

# DV5 Series

## 3-way Switching Diaphragm Valves



Available as...

- Stand-alone: *page 8*
- Multi-stream modular: *page 11*
- Surface mount (ANSI/ISA-76  $\mu$ MS<sup>3</sup>): *page 12*

The DV5 Series diaphragm valve is a modular, flexible 3-way valve assembly available in three configurations: 1) stand-alone, 2) modular multi-stream, swept manifold, and 3) ANSI/ISA-76 compliant configuration. (See  $\mu$ MS<sup>3</sup>™ Modular Substrate System brochure for more data). The DV5 is totally free of springs, bellows, packing and lubricants in the process wetted area. Metal-to-metal seals to atmosphere ensure that there is no leaching of undesirable elements into the flow stream. Elgiloy® diaphragms ensure the utmost in corrosion resistance and life span. For Elgiloy® chemical compatibility see the *Technical Support* section of the CIRCOR Tech website at [www.circortech.com](http://www.circortech.com).

### Features & Benefits

- 3-way switching
- Surface mount ANSI/ISA-76 compliant\*
- Metal-to-metal seals to atmosphere
- Wide variety of materials for virtually all applications
- No o-rings, springs, or lubricant in wetted flow path
- Very low internal volume (0.64 cc)
- Pneumatic actuation
- Pressures from vacuum (50 torr) to 400 psig (27.6 BAR)
- Compact package (3" L x 2.3" H x 1.5" W)

\* with  $\mu$ MS<sup>3</sup>™ adapter plate

### Technical Data

<b>BODY</b>	316L stainless steel, Monel® and Hastelloy® C-276
<b>SEATS</b>	Tefzel®, PCTFE (Kel-F®), Polyimide (Vespel®) and PEEK™
<b>DIAPHRAGMS</b>	Elgiloy® AMS 5876
<b>ORIFICE SIZE</b>	0.110" (2.8 mm)
<b>FLOW CAPACITY</b>	0.15 Cv
<b>VALVE INTERNAL VOLUME*</b>	0.64 cc
<b>LEAKAGE</b>	1 x 10 <sup>-5</sup> cc/sec helium (inboard)
<b>MIN. ACTUATION PRESSURE</b>	35 psig @ 50 psig process

\* Dead volume in machined passages of the valve body between mounting surface and sealing diaphragm(s).

### Operating Pressures

<b>OPERATING PRESSURE</b>	Vacuum (50 torr) to 400 psig (27.6 BAR)
<b>PROOF PRESSURE</b>	1,000 psig
<b>BURST PRESSURE</b>	2,000 psig

### Operating Temperatures

SEAT MATERIAL	TEMPERATURE	
Tefzel®	-40° F to +140° F	-40° C to +60° C
PCTFE (Kel-F®)	-40° F to +300° F	-40° C to +149° C
Polyimide (Vespel®)	-40° F to +400° F	-40° C to +204° C
PEEK™	-40° F to +400° F	-40° C to +204° C

### CIRCOR Tech

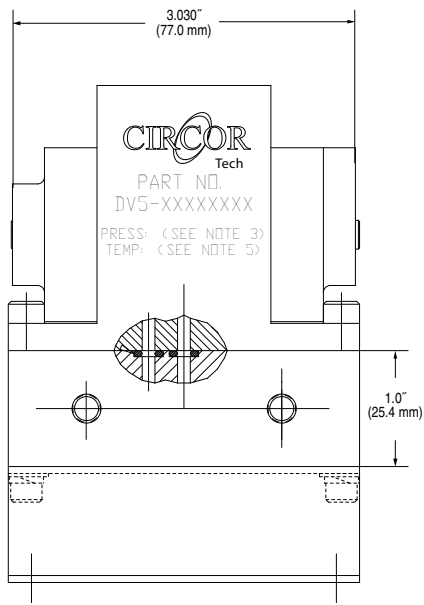
405 Centura Court • PO Box 4866 (29305) • Spartanburg, SC 29303  
 Phone (864) 574-7966 • Fax (864) 574-5608  
[www.circortech.com](http://www.circortech.com)

