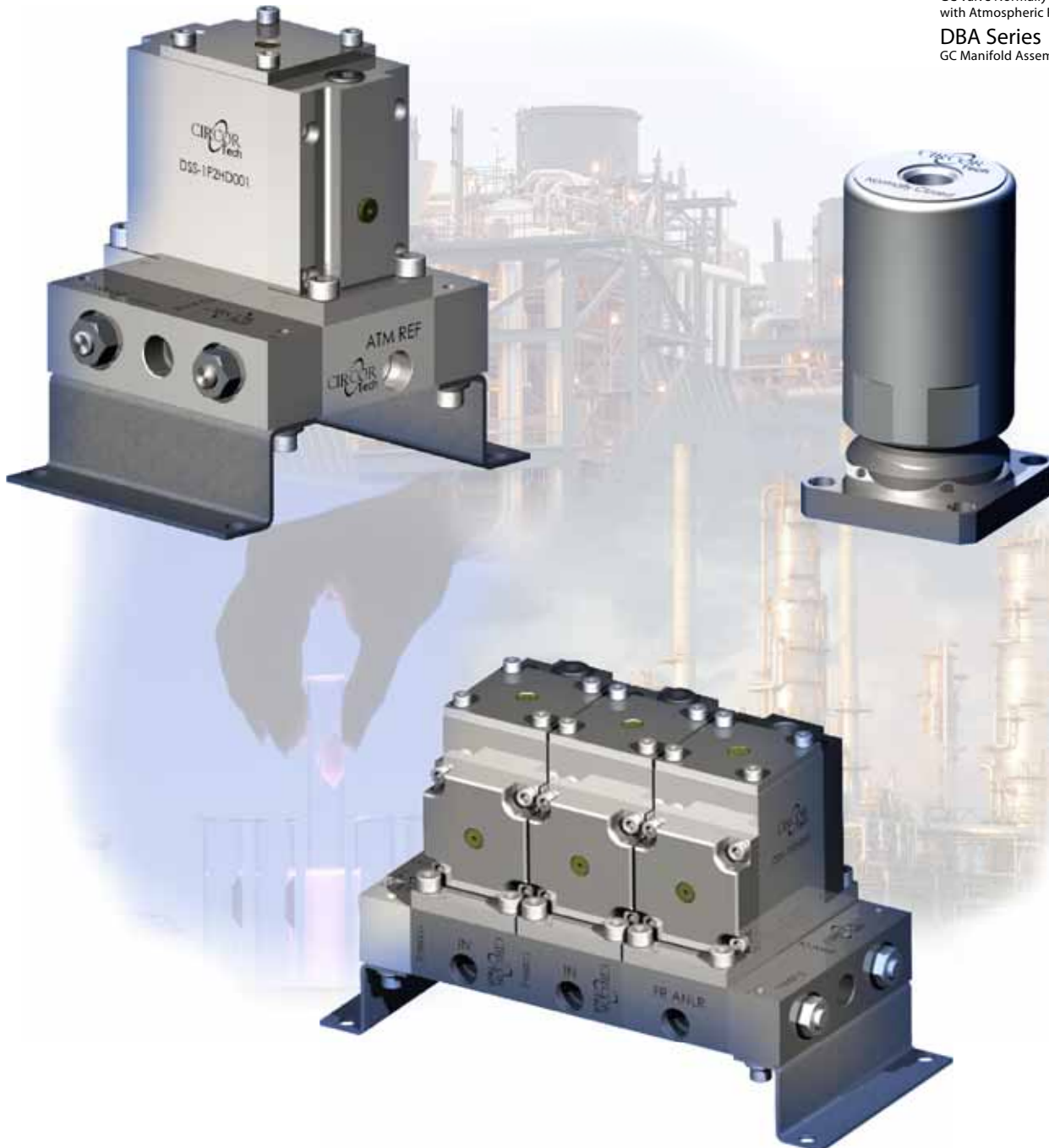


# Diaphragm Valves

## Index

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*diaphragm valves*

## DV1 Series

### 2-Way Diaphragm Valves



The DV1 Series<sup>1</sup> diaphragm valves are totally free of springs, bellows, packing, dynamic o-rings and lubricants in the process wetted area. Metal-to-metal seals to atmosphere ensure that there is no transport of undesirable elements into the flow stream and no escaping of process material into the atmosphere. Elgiloy<sup>®</sup> diaphragms ensure the utmost in corrosion resistance and extend overall life. For Elgiloy<sup>®</sup> chemical compatibility information, visit the *Technical Support* section of the CIRCOR Tech website ([www.circortech.com](http://www.circortech.com)).

#### Features & Benefits

- 2-Way on/off control
- Metal-to-metal seals to atmosphere to prevent leakage
- Wide choice of materials for virtually all applications
- No dynamic o-rings, springs, or lubricant in wetted flow path to eliminate sample contamination
- Very low internal volume (0.16 cc) for low purge time
- Replaceable valve seats for longer service life
- Manual ¼-plus turn or pneumatic actuation
- Multiple stacked diaphragms for extended service life and added safety
- Pressures from vacuum (50 torr) to 500 psig (34 barg)  
Consult factory for higher pressures

diaphragm valves

#### 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)

<sup>1</sup> Patent pending

# DV1 Series

Manual 1/4-plus turn Valves

## Technical Data



<b>BODY</b>	316L stainless steel, Monel® and Hastelloy® C-276
<b>SEATS</b>	PCTFE or PEEK™
<b>DIAPHRAGMS</b>	Elgiloy® AMS 5876
<b>ORIFICE SIZE</b>	0.110" (2.8 mm)
<b>FLOW CAPACITY</b>	0.17 Cv
<b>VALVE INTERNAL VOLUME*</b>	0.16 cc
<b>EXTERNAL LEAKAGE</b>	1 × 10 <sup>-5</sup> cc/sec helium (inboard)

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

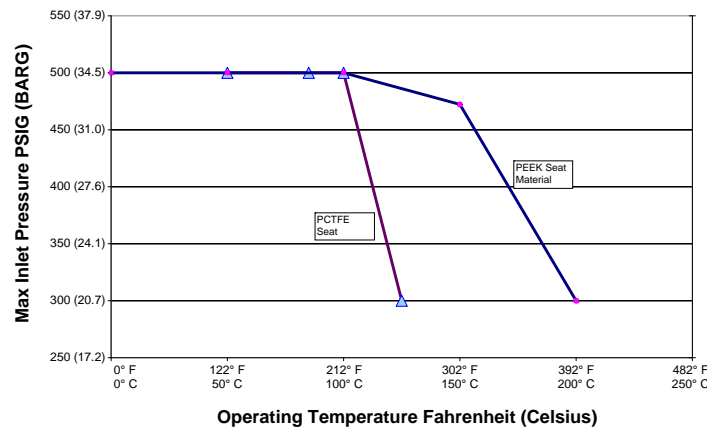
### Operating Temperatures

SEAT MATERIAL	1/4-PLUS TURN TEMPERATURE	
PCTFE	-40° F to +212° F	-40° C to +100° C
PEEK™	0° F to +400° F	-18° C to +204° C

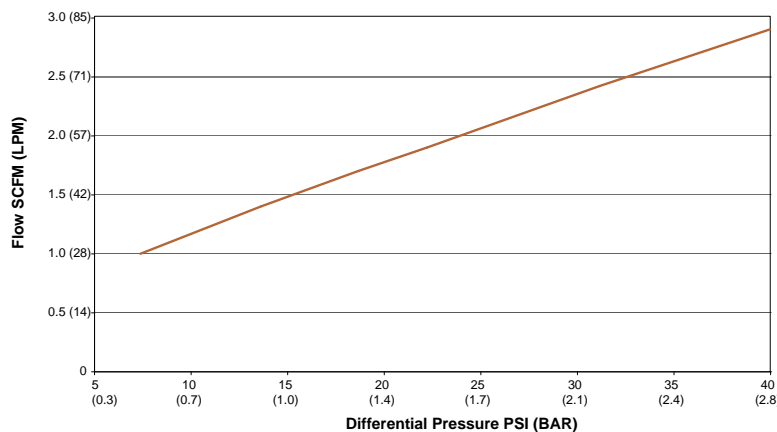
### Operating Pressures

<b>OPERATING PRESSURE</b>	Vacuum (50 torr) to 500 psi (34 bar)
<b>PROOF PRESSURE</b>	2000 psig (138 barg)
<b>BURST PRESSURE</b>	8000 psig (552 barg)

## Pressure vs. Temperature Curve



## Pressure vs. Flow Curve



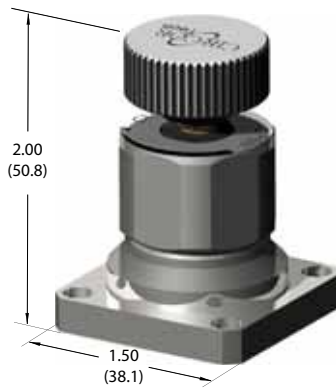
# DV1 Series

Manual 1/4-plus turn Valves

## Dimensions

Dimensions are in inches (millimeters) for reference only and are subject to change.

