4", and 6" standoffs are also available.

Description	With closemount assembly *Prod No*	With 2" standoff assembly *Prod No*	With standoff mounting hardware *Prod No*
4 position	A4	A42	A4S
6 position	A6	A62	A6S
8 position	A8	A82	A8S
10 position	A10	A102	A10S
12 position	A12	A122	A12S
16 position	A16	A162	A16S

High temperature air actuators *for selectors*

Temperature range 50-175°C
Standoff version includes a 4" standoff. 2", 3", and 6" standoffs are also available.

Description	With closemount assembly *Prod No*	With 4" standoff assembly *Prod No*	With standoff mounting hardware *Prod No*
4 position	AT4	AT44	AT4S
6 position	AT6	AT64	AT6S
8 position	AT8	AT84	AT8S
10 position	AT10	AT104	AT10S
12 position	AT12	AT124	AT12S
16 position	AT16	AT164	AT16S

Replacement O-rings

Includes a complete set of O-rings for a multiposition air actuator.

Description	*Prod No*	*Price*
Standard	ORMP	$16
High temp	ORTMP	20

TECH TIP
The actuator's rotation must be properly matched to the valve's. If you are converting a manual valve to air actuation and have any doubts about which actuator and hardware you need, call our sales or technical staff for assistance.

MORE INFORMATION
PFAF . . . . . page 199
Position feedback

Mounting Hardware
Closemount hardware . . . . . page 208
Right angle drive 204
Standoff assembly 205
Standoff mounting hardware 205

ORDER TIP
To purchase a ***valve with an air actuator installed***, go directly to valve ordering information.

MORE INFORMATION

HSSA. . . . . page 198
High speed switching accessory
PFAF 199
Position feedback

TECH TIP

Here's what you'll get when you order:

Air actuator with a **closemount assembly**

Air actuator with a **4" standoff assembly**

Air actuator **for use with an existing standoff**

The recommended method for implementing a two position air actuator is a manifold solenoid valve assembly (MSVA), a block-mounted pair of 3-way solenoids that pulses air to the actuator to switch it from position to position. If air is applied continuously, the continuous rotational force applied to the valve can cause sideloading, leaking, and additional wear.

Typical actuation pressure is 40 to 50 psig, but up to 80 psig may be used.

Ideally, only enough air pressure should be used to switch the valve in 1/3 to 1/2 second. Bottled instrument air or nitrogen is recommended. If plant air from compressors must be used, an oil separator and water dryer are required.

A high speed switching accessory (HSSA) can upgrade valve switching times to less than 30 ms with air or 8 ms with helium. A position feedback (PFAF) with contact closures in both positions is also available as an option.

Standard air actuators

for two position valves

Temperature range 0-70°C
Standoff version includes a 4" standoff. 2", 3", and 6" standoffs are also available.

No. of ports in valve	*Description*	**With closemount assembly** *Prod No*	**With 4" standoff assembly** *Prod No*	**For use with existing standoff** *Prod No*
3, 4	90° rotation	A90	A904	A90S
6	60° rotation	A60	A604	A60S
8	45° rotation	A45	A454	A45S
10	36° rotation	A36	A364	A36S
12	30° rotation	A30	A304	A30S

High temperature air actuators

for two position valves

Temperature range 50-175°C
Standoff version includes a 2" standoff. 3", 4", and 6" standoffs are also available.

No. of ports in valve	*Description*	**With closemount assembly** *Prod No*	**With 2" standoff assembly** *Prod No*	**For use with existing standoff** *Prod No*
3, 4	90° rotation	AT90	AT902	AT90S
6	60° rotation	AT60	AT602	AT60S
8	45° rotation	AT45	AT452	AT45S
10	36° rotation	AT36	AT362	AT36S
12	30° rotation	AT30	AT302	AT30S

Replacement O-rings

Includes a complete set of O-rings for a two position air actuator.

Description	*Prod No*
Standard	OR
High temp	ORT

Actuator compression fittings

Includes 1/8" compression to 10-32 male thread, plus 1/8" brass ferrule and hex nut.

Description	*Prod No*
3 piece fitting assembly	F-TCF

Digital Valve Sequence Programmer (DVSP)

The digital valve sequence programmer (DVSP) is an add-on or stand-alone timer/programmer with 4 intervals, settable in ranges of 0-99 seconds, 0-9.9 minutes, or 0-99 minutes. The DVSP is most commonly used for remote operation of electrical devices such as solenoid valves, Valco two position or multiposition electric actuators, and the Valco DVI (digital valve interface), which converts contact closures into pneumatic pulses for switching Valco two position air actuators.

The DVSP has two operational modes: in the AUTO mode, the DVSP will return to the first interval and begin another sequence after the last interval is completed, and in the SINGLE CYCLE mode it stops after completing one sequence. During a cycle or sequence, simple controls allow the user to stop the cycle, reset it to Interval 1, switch to the AUTO mode, or advance to the next interval. The DVSP can also be wired for remote operation by contact closure from a data system or other control device.

Each interval has one double pole, double throw relay, rated at 5 amps, which provides two sets of contacts with no connection from one side to the other. This means that a single interval can be used to perform two separate functions requiring differing voltage requirements. For example, one side of Relay A (Interval 1) can be used to switch an electric actuator (contact closure) while the other side is connected to 110/230 VAC and switches a 110/230 VAC solenoid valve at the same time as the electric actuator. In addition, Relay E supplies a two second contact. When solenoid valves are wired in series with this relay the result is "pulsed operation" of the air actuator, which avoids the potential valve and actuator problems associated with continuously-applied air pressure.

Both 12 VDC and 110/230 VAC power supplies are included within the DVSP, but the relays may be supplied with power from an external power source. For example, 24 VDC solenoid valves can be switched by the DVSP relays if the 24 volts is supplied to the relays from an external 24 VDC power supply.

DVSP
Digital valve sequence programmer

for all air and electric actuators

	Prod No
110 VAC	DVSP4
230 VAC	DVSP4-220

MORE INFORMATION

Actuators

Air .....pages 194-195
Microelectric 188-191
Standard elec 193

Controllers and Interfaces

HSSA.....198
High speed switching accessory
PFAF 199
Position feedback for air actuators
PFW/PFC.....199
Position feedback for manual valves

Mounting Hardware

Closemount hardware..... page 208
Right angle drive 204
Standoff assembly....205
Standoff mounting hardware.....205

The serial valve interface (SVI) is a device that converts commands from a computer, via a serial port, into positional control for two position and selectors (multiposition valves). Each SVI can control up to four air actuated (via a DVI, page 199) or electrically actuated two position valves and two electrically actuated selectors. The timing program can be run in the background, freeing the computer for other applications. Two serial ports (one male, one female) allow up to eight SVIs to be daisy-chained and run from a single serial communication port. In addition to controlling valves, the SVI can be used to control other devices which require logic level, BCD, or single line inputs.

The SVI is a self-contained unit, with its own 110 VAC (or 230 VAC Eurostandard) power supply. There is no need to open the computer to connect the SVI, because its DB-9 to DB-9 RS-232 cable connects to any available serial port. It also includes an interface cable for Valco two position actuators, and two Ansley 20-wire connectors for installation on the interface cable which comes as part of the multiposition electric actuator. For air actuated valves, optional interface cables are available for the DVI, which converts electrical signals to pneumatic pulses.

Software is supplied on a Windows-compatible CD. If different program functionality is needed, information is given in the manual which will assist in writing the necessary software.

SVI
Serial valve interface

for all air and standard electric actuators

	Prod No
110 VAC	SVI
230 VAC	SVI-220
DVI/SVI interface cable	I-22239

Solenoids and High Speed Accessory

41E1 4-Way solenoid air valve *for selector air actuators*

This 4-way solenoid air valve with 1/8" tube fittings is the simplest method of stepping a selector air actuator. Energizing the solenoid steps the valve to its next position, and de-energizing the solenoid resets the mechanical ratchet in the actuator. This implementation, not recommended for two position actuators, can be useful when only a limited number of external events is available on the data system.

	Prod No
110 VAC	41E1-120VAC
230 VAC	41E1-220VAC
24 VAC	41E1-24VAC
12 VDC	41E1-12VDC
24 VDC	41E1-24VDC

MSVA Manifold 3-way solenoid valve assembly *for two position air actuators*

The recommended way to switch two position air actuated valves is to "pulse" a pair of 3-way solenoid valves. This method applies air to the actuator only during switching, and alleviates problems associated with continuous air pressure. The MSVA is a block-mounted pair of 3-way solenoid air valves with 1/8" tube connections, available in 12 VDC, 24 VDC, 24 VAC, 110 VAC, and 230 VAC models.

	Prod No
110 VAC	MSVA-110VAC
230 VAC	MSVA-220VAC
24 VAC	MSVA-24VAC
12 VDC	MSVA-12VDC
24 VDC	MSVA-24VDC

HSSA High speed switching accessory *for two position air actuators*

The HSSA is an add-on for our standard air actuators, providing increased air or helium flow for the fast actuation required in microbore chromatography or partial loop injections. Normal switching time for a C6W with 100 psi air is 180 ms. With the HSSA that drops to 20 ms; substitute 100 psi helium and the valve switches in 8 ms. Usually the HSSA is used in conjunction with the DVI discussed on page 199.

Prod No
HSSA

MORE INFORMATION

Actuators

Controllers and Interfaces

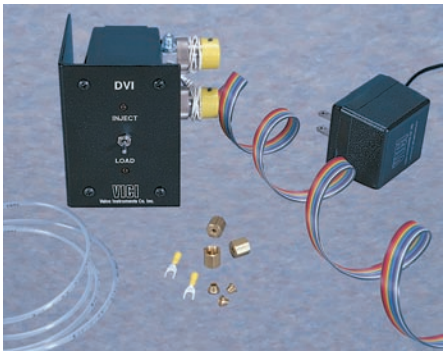
Mounting Hardware

Digital Valve Interface (DVI) and Position Feedbacks

DVI Digital valve interface *for two position air actuators*

We highly recommend the DVI for use with two position air actuators. It sends a two second pulse of air to switch the valve and then vents the air, simulating switching by hand and eliminating the potential for damaging the valve or actuator with continuously-applied pressure. It also features LED position indication, manual and remote operation, and a contact closure output on arrival to the INJECT position, a feature which can be used to start a run or integration. The DVI is available for 110 or 230 VAC.

	Prod No
110 VAC	DVI
230 VAC	DVI-220



PFAF Position feedback *for two position air actuators*

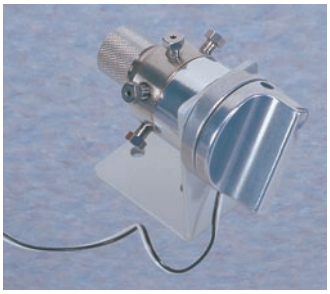
The optional position feedback (PFAF) can be field installed on any two position standard air actuator. Each position provides a contact closure for TTL logic level signals.

Prod No
PFAF

Position feedback *for manual valves*

An optional position feedback is available for manual Valco W type and Cheminert C2 and C4 series valves (standard on Cheminert C1 valves). The continuous contact closure, provided only while the valve is in the inject position, can remote start a chromatograph or data system.

Description	*Prod No*
For Valco W type valves	
4 port	PFW90
6 port	PFW60
8 and 10 port	PFW36
For Cheminert valves	
C2 series except 4 port	PFC2
C2 series, 4 port	PFC4
C4 series	PFC4



BIO-CHEM VALVE™ INC.

SERIES: C

BIO-CHEK™ IN-LINE CHECK VALVE

FEATURES

- Inert Flow Path, no metal parts
- Choice of EPDM, Viton®, or Chemraz® check element
- PEEK or PPS housing materials
- Check against backflow pressure to 100 psi
- Small Internal Volume
- Low Cracking Pressure
- Gravity Independent installation

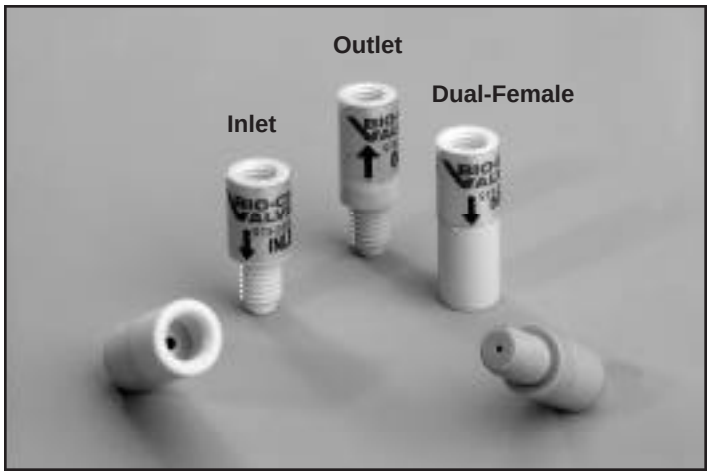
SPECIFICATIONS

Series	C	
Cracking Pressure:	EPDM Viton® Chemraz®	1.0 psi 0.8 psi 0.3 psi
Backpressure generated:	@0-30 psi @30-50 psi	< 1 psi 1 - 2 psi
Maximum Pressure Rating	50 psi	
Maximum Backpressure	100 psi	
Internal Volume:	Inlet Outlet Dual-Female	60 µl 68 µl 49 µl
Connection*	1/4 - 28 UNF flat bottom	
Flow	See chart on back page	

* Consult factory for other connection options.
Note:These check valves are intended for liquids only.
® Viton is a registered trademark of DuPont Co.
® Chemraz is a registered trademark of Greene Tweede & Co.

DIMENSIONS

Series	Diameter	Female Port Depth	Male Thread Length	Total Length
CI	0.36”	0.25”	0.41”	1.00”
CO	0.36”	0.25”	0.34”	1.00”
CF	0.36”	0.25”	-----	0.87”



The *Bio-Chek*™ self-sealing in-line check valves feature an inert flow path, no metal components and zero maintenance in high-purity, low-pressure applications.

Unlike spring-actuated check valves that can restrict or impede the flow path causing content (product) damage, the *Bio-Chek*™ in-line check valve design features a smooth flow path that minimizes shear and turbulence. The *Bio-Chek*™ valve provides a flow rate equivalent to a 0.030" orifice, a cracking pressure of 1 psi or less and check against backflow pressure to 100 psi. Available in inlet, outlet, or dual-female configurations, applications include handling syringe pump systems, vacuum systems and other low-flow processes. The valves connect to standard 1/4 - 28 flat bottom ports and fittings. Please contact a Bio-Chem Valve applications engineer for customized modifications.

How to order:

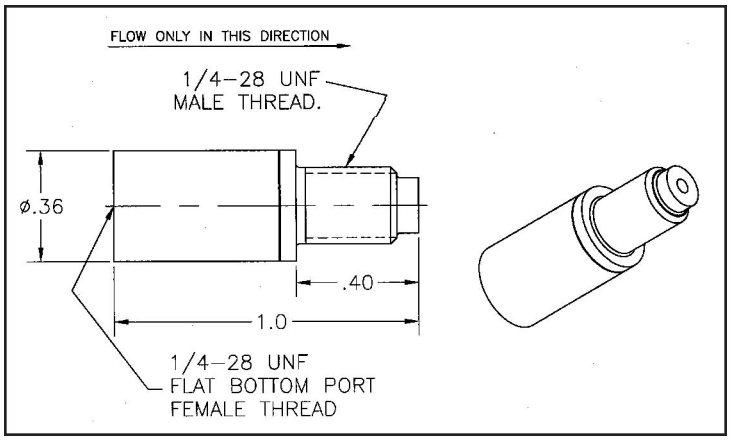
1	C (check valve)	
2	Operating configuration	O (Outlet), I (Inlet), F (Dual-Female)
3	Housing material*	4 (PPS), 5 (PEEK)
4	Check element material	E (EPDM), V (Viton), C (Chemraz®)

* Note: PPS housing only with Chemraz® check element

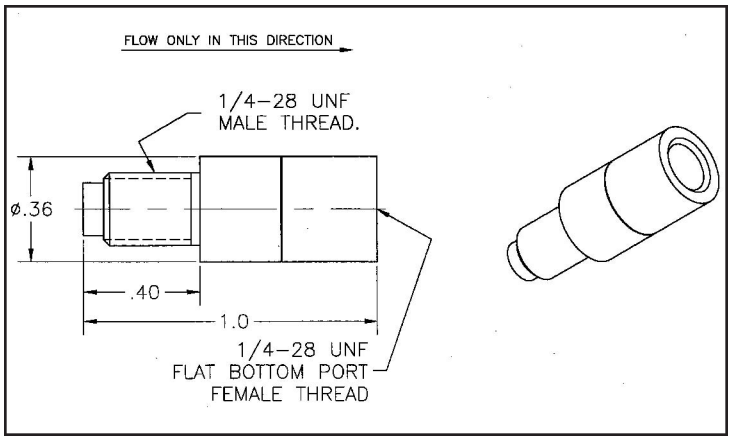
Example: **P/N** **C** Style **O** Operating Configuration **-** **5** Housing Material **E** Check Element Material

INSTALLATION DIMENSIONS

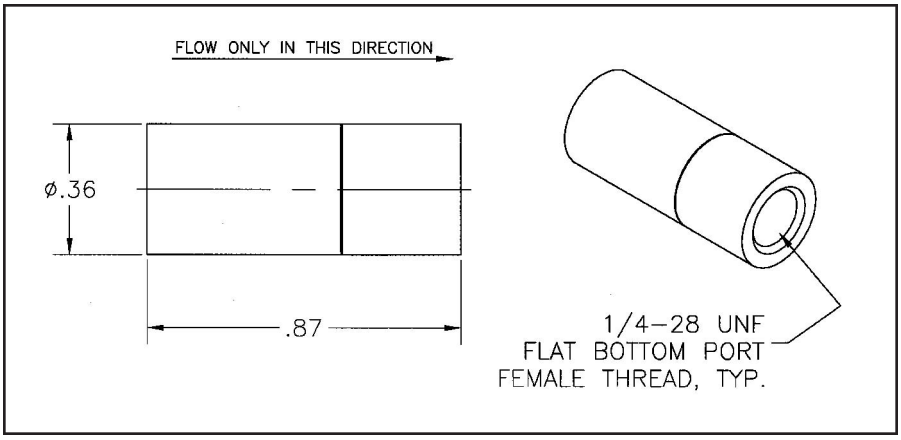
Series CI Inlet Check Valve



Series CO Outlet Check Valve

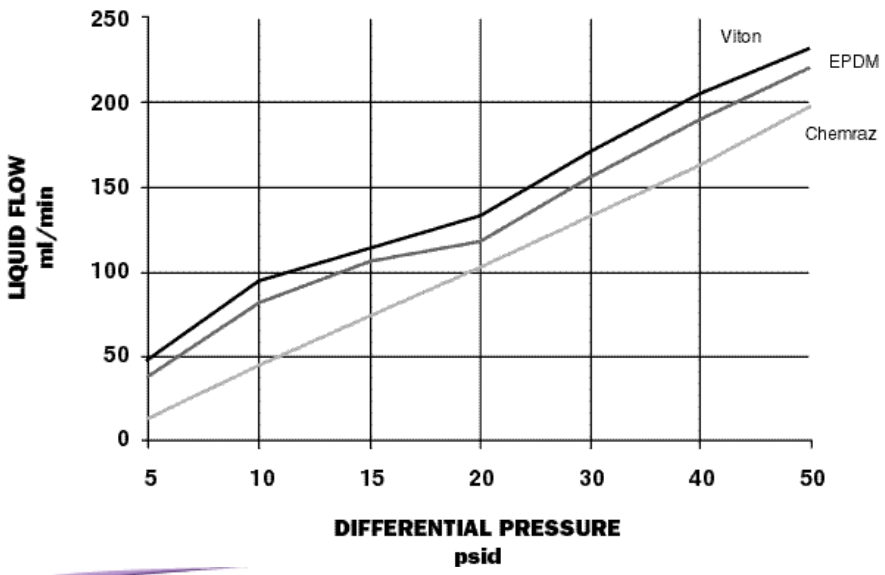


Series CF Dual-Female Check Valve



Average Flow vs. Pressure

(Intended as a guide only)



Self-Priming Micro Pumps

Inert solenoid operated self-priming fixed displacement diaphragm pumps

- High accuracy dispense settings from 8µl to 250µl
- Low power consumption / minimal heat generation
- Low internal volume
- Positive shut off
- High cycle life - up to 20 million dispense cycles
- Choice of inert wetted materials

Inside.....

Broad range of dispense settings and flow rates

The diaphragm pumps are factory set for discrete outputs ranging from 8µl to 250µl. The pumps can be cycled at up to 2.0 Hz for the smallest version and 1.6 Hz for the largest version. Flow rates reach up to 25 ml / minute. Depending on the dispense setting, very high accuracy can be achieved with deviations from set-point of less than 1%. For optimal accuracy, the pumps should be used for the transfer of fluids between un-pressurized containers.

Self-priming

At startup, the pump is able to draw air. The suction created by the larger pumps is sufficient to pull liquids from an un-pressurized container located up to 1.3 meters (4' 3") beneath the pump. Once the pump is primed, it is able to generate around 5 psi (0.3 bar) pressure, equating to 3.5 meters (11' 6") of water.

Wide assortment of inert wetted materials available

The pumps provide a non-metallic, inert fluid path for the dispensing of high purity or aggressive fluids. The standard pump body is made of PPS (polyphenylsulfide). Other materials available for the pump body include PTFE, PEEK™ and Delrin®. The elastomers that can be used for the diaphragms and check valves include PTFE, EPDM, and Viton®.

High reliability

The pumps are designed for continuous duty. They are guaranteed for up to 20 million actuations, corresponding to nearly 3,000 hours of continuous use at a 2 Hz cycle rate.

Specifications

Pump series & weight

The self-priming pumps are offered in four pump series, distinguished by the solenoid shell sizes:

Valve Series	Shell Diameter	Weight
090SP	0.75 inches	2 oz. (60 g)
120SP	1.00 inches	5 oz. (140 g)
130SP	1.00 inches	6 oz. (170 g)
150SP	1.50 inches	16 oz. (450 g)

Electrical

Valve Series	Voltage	Power @ 70°F (21°C)	Current @ 70°F (21°C)	Effective continuous power at max cycle rate
090SP	12 Vdc	2.6 Watts	0.22 amps	0.8 Watts
090SP	24 Vdc	2.6 Watts	0.11 amps	0.8 Watts
120SP	12 Vdc	4.0 Watts	0.32 amps	1.2 Watts
120SP	24 Vdc	4.0 Watts	0.16 amps	1.2 Watts
130SP	12 Vdc	4.0 Watts	0.32 amps	1.2 Watts
130SP	24 Vdc	4.0 Watts	0.16 amps	1.2 Watts
150SP	12 Vdc	8.0 Watts	0.66 amps	3.2 Watts
150SP	24 Vdc	8.0 Watts	0.33 amps	3.2 Watts

Lead Wires

All lead wires are Teflon® coated. Different lengths of lead wires and terminal connectors can be provided. Please consult Bio-Chem Valve and Omnifit concerning non-standard lead wire lengths and the addition of terminal connectors.

Valve Series	Lead wire length	Wire thickness
090SP	15 in. / 38cm	26 gauge
120SP	15 in. / 38cm	26 gauge
130SP	15 in. / 38cm	26 gauge
150SP	15 in. / 38cm	22 gauge

Specifications (contd.)

Pressure limits

To attain optimal dispense accuracy, pressure on both the inlet and the outlet side of the pump must be kept between ± 0.5 psi (0.035 bar) and 0 psi (equating to a head of ± 12 in / 30 cm of water).
During the pump's up-stroke, suction is created on the inlet. Positive pressure is generated at the outlet during the down-stroke. When the pump is not actuated, it will shut off flow as long as the pressure on the inlet does not exceed the maximum holding pressure. To ensure correct operation, pressure on the inlet side should never exceed 2 psi even when the pump is in the closed position. The check valves in the pump prevent fluid from flowing against the intended flow direction.

Valve Series	Inlet suction (priming w/air)	Inlet suction (after priming)	Outlet pressure
090SP	1 psi / 0.07 bar	3 psi / 0.20 bar	3 psi / 0.20 bar
120SP	2 psi / 0.15 bar	5 psi / 0.35 bar	5 psi / 0.35 bar
130SP	2 psi / 0.15 bar	5 psi / 0.35 bar	5 psi / 0.35 bar
150SP	2 psi / 0.15 bar	5 psi / 0.35 bar	5 psi / 0.35 bar

Cycle rates

To operate the solenoid micro pumps, first place the rated voltage over the pump's coil (causing the intake stroke) and then turn the voltage off again (causing the output stroke). To achieve the optimal dispense accuracy, the pump must remain in the on and in the off position for a minimum amount of time. To operate the pumps at less than the maximum cycle rate, the on-time should remain unchanged and the off-time should be lengthened appropriately.

Valve Series	Minimum on time	Minimum off time	Maximum cycle rate
090SP	150 msec	350 msec	2.0 Hz
120SP	150 msec	350 msec	2.0 Hz
130SP	150 msec	350 msec	2.0 Hz
150SP	200 msec	400 msec	1.6 Hz

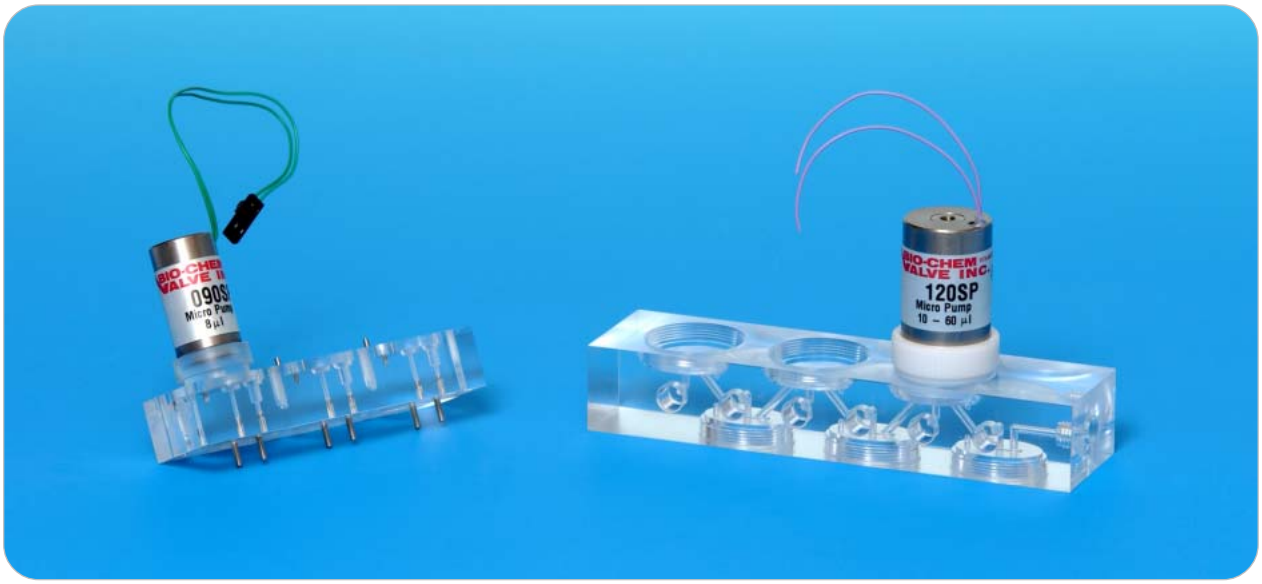
Dispense volume accuracy

Valve Series		Minimum setting	Maximum setting	Max flow rate
090SP	Dispense volume:	8 µl	8 µl	1.0 ml / min
	Set-point accuracy:	+/- 25%	+/- 25%	
	Repeatability:	+/- 5%	+/- 5%	
120SP	Dispense volume:	10 µl	60 µl	7.2 ml / min
	Set-point accuracy:	+/- 4%	+/- 2%	
	Repeatability:	+/- 3%	+/- 1%	
130SP & 120SP w/PTFE dia.	Dispense volume:	10 µl	50 µl	6.0 ml / min
	Set-point accuracy:	+/- 5%	+/- 5%	
	Repeatability:	+/- 3%	+/- 1%	
150SP	Dispense volume:	100 µl	250 µl	25 ml / min
	Set-point accuracy:	+/- 5%	+/- 3%	
	Repeatability:	+/- 1%	+/- 0.5%	

Specifications (contd.)

Manifold mounted pumps

The Bio-Chem Valve diaphragm pumps can be mounted directly on manifolds. Many configurations are possible to meet the specific needs of the application. Please consult with Bio-Chem Valve regarding manifold mounted pump designs.



Ports and tubing

To achieve an optimal dispense accuracy, the tubing should conform to the recommended inner diameters stated below and friction losses should be kept to a minimum.

For more information regarding 1/4"-28 fittings and tubing sets, please consult the Omni-Lok™ Fitting System and Fitting Systems specification sheets.

Pump Series	Standard ports	Recommended inlet tubing size	Recommended outlet tubing size
090SP	1/4"-28 flat bottom	≥ 1/32" I.D.	≥ 1/32" I.D.
120SP	1/4"-28 flat bottom	≥ 1/32" I.D.	≥ 1/32" I.D.
130SP	1/4"-28 flat bottom	≥ 1/32" I.D.	≥ 1/32" I.D.
150SP	5/16"-24 flat bottom	≥ 1/8" I.D.	≥ 1/8" I.D.

Internal volume

Pump Series	Internal volume
090SP	130 µl
120SP	105 µl
130SP	105 µl
150SP	710 µl

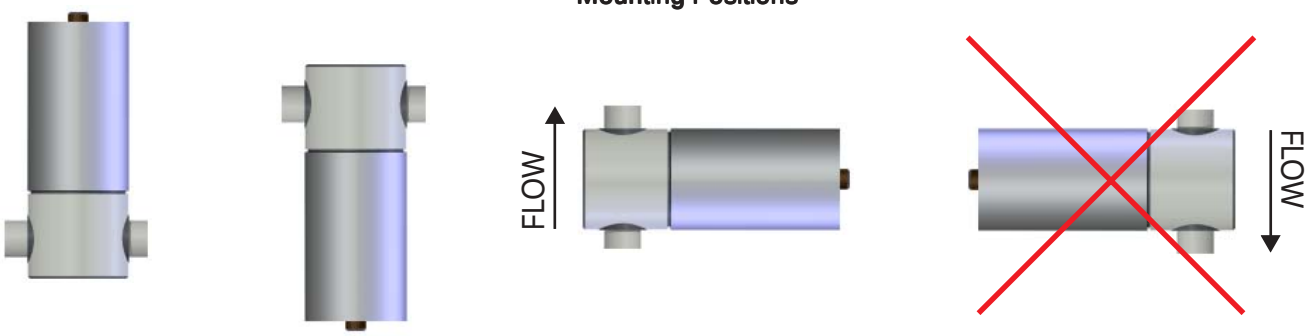
Specifications (contd.)

Mounting

For mounting clips, rings and flanges, please see the Mounting Accessories and Options specification sheet. Two mounting holes in the body permit bottom mounting in the 120SP series pumps. Please see the dimensional diagrams on the following pages for further information.

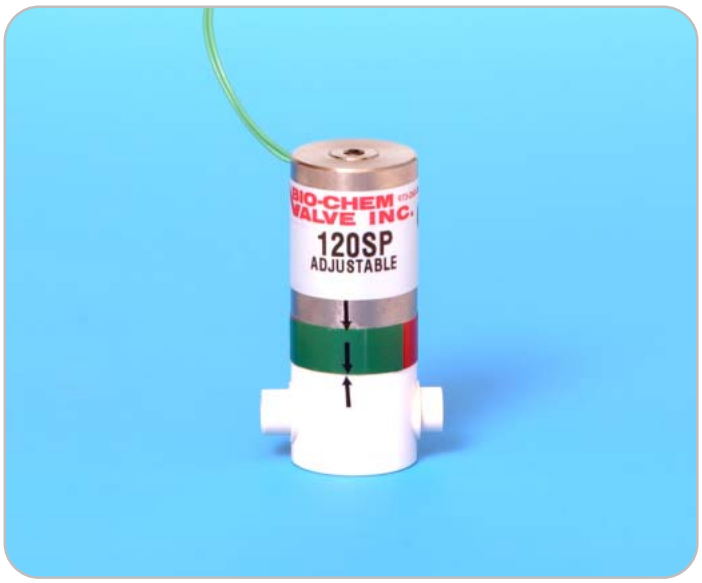
The pumps should be installed with the solenoid portion of the pump pointing upwards, downwards, or in a horizontal position with the outlet on top. The horizontal position with the outlet on the bottom could affect the output accuracy.

Mounting Positions



Adjustable pumps

In cases where the dispense volume for the application is unknown, Bio-Chem Valve offers an adjustable pump designed to be used as an R&D tool by the instrument design engineer to help determine the optimal dispense setting. By turning the shell on the pump, the engineer can compensate for the instrument's friction losses or pressure imbalances. Once the correct pump setting and dispense volume have been determined, the engineer can provide the dispense volume to the factory. This information will be used to manufacture a factory-set (non-adjustable) pump specific to the application.



Pump Series	Dispense range
090SP - adjustable	8 µl to 12 µl
120SP - adjustable	10 µl to 60 µl
150SP - adjustable	100 µl to 250 µl

Aside from the adjustability of these pumps, all other specifications are identical with those stated in this product data sheet for the same pump series.

For part numbers of the adjustable pump versions, please contact Bio-Chem Valve and Omnifit.

Specifications (contd.)

Wetted materials

Valve Series		Standard materials	Options
090SP	Body:	PPS	PEEK™
	Diaphragm:	PTFE	
	Check valves:	EPDM	Viton®, Perfluoroelastomer
120SP	Body:	PPS	Delrin®, PEEK™
	Diaphragm:	EPDM	PTFE
	Check valves:	EPDM	Viton®, Perfluoroelastomer
130SP	Body:	PTFE	
	Diaphragm:	PTFE	
	Check valves:	Perfluoroelastomer	
150SP	Body:	PPS	PEEK™
	Diaphragm:	EPDM	
	Check valves:	EPDM	

Ordering Information

1	Select pump series	090SP, 120SP, 130SP, 150SP
2	Indicate voltage	12 VDC, 24 VDC
3	Indicate dispense setting (µl)	8 (090SP), 10, 20, 30, 40, 50, 60 (120SP), 10, 20, 30, 40, 50 (130SP), 100, 125, 150, 175, 200, 225, 250 (150SP)
4	Indicate body material (See optional materials in chart above.)	1 (PTFE, 130SP only), 4 (PPS), 5 (PEEK), 6 (Delrin®, 120SP only)
5	Indicate diaphragm material (See optional materials in chart above.)	E (EPDM), T (PTFE)
6	Indicate check valve material (See optional materials in chart above.)	E (EPDM), V (Viton®), P (Perfluoroelastomer)

Part Number Example:

120SP 24 50 - 5 T P

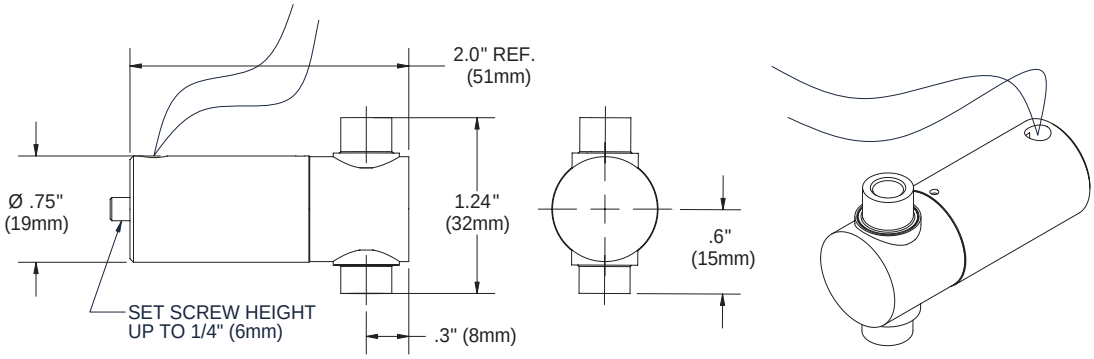
Pump Series	Voltage	Dispense setting	Body material	Diaphragm material	Check valve material

Please see our other product specification sheets for the following accessories:

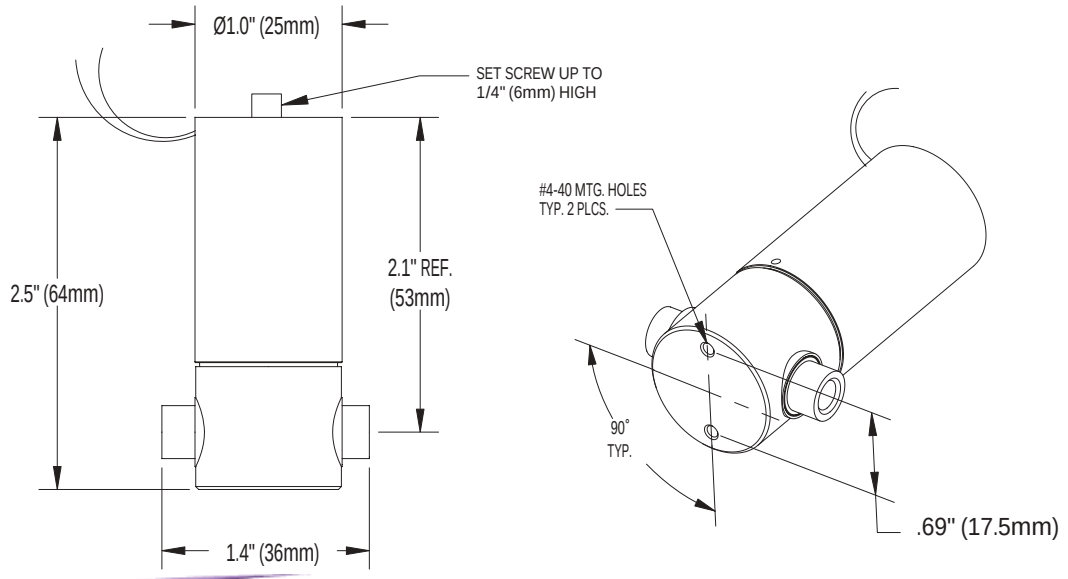
- Omni-Lok™ fittings and tubing sets
- CoolCube™ control module
- Mounting clips

Installation Drawings

090SP

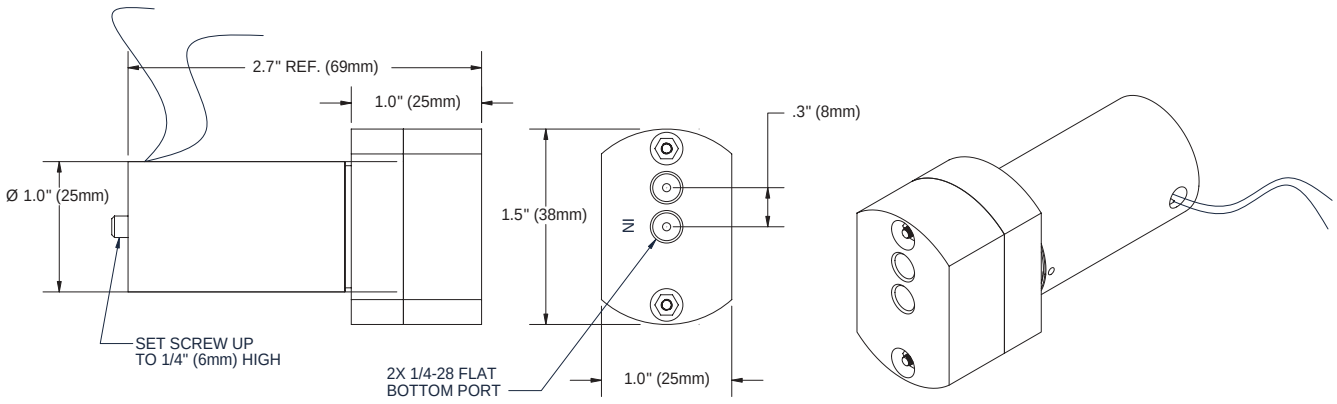


120SP

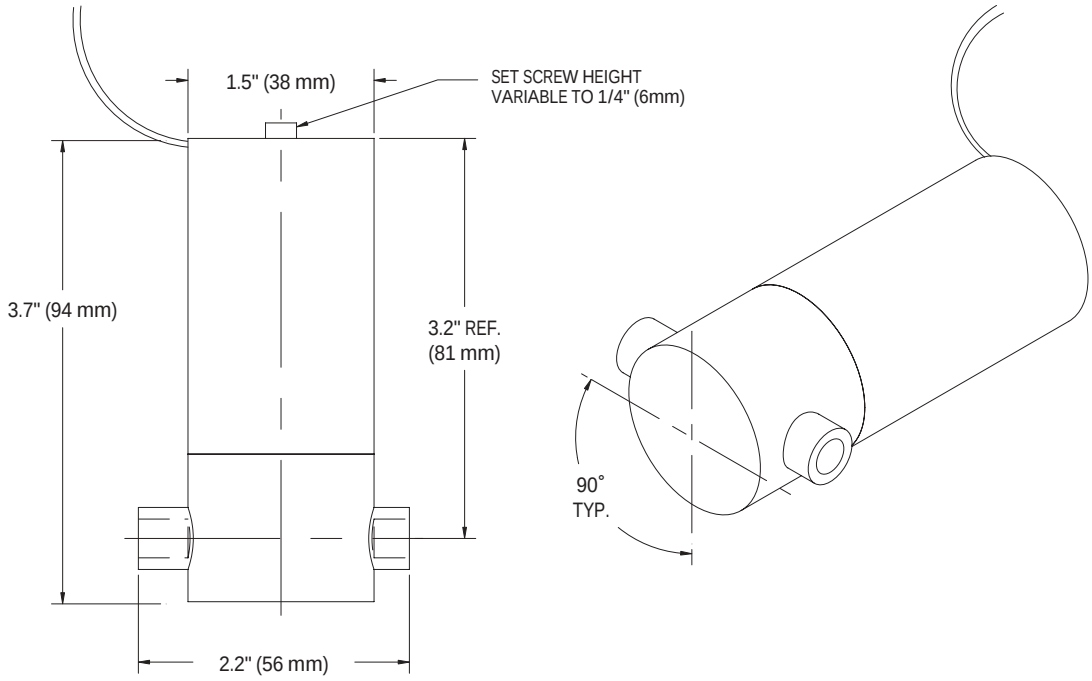


Installation Drawings (contd.)

130SP



150SP



BIO-CHEM VALVE™ INC.

Series: 075RV and 075RS Inert Relief Valves

Features

- 2 Versions
  - 075RV - stand-alone, spring loaded
  - 075RS - spring loaded with solenoid control

Series 075RV & 075RS

- 6 Pressure Relief Settings from 20 to 150 psi
- Fully Chemically Inert
- Perfluoroelastomer and PPS Wetted Fluid Path[2]
- Minimal Internal Volume
- High Cycle Life

Series 075RS

- Isolated solenoid
- Continuous Duty Coil
- Low Power Consumption
- Fast Response Time

Specifications

Series	075RV / 075RS
Orifice Diameter	0.062" (1.57mm)
Flow Rate	C_v = 0.030 +/- 0.005
Internal Volume	0.054 cc
Ports[1]	1/4"-28 Flat Bottom

Series	075RS	
Voltage	12 VDC	24 VDC
Power Watts @ 70° F (21° C)	2.8	2.8
Current Amps @ 70° F (21° C)	0.23	0.12
Lead Wires	15" (381mm) 26 Gauge Teflon® Coated	

1 Other ports available (e.g. M6 x 1.0, or 10-32). Please consult factory.
2 PTFE optionally available for body and/or diaphragm. Please consult factory.

See back for standard pressure configurations.

BIO-CHEM VALVE™ INC. Omnifit

The 075RV / 075RS relief valve series is ideally suited for use with aggressive and high-purity fluids. Wetted parts consist of the PPS (Ryton) valve body and the Chemraz® diaphragm. Custom body and diaphragm configurations are available from a broad menu of engineered plastics and elastomers, including Teflon®. The unique Bio-Chem Valve diaphragm retention design ensures the most reliable performance and longest life available.

The solenoid operated, normally closed 075RS relief valve provides dual functionality as a solenoid valve with pressure relief function. This provides flow control and the capability to periodically purge the system.

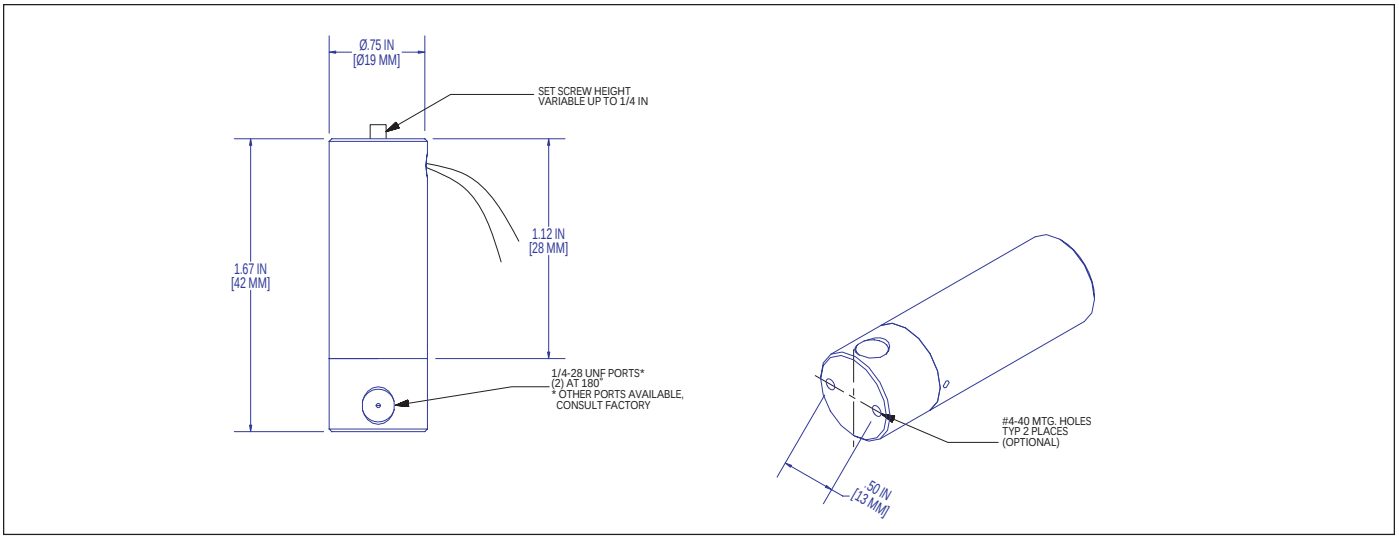
Relief pressure settings other than the standard values indicated on this product data sheet are also possible. Contact Bio-Chem Valve and Omnifit for custom modifications.