diaphragm valves

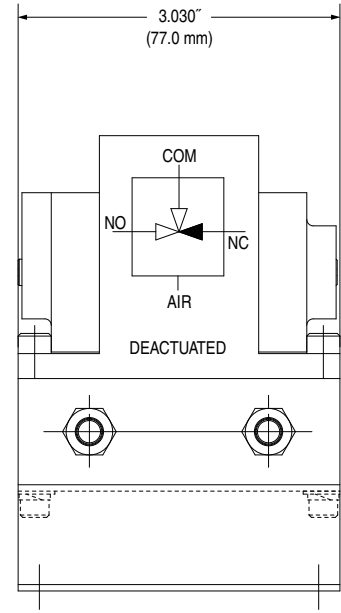
# DV5 Series

## Dimensions

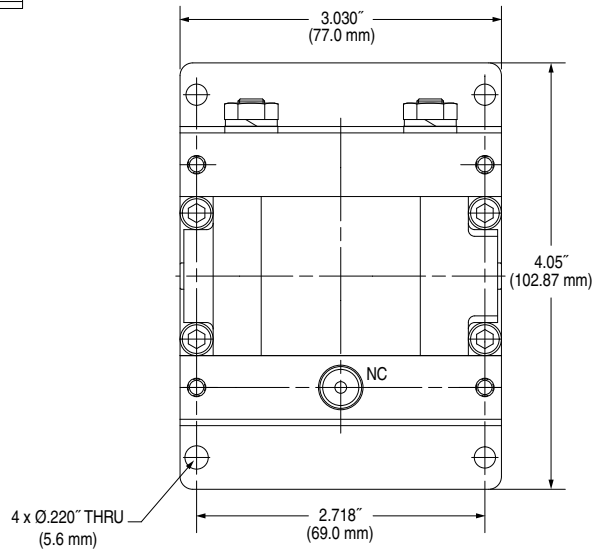
### Stand-alone, 3-way Switching Valve



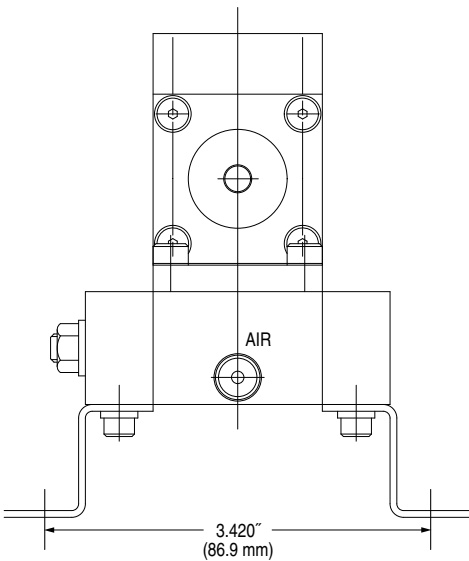
Front view



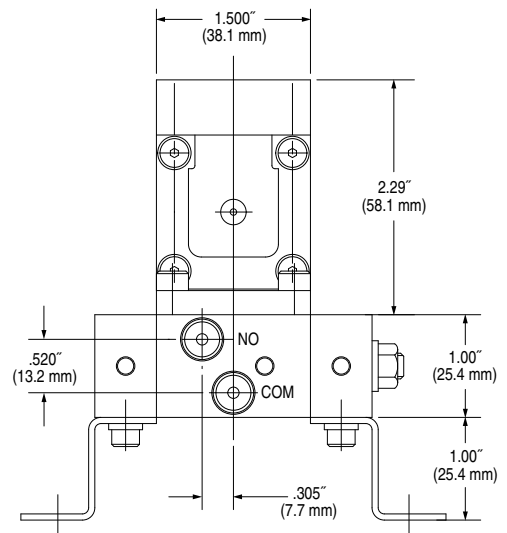
Back view



Top view



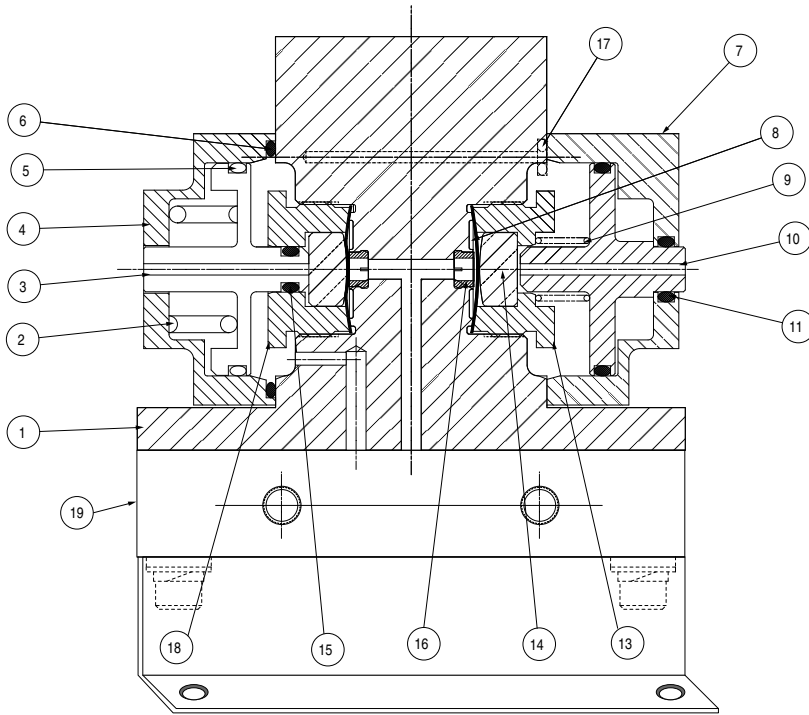
Side view



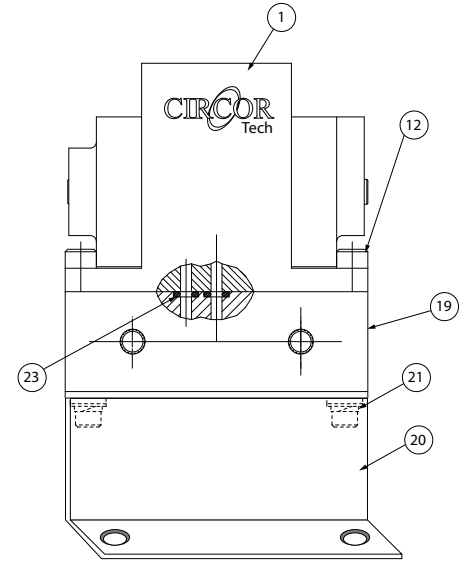
Back side view

# DV5 Series

## Materials of Construction



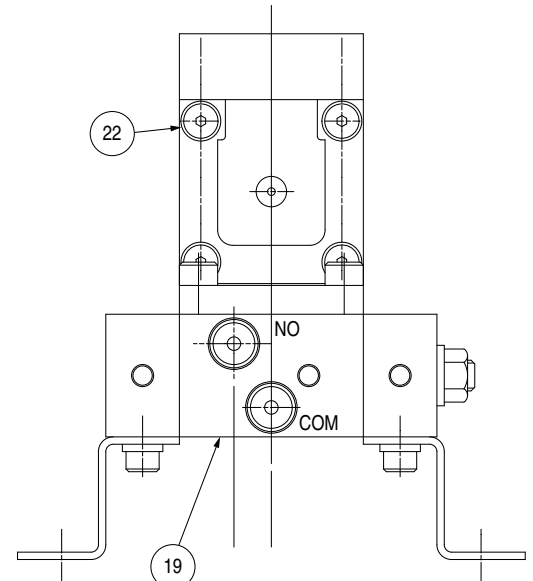
Side view, sectioned



Side view

#	PART	MATERIALS
1	Body*	316L stainless steel, Monel® & Hastelloy® C-276
2	Spring	316 stainless steel
3	Piston	316 stainless steel
4	Cap	316 stainless steel
5	O-ring	Viton®
6	O-ring	Viton®
7	Cap	316 stainless steel
8	Diaphragm*	Elgiloy® AMS 5876
9	Spring	17-7PH stainless steel
10	Piston	316 stainless steel
11	O-ring	Viton®
12	Screw	300 stainless steel
13	Retainer	316 stainless steel
14	Thrust plug	Brass
15	O-ring*	Viton®
16	Seat*	Tefzel®, PCTFE (Kel-F®), Polyimide (VespeI®), and PEEK™
17	O-ring	Viton®
18	Retainer	316 stainless steel
19	Manifold baseplate*	316L stainless steel, Monel® & Hastelloy® C-276
20	Mounting bracket	316 stainless steel
21	Screw	18-8 stainless steel
22	Screw	316 stainless steel
23	O-ring*	Viton®, Kalrez® or Teflon®