**Circular Handle  
Manual 1/4-plus turn Valves**



**T-handle  
Manual 1/4-plus turn Valves**

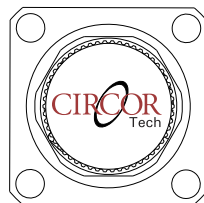
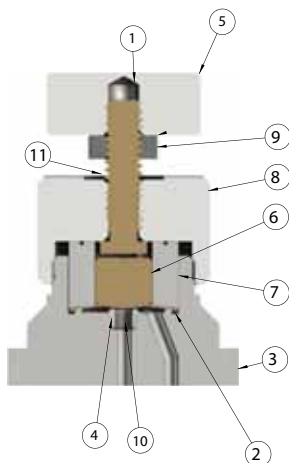


## Materials of Construction

#	PART	MATERIALS
1	Stem	17-4PH stainless steel, condition H900
2	Diaphragm*	Elgiloy® AMS 5876
3	Body*	316L stainless steel, Monel®, Hastelloy® C-276
4	Seat*	PCTFE or PEEK™
5	Handle	316 stainless steel
6	Thrust plug	Brass
7	Diaphragm retainer	316 stainless steel
8	Bonnet	316L stainless steel, Monel®, Hastelloy® C-276
9	Handle nut	18-8 stainless steel
10	Seat Retainer	316 stainless steel or Inconel®
11	Spring Washer	18-8 stainless steel

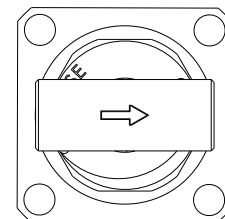
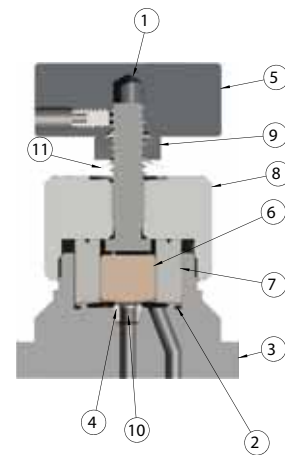
\* Wetted components

**Circular Handle  
Manual 1/4-plus turn Valves**



Top view

**T-handle  
Manual 1/4-plus turn Valves**



Top view

# DV1 Series

Pneumatic Actuated Valves

## Technical Data



<b>BODY</b>	316L stainless steel, Monel® and Hastelloy® C-276
<b>SEATS</b>	PCTFE or PEEK™
<b>DIAPHRAGMS</b>	Elgiloy® AMS 5876
<b>ORIFICE SIZE</b>	0.110" (2.8 mm)
<b>FLOW CAPACITY</b>	0.17 Cv
<b>VALVE INTERNAL VOLUME*</b>	0.16 cc
<b>EXTERNAL LEAKAGE</b>	1 × 10 <sup>-5</sup> cc/sec helium (inboard)
<b>PNEUMATIC ACTUATOR</b>	Anodized aluminum standard (other materials optional) 40μ sintered stainless steel inlet air filter

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

### Operating Pressures Ratings

	SMALL DIAMETER	MEDIUM DIAMETER	LARGE DIAMETER
<b>VALVE WORKING PRESSURE* (INLET)</b>	Vacuum (50 torr) to 500 psig	Vacuum (50 torr) to 800 psig	Vacuum (50 torr) to 3600 psig
<b>VALVE PROOF PRESSURE</b>	1000 psig	1600 psig	7200 psig
<b>VALVE BURST PRESSURE</b>	2000 psig	3600 psig	14,400 psig

\* Valves cleaned for oxygen service are limited to 3000 psig (207 bar).

### Operating Temperatures

SEAT MATERIAL	¼-PLUS TURN TEMPERATURE	
PCTFE	-40° F to +212° F	-40° C to +100° C
PEEK™	0° F to +400° F	-18° C to +204° C

## Air Actuation Pressure Requirements

psig nominal

PRESSURE	SMALL DIAMETER	MEDIUM DIAMETER	LARGE DIAMETER
Valve Operating Pressure	Vacuum (50 torr) to 500 psig (Inlet)	Vacuum (50 torr) to 800 psig (Inlet)	Vacuum (50 torr) to 3600 psig (Inlet)
Actuation Pressure Normally Closed	40 psig (3 bar) (0–250 psig process pressure)	40 psig (3 bar) (0–250 psig process pressure)	50 psig (0–3600 psig process pressure)
	40 psig (3 bar) (251–500 psig process pressure)	40 psig (3 bar) (251–500 psig process pressure)	
Actuation Pressure Normally Open	40 psig (3 bar) (500 psig process pressure)	40 psig (3 bar) (501–800 psig process pressure)	N/A
		40 psig (3 bar) (800 psig process pressure)	

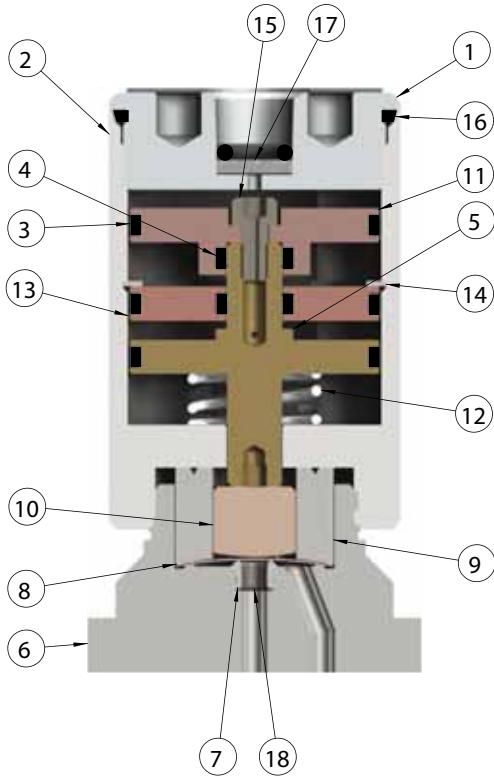
# DV1 Series

Pneumatic Actuated Valves

## Dimensions & Materials of Construction

Dimensions are in inches (millimeters) for reference only and are subject to change.

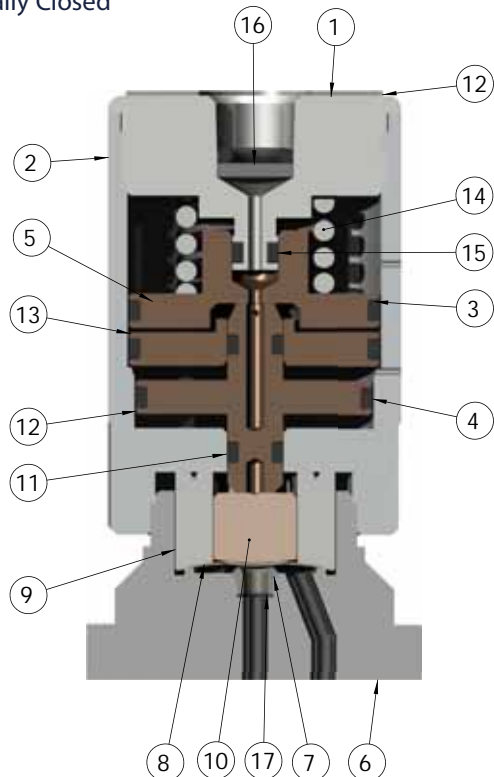
Normally Open



#	PART	MATERIALS
1	Actuator cap	Aluminum, 316L stainless steel, Monel® & Hastelloy® C-276
2	Actuator	Aluminum, 316L stainless steel
3	O-ring	Viton®
4	O-ring	Viton®
5	Piston	Brass
6	Body*	316L stainless steel, Monel® & Hastelloy® C-276
7	Seat*	PCTFE or PEEK®
8	Diaphragm*	Elgiloy® AMS 5876
9	Diaphragm retainer	316 stainless steel
10	Thrust plug	Brass
11	Upper piston	Brass
12	Spring	302 stainless steel
13	Chamber separator	Brass
14	Retaining ring	302 stainless steel
15	Cap screw	Alloy steel
16	O-ring	Viton®
17	Sintered filter	316 stainless steel, 40µ

\* Wetted components

Normally Closed



#	PART	MATERIALS
1	Actuator cap	Aluminum, 316L stainless steel, Monel® & Hastelloy® C-276
2	Actuator	Aluminum, 316L stainless steel
3	O-rings	Viton®
4	O-rings	Viton®
5	Upper piston	Brass
6	Body*	316L stainless steel, Monel® & Hastelloy® C-276
7	Seat*	PCTFE (formerly Kel-F®) or PEEK™
8	Diaphragm*	Elgiloy® AMS 5876
9	Diaphragm retainer	316 stainless steel
10	Thrust plug	Brass
11	O-ring	Viton®
12	Lower piston	Brass
13	Chamber separator	Brass
14	Spring	302 stainless steel
15	O-ring	Viton®
16	Sintered filter	316 stainless steel, 40µ

\* Wetted components

# DV1 Series

All DV1 Valves

## How to Order

**STANDARD ITEMS IN BOLD.** Consult Customer Service for pricing and lead times for non-standard items.

**DV1 – 1 C 1 5 A SM SM H 0**

### BODY MATERIAL

- 1 316L stainless steel**
- 4 Monel®
- 6 Hastelloy® C-276

### ACTUATION METHOD

- C Air actuated – normally closed
- M Manual ¼-plus turn round handle
- O Air actuated – normally open
- T Manual ¼-plus turn T-handle

### ACTUATOR SIZE

- X Manually operated
- 1 Air actuated – (500 psig max.)**
- 2 Air actuated—medium (800 psig max.)
- 3 Air actuated—large (3,600 psig max.)