1	Select valve size	075
2	Indicate Style	RV - Relief Valve RS - Relief Valve with solenoid
3	Indicate Voltage	(Blank for RV Series), 12VDC, 24VDC
4	Indicate orifice size	0.062"
6	Indicate Relief Pressure	20, 35, 60, 85, 110, or 150 psi

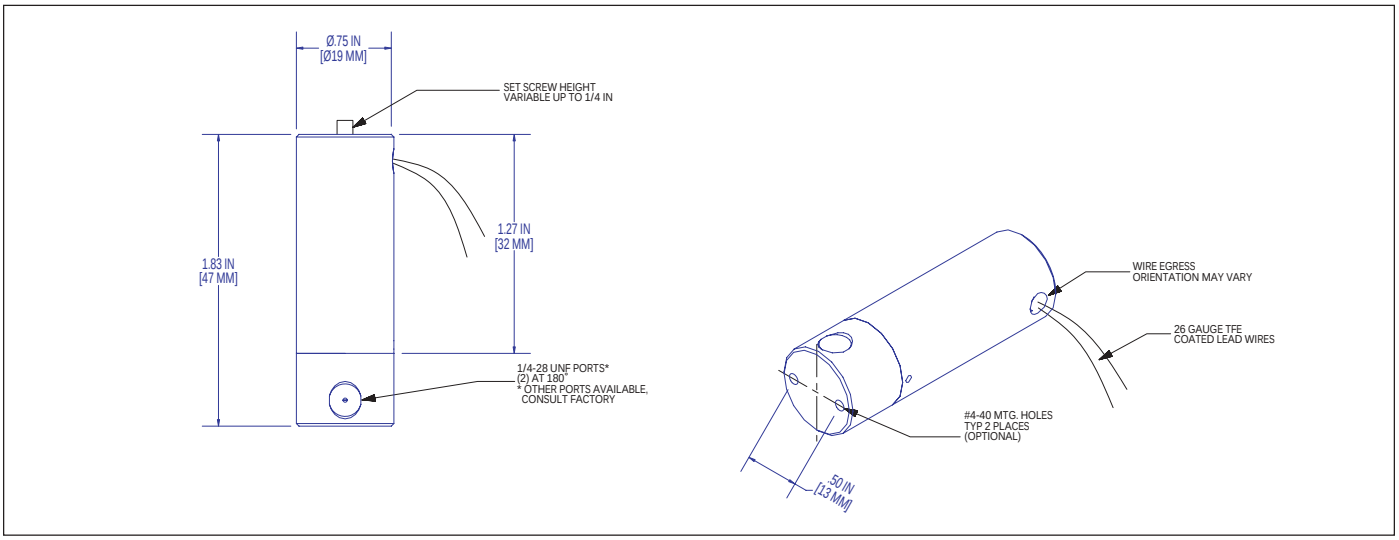
Example:

Valve Size	Valve Type	Voltage		Orifice Diameter		Relief Pressure
075	RV		-	62	-	35
075	RS	12	-	62	-	110

Series 075RV Relief Valve



Series 075RS Relief Valve with solenoid



Standard Pressure Configurations

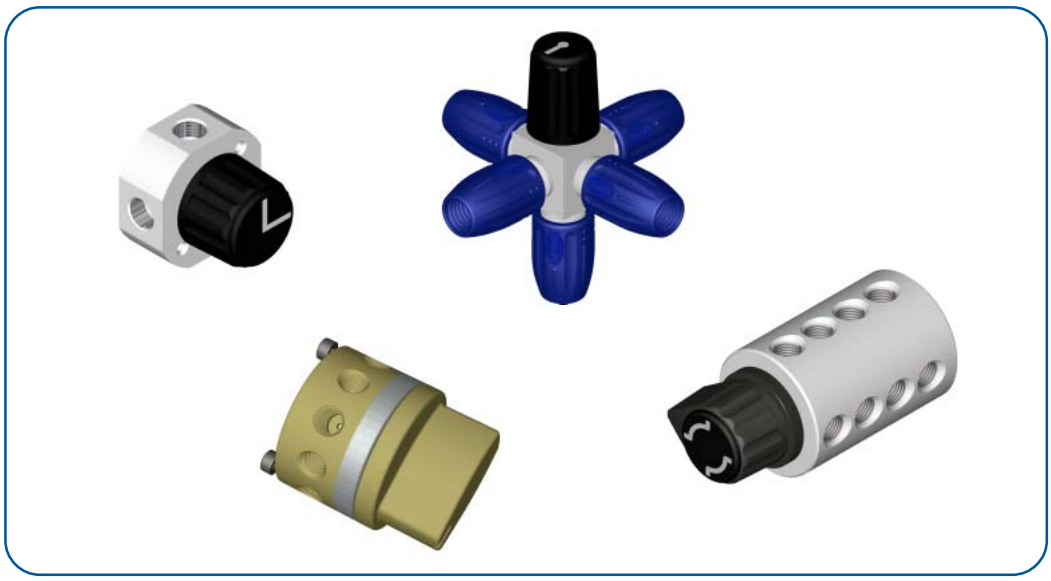
Operating Pressure	Relief Pressure
0 - 17 psig	20 +/- 3 psi
0 - 31 psig	35 +/- 4 psi
0 - 54 psig	60 +/- 6 psi
0 - 77 psig	85 +/- 8 psi
0 - 100 psig	110 +/- 10 psi
0 - 138 psig	150 +/- 12 psi

Rev. 1104

A HALMA GROUP COMPANY

Manual Valves

Inside.....



A range of large and small manual valves offering a variety of flow paths and connection options

- Low and high pressure versions
- Excellent chemical resistance
- Accept 1/4"-28 UNF fittings
- Custom designs available for OEM applications

Small High Pressure Rotary Valves

These manual rotary valves are constructed from PTFE with a Kel-F® rotor and have a 0.8mm bore size, making them suitable for pressure applications up to 500 psi (33 bar). They are available in 4 and 5 port versions. All ports are 1/4"-28 UNF flat-bottom and will accept any 1/4"-28 UNF male fitting. Omnifit's 1000 psi (68 bar) pressure rated Gripper fittings or Omni-Lok™ fittings are ideal for use with these valves. These valves are bulkhead mountable.

Small Rotary Valves with 'Omnifit Cap' connections

Omnifit's small manual rotary valves use the 'Omnifit-Cap' connection system and can be used for sampling, flow-splitting, mixing and fluid line interconnection. They have a 1.5mm bore size and accept tubing sizes between 0.5 and 4mm OD. They are pressure rated to 50 psi (3.3 bar).

Distribution and Loop Injection Valves

These manual valves have a click-stop mechanism to ensure correct flow path alignment. Each valve consists of a glass filled PTFE body with a Kel-F® rotor and a PEEK™ casing. These valves are rated to 500 psi (34 bar).

Sample Injection Valve

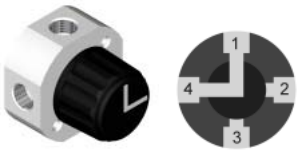
Designed for low to medium pressure chromatography systems, this injection valve sytem is supplied with 0.5ml, 1.0ml and 2.5ml loops and a 5ml syringe. Other loops can be supplied on request. Pressure rating is 500 psi (34 bar).

Stacked Distribution Valves

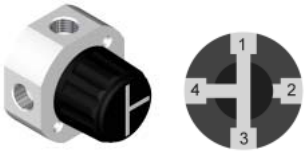
Omnifit's manual stacked distribution valves are constructed using PTFE bodies with a Kel-F® rotor giving excellent chemical compatibility. The valves have a 1.5mm bore size and are available in 2, 3 and 4 tiers to switch 2, 3 or 4 flow lines simulta-neously. 1/4''-28 UNF ports are compatible with all Omnifit 1/4''-28 male fittings. A mechanical stop provides positive flow path aligment.

Small High Pressure Rotary Valves

- Pressure rated to 500 psi (33 bar)
- Accepts 1/4''-28 UNF fittings
- M3 holes for mounting
- Flow paths indicated by control knob



1120



1121

1122

1126

These manual rotary valves are constructed from PTFE with a Kel-F® rotor and have a 0.8mm bore size, making them suitable for high pressure applications up to 500 psi (33 bar). They are available in 4 and 5 port versions and any spare ports can be sealed with a plug (part number 2320) for maximum flexibility. All ports are 1/4"-28 UNF flat-bottom and will accept any 1/4"-28 UNF male fitting. These valves are bulkhead mountable with pre-drilled M3 threaded holes for easy mounting.

4-port valves

4-port valves allow flow across selected ports, from either one or two inlets to a comnbination of the remaining ports.

5-port valve

The 5-port valve utilizes the common port as the inlet and allows flow to a combination of the remaining 4 ports.

Part Number	Ports	Pack Size
1120	4	1
1121	4	1
1122	4	1
1126	5	1

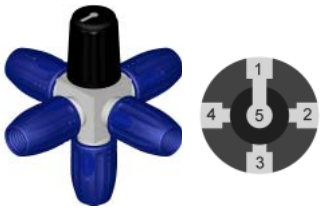
Small Rotary Valves with 'Omnifit-Cap' connectors

- Range of flow path options
- PTFE body
- Kel-F® rotor
- Flow paths indicated by control knob

1112

1113

1114



1118

Omnifit's small manual rotary valves use the 'Omnifit Cap' connection system and can be used for sampling, flow-splitting, mixing and fluid line interconnection. They have a 1.5mm bore size and accept tubing sizes between 0.5 and 4mm OD. They are pressure rated to 50 psi (3.3 bar). The valves are available in 4 and 5 port versions and any spare ports can be sealed with a plug (part number 2320) or by using a PTFE cone blank (part number 1514) for maximum flexibility.

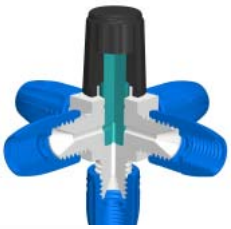
4-port valves

4-port valves allow flow across selected ports, from either one or two inlets to a comnbination of the remaining ports.

5-port valve

The 5-port valve utilizes the common port as the inlet and allows flow to a combination of the remaining 4 ports.

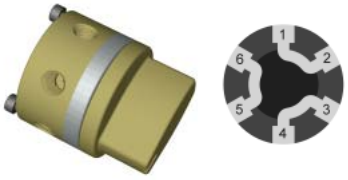
See the connectors spec sheet for information on the 'Omnifit Cap' connection system.



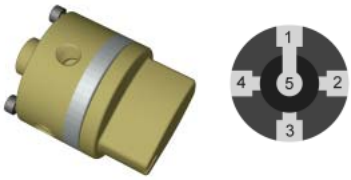
Part Number	Ports	Pack Size
1112	4	1
1113	4	1
1114	4	1
1118	5	1

Distribution and Loop Injection Valves

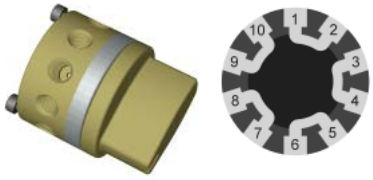
- 500 psi (33 bar) pressure rating
- Click-stop for port identification & alignment
- Ready for mounting on a flat surface
- PEEK™ casing
- Glass filled PTFE Body
- Kel-F® rotor



1127-6LI



1127-4D



1127-10LI

Distribution valve
Omnifit's click-stop distribution valve is available in a 5-port option. This enables it to be used as a 4-way distribution valve, by using one port as the inlet and selecting flow to any of the other available ports for outlet. This distribution valve can be used for sample collection and stream selection.

Loop injection valves
Omnifit's click-stop loop injection valves are available in 6 or 10-port options.

See back page for application notes.

Part Number	Valve Type	Ports	Pack Size
1127-6LI	Loop injection	6	1
1127-10LI	Loop injection	10	1
1127-4D	Distribution	5	1

Stacked Distribution Valves

- Pressure rated to 500 psi (33 bar)
- Minimal dead volumes
- 2, 3 or 4 tier configurations
- Positive switch stops

1142 1143 1144

1152 1153 1154

1162 1163 1164

Omnifit's manual stacked distribution valves are constructed using PTFE bodies with a Kel-F® rotor giving excellent chemical compatibility. The valves have a 1.5mm bore size and are available in 2, 3 and 4 tiers to accept 2, 3 or 4 flow lines. The 1/4''-28 UNF ports are compatible with all Omnifit 1/4''-28 male fittings.

Valves are available in three flow configurations and have the same configuration on each tier.

Part Number	Description	Pressure rating	Pack Size
1142	2-tier valve allowing flow between two ports at 90⁰	500 psi	1
1152	3-tier valve allowing flow between two ports at 90⁰	100 psi	1
1162	4-tier valve allowing flow between two ports at 90⁰	100 psi	1
1143	2-tier valve allowing flow between 3 ports in a 'T' formation	500 psi	1
1153	3-tier valve allowing flow between 3 ports in a 'T' formation	100 psi	1
1163	4-tier valve allowing flow between 3 ports in a 'T' formation	100 psi	1
1144	2-tier valve allowing flow between pairs of adjacent ports	500 ps	1
1154	3-tier valve allowing flow between pairs of adjacent ports	100 psi	1
1164	4-tier valve allowing flow between pairs of adjacent ports	100 psi	1

Sample Injection Valve

- Allows introduction of reproducible sample volumes
- 0.5ml, 1.0ml and 2.5ml sample loops included

1106

Designed for low pressure chromatography systems, this loop injection valve sytem is supplied with 0.5ml, 1.0ml and 2.5ml loops and a 5ml syringe. Other loops can be supplied on request. A clamp for easy mounting to a retort stand is included.

See application notes below.

Part Number	Description	Pack Size
1106	Manual sample injection valve	1
1106.5	Spare sample loop for use with 1106 0.5ml	1
1106-1	Spare sample loop for use with 1106 1ml	1
1106-2	Spare sample loop for use with 1106 2.5ml	1
1106-5	Spare sample loop for use with 1106 5ml	1

Application and set up notes.

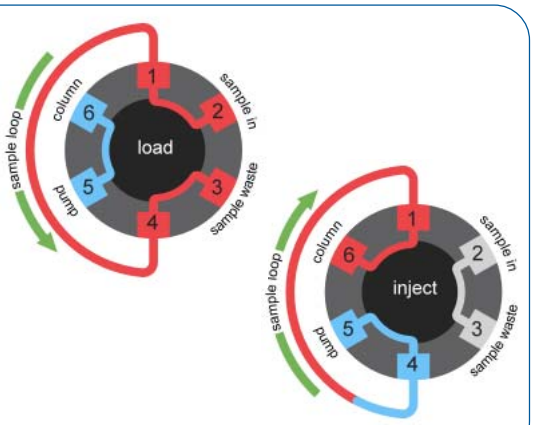
The images below show Omnifit loop inject valves in use as sample injection devices in a chromatography system. These are the most common applications but the use of the valves is not limited to these.

6 port loop inject valve used as a sample injector

With the valve in the load position the sample can be injected into the sample loop while the mobile phase is pumped directly through to the column.

When the valve is switched to the inject position, the pump is then connected to the sample loop and the sample is carried onto and through the column. The 'sample in' and 'waste' ports are joined but isolated from the loop.

It is suggested that ports are connected to the corresponding lines as shown. This ensures that the flow of the mobile phase is in opposite directions during the load and inject operations.

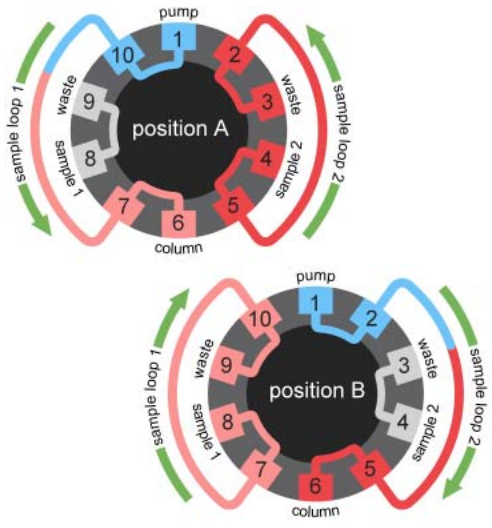


10 port loop inject valve used as a sample injector

This valve allows alternate injection from two different sample loops, either identical or of different sizes. This application can alternatively be satisfied with a 4 port switching valve and a 6 port loop inject valve.

With the valve in position A, sample 2 can be loaded into sample loop 2 while the mobile phase is pumped through sample loop 1 and carries sample 1 onto the column. The 'sample 1 in' and 'waste' ports are connected but isolated from the loop.

When the valve is switched to position B, the pump is connected to sample loop 2 and sample 2 is carried onto and through the column. The 'sample 2 in' and 'waste' ports are connected but isolated from the loop. Whilst sample 2 is pumped onto the column, sample loop 1 can be re-loaded.



Mininert push-button valves are highly dependable, leak-tight closures for screw-cap vials and other laboratory containers. When used with a glass vial, only PTFE and glass are in contact with the contents. Their unique features make Mininert valves the ideal closure for calibration standards, air- or moisture-sensitive fluids, derivatizing reagents, or volatile chemicals. Operation is extremely simple – push the green button to open the valve, insert the needle through the septum and take a sample, withdraw the needle, and push the red button to close the valve.

Valves for vials

The screw-cap Mininert is available in a variety of sizes. The crimp-top valve for 13 mm ID glassware slides into the neck of the vial and features a threaded flange which is turned to provide a leak-tight fit.

Pkg/12:	*Cap / thread size*	*Prod No*
	13 mm-425	PS-614158
	15 mm-425	PS-614160
	18 mm-400	PS-614161
	20 mm-400	PS-614170
	24 mm-400	PS-614163
	Crimp top	PS-614250

Valves with threaded fittings

Our threaded designs offer positive on/off fluid control as an in-line valve or syringe access as a termination valve at a sample point. In-line valves are 1/4-28 male to male or 1/4-28 female to female. Termination valves are offered in 1/4-28 male or female and 1/8" NPT male or female.

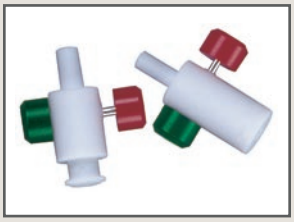
In-line valves	*Prod No*
1/4-28 male to male	PS-631205
1/4-28 female to female	PS-631206

Termination valves	
1/4-28 male	PS-631201
1/4-28 female	PS-631203
1/8" NPT male	PS-631202
1/8" NPT female	PS-631204

Replacement septa and septum installation tool

These silicone septa fit all Mininert valves. The installation tool is a handy device for quickly removing and replacing needle seal septa.

Septa, *pkg/50*	PS-644350
Installation tool	PS-644850



Mininert syringe valves

These convenient add-on valves allow our Series C and D syringes to store samples at up to 250 psi. The valve body is all PTFE, with a stainless steel stem. Also available to fit luer-tip syringes from any manufacturer. All accept traditional luer needles.

For C or D syringe	PS-654050
For Luer-tip syringe	PS-654051

SPECS

TEMPERATURES

Mininert valves can be used at temperature up to 105°F. However, after use at high temperatures, the valve may leak slightly when cooled to room temperature.

MATERIALS

PTFE is highly inert and may be used with most common materials. It is particularly useful for working with most acids and organic solvents. However, problems may be encountered when used with organometallics and some strong bases. We recommend actual exposure tests before use with any material.

PRESSURE

The sealing ability of Mininert valves is more than adequate for containing most volatile liquids and gases at low pressures. Mininert valves have been used as high as 120 psi without leakage, but this is ***not*** a recommendation for pressurizing glass containers to these levels. Such pressurization of glass containers can be extremely dangerous.

General Description

- ***Leak-tight closure with syringe access*** – take a sample with no exposure of vial contents to atmosphere
- ***Models for virtually any laboratory glassware*** – screw-cap and crimp-top vials, test tubes, flasks, reaction chambers, 1/4-28 or pipe thread
- ***Economical*** – save time and money through conservation of reagents, etc.
- ***Replaceable septum*** – easily replaced with no exposure of contents to atmosphere
- ***Simple installation*** – no tools required

Mininert push-button valves are highly dependable, leak-tight closures for screw-cap vials and other laboratory containers. When used with a glass vial, only PTFE and glass are in contact with the contents. Their unique features make Mininert valves the ideal closure for calibration standards, air- or moisture-sensitive fluids, derivatizing reagents, volatile chemicals, etc.

Operation is extremely simple – push the green button to open the valve, insert the needle through the septum and take a sample, withdraw the needle, and push the red button to close the valve.

Specifications

Temperature
Mininert valves can be used at temperature up to 105°F. However, after use at high temperatures, the valve may leak slightly when cooled to room temperature.

Pressure
The sealing ability of Mininert valves is more than adequate to contain most volatile liquids and gases at low pressures. Mininert valves have been used as high as 120 psi without leakage, but this is NOT a recommendation for pressurizing glass containers to these levels. Such pressurization of glass containers can be extremely dangerous.

Chemical Resistance
PTFE is highly inert and may be used with most common materials. It is particularly useful for working with most acids and organic solvents. Problems may be encountered when used with organometallics and some strong bases. We recommend actual exposure test before use with any material.

Mininert syringe valves are found on page 9

Valves for Vials

Models are available for screw-cap and crimp-top vials. The screw-cap Mininert is available in 13, 15, 18, 20, and 24 mm cap sizes. The crimp-top valve for 13 mm ID glassware slides into the neck of the vial and features a threaded flange which is turned to secure a tight fit.

Cap size:	13 mm	15 mm	18 mm	20 mm	24 mm	Crimp top
Thread size:	13 mm-425	15 mm-425	18 mm-400	20 mm-400	24 mm-400	
Pkg. of 12:	614158	614160	614161	614170	614163	614250

Valves with Standard Tapers

The laboratory taper model brings Mininert convenience and ease to a variety of applications using standard laboratory glassware, such as reaction chambers, test tubes, and other glass systems.

Taper:	14/20	19/22
	621102	621103

Valves with Threaded Fittings

Our threaded designs offer positive on/off fluid control as an in-line valve or syringe access as a termination valve at a sample point. In-line valves are 1/4-28 male to male or 1/4-28 female to female. Termination valves are offered in 1/4-28 male or female and 1/8" NPT male or female.

In-line valve:	1/4-28, male to male	1/4-28, female to female
	631205	631206

Termination valve:	1/4-28 male	1/4-28 female	1/8" male NPT	1/8" female NPT
	631201	631203	631202	631204

Replacement Septa and Septum Installation Tool

These silicone septa fit all Mininert valves. The installation tool is a handy device for quickly removing and replacing needle seal septa.

Pkg. of 50 septa	Installation tool
644350	644850

Analytical Syringes, Valves, Probes, and Custom Bent Tubing from VICI Precision Sampling

Micro Valves for GC and LC

- 200 psi, .060" bore
- Compact 1" design
- Convenient panel mount
- Variety of configurations

Simplify your liquid or gas handling application with a VICI Precision Sampling Micro valve. The unique design of the fitting detail allows a leak-free seal with no potential for rotor damage from overtightening. Internal parts are PEEK and PTFE.

(Fittings not included.
For example fittings, see page 68.)

Micro valves for GC and LC *1/4-28*

	Prod No				
"T" flow path		3 PORT	4 PORT		
3 ports	660100			"T"	
4 ports	660110				
180° flow path		2 PORT	4 PORT		
2 ports	660200			180°	
4 ports	660210				
90° flow path		2 PORT	3 PORT	4 PORT	
2 ports	660300				90°
3 ports	660310				
4 ports	660320				

SPECS
200 psi
.060" bore
1/4-28 fitting detail
All polymer-based materials

MORE INFORMATION
1/4-28 fittings . . .pp 68-78

TO ORDER
Toll-free 800–828–1653
Tel 225–927–1128
Toll-free
fax 866–429–7741
Fax. 225–923–1331

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Visit our website at **viciprecisionsampling.com** or call us for a catalog:

Pinch Valves

Solenoid operated pinch valves with Silicone Select™ or Bio-Chem (C-Flex) tubing

- High cycle life (valve: 20 million; tubing: 500,000 minimum)
- Low power consumption / minimal heat generation
- Tubing securely seated in valve body
- Rated for continuous duty suitable for hit & hold
- Zero dead volume closure
- Tubing options selected for chemical resistance and superior memory characteristics
- Options for especially quiet operation and integrated optical position sensor

Inside.....

High Cycle Life

Each valve is factory adjusted to ensure an optimal closing force with the tubing provided. The Silicone Select™ and Bio-Chem (C-Flex) tubing have been specially selected and treated for excellent memory characteristics. The tubing will not stick shut even after prolonged periods in the closed position. The Silicone Select™ tubing is rated for a minimum of 500,000 cycles.

Tubing securely seated without flow restriction

The tubing is seated within a groove in the pinch valve body. The tubing remains securely seated at all times. No mechanical locking feature is required to retain the tubing during operation. Flow is not restricted when the valve is in the open position.

Wide assortment of sizes and configurations

Bio-Chem Valve standard pinch valves are offered with tubing internal diameters ranging from 0.010” (0.25 mm) to 5/16” (7.95 mm). The valves are available in normally open, normally closed, and 3-way (one tube normally open, the other normally closed) configurations. Dual tubing configurations (two tubes being operated simultaneously) are offered with smaller tubing sizes. Multi-tube pinch valves with 4.6, or 8 tubes are available in normally open configurations only. Through Bio-Chem Valve’s Quick-Change Customization™ process, standard pinch valve configurations can be modified to meet customer specifications. For alternative tubing materials, operating pressures, electrical terminal connectors and other features, please consult Bio-Chem Valve and Omnifit.

Further advantages of Bio-Chem Valve Pinch Valves include:

- Ease of installation
- Resistance to particulate damage
- Minimal pressure drop

Specifications

Pinch Valve Tubing Options

Bio-Chem Valve supplies two choices of high-purity medical grade pinch valve tubing:

- Silicone Select™ platinum cured silicone tubing
- Bio-chem (C-Flex) tubing

Both tubing materials comply with USP XXII, Class VI, FDA and USDA standards and are FDA master file listed. These tubing options have been specially developed to withstand the rigors of usage with pinch valves. The tubing will not stick shut even after the valve has been in the closed position for an extended period of time. Excellent tubing memory characteristics ensure unencumbered flow when the valve is in the open position. The Silicone Select™ tubing is rated for a minimum of 500,000 open-and close cycles, the Bio-Chem (C-Flex) tubing is rated for a minimum of 350,000 cycles.

Due to its superior life cycle characteristic, the Silicone Select™ tubing is recommended for all pinch valve applications except:

- Bio-chem (C-flex) tubing is preferable in applications where gas permeability is at issue
- Bio-chem (C-flex) tubing exhibits higher chemical resistance with certain media

Bio-Chem Valve pinch valves are supplied with tubing mounted in the valve:

- 2-way valves: one 12-inch (30 cm) tubing section
- 3-way valves: two 6-inch (15 cm) tubing sections joined by a “Y” connector

Tubing is easily replaced without removing the valve from the system. The tubing is also offered separately from the pinch valves in 50-foot (15 meter) coils.

Note: Different tubing may be requested for special applications. In that case, tubing samples should be provided to Bio-Chem Valve so that the appropriate adjustments in the valve settings can be made. Deviations from standard Bio-Chem Valve pinch valve tubing usually results in reduced life cycle expectancy.

Tubing Dimensions and Part Numbers

Valve Part Number extension	50' (15m) coil Part Number	Silicone	Bio-Chem (C-Flex)	I.D. (in/mm)	O.D. (in/mm)	Wall thickness (in/mm)
-10	10025-10	✓		0.010" / 0.25mm	0.093" / 2.36mm	0.041" / 1.05mm
-23	10025-23	✓	✓	0.023" / 0.58mm	0.093" / 2.36mm	0.035" / 0.89mm
-50	10025-50	✓		0.050" / 1.27mm	0.134" / 3.40mm	0.042" / 1.07mm
-01	10025-01	✓	✓	1/32" / 0.79mm	3/32" / 2.38mm	1/32" / 0.79mm
-02	10025-02	✓	✓	1/16" / 1.59mm	1/8" / 3.17 mm	1/32" / 0.79mm
-03	10025-03	✓	✓	1/16" / 1.59mm	3/16" / 4.76mm	1/16" / 1.59mm
-04	10025-04	✓		3/16" / 4.76mm	1/4" / 6.35mm	1/32" / 0.79mm
-05	10025-05	✓	✓	1/8" / 3.17mm	1/4" / 6.35mm	1/16" / 1.59mm
-06	10025-06	✓	✓	1/4" / 6.35mm	3/8" / 9.52mm	1/16" / 1.59mm
-07	10025-07	✓	✓	5/16" / 7.94mm	7/16" / 11.1mm	1/16" / 1.59mm

To identify the type of tubing when ordering 50-foot (15 meter) tubing coils, add the following designators to the part numbers shown above:

- **S** - Silicone Select™ tubing
- **B** - Bio-Chem (C-Flex) tubing

Specifications (contd.)

Valve Series & Weight

The pinch valves are offered in three valve series, distinguished by the solenoid shell sizes:

Valve Series	Shell Diameter	Weight
075P	0.75 inches	2 oz. (57 g)
100P	1.00 inches	5 oz. (142 g)
150P	1.50 inches	16 oz. (454 g)

Lead Wires

15 inches (380 mm) 26-guage Teflon® coated. Different lengths of lead wires and terminal connectors can be provided.

Electrical

Standard:

Valve Series	Voltage	Power @ 70°F (21°C)	Current @ 70°F (21°C)
075P	12 VDC	2.8 Watts	0.22 amps
075P	24 VDC	2.8 Watts	0.10 amps
100P	12 VDC	4.0 Watts	0.32 amps
100P	24 VDC	4.0 Watts	0.16 amps
150P	12 VDC	8.0 Watts	0.66 amps
150P	24 VDC	8.0 Watts	0.33 amps

Exceptions:

Valve Series	Tubing Size	Configuration	Voltage	Power @ 70°F (21°C)	Current @ 70°F (21°C)
075P	I.D. = 0.010"	2-way	12 Vdc	3.5 Watts	0.29 amps
075P	I.D. = 0.010"	2-way	24 Vdc	3.5 Watts	0.15 amps
075P	I.D. = 1/32"	3-way	12 Vdc	3.5 Watts	0.29 amps
075P	I.D. = 1/32"	3-way	24 Vdc	3.5 Watts	0.15 amps
100P	O.D. = 3/8"	2-way	12 Vdc	8.0 Watts	0.66 amps
100P	O.D. = 3/8"	2-way	24 Vdc	8.0 Watts	0.33 amps
100P	O.D. ≥ 3/16"	3-way	12 Vdc	8.0 Watts	0.66 amps
100P	O.D. ≥ 3/16"	3-way	24 Vdc	8.0 Watts	0.33 amps
100P	O.D. ≥ 3/32"	dual 3-way	12 Vdc	8.0 Watts	0.66 amps
100P	O.D. ≥ 3/32"	dual 3-way	24 Vdc	8.0 Watts	0.33 amps

Note: 115 Vac and 220 Vac solenoid coils are also available.

Configuration and Pressure Limits

Several configurations are available with the Bio-Chem Valve pinch valves:

- 2-way normally closed (designated as NC)
- 2-way normally open (designated as NO)
- 3-way (designated as MP). One tube is NC and the other is NO.

Dual tubing for both 2-way and 3-way configurations is offered for some tubing sizes.

Valve Series	Tubing size (valve p/n ext)	2-Way NC	2-way NO	3-Way MP	Dual tubing	Minimum pressure	Maximum pressure
075P	-10	✓	✓			vacuum	30 psi
075P	-23	✓	✓	✓		vacuum	20 psi
075P	-50	✓	✓	✓		vacuum	15 psi
075P	-01	✓	✓	✓		vacuum	15 psi
075P	-02	✓	✓	✓		0 psi	15 psi
100P	-01	✓	✓	✓	✓	vacuum	25 psi
100P	-02	✓	✓	✓	✓	0 psi	25 psi
100P	-03	✓	✓	✓		vacuum	25 psi
100P	-04	✓	✓	✓		0 psi	10 psi
100P	-05	✓	✓	✓		vacuum	20 psi
100P	-06	✓	✓			0 psi	10 psi
150P	-06	✓		✓		0 psi	10 psi
150P	-07	✓				0 psi	10 psi

108P multi-tube pinch valves

Two-way normally open valves using the –01B and –01S tubing with 4, 6, or 8 tubes operating simultaneously are also available. The maximum pressure is 15 psi. For further information, please consult Bio-Chem Valve.

Specifications (contd.)

Valve Height

Valve Series	2-Way NC	2-Way NO	3-Way MP
075P	1.88" (48 mm)	2.19" (56 mm)	2.13" (54 mm)
100P	2.50" (64 mm)	2.81" (71 mm)	2.50" (64 mm)
150P	3.80" (97 mm)	N/A	3.78" (96 mm)

Enhancement Options

"Quiet" Option
Through the use of noise dampening materials on internal valve components, the noise generated at actuation of the 075P and 100P pinch valves is reduced dramatically from approximately 72 dB to 52 dB. This optional feature is recommended for applications in noise-sensitive environments, such as hospitals and certain laboratories.

Optical Sensor Position Feedback Option
An infrared optical sensor can be factory mounted on the pinch valve. The sensor detects the position of the valve pusher/armature assembly and sends an electrical signal back to the controller confirming the open or closed valve position. With no moving parts, this sensor has been designed for virtually unlimited life.

Available valve configurations: 100P series valves with normally closed and 3-way configurations. Not available with normally open valves. 12 VDC and 24 VDC versions are offered.

Wiring: The entire valve and sensor assembly requires only three electrical wires:

■ : positive lead wire ■ : negative lead wire ■ : sensor feedback wire

Feedback signal:

- NC valve not actuated at 12 VDC or 24 VDC: tubing closed, 0 milliamp current on signal wire.
- NC valve actuated at 12 VDC or 24 VDC:
  - Tubing open: 0 milliamp current on signal wire.
  - Tubing closed (i.e. failure): 20 milliamp current on signal wire.

Dimensions: the optical sensor adds 1 inch (25 mm) to the height of the pinch valve.

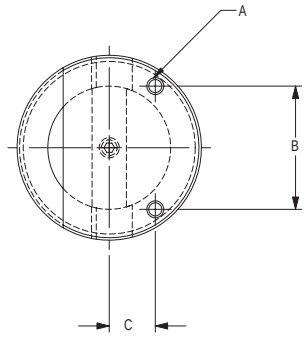
Specifications (contd.)

Mounting

For mounting clips, rings and flanges, please see the Mounting Accessories and Options specification sheet. Bottom mounting (add "M" to the end of the part number) is available for two-way normally open and normally closed pinch valves. The dimensions of the mounting holes in the pinch valve body are:

Valve Series	"A" Thread	"B" Center	"C"
075P2*	#2-56	0.500" (13mm)	0.125" (3mm)
100P2*	#4-40	0.687" (17mm)	0.218" (6mm)
150P2*	#6-32	1.000" (25mm)	0.375" (10mm)

* For P3 series consult factory.



Mounting holes can be provided in the shell on top of the valve. Please consult Bio-Chem Valve and Omnifit concerning top mounting holes.

Ordering Information

Important note:
Certain part number configurations may be subject to minimum order quantities and extended delivery schedules.
Please refer to factory before ordering.
Call: 973-263-3001 or e-mail: sales.us@biochemfluidics.com

Standard Pinch Valves

1	Select pinch valve series	075P, 100P, 150P
2	Indicate number of paths	2 (2-way), 3 (3-way), D2 (dual 2-way), D3 (dual 3-way)
3	Indicate operating configuration	NC, NO, MP (3-way)
4	Indicate voltage	12 vdc, 24 vdc, 115 vac, 220 vac
5	Indicate tube size	10, 23, 50, 01, 02, 03, etc.
6	Select tubing material	S (Silicone Select™), B (Bio-chem / C-Flex)
7	Indicate selected options	Q (Quiet), F (Feedback sensor), M (Mounting holes)

Part Number Example:

100P	D3	MP	24 - 02	S	QFM
Valve Size	Paths	Configu-ration	Voltage	Tube Size	Tube Material	Options

Multi-tube Pinch Valves

1	Select pinch valve series	108P
2	Indicate number of tubes	4, 6, or 8
3	Indicate operating configuration	NO
4	Indicate voltage	12 vdc, 24 vdc, 115 vac, 220 vac
5	Indicate tube size	01
6	Select tubing material	S (Silicone), B (Bio-chem / C-Flex)
7	Indicate selected options	Q (Quiet), F (Feedback sensor)

Part Number Example:

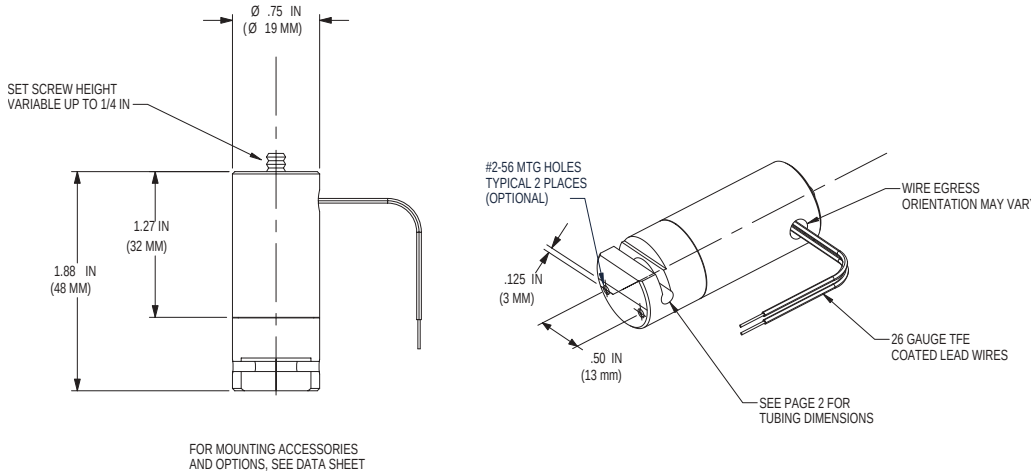
108P	8	NO	24 - 01	B	QF
Valve Size	Tubes	Configu-ration	Voltage	Tube Size	Tube Material	Options

Consult Bio-Chem Valve for further options concerning:
- Terminal connectors and non-standard lead wire lengths.
- Above standard operating pressure requirements.
- Custom tubing.

Please see our other product specification sheets for the following accessories:
- Omnifit PEEK barb fittings and adaptors
- CoolCube™ control module
- Mounting clips, flanges and rings

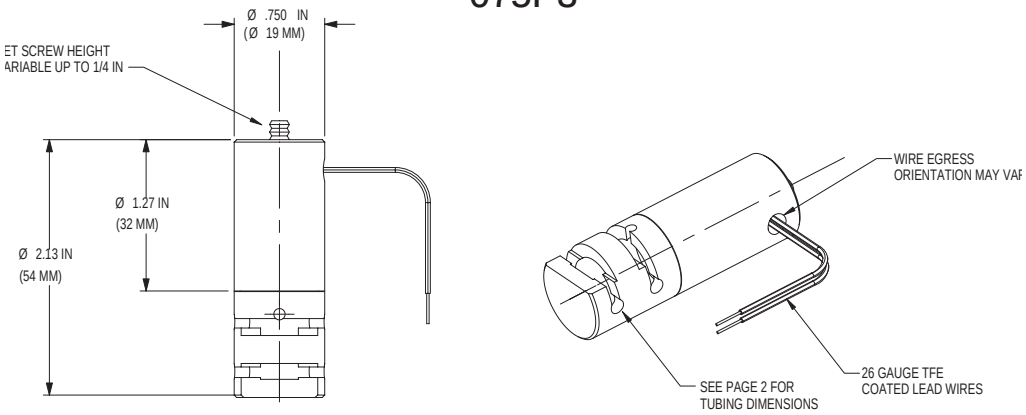
Installation Drawings

075P2NC



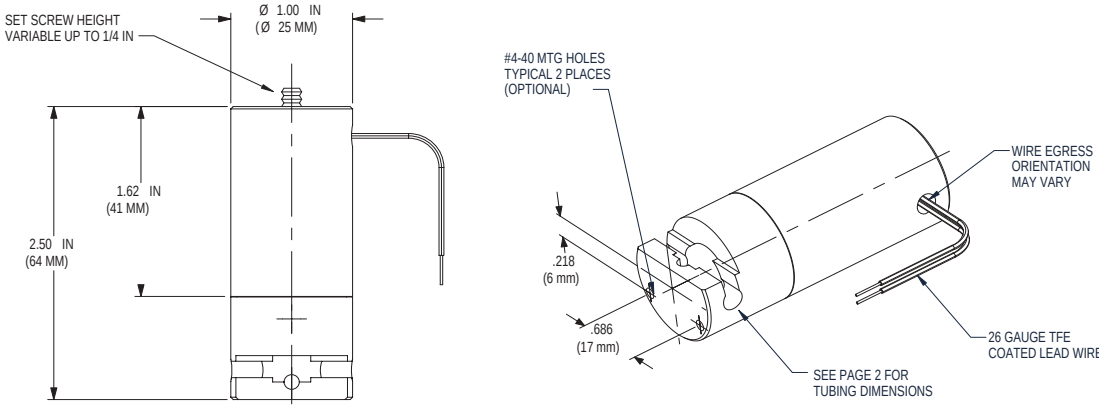
FOR MOUNTING ACCESSORIES
AND OPTIONS, SEE DATA SHEET

075P3



FOR MOUNTING ACCESSORIES
AND OPTIONS, SEE DATA SHEET

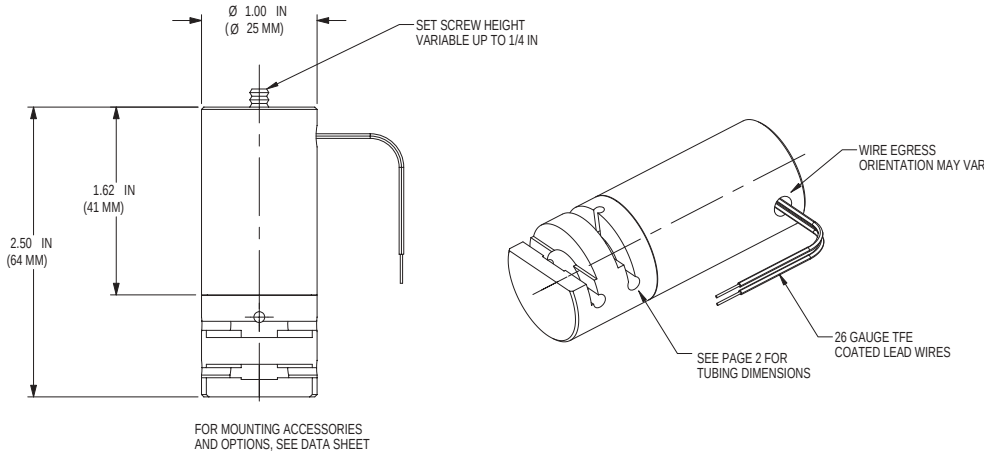
100P2NC



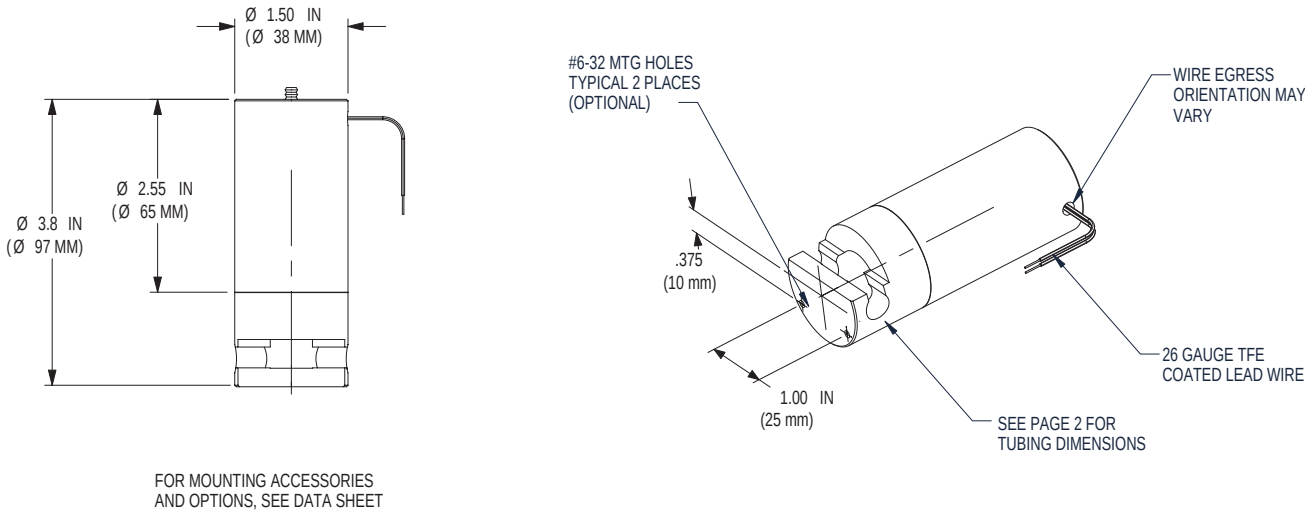
FOR MOUNTING ACCESSORIES
AND OPTIONS, SEE DATA SHEET

Installation Drawings (contd.)