\* Wetted components

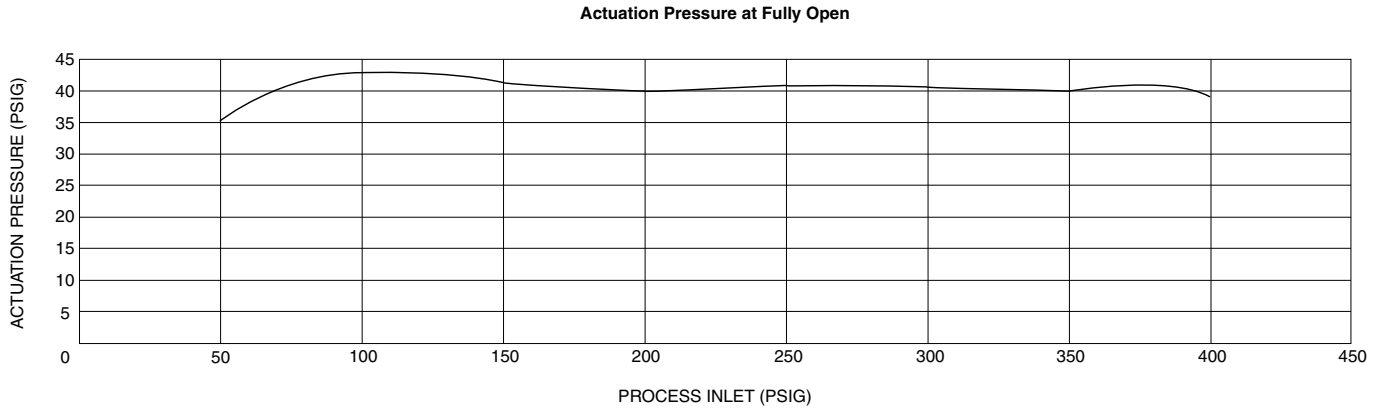


Front view

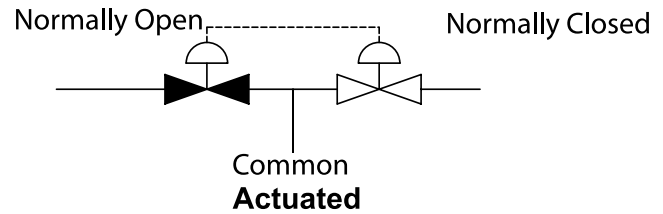
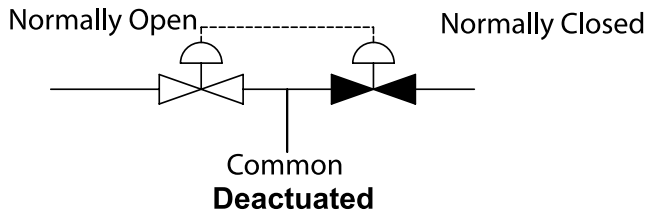
# DV5 Series

## Actuation Pressure Curve

### Stand-alone, 3-way Switching Valve



## Typical Flow Schematic



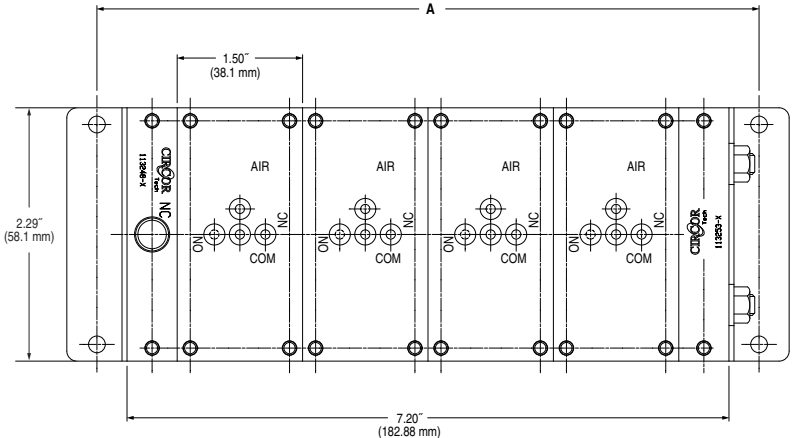
# DV5 Series

## Dimensions & Materials of Construction

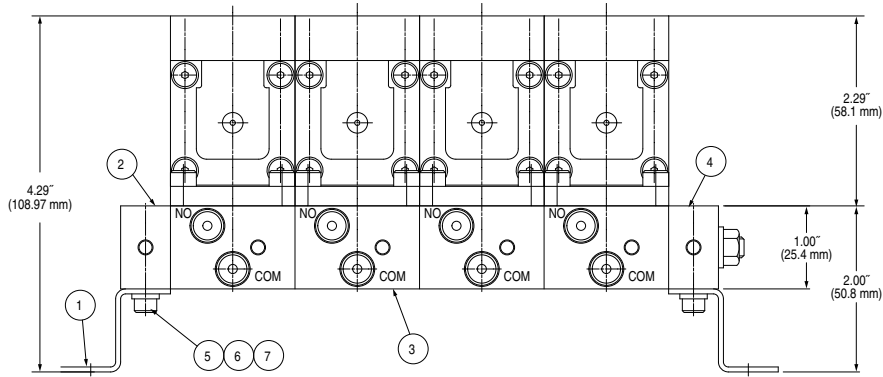
### Modular Multi-stream, 3-way Switching Valve with Swept Manifold