### ACTUATOR MATERIAL

- X Manually operated
- 1 316L stainless steel
- 5 Aluminum**

### OPTION

- 0 None**
- 1 Cleaned for oxygen service
- 5 Silcosteel® passivated\*\*
- 9 Sulfinert® passivated\*\*

### SEAT MATERIAL

- H PCTFE**
- Q PEEK™

### OUTLET CONNECTION TYPE

- SM Surface mount (ANSI/ISA-76 compliant)**

### INLET CONNECTION TYPE

- SM Surface mount (ANSI/ISA-76 compliant)**

### MAXIMUM PROCESS PRESSURE

- A 250 psig (17 bar)**
- B 500 psig (34 bar)
- C 800 psig (55 bar)
- D 3600 psig (248 bar)

\*\* Restek Corp. coatings

# DV5 Series

## 3-Way Switching Diaphragm Valves



The DV5 Series<sup>1</sup> diaphragm valve 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 transport of undesirable elements into the flow stream. Elgiloy<sup>®</sup> diaphragms ensure the utmost in corrosion resistance and extended overall life span. For Elgiloy<sup>®</sup> chemical compatibility see the *Technical Support* section of the CIRCOR Tech website at [www.circortech.com](http://www.circortech.com).

- Available as...
- Stand-alone
  - Multi-stream manifold
  - Surface mount modular (ANSI/ISA-76  $\mu$ MS<sup>3</sup><sup>®</sup> sampling system)

### Features & Benefits

- Integrated sweep loop in manifold
- 3-Way switching
- Surface mount ANSI/ISA-76 compliant\*
- Metal-to-metal seals to atmosphere to prevent leakage
- Replaceable valve seats for extended service life
- Wide choice 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 from top of manifold
- Pressures from vacuum (50 torr) to 500 psig (34 bar)
- Compact valve body (3" L x 2.3" H x 1.5" W)
- Interlocking pins between valve body and manifold baseplate to ensure 100% correct reassembly (not applicable for surface mount models)

\*  $\mu$ MS<sup>3</sup><sup>®</sup> Base adapter plate required for non-CIRCOR Tech manufactured surface mount systems-consult factory

### Technical Data

<b>BODY</b>	316L stainless steel, Monel <sup>®</sup> and Hastelloy <sup>®</sup> C-276
<b>SEATS</b>	PCTFE and PEEK <sup>™</sup>
<b>DIAPHRAGMS</b>	Elgiloy <sup>®</sup> AMS 5876
<b>ORIFICE SIZE</b>	0.110" (2.8 mm)
<b>FLOW CAPACITY</b>	0.13 Cv
<b>VALVE INTERNAL VOLUME**</b>	0.64 cc
<b>EXTERNAL LEAKAGE</b>	1 x 10 <sup>-5</sup> cc/sec helium (inboard)
<b>MIN. ACTUATION PRESSURE</b>	50 psig @ 50 psig process

### Operating Pressures

<b>OPERATING PRESSURE</b>	Vacuum (50 torr) to 500 psig (34 bar)
<b>PROOF PRESSURE</b>	2000 psig (138 bar)
<b>BURST PRESSURE</b>	8000 psig (552 bar)

### Operating Temperatures

SEAT MATERIAL	TEMPERATURE	
PCTFE	-40° F to +212° F	-40° C to +100° C
PEEK <sup>™</sup>	0° F to +400° F	-18° C to +204° C

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

### CIRCOR Tech

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 Phone (864) 574-7966 • Fax (864) 574-5608  
[www.circortech.com](http://www.circortech.com)

<sup>1</sup> Patent pending

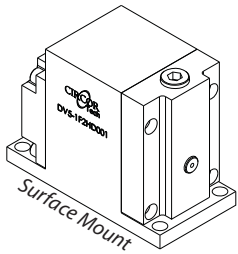
diaphragm valves



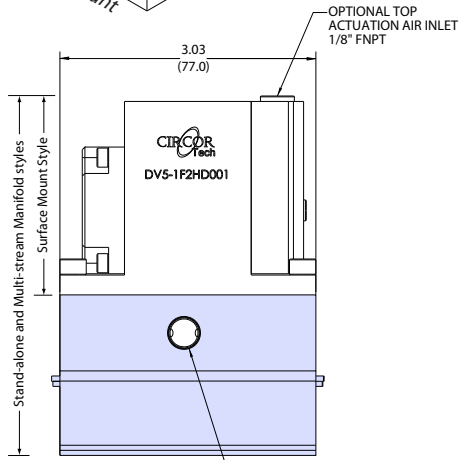
# DV5 Series

## Dimensions—All Styles

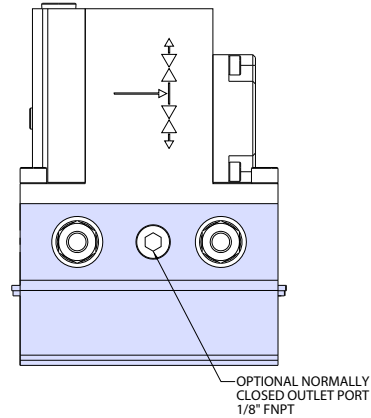
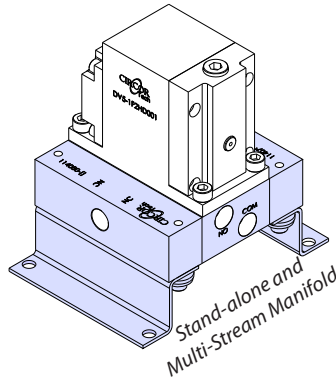
Dimensions are in inches (millimeters) for reference only and are subject to change.



Shaded areas refer to parts and dimensions specific to stand-alone and Multi-stream manifold styles.

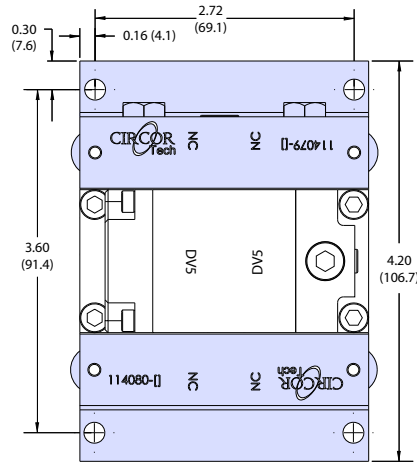


Front side view

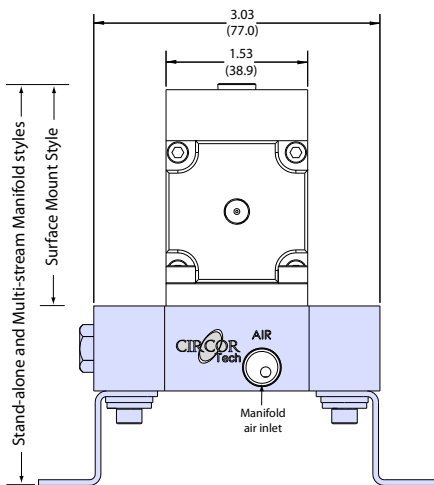


Back side view

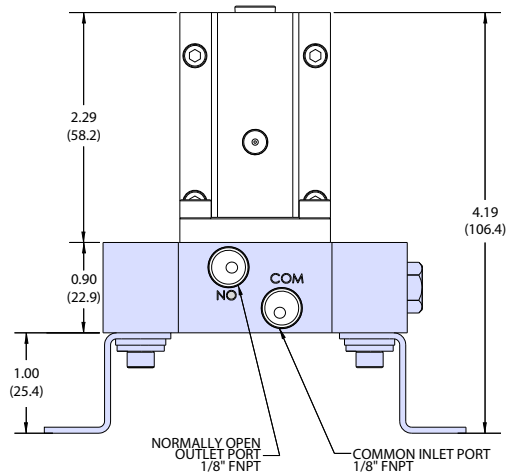
User can change from top air inlet to manifold air inlet by blocking top air inlet with 1/8" FNPT plug.



Top view



Left end view

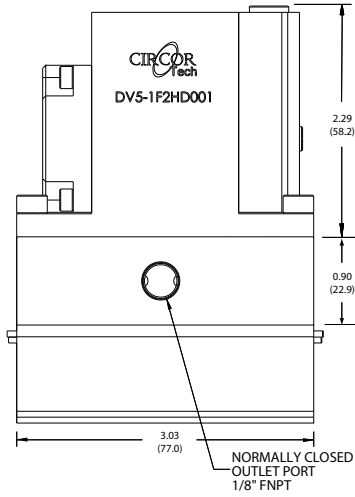


Right end view

# DV5 Series

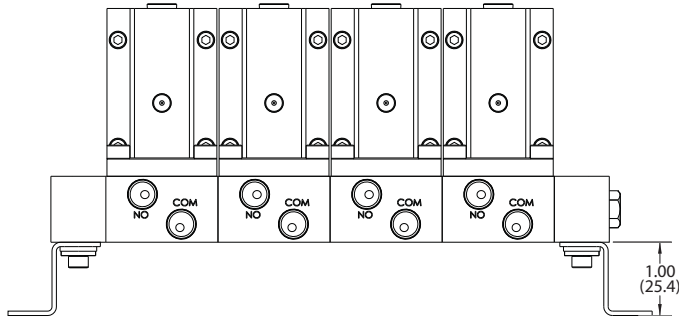
## Dimensions – Multi-Stream Manifold

Dimensions are in inches (millimeters) for reference only and are subject to change.