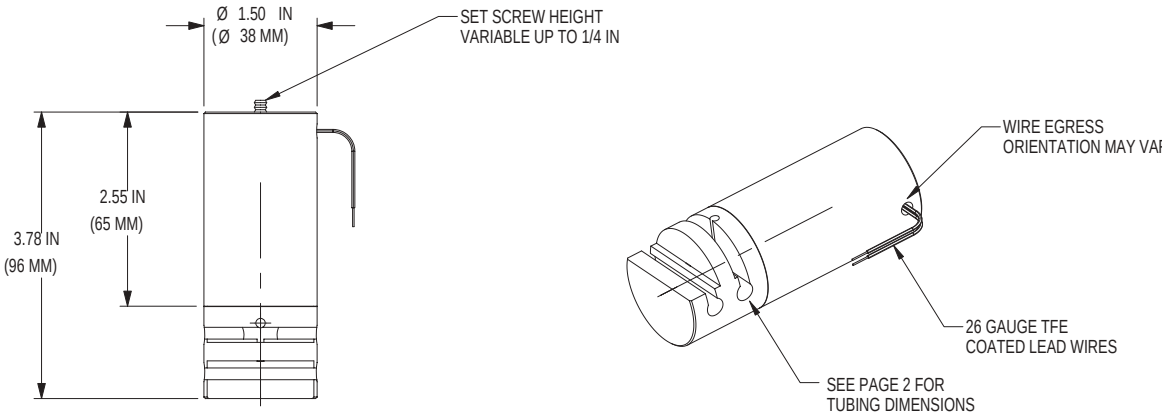
100P3



150P2NC



150P3



Accessories

Polypropylene Connectors and Fittings for Soft Tubing

Reducer

R-02/-01P

R-05/-02P

Part Number	Intended Tube Size
R-02/-01P	1/16" to 1/32" I.D.
R-05/-02P	1/8" to 1/16" I.D.

Straight

S-01P

S-02P

S-02P

Part Number	Intended Tube Size
S-01P	1/32" I.D.
S-02P	1/16" I.D.
S-05P	1/8" I.D.

"Y"

Y-01P

Y-02P

Y-04P

Y-05P

Part Number	Intended Tube Size
Y-01P	1/32" I.D.
Y-02P	1/16" I.D.
Y-04P	3/16" I.D.
Y-05P	1/8" I.D.

1/4"-28 Flat Bottom to Barb

B-062ID

B-095ID

B-125ID

Part Number	Intended Tube Size
B-062ID	1/16" I.D.
B-095ID	3/32" I.D.
B-125ID	1/8" I.D.

BIO-CHEM VALVE™ INC.

Isolation Valves

Inside.....

Solenoid valves with an isolated solenoid for use with aggressive and high-purity fluids.

- 2-way or 3-way configuration
- Low Power Consumption
- Fully Isolated Solenoid
- Choice of PTFE, PEEK™, PPS, Tefzel®, EPDM, Viton® and pefluoroelastomer wetted parts
- Manifold Mountable for Minimizing Leak Points and Space Requirements
- Designed for over 20 million cycles continuously
- Minimal Space Requirements
- Fast Response Time
- Minimal Dead Space
- Design Pressure Limits for 15 to 550 psig

Compact valve configurations

The Bio-Chem Valve isolation valves are available with three valve sizes, using 0.38 inch, 0.75 inch and 1.00 inch solenoid shell diameters. These sizes correspond to orifice diameters spanning from 0.032 inches to 0.125 inches, covering a broad range of application requirements. Valves are offered in 2-way normally open, 2-way normally closed and 3-way configurations.

Choice of inert wetted materials

The isolation valve design ensures that the only wetted parts are the valve diaphragm and the valve body. PTFE is a standard material for the majority of isolation valves, offering the most chemically inert solution available. For different mechanical and chemical requirements, the customer also has the option of using PEEK™, PPS or Tefzel® for the body material and EPDM, Viton® or a perfluorelastomer for the diaphragm material.

Quick-Change Customization™

Through Bio-Chem Valve's Quick-Change Customization™ process, the standard isolation valve configurations shown on this product data sheet can be modifed to meet the customer's specifications. For possibilities regarding solenoid and spring response times, operating pressures, port threads and locations, body configurations, wetted material and other features, please consult Bio-Chem Valve and Omnifit.

Specifications

Valve Series

The isolation valves are offered in five valve series, distinguished by the solenoid shell size, manifold mountability, and flow configuration:

Valve Series	Shell Diameter	Manifold Mountable	Flow Configuration
038T2	0.38 inches	no	2-way NC
039T2	0.38 inches	yes	2-way NC
075T2	0.75 inches	no	2-way NC/NO
075T3	0.75 inches	no	3-way
079NC	0.75 inches	yes	2-way NC/NO
100T2	1.00 inches	no	2-way NC/NO
100T3	1.00 inches	no	3-way

Electrical

Valve Series	Voltage	Power @ 70ºF (21ºC)	Power with CoolCube™	Current @ 70ºF (21ºC)
038T2	12 VDC	1.8 Watts	0.22 Watts	0.17 amps
	24 VDC	1.9 Watts	0.22 Watts	0.08 amps
039T2	12 VDC	1.8 Watts	0.22 Watts	0.17 amps
	24 VDC	1.9 Watts	0.22 Watts	0.08 amps
075T2	12 VDC	2.8 Watts	0.29 Watts	0.22 amps
	24 VDC	2.9 Watts	0.29 Watts	0.10 amps
075T3	12 VDC	2.8 Watts	0.29 Watts	0.22 amps
	24 VDC	2.9 Watts	0.29 Watts	0.10 amps
079NC	12 VDC	2.8 Watts	0.29 Watts	0.22 amps
	24 VDC	2.9 Watts	0.29 Watts	0.10 amps
100T2	12 VDC	4.0 Watts	0.44 Watts	0.32 amps
	24 VDC	4.0 Watts	0.44 Watts	0.16 amps
100T3	12 VDC	4.0 Watts	0.44 Watts	0.32 amps
	24 VDC	4.0 Watts	0.44 Watts	0.16 amps

Note: 115 VAC and 220 VAC solenoid coils are also available on all valve series except 038 and 039.
Note 2: The Bio-Chem Valve CoolCube™ control module allows the application of over-voltage to actuate the valve (e.g. using 24 VDC to actuate a valve rated for 12 VDC). After a delay of 110 milliseconds, the CoolCube™ drops the voltage to 1/3 (e.g. to 8 VDC from the original 24 VDC), which is sufficient to hold the valve in position. The CoolCube50™ is designed for use with 038 and 039 series valves and drops the voltage to 1/2. (Please refer to the CoolCube™ specification sheet.)

Orifice diameter options & maximum operating pressures

Valve Series	Orifice Diameters					
	0.032" (0.80 mm)	0.046" (1.17 mm)	0.054" (1.40 mm)	0.062" (1.57 mm)	0.092" (2.34 mm)	0.125" (3.18 mm)
038T2	20 psi	n/a	20 psi	n/a	n/a	n/a
039T2	20 psi	n/a	20 psi	n/a	na/	n/a
075T2	20 psi	n/a	20 psi	20 psi	n/a	n/a
075T3	15 psi (NC/NO) 20 psi (Com)	15 psi (NC/NO) 20 psi (Com)	n/a	n/a	n/a	n/a
079NC	20 psi	n/a	n/a	20 psi	n/a	n/a
100T2NC	n/a	n/a	n/a	15 psi	15 psi	15 psi
100T2NO	n/a	n/a	n/a	10 psi	10 psi	10 psi
100T3	30 psi (NC/NO) 60 psi (Com)	n/a	n/a	30 psi (NC/NO) 60 psi (Com)	n/a	n/a

Note: All valves can be operated at a vacuum.
Note 2: Higher pressures are available, consult factory.

Internal Volumes (µL)

Valve Series	Orifice Diameter	Internal Volume
038T2 Side-Ported	0.032"	20 µl
	0.054"	42 µl
038T2 Bottom-Ported	0.032"	18 µl
	0.054"	35 µl
039T2	0.032"	13 µl
	0.054"	21 µl
075T2	0.032"	19 µl
	0.054"	39 µl
	0.062"	54 µl
075T3	0.032"	45 µl
	0.046"	52 µl
079NC	0.032"	21 µl
	0.062"	31 µl
100T2	0.062"	55 µl
	0.092"	133 µl
	0.125"	296 µl
100T3	0.032"	47 µl
	0.062"	87 µl

Flow Factors (C_v)

Valve Series	Orifice Diameter	C_v
038T2	0.032"	0.008
	0.054"	0.015
039T2	0.032"	0.008
	0.054"	0.015
075T2	0.032"	0.011
	0.054"	0.027
	0.062"	0.030
075T3	0.032"	0.010
	0.046"	0.023
079NC	0.032"	0.011
	0.062"	0.027
100T2	0.062"	0.042
	0.092"	0.080
	0.125"	0.105
100T3	0.032"	0.010
	0.062"	0.028

Specifications (contd.)

Reaction times (for normally closed operators)

Valve Series	Opening time (milliseconds)		Closing time (milliseconds)
	Standard	with CoolCube™	
038T2	10 ms	5 ms	5 ms
039T2	10 ms	5 ms	5 ms
075T2	15 ms	5 ms	5 ms
075T3		Call Factory	
079NC	15 ms	5 ms	5 ms
100T2	20 ms	7 ms	20 ms
100T3		Call Factory	

Note 1: Reaction times were tested with air. Reaction times will vary depending on the medium.

Note 2: The Bio-Chem Valve CoolCube™ control module allows the application of over-voltage to actuate the valve (e.g. using 24 VDC to actuate a valve rated for 12 VDC). After a delay of 110 milliseconds, the CoolCube™ drops the voltage to 1/3 (e.g. to 8 VDC from the original 24 VDC), which is sufficient to hold the valve in position. The CoolCube50™ is designed for use with 038 and 039 series valves and drops the voltage to 1/2. (Please refer to the CoolCube™ specification sheet.)

Note 3: With use of CoolCube™ and CoolCube50™, power consumption will be reduced to 1/9 and 1/4 respectively after initial energization.

Port Threads

The standard isolation valve has 1/4"-28 UNF flat bottom port threads.

Other port threads are available, such as M6 x 1.0, 10-32, 5/16"-24 and 1/8" NPT. Consult factory.

Lead Wires

Valve Series	Lead Wires
038T2	24" 28-Gauge Teflon® coated
039T2	24" 28-Gauge Teflon® coated
075T2	15" 26-Gauge Teflon® coated
075T3	15" 26-Gauge Teflon® coated
079NC	15" 26-Gauge Teflon® coated
100T2	15" 26-Gauge Teflon® coated
100T3	15" 26-Gauge Teflon® coated

Fittings

The Omni-Lok™ Fitting System has been designed for connecting to Bio-Chem Valve Isolation Valve ports. The glass filled polypropylene material provides a stronger hold in PTFE ports where other fittings tend to back out. The Omni-Lok™ is also designed to provide more thread engagement in the shallow ports of an isolation valve. See The Omni-Lok™ Fitting System spec sheet for more information.

The Omni-Lok™ Fitting System

Mounting

Mounting Clips, Rings and Flanges are available for standard valves. Manifold mountable valves are also available. (Series 079NC and 039T)

Two 0.093 inch (2.4 mm) diameter mounting holes for self-tapping screws are an option with 075T2 and 100T2 series valves. Two 4-40 threaded mounting holes are an option with 075T3 and 100T3 series valves.

See Mounting Accessories & Options data sheet for more information.

Specifications (contd.)

Wetted Material Options by Valve Series

Body Material \ Diaphragm Material	PTFE	EPDM	Viton®	Perfluoroelastomer
PTFE	075T2 075T3 100T2 100T3	075T2 079NC 100T2	075T2 079NC 100T2	075T2 079NC 100T2
Tefzel®	075T2 100T2	075T2 100T2	075T2 100T2	075T2 100T2
PPS	075T2 075T3 100T2 100T3	038T2 039T2 075T2 075T3 079NC 100T2	038T2 039T2 075T2 079NC 100T2	038T2 039T2 075T2 075T3 079NC 100T2
PEEK	038T2 039T2 075T2 075T3 079NC 100T2 100T3	038T2 039T2 075T2 075T3 079NC 100T2	038T2 039T2 075T2 079NC 100T2	038T2 039T2 075T2 075T3 100T2

Ordering Information

1	Select valve size	038, 039T2M, 075, 079, 100
2	Indicate Style	T2, T3 (leave blank for 079 and 039T2M valve sizes)
3	Indicate Porting Option **(for 038 size only)**	B (bottom ported), S (side ported)
4	Indicate Operating Configuration	NC, NO (leave blank for 039T2M valve size)
5	Indicate voltage	12 VDC, 24 VDC, 115 VAC, 220 VAC
6	Indicate orifice diameter (in 1/1000 inch) (See chart on page 2 for available orifice sizes with specific models.)	32, 46, 54, 62, 92, 125
7	Body material (PTFE Standard except on 038 and 039 series. See chart on page 4 for options.)	2 (Tefzel®), 4 (PPS), 5 (PEEK™)
8	Diaphragm material (PTFE Standard. See chart on page 4 for options.)	E (EPDM), V (Viton®), P (Perfluoroelastomer)
9	Mounting holes on valve base	M

Options

Consult Bio-Chem Valve and Omnifit for options concerning:

- Port threads
- Helicoils
- Terminal connectors and non-standard lead wire lengths
- Above standard operating pressure requirements
- Manifold configurations

Accessories

Please see the following product specification sheets for accessories:

- Fitting Systems
- The Omni-Lok™ Fitting System
- CoolCube™ control module
- Mounting Accessories & Options

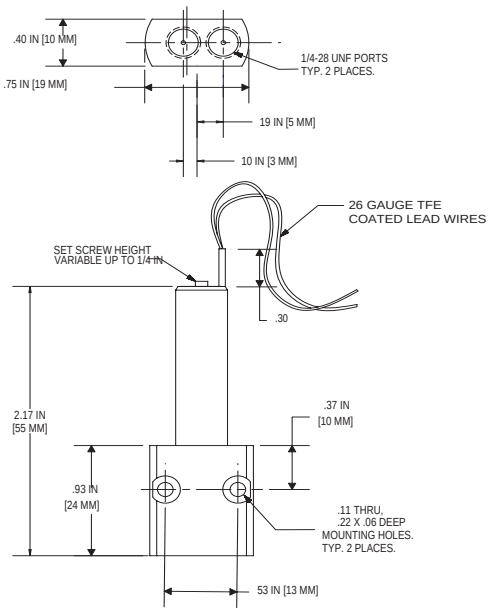
Example P/N:

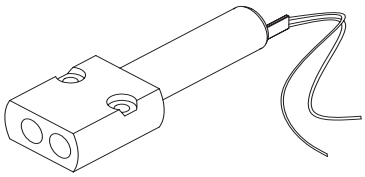
075	T2	NC	24	-	62	-	4	V	M
Valve Size	Style	Operating Config.	Voltage		Orifice Diameter		Body Material (Leave blank for PTFE)	Diaphragm Material (Leave blank for PTFE)	Mounting Holes (Leave blank for no mounting holes)

Important note:
Certain part number configurations may be subject to minimum order quantities and extended delivery schedules.
Please refer to factory before ordering.
Call: 973-263-3001 or e-mail: sales.us@biochemfluidics.com

Installation Drawings

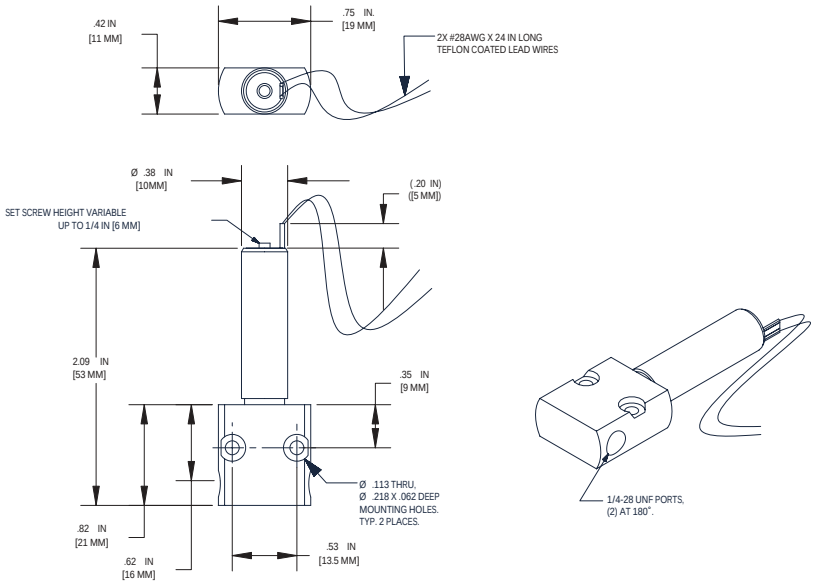
038T2B
Bottom Ported



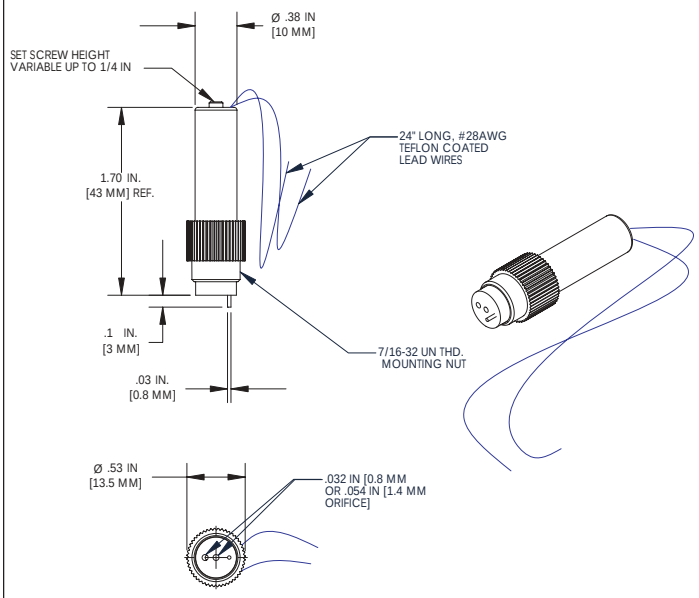


Installation Drawings

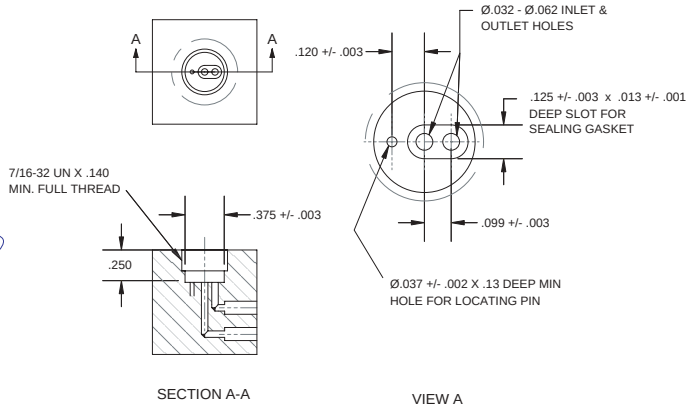
038T2S
Side Ported



039T2M
Manifold Mountable



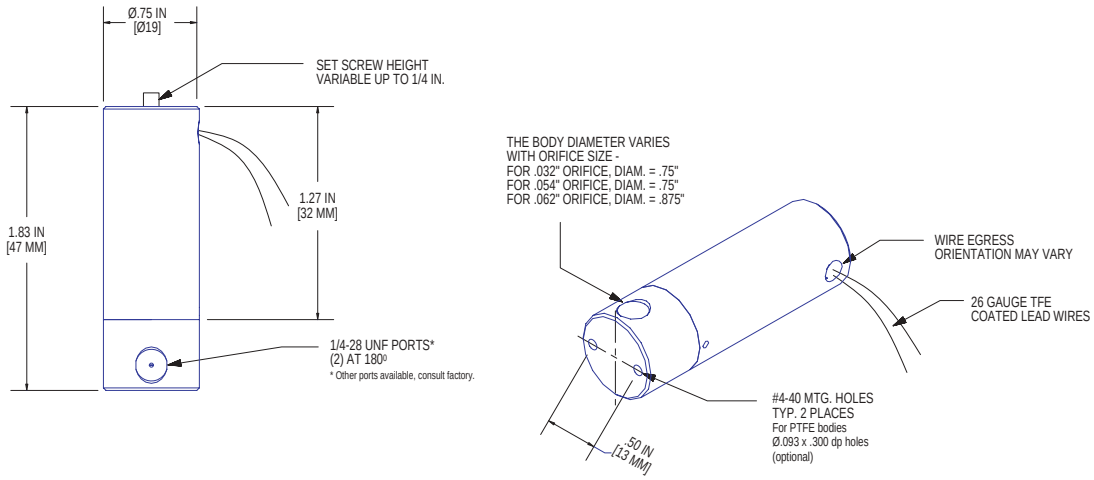
Manifold Interface



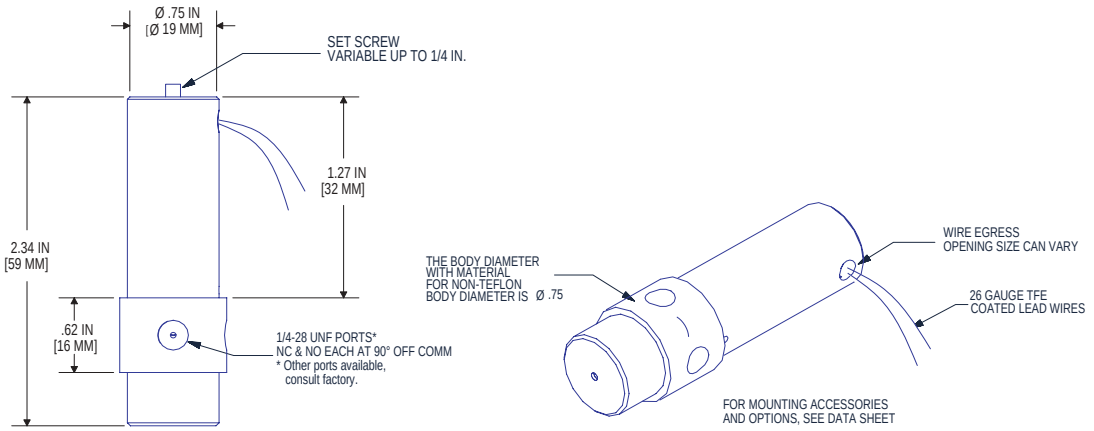
Installation Drawings (contd.)

DISCONTINUED BioChem/OmniFit 2014+ some stock still in Melbourne ?

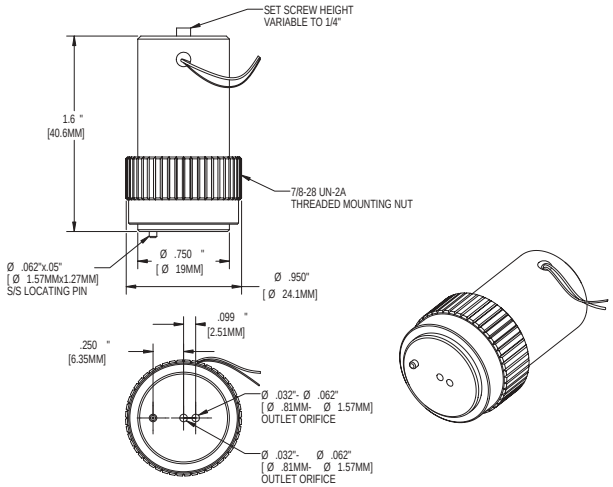
075T2NC



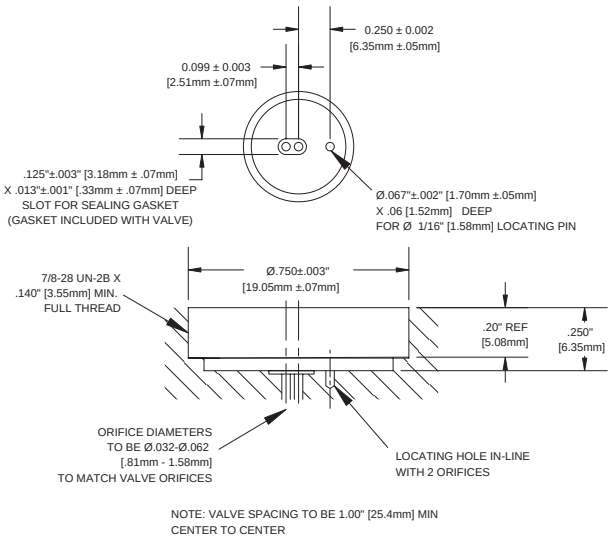
075T3MP



079NC Manifold Mountable

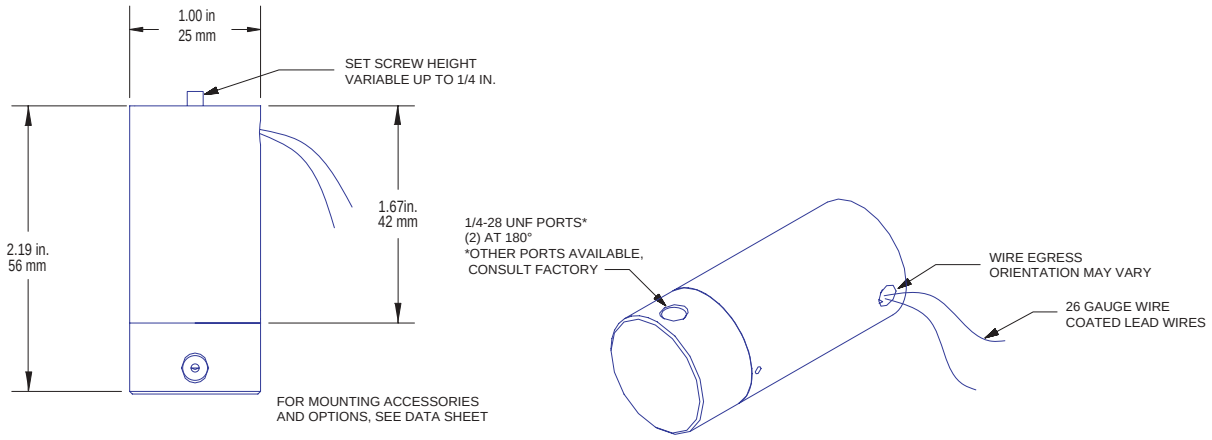


Manifold Interface

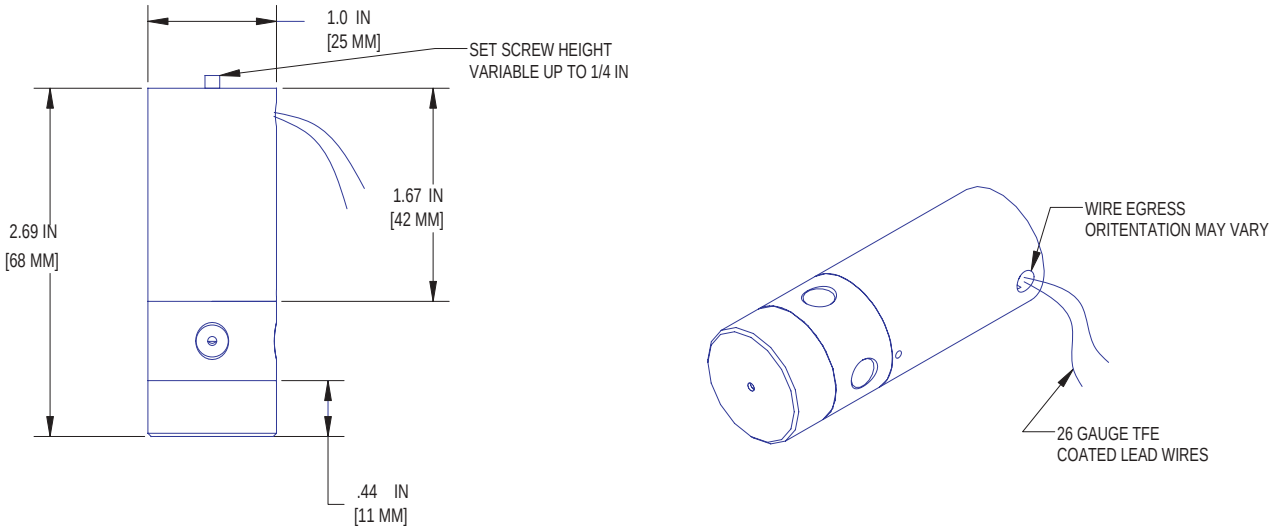


Installation Drawings (contd.)

100T2NC

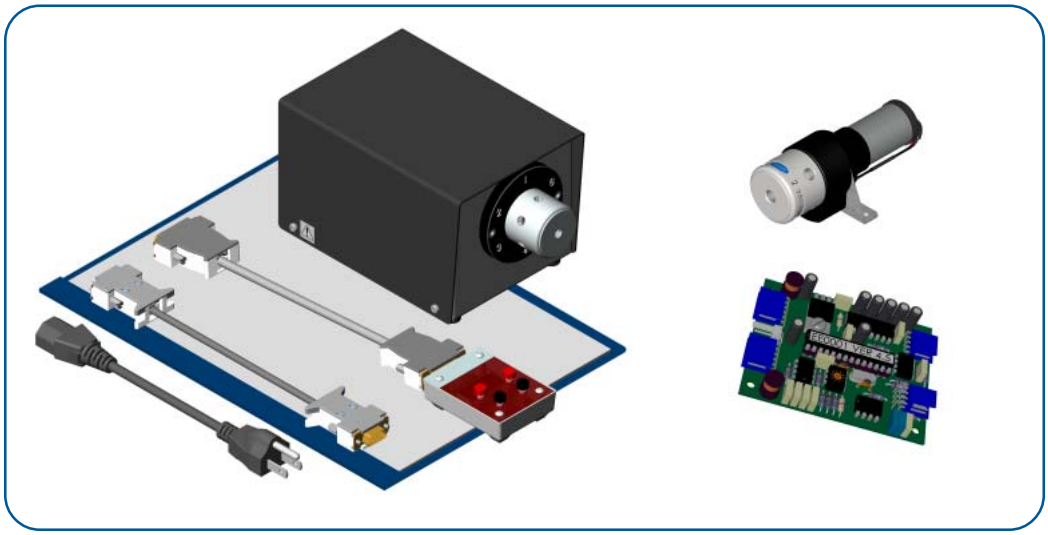


100T3MP



Electric Rotary Valves

Inside.....



Electrically controlled rotary valves in several configurations providing high chemical resistance

- Exceptional chemical resistance
- Inert PTFE body and Kel-F® rotor
- 4 to 11 ports available
- 1.5mm standard bore size
- Custom designs available for OEM applications

Electric rotary valves

Omnifit's electrically operated rotary valves are deigned for use with aggressive and biologically sensitive materials. Each valve has an inert PTFE body and Kel-f® rotor, 1.5mm bore size, and 1/4"-28 UNF flat-bottomed ports. Omnifit's 1/4"-28 UNF Gripper or Omni-Lok™ fittings are ideal for use with these valves. Standard configurations available include 4, 5, 6 and 10 way selection/distribution and 6 port loop inject valves. Complementary Omnifit products such as fittings, tubing and bottle caps are available to satisfy all your fluid system requirements. Please see relevant specification sheets.

Small Electric Rotary Valves

Omnifit's small electric rotary valves are designed for integration into an instrument making them particularly suited for OEM applications. The valves are available in 4 or 5 port versions for either flow switching or distribution. The pressure rating for this range is 500 psi (34 bar). The valve is driven by a 12 VDC, 4 Watt motor and is shipped with a controller PCB, TTL control cable and instruction manual. A cable enabling control via RS232 interface is available as an option.

Large Electric Rotary Valves with smart actuator

Omnifit's large electric rotary valves are designed for use as a stand-alone unit, ideal for bench top fluid management. The valves are available in 6, 7, 10 and 11 port versions for flow switching, sample collecting, distribution and loop inject applications. The valves are controlled by a 'smart actuator' which is controlled via a remote handset with 4 digit display. The option of RS232 control is provided with the valve. The actuator has a universal 100 to 240 VAC power requirement. The valve and actuator combination is shipped complete with a RS232 control, power leads, hand controller and instruction manual.

An overview of flow path configurations available and typical application notes can be found on page 4.

Both ranges of valves can be customized to suit OEM applications, please contact the sales office with your requirements.

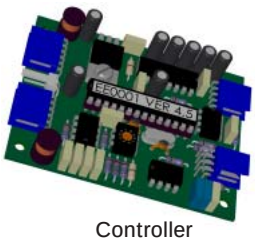
Small Electric Rotary Valves

- Exceptional chemical resistance
- Pressure ratings to 500 psi (33 bar)
- Optoelectronic encoder
- Microprocessor control
- TTL & RS232 interface
- Custom designs available

11522
4 port valve

11526
5 port valve

11528
5 port valve



Controller
PCB

This range of valves has an optoelectronic encoder and microprocessor-based control that carries out all functions to enable the user to control the valve at all times. The high speed microprocessor accommodates many functions including:

- Automatic initialisation
- Intelligent port alignment
- Manual switch debounce
- Selectable format position output code
- Reset facility
- RS232 interface

A primary function of the microprocessor is to provide exceptional alignment between the fluid paths of the rotor and valve body. This is achieved by the constant monitoring and minute adjustment of the valve position throughout the life of the valve. All of the valves may be actuated in either direction and programmed to stop at any combination of ports to provide maximum versatility.

Please visit our website to view the complete instruction manual. http://www.omnifit.com/erv_data.pdf

Specifications

Series 11500		
Wetted materials	Body:	PTFE
	Rotor:	Kel-F®
Number of ports	Standard 4 or 5 port options available with a variety of flow configurations	
Connection options	Hardwall tubing (e.g. PTFE) use Omnifit 1/4"-28 UNF Gripper fittings Softwall tubing (e.g. Silicone) use 1/4"-28 UNF to barb adaptor	
Bore size	1.5mm	
Internal volume	19 - 30 µL depending on configuration	
Max pressure	500 psi (33 bar) at 25° C	
Electrical	Power:	4 Watts
	Supply:	12 VDC
Step time	~ 300 milliseconds	
Weight	Complete Unit:	225g

Flow Configurations

11522
4 port valve allowing flow between 2 pairs of radially adjacent ports

11526
5 port valve allowing flow from the common axial port to exit through one of the 4 radial ports or vise-versa

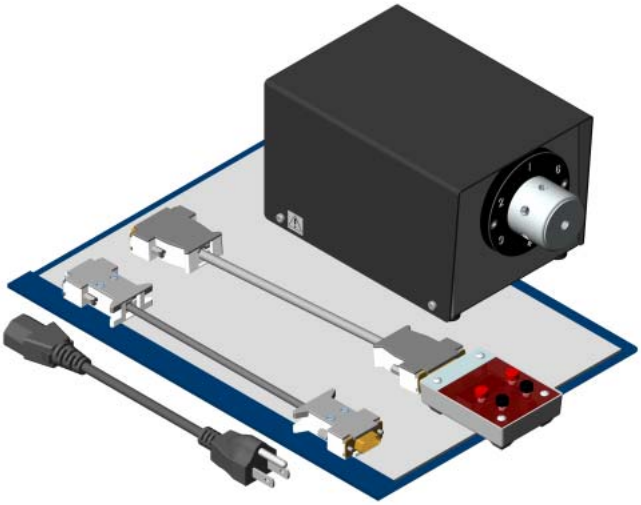
11528
5 port valve connecting 2 radial ports at 90° and the common axial port to one other radial port

Ordering Information

P/N	Configuration	Ports	Pack Size
11522	Flow between 2 pairs of radially adjacent ports	4	1
11526	Flow from the common port to exit through one port	5	1
11528	Connects 2 ports at 90° and the common port to one other port	5	1
11511	RS232 control/feedback cable	-	1
11510	TTL position feedback cable	-	1

Large Electric Rotary Valves with Smart Actuator

- Inert PTFE body and Kel-F® Rotor
- Accepts 1/4”-28 UNF fittings
- 30 psi (2 bar) pressure rating
- Remote control handset with 4 digit LED display
- Clockwise and anti-clockwise rotation
- Computer interface
- Software included



11101 Series Smart Actuator shown with a 6 port valve, remote control unit and cable, RS232C interface cable and power lead

Omnifit’s large electric rotary valves are the ideal solution for controlling the movement of fluids in the lab or similar applications where a self contained unit is required. The microprocessor-based Smart Actuator operates either a two-position loop inject or multi-position valve. The Smart Actuator allows precise valve positioning for almost any chromatography application, such as sampling and injecting samples on columns.

The actuator accepts input voltages between 100 and 240 VAC. The actuator’s configuration can be set or interrogated without removing the cover, via the remote control unit or the RS232C interface with the supplied software. For automated processing, the actuator can be controlled by a PC through the RS232C interface. Multiple actuators may be controlled from a single RS232C interface using a daisy chain cable that is available as an option.

In addition to the flexibility built into every Smart Actuator, several basic features support the functionality needed for precise valve operation:

- Electronic alignment for accuracy, control and ease of use
- Reversible rotor direction for reduced contamination and fast movement
- Automatic switching based on a timer

An overview of flow path configurations available and typical application notes can be found on page 4.

Specifications

Series 11101		
Wetted materials	Body:	PTFE
	Rotor:	Kel-F®
Number of ports	Standard 6, 7, 10, or 11 port options	
Connection options	Hardwall tubing (e.g. PTFE) use Omnifit 1/4"-28 UNF Gripper or Omni-Lok™ fittings	
	Softwall tubing (e.g. Silicone) use a 1/4"-28 UNF to barb adaptor	
Bore size	1.5mm	
Swept volume @ each position	11106 = 26 µL, 11107 = 26 µL, 11110 = 29 µL, 11111 = 29 µL	
Max pressure	30 psi (2 bar) at 25⁰ C	
Electrical	Supply:	100 to 240 VAC
	Power:	50 Watts
Size	W = 115mm D = 192mm H = 106mm	

Flow Configurations

11106
For loop injection

11107
For sample collection and stream selection

11110
For double loop injection

11111
For sample collection and stream selection

Large Electric Rotary Valves with Smart Actuator (contd.)

Ordering Information

P/N	Description	Voltage	Ports	Pack Size
11101A/11106	Smart Actuator with 6 port loop injection valve USA power lead	100 to 240 VAC	6	1
11101A/11107	Smart Actuator with 7 port distribution valve USA power lead	100 to 240 VAC	7	1
11101A/11110	Smart Actuator with 10 port loop injection valve USA power lead	100 to 240 VAC	10	1
11101A/11111	Smart Actuator with 11 port distribution valve USA power lead	100 to 240 VAC	11	1
11101E/11106	Smart Actuator with 6 port loop injection valve European power lead	100 to 240 VAC	6	1
11101E/11107	Smart Actuator with 7 port distribution valve European power lead	100 to 240 VAC	7	1
11101E/111010	Smart Actuator with 10 port loop injection valve European power lead	100 to 240 VAC	10	1
11101E/11111	Smart Actuator with 11 port distribution valve European power lead	100 to 240 VAC	11	1
11101U/11106	Smart Actuator with 6 port loop injection valve UK power lead	100 to 240 VAC	6	1
11101U/11107	Smart Actuator with 7 port distribution valve UK power lead	100 to 240 VAC	7	1
11101U/11110	Smart Actuator with 10 port loop injection valve UK power lead	100 to 240 VAC	10	1
11101U/11111	Smart Actuator with 11 port distribution valve UK power lead	100 to 240 VAC	11	1

Application and set up notes.

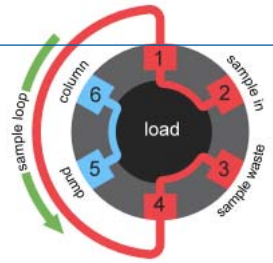
The images below show Omnifit loop inject valves in use as sample injection devices in a chromatography system. These are the most common applications but the use of the valves is not limited to these.

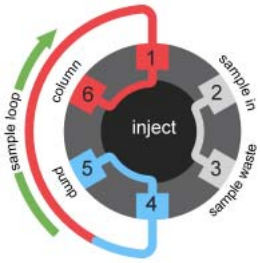
6 port loop inject valve used as a sample injector

With the valve in the load position the sample can be injected into the sample loop while the mobile phase is pumped directly through to the column.

When the valve is switched to the inject position, the pump is then connected to the sample loop and the sample is carried onto and through the column. The ‘sample in’ and ‘waste’ ports are joined but isolated from the loop.

It is suggested that ports are connected to the corresponding lines as shown. This ensures that the flow of the mobile phase is in opposite directions during the load and inject operations.



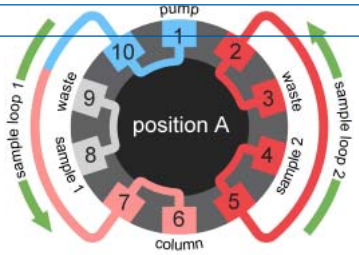


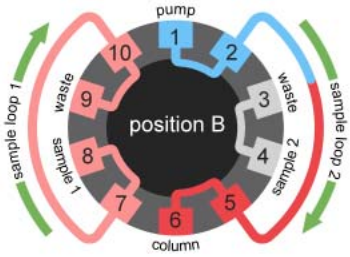
10 port loop inject valve used as a sample injector

This valve allows alternate injection from two different sample loops, either identical or of different sizes. This application can alternatively be satisfied with a 4 port switching valve and a 6 port loop inject valve.

With the valve in position A, sample 2 can be loaded into sample loop 2 while the mobile phase is pumped through sample loop 1 and carries sample 1 onto the column. The ‘sample 1 in’ and ‘waste’ ports are connected but isolated from the loop.

When the valve is switched to position B, the pump is connected to sample loop 2 and sample 2 is carried onto and through the column. The ‘sample 2 in’ and ‘waste’ ports are connected but isolated from the loop. Whilst sample 2 is pumped onto the column, sample loop 1 can be re-loaded.





OTHER COMPONENTS

VPS5401068N

NUMBER	MATERIAL
VPS5401068N	Polycarbonate with Silicone Disk

Check Valve, Male/Female Luer, 420 mL/min flow rate at 1 M head 30 psi back pressure, 1/4 psi inlet cracking pressure

VPS5401020N

NUMBER	MATERIAL
VPS5401020N	Polycarbonate with Silicone Disk

Check Valve, Male/Female Luer, 129 mL/min flow rate at 100mmHg, 45 psi back pressure, 1-5 psi inlet cracking pressure

VPS5401036SN

NUMBER	MATERIAL
VPS5401036SN	Polycarbonate with Silicone Disk

Reflux Check Valve, Male/Female Luer, 350mL/min flow Rate at 1 M head, 45 psi back pressure, opens at 284 mmHg

VPS5401001N

NUMBER	MATERIAL
VPS5401001N	ABS Housing with Silicone Disk

Check Valve, Male Slip Luer, 420 mL/min flow rate at 1M head, 30 psi back pressure, 1/4 psi inlet cracking pressure

VPM2930601N

NUMBER	MATERIAL
VPM2930601N	White ABS

Tube Clamp with split, 1/8" (3.2 mm) OD Tubing

VPS3901074N

NUMBER	MATERIAL
VPS3901074N	Polyisoprene with ABS Acrylic Body

IN-4000 Intermittent Injection Site to Male Luer Lock

VPM1060200N

NUMBER	MATERIAL
VPM1060200N	Clear Low Density Polyethylene

Long Spike Guard Closed at Tip

VPM0480201N

NUMBER	MATERIAL
VPM0480201N	White Polyethylene

Luer Tip Syringe Cap

VPB0850400N

NUMBER	MATERIAL
VPB0850400N	Clear ABS

Female Luer Thread Style Coupler

VPM0031400N

NUMBER	MATERIAL
VPM0031400N	Clear Acrylic

Female Luer Lug Style, Bond-in 5/32" ID

VPM3341750SN

NUMBER	MATERIAL
VPM3341750SN	Blue Rad. Stable Polycarbonate

Tri-female Luer Y Connector to Male Luer Slip

VPM1080303N

NUMBER	MATERIAL
VPM1080303N	Blue Polyethylene

Male Luer Integral Lock Ring Plug

VPB1000055N

NUMBER	MATERIAL
VPB1000055N	Polycarbonate Body with Polyethylene Handle

One way Stopcock, Male Slip Luer to Capped Female Luer Thread Style

VP455980

NUMBER	MATERIAL
VP455980	Polycarbonate Body with Polyethylene Handle

One Way Stopcock, Capped Male Luer Lock to Capped Female Luer Thread Style
Sterile Version

VPB1000079N

NUMBER	MATERIAL
VPB1000079N	Polycarbonate Body with Polyethylene Handle

Three Way Stopcock, (2) Capped Female Luer Thread Style and Capped Male Luer Lock

VPB15311LG2

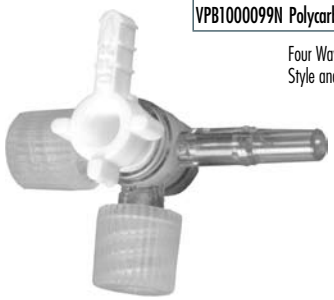
NUMBER	MATERIAL
VPB15311LG2	Rad. Stable Polycarbonate Body with White HDPE Handle

3-Way Stopcock, (2) Female Luer Thread Style & (1) Male Luer with Rotating Lock Ring (NO caps)

VPB1000062N	NUMBER	MATERIAL
	VPB1000062N	Polycarbonate Body with Polyethylene Handle

Three Way Stopcock, (2) Female Luer Thread Style and Male Slip Luer

VPB1000099N	NUMBER	MATERIAL
	VPB1000099N	Polycarbonate Body with Polyethylene Handle



Four Way Stopcock, (2) Capped Female Luer Thread Style and Male Slip Luer

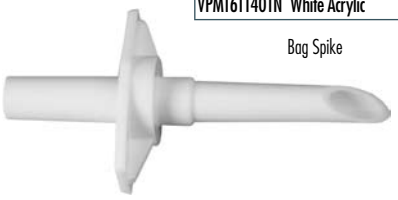
VPB1000110N	NUMBER	MATERIAL
	VPB1000110N	Polycarbonate Body with Polyethylene Handle

Four Way Stopcock, (2) Capped Female Luer Thread Style & Capped Male Luer Lock

VPS5069700N	NUMBER	MATERIAL
	VPS5069700N	White Acrylic Spike with Clear LDPE Guard

Bag Spike with vented guard

VPM1611401N	NUMBER	MATERIAL
	VPM1611401N	White Acrylic



Bag Spike

POLYVINYL CHLORIDE (PVC) TUBING

75 Durometer

Our PVC tubing is a very cost effective product that can satisfy a broad array of end use applications. It is flexible in nature, optically clear, and easily sterilized.