#	PART	MATERIALS
1	Bracket	316 stainless steel
2	End plate with port*	316L SS, Monel® & Hastelloy® C-276
3	Manifold baseplate*	316L SS, Monel® & Hastelloy® C-276
4	End plate*	316L SS, Monel® & Hastelloy® C-276
5	Screw	18-8 stainless steel
6	Flat washer	18-8 stainless steel
7	Lock washer	18-8 stainless steel
8	Nut	18-8 stainless steel
9	Threaded rod	18-8 stainless steel
10	Lock washer	18-8 stainless steel
11	Flat washer	18-8 stainless steel
12	O-ring*	Viton®, Kalrez®, or Teflon®

\* Wetted components



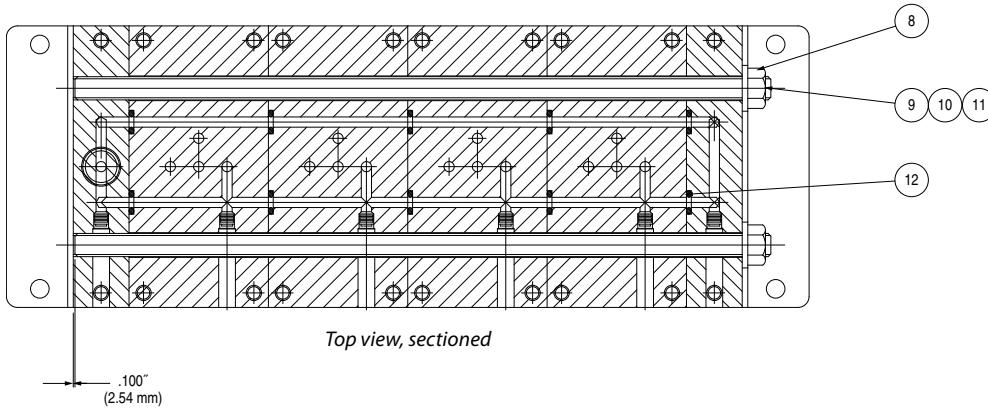
Top view



Manifold Plate Assembly (with Valves)  
(4 streams shown, can be 2 to 12 streams)

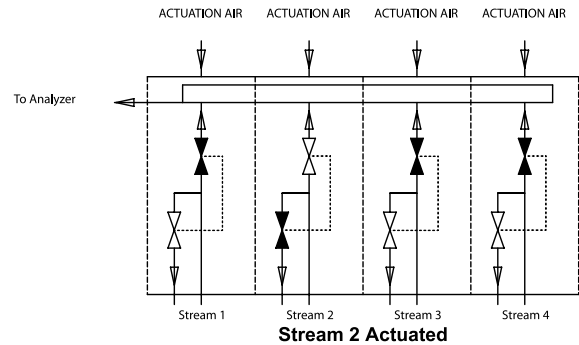
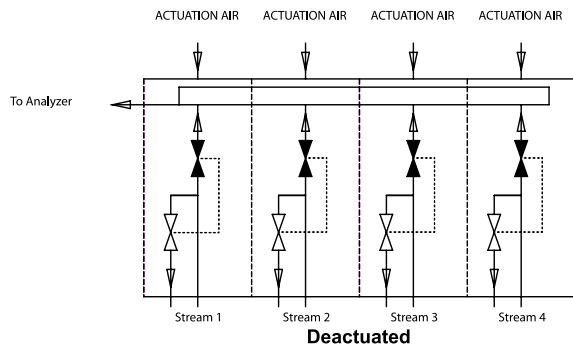
Side view

NUMBER OF VALVES (A)	INCH	MM
1	3.42	86.9
2	4.92	125
3	6.42	163
4	7.92	201.2
5	9.42	239.3
6	10.92	277.4
7	12.42	315.5
8	13.92	353.6
9	15.42	391.7
10	16.92	429.8
11	18.42	467.9
12	19.92	506