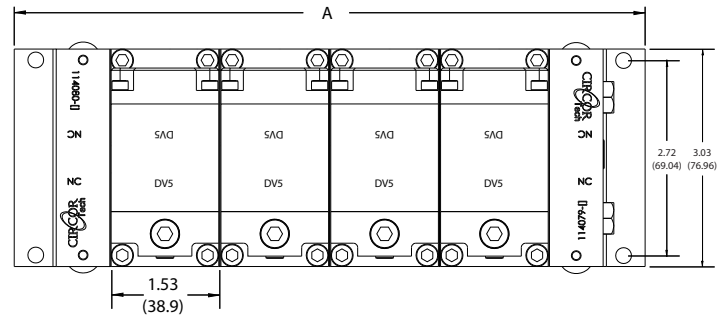


Front side view

NUMBER OF VALVES	A DIMENSION	
	INCHES	MM
1	3.60	91.4
2	5.13	134.6
3	6.66	169.2
4	8.19	208.0
5	9.72	246.9
6	11.25	285.8
7	12.78	324.6
8	14.31	363.5
9	15.84	402.3
10	17.37	441.2
11	18.90	480.1
12	20.43	518.9



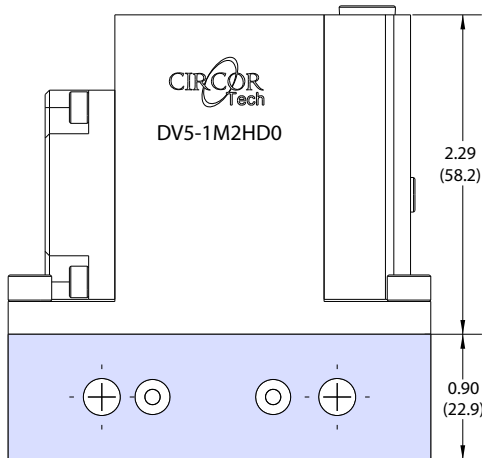
Right end view



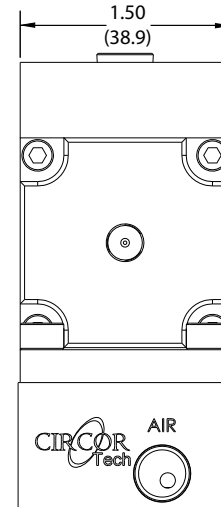
Top view

## Dimensions – M2 Expansion Module

This module is a turn-key package for adding streams to the DV5. M2 Expansion Module includes one (1) surface mount valve, one (1) manifold baseplate, four (4) mounting screws, and seven (7) O-rings.



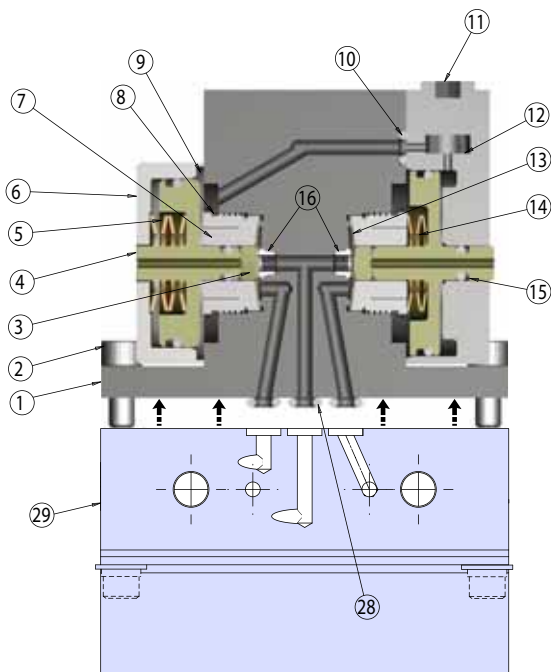
Front side view



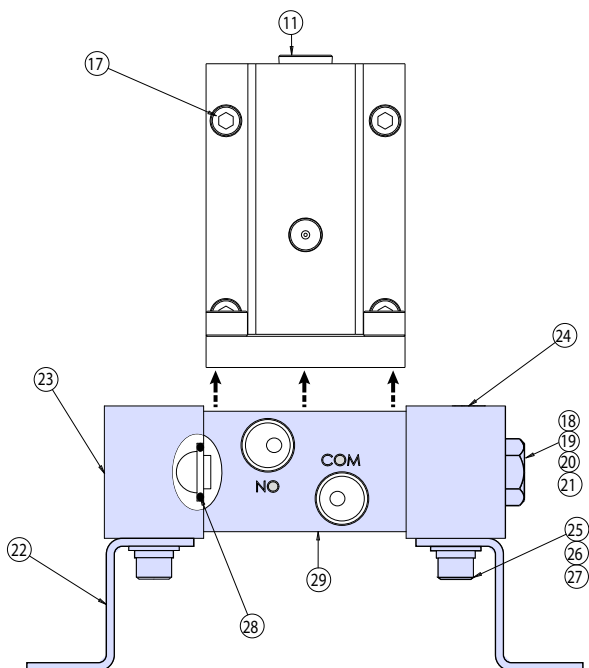
Left end view

# DV5 Series

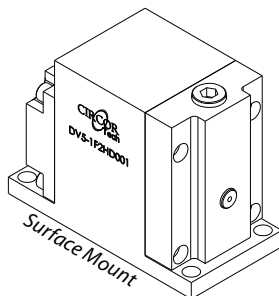
## Materials of Construction—All Styles



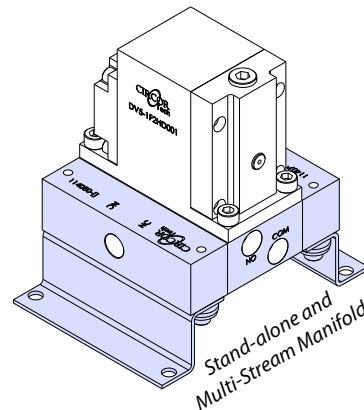
Front side view, sectioned



Right view



Shaded areas refer to parts and dimensions specific to stand-alone and Multi-stream manifold styles.



### All Styles – Valve Body

#	PART	MATERIALS
1	Body*	316L stainless steel, Monel® or Hastelloy® C-276
2	10-32 x .50 SHC screw	18-8 stainless steel
3	Thrust plug	Delrin® or PEEK™
4	N.C. piston	Delrin® or PEEK™
5	N.C. spring stack	18-8 stainless steel
6	N.C. cap	316L stainless steel
7	Compression collet	316L stainless steel
8	Retainer nut	316L stainless steel
9	O-ring	Viton®
10	O-ring	Viton®
11	Hex plug	316 stainless steel
12	N.O. Cap	316L stainless steel
13	Diaphragm*	Elgiloy®
14	N.O. spring stack	18-8 stainless steel
15	N.O. piston	Delrin® or PEEK™
16	Seat*	PCTFE or PEEK™
17	6-32 x .375 HSC Screw	18-8 Stainless steel

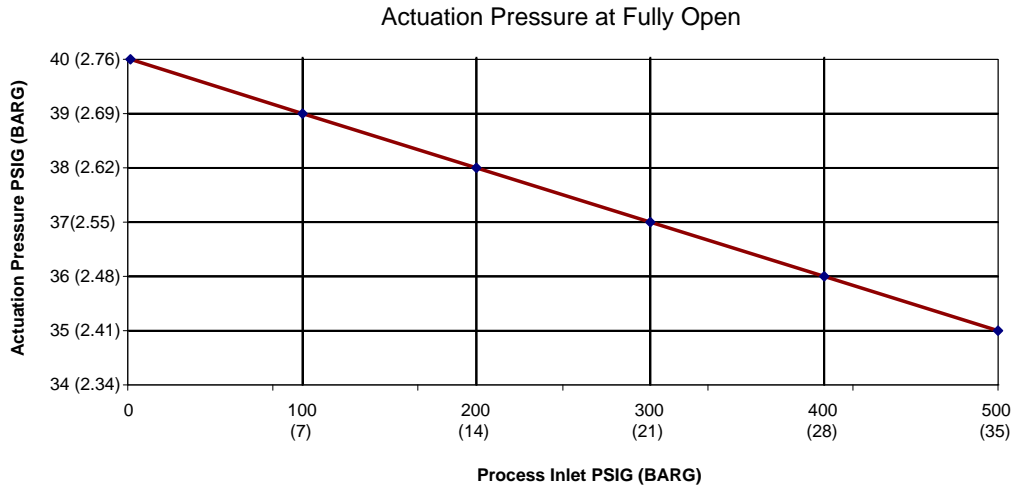
### Stand-Alone and Multi-stream manifold styles

18	Threaded rod	18-8 stainless steel
19	.25" flat washer	301 stainless steel
20	.25" lock washer	18-8 stainless steel
21	Hex nut	18-8 stainless steel
22	Mounting bracket	316 stainless steel
23	Left end plate*	316L stainless steel, Monel® or Hastelloy® C-276
24	Right end plate*	316L stainless steel, Monel® or Hastelloy® C-276
25	8-32 SHCS screw	18-8 stainless steel
26	#8 flat washer	18-8 stainless steel
27	#8 lock washer	18-8 stainless steel
28	O-ring*	Viton® or Kalrez®
29	Manifold baseplate*	316L stainless steel, Monel® or Hastelloy® C-276