Resin Grade & Technical Information:
This tubing is extruded from Unichem 7511 G-015 resin, which is in compliance with all US Food & Drug Administration regulations for food grade use under Title 21 CFR. It is also certified USP Class VI. It can be sterilized by gamma radiation or Ethylene Oxide (EtO) gas. This tubing is not autoclavable.

We recommend that you request free samples for testing in your particular applications.

DIMENSION (ID X OD X LGTH)	**NUMBER**
1/16" X 1/8" X 100'	PV00-1031C
1/16" X 1/8" X 1000'	PV00-1031M
3/32" X 3/16" X 100'	PV00-2047C
3/32" X 3/16" X 1000'	PV00-2047M
1/8" X 1/4" X 100'	PV00-3062C
1/8" X 1/4" X 1000'	PV00-3062M
5/32" X 9/32" X 100'	PV00-4062C
5/32" X 9/32" X 1000'	PV00-4062M
3/16" X 5/16" X 100'	PV00-5062C
3/16" X 5/16" X 1000'	PV00-5062M
1/4" X 3/8" X 100'	PV00-6062C

POLYURETHANE TUBING

80 Durometer

Our polyurethane tubing is extremely kink resistant. It is also highly resistant to abrasion and scuffing. It is widely accepted as a premium material for medical device use because of its flexible nature and easy sterilizability.

Resin Grade & Technical Information:
This tubing is extruded from Dow's compound Pellethane 2363-80AE, which has passed USP Class VI testing. It can be sterilized by gamma radiation or Ethylene Oxide (EtO) gas. Please do not autoclave this tubing, as it may alter the chemical nature of the resin.

DIMENSION (ID X OD X LGTH)	**NUMBER**
1/16" X 1/8" X 100'	UR00-1031C
1/16" X 1/8" X 1000'	UR00-1031M
3/32" X 3/16" X 100'	UR00-2047C
3/32" X 3/16" X 1000'	UR00-2047M
1/8" X 1/4" X 100'	UR00-3062C
5/32" X 9/32" X 100'	UR00-4062C

LOW DENSITY POLYETHYLENE TUBING

92 Durometer

Our polyethylene tubing has excellent mechanical and chemical resistance properties. However, please use caution if your application involves possible bending or kinking the tubing. It is a semi-rigid material and will be permanently deformed if kinked or bent too tight.

Resin Grade & Technical Information:
This tubing is extruded from DuPont 2020T, which is in compliance with all U.S. Food & Drug Administration regulations for food grade use under Title 21 CRF. It can be sterilized by gamma radiation or Ethylene Oxide (EtO) gas. Autoclaving is not recommended.

DIMENSION (ID X OD X LGTH)	**NUMBER**
1/16" X 1/10" X 100'	LDPE01-1019C
1/16" X 1/10" X 1000'	LDPE01-1019M
1/16" X 1/8" X 100'	LDPE01-1031C
1/16" X 1/8" X 1000'	LDPE01-1031M
3/32" X 5/32" X 100'	LDPE01-2031C
3/32" X 5/32" X 1000'	LDPE01-2031M
1/8" X 3/16" X 100'	LDPE01-3031C
1/8" X 3/16" X 1000'	LDPE01-3031M
5/32" X 7/32" X 100'	LDPE01-4031C
5/32" X 7/32" X 1000'	LDPE01-4031M

Takasago Fluidic Systems

TAKASAGO Fluidic Systems

PRODUCT INFORMATION

OVERVIEW 2014 *1-19p*

FLUIDICS - Components 2016 *20-76p*

Environment

Preserve clean air and water for future generations

Our products are installed into many kinds of environment-related applications like water quality analyzers, automotive emissions etc. to protect the environment.

Health

For mankind's well-being

We hope our products are used to improve people's health and happiness. e.g. in blood analyzers, dialysis machines and other medical / diagnostic applications.

Technology

Small, Fast, Highly Accurate

We, as a high-tech fluidic control system manufacturer, always aim to achieve the most advanced technological standards.

TAKASAGO ELECTRIC, INC.

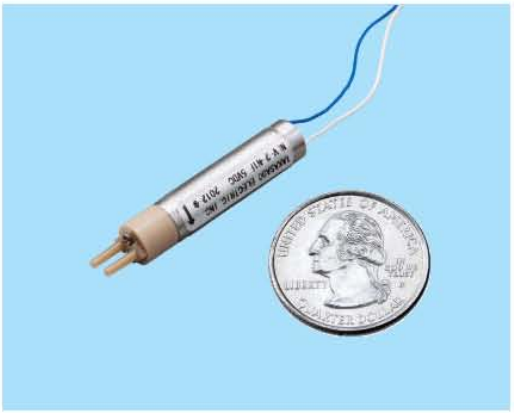
Having developed in excess of 5000 different valves over 50 years, Takasago has established itself as a leading manufacturer of valves and other fluidic devices. With this experience and knowledge about fluid-handling and precision control, we can provide our customers with high quality custom-made products. The products listed in this brochure represent only a small part of our product range.
Various applications of our products include :

- Diagnostic instruments such as clinical chemistry/immunoassay analyzers
- Environmental measuring instruments for water, air, flue gas or automotive exhaust gas
- Analytical instruments including liquid/gas chromatographs
- Medical instruments including dialysis machines
- Biotechnology equipment for DNA analysis, cell culture, cell handling, etc.
- Semiconductor and LCD manufacturing equipment
- Ink-jet printers
- Fluid control devices for beverages, etc.
- etc.

CONTENTS

Innovatively Small and Highly Fun

NV NLV Series



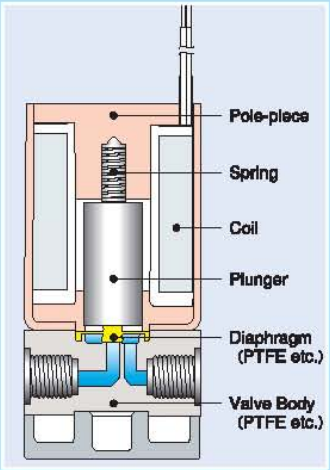
	NV Series	NLV Series
Dimensions (mm)	ϕ5.7 x H 32.5*1	
Orifice Diameter (mm)	ϕ0.4	
Port Connection	Barb	
Pressure	0 ~ 100 kPa	
Voltage	5 VDC, 12 VDC, 24 VDC	5 VDC
Power Consumption	1 W	1.5 W when energized (Latching Solenoid*2)

*1.Dimensions of NV-2-N1G and NLV-2-N1G *2.Please refer to page12 on the latching solenoid.

KV Series

Dimensions (mm)	W 6 x L 50x H 12.5
Orifice Diameter (mm)	ϕ0.8
Port Connection	O-ring
Pressure	0 ~ 100 kPa
Voltage	12 VDC, 24 VDC
Power Consumption	1.8 W

Miniature Isolation Valves



Our solenoid valve consists of two sections ; one is the valve part made of highly inert plastics like PTFE or PEEK, which opens and closes a flow path. The other is the actuator made of a coil and metallic parts, driving the valve part. In order to preserve the purity of the fluid, a diaphragm is installed between the two sections in our isolation valves. The diaphragm prevents the fluids from flowing into the actuator and protects the metallic parts from being corroded. Also, metal dust generated in the actuator does not contaminate the fluid. This structure is ideal for analytical and diagnostic applications which are sensitve to particles. It is also suitable for handling acids and chemicals which erode metals.

By reducing the size of these isolation valves, we have been able to reduce the dead volume, improve the control of the pumping volume, and reduce the installation area, thereby improving accuracy and avoiding wasting chemicals and solvents.

TAKASAGO
ELECTRIC, INC.

ctional : Miniature Isolation Valves

EXAK Series

Dimensions (mm)	ϕ12× H 48.1
Orifice Diameter (mm)	ϕ0.8
Port Connection	Barb, M5
Pressure	−40 ~ 100 kPa
Voltage	12 VDC, 24 VDC
Power Consumption	0.94 W

WTE Series

Dimensions (mm)	W19 × L11 × H 31.3
Orifice Diameter (mm)	ϕ1
Port Connection	Gasket
Pressure	−65 ~ 100 kPa
Voltage	12 VDC, 24 VDC
Power Consumption	1.5 W

Pumping Volume

The diaphragm produces a pumping effect on the fluid as the valve opens and closes. As some valve models pump several microliters of fluid at one time, the pumping volume forms a negative factor in metering an accurate fluid volume, and also in preventing fluid from dripping from a dispensing nozzle.
Some of the valve models we provide have remarkably small pumping volumes due to their unique internal structures or miniaturized dimensions. The EXAK series has a distinctive design called a "zero-pumping-volume structure" that allows the pumping volume to run 100 times smaller than our standard valves. Rocker valves (page 9) and non-diaphragm inert valves (made of inert materials like stainless steel) have very small pumping volumes due to no volumetric change in the valve chamber during an operation. We also provide slider valves (page 10) with pumping volumes that have been ultimately reduced to an immeasurable level.

unit:μl

TYPE	PORT	ON-1	OFF-1	ON-2	OFF-2	ON-3	OFF-3
Zero-pumping-volume type (EXAK-3)	COM.	0.002	-0.015	0.002	-0.015	0.002	-0.015
	N.C.	0.024	-0.01	0.024	-0.01	0.024	-0.01
	N.O.	0.005	-0.005	0.005	-0.005	0.005	-0.005
Rocker solenoid type (Low pumping volume model)	COM.	0	0	0	0	0	0
	N.C.	0.103	-0.18	0.137	-0.263	0.145	-0.213
	N.O.	-0.059	0.103	-0.027	0.025	-0.033	0.027
Non-diaphragm valve	IN	-0.009	0.018	-0.018	0.009	-0.017	0.018
	OUT	-0.725	0.81	-0.71	0.826	-0.708	0.849
Conventional type (MTV-3R)	COM.	2.346	2.609	2.425	2.604	2.427	2.661
	N.C.	2.63	2.317	2.481	2.293	2.521	2.34
	N.O.	7.238	7.373	7.443	7.395	7.506	7.388

Diaphragm Valves with High Rel

EXV Series

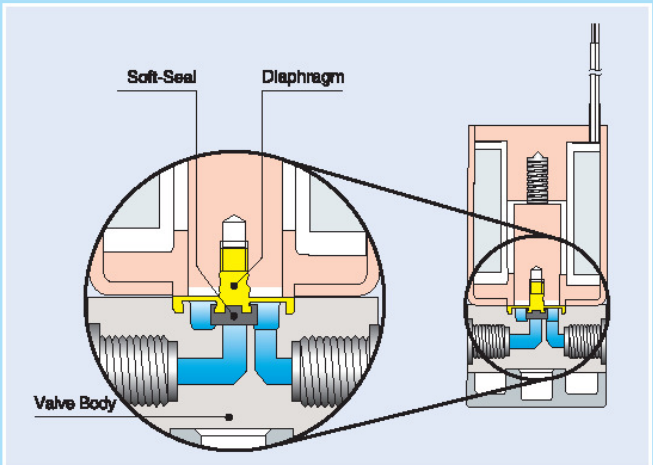
Dimensions (mm)	W 14 × L 25.0 × H 31.7
Orifice Diameter (mm)	ϕ1
Port Connection	Gasket
Pressure	−50 ~ 200 kPa
Voltage	12 VDC, 24 VDC
Power Consumption	2.8 W

STV CTV Series

	❶ STV Series	❷ CTV Series
Dimensions (mm)	ϕ20 × H 42.5	ϕ21 × H 59.8 (excluding projection parts)
Orifice Diameter (mm)	ϕ1.2	ϕ1.6
Port Connection	M6, 1/4-28UNF, Barb	
Pressure	−50 ~ 200 kPa	
Voltage	12 VDC, 24 VDC	
Power Consumption	2.5 W	3.5 W

*Manifold-mountable models are also available.

Soft-Seal



Problems can arise with PTFE diaphragm valves when scratches on the seal part of the valve, due to dust or crystals in the fluid, cause the valve to leak. Takasago offers an optional "Soft-Seal" to protect the sealing surface from being scratched by covering it with perfluoroelastomer, which is a special elastomer that has outstanding resistance to most chemicals and solvents. The chemical inertness of the perfluoroelastomer is almost equal to PTFE. It has a high reputation for use with chemicals in analytical or semi-conductor industries. FPM (FKM) is also available for the Soft-Seal material.

TAKASAGO ELECTRIC, INC.

iability and Outstanding Inertness

MTV Series

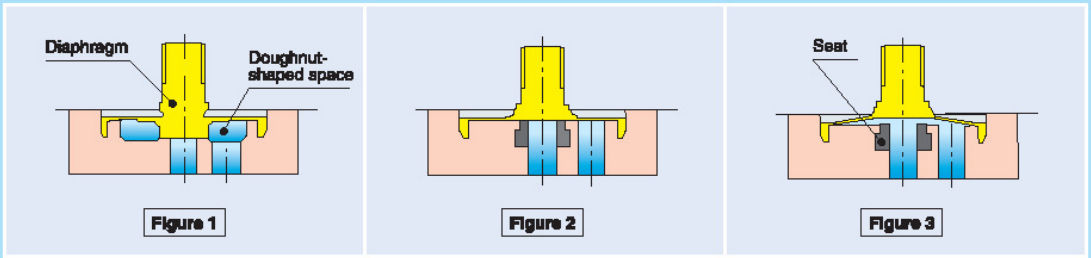
Dimensions (mm)	ϕ26 × H 53.2
Orifice Diameter (mm)	ϕ1.6 ~ ϕ2
Port Connection	M6, 1/4-28UNF, Barb
Pressure	−90 ~ 300 kPa
Voltage	12 VDC, 24 VDC
Power Consumption	1.9 W, 2.8 W

*Manifold-mountable models are also available.

PKV Series

	❶ PKV-2	❷ PKV-3
Dimensions (mm)	W 43 × L 36 × H 71	W 43 × L 36 × H 62
Orifice Diameter (mm)	ϕ4 ~ ϕ6	
Port Connection	Rc1/8, Rc1/4, 1/8-27NPT, 1/4-18NPT, Barb	
Pressure	−50 ~ 200 kPa	−50 ~ 100 kPa
Voltage	12 VDC, 24 VDC	
Power Consumption	6 W, 10 W	10 W

Zero-Internal-Volume Design

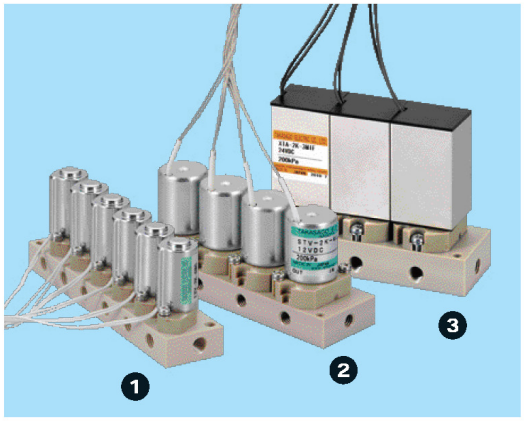


■ Applicable models
- STV Series (2-way type only)
- MTV Series
- MLV Series

A diaphragm solenoid valve normally has a doughnut-shaped space right under the diaphragm, through which fluids flow to the outlet port (Figure 1). This space, often called a "valve chamber", works as excess internal volume to waste solvents and samples. Fluids tend to stay in this dead space and therefore decrease the purity of each fluid. In addition, air bubbles may be trapped in this valve chamber and can have a negative effect on analytic accuracy. To conclude a valve chamber causes various undesirable results for applications. To overcome these problems, Takasago has designed the Zero-Internal-Volume Valve, in which a special structure is employed to eliminate the valve chamber (Figure 2). On opening, the diaphragm is lifted and the space is formed for the fluid to stream (Figure 3).
(Note) This Zero-Internal-Volume structure is patented.

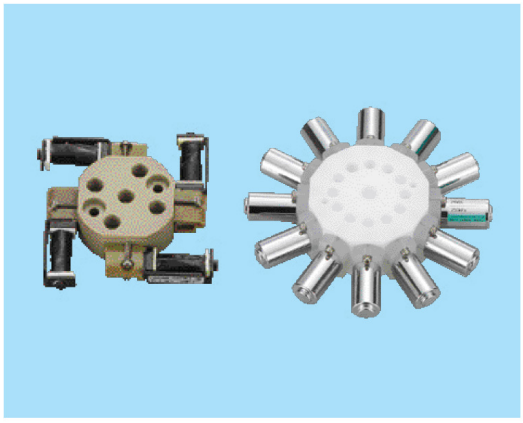
Products to Meet Your

Standard Manifolds



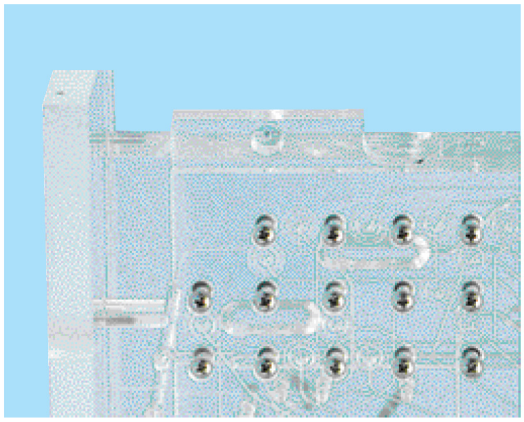
	❶ EXV Series	❷ STV Series	❸ XTA Series
Orifice Diameter(mm)	φ1	φ1.2	φ2
Port Connection	M6, 1/4-28UNF		
Pressure	−20 ~ 200 kPa	−50 ~ 200 kPa	−50 ~ 200 kPa
Voltage	12 VDC, 24 VDC		
Power Consumption	2.8 W x (No. of valve)	2.5 W x (No. of valve)	2.8 W x (No. of valve)
Max. number of valves	6		

Custom Manifolds

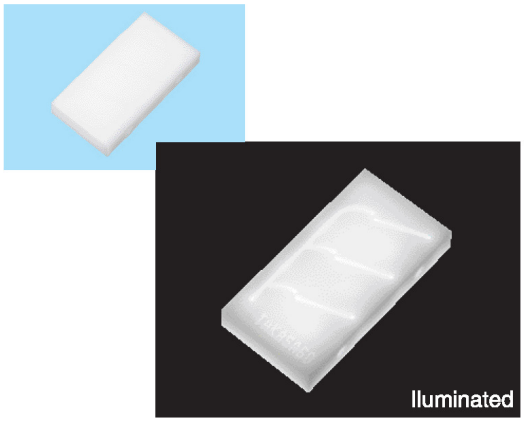


If you wish install valves compactly and connect flow-paths over a short distance, the manifold is the best choice. If you let us know the flow diagram you require, we can design and produce the manifold to meet your requirements. A variety of shapes, materials, and structural methods are available and we are also capable of equipping the manifold with components like pumps. Please contact us for further details.

Multi-layer Bonded Manifold



Bonded PTFE Manifold



These multi-layer manifolds are made by bonding layers that have channels engraved on the surface. The result is a highly integrated manifold with freely curving channels that could not be fabricated through a conventional drilling process. The bonding process does not use any adhesive in order to utilize the pure characteristics of each material. Materials available are PMMA, mpatibility, in this way.

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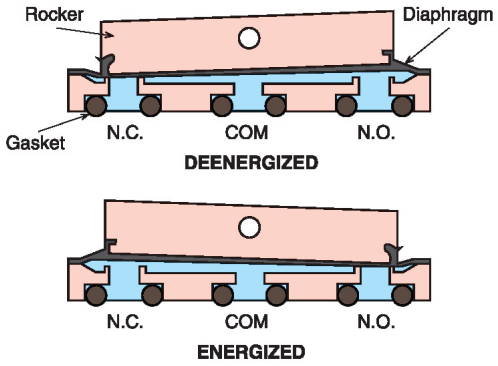
Requirements Flexibly

Rocker Solenoid Valve RVA Series

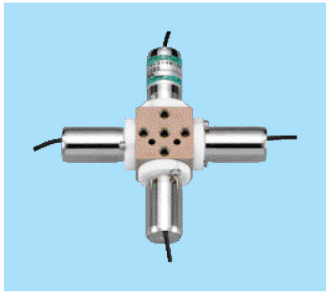
Dimensions (mm)	W 16 × L 27× H 46
Orifice Diameter (mm)	ϕ1.6
Port Connection	Gasket
Pressure	−95 ~ 200 kPa
Voltage	12 VDC, 24 VDC
Power Consumption	3.4 W (Standard) with built-in "hit & hold" circuit (page 13): 0.85 W

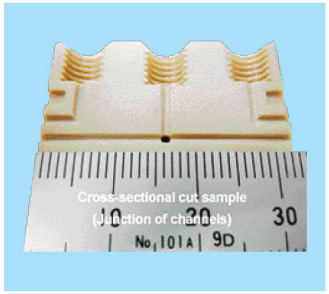
■Cross-sectional Image of Rocker Structure



- Width of 16 mm enables efficient mounting of rocker valves on a manifold.
- The rocker moves like a seesaw inside the valve and alternately seals the left and right valve seats.
- COM., N.C. and N.O. ports are all rated to the same operating pressure. Can be pressurized from any direction.
- High pressure models (600 kPa, orifice diameter 0.8 mm) are available.
- Small pumping volume due to no volumetric change in the valve chamber during an operation. Lower pumping volume models are also available.

Molded Quaternary Valve





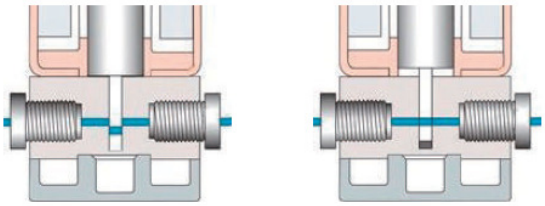
Dimensions (mm)	W 117 × L 117 × H 31
Orifice Diameter (mm)	ϕ1.2
Port Connection	M6, 1/4-28UNF
Pressure	0 ~ 300 kPa
Voltage	12 VDC, 24 VDC
Power Consumption	3.5 W × 4
Wetted Materials	PTFE, PEEK, Perfluoroelastomer

A quaternary valve, in which the four channels from the valves all join at one point and connect to the common port, requires a high processing accuracy at the junction of the channels. Thus the manifold bases of almost all conventional models, including those of other manufacturers, are manufactured by machining, which results in an increased cost. With advanced molding techniques, TAKASAGO has achieved the molding of this junction in PEEK, enabling us to provide our quaternary valves at prices conventional models cannot match.

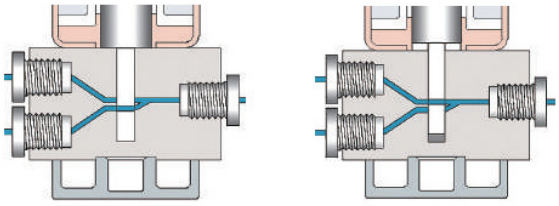
Various Unique Products

Solenoid-driven Slider Valves

●2-way (N.C.)



●3-way



This is a kind of shear valve in which a shutter called a "slider" moves vertically and shuts off the flow path. The pumping volume* and the dead volume are reduced to almost zero, preventing reduction of accuracy in analysis or fluid dispensation. It features an excellent fluid exchangeability compared to a diaphragm solenoid valve due to its almost linear flow path and very small internal volume.

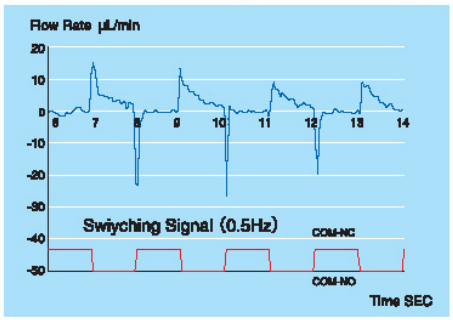
*Please refer to page 5 for more details on the pumping volume.

	MTV	NRV
Dimensions (mm)	W 33 × L 25 × H 62	W 41 × L 38 × H 86
Orifice Diameter (mm)	φ0.4	φ1.0
Port Connection	No. 10-32UNF	M6, 1/4-28UNF
Pressure	0 ~ 500 kPa	0 ~ 300 kPa
Voltage	12 VDC, 24 VDC	
Power Consumption*	18 W (Intermittent : 45 s*)	18 W (Intermittent : 2 min*)
Wetted Materials	PTFE, PEEK, Al_2O_3	PTFE, PEEK, SiC

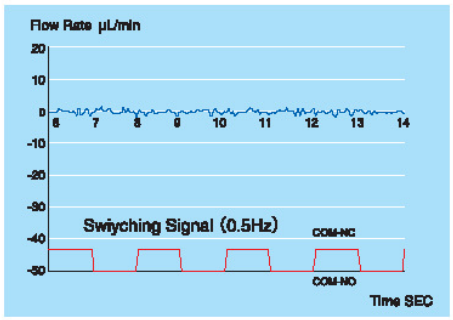
Patented *Continuous operation possible with a "hit and hold" circuit (page 13)

■Pumping Volume Comparison (Diaphragm Valve vs. Slider Valve)

(Flow rate at the N.C. port when turning a 3-way valve on/off)



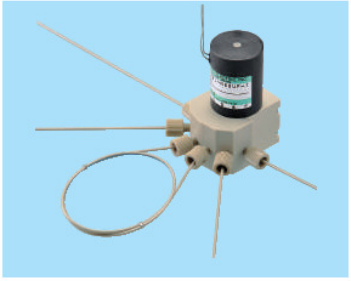
<Diaphragm Valve (KV-3K Series)>

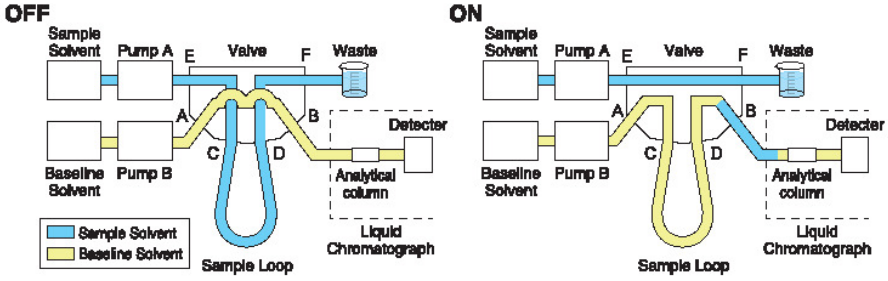


<Slider Valve (MTV-3SL Series)>

These data are provided by Fuji T. Lab, Institute of Industrial Science, the University of Tokyo.

Solenoid-driven Injection Valve





The valve in the photograph is a 2-Position 6-Port valve that employs the technology of a solenoid-driven slider valve. As the solenoid driven actuator requires no driver or external stepper motor, it is more economical and easier to operate than a conventional motor-driven rotary valve. It is suitable for sample metering/injection in a liquid chromatograph. A 2-Position 4-Port type injection valve is also available. Please consult with us for details.

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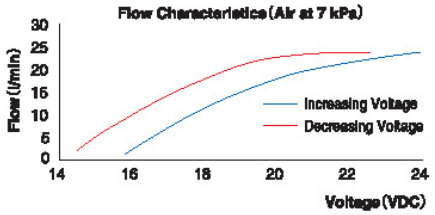
; Including Slider Valves

Proportional Diaphragm Valve



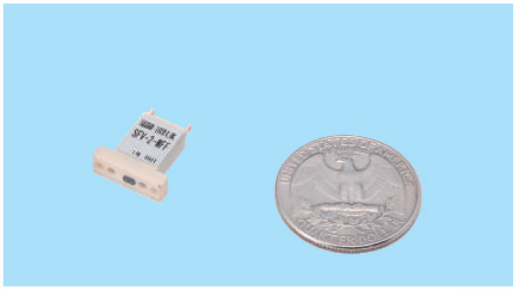
Push-in Fitting Diaphragm Valve

- Just insert plastic tubing into ports and you are connected. No special preparation of the tubing is required, such as enlarging the connection end.
- For disconnection, simply pull out the tubing while pushing in the port ends.
- Applicable to O.D. 2 mm PTFE/PFA tubing.
- High chemical resistance due to PPS, FPM (FKM) and PTFE wetted materials.
- Integral molding eliminates the concern of leakage between the fittings and the body.

Air Operated Valves

		❶ PDT	❷ PMDP
Dimensions	(mm)	ϕ44.5 × H 52 ~ 67	ϕ25 × H 42 ~ 49
Orifice Diameter	(mm)	ϕ3 ~ 5	ϕ2
Fluid Flow Connection		Rc1/8, Rc1/4	M5, 1/4-28UNF, Barb
Operating Pressure		0 ~ 300 kPa	−90 ~ 500 kPa
Port Connection for air pressure		Rc1/8	M5, M6, 1/4-28UNF
Air Pressure for actuation		300 ~ 600 kPa	300 ~ 600 kPa

Low Power Consumption Miniature Valve



Patented

Dimensions (mm)	W 4 × L 16 × H 16.5
Orifice Diameter (mm)	ϕ0.4
Driving Current	250 mA
Operating Frequency	0.5 Hz or less
Power Consumption	0.3 W or less

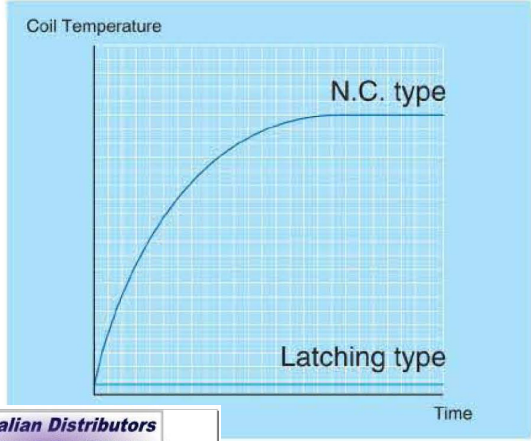
Pinch Valves, Power Sav

Pinch Valves

	1 PE Series	2 PSK Series	3 PMK Series	4 PK Series	5 NP Series	6 EPK Series
Dimensions (mm)	ϕ14 × H 55.1	ϕ20 × H 51	ϕ26 × H 61.5	W 40 × L 36 × H 65 ~ 88.3	W 40 × L 36 × H 65 ~ 88.3	ϕ64 × H 112 ~ 132
Tube Material	Silicone	Silicone, PharMed®	Silicone, PharMed®	Silicone	Silicone	Silicone
Tube Diameter (mm)	ϕ0.8 × ϕ2.4	ϕ1 ×ϕ3 ϕ1.6 × ϕ3.2	ϕ0.8 × ϕ2.4 ϕ1 × ϕ3	ϕ3 × ϕ5 ϕ6 × ϕ8	ϕ3 × ϕ5 ϕ6 × ϕ8	ϕ10 × ϕ13 ϕ15 × ϕ19
Pressure	0 ~ 100 kPa	0 ~ 150 kPa	0 ~ 150 kPa	0 ~ 50 kPa	0 ~ 50 kPa	0 ~ 50 kPa
Voltage	12 VDC, 24 VDC	12 VDC, 24 VDC	12 VDC, 24 VDC, 100 VAC	12 VDC, 24 VDC, 100 VAC	12 VDC, 24 VDC, 100 VAC	12 VDC, 24 VDC, 100 VAC
Power Consumption	2.8 W	3 W	4.4 W	10 W	10 W	60 W (intermittent : 5 min.)

Latching Solenoid Valves

	Orifice Diameter or Tube Diameter (mm)	Valve Type
1 FLV Series	ϕ0.4	Diaphragm valve
2 WLB Series	ϕ2	Diaphragm valve
3 PL Series	ϕ1 ×ϕ3, ϕ3 ×ϕ5	Pinch valve
4 EL Series	ϕ10 ×ϕ13	Pinch valve



In the case of a conventional (e.g. N.C. - Normally Closed) solenoid valve, continuous energization is required to maintain open status. The latching solenoid does not require a power supply for the purpose of maintaining open status through the utilization of a permanent magnet. Suitable for applications where the power consumption and the effect of

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ing Items and Accesories

Example of Custom Pinch Valve

(PL Series, Small Latching Pinch Valve)

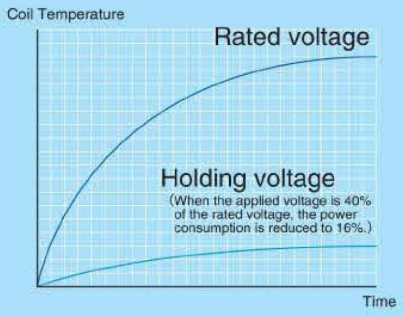
Dimensions (mm)	W 45 x L 29.7 x H 66.5
Tube Material	PharMed®
Tube Diameter (mm)	ϕ3 x ϕ5
Pressure	−55 ~ 80 kPa
Voltage	12 VDC, 24 VDC
Power Consumption	8 W when energized (Latching Solenoid)

ß-Titanium Probes

1. **Non-bending piercing probe**
   Long-lasting due to its shape recovery characteristics with respect to bending (high tensile strength and superior spring characteristics), which contributes to longer life expectancy compared to stainless steel probes.
2. **Non-magnetic**
   Having absolutely no magnetism makes it particularly suitable for analyzers that use magnetic particles, like an immunoassay system.
3. **Finely polished titanium**
   The fine bore polishing (Ra 0.02 at minimum) reduces the carryover of samples (especially proteins), system flushing time and sample loss.

Holding Voltage and "Hit & Hold" Circuit

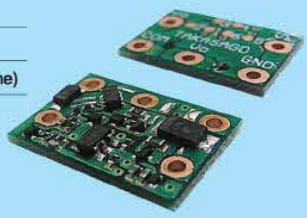
Once switched to ON-position by energizing at the rated voltage, a solenoid valve can hold the ON-position status even after the applied voltage is dropped to a lower voltage. For example, in case that a 2-way normally closed valve with a rated voltage of 24 VDC is switched to ON-position, it can hold the ON-position even after the applied voltage is dropped to around 10 VDC (Holding Voltage). Using this characteristic, various benefits are achieved, such as low power consumption, reduction of coil heat-generation (see graph below), improvement of response time, increase of operating pressure, minimization of size, etc. This requires you to control the applied voltage. As an alternative to controlling the voltage at the equipment side we can offer you a "Hit & Hold" circuit, which can be simply attached to a valve. This circuit automatically drops the applied voltage to a lower value after a very short period of time (Inrush Time).



■Standard specifications of our "Hit & Hold" circuit

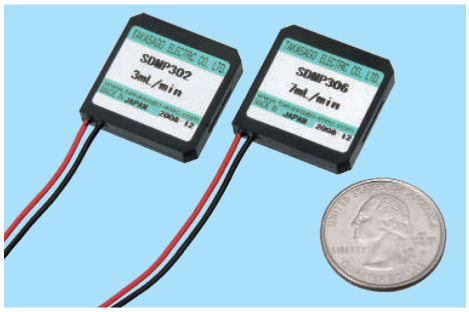
Input	5 VDC ~ 27 VDC
Inrush Time	100 ms, 300 ms
Output	40 % of Input (after Inrush Time)

■Dimensions



A Wide Range of Sma

Piezoelectric Micro Pumps



The SDMP302/306/320 and APP-20KG are piezoelectric diaphragm micro pumps. The main features are as follows;

- Small-sized, lightweight and thin
- No metal parts in contact with fluid. The APP-20KG has particularly high chemical compatibility and can be used for wide range of fluids.
- Quiet and low power consumption
- Flow controllable by adjusting drive voltage and drive frequency
- Self-priming

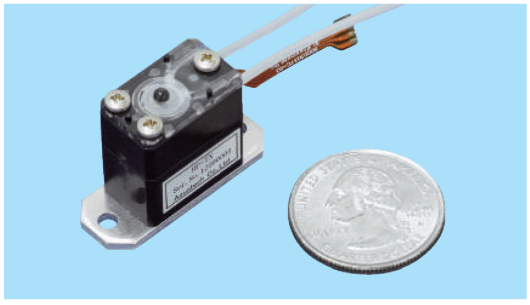
The SDMP302D/306D is the same as the SDMP302/306 but with a built-in driving circuit. When 2.5-6 VDC is applied, the pump starts operating at a fixed voltage and frequency.

Replaceable-cartridge types available upon request.

	SDMP302	SDMP306	SDMP320	APP-20KG
Pump Type	Piezoelectric diaphragm pump			
Typical Flow Rate	3 ml/min	7 ml/min	20 ml/min	15 ml/min
Typical Pump Pressure	40 kPa	45 kPa	35 kPa	25 kPa
Voltage	60 ~ 250 Vp-p			
Drive Frequency	10 ~ 60 Hz			
Typical Suction Load Pressure	-1.0 kPa			
Operating Temparature	5 ~ 50 °C			
Wetted Materials	COC (Cyclic Olefin Copolymer) EPDM (Ethylene Propylene Diene Monomer)			PTFE, PEEK, and Perfluoroelastomer
Dimensions (mm)	25 × 25 × 4.8		33 × 33 × 5.5	33 × 33 × 9
Weight	Approx. 4 g		Approx. 9 g	Approx. 17 g
Input / Output Pipes (mm)	I.D. 0.6 × O.D. 1.2 × L 2.5	I.D. 1.2 × O.D. 2.2 × L 3.5	I.D. 1.8 × O.D. 2.8 × L 0.5	

*The specifications above are based on sine wave drive. Flow rate and pump pressure are larger if driven by Takasago Standard wave.

Micro Peristaltic Pump RP-TX Series



- The world's lowest level of flow for a peristaltic pump on the market: 0.1 ~ 40 µl/min
- A replaceable pump head, which includes tubing.
- Compact size: Dimensions of 33 × 12 × 21.5 mm
- An easy-to-use controller is available upon request. (Sold separately)

Flow Rate	0.1~40 µl/min ±15 % (Water at 25 °C, Pulse speed:3~1000 pps)
Tubing Material	Silicone or Olefine (I.D. 0.5 mm)
Pump Pressure	30 kPa or more
Motor	Stepper motor
Voltage	3 VDC

Miniature Peristaltic Pump RP-Q1 Series

Model Number	RP-Q1-S-P45A-DC3V	RP-Q1.2N-P20A-DC3V
Flow Rate	0.45 ml/min ±15 % (water at 20 °C)	0.20 ml/min ±15 % (water at 20 °C)
Tubing Material	Silicone (I.D. 1.5 mm)	Norprene (I.D. 1.2 mm)
Discharge Pressure	50 kPa	
Motor	DC Geared Motor	
Voltage	DC 3 V	
Power Consumption	0.12 W	
Dimensions (mm)	W12 × L30 × H14	

*This is a product of Aquatech Co., Ltd.

TAKASAGO
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ll-sized Liquid Pumps

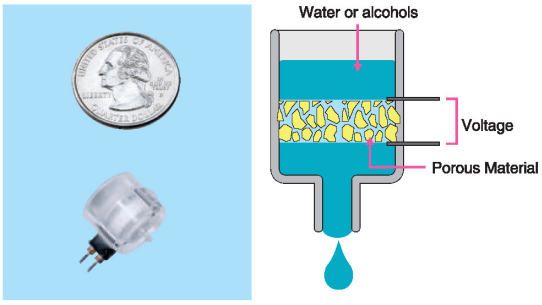
Pen Type Syringe Pump

This is a remarkably small syringe pump with an outer diameter of 12 mm and a built-in stepper motor. The theoretical resolution is as small as 0.105 nl at 1/100 micro-step. Different needle lengths and thicknesses are available along with various port connections (ex. screws) . The SAP series with the ultra-small outer diameter of 8.8 mm is also available by custom order. Please contact us for details.

Specifications (Needle Type)

Model Number	**SBP-100G-N**
Syringe Capacity	**100μl**
Dimensions (mm)	**φ12 × L 170 (Excluding needle and sensor case)**
Theoretical Resolution	**0.105 nl at 1/100 micro-step 10.5 nl at full step**
Wetted Materials	**Glass(barrel), PTFE(tip, seal), Stainless Steel(needle)**
Needle Size	**22G (I.D. 0.40 × O.D. 0.72) × L 51 mm**

Electro-Osmotic Micro Pump [Under Development]

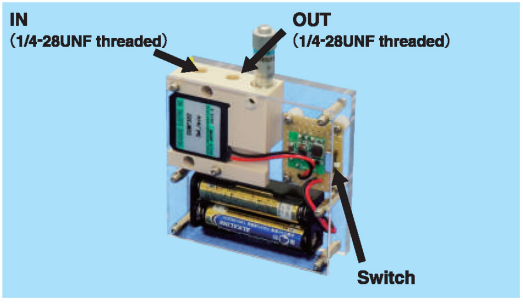


This pump utilizes an electro-osmotic flow induced by applying an external electric field on a charged solid-liquid interface of narrow channels inside a porous material.

Features

- Zero-pulsation flow and no operating noise due to no mechanical parts.
- Small size (a few millimeters) and lightweight (a few grams).
- Adjustable flow. Linearly proportional to applied voltage.

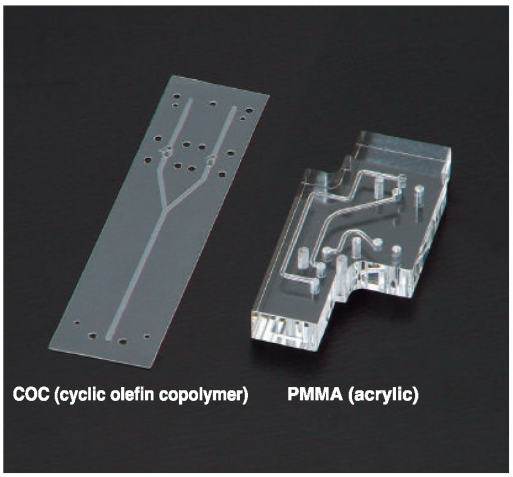
Manually Adjustable Low Pulsation Micro Pump Unit



- Suitable for lab-on-a-chip devices, cell culture media circulation, etc.
- Flow from a piezoelectric micro pump is adjusted by a micro needle valve.
- Can adjust flow from sub-microliter level to around 1.5 ml/min.
- Flow pulsation at low flow rates is drastically reduced by the micro needle valve.
- Stand-alone functionality powered by AAA or R03 batteries.
- Compact size: Dimensions of 70 x 25 x 94 mm

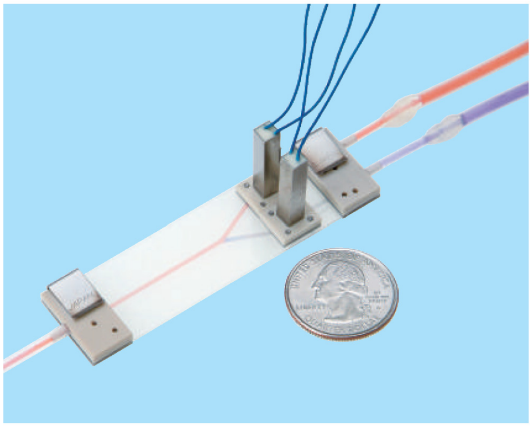
Microfluid

Microfluidic Chips



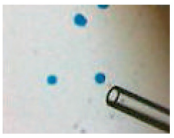
These are chips made by bonding plastic or elastomer layers. The layers can be made by machining for prototypes or injection molding for production. Available in the following materials : PMMA (acrylic) , COC (cyclic olefin copolymer) , PDMS (silicone) , PI (polyimide) , PEN (polyethylene naphthalate) , PC (polycarbonate) , ceramic, etc. In addition to bonding plastic + plastic or elastomer + elastomer, special bonding of plastic + elastomer is also possible.

Example of Module with Film Chip

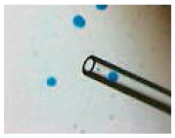


This is a demo module exhibiting the introduction and mixing of two liquids in the internal channels of a film chip of just 225 µm thickness. The flow of each liquid can be controlled by opening and closing the mounted ultra-small solenoid valves. A "clip-on" connection is adopted for easy interface between the film chip and tube connection barbs.

PicoPipet



1. Target



2. Suck & hold

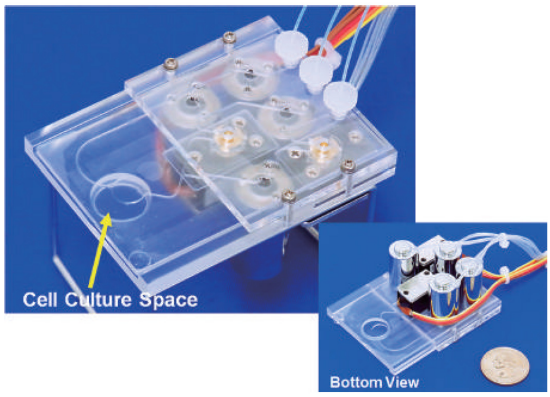
3. Discharge at intended position

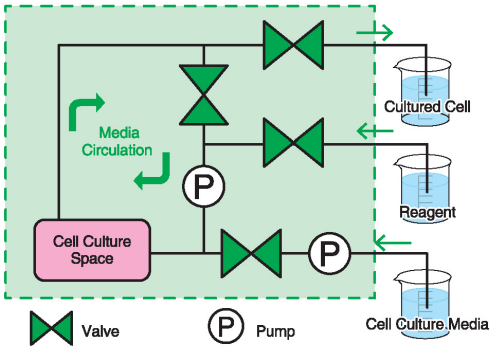
- Simplify single cell isolation & transfer
- Requires an extremely small volume of cell culture media during a cell/bacteria transfer, which contributes to mitigating contamination.
- Flow range is 1 nl/min – 12 µl/min.
- Simple operation. Just turn the dial, or push the buttons for preset volumes of suction or discharge.
- Optional accessories further simplify precise handling of a single cell

TAKASAGO
ELECTRIC, INC.

ic Devices

All-in-one Disposable PDMS Chip【Under Development】





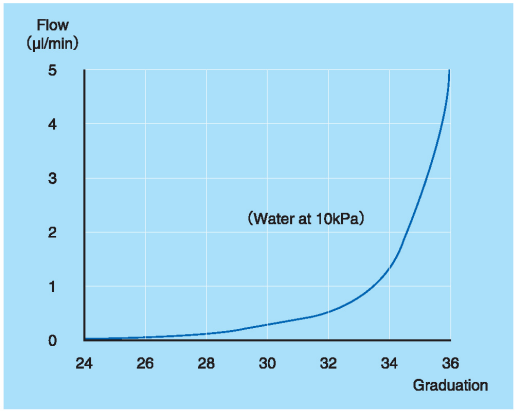
This all-in-one system on a disposable PDMS chip is a microfluidic module designed for cell culture. It has peristaltic pumps, miniature valves, and a built-in cell culture space which can be observed under a microscope. The replaceable chip is sterilizable before use. A remote controller using an Android application is available for this module upon request.