Top view, sectioned

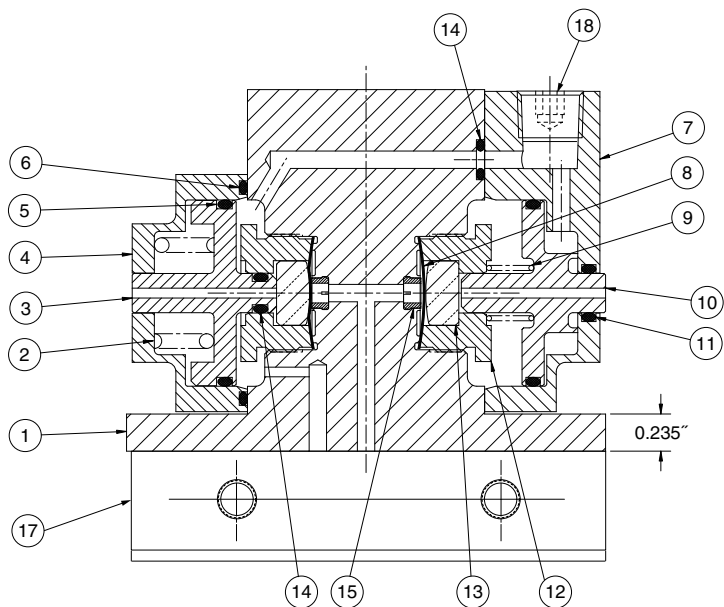
## Typical Flow Schematic



# DV5 Series

## Dimensions & Materials of Construction

Surface Mount (ANSI/ISA-76 compliant) – Valve Only with optional top air inlet

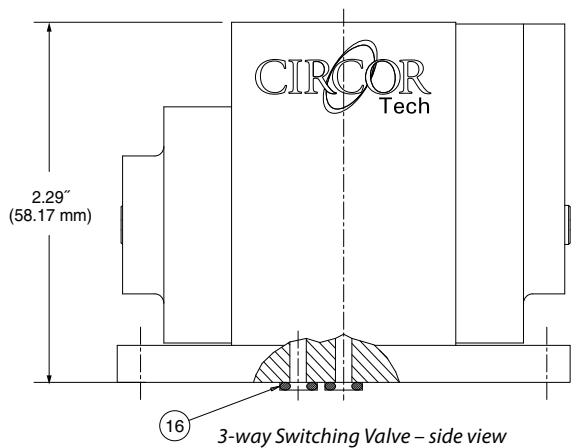


Side view, sectioned

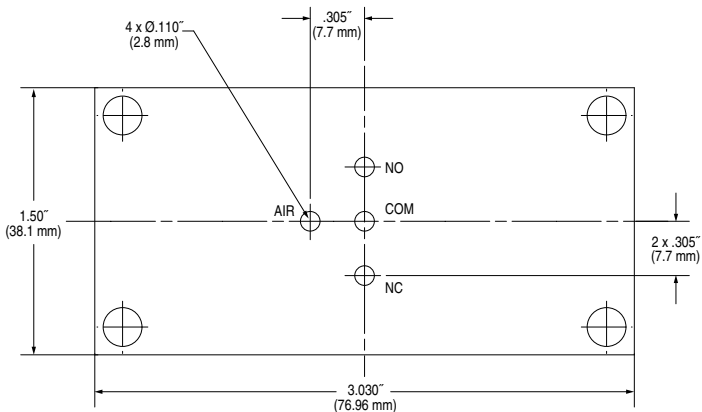
#	PART	MATERIALS
1	Body*	316L stainless steel, Monel® & Hastelloy® C-276
2	Spring	316 stainless steel
3	Piston	316 stainless steel
4	Cap	316 stainless steel
5	O-ring	Viton®
6	O-ring	Viton®
7	Cap	316 stainless steel
8	Diaphragm*	Elgiloy® AMS 5876
9	Spring	17-7PH stainless steel
10	Piston	316 stainless steel
11	O-ring	Viton®
12	Retainer	316 stainless steel
13	Thrust plug	Brass
14	O-ring	Viton®
15	Seat*	Tefzel®, PCTFE (Kel-F®), Polyimide (VespeI®), and PEEK™
16	O-ring*	Viton®, Kalrez®, or Teflon®
17	µMS <sup>3</sup> ™ Adapter plate*† (ANSI/ISA-76 compliant) supplied separately	316L stainless steel
18	Top air inlet (optional)	