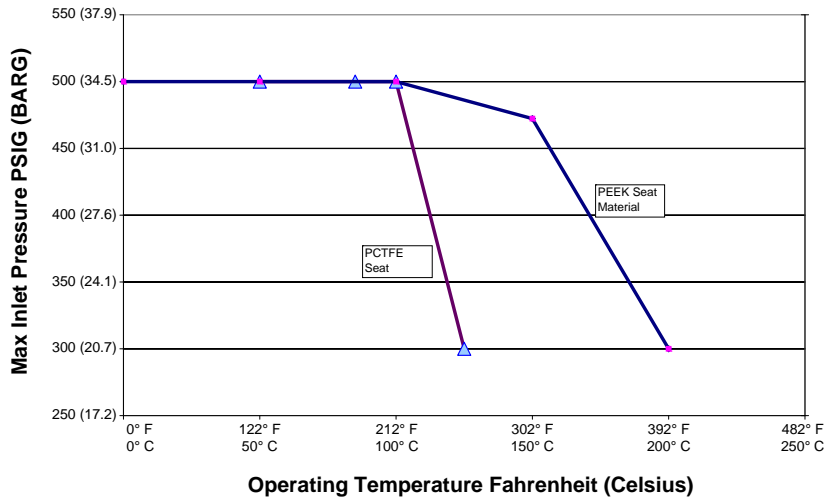
\* Wetted components

# DV5 Series

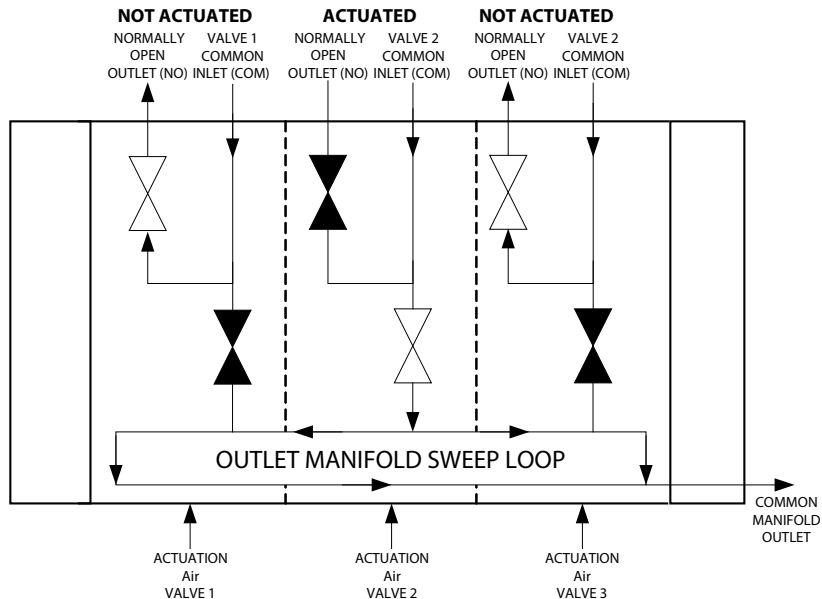
## Actuation Pressure Curve



## Pressure Temperature Curve



## Typical Flow Schematic For 3-Valve Stack



# DV5 Series

## How to Order - All DV5 Valves

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

**DV5 - 1 F2 H D 8 01**

### BODY MATERIAL

- 1 316L stainless steel**
- 4 Monel®
- 6 Hastelloy® C-276

### CONNECTION TYPE

- 00 Surface mount only
- F2 1/8" female NPT**
- M2 Expansion module (1/8" female NPT)\*\*\*\*

### SEAT MATERIAL

- H PCTFE (Delrin® pistons)**
- Q PEEK™ (PEEK® pistons)

### NUMBER OF STREAMS / VALVES

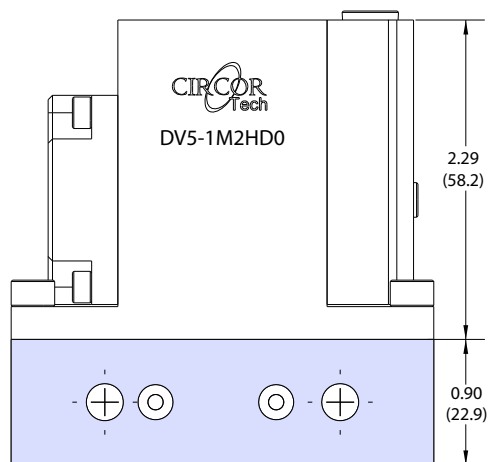
Specify from one (01) to twelve (12) valves  
Leave blank when ordering surface mount or M2 expansion modules

### OPTIONS

- 0 None
- 1 Cleaned for oxygen service
- 5 Silcosteel® passivated\*\*
- 8 Top air inlet**
- 9 Sulfinert® passivated\*\*

### O-RING MATERIAL

- D Viton®**
- F Teflon®\*\*
- K Kalrez®
- X Surface mount o-ring\*\*\*  
(supplied with valve, Viton® standard)



**M2 EXPANSION MODULE (O-RINGS NOT SHOWN)\*\*\*\***

\* Available as special (not suitable for all applications, consult factory)

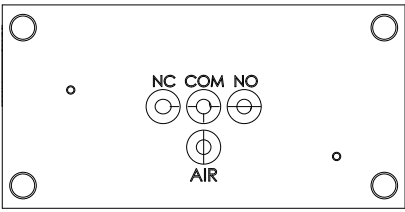
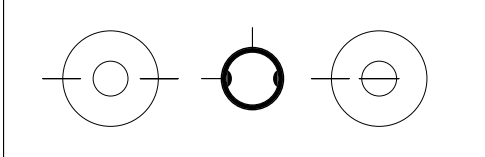
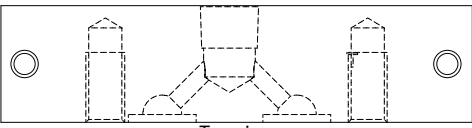
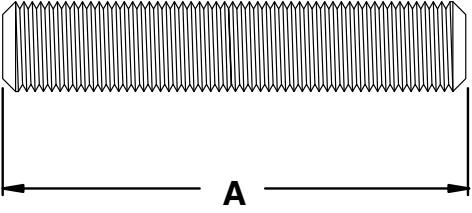




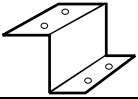
\*\* Restek Corp. coatings

\*\*\* Required for surface mount units.

\*\*\*\* M2 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, four (4) mounting screws, and seven (7) o-rings.

# DV5 Series

## DV5 Manifold Parts

	Description	Part #	Material
 <p>Top view</p>	Manifold baseplate with pins	CT114085-[ ]	-1: 316L stainless steel -4: Monel® -6: Hastelloy® C-276
 <p>Front side view</p>	Right end plate	CT114079-[ ]	-1: 316L stainless steel -4: Monel® -6: Hastelloy® C-276
 <p>Top view</p>	Left end plate	CT114080-[ ]	-1: 316L stainless steel -4: Monel® -6: Hastelloy® C-276
	Threaded 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 (A = 4.42") G111609-3 (A = 5.92") G111609-4 (A = 7.42") G111609-5 (A = 8.92") G111609-6 (A = 10.42") G111609-7 (A = 11.92") G111609-8 (A = 13.42") G111609-9 (A = 14.92") G111609-10 (A = 16.42") G111609-11 (A = 17.92") G111609-12 (A = 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-[ ]	-50: Viton® -53: Kalrez®
	Mounting bracket	CT112609	316 stainless steel

# DBB Series

## Double-Block-and-Bleed Diaphragm Valves



The DBB Series<sup>1</sup> diaphragm valve is a modular, double-block-and-bleed valve assembly. Stand-alone and multi-stream DBB Manifold assemblies can be easily integrated into an ANSI/ISA-76 compliant system with the use of a simple adapter plate. (see the  $\mu$ MS<sup>3</sup> Modular Substrate System CTMS3 catalog for additional information).

DBB series valves are totally free of springs, bellows, packing, and lubricants in the process wetted area. Metal-to-metal seals to atmosphere to prevent transport of undesirable elements into the flow stream.

Available as:

- Stand-alone
- Multi-stream manifold
- Surface mount modular (ANSI/ISA-76  $\mu$ MS<sup>3</sup> sampling system)
- Base manifold with mounting brackets

### Features & Benefits

- Integrated sweep loop in manifold
- Double-block-and-bleed on/off control
- Surface mount ANSI/ISA-76 compliant\*
- Metal-to-metal seals to atmosphere to prevent leakage
- Replaceable seats for extended service life
- Wide choice of body and elastomer materials
- No dynamic o-rings, springs, or lubricant in process wetted area of valves to eliminate sample contamination
- Very low internal volume (0.16 cc)
- Pneumatic actuation from top or manifold
- Process pressure from vacuum (50 torr) to 500 psig (34 barg)
- Multiple stacked diaphragms for extended service life
- Compact valve body (3" L x 1.5" W x 2.56" H)
- Interlocking pins between valve body and manifold baseplate to ensure 100% correct reassembly (not applicable for surface mount models)

\*  $\mu$ MS<sup>3</sup> base adapter plate CT11358-[ ] required for non-CIRCOR Tech manufactured surface mount systems - consult factory

### Technical Data

<b>BODY</b>	316L stainless steel, Monel® and Hastelloy® C-276
<b>SEATS</b>	PCTFE or PEEK™
<b>DIAPHRAGMS</b>	Elgiloy® AMS 5876
<b>ORIFICE SIZE</b>	0.110" (2.8 mm)
<b>FLOW CAPACITY</b>	0.23 Cv
<b>VALVE INTERNAL VOLUME**</b>	0.16 cc
<b>EXTERNAL LEAKAGE</b>	1 x 10 <sup>-5</sup> cc/sec helium (inboard)
<b>MIN. ACTUATION PRESSURE</b>	50 psig @ 50 psig process

### Operating Pressures

<b>OPERATING PRESSURE</b>	Vacuum (50 torr) to 500 psig (34 barg)
<b>PROOF PRESSURE</b>	2000 psig (138 barg)
<b>BURST PRESSURE</b>	8000 psig (552 barg)

### Operating Temperatures

SEAT MATERIAL	TEMPERATURE	
PCTFE	-40° F to +212° F	-40° C to +100° C
PEEK™	0° F to +400° F	-18° C to +204° C

\*\* Internal volume between double block valves.