This is just an example of our integrated fluid control systems. Other microfluidic systems can be designed and manufactured in accordance with your requirements.

This system is jointly developed with Aquatech Co., Ltd. and Fukoku Bussan Co., Ltd.

Micro Needle Valve

< Example Flow Data* >

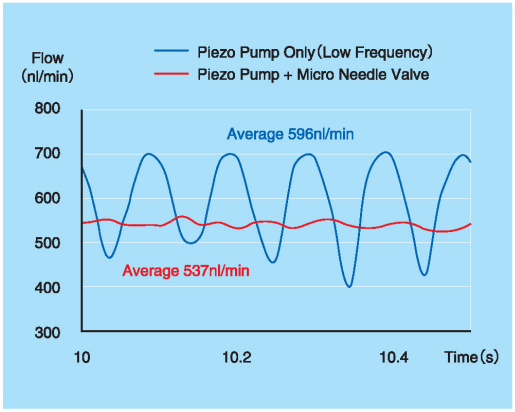


*Flow-graduation relationship varies according to valve.

- Allows the adjustment of flows below 1 µl/min.
- Reduces flow pulsation.
- Only Perfluoroelastomer and PEEK as the wetted materials. (The pipe insert type includes stainless steel.)

< Example of Reduced Pulsation >

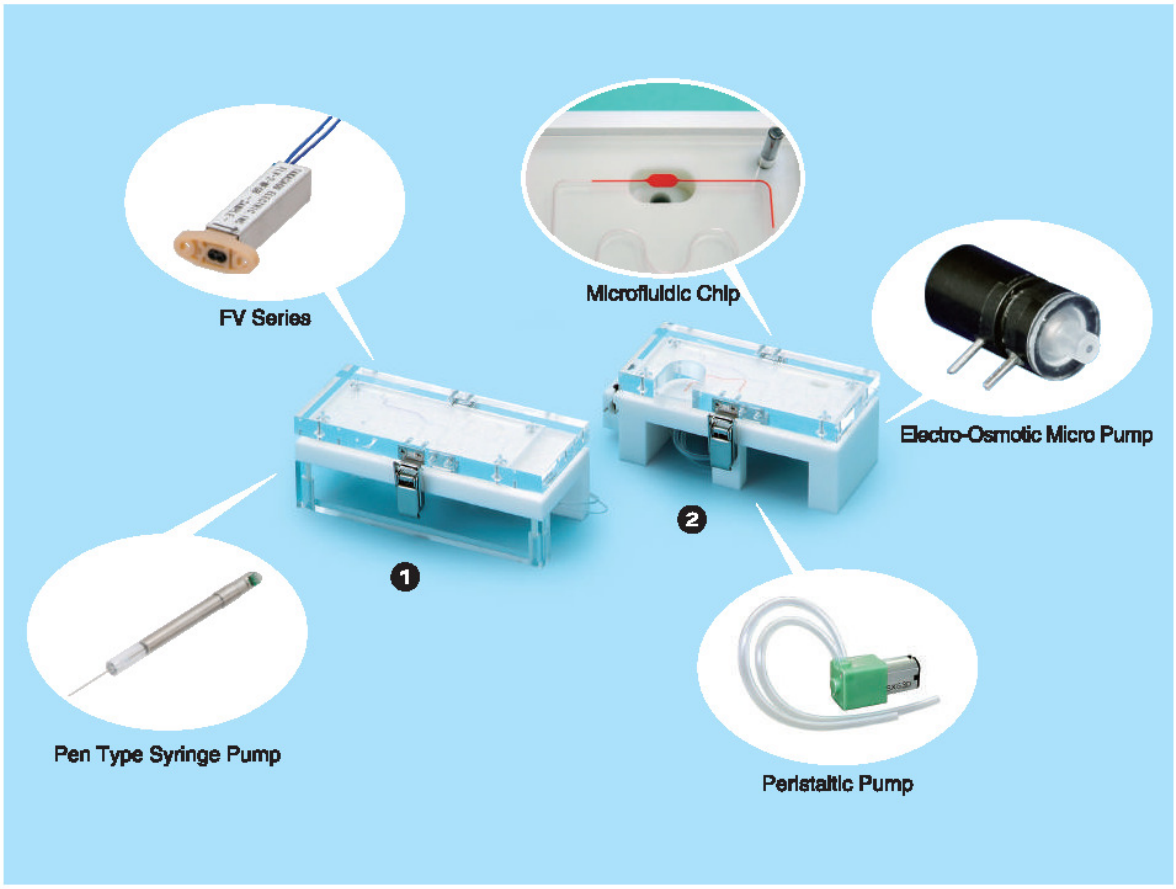
By incorporating a micro needle valve on the discharging side of a piezoelectric micro pump, the significant pulsations created by the low flow operation of a piezoelectric pump are eliminated and a low flow rate with almost no pulsation can be achieved. The graph below is an example of this remarkable reduction in pulsation. Pulsation can also be reduced when combined with other kinds of pumps, such as peristaltic pumps.



Microfluidic Device Specialist

Microfluidic control devices are our key products. The trend of minimization and modularization is prevailing in markets worldwide. Our products are supplied not only as standalone equipment and components, but also in the form of integrated modules combining such products with other devices. We serve our customers with elegant and sophisticated solutions for various applications; presenting modules of integrated devices designed to solve the particular microfluidic control challenge posed. The below is an example of one such microfluidic control module.

Example of Microfluidic Control Module



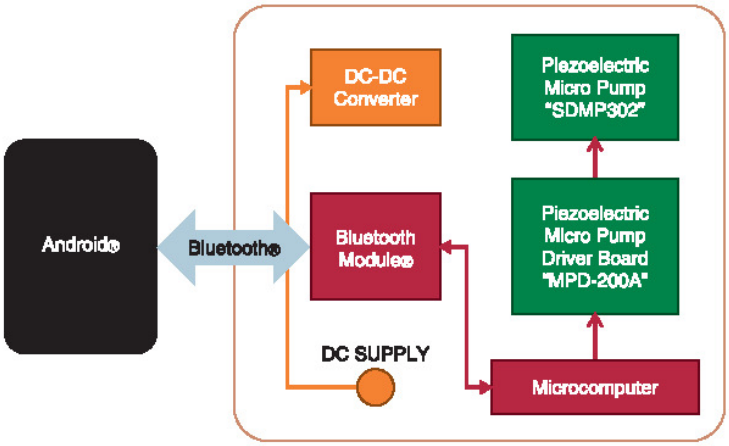
1. This is a demo module in which a plastic chip is prefilled with a reagent. It is constructed from a pen type syringe pump and an ultra-small inert 3-way valve.

2. This module demonstrates the basic processes including sample introduction, mixing with a reagent, and detection, by using a chip with Y-shaped internal channels. A sample is introduced into the chip by an ultra-small peristaltic pump and, after being metered in accordance with the length of the channel, transported and mixed with the pre-filled reagent by a pair of electro-osmotic pumps. The flow is switched by ultra-small valves. The chip is designed to be disposable and can be easily fixed on the module by the holding plate.

TAKASAGO ELECTRIC, INC.

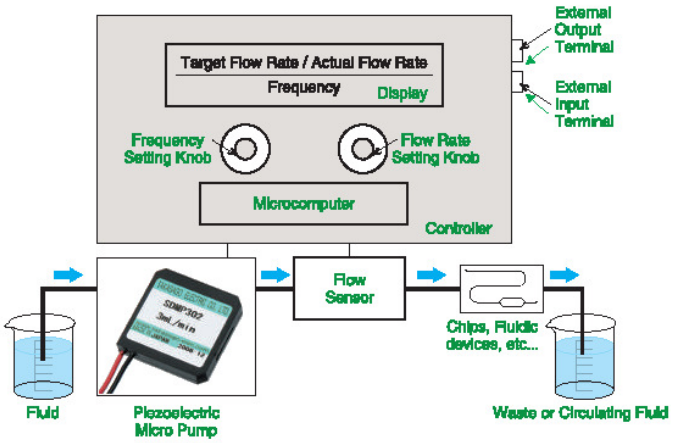
lution Provider

Remote Control System <Android® Application>



This Android® application is for the remote control of Takasago piezoelectric micro pumps. Your Android® device wirelessly connects to a microcomputer, and allows you to easily switch on/off and adjust the drive voltage and drive frequency. A ready-to-use sample package that includes a Bluetooth® module, a microcomputer and a driver board is available upon request. Consult with us for developing other systems to control pumps, valves, etc.

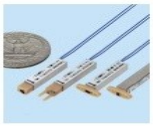
Flow Control System for Piezoelectric Micro Pump【Under development】

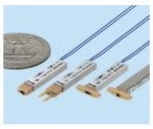


- Automatically adjusts the flow to the target rate set manually by the flow setting knob. Flow remains stable even when the liquid levels of the vessel change.
- Programmed flow control using an external input is also possible.
- The flow data can be exported through the external output terminal.
- Applicable to Takasago piezoelectric micro pump models SDMP302, SDMP308 and APP-20KG.
- The flow sensor can be selected from Sensirion LG16-0150 or LG16-1000. These support a range of flow rates from a few hundred nl/min to 7 µl/min and from a few µl/min to 1 ml/min, respectively.
- The wetted materials of the flow sensors are PEEK and glass, and those of the pumps are plastics and elastomers. The highly inert model allows the handling of a wide range of fluids.

TSJ Fluidics Components 2016

Solenoid Valves


FV Series 283KB


FLV Series 294KB


NLV Series 208KB


KV Series 262KB


LV Series 113KB


EXV Series 43KB


PKV Series 264KB


Solenoid Proportional Valve NPV Series 230KB


High-Temperature High-Pressure Valve 171KB

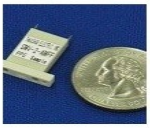

CTV-2-4MICK 238KB

Pinch Valves


PM Series 747KB

Others

Shape Memory Alloy Valve


SMV Series 187KB

Solenoid Pumps

Small Syringe Pumps

Pen-Type Syringe Pumps

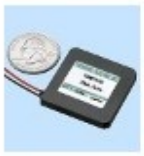

SBP Series 209KB


SAP Series 207KB

Transfer Pumps

Piezoelectric Micro Pumps


SDMP302/306 Series 287KB


SDMP320 330W 342KB


Cartridge Type Piezo Pump 321KB

Highly Inert Piezoelectric Micro Pumps


APP Series 252KB

Peristaltic Pumps


RP-Q1 Series 200KB

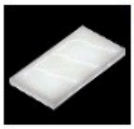

RP-TX Series 307KB

Pump Unit


Manually Adjustable Low Pulsation Micro Pump Unit 279KB

Miscellaneous

Bonded PTFE Manifold


Bonded PTFE Manifold 159KB

Others

Module


All-in-one Disposable PDMS Chip Valve 335KB

2-Position 6-Port Valve


2-Position 6-Port Valve 300KB

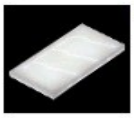
Solenoid-driven Slider Valve


Solenoid-driven Slider Valve 384KB

Solenoid-driven Sample Injector


Solenoid-driven Sample Injector 233KB

Bonded PTFE Manifold


Bonded PTFE Manifold 159KB

Others

Module


All-in-one Disposable PDMS Chip Valve 335KB

2-Position 6-Port Valve


2-Position 6-Port Valve 300KB

Solenoid-driven Slider Valve


Solenoid-driven Slider Valve 384KB

Solenoid-driven Sample Injector


Solenoid-driven Sample Injector 233KB

Solenoid PINCH Valves

PE Series

The smallest pinch valve in our product range with an actuator of 14 mm in diameter.See more details.

Tubing I.D.	0.8 mm
Tubing O.D.	2.4 mm
Tubing material	silicone
Pressure	0 ~ 100 kPa
Power consumption	2.8 W
Outer dimensions	21 × 26 × 55.1 mm

PS Series

This is a standard miniature pinch valve for small diameter tubing. There are three types - NC (Normally Closed), NO (Normally Open) and Dual which has both an N.O. and N.C. side that are simultaneously operated.See more details.

Tubing I.D.	0.8 ~ 1.6 mm
Tubing O.D.	2.4 ~ 3.2 mm
Tubing material	silicone, PharMed®
Pressure	0 ~ 150 kPa
Power consumption	3 W
Outer dimensions	26 × 39.2 × 49.5 mm

PSK Series

This is the PS pinch valve with the tube holding feature.See more details.

Tubing I.D.	0.8 ~ 1.6 mm
Tubing O.D.	2.4 ~ 3.2 mm
Tubing material	silicone, PharMed®
Pressure	0 ~ 150 kPa
Power consumption	3 W
Outer dimensions	26 × 39.2 × 49.5 mm

PM Series

This valve supports a wide range of tubing materials such as silicone, PharMed® and Tygon®.This pinch valve can be freely used as an NC/NO type with a single tube or as a Dual type with two tubes. It can also be configured as a 3-way valve by using a Y-shaped fitting.See more details.

Tubing I.D.	0.8 ~ 1.6 mm
Tubing O.D.	2.4 ~ 3.2 mm
Tubing material	silicone, PharMed® ,Tygon®
Pressure	0 ~ 150 kPa
Power consumption	4.4 W
Outer dimensions	26 × 40 × 60 mm

PMK Series

This is the PM pinch valve with the tube holding feature.See more details.

Tubing I.D.	0.8 ~ 1.6 mm
Tubing O.D.	2.4 ~ 3.2 mm
Tubing material	silicone, PharMed® ,Tygon®
Pressure	0 ~ 150 kPa
Power consumption	4.4 W

PL Series

This is a pinch valve adopting a latching solenoid, which maintain the valve open or closed state through the utilization of a permanent magnet.See more details.

Tubing I.D.	0.8 ~ 2.0 mm
Tubing O.D.	2.4 ~ 4.0 mm
Tubing material	silicone
Pressure	0 ~ 150 kPa
Power consumption	8 W (when energized)
Outer dimensions	30.4 × 30.4 × 61.7 mm

PK Series

This is a standard pinch valve for medium diameter tubing (Inner diameter of around 3-6mm).See more details.

Tubing I.D.	1.6 ~ 6.4 mm
Tubing O.D.	4.8 ~ 9.6 mm
Tubing material	silicone
Pressure	0 ~ 50 kPa
Power consumption	10 W
Outer dimensions	36 × 40 × 65 ~ 88.3 mm

NP Series

This is an improved model of the PK series. There is a slit in the tube holder by which to insert tubing from the side of the pinch valve.See more details.

Tubing I.D.	2.0 ~ 6.4 mm
Tubing O.D.	4.0 ~ 9.6 mm
Tubing material	silicone
Pressure	0 ~ 50 kPa
Power consumption	10 W
Outer dimensions	36 × 40 × 64.5 ~ 87.5 mm

EPK Series

This is a standard pinch valve for large diameter tubing.See more details.

Tubing I.D.	10.0 ~ 15.0 mm
Tubing O.D.	13.0 ~ 19.0 mm
Tubing material	silicone
Pressure	0 ~ 50 kPa
Power consumption	60 W
Outer dimensions	φ64 × 112 ~ 132 mm

EL Series

This is an equivalent model to the EPK series (for large diameter tubing) but with latching solenoid. See more details.

Tubing I.D.	10.0 ~ 15.0 mm
Tubing O.D.	13.0 ~ 19.0 mm
Tubing material	silicone
Pressure	0 ~ 50 kPa
Power consumption	15 W (when energized)
Outer dimensions	φ64 × 128.7 ~ 140.7 mm

* Tygon® and Pharmed® are registered trademarks of Saint-Gobain Performance Plastics.

Solenoid ISOLATION Valves - Diaphram

Orifice smaller than 1mm

FV Series

This is an innovative and groundbreaking ultra-small solenoid diaphragm valve, with size of just 4.2 mm square. The internal volume is now only 1.1 µl - contributes to reductions in reagent and improvements in accuracy.

Orifice diameter	0.4 mm
IN port pressure	0 ~ 100 kPa
Power consumption	1 ~ 1.2 W
Outer dimensions	4.2 x 4.2 x 23.1 mm

FLV Series

This valve is a latching solenoid valve in which the open and closed status of the valve is maintained by magnetic force. Contributes low power consumption, because electricity is consumed only when energized. With the size of 4.2 mm square, it is an ultra-small solenoid valve of an internal volume just 1.1 µl. It is suitable for microfluidic control.

Orifice diameter	0.4 mm
IN port pressure	0 ~ 100 kPa
Power consumption	2.4 ~ 3 W(when energized)
Outer dimensions	4.2 x 4.2 x 23.1 mm

KV Series

This is a diaphragm valve of just 6 mm width. substantial shortening of the flow-path between ports and reduction in mounting space are made possible by the manifold-mountable type. The internal volume is just 10 µl on both the IN and OUT port.

Orifice diameter	0.8 mm
IN port pressure	0 ~ 100 kPa
Power consumption	1.8 W
Outer dimensions	6.0 x 50.0 x 12.5 mm

LV Series

This manifold mountable diaphragm valve is just 8.9 x 10.4 mm, giving a footprint of less than 1cm2. It simultaneously realizes a very small internal volume of 3.3 µl at the IN port and 8.3 µl at the OUT port, and a shortening of the flow-path between ports.

Orifice diameter	0.8 mm
IN port pressure	0 ~ 100 kPa
Power consumption	1.2 W
Outer dimensions	8.9 x 10.4 x 28 mm

EXAK Series

This is a zero-pumping volume type of diaphragm isolation valves. Fluoropolymer is used for all of the wetted parts giving it great chemical compatibility. The size of this valve is quite small.

Orifice diameter	0.8 mm
IN port pressure	-40 ~ 100 kPa
Power consumption	0.94 W
Outer dimensions	12 x 26.0 x 35.45 mm

EXAKN Series

This is a zero-pumping volume type of diaphragm valves. Perfluoroelastomer is used for the seal part and the valve has increased sealing ability. The outer dimensions are a very compact.

Orifice diameter	0.8 mm
IN port pressure	-40 ~ 300 kPa
Power consumption	1.2 W
Outer dimensions	φ14.0 x 42.3 mm

EXV Series

This is a diaphragm isolation manifold mountable valve with a molded body. It is small with dimensions of W14 mm x H32 mm. You can choose the body material from the highly chemically resistant PEEK or PPS.

Orifice diameter	1.0 mm
IN port pressure	-20 ~ 200 kPa
Power consumption	2.8 W
Outer dimensions	14.0 x 25.0 x 31.7 mm

Orifice of 1-2mm

STV Series

This is a diaphragm isolation valve of outer dimensions φ20.0 x 42.5 mm. Highly chemically compatible materials PTFE, PEEK, PPS, etc. are available for the valve body material. This valve is a popular model among small inert solenoid valves and is playing an active role in a wide range of applications.

Orifice diameter	1.0 ~ 1.2 mm
IN port pressure	-50 ~ 200 kPa
Power consumption	1.7 ~ 2.9 W
Outer dimensions	φ20.0 x 42.5 mm

XTA Series

This is a diaphragm valve with a built-in microcomputer control circuit as standard. By making use of the circuit, we have added various features to this series, such as a silent type, high pressure type, and low power consumption type. Various body materials and port connections are available. While the open frame solenoid gives the XTA series a good cost performance, it is also covered by a stainless steel case of refined design.

Orifice diameter	1.2 ~ 2.0 mm
IN port pressure	-50 ~ 600 kPa
Power consumption	0.8 ~ 3.1 W
Outer dimensions	24.0 x 20.6 x 53.9 mm

MTV Series

This solenoid valve represents TAKASAGO brand. The PTFE machined diaphragm has a high chemical compatibility. There are a wide variety of valve bodies such as molded or machined bodies, thread port or hose barb connections, etc.

Orifice diameter	1.0 ~ 2.0 mm
IN port pressure	-100 ~ 600 kPa
Power consumption	1.9 ~ 4.4 W
Outer dimensions	φ26.0 x 57 mm

JTV Series

This is a miniature 2-way elastomer diaphragm valve. The hose barb connection enables you to connect silicone tubing directly to the valve.

Orifice diameter	1.2 mm
IN port pressure	0 ~ 80 kPa
Power consumption	1.0 W
Outer dimensions	φ14.5 x 34.1 mm

WTA · WTB Series

For the purpose of cost reduction, this valve adopts a open framed solenoid, which is covered by a plastic case.

Orifice diameter	1.6 ~ 2.0 mm
IN port pressure	-90 ~ 200 kPa
Power consumption	2.8 ~ 3.4 W
Outer dimensions	W27.5 ~ 28.2 x L24 ~ 24.5 x H47 ~ 61.7 mm

WLB Series

This is a latching solenoid valve. Electricity is consumed when energization is only required just an instant opening or closing, so heat generation is very limited.

Orifice diameter	2.0 mm
IN port pressure	-50 ~ 200 kPa
Power consumption	8.0 W (when energized)
Outer dimensions	25.0 x 26.0 x 55.9 mm

Solenoid ISOLATION Valves - Diaphram

Orifice greater than 2mm

MCV Series

This is an elastomer diaphragm valve with a diameter of φ26.0 mm. There are a wide variety of body materials or port connections etc.

Orifice diameter	2.0 mm
IN port pressure	-27 ~ 100 kPa
Power consumption	2.6 W
Outer dimensions	φ26.0 x 48.7 mm

MLV Series

The outer dimensions of this solenoid diaphragm valve are φ30.0 x 57.2 mm. The PTFE machined diaphragm has a high chemical compatibility. The port connection can be selected from M8, 5/16-24UNF, Rc1/8 and 1/8-27NPT.

Orifice diameter	2.5 mm
IN port pressure	-40 ~ 200 kPa
Power consumption	3.1 ~ 4.4 W
Outer dimensions	φ30.0 x 57.2 mm

ACV Series

This is a 2-way solenoid valve with a moulded actuator, a molded body and an elastomer diaphragm. The port connections are the hose barbs to which silicone tubing can be connected directly.

Orifice diameter	3.0 mm
IN port pressure	-55 ~ 100 kPa
Power consumption	5.0 W
Outer dimensions	34.0 x 47.0 x 62.0 mm

YTV Series

The outer dimensions of this diaphragm valve are 40 x 40 x 90 mm. A PTFE machined diaphragm is used in this solenoid valve. 2-way and 3-way versions are available for this series.

Orifice diameter	3.0 mm
IN port pressure	-100 ~ 150 kPa
Power consumption	5.0 W
Outer dimensions	40.0 x 50.0 x 77.0 mm

WBV Series

Suitable for dialysis machines & waste lines. Can be mounted directly on a balance chamber. An improved internal structure enables the following features in this valve.

1. Compact size with a larger flow
2. Bi-directional - up to 300 kPa for both IN and OUT ports

Orifice diameter	4.0 mm
IN port pressure	-90 ~ 300 kPa
Power consumption	5.8 W
Outer dimensions	48 ~ 57 x 33 x 84.8 mm

NPV Series

This is a solenoid-driven proportional diaphragm valve for chemical fluids whose flow is controllable by changing the input voltage. It has a comparatively large orifice diameter of 4 mm. It has excellent chemical compatibility because PTFE (teflon) is used for all the wetted parts.

Orifice diameter	4.0 mm
IN port pressure	0 ~ 100 kPa
Power consumption	7 W (at 24 VDC)
Outer dimensions	φ40 × **L** 95 mm

NRV Series

The orifice diameter of this diaphragm valve is φ4-6 mm. Valve bodies machined from a variety of materials are available. Select the port connection from Rc1/4, 1/4-15NPT, Rc1/8, 1/8-27NPT.

Orifice diameter	4.0 ~ 6.0 mm
IN port pressure	-90 ~ 200 kPa
Power consumption	5.5 ~ 10.0 W
Outer dimensions	φ44.0 ~ 45.0 x 80.0 ~ 84.0 mm

PKV Series

This is a diaphragm valve with a wide range of orifice diameters from φ3.5 - 6 mm and outer dimensions of 66.0 x 45.0 x 75.0 mm. The standard materials are PEEK for the body and PTFE for the diaphragm.

Orifice diameter	4.0 ~ 6.0 mm
IN port pressure	-90 ~ 200 kPa
Power consumption	6.0 ~ 21.0 W
Outer dimensions	40.0 x 42.0 x 71.0 mm

HTV Series

This 2way diaphragm isolation valve has a large orifice diameter of φ10.0 mm. The PTFE machined diaphragm used for this model has a high chemical compatibility.

Orifice diameter	10.0 mm
IN port pressure	-90 ~ 100 kPa
Power consumption	10 W
Outer dimensions	60.0 x 75.0 x 124.0 mm

Solenoid ISOLATION Valves - nonDiaphram

UDV Series

This is a main model among our non-diaphragm valves. It is a 2 mm orifice-size class valve and both types of a moulded plastic body and a stainless steel body are available.See more details.

Orifice diameter	2.0 mm
IN port pressure	0 ~ 600 kPa
Power consumption	2.4 ~ 3.1 W
Outer dimensions	25 x 22 x 52.2 mm

Metering PUMPS - Diaphram

MCP Series

This is a diaphragm pump with a maximum pumped volume of 50 µl. The adjustable range of pumped volume per shot is 5 - 50µl. See more details.

Adjustable range of pumped volume	5 ~ 50µl
Max. operating frequency	4 Hz
Outer dimensions	30.0 x 26 x 63.5 mm

MLP Series

This is a diaphragm pump with a maximum pumped volume of 200 µl. The adjustable range of pumped volume per shot is 10 - 200µl.See more details.

Adjustable range of pumped volume	10 ~ 200 µl
Max. operating frequency	2 Hz
Outer dimensions	36.0 x 50.0 x 70.0 mm

PKP Series

This is a diaphragm pump with a maximum pumped volume of 500 µl. The adjustable range of pumped volume per shot is 50 - 500µl. See more details.

Adjustable range of pumped volume	50 ~ 500 µl
Max. operating frequency	2 Hz
Outer dimensions	36.0 x 43.0 x 78.0 mm

MiniPERISTALTIC PUMPS

RP-TX Series

RP-TX Series has the lowest level of flow for a peristaltic pump on the market. Its pump head, including tubing, is replaceable. An easy-to-use controller is available upon request (sold separately).See more details.

Flow rate	0.1 ~ 40 µl/min
Motor	Stepper motor
Tubing material	Silicone
Outer dimensions	30.0 x 12.0 x 21.5 mm

RP-Q1 Series

This is a peristaltic pump so compact that it can sit on the tip of a finger.It is small and reasonably priced, making it an easy-to-use pump.See more details.

Flow rate	0.2 or 0.45 ml/min
Motor	DC geared motor
Tubing material	Norprene,Silicone
Outer dimensions	30.0 x 12.0 x 14.0 mm

Piezoelectric Micro PUMPS

Standard type

This is a miniature, slim and lightweight diaphragm micro pump driven by piezoelectric element. The driving voltage and frequency for operating the piezoelectric micro pump can be arbitrarily set by an external control signal, which enables a flow rate control. It is very suitable for integration into small equipment. See more details.

Standard flow rate	3 or 7 ml/min
Max. pump pressure	45 kPa
Outer dimensions	25 x 25 x 4.8 mm

Large flow type

This is a diaphragm micro pump driven by piezoelectric element, which is a larger size than the standard type so as to pump a larger flow rate. See more details.

Standard flow rate	20 ml/min
Max. pump pressure	35 kPa
Outer dimensions	33 x 33 x 5.5 mm

Built-in driver type

This is a piezoelectric micro pump with a built-in driver board. The driver board enables the delivery of a constant flow rate by operating the pump at a constant voltage and constant frequency signal generated by a direct current voltage supply without making the particular waveform for the piezoelectric element. Flow rate and pressure range are not able to be adjusted. See more details.

Standard flow rate	3 or 7 ml/min
Max. pump pressure	40 kPa
Outer dimensions	25 x 25 x 8.2 mm

Highly inert type

This type uses highly chemically inert materials such as PEEK and Perfluoroelastomer etc. for the wetted parts in order to improve its chemical inertness above that of the standard type. It is most suitable for the delivery of chemical reagents and solvents etc. See more details.

Standard flow rate	15 ml/min
Max. pump pressure	25 kPa
Outer dimensions	33 x 33 x 9 mm

Driver and Controller for Piezoelectric Micro PUMPS

Driver Board MPD-200A

The MPD-200A is a thin, compact and lightweight driver board. It is a high voltage circuit board, specifically designed for the piezoelectric micro pumps. From a regular 5 VDC input, it readily generates approximately the 250 Vp-p, 40 Hz necessary for driving the pump.

Item	Specifications
Input voltage	5 VDC ±5%
Output frequency	1 ~ 60 Hz
Output voltage	50 ~ 340 Vp-p
The maximum number of pumps	2 pieces
External dimensions	30 x 30 x 18 mm
Weight	Approximately 9 g

Controller MPC-200A

The MPC-200A is a compact and lightweight controller that can provide the high voltage power output necessary to drive the piezoelectric micro pumps. It is user-friendly with a front panel digital display for configuring the output voltage and output frequency, and a memory function to store the most recently used settings.

Item	Specifications
Input voltage	5 VDC ±5%
Output frequency	1 ~ 60 Hz
Output voltage	60 ~ 300 Vp-p
The maximum number of pumps	2 pieces
External dimensions	75 x 30 x 89 mm
Weight	Approximately 140 g
Attachment	AC adapter (100 ~ 240 VAC)

Accessory for Piezoelectric Micro Pumps

Tygon® tubing (Accessory, sold separetely)

Material： Tygon® 2001 (for use with methanol, water and most general uses)
Size: I.D. 0.79 mm (for SDMP302 and SDMP302D), I.D. 1.59 mm (for SDMP306 and SDMP306D)

Material： Tygon® 2375 (for use with methanol, water and most general uses)
I.D. 2.38 mm (for SDMP320 and APP-20KG)

*Note: TYGON® is a trademark of Saint-Gobain Performance Plastics.
*Note : If the flow is decreased with the above tubing, please use the larger size tubing.

Fittings for PTFE Tubing

SM Series
This is a flare type fitting for a flat bottom thread. Simply insert the flange-shaped moulded seal part ("Seal Joint") into the end of the tubing for use. See more details.

Tubing I.D.	1.0 ~ 4.0 mm
Tubing O.D.	2.0 ~ 5.0 mm
Thread size	M6, 1/4-28UNF, M8 P=1, 5/16-24UNF, M5

FM Series
It is necessary for the user to enlarge the end of the PTFE tubing into a trumpet shape before using this fitting. See more details.

Tubing I.D.	1.0 ~ 4.0 mm
Tubing O.D.	2.0 ~ 5.0 mm
Thread size	M6, 1/4-28UNF, M8 P=1, 5/16-24UNF, M5

SMC Series
This is a straight fitting for a taper pipe thread. It is made from machined fluoropolymers, so it has high chemical compatibility. See more details.

Tubing I.D.	1.0 ~ 10.0 mm
Tubing O.D.	2.0 ~ 12.0 mm
Thread size	R1/8, R1/4, R3/8

>

SML Series
This is an elbow fitting for a taper pipe thread. It is useful for limited plumbing space. See more details.

Tubing I.D.	1.0 ~ 10.0 mm
Tubing O.D.	2.0 ~ 12.0 mm
Thread size	R1/8, R1/4, R3/8

>

Accessory for Piezoelectric Micro Pumps

Tygon® tubing (Accessory, sold separetely)

Material： Tygon® 2001 (for use with methanol, water and most general uses)
Size: I.D. 0.79 mm (for SDMP302 and SDMP302D), I.D. 1.59 mm (for SDMP306 and SDMP306D)

Material： Tygon® 2375 (for use with methanol, water and most general uses)
I.D. 2.38 mm (for SDMP320 and APP-20KG)

*Note: TYGON® is a trademark of Saint-Gobain Performance Plastics.
*Note : If the flow is decreased with the above tubing, please use the larger size tubing.

Manifolds - Solenoid Valves

Standard Manifolds

Our standard range consists of line-type manifolds mounted with EXV series, STV series and WTA series valves. These products achieve a shorter delivery time compared to custom-made manifold valve units. See more details.

Custom Manifolds

Using our precise processing machines, we manufacture Custom Manifolds according to your requirements. In addition to solenoid valves and pumps, sensors, filters, or fittings can also be mounted on the Custom Manifolds. We are pleased to offer you manifolds with flow channel configuration suitable to applications.
See more details.

Bonded PTFE Manifold

This is a 100% PTFE manifold, with internal channels made by the bonding of two layers of modified PTFE. The internal channels are pre-machined on the bonding surfaces. Due to excellent chemical resistance, this product is compatible with a wide range of fluids. See more details.

Our standard product range consists of in line manifolds mounted with EXV series, STV series and WTA series valves. These products achieve a shorter delivery time compared to customized manifold valve units.

Characteristics of Standard Manifolds

Chemical compatibility

The manifold is made from PEEK, giving it a high level of chemical resistance. FPM and perfluoroelastomer can be chosen for the sealing material.

Channel configuration

A flow channel configuration with a common inlet or a common outlet is available. Please choose M6 or 1/4-28UNF for the port connections.

Number of mounted valves

From 2 to 6 valves can be mounted on the manifold, according to your requirements.

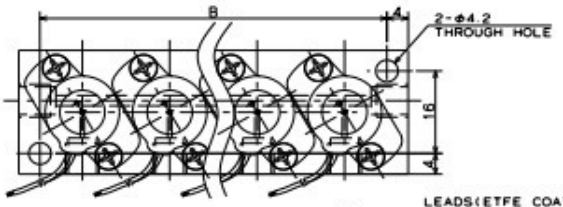
For details of the mounted valves

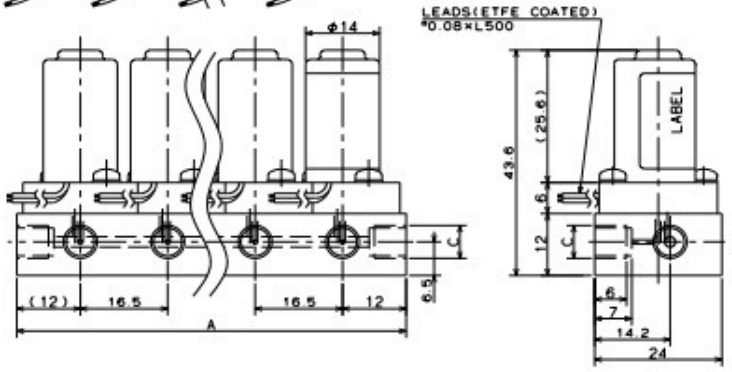
Please see the drawings at the links below.

EXV Series: EXV-2X-XXX

STV Series: STV-2K-XXIX

Manifolds - Solenoid Valves





FOR REFERENCE ONLY

SOLENOID VALVE

SPECIFICATIONS for MODEL EXV-2X-XXX

ORIFICE DIAMETER	:	1mm
PORT CONNECTION	:	M6. 1/4-28UNF
OPERATING PRESSURE RANGE	:	IN -20 ~ 200kPa (-150mmHg ~ 2bar)
FLUID MEDIA	:	FLUIDS CHEMICALLY COMPATIBLE WITH MATERIALS BELOW
MEDIA TEMPERATURE RANGE	:	5 ~ 40℃
AMBIENT TEMPERATURE RANGE	:	5 ~ 40℃
RATED VOLTAGE	:	12VDC. 24VDC
POWER CONSUMPTION	:	2.8W×n
DUTY CYCLE	:	CONTINUOUS
COIL TEMPERATURE INCREASE	:	MAX. 110℃ FROM ROOM TEMPERATURE
INSULATION CLASS	:	CLASS F
DIELECTRIC STRENGTH	:	1500VAC FOR 60s

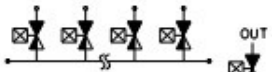
NOTES

EXV-2x-xxx

BODY MATERIAL		NUMBER OF VALVES	PORT CONNECTION		SOFT SEALER MATERIAL	
K	PEEK	2	M	M6	F	FPM
R	PPS	3	U	1/4-28UNF	G	DAIEL●PERFLUOR
		4				
		5				
		6				

DIMENSION TABLE

n	DIMENSION		
	A	B	C
2	40.5	32.5	M6. 1/4-28UNF
3	57.0	49.0	M6. 1/4-28UNF
4	73.5	65.5	M6. 1/4-28UNF
5	90.0	80.0	M6. 1/4-28UNF
6	106.5	88.5	M6. 1/4-28UNF



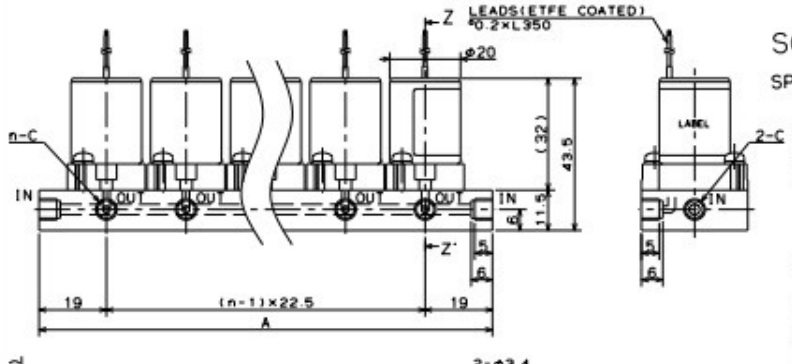
FLOW DIAGRAM

WETTED MATERIALS

PART NAME	MATERIAL	REQD.	NOTE
DIAPHRAGM	PTFE	n	
SOFT SEAL	FPM/DAIEL●PERFLUOR	n	
GASKET	FPM/DAIEL●PERFLUOR	n	
VALVE BODY	PEEK/PPS	n	
MANIFLOD	PEEK	1	

SOLENOID VALVE

EXV-2X-XXX



FOR REFERENCE ONLY

SOLENOID VALVE

SPECIFICATIONS for MODEL STV-2K-XXIX

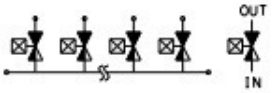
ORIFICE DIAMETER	:	1.2mm
PORT CONNECTION	:	M6. 1/4-28UNF
OPERATING PRESSURE RANGE	:	IN -50 ~ 200kPa (-375mmHg ~ 2bar)
		OUT 0 ~ 50kPa (0 ~ 0.5bar)
FLUID MEDIA	:	FLUIDS CHEMICALLY COMPATIBLE WITH MATERIALS BELOW
MEDIA TEMPERATURE RANGE	:	5 ~ 50℃
AMBIENT TEMPERATURE RANGE	:	5 ~ 50℃
RATED VOLTAGE	:	12VDC. 24VDC
POWER CONSUMPTION	:	2.5W×n
DUTY CYCLE	:	CONTINUOUS
COIL TEMPERATURE INCREASE	:	MAX. 80℃ FROM ROOM TEMPERATURE
INSULATION CLASS	:	CLASS B
DIELECTRIC STRENGTH	:	1500VAC FOR 60s

STV-2K-xxIx

NUMBER OF VALVES	PORT CONNECTION		COMMON INLET SOFT SEAL MATERIAL	
2	M	M6	F	FPM
3	U	1/4-28UNF	G	DAIEL●PERFLUOR
4				
5				
6				

DIMENTION TABLE

n	DIMENTIONS		
	A	B	C
2	60.5	52.5	M6. 1/4-28UNF
3	83.0	75.0	M6. 1/4-28UNF
4	105.5	97.5	M6. 1/4-28UNF
5	128.0	120.0	M6. 1/4-28UNF
6	150.5	142.5	M6. 1/4-28UNF



FLOW DIAGRAM

WETTED MATERIALS

PART NAME	MATERIAL	REQD.	NOTE
DIAPHRAGM	PTFE	n	
SOFT SEAL	FPM/DAIEL●PERFLUOR	n	
VALVE BODY	PEEK	n	
O RING	FPM/DAIEL●PERFLUOR	2n	
MANIFLOD	PEEK	1	

SOLENOID VALVE

STV-2K-XXIX

Manifolds - Custom

We not only provide our customers with components such as valves, pumps etc., but also design and manufacture Custom Manifolds to satisfy our customers' requirements. These manifolds contribute to decrease in plumbing and minimization of the internal volume. Depending on the manufacturing technologies a manifold with channels of the minimum width as narrow as 0.2 mm is also possible to provide.

Chemical Compatibility

Suitable, highly chemically inert materials such as PEEK, PPS, PTFE, etc can be chosen for the manifold.

Channel Configuration

Flow channel configurations with a common inlet or a common outlet, and a radial type or a line type are available according to your requirements. Through the use of a bonding technique, 3D flow channel configurations that cannot be produced by machining process are possible.

Number of Mounted Valves

The number of mounted valves can be selected. We have the experience of manufacturing a manifold unit with 192 valves.

Manifolds - Custom Types

Built-in Type

The valve mechanism is built into the manifold to make a single integrated unit.

【Advantages】

Easy to design an economical model in comparison to a valve mounted type as the structure is simple.

Fewer parts are used, which contributes to a compact size.

【Disadvantages】

Mounted valves are unable to be exchanged for repair.

Unsuitable for complicated channel configurations.

Valve Mounted Type

Multiple valves are mounted on a manifold in which only the channels are machined. Gaskets (mainly elastomers) are used for the channel connection parts. (Advantages) Mounted valves can be replaced for repair. Suitable for a manifold unit using lots of valves. The photo is an example of a manifold mounted with 196 valves.

【Advantages】

Mounted valves can be replaced for repair.

Suitable for a manifold unit using lots of valves.

The photo is an example of a manifold mounted with 196 vales.

Can combine bonded chips, manifolds made of special materials such as ceramics, and other components such as pumps etc. and various structures of manifold can be produced.

【Disadvantages】

Gaskets (mainly elastomers) are necessary. Therefore, chemical compatibility may be restricted.

In-line Type

By directly connecting each port of multiple valves in line, a flow channel is produced. A manifold block is not used.

【Advantages】

Manifold block is not used meaning less space is required.

Valves are able to be replaced for repair.

【Disadvantages】

Gaskets (mainly elastomers) are necessary for the connecting parts. Therefore, chemical compatibility may be restricted.

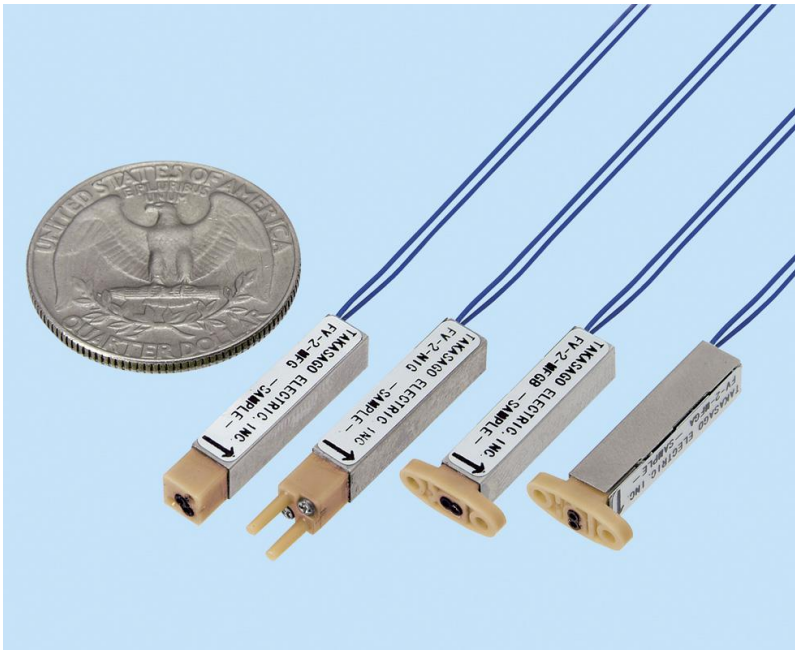
Basically, only a line-type of flow configuration is available.

Unsuitable for a manifold unit using many valves.

(Patented in the United States)

Ultra-small Diaphragm-isolation Solenoid Valve

FV Series



1. 4.2mm square: 4.2×4.2×23.1mm*1

An innovative and groundbreaking ultra-small solenoid valve - can be mounted in the smallest of spaces, minimizing the manifold size and shortening the length of flow paths.

*1 Dimensions for FV-2-MFG, not including wire connections

2. Diaphragm valve

Excellent chemical resistance – PEEK and perfluoroelastomer are used for wetted materials (materials can be changed according to your requirements).

3. Internal volume only 1.1µl*2

Through pursuing miniaturization to the uttermost limits, internal volume is now only 1.1µl – contributes to reductions in reagent and sample quantities and improvements in analysis accuracy.

*2：value for FV-2-MFGA(B). FV-2-N1G: 4.3㎕、FV-2-MFG: 1.5㎕

REMARKS

The FLV series is a model that uses a latching solenoid. This FV series is a normal solenoid valve. This product doesn't require a polarity change, which is necessary for the actuation of the FLV series.

