



## Diaphragm Valves

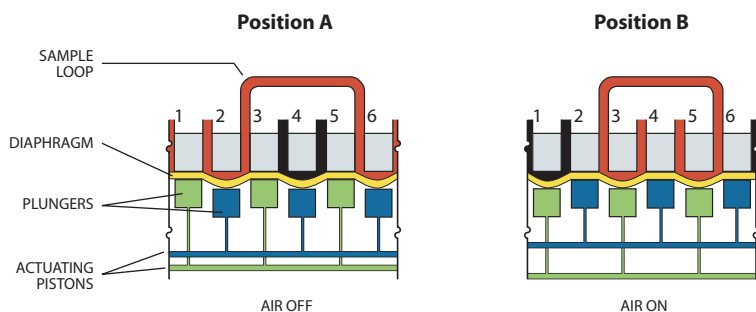
- Only 35 mm (1.375") in diameter
- >1,000,000 cycle lifetime
- Three configurations – 6 port, 10 port, and 4 port internal sample
- Built in actuator
- 1/16" or 1/32" Valco zero dead volume fittings

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  $\pm .002$ ".

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

# DIAPHRAGM VALVES

## Ordering Information

### Diaphragm valves, 1/32" fittings, 0.25 mm ports (.010")

Process GC		Includes stainless steel nuts and ferrules.	A 3-way solenoid is required for actuation. Order separately.	4 port		6 port		10 port	
1/32"	0.25 mm								
									
		<b>.5 µl internal sample</b>	<b>1 µl internal sample</b>	<b>sampling/switching</b>	<b>multifunctional</b>				
Prod No	Price	Prod No	Price	Prod No	Price	Prod No	Price		
DV12-1114-5		DV12-1114-1		DV12-1116		DV12-1110			

**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, 0.40 mm ports (.016")

Process GC		Includes stainless steel nuts and ferrules.	A 3-way solenoid is required for actuation. Order separately.	4 port		6 port		10 port	
1/16"	0.40 mm								
		<b>.5 µl internal sample</b>	<b>1 µl internal sample</b>	<b>sampling/switching</b>	<b>multifunctional</b>				
Prod No	Price	Prod No	Price	Prod No	Price	Prod No	Price		
DV22-2114-5		DV22-2114-1		DV22-2116		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		Includes stainless steel nuts and ferrules.	A 3-way solenoid is required for actuation. Order separately.	4 port		6 port		10 port	
1/16"	0.75 mm								
		<b>.5 µl internal sample</b>	<b>1 µl internal sample</b>	<b>sampling/switching</b>	<b>multifunctional</b>				
Prod No	Price	Prod No	Price	Prod No	Price	Prod No	Price		
DV22-3114-5		DV22-3114-1		DV22-3116		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

**MORE INFORMATION**  
 More applications . . . pp 117-121

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

### Replacement diaphragms

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

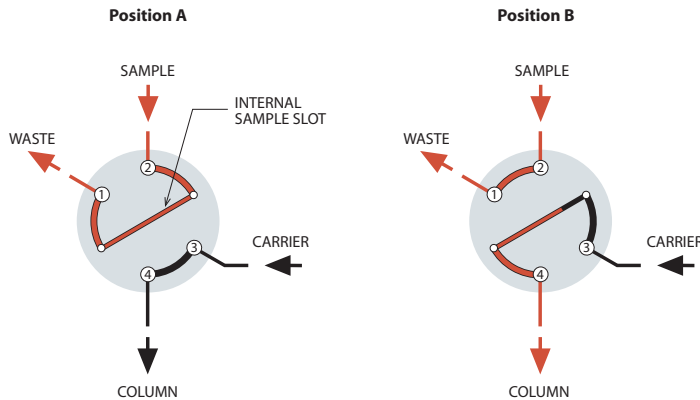
**OPTIONS**

- 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 .

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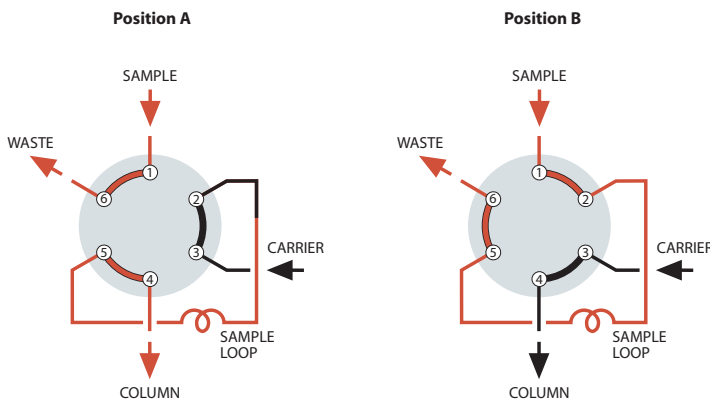
4 port sample injector



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



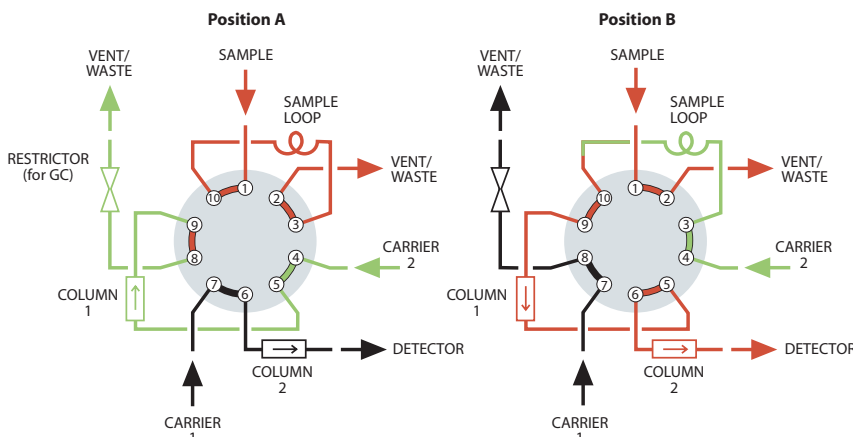
SAMPLE INJECTION

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