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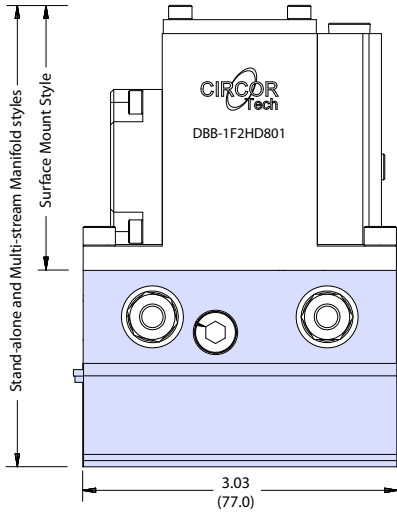
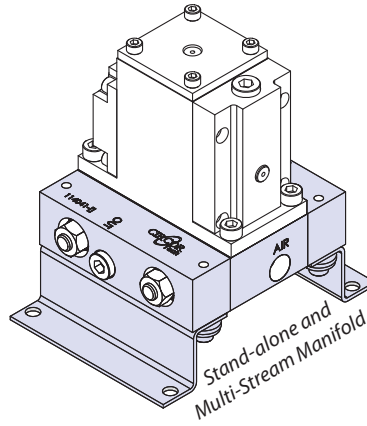
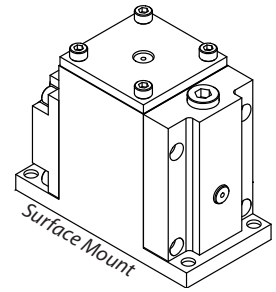
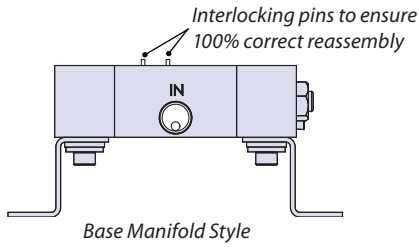
<sup>1</sup> Patent pending

diaphragm valves

# DBB Series

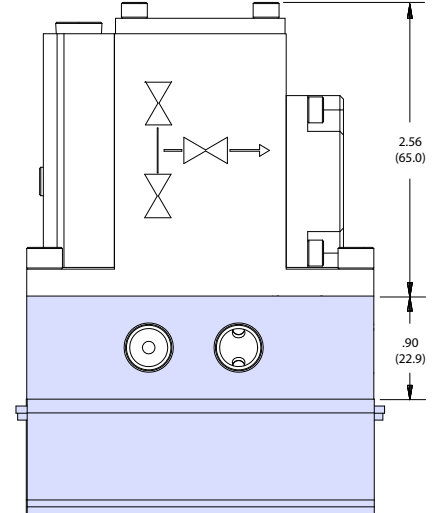
## Dimensions – All Styles

Dimensions are inches (millimeters) for reference only and are subject to change.

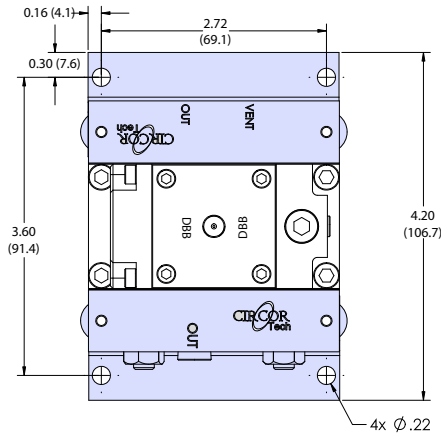


Front view

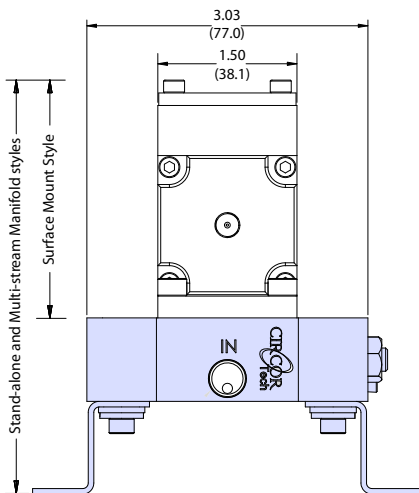
Shaded areas refer to parts and dimensions specific to stand-alone and Multi-stream manifold styles.