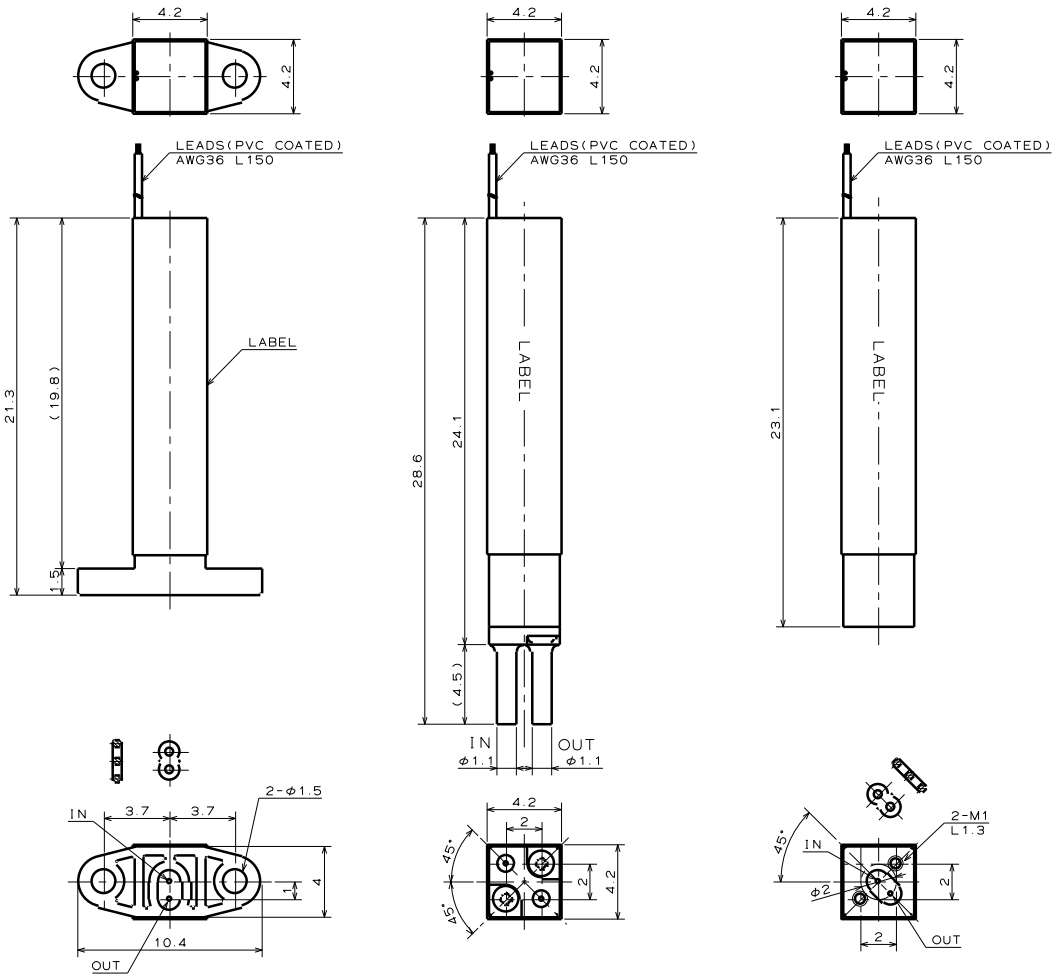
Note: Details including specifications may change without notification

Specifications

Model number	FV-2-N1G	FV-2-MFGA(B)*1	FV-2-MFG
Type	2 Way N.C.		
Orifice Diameter	0.4mm		
Port Connection	Hose Barb	Gasket	
Operating Pressure Range	IN：0 - 100kPa		
	OUT：0 - 50kPa		
Fluid Temp. Range	10 - 50°C		
Ambient Temp. Range	10 - 50°C		
Voltage	5VDC		
Power Consumption	1W		
Duty Cycle	Intermittent ED=40%		
Coil Temp. Increase	Max. 80 °C From Ambient Temperature (when energized for 1.5 minutes at rated voltage)		
Max. Energizing Time	1.5 minutes		
Diaphragm Material	Perfluoroelastomer (Optionally FPM)		
Body Material	PEEK (Optionally PPS)		
Hose Barb Material	PEEK (Optionally PPS)	—	

*1 A and B have a 90° difference in port orientation.

Dimensions

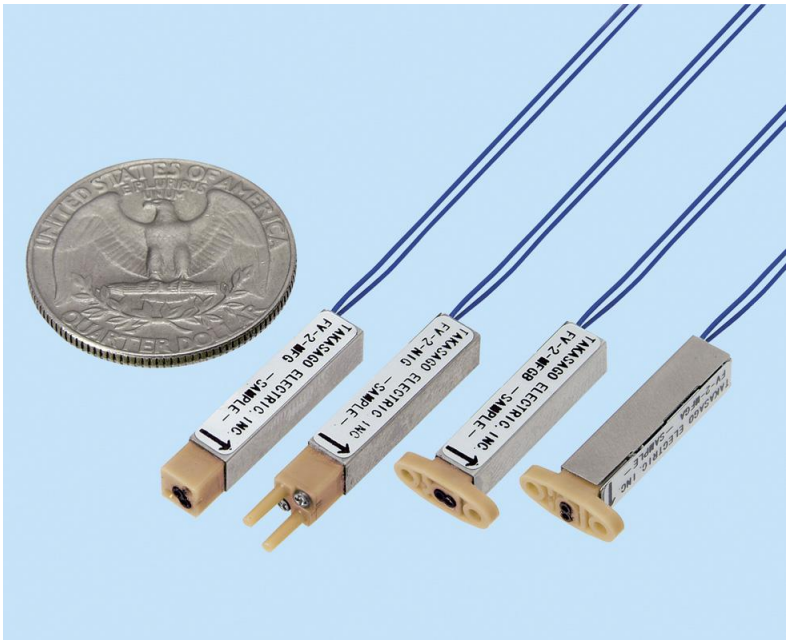


FV-2-MFGA　　FV-2-N1G　　FV-2-MFG

(Patented in the United States)

Ultra-small Diaphragm-isolation Latching Solenoid Valve

FLV Series



1. 4.2mm square: 4.2×4.2×23.1mm*1

An innovative and groundbreaking ultra-small solenoid valve - can be mounted in the smallest of spaces, minimizing the manifold size and shortening the length of flow paths.

*1 Dimensions for FLV-2-MFG, not including wire connections

2. Diaphragm valve

Excellent chemical resistance – PEEK and Perfluoroelastomer are used for wetted materials (materials can be changed according to your requirements).

3. Internal volume only 1.1µl*2

Through pursuing miniaturization to the uttermost limits, internal volume is now only 1.1µl – contributes to reductions in reagent and sample quantities and improvements in analysis accuracy.

*2：value for FLV-2-MFGA(B). FLV-2-N1G: 4.3㎕、FLV-2-MFG: 1.5㎕

4. Latching Solenoid Valve

The open status of valve is maintained by magnetic force. No energization is required to maintain the valve status. Contributes to energy saving and lower heat generation through energization.

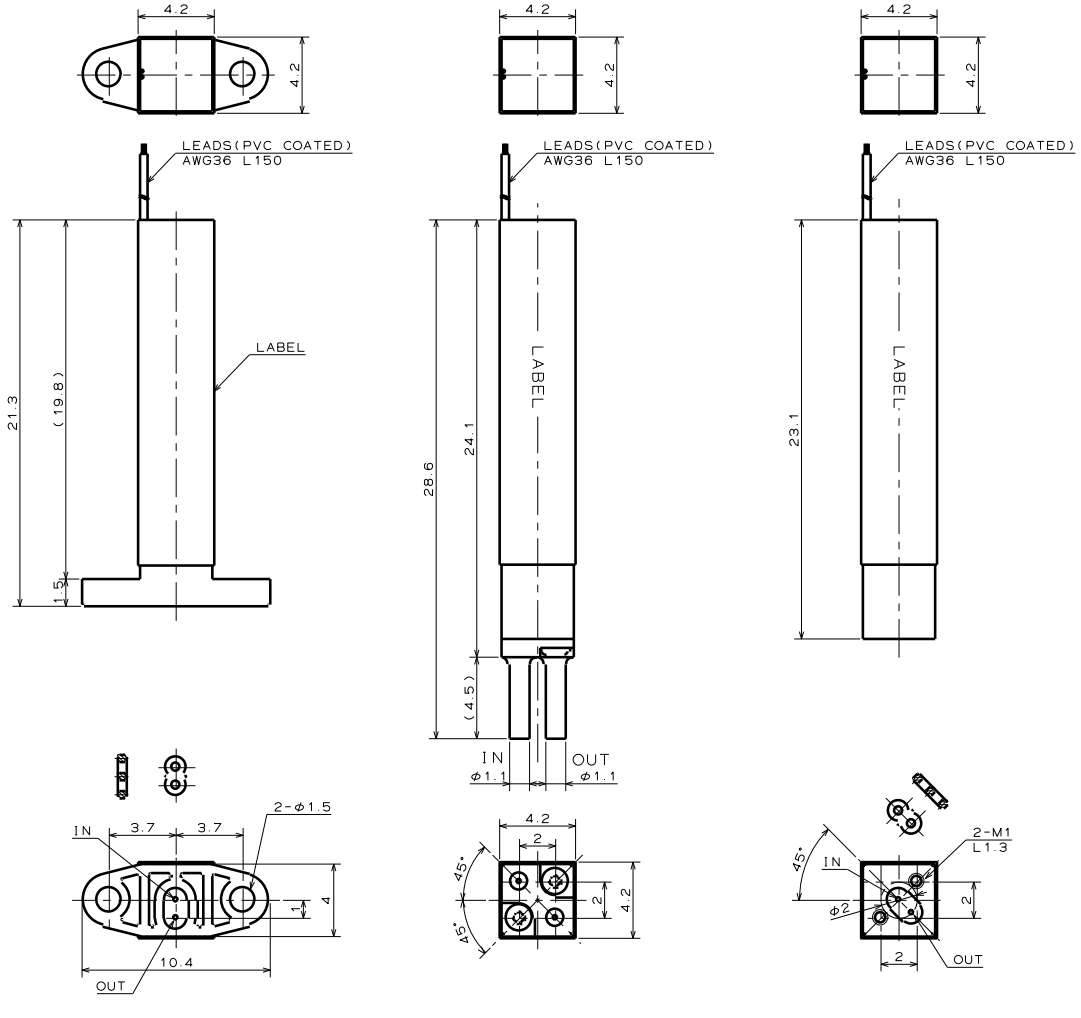
See page 3.

Specifications

Model number	FLV-2-N1G	FLV-2-MFGA(B)*1	FLV-2-MFG
Type	2 Way		
Orifice Diameter	0.4mm		
Port Connection	Hose Barb	Gasket	
Coil Type	Latch Type Solenoid		
Operating Pressure Range	IN:0 – 100kPa		
	OUT:0 – 50kPa		
Fluid Temp. Range	10 - 50°C		
Ambient Temp. Range	10 - 50°C		
Voltage	12VDC		
Power Consumption	2.4W (When energized)		
Diaphragm Material	Perfluoroelastomer (Optionally FPM)		
Body Material	PEEK		
Hose Barb Material	PEEK	—	

*1 A and B have a 90° difference in port orientation.

Dimensions



FLV-2-MFGA FLV-2-N1G FLV-2-MFG

Latching Solenoid Valve

In the case of a normally closed type of conventional solenoid valve, continuous energization is required to maintain open status. The latching solenoid doesn't require a power supply for the purpose of maintaining open status through the utilization of a permanent magnet.

Merits of the Latching Solenoid Valve

1. Energy saving

Valve does not require energizing to maintain its state, so for applications where a conventional valve would require long periods of energization the economical benefits are significant.

Note: Power is required during changing of state (Open to Closed, Closed to Open). Also, it is necessary to reverse the polarity of the current to change the state.

2. Low heat generation, decreased thermal influence on surroundings

As energization is not required to maintain state, the heat generation associated with energization is reduced. Suitable for analytical fields and other applications where the effect of temperature on a fluid is a concern.

Slim Diaphragm-isolated Solenoid Valve

KV Series

1. 6mm Slim Design

This small valve enables you to reduce not only the installation space but also internal pipe length of your manifold by making it possible to mount at 6mm intervals.

2. Capacity for Bilateral Connection

Easy to make manifolds (see page 3)

3. Small Internal Volume

Only 10 micro liters (each port)

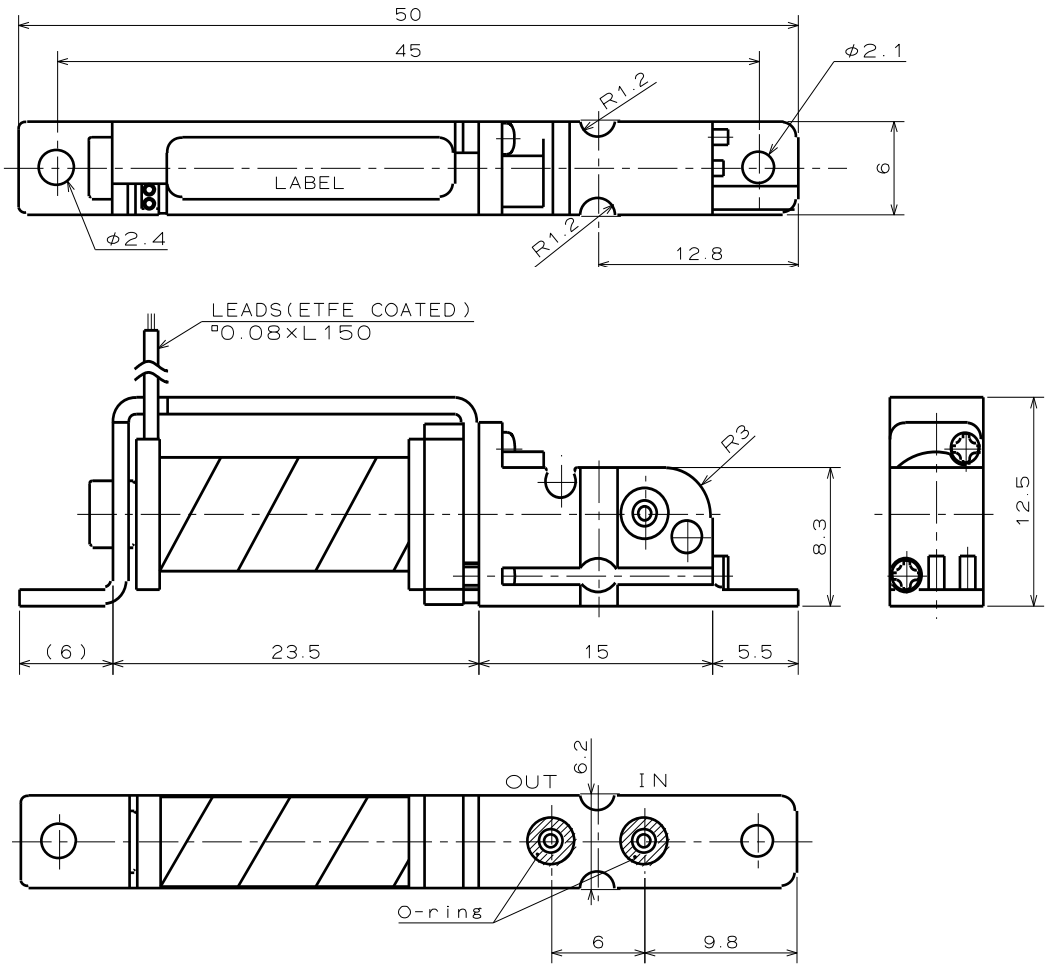
4. Excellent Chemical Resistance

PEEK molded body and Perfluoroelastomer diaphragm

Specifications

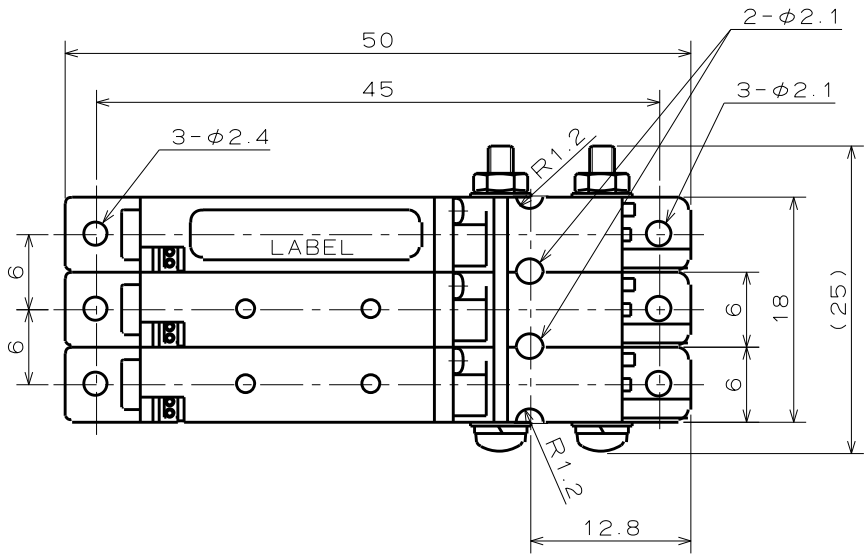
Model Number	KV-2-NCG	
Type	2-way N. C.	
Orifice Diameter	0.8mm	
Port Connection	O-ring Seal	
Operating Pressure Range	IN: 0 - 100kPa OUT: 0 - 50kPa	
Fluid Temp. Range	0 – 50 °C	
Ambient Temp. Range	0 – 40 °C	
Voltage	12VDC, 24VDC	
Power Consumption	1.8W	
Duty Cycle	Continuous Duty	
Coil Temp. Increase	Max. 90 °C From Ambient Temperature	
Internal Volume	Inlet: 10 micro liters Outlet: 10 micro liters	
Insulation Class	Class B	
Dielectric Strength	1500VAC for 60s	
Weight	8g	
Wetted Materials	Diaphragm	Perfluoroelastomer
	O-ring	Perfluoroelastomer
	Body	PEEK (poly ether ether ketone)

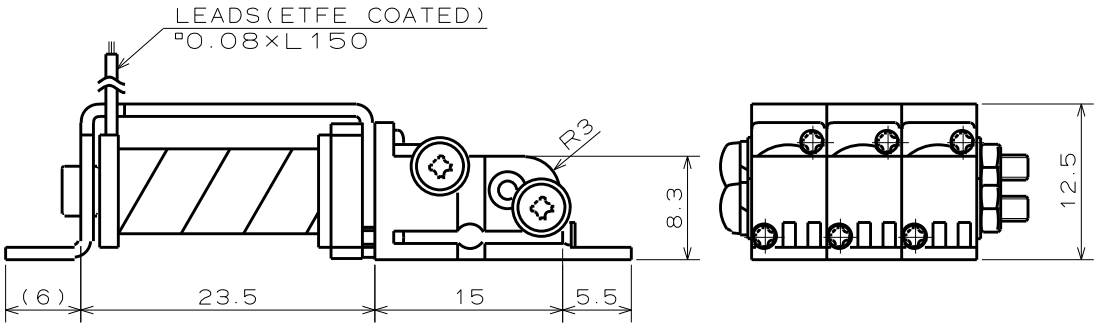
Dimensions

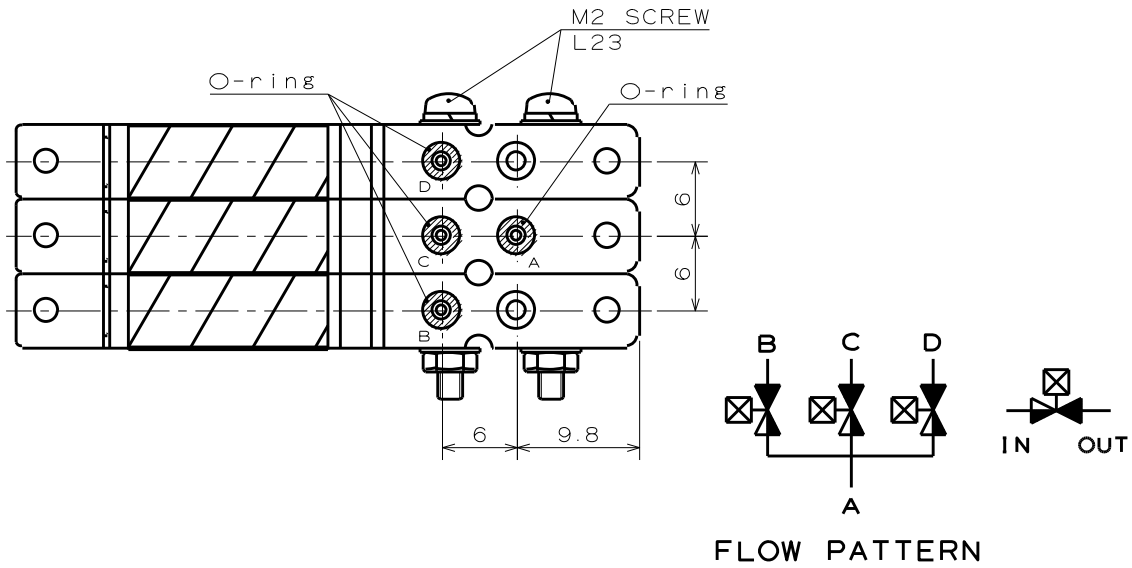


Example of Manifold Configuration

3-valve manifold clamped by screws







Ultra-Small Inert Solenoid Valve

LV Series

1. This manifold mountable diaphragm valve is just 8.9 mm x 10.4 mm (Width X Depth), giving a footprint of less than 1 cm^2. Because it can be mounted in the smallest of spaces, miniaturization of manifolds and shortening the flow-path between ports are possible.

2. The internal volume is just 3.3µl on the inlet side, and it is 8.3µl on the outlet side.

3. Shortening the flow-path between ports helps to reduce the volume of samples and reagents in use, whilst also greatly increasing analysis accuracy.

4. The body material is PEEK and the diaphragm material is perfluoroelastomer meaning this valve is highly chemically inert. (The body material can be changed according to your preferences.)

The specifications of the product may be changed without a notice.

Chemically Inert Moulded Body Solenoid Valve

PKV Series

2-way hose barb type 3-way threaded type (New line-up)

Moulded 3-way PKV series valve now available

Features

ϕ4-6mm is its orifice diameter, which enables it to be used in a wide-range of fluid control applications for various kinds of analysis, IVD diagnostics, medical, and other life science instruments, etc., which necessitate such large orifice. An elastomer is employed for the seal material, reducing damage to the valve seat by foreign matters in the fluid and the associated leak trouble.

Specifications

Model Number	PKV-2(21)×-B×××	PKV-02(021)×-D×××	PKV-3(31)×-B×××	PKV-3(31)×-D×××
Type	2-way N.C.	2-way N.O.	3-way	
Orifice Diameter	4 mm equiv.	6 mm equiv.	4 mm equiv.	6 mm equiv.
Port Connection	Rc1/8, Rc1/4, 1/8-27NPT, 1/4-18NPT, (※) hose barb <※ only available for 2-way>			
Operating Pressure Range	IN: -90 ~ 200 kPa OUT: 0 ~ 50 kPa	IN: -50 ~ 200 kPa OUT: 0 ~ 50 kPa	COM: -90 ~ 100 kPa N.C., N.O.: 0 ~ 50 kPa	COM: -50 ~ 100 kPa N.C., N.O.: 0 ~ 50 kPa
Fluid Temp. Range	0 ~ 60 °C (5 ~ 60 °C in the case the seal material is perfluoroelastomer)			
Ambient Temp. Range	0 ~ 60 °C	0 ~ 40 °C		
Rated Voltage	12VDC, 24VDC, 90VDC, 100VAC (50/60Hz, with a rectifier)			
Power Consumption	6 W	10 W		
Duty Cycle	Continuous			
Insulation Class	Class B			
Dielectric Strength	1500 VAC for 60 s			
Diaphragm Material	PTFE			
Seal Material	EPDM, FPM, Perfluoroelastomer			
Body Material	PPS, PEEK			

Note: Specifications etc. may be changed at any time without notice.

Model Number

PKV－ＸＸ－ＸＸＸＸ

Type

02	2-way N.O.
021	2-way N.O.(※)
2	2-way N.C.
21	2-way N.C.(※)
3	3-way
31	3-way(※)

※Available only when seal material is "G".

Orifice

B	φ4mm
D	φ6mm

Body Material

R	PPS
K	PEEK

Port Connection

1/8	Rc1/8
1/4	Rc1/4
1/8N	1/8-27NPT
1/4N	1/4-18NPT
N2	Hose barb (only available for 2-way)

Installation Method

3-way	-	Frame and Underside M4 screws
	B	with mounting base
2-way	-	Frame M4 screws
	A	Underside M4 screws
	B	with mounting base

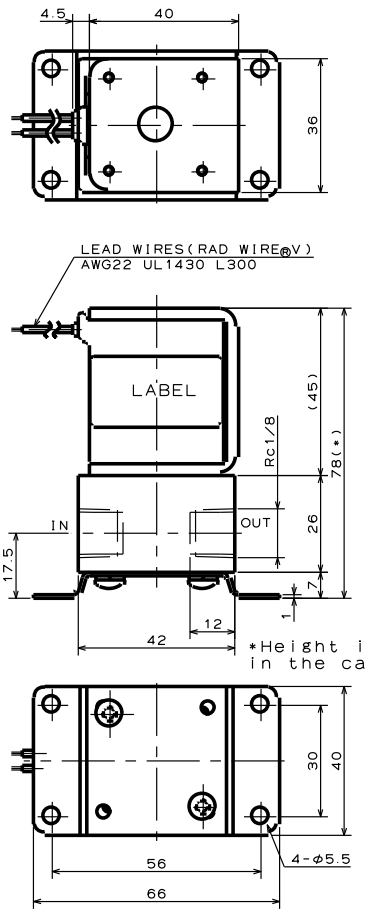
Seal Material

E	EPDM
F	FPM
G	Perfluoroelastomer

Dimensions

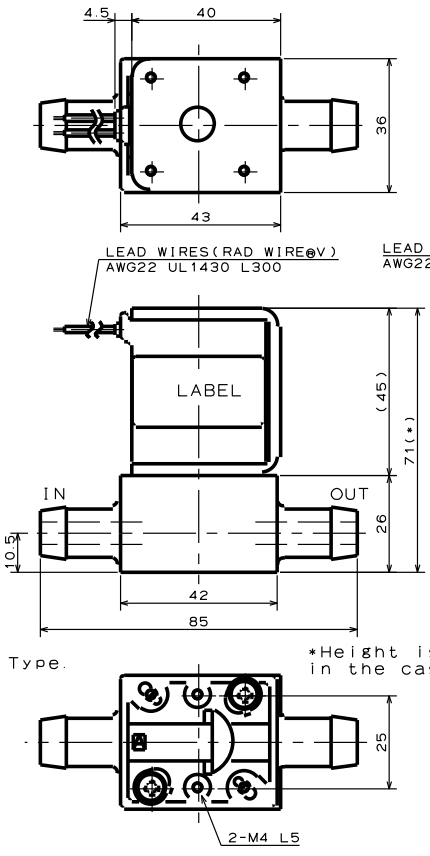
PKV-2K-B1/8GB

(2-way N.C., Rc1/8, with mounting base)



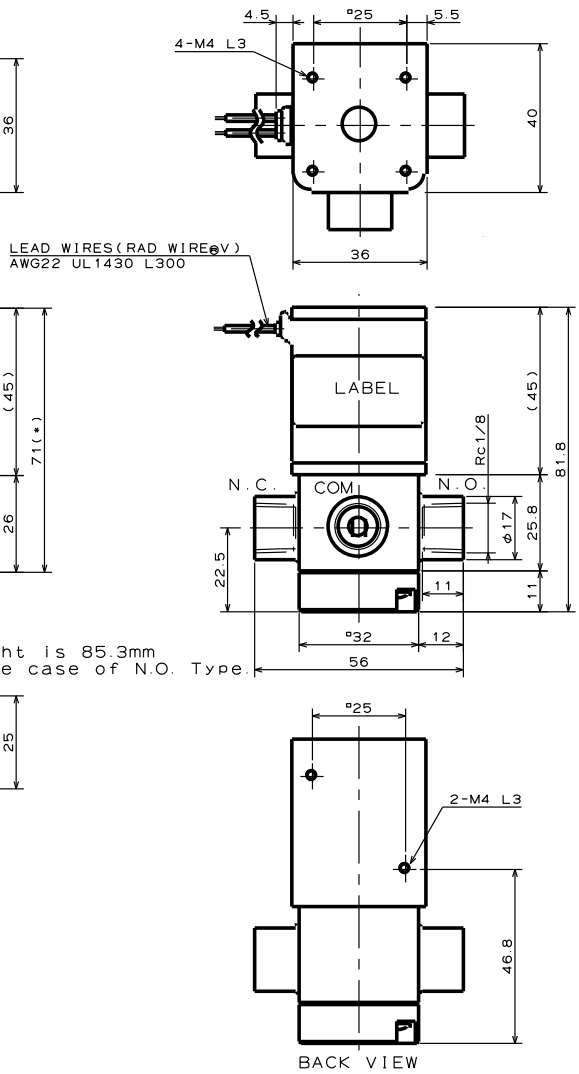
PKV-2K-DN2GA

(2-way N.C., Hose barb, Underside M4 screws)



PKV-3R-B1/8F

(3-way, Rc1/8, Frame and, Underside M4 screws)



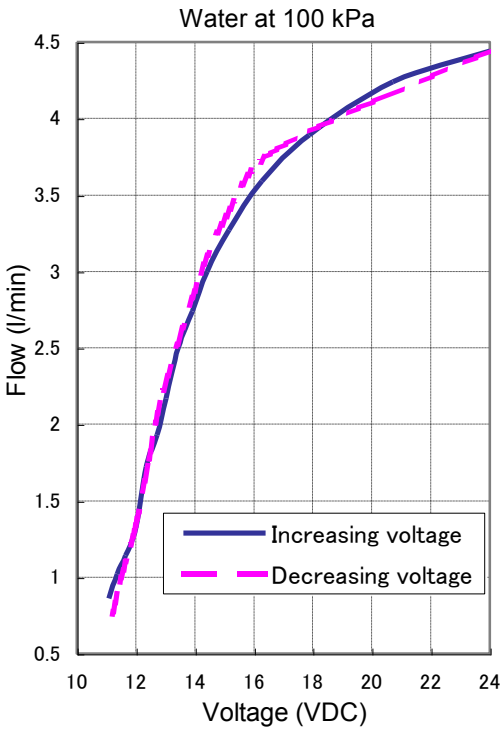
PROPORTIONAL VALVE

Proportional Diaphragm Valve NPV Series

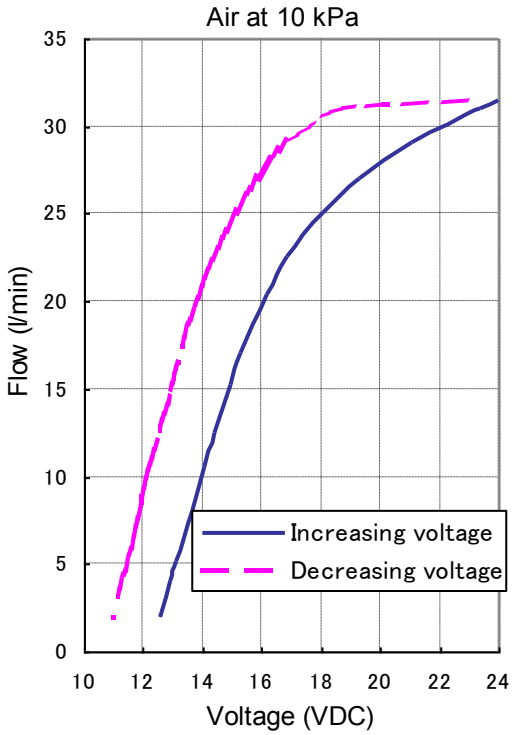
Features

- Has a very high chemical resistance due to all PTFE wetted parts.
- Flow controllable by changing the input voltage.
- Has a comparatively large orifice diameter of 4mm, which can cover a wide range of flows.

Flow Characteristics



* Volume flowing in 1 minute measured by gravimetry



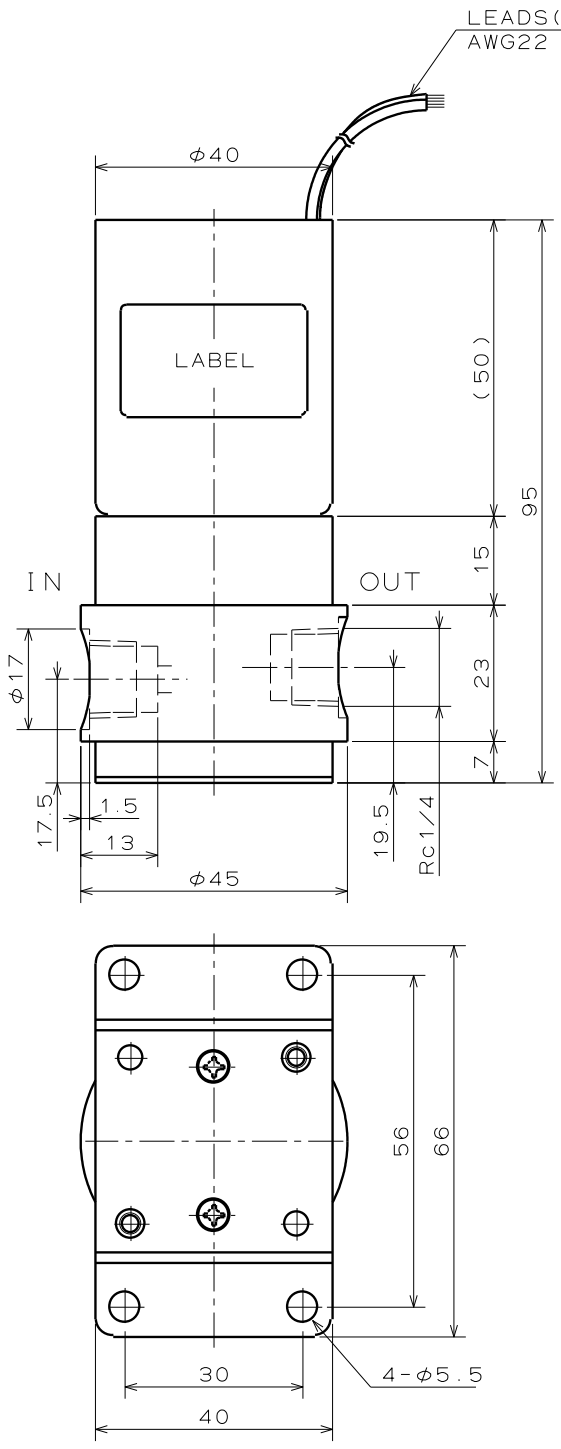
*Measured by a rotameter

Specifications

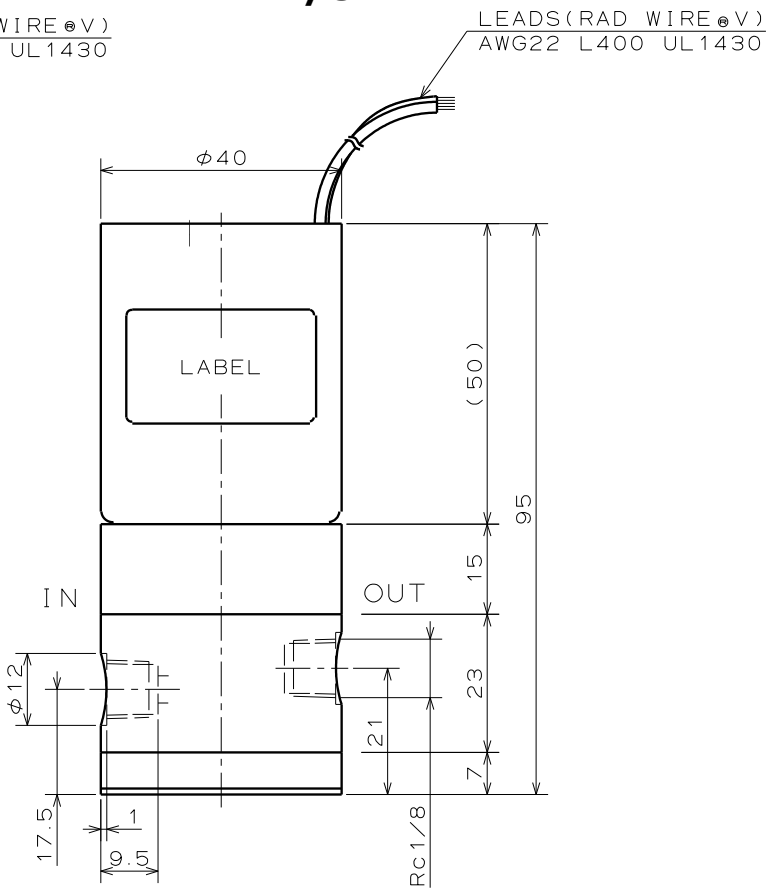
Model Number	NPV-4T1/8 (1/4)
Type	N.C. (Normally Closed) Proportional type
Orifice Diameter	4 mm
Wetted Material	PTFE (Valve Body, Diaphragm)
Operating Pressure Range	0 — 100 kPa
Flow Control Range	0 — 30 l/min (ΔP=10 kPa, Air) 0 — 4 l/min (ΔP=100 kPa, Water)
Power Consumption	7 W (at 24 VDC)

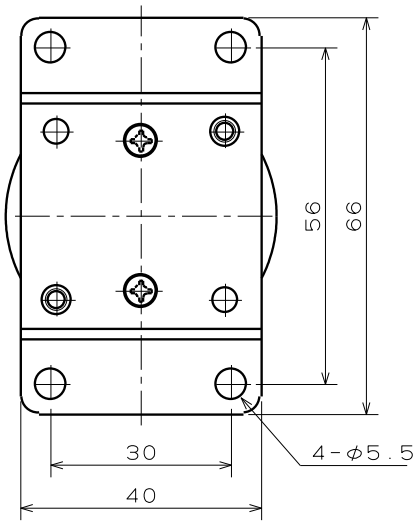
Dimensions

NPV-4T1/4



NPV-4T1/8

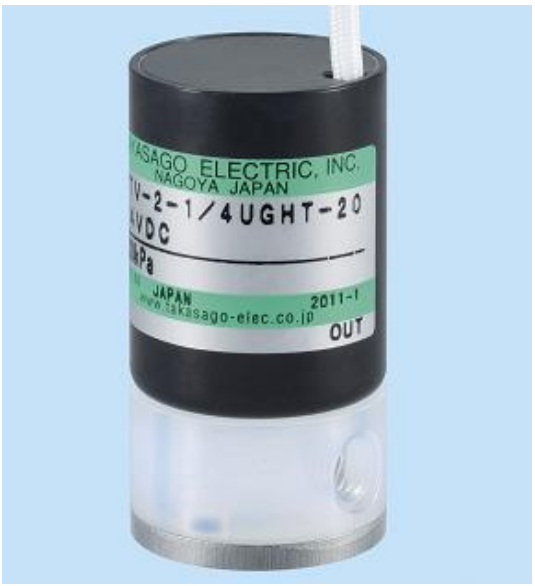




Note: Details including specifications may change without notification.

Chemically Inert Solenoid Valve

High-Temperature High-Pressure Valve



Up to 180°C & 800 kPa

Features

- Employs a unique mechanism to absorb the dimensional changes of the plastic body caused by temperature changes. No leakage with high temperature fluids.
- Most suitable for the case sulfuric acid is heated for COD Measurement.
- An elastomer is employed for the seal material, reducing damage to the valve seat by foreign matters in the fluid and associated leakage problem.

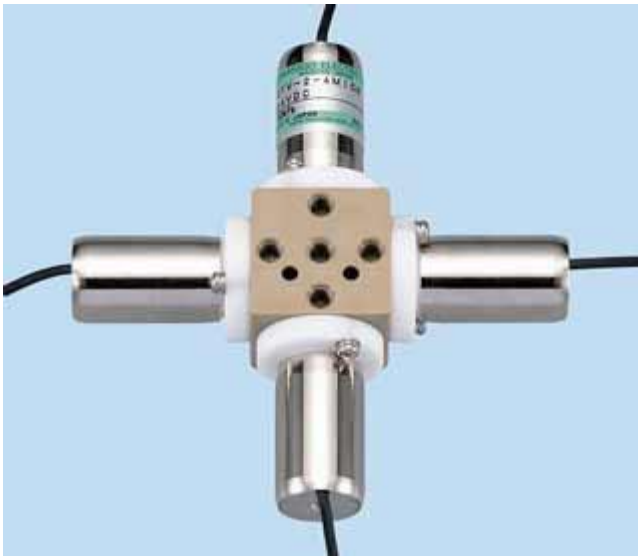
Specifications

Model Number	MTV-2-M6(1/4U)GHT-20
Type	2-way Normally Closed
Orifice Diameter	1.8 mm
Port Connection	M6 or 1/4-28UNF
Operating Pressure Range	IN:0 ~ 800 kPa OUT:0 ~ 100 kPa
Fluid Temp. Range	5 ~ 180 °C
Ambient Temp. Range	5 ~ 40 °C
Rated Voltage	12 or 24 VDC
Power Consumption	7.6 W
Duty Cycle	ED=20 %, Maximum ON time: 5 min (Continuous operation possible with an optional circuit)
Insulation Class	Class H
Dielectric Strength	1500 VAC for 60 s
Wetted Materials	PFA, Perfluoroelastomer
Outer Dimensions	ϕ25 x 47.5 mm

Note: Details including specifications may change without notification.

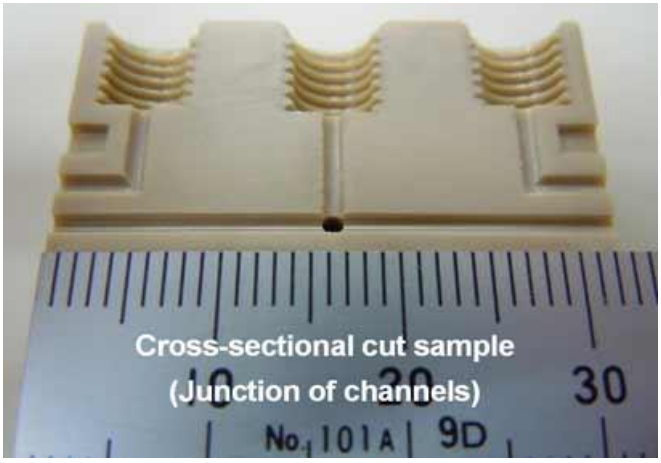
MOULDED QUATERNARY VALVE

CTV-2-4MICK



For Cost Reduction of a Gradient Unit in a LC

The Quaternary Valve is a kind of manifold valve where, due to its structure, the four channels from the valves all join at one point and connect to the common port. The lengths of the four channels are the same and the flow rate of each is almost identical. This structure is designed to maintain a high accuracy of the mixing ratio. The product is often used to mix several kinds of eluant gradually in a low pressure gradient unit in a liquid chromatograph. Since a high processing accuracy is required at the junction of the channels, the manifold bases of almost all conventional models, including those of other manufacturers, are manufactured by machining, which results in an increased cost. With advanced moulding techniques, TAKASAGO has achieved the moulding of this junction in PEEK, and we are pleased to provide our Quaternary Valve at prices conventional models cannot match.

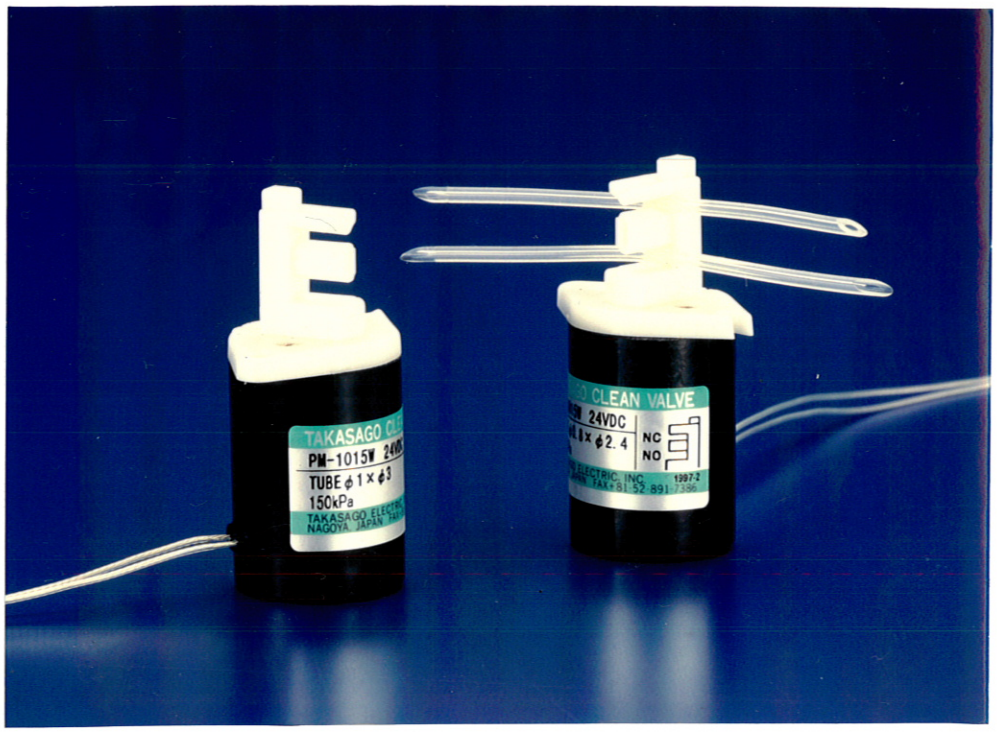


Various customisations are also possible, including improvement of the response time of the valves. Please feel free to ask us for the details.