\* Wetted components

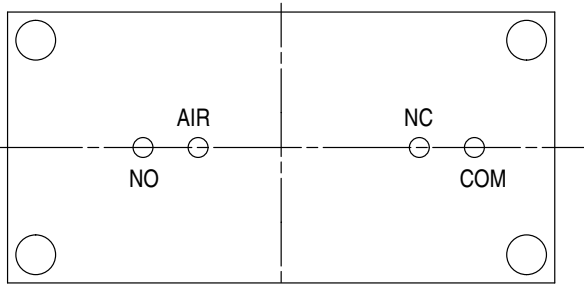
† Required when mounting to an ANSI/ISA-76 platform



3-way Switching Valve – side view

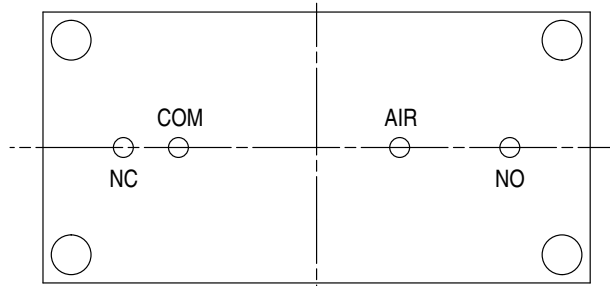


3-way Switching Valve – bottom view



Surface mount – bottom view  
(ANSI/ISA-76 compliant)  
µMS<sup>3</sup>™ adapter plate part #CT113159-[]

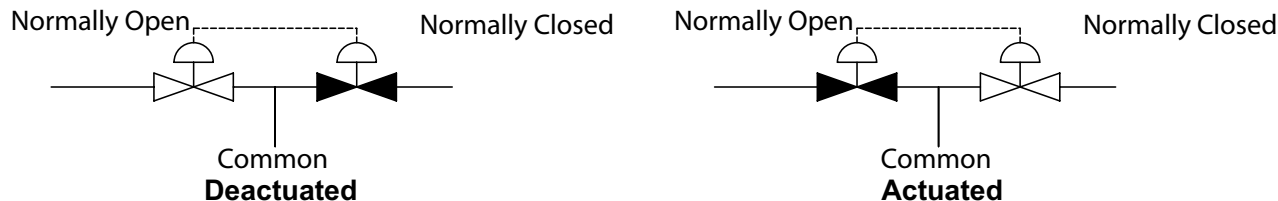
OR



Surface mount – bottom view  
(ANSI/ISA-76 compliant)  
µMS<sup>3</sup>™ adapter plate part #CT112687-[]

# DV5 Series

## Typical Flow Schematic



## How to Order

**STANDARD ITEMS IN BOLD.** Consult Customer Service for pricing and lead times for non-standard items. To order manifold components only, see page 14.

**DV5 - 1 F2 H D 0 01**

<p><b>BODY MATERIAL</b></p> <ul style="list-style-type: none"> <li><b>1 316L stainless steel</b></li> <li>4 Monel®</li> <li>6 Hastelloy® C-276</li> </ul> <p><b>CONNECTION TYPE</b></p> <ul style="list-style-type: none"> <li><b>00</b> Surface mount only***</li> <li><b>B2</b> 1/8" female BSP/ISO 7/1</li> <li><b>F2</b> 1/8" female NPT</li> <li><b>G2</b> 1/8" Gyrolok® male nut</li> <li><b>G4</b> 1/4" Gyrolok® male nut</li> <li><b>M2</b> Expansion module (1/8" female NPT)****</li> </ul> <p><b>SEAT MATERIAL</b></p> <ul style="list-style-type: none"> <li><b>A</b> Tefzel®</li> <li><b>C</b> Polyimide (VespeI®)</li> <li><b>H</b> PCTFE (Kel-F®)</li> <li><b>Q</b> PEEK™</li> </ul>	<p><b>NUMBER OF STREAMS</b></p> <p>Specify from one (01) to twelve (12) valves</p> <p><b>OPTIONS</b></p> <ul style="list-style-type: none"> <li><b>0</b> None</li> <li><b>1</b> Cleaned for oxygen service</li> <li><b>5</b> Silcosteel® passivated**</li> <li><b>8</b> Top air inlet</li> </ul> <p><b>O-RING MATERIAL</b></p> <ul style="list-style-type: none"> <li><b>D</b> Viton®</li> <li><b>F</b> Teflon®*</li> <li><b>K</b> Kalrez®</li> <li><b>X</b> Surface mount o-ring*** (supplied with valve)</li> </ul>
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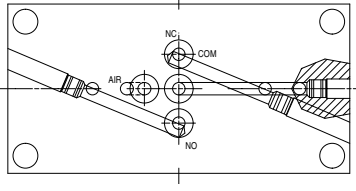
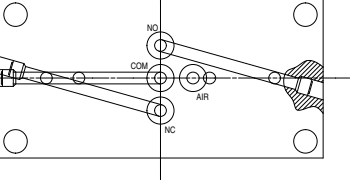
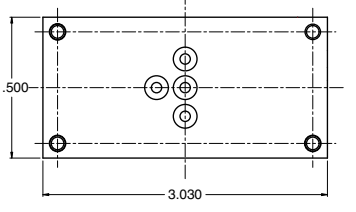
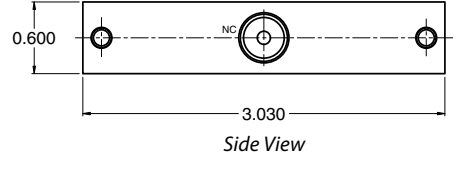
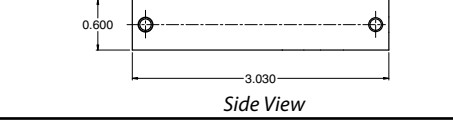
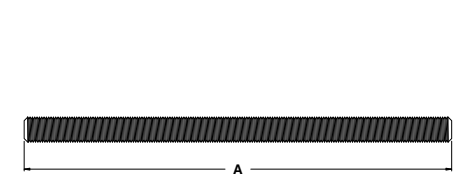