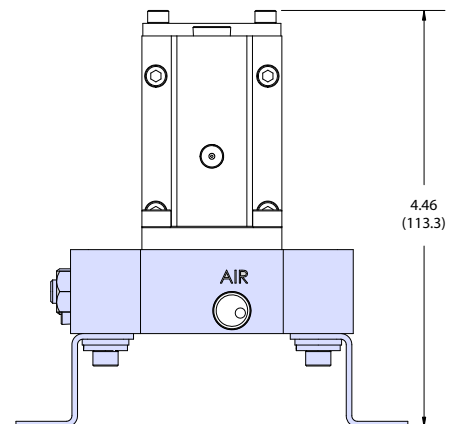
Back view



Top view



Left end view

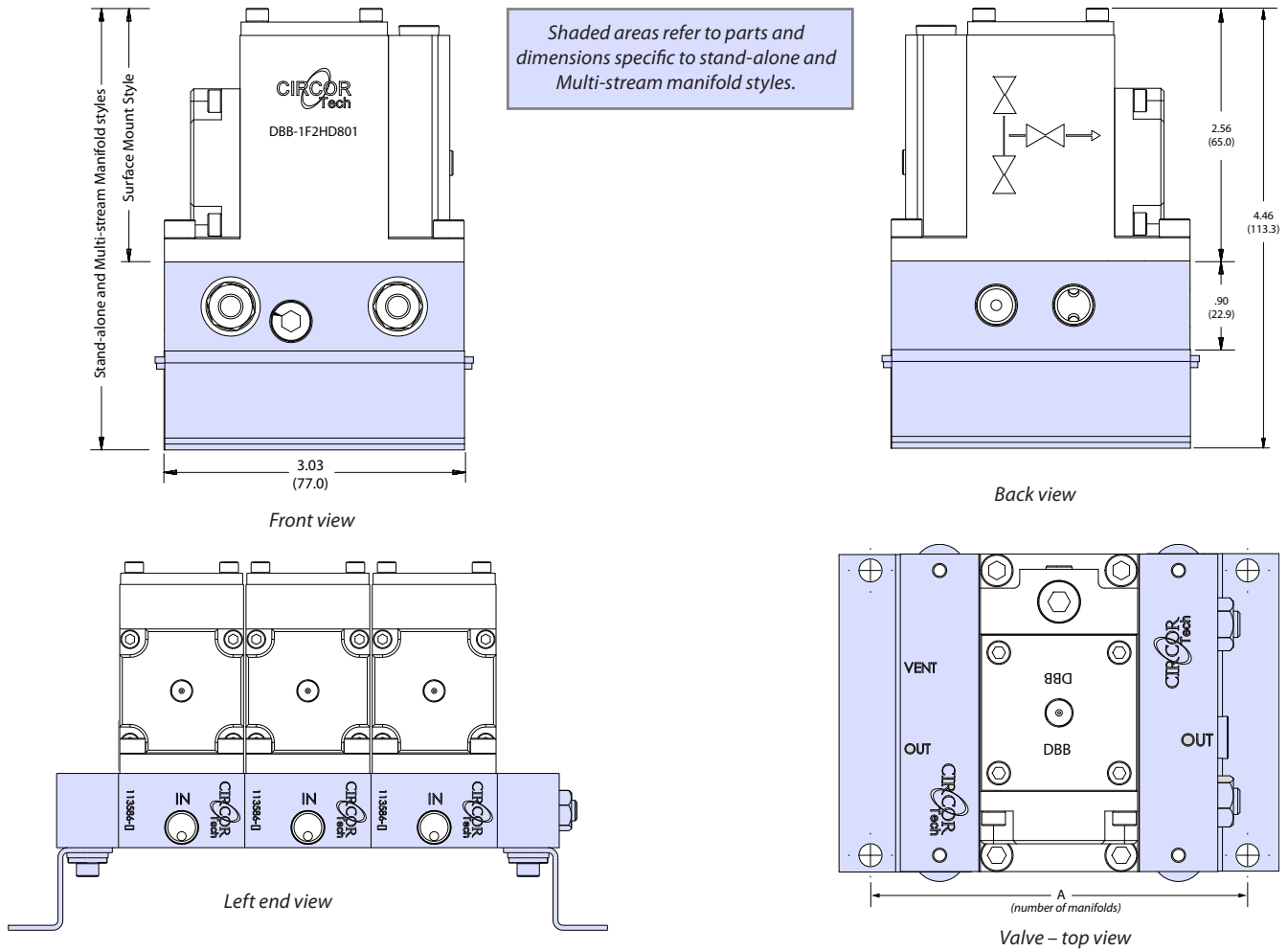


Right end view



# DBB Series

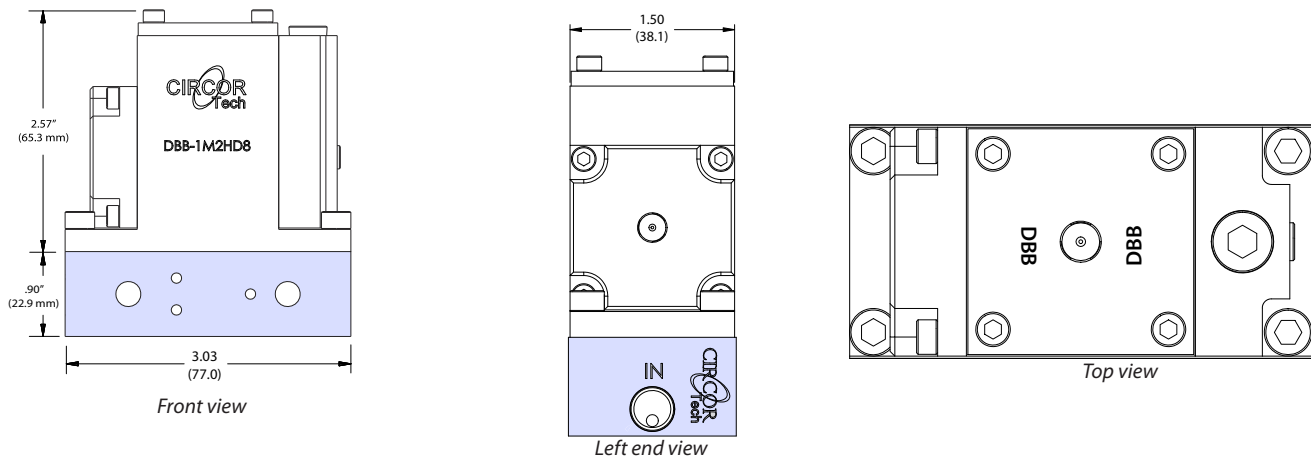
## Dimensions – Multi-Stream Manifold & Base Manifold Styles



NUMBER OF MANIFOLDS		2	3	4	5	6	7	8	9	10	11	12
A	inches	5.13	6.66	8.19	9.72	11.25	12.78	14.31	15.84	17.37	18.90	20.43
	mm	130.3	169.2	208.0	246.9	285.8	324.6	363.5	402.3	441.2	480.1	518.9

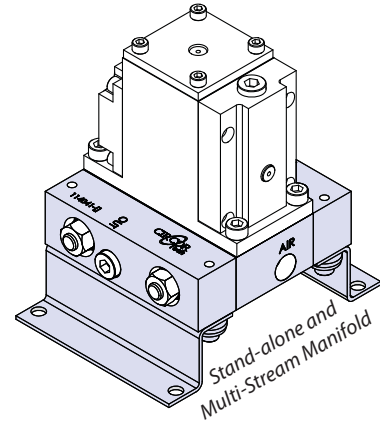
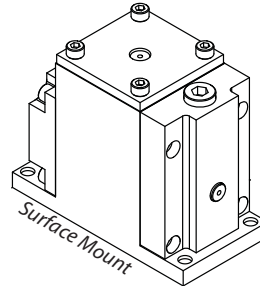
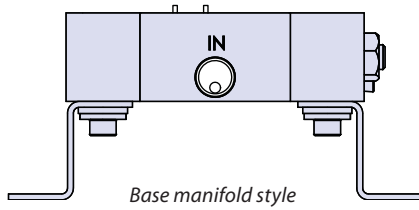
## Dimensions – M2 Expansion Module

This module is a turn-key package for adding streams to the DBB. M2 Expansion Module includes one (1) surface mount valve, one (1) manifold baseplate, four (4) mounting screws, and seven (7) O-rings.

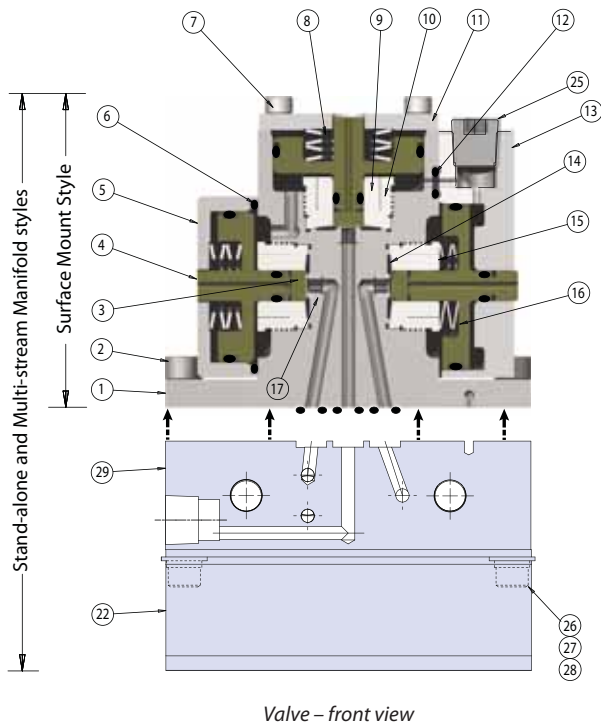


# DBB Series

## Materials of Construction—All Styles



Shaded areas refer to parts and dimensions specific to stand-alone and Multi-stream manifold styles.



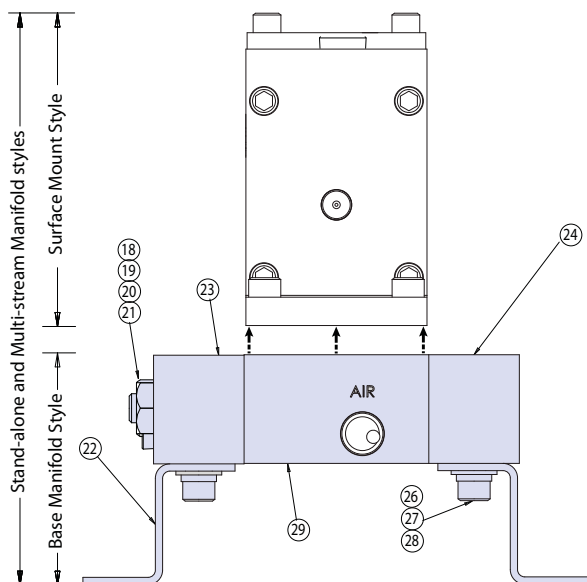
### All Styles - Valve Body

#	PART	MATERIALS
1	Body*	316L stainless steel, Monel® or Hastelloy® C-276
2	10-32 x .50 screw	18-8 stainless steel
3	Thrust plug	Delrin® or PEEK™
4	N. C. Piston	Delrin® or PEEK™
5	N. C. Cap	316 stainless steel
6	O-ring	Viton®
7	6-32 x .375 screw	18-8 stainless steel
8	N. C. spring stack	316L stainless steel
9	Compression collet	316L stainless steel
10	Retainer nut	316L stainless steel
11	Top cap	316L stainless steel
12	O-ring	Viton® or Kalrez®
13	N. O. cap	316L stainless steel
14	Diaphragm*	Elgiloy®
15	N. O. spring washer	18-8 stainless steel
16	N. O. piston	Delrin® or PEEK™
17	Seat	PCTFE or PEEK™

### Stand-alone, Multi-Stream Manifold, and Base Manifold styles

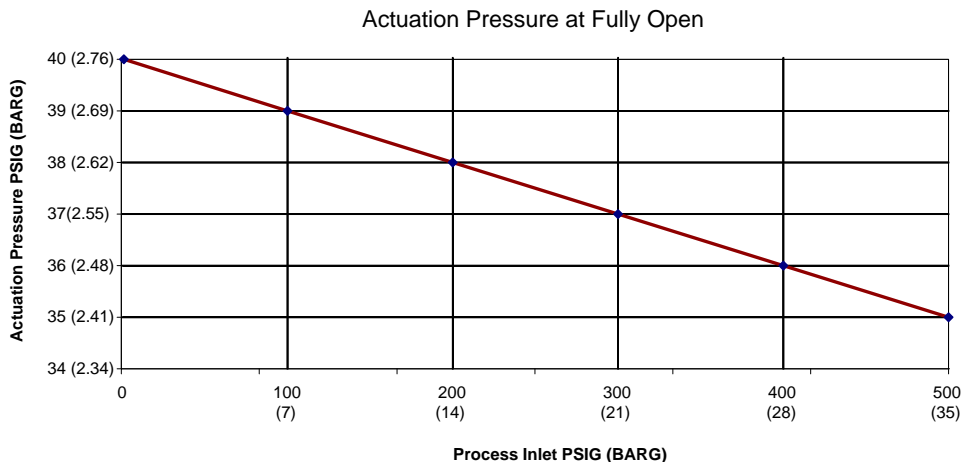
18	Threaded rod	18-8 stainless steel
19	.25" flat washer	301 stainless steel
20	.25" lock washer	18-8 stainless steel
21	.25" hex nut	18-8 stainless steel
22	Mounting bracket	316 stainless steel
23	Left end plate*	316L stainless steel, Monel® or Hastelloy® C-276
24	Right end plate*	316L stainless steel, Monel® or Hastelloy® C-276
25	Hex plug*	18-8 stainless steel
26	8-32 x .50 screw	18-8 stainless steel
27	#8 flat washer	18-8 stainless steel
28	#8 lock washer	18-8 stainless steel
29	Manifold baseplate*	316L stainless steel, Monel® or Hastelloy® C-276