TAKASAGO

Small Double–Tube Pinch Valve PM Series

PM–1015W
PM–0815W



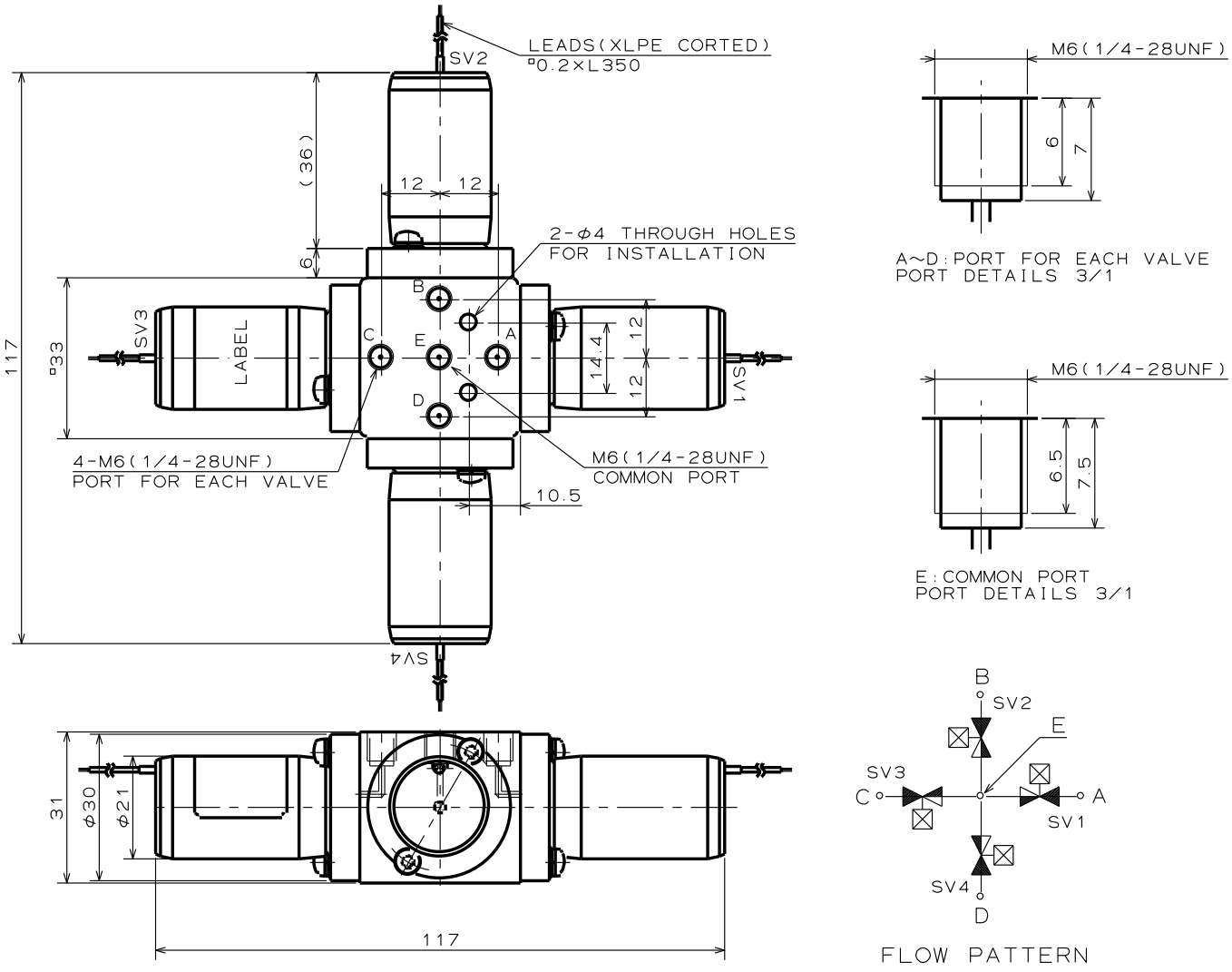
- Dual–tubing : Normally closed and Normally open
  3–way valve operation available with Y–shape fitting
- Also suitable for single tube valve use (N.C. or N.O.)
- Compact size and reasonable price achieved by our moulding technology
- Pressure : 150 kPa (1.5 bar)
- Long life made possible by using PharMed™ tube

TAKASAGO ELECTRIC, INC.
66 KAKITSUBATA, NARUMI-CHO, MIDORI-KU, NAGOYA, 458-8522 JAPAN
TEL: +81 52 891 2301 FAX: +81 52 891 7386
E-mail: info@takasago-elec.co.jp URL : http://www.takasago-elec.co.jp

Specifications

Model Number	CTV-2-4MICK
Type	2-way N.C. (Normally Closed)
Orifice Diameter	1.2 mm
Port Connection	M6 (Optionally 1/4-28UNF)
Operating Pressure Range	A ～ D： 0 ～ 50 kPa E： -65 ～ 150 kPa
Fluid / Ambient Temp. Range	5 ～ 40 °C
Rated Voltage	12 VDC, 24 VDC
Power Consumption	3.5 W × 4
Duty Cycle	Continuous
Insulation Class	Class B
Dielectric Strength	1500 VAC for 60 seconds
Wetted Materials	PTFE / PEEK / Perfluoroelastomer (Partially used as a gasket at the connection between the individual valves and the manifold base. It is not directly exposed to the flow path.)

Dimensions and Flow Pattern

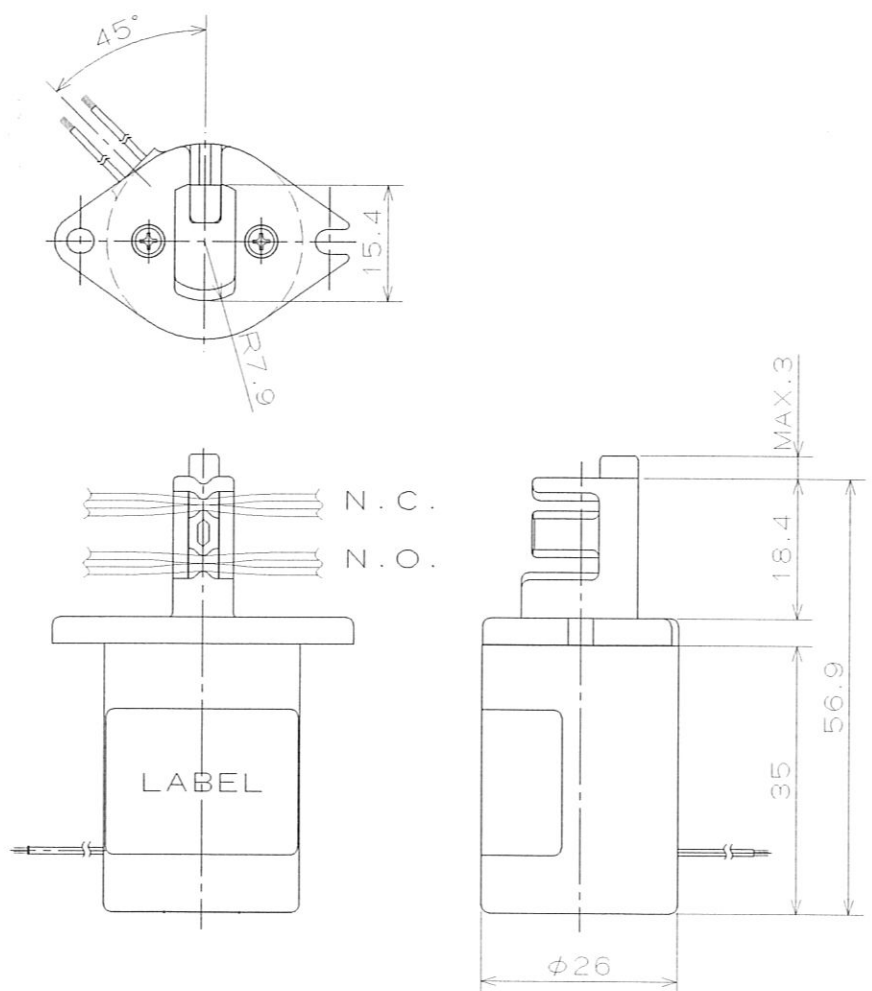


Note: Details including specifications may change without notification.

SPECIFICATIONS

	PM-1015W	PM-0815W
Tube Size	ID 1.0 mm X OD 3.0 mm	ID 0.8 mm X OD 2.4 mm
Tube Material	Silicone Rubber PharMed™	Silicone Rubber PharMed™ ,Tygon™
Operating Pressure Range	0 - 150 kPa (0 - 1.5 bar)	
Ambient Temperature Range	10 - 50℃	
Rated Voltage	12VDC, 24VDC, 100VAC	
Power Consumption	4.4W (100VAC : 5W)	
Operating Duty	Continuous Duty	
Coil Temperature Increase	Max. 75℃ From Room Temperature (When continuously energied)	
Insulation Class	Class B	
Insulation Resistance	50 MΩ (using 500VDC Megger)	
Dielectric Strength	1500VAC for 1min	
Weight	89 g	

DIMENSIONS



* "PharMed" , "Tygon" : T.M. of Norton Company

PEN-TYPE SYRINGE PUMP

SBP Series

Extremely Compact and High Resolution

Features

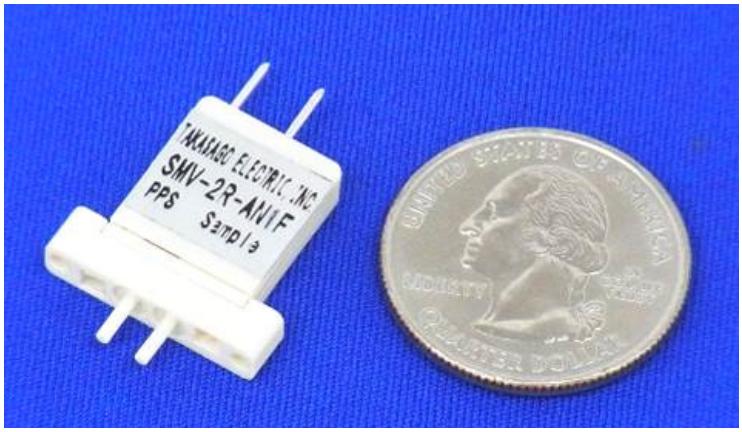
- High resolution provides smooth flow (theoretical resolution: 0.105 nl at 1/100 micro-step).
- Remarkably small outer dimensions of Dia. 12 x L 170 mm (threads model), now with a built-in 2-phase stepper motor with a reduction gear. Suitable for portable devices.
- An ultra-small type with an outer diameter of 8.8 mm is also available by custom order. (Please contact us for details of the micro-stepper drive mode.)
- Various syringe terminations: needle, Luer Lock, M6 or 1/4-28UNF threads, disposable tip adaptor, attachment for our ultra-small 3-way valve, etc. See reverse page.
- Has a built-in sensor to prevent overrun.
- An easy-to-use controller is available upon request.

Use the QR code on the right or the link below to see a video.
http://www.takasago-elec.co.jp/movie/SBP-e.wmv

MINIATURE LOW-COST VALVE

SMV Series

(Patented)



Features

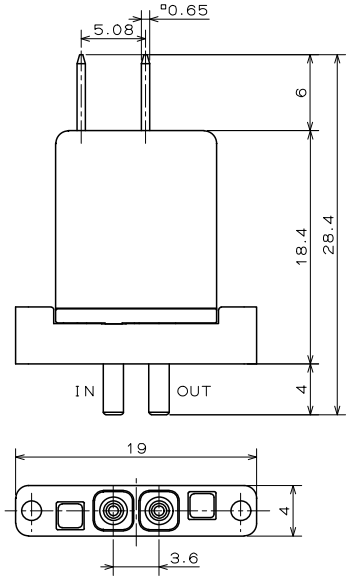
This valve is driven by a piece of shape memory alloy, giving it the following features:

- Compact and light weight: 19 x 18.4 x t4 mm and 1.5 g (approx.).
- Silent operation
- Low power consumption – 0.3 W or less.
- Low cost and disposable.

Specifications

Type		2-Way N.C.		
Model		Standard	High pressure	
Orifice Diameter (mm)		0.4, 0.8	0.4	0.8
Port Connection		Hose pipe, O-ring (Manifold mount)		
Operating Pressure Range (kPa)	IN	0 ~ 100	0 ~ 250	0 ~ 200
	OUT	0 ~ 50	0 ~ 100	
Operating Temp. Range		5 ~ 40 °C		
Electrical Supply		Current 250 mA *1		
Response Time(Typ.) *2		ON: 600 ms, OFF: 600 ms		
Wetted Materials	Body	PPS *3		
	Diaphragm	FPM or EPDM *3		

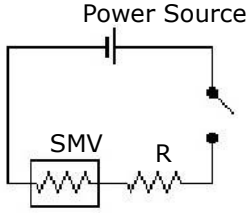
Dimensions



*1: Please see "Cautions concerning Power Supply" below.
*2: Response times vary depending on the ambient temperature. The values above are measured at 30°C. Can be improved by controlling the applied current (e.x. PWM, a spike & hold circuit, etc.). Please contact us for details.
*3: PEEK & Perfluoroelastomer are optionally available.

Cautions concerning Power Supply

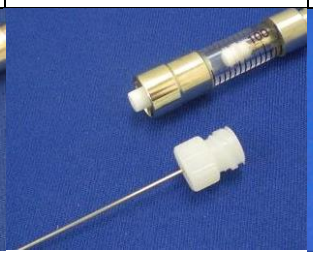
1. Power supply by a constant current circuit is recommended.
2. Operation by 12 VDC power supply or batteries is also possible, but a resistor must be inserted between the valve and the power source. See diagram on right.
3. If you operate the valve by any other method, the shape memory alloy may burn out, resulting in the valve malfunctioning.



Power Source	Resistor	
12 VDC Power Supply	45 Ω	5 W
AA battery x 2	10 Ω	1 W

Note: Details including specifications may change without notification.

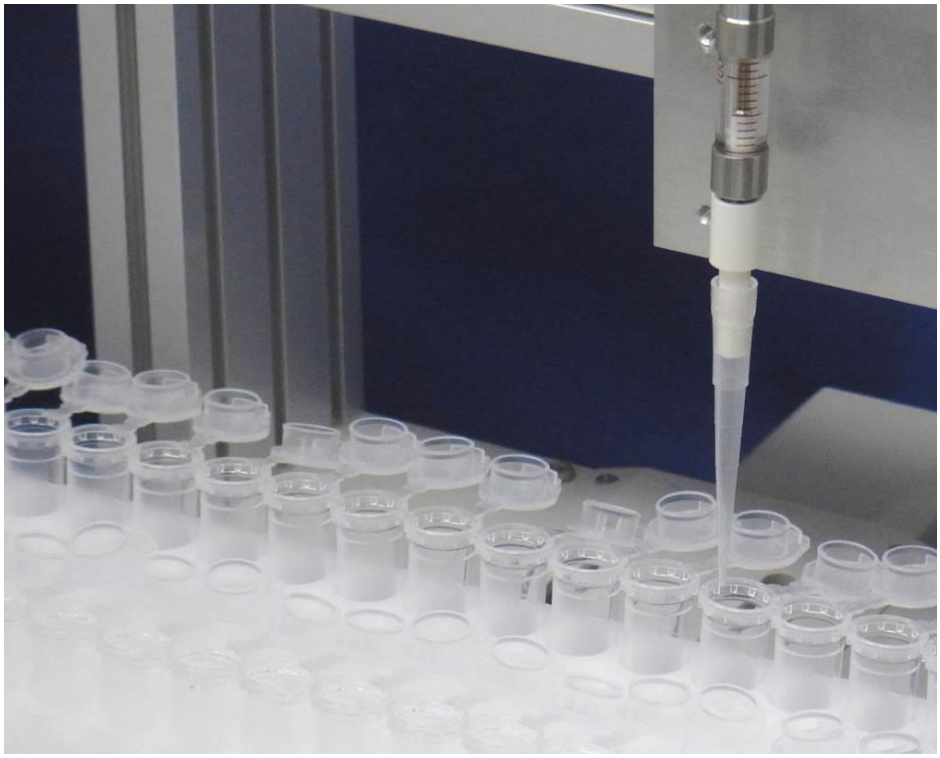
Specifications

Model Number	SBP-100G-N	SBP-100G-LL	SBP-100G-M6(1/4U)F	SBP-100G-DT
Outer Dimensions (excluding sensor case)	Dia. 12 x L165 mm (excluding needle)		Dia. 12 x L170 mm	Dia. 12 x L183 mm
Syringe Capacity	100 µl			
Theoretical Resolution	At 1/100 micro-step: 0.105 nl At full step: 10.5 nl			
Wetted Materials	Glass (barrel) PTFE (tip, seal) Stainless steel (needle)	Glass (barrel) PTFE (tip, seal) PVDF, Stainless steel (attached needle)	Glass (barrel) PTFE (tip, seal) PEEK (port)	Glass (barrel) PTFE (tip, seal) *Samples only contact with a disposable tip (material: PP).
Syringe Termination	Needle 22G (I.D. 0.40 x O.D. 0.72 x L51 mm)	Luer Lock (with needle)	M6 or 1/4-28UNF female threads *1	Adapter for disposable tip (Eppendorf®, epT.I.P.S., 2-200 µl) *2
				

*1 Male threads also available.
*2 Disposable tip not included with this product.

Image of SBP-100G-DT with a Disposable Tip

The Pen-type Syringe Pump can be directly installed onto a moving arm. Therefore, a tip is attached just below the pump, reducing the air gap between the syringe and the sample to a minimum and resulting in higher accuracy.



Note: Details including specifications may change without notification.

Pen-Type Glass Syringe Pump

Features

- Remarkably small outer dimensions of Dia. 8.8 x L 121 mm, now with a built-in 2-phase stepper motor (with a reduction gear).
- With a lightweight of only 33 g, this pump is very suitable for installation on a microscope stage, inside an incubator, or on moving parts, etc.
- Continuous microlitre transfer system can also be made possible by operating 2 pieces of syringe pumps alternately.
- Theoretical resolution is 21 nl.
- Has a built-in sensor that enables zero-point detection.
- In addition to the needle model in the above picture, a No.6-40UNF threaded port model and a special attachment model to connect with our small 3-way valve are also available.
- A driver for operating this pump has also been prepared.

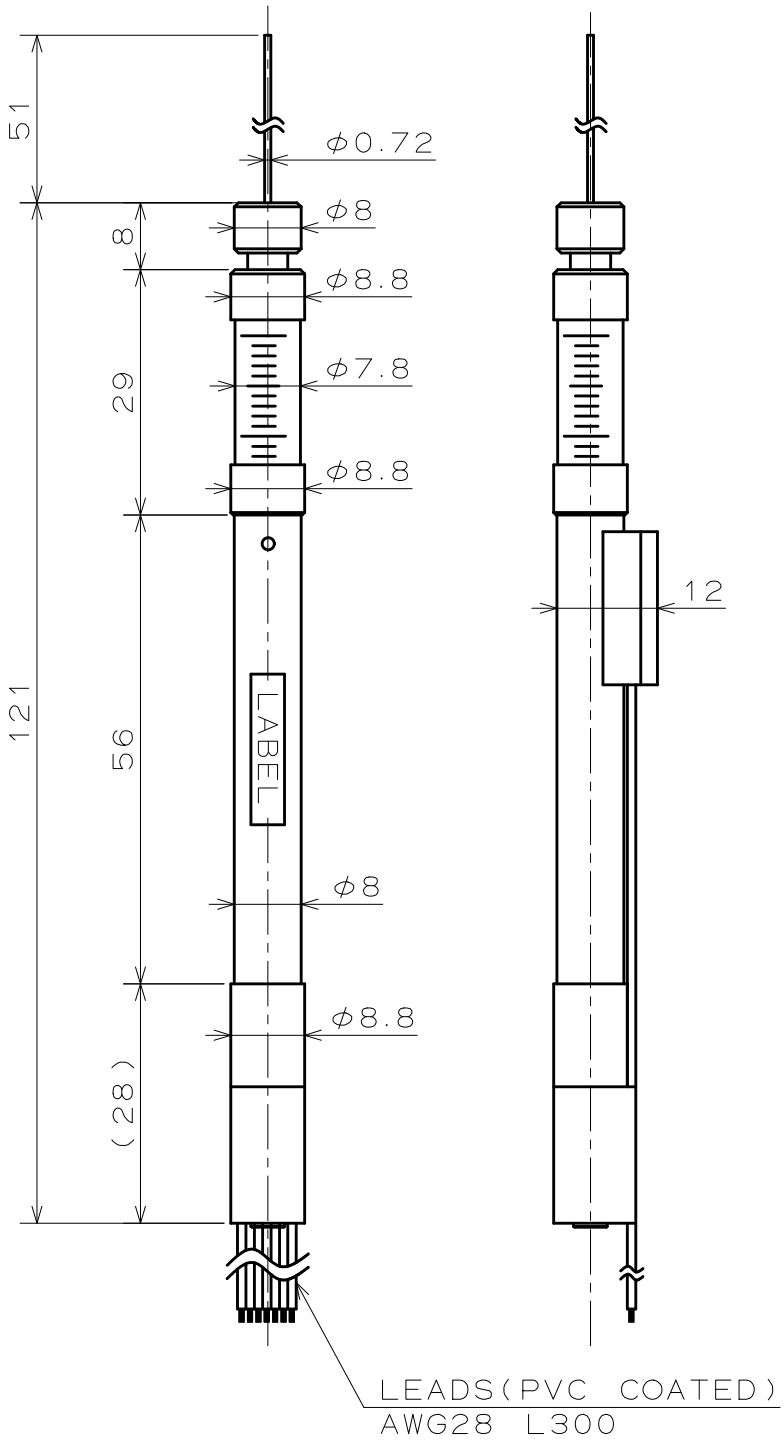
Specifications

Model Number	SAP-100G-N
Syringe Capacity	100 µ l
Theoretical Resolution	21 nl
Duty Cycle	10 s　ED＝33%
Maximum Frequency	1500 Hz
Wetted Materials	Glass (barrel), PTFE (tip), Stainless Steel (needle) • Extremely small amount of silicone oil applied to the tip as lubricant.
Outer Dimensions	Dia. 8.8 × L121 mm (excluding the needle)
Needle Size	22G（I.D. 0.4　× O.D. 0.72 × L51mm）
Weight	33 g

Note: Details including specifications may change without notification.

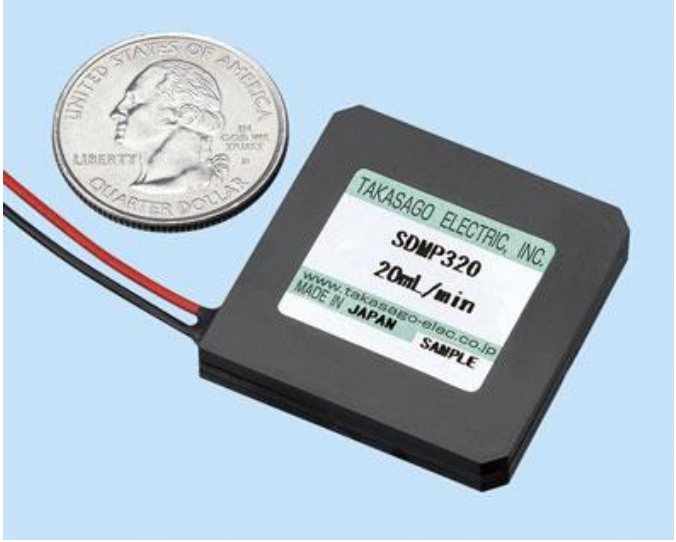
Dimensions

Needle Type



PIEZOELECTRIC MICRO PUMPS

SDMP320/330W



Features

- Small-sized, lightweight and slim.
- No metal is used as wetted materials.
- Low noise and low power consumption.
- Flow rate is adjustable by changing drive voltage or drive frequency.
- Self-priming is possible.

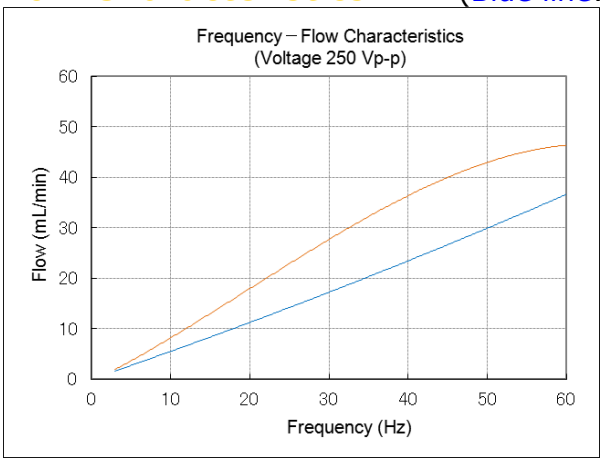
Specifications

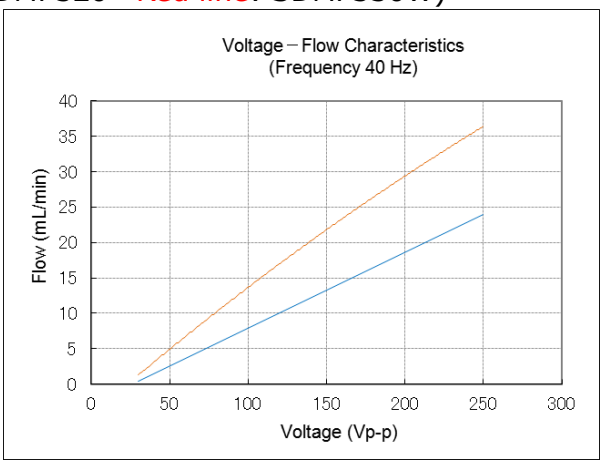
Model Number	SDMP320	SDMP330W <Under Development>
Pump Type	Piezoelectric Diaphragm Pump (Unimorph)	Piezoelectric Diaphragm Pump (Bimorph)
Typical Flow Rate	20 ml/min	30 ml/min
Typical Pump Pressure	35 kPa	-
Drive Voltage	60 ~ 250 Vp-p	
Drive Frequency	10 ~ 60 Hz	
Typical Suction Load Pressure	-1.0 kPa	
Operating Temp.	5 ~ 50 °C	
Wetted Materials	COC (Cyclic Olefin Copolymer) EPDM (Ethylene Propylene Diene Monomer)	
External Dimensions	33 × 33 × 5.5 mm	
Weight	Approx. 9 g	Approx. 12 g
Input / Output Pipes	φ1.8 – φ2.8 – L5.0 mm	

*1. The data above are based on sine wave drive. Flow rate and pump pressure are larger if driven by Takasago Standard wave.
*2. SDMP330W is under development and some of the specifications are not fixed.
*3. Smaller models (Typical flow rate: 3 or 7ml/min) are also available.

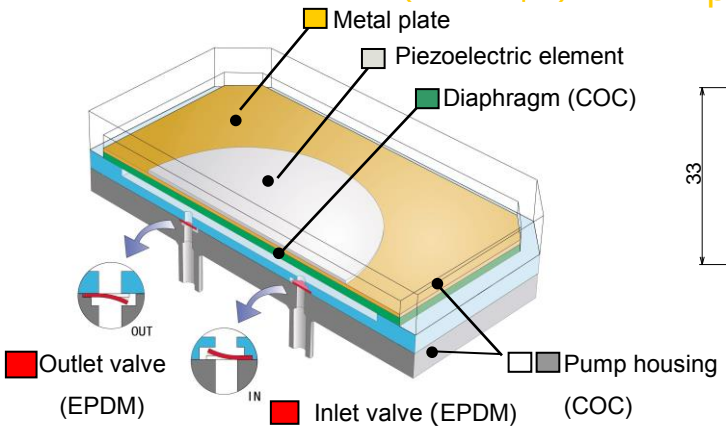
Note: Details including specifications may change without notification.

Flow Characteristics (Blue line: SDMP320 Red line: SDMP330W)

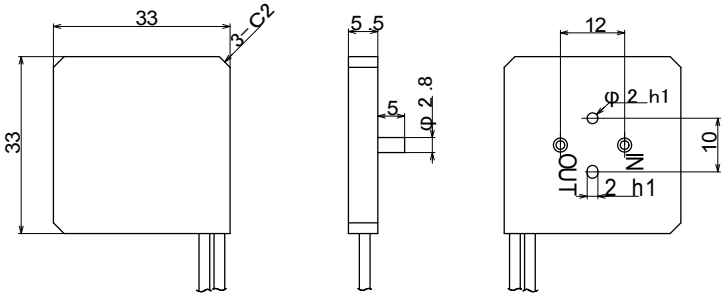




Internal Structure (Unimorph)



Appearance and Dimensions



Driver Board MPD-200A

This driver board is a thin, compact and lightweight, yet high-voltage circuit board, designed for the piezoelectric micro pumps. From a regular 5 VDC input voltage, it can easily generate the high voltage supply of approximately 250 Vp-p, 40 Hz necessary for driving the micro pumps.

Item	Specifications
Input Voltage	5 VDC ± 5%
Output Frequency	1 ~ 60 Hz
Output Voltage	50 ~ 340 Vp-p
Number of Pumps Connectable	2 pieces (maximum)
External Dimensions, Weight	30 x 30 x 18 mm, approx. 9 g

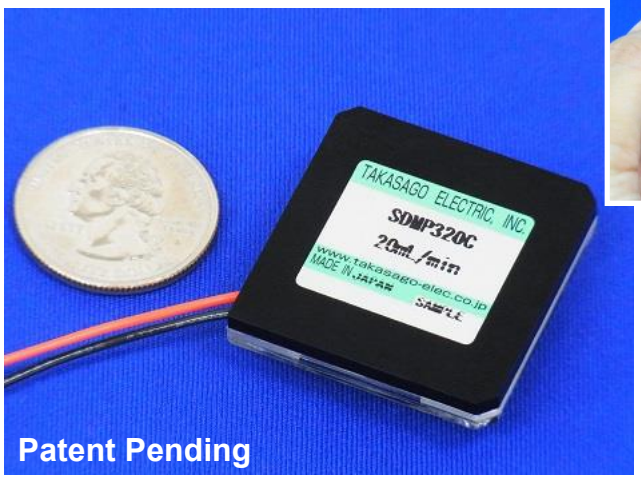
Controller MPC-200A

This is a compact and lightweight controller that can provide the high voltage power necessary for driving the micro pumps. It is user-friendly with a front panel digital display for configuring the output voltage and output frequency, and a memory function to store the latest setting used.

Item	Specifications
Input Voltage	5 VDC ± 5%
Output Frequency	1 ~ 60 Hz
Output Voltage	60 ~ 300 Vp-p
Number of Pumps Connectable	2 pieces (maximum)
External Dimensions, Weight	75 x 30 x 89 mm, approx. 140 g
Attachment	AC adapter

PIEZOELECTRIC MICRO PUMP (Under Development)

Cartridge Type Piezo Pump SDMP320C



Can be easily replaced for each fluid

Features

- A built-in magnet enables the pump cartridge to be easily removed from and attached to an actuator with a piezoelectric element.
- Sterilisation of the pump cartridge prior to use is possible.
- No metal is used as wetted materials.
- Self-priming is possible.
- Flow rate is adjustable by changing drive voltage or drive frequency.
- Small-sized, lightweight and slim.
- Low noise and low power consumption.

Use the QR code on the right or the link below to see the movie "How to use"
https://youtu.be/0XMQHMF_qu8

Specifications (Target Values)

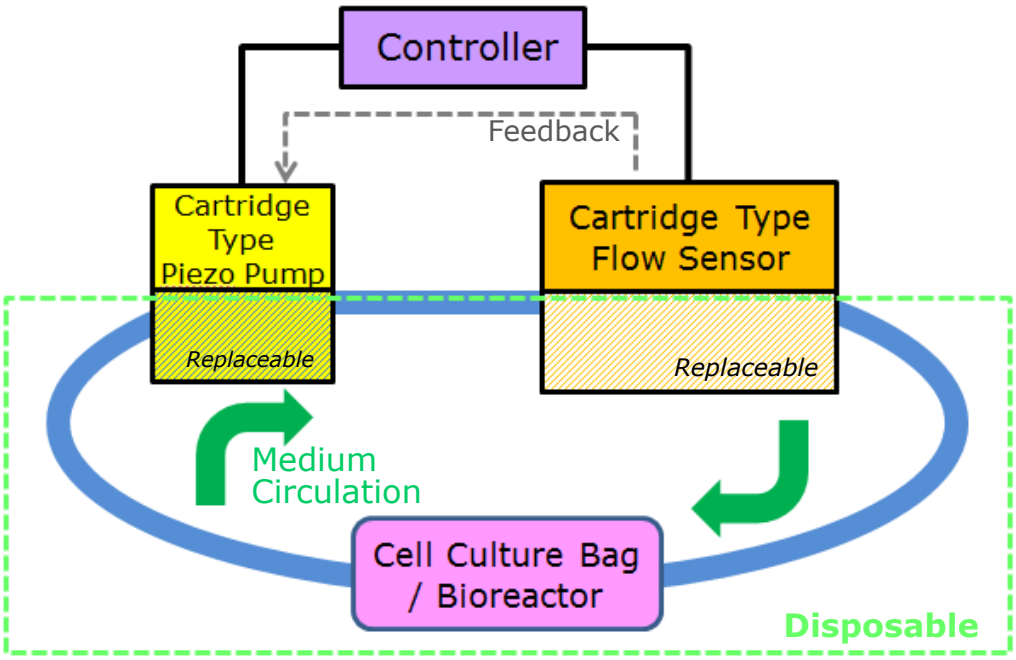
Model Number	SDMP320C
Pump Type	Piezoelectric Diaphragm Pump
Typical Flow Rate	20 ml/min
Typical Pump Pressure	20 kPa
Drive Voltage	60 to 250 Vp-p
Drive Frequency	10 to 60 Hz
Typical Suction Load Pressure	-1.0 kPa
Operating Temp.	5 to 50 °C
Wetted Materials	COC (Cyclic Olefin Copolymer) EPDM (Ethylene Propylene Diene Monomer)
External Dimensions	33 x 33 x 6.9 mm
Weight	Approx. 13 g
Input / Output Pipes	φ1.8-φ2.8-L5.0 mm

The data above are based on sine wave drive. Flow rate and pump pressure are larger if driven by Takasago Standard wave.

Note: Details including specifications may change without notification.

Application Example

●Flow Control System for a Biotech Application



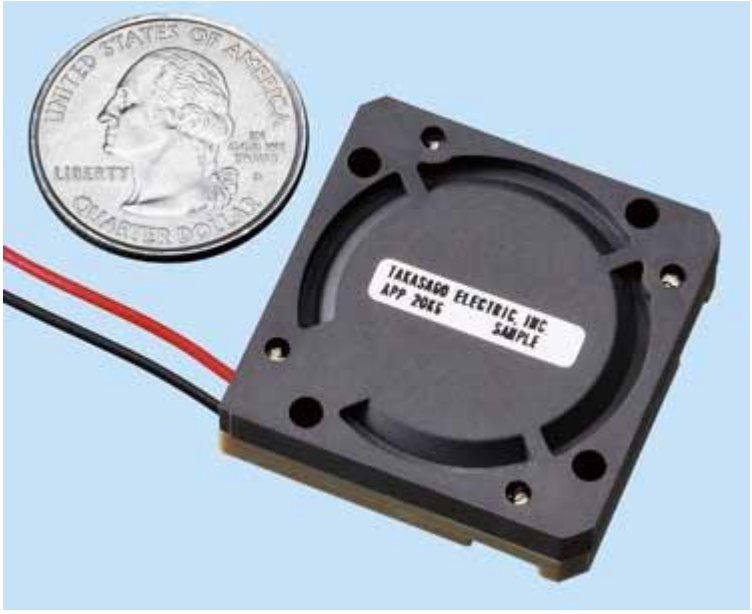
The features of the Cartridge Type Piezo Pump are most useful for applications sensitive to cross-contamination, for example, biotech devices. It also works most effectively when used with other replaceable items as a system. The system in the photo above is one example; a circulation system of culture medium, which consists of a cartridge type flow sensor, the Cartridge Type Piezo Pump, and a controller. As the flow sensor monitors the flow and the controller adjusts the output of the pump accordingly, the flow remains very stable even over a long period, despite changes in the liquid level. Programmed flow control using an external input is also possible. All wetted parts can be replaced after each cell/tissue culturing cycle is completed.

Note:

- The controller is compatible with other Takasago piezoelectric micro pumps. It is also customisable for other flow sensors. Please contact us for details.
- The flow sensor in the photo above is manufactured by Aichi Tokei Denki Co., Ltd. and is currently under development. More information is available on request.

PIEZOELECTRIC MICRO PUMP

Highly Inert Models APP Series



Uses only PTFE, PEEK and Perfluoroelastomer as wetted materials.
Most suitable for aggressive chemicals, solvents, etc.

Features

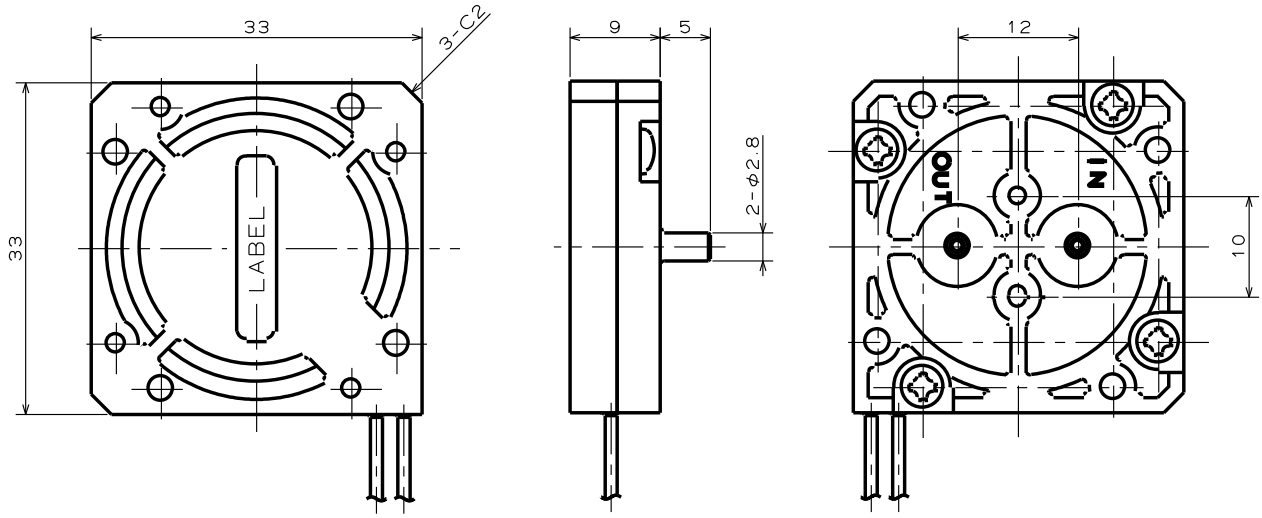
- Small-sized, lightweight and slim.
- Typical flow is 15 ml/min, which is adjustable by changing drive voltage or drive frequency.
- Low noise and low power consumption.
- Self-priming is possible.

Specifications

Model Number	APP-20KG
Pump Type	Piezoelectric Diaphragm Pump
Flow Rate	15 ml/min (typical)
Pump Pressure	25 kPa
Drive Voltage	60 ~ 250 Vp-p
Drive Frequency	10 ~ 60 Hz
Suction Load Pressure	−1.0 kPa
Operating Temperature	5 ~ 50 °C
Wetted Materials	PTFE, PEEK (polyether ether ketone) and Perfluoroelastomer
External Dimensions	33 × 33 × 9 mm
Weight	17 g

Note: Details including specifications may change without notification.

Appearance and Dimensions



Driver board MPD-200A

This driver board is a thin, compact and lightweight, yet high-voltage circuit board, designed for the piezoelectric micro pumps. From a regular 5 VDC input voltage, it can easily generate the high voltage supply of approximately 250 Vp-p, 40 Hz necessary for driving the micro pumps.

Item	Specifications
Input Voltage	5 VDC ± 5%
Output Frequency	1 ~ 60 Hz
Output Voltage	50 ~ 340 Vp-p
Number of Pumps Connectable	2 pieces (maximum)
External Dimensions, Weight	30 x 30 x 18 mm, approx. 9 g

Controller MPC-200A

This is a compact and lightweight controller that can provide the high voltage power necessary for driving the micro pumps. It is user-friendly with a front panel digital display for configuring the output voltage and output frequency, and a memory function to store the latest setting used.

Item	Specifications
Input Voltage	5 VDC ± 5%
Output Frequency	1 ~ 60 Hz
Output Voltage	60 ~ 300 Vp-p
Number of Pumps Connectable	2 pieces (maximum)
External Dimensions, Weight	75 x 30 x 89 mm, approx. 140 g
Attachment	AC adapter

Tygon® tubing (accessory)

Product Name ： Tygon® 2375 (for use with methanol, water and most general uses)

Size: I.D. 2.38 mm

＊Note ：If the flow decreases with the above tubing, please use the larger size tubing.

＊Tygon® is a trademark of Saint-Gobain Performance Plastics.

Miniature Peristaltic Pump

RP-Q1

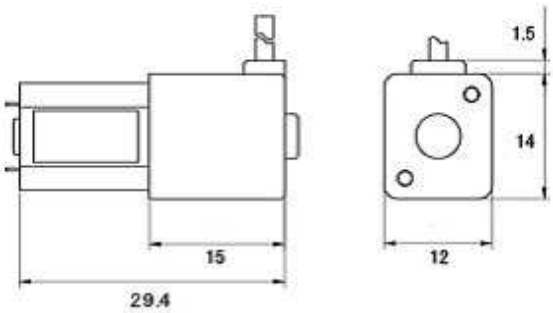
Features

- Compact size: Dimensions of 30 mm X 12 mm X 14 mm
- Low Power consumption: only 0.12 W

Specifications

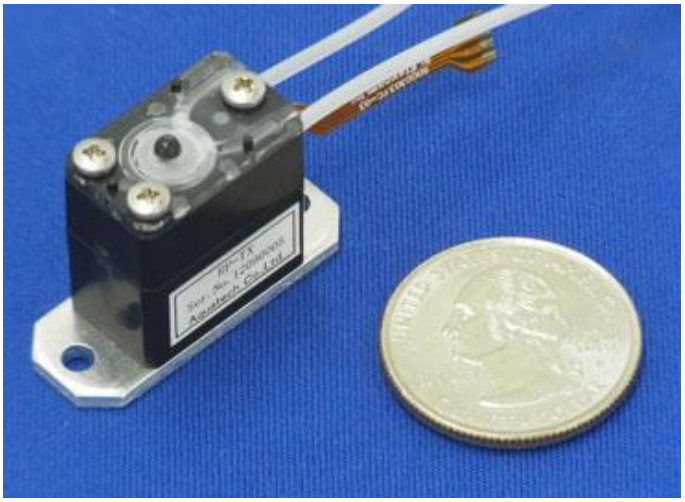
Discharge Rate	0.45 ml/min ±15 % (tap water at 20 ℃)
Discharge Pressure	50 kPa
Tube Material	Silicone (I.D. 1.5 mm)
Motor	DC geared motor
Rated Voltage	DC 3 V
Power Consumption	0.12 W
Weight	11 g

Dimensions



Note: Details including specifications etc. may be changed at any time without notice.

MICRO PERISTALTIC PUMP
RP-TX Series



Pulse Speed Display
& Controller

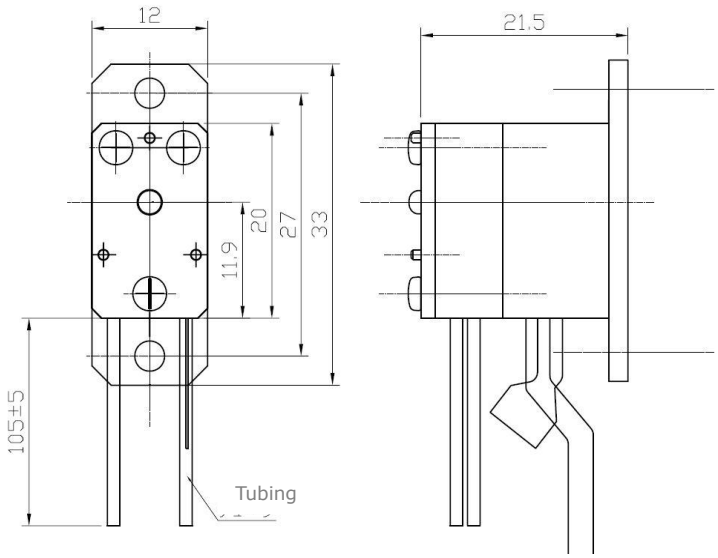
Features

- The world's lowest level of flow for a peristaltic pump on the market: 0.1 ~ 40 µl/min
- A replaceable pump head, which includes tubing.
- Compact size: Dimensions of 33 × 12 × 21.5 mm
- An easy-to-use controller is available upon request. (Sold separately)

Specifications

Flow Rate	0.1 ~ 40 µl/min ±15 % (Water at 25 °C, Pulse speed: 3 ~ 1000 pps)
Tubing Material	Silicone or Olefine (I.D. 0.5 mm)
Pump Pressure	30 kPa or more
Motor	Stepper motor
Rated Voltage	3 VDC

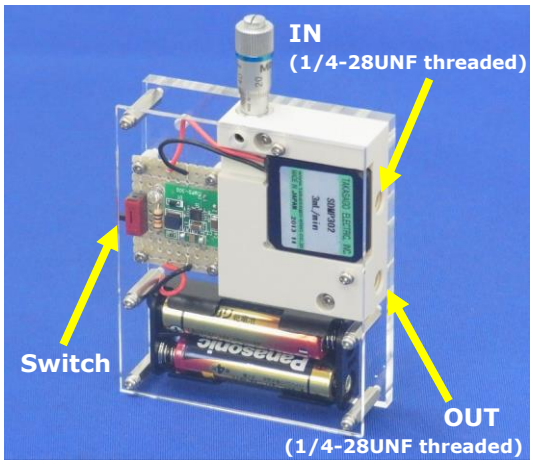
Dimension



Note: Specifications etc. may be changed at any time without notice.
This is a product of Aquatech Co., Ltd.

INTEGRATED PRODUCT

Manually Adjustable Low Pulsation Micro Pump Unit



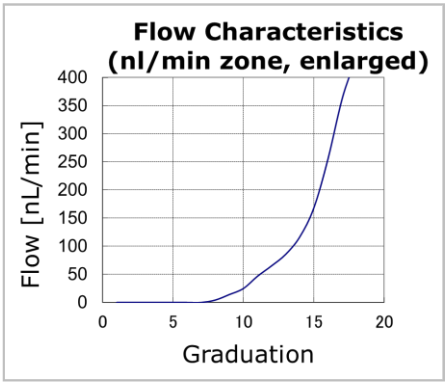
Suitable for Lab-on-a-Chip Devices, Cell Culture Media Circulation, etc.