M2 EXPANSION MODULE (O-RINGS NOT SHOWN)

\* Available as special (not suitable for all applications)  
 \*\* Other Restek Corp. coatings (Sulfinert®, Silcosteel®-CR) available on request.  
 \*\*\* Required for surface mount units.  
 \*\*\*\* Expansion module is a turn-key package for adding streams to the DV5. Module consists of one (1) surface mount valve, one (1) manifold baseplate, and seven (7) o-rings.

# DV5 Series

## DV5 Spare Parts

	Description	Part #	Material
 <p>Top View</p>	<b>μMS<sup>3</sup>™ adapter plate</b> ANSI/ISA-76 compliant BLANK-NC-AIR-BLANK-NO-COM	CT112687-[ ]	-1: 316L stainless steel -4: Monel® -6: Hastelloy® C-276
 <p>Top View</p>	<b>μMS<sup>3</sup>™ adapter plate</b> ANSI/ISA-76 compliant NC-COM-BLANK-AIR-BLANK-NO	CT113159-[ ]	-1: 316L stainless steel -4: Monel® -6: Hastelloy® C-276
 <p>Top View</p>	Manifold baseplate	G113245-[ ]	-1: 316L stainless steel -4: Monel® -6: Hastelloy® C-276
 <p>Side View</p>	End plate with outlet	G113248-[ ]	-1: 316L stainless steel -4: Monel® -6: Hastelloy® C-276
 <p>Side View</p>	End plate without outlet	G113253-[ ]	-1: 316L stainless steel -4: Monel® -6: Hastelloy® C-276
	All-thread rod: <ul style="list-style-type: none"> <li>• 2-module</li> <li>• 3-module</li> <li>• 4-module</li> <li>• 5-module</li> <li>• 6-module</li> <li>• 7-module</li> <li>• 8-module</li> <li>• 9-module</li> <li>• 10-module</li> <li>• 11-module</li> <li>• 12-module</li> </ul>	G111609-2 ( <b>A</b> = 4.42") G111609-3 ( <b>A</b> = 5.92") G111609-4 ( <b>A</b> = 7.42") G111609-5 ( <b>A</b> = 8.92") G111609-6 ( <b>A</b> = 10.42") G111609-7 ( <b>A</b> = 11.92") G111609-8 ( <b>A</b> = 13.42") G111609-9 ( <b>A</b> = 14.92") G111609-10 ( <b>A</b> = 16.42") G111609-11 ( <b>A</b> = 17.92") G111609-12 ( <b>A</b> = 19.42")	18-8 stainless steel
	Nut, 1/4"-28	G074208	18-8 stainless steel
	Flat washer	G098023	18-8 stainless steel
	Lock washer	G098014	18-8 stainless steel
	O-ring	58-006-[ ]	-64: Kalrez® -50: Viton® -06: Teflon® (Special)