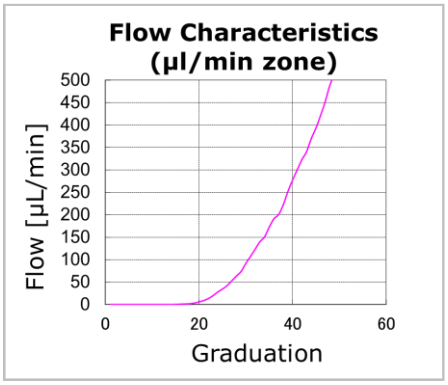
Features

- Flow from a piezoelectric micro pump is adjusted by a micro needle valve.
- Can adjust flow from nl/min level to around 1.5 ml/min manually.
- Flow pulsation at low flow rates is drastically reduced by a micro needle valve (See the graph at the bottom).
- Usable as a stand alone by AAA or R03 batteries.
- Compact size: Dimensions of 66 x 25 x 105 mm
- Maximum pump pressure is around 35 kPa (The value varies depending on the flow channel configuration and fluid characteristics).

Demonstration video is available at the following website.
http://www.takasago-elec.co.jp/movie/low_pulsation_pump_unit-e.wmv

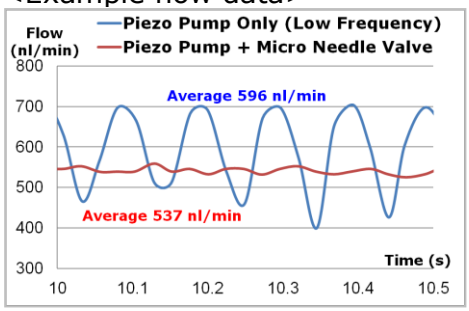
Flow Characteristics <Example flow data>





Reduction of Flow Pulsation

<Example flow data>

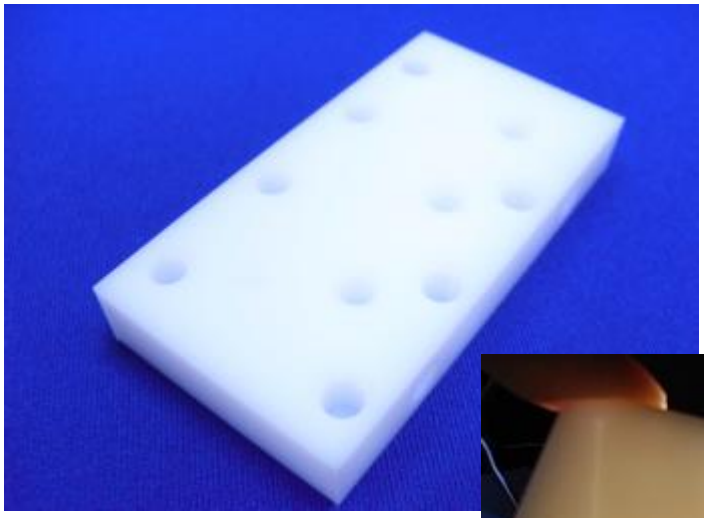


Similar Item

Unit of a piezo pump and a needle valve is also available (Either a driver or a controller is separately needed).

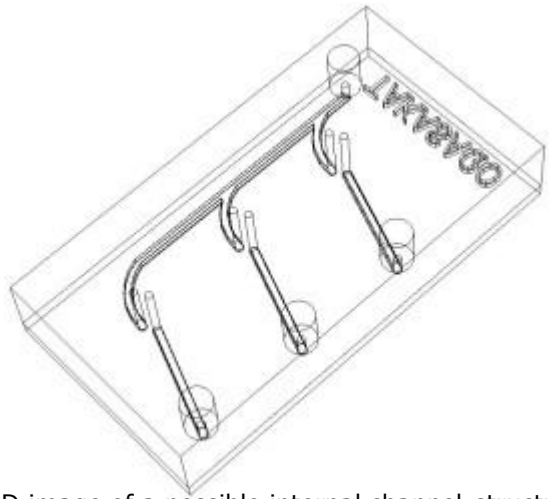
Note: Details including specifications may change without notification.

Bonded PTFE Manifold



Features

- This is a 100% PTFE manifold, with internal channels made by the bonding of two layers of modified PTFE. Due to excellent chemical resistance, this product is compatible with a wide range of fluids.
- Highly integrated manifolds with freely curving channels that could not be fabricated through the conventional drilling process are now made available.
- Bonding is achieved through the use of a special technique that does not use adhesive, so the channels are absolutely contamination-free. The bonding method is highly reliable such that the bonding surfaces are unified so well that the point of joining can be hardly distinguished.



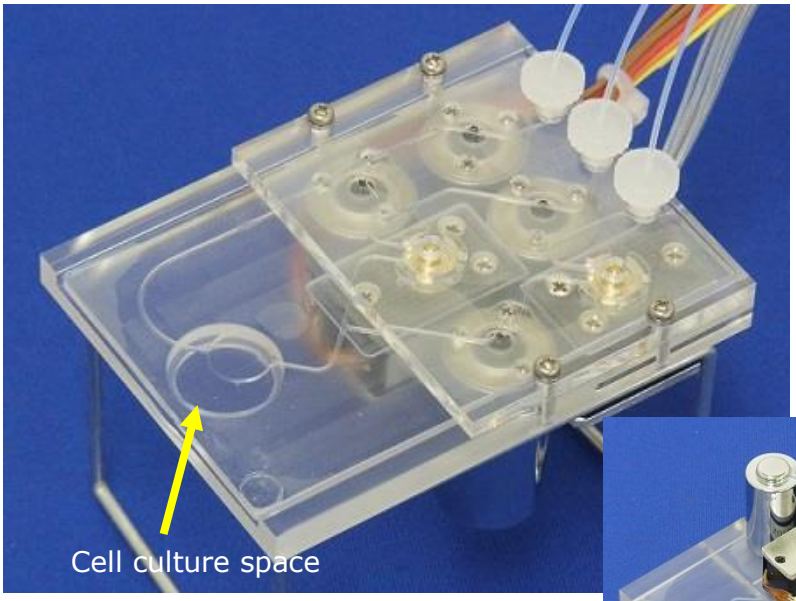
A 3D image of a possible internal channel-structure

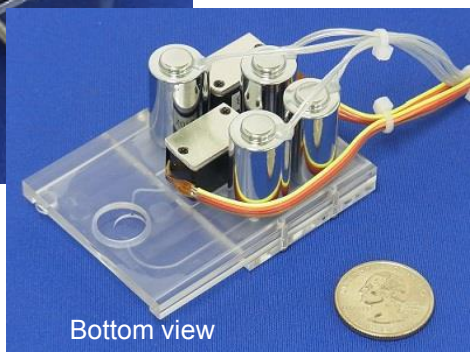
Note: Specifications etc. may be changed at any time without notice.

INTEGRATED PRODUCT

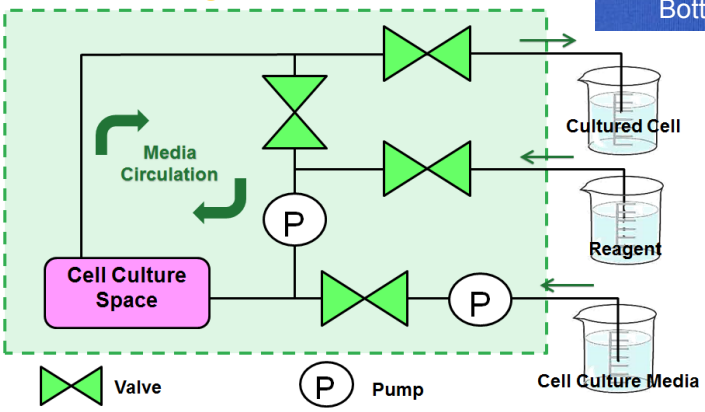
(Under development)

All-in-one Disposable PDMS Chip





Flow Diagram



This all-in-one system on a disposable PDMS chip is a microfluidic module designed for cell culture. It has peristaltic pumps, miniature valves, and a built-in cell culture space which can be observed under a microscope. The replaceable chip is sterilisable before use. A remote controller using an Android application is available for this module upon request.

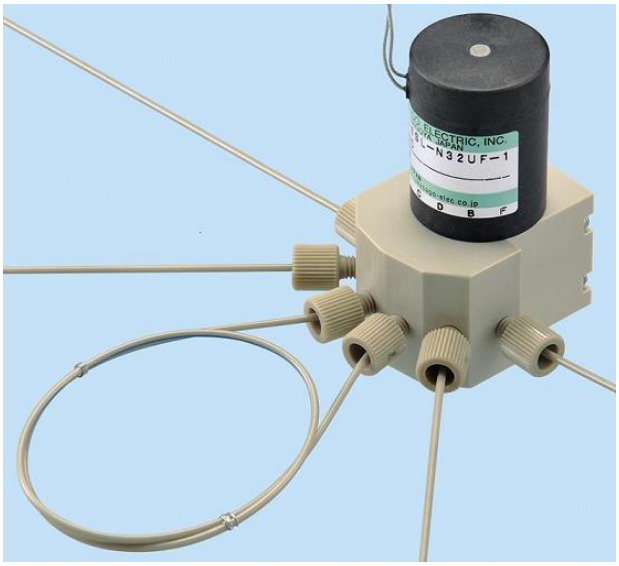
This is just an example of our integrated fluid control systems. We design and manufacture systems for various microfluidic operations in accordance with your requirements. Please feel free to contact us.

Note:

1. This system is jointly developed with Aquatech Co., Ltd. and Fukoku Bussan Co., Ltd.
2. Details including specifications may change without notification.

SOLENOID-DRIVEN SHEAR VALVE

2-Position 6-Port Valve



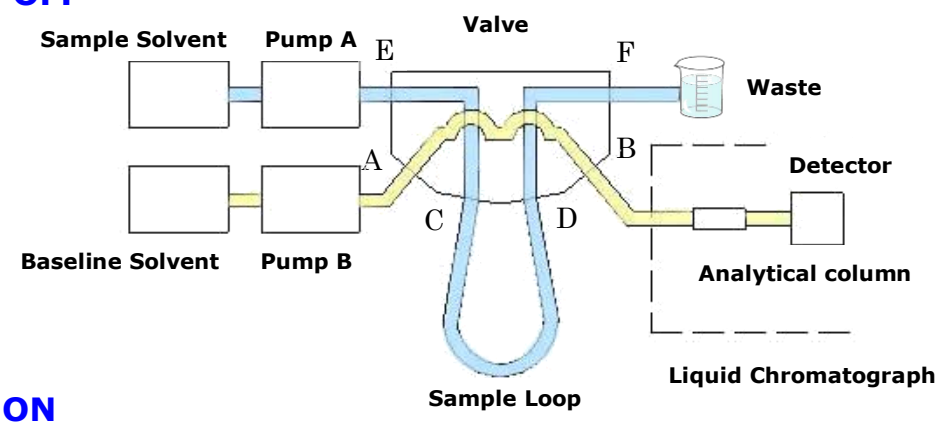
For Sample Injection or Metering in a LC

Features

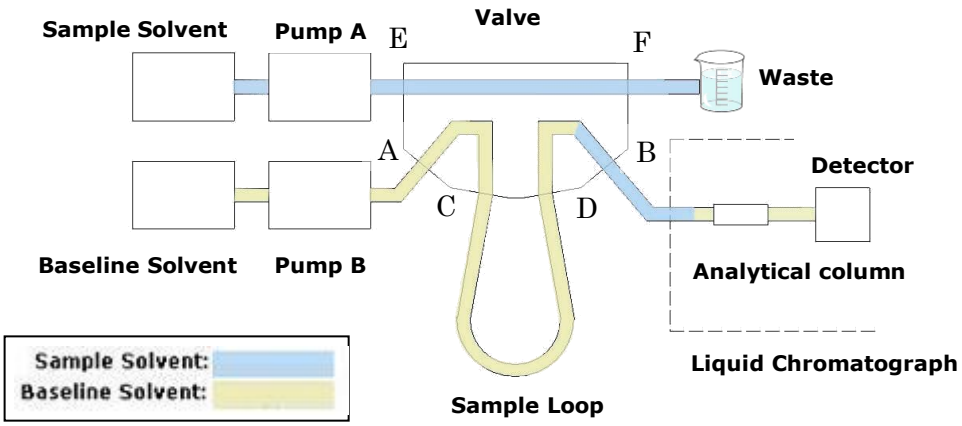
This is the first solenoid-driven linearly-actuating valve that realises the same functions as a motor-driven rotary valve. As it is solenoid-driven, a stepper motor or a driver is not required. It is economical and easy to operate, comparing to the conventional rotary valve.

Example of Connections

OFF



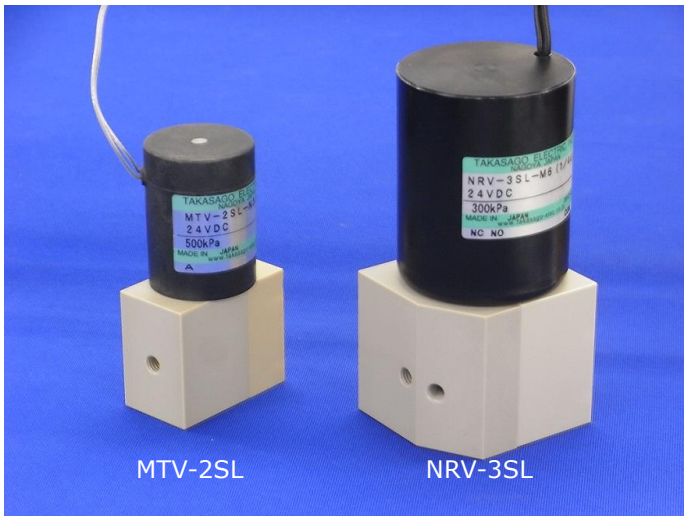
ON



SOLENOID VALVE

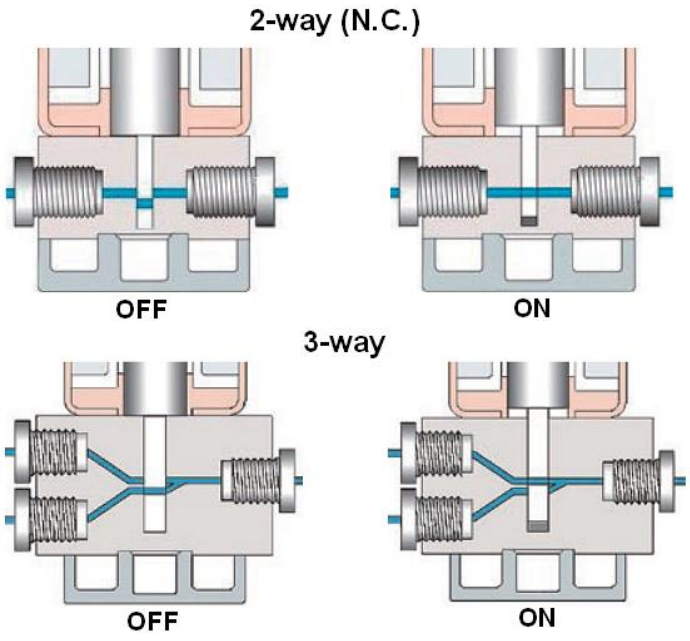
(Patented)

Solenoid-Driven Slider Valve



The solenoid-driven slider valve is a kind of shear valve in which a shutter called a "slider" moves vertically and shuts off the flow path. The pumping volume which occurs when a diaphragm valve opens and closes, or the dead volume in which some fluid may stay in the valve is reduced to almost zero, preventing reduction of accuracy in analysis or fluid dispensation. Furthermore, the pressure capability of this slider valve is greatly improved.

Image of Internal Structure



Features

- No pumping volume, as there is no structural change in the internal volume when the valve operates.
- An excellent fluid exchangeability compared to a diaphragm solenoid valve due to its almost linear flow path and very small internal volume.
- Easily controlled compared to a motor-driven rotary type shear valve because the slider valve is simply driven by the ON-OFF operation of a solenoid and no special driver is required. It is also compact in size.

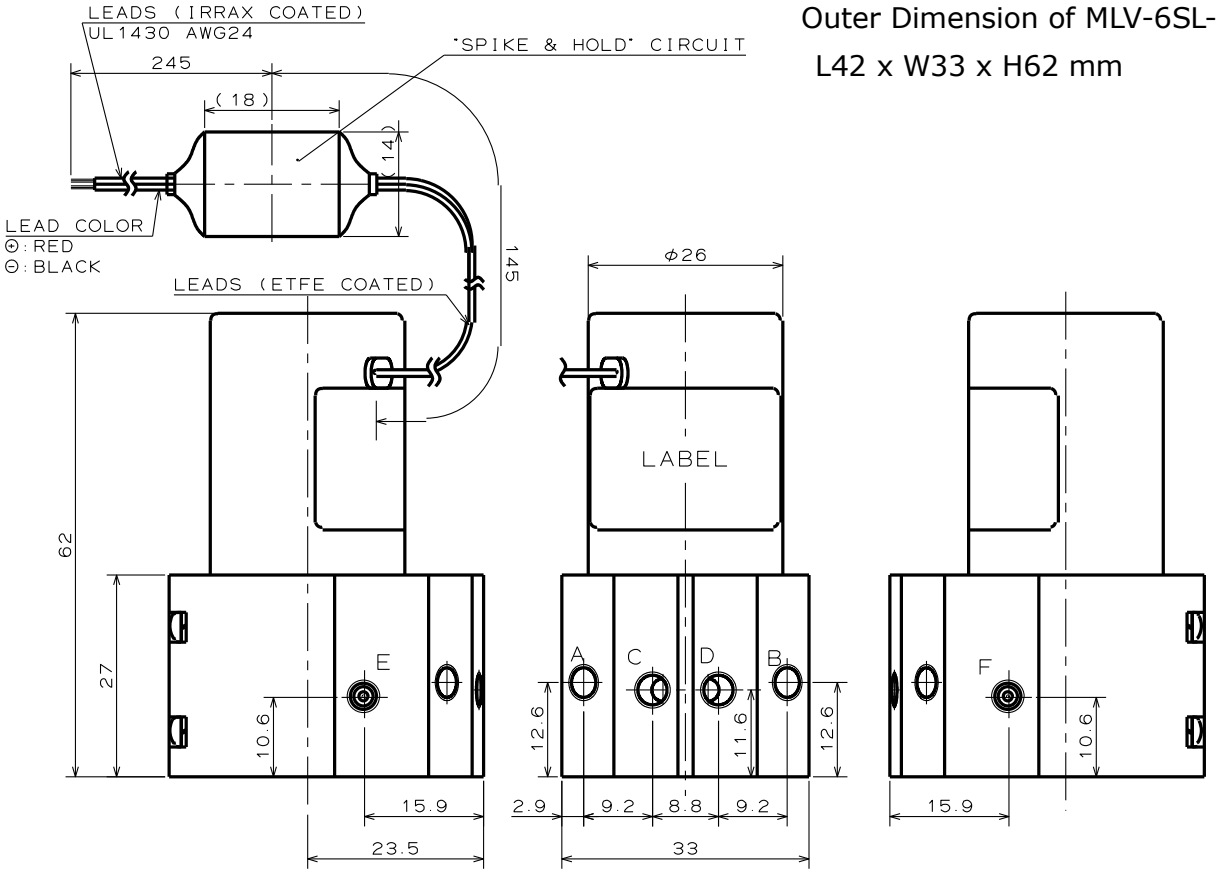
Specifications

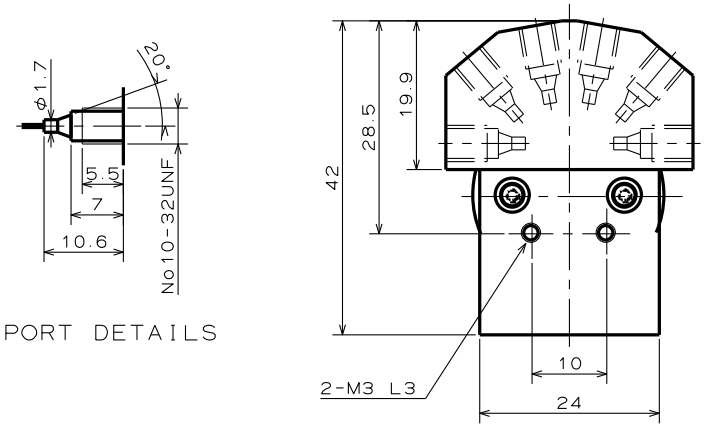
Model Number	MTV-6SL-N32UF-1	MLV-6SL-32UFH-1
Orifice Diameter	0.4 mm	
Port Connection	No.10-32UNF	
Operating Pressure Range	0 ～ 500 kPa	0 ～ 2.5 MPa
Fluid Temp. Range	5 ～ 50 °C	
Ambient Temp. Range	5 ～ 50 °C	
Rated Voltage	12VDC, 24VDC	
Power Consumption	23 W (3.6 W holding with power save electronics)	18 W (3 W holding with power save electronics)
Internal Volume	9.0 µl	
Life Expectancy	100 thousand cycles（not guaranteed value)	
Wetted Materials	PTFE, PEEK, SiC (Silicon Carbide)	

* This product carries a circuit that controls the voltage by timer. It is not recommendable to run the ON / OFF cycles at over 0.5 Hz.

Dimensions (MTV-6SL-N32UF-1)

Outer Dimension of MLV-6SL-32UFH-1:
L42 x W33 x H62 mm

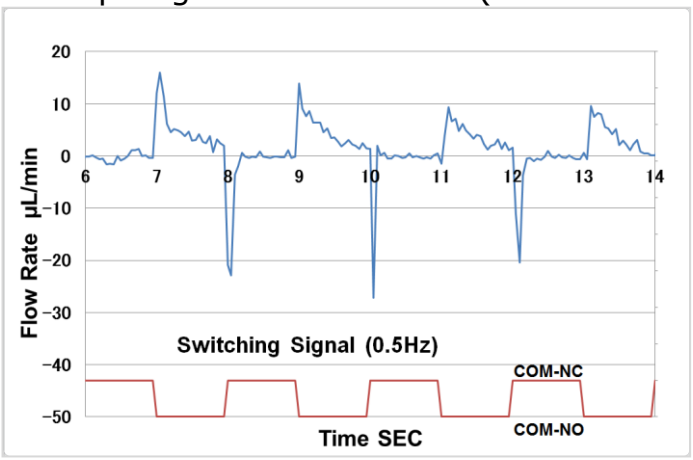




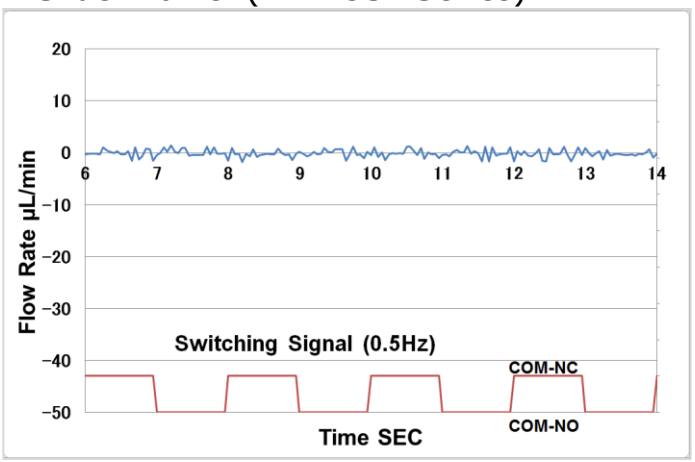
Note: Details including specifications may change without notification.

Pumping Volume Comparison (Flow rates of the N.C. ports when turning on/off 3-way valves)

< Diaphragm Isolation Valve (KV-3K Series) >



<Slider Valve (MTV-3SL Series) >



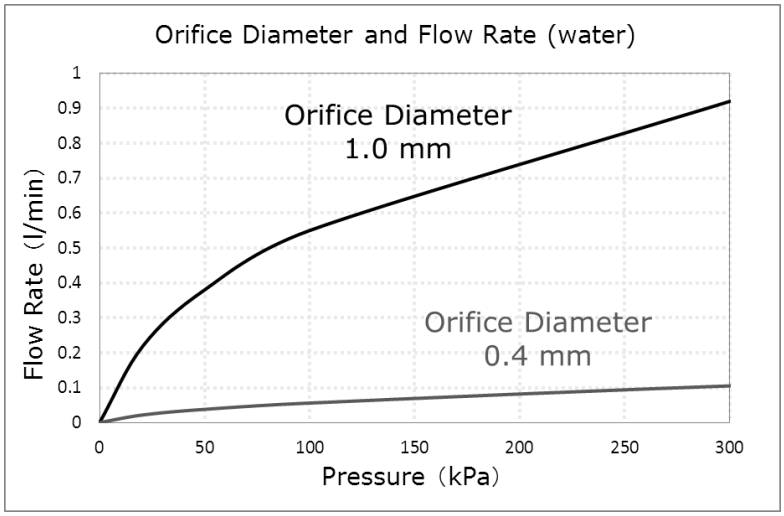
Measurement method: Measure the flow rates at the N.C. ports with a micro flowmeter when turning the valves on/off while filled with water and with the COM. and N.O. ports plugged.

These data are provided by Fujii T. Lab, Institute of Industrial Science, the University of Tokyo.

Specifications

Model Number	MTV-2SL-N32UF-1	MTV-3SL-N32UF-2	NRV-2SL-M6(1/4U)	NRV-3SL-M6(1/4U)
Type	2-way (N.C.)	3-way	2-way (N.C.)	3-way
Orifice Diameter	0.4 mm		1.0 mm	
Port Connection	No.10-32UNF		M6, 1/4-28UNF	
Operating Pressure Range	0 ~ 500 kPa		-90 ~ 300 kPa	
Media/Ambient Temp. Range	10 ~ 50 °C			
Rated Voltage	12 VDC, 24 VDC			
Power Consumption	18 W		16 W	
Duty Cycle	Intermittent (ED = 15 %), Maximum ON time: 45 s *Incorporation of our hit and hold circuit (option) allows a continuous energisation at the rated voltage.		Intermittent (ED = 33 %), Maximum ON time: 2 minutes *Incorporation of our hit and hold circuit (option) allows a continuous energisation at the rated voltage.	
Internal Volume	1.5 µl	3.7 µl	16.5 µl	36.2 µl
Wetted Material	PTFE, PEEK, Al_2O_3		PTFE、PEEK、SiC（Silicon Carbide）	
Outer Dimensions (mm)	L24 x W34 x H62	L24 x W38.5 x H62	L38 x W38 x H86	L38 x W41 x H86
Life Expectancy	200 thousand cycles (not guaranteed value)		100 thousand cycles (not guaranteed value)	

Flow Rate (Comparison of Orifice Diameter 0.4 mm and 1.0 mm)



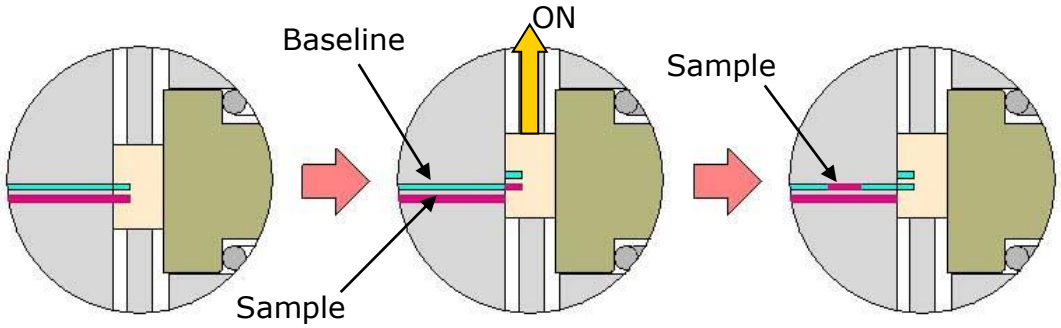
Note: Details including specifications may change without notification.

For liquid chromatography

Solenoid-driven Sample Injector

This is a solenoid driven injector for injecting a small volume of samples into a baseline in various analytical instruments, such as those for liquid chromatography. As it is driven by a solenoid, it is more economical and easier to operate compared to a conventional stepper motor driven injector.

Image of the internal structure



Features

- Volume of injection variable from 0.2 to 1.0µl
- Small with outer dimensions of L39.1 x W30 x H62.5 mm
- Controlled just by the ON and OFF operations of a DC power supply

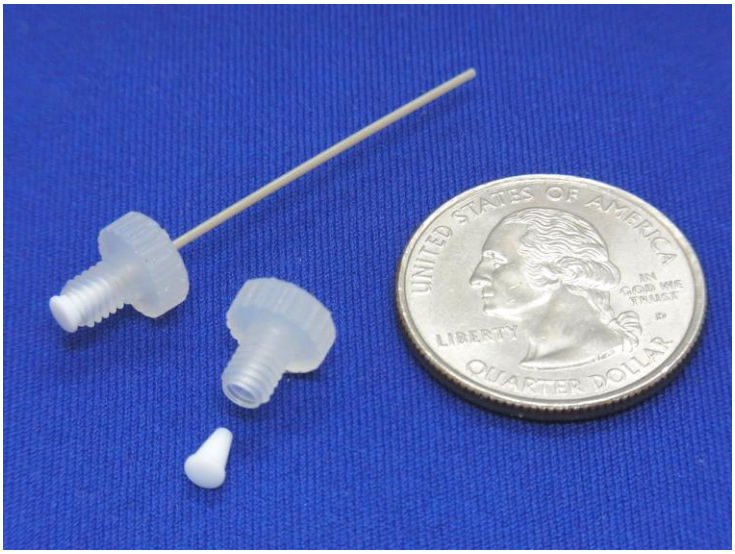
Specifications

Operating Pressure Range	0 - 300kPa
Port Connection	10-32UNF (Standard)
Voltage	12VDC, 24VDC
Power Consumption	18W
Duty Cycle	Intermittent (ED=15%)
Max. Continuous Energising Time	45 s
Wetted Materials	PTFE, PEEK, Al_2O_3
Lifetime	100 thousand operations (Experimental result)

Note: Specifications etc. may be changed at any time without notice.

CAPILLARY TUBE FITTINGS

CJ Series

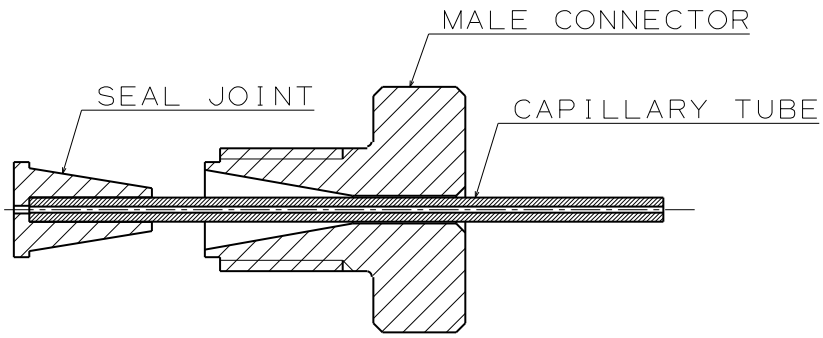


Connects Glass/PEEK Capillary Tubes Easily

Features

- Pressure capability of -90 ～ 700 kPa at temperature range of 5 ～ 60 degrees C.
- Flat bottom seal design that enables easier machining on female port compared to tapered seal design.
- Customization to meet customer's tubing diameters is possible.

How to Connect



*You can connect this fitting to a female port by simply screwing it into the port after a capillary tube is inserted into the seal joint and the male connecter.

Standard Models and Applicable Tubing Diameters

Model Number	Tubing Outer Diameter	Tubing Inner Diameter	Seal Joint Inner Diameter	Port Connection
CJM4-0375	0.375 mm	0.1 - 0.15 mm	0.2 mm	M4
CJM6-1/32	1/32 inch (0.79 mm)	0.012 - 0.016 inch (0.3 - 0.4 mm)	0.4 mm	M6

Note: Details including specifications may change without notification.

MICRO NEEDLE VALVE

MNV Series

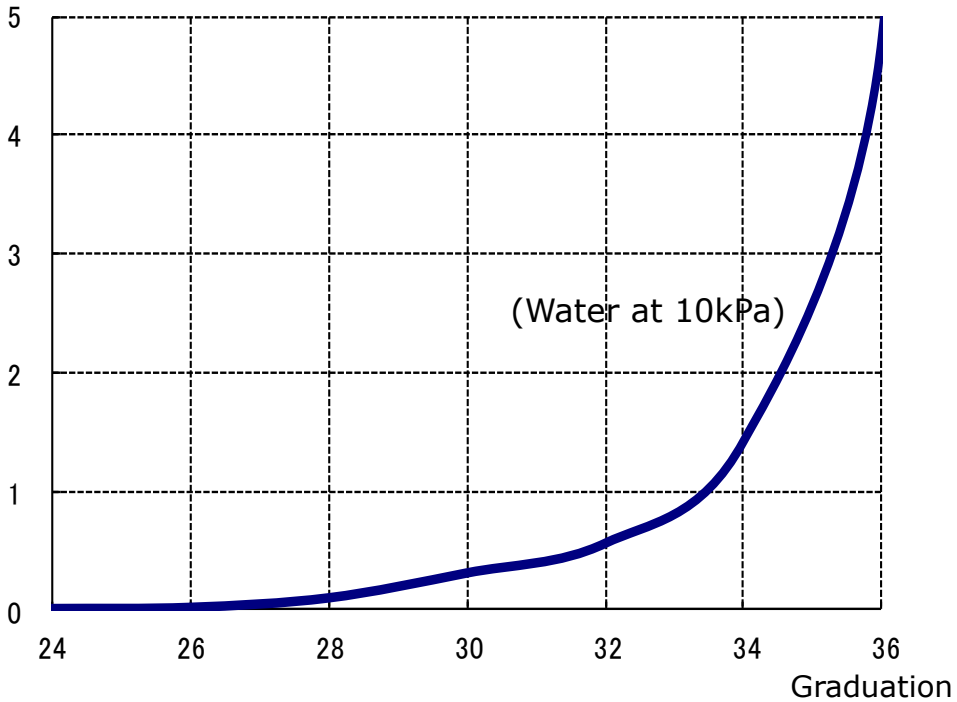
Features

- Fine manual adjustment of flows below 1 µl/min
- Reduced flow pulsation by restricting flow
- Wetted materials: Perfluoroelastomer, PEEK and stainless steel
- Operating pressure range: 0 ～ 200 kPa

Flow Characteristics

<Example Flow Data*>

Flow (µL/min)



*Flow-graduation relationship varies according to valve.

Note: Details including specifications may change without notification.

Reduction of Flow Pulsation

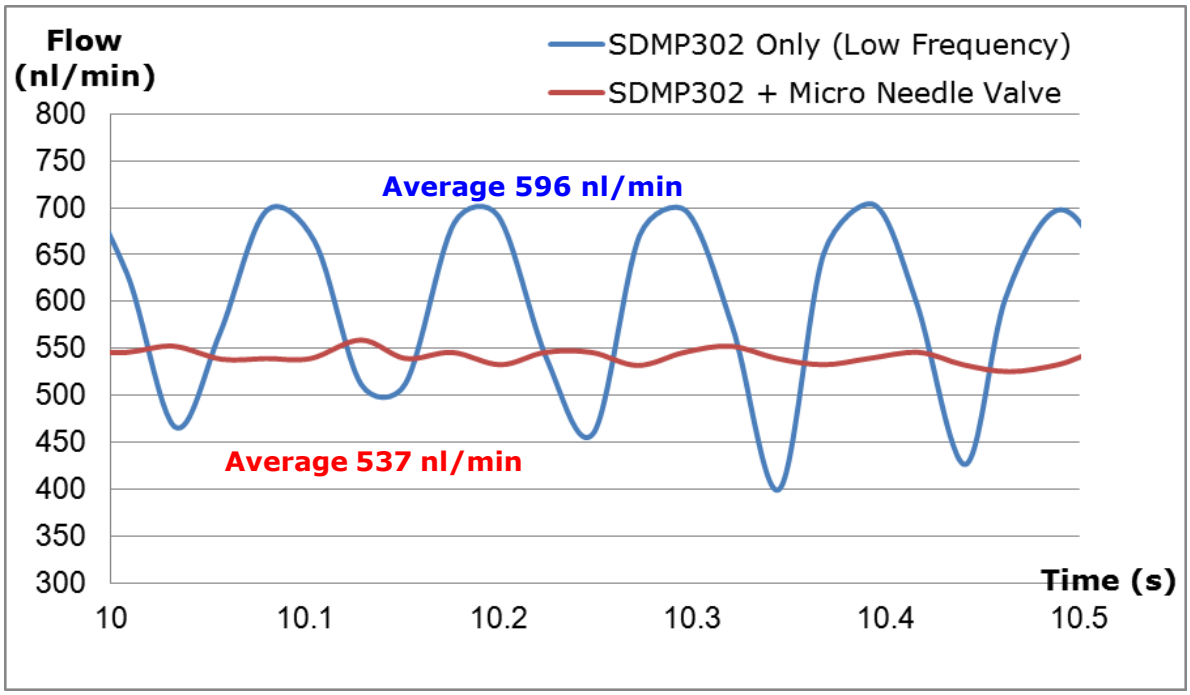
<Example of Combination with Piezoelectric Micro Pump>

Piezoelectric micro pumps are small-sized, lightweight and slim diaphragm micro pumps driven by piezoelectric element. By considerably reducing the drive frequency and the drive voltage from the standard operating ranges, a piezoelectric micro pump alone can transfer µl/min level flows. However, significant pulsation is created at a low flow rate as represented by the blue line in the graph below.

By incorporating a micro needle valve on the discharging side of a piezoelectric micro pump, a low flow rate with almost no pulsation can be achieved. The red line on the graph below is an example that shows this remarkable reduction in pulsation. Pulsation can also be reduced when combined with other kinds of pumps, such as peristaltic pumps.

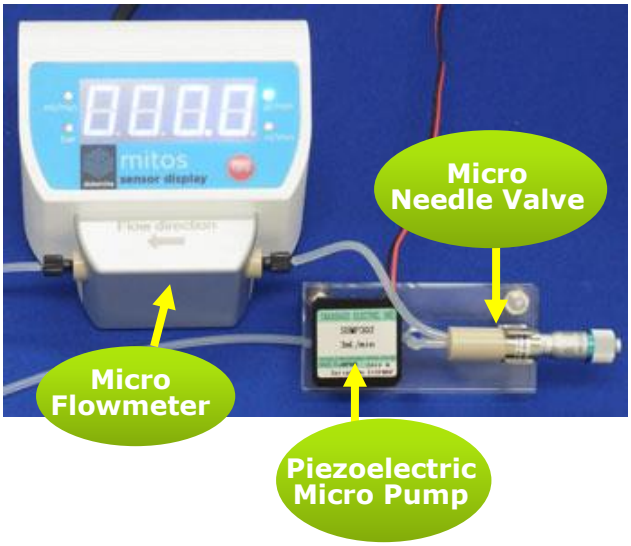
Note: The actual effect may change depending on the flow rates, pumps, types of tubing, etc. Please consult with us for more details.

Flow Data of Piezoelectric Micro Pump SDMP302 (at 10 Hz, 150 Vp-p)



Low Pulsation Micro Pump Module

<Piezoelectric Micro Pump + Micro Needle Valve + Micro Flowmeter>

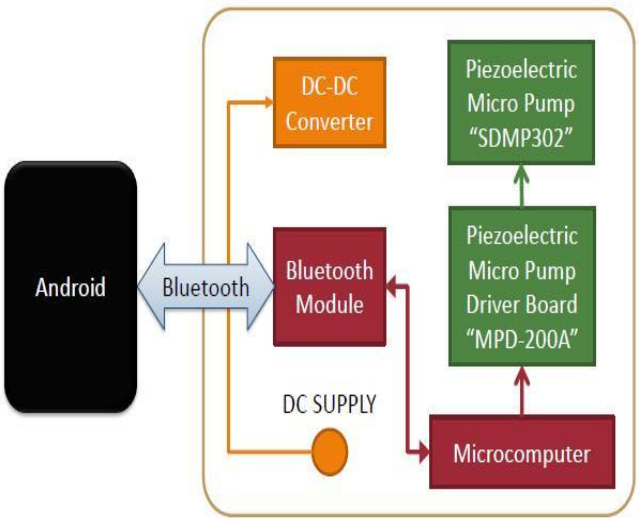


The Low Pulsation Micro Pump Module is a module to adjust the flow of a piezoelectric micro pump at the µl/min level using a micro needle valve. In the setup in the left picture, the output flow from the module is being measured by a micro flowmeter. The features of this module make it suitable for various fields, such as flow cytometers, cell culture equipment, etc.

ANDROID APPLICATION **(For R&D)**

Micro Pump Remote Control System

Operation Screen Image



Control System Block Diagram

Just Drag the Bars to Adjust the Flow

This Android application is for the remote control of Takasago piezoelectric micro pumps. Your Android device* wirelessly connects to a microcomputer, and allows you to easily switch on/off and adjust the drive voltage and drive frequency. A ready-to-use sample package** that includes a Bluetooth module, a microcomputer and a driver board is available upon request.

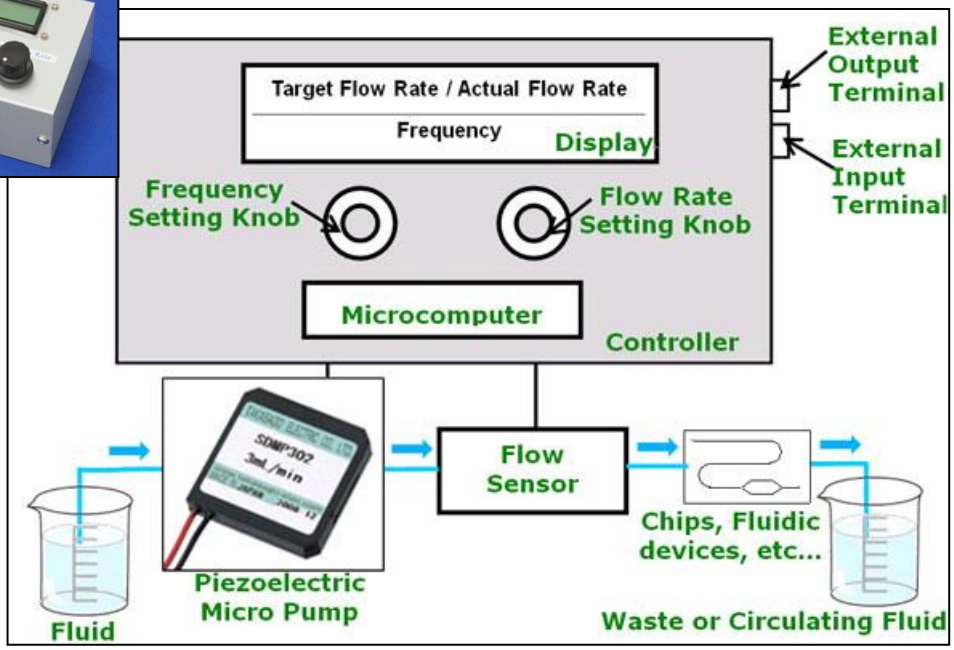
This specific system for piezoelectric micro pumps is just an example of our Android-controlled fluidic systems. Consult with us for developing other systems to control pumps, valves, etc.

* This application requires Android platform version 2.3.6 or later and a Bluetooth terminal.

** Sample package is for sale. Pumps are not included in the package.

[Under Development]

Flow Control System for Piezoelectric Micro Pump



Automatically Adjust to a Target Flow Rate

Features

- Automatically adjusts the flow to the target rate set manually by the flow setting knob. Flow remains stable even when the liquid levels of the vessel change.
- Programmed flow control using an external input is also possible.
- The flow data can be exported through the external output terminal.
- Applicable to Takasago piezoelectric micro pump models SDMP302, SDMP306 and APP-20KG.
- The flow sensor can be selected from Sensirion LG16-0150 or LG16-1000. These support a range of flow rates from a few hundred nl/min to 7 µl/min and from a few µl/min to 1 ml/min, respectively. Please consult us for more details.
- The wetted materials of the flow sensors are PEEK and glass, and those of the pumps are plastics and elastomers. The highly inert model allows the handling of a wide range of fluids. For the details, please refer to the user's manual of each piezoelectric micro pump.

Note:
The flow rate of a piezoelectric micro pump is adjustable by changing either the drive voltage or drive frequency. However, the automatic flow control of this system is enabled by the adjustment of drive voltage only. Thus, the range of automatic flow control is restricted to within the adjustable range of the drive voltage. Please manually adjust the drive frequency when you require flow rates outside of this range.

*Details including specifications may change without notification.

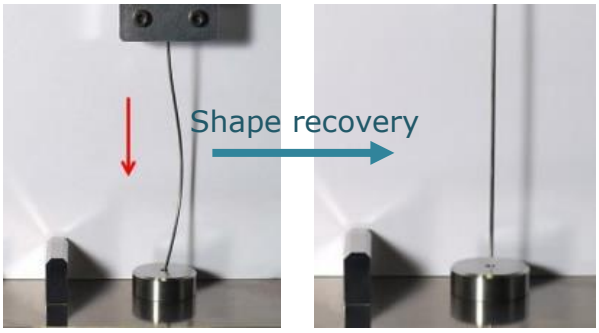
TITANIUM TUBING

β-Titanium Probes

Non-bending and Absolutely Non-magnetic Features

1. Non-bending piercing probe

Long-lasting due to its shape recovery characteristics with respect to bending (high tensile strength and superior spring characteristics), which contributes to longer life expectancy compared to stainless steel probes.



2. Non-magnetic

Having absolutely no magnetism makes it particularly suitable for analyzers that use magnetic particles, like an immunoassay system.

3. Finely polished titanium

The fine bore polishing (Ra 0.02 at minimum) reduces the carryover of samples (especially proteins), system flushing time and sample loss.

Comparison with Stainless Steel

	Elasticity	Magnetism	Corrosion resistance
β-Titanium	Good	Non-magnetic	Excellent
Stainless stl.	Bad	Can be magnetic	Good

Made to order. Please contact us for more details.