\* Wetted components



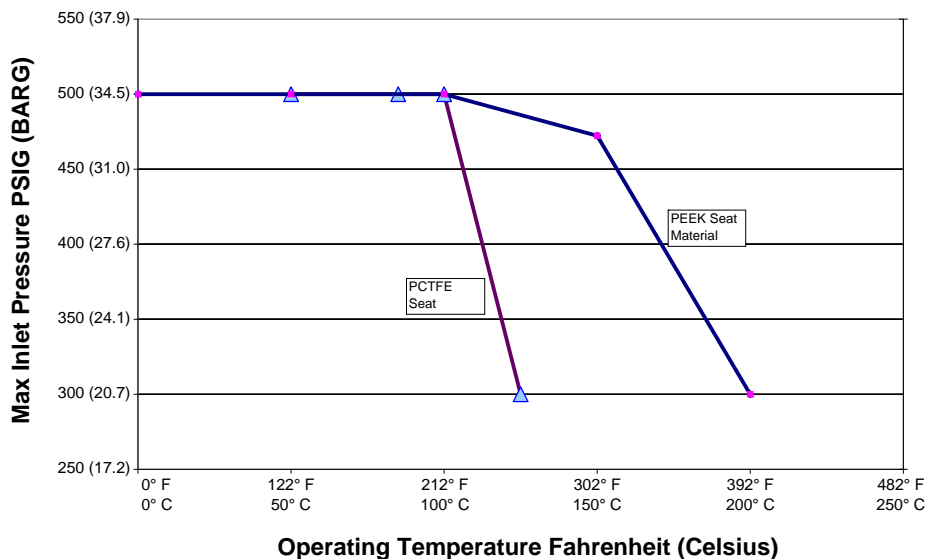
# DBB Series

## Actuation Pressure Curve

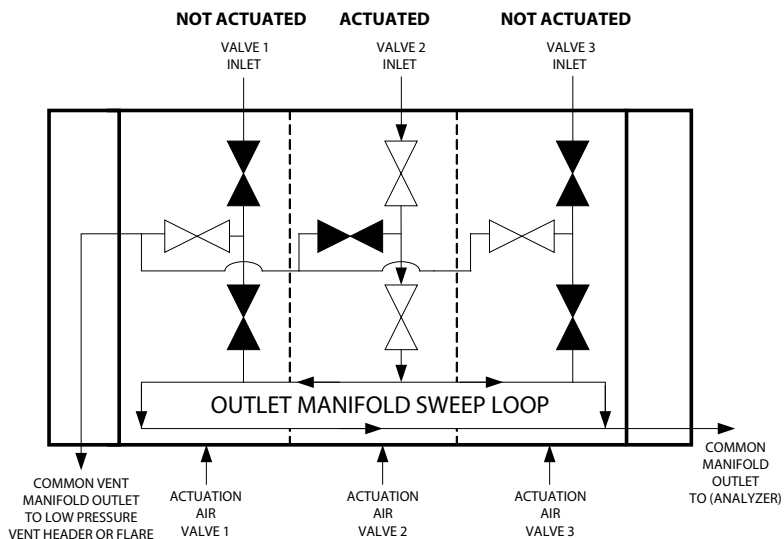


## Pressure Temperature Curves

Pressures in psig (barg)



## Typical Flow Schematics



# DBB Series

## How to Order - All DBB Valves (except Base Manifolds)

**STANDARD ITEMS IN BOLD.** Consult Customer Service for pricing and lead times for non-standard items. To order manifold components, see page 20.

**DBB - 1 F2 H D 8 06**

**BODY MATERIAL**

- 1 316 stainless steel**
- 4 Monel®
- 6 Hastelloy® C-276

**CONNECTION TYPE**

- 00 Surface mount only
- F2 1/8" female NPT**
- M2 Expansion module (1/8" female NPT)\*\*\*\*

**SEAT MATERIAL**

- H PCTFE (Delrin® pistons)**
- Q PEEK™ (PEEK pistons)

**NUMBER OF STREAMS / VALVES**

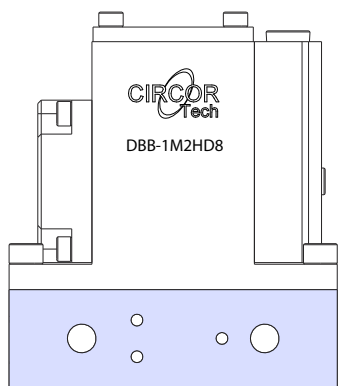
Specify from one block (01) to twelve (12)  
Leave blank for surface mount and M2 expansion modules

**OPTIONS**

- 0 None
- 1 Cleaned for oxygen service
- 5 Silcosteel® passivated\*\*
- 8 Top air inlet**
- 9 Sulfinert® passivated\*\*

**O-RING MATERIAL**

- D Viton®**
- F Teflon®\*
- K Kalrez®
- X Surface mount o-ring\*\*\*  
(supplied with valve, Viton® standard)



M2 Expansion Module

\* Available as special (not suitable for all applications, consult factory)  
 \*\* Restek Corp. coatings  
 \*\*\* Required for surface mount units.  
 \*\*\*\* M2 expansion module is a turn-key package for adding streams to the DBB. Module consists of one (1) surface mount valve, one (1) manifold baseplate, four (4) mounting screws and seven (7) o-rings.

## How to Order - Base Manifold with Mounting Brackets (valve body not included)

This option is available in the event the customer already possesses surface mount valves, or desires to order base manifold assemblies separately from valves

**STANDARD ITEMS IN BOLD.** Consult Customer Service for pricing and lead times for non-standard items.

**113351 - 1 F2 01 D 0**

**BODY MATERIAL**

- 1 316L stainless steel**
- 4 Monel®
- 6 Hastelloy® C-276

**CONNECTION TYPE**

- F2 1/8" female NPT**

**OPTIONS**

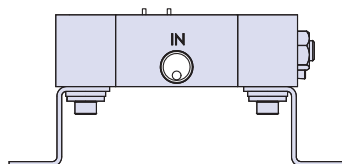
- 0 None
- 1 Cleaned for oxygen service
- 5 Silcosteel® passivated\*\*
- 9 Sulfinert® passivated\*\*

**O-RING MATERIAL**

- D Viton®**
- K Kalrez®
- F Teflon®\*

**NUMBER OF MANIFOLDS**

- 01 (minimum) to 12



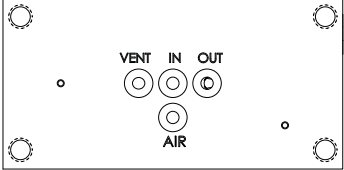

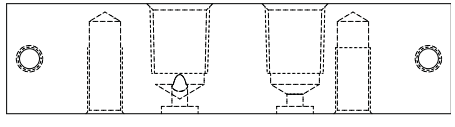
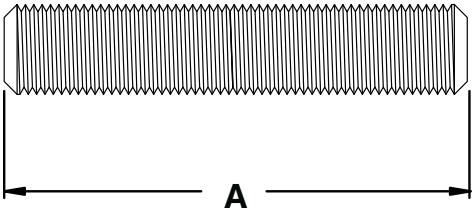




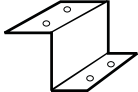
Base manifold style

\* Available as special (not suitable for all applications, consult factory)  
 \*\* Restek Corp. coatings

# DBB Series

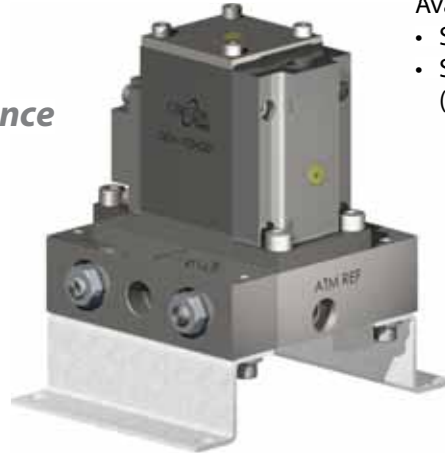
Stand-alone Valve with Mounting Brackets

## Spare Parts for Base Manifolds

	Description	Part #	Material
 <p>Top View</p>	DBB Manifold baseplate	114024-[ ]	-1: 316L stainless steel -4: Monel® -6: Hastelloy® C-276
 <p>Top View</p>	Right end plate	114020-[ ]	-1: 316L stainless steel -4: Monel® -6: Hastelloy® C-276
 <p>Top View</p>	Left end plate	114019-[ ]	-1: 316 stainless steel -4: Monel® -6: Hastelloy® C-276
 <p>A</p>	Threaded 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 (A = 4.42") G111609-3 (A = 5.92") G111609-4 (A = 7.42") G111609-5 (A = 8.92") G111609-6 (A = 10.42") G111609-7 (A = 11.92") G111609-8 (A = 13.42") G111609-9 (A = 14.92") G111609-10 (A = 16.42") G111609-11 (A = 17.92") G111609-12 (A = 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-[ ]	-50: Viton® -53: Kalrez®
	Mounting bracket	CT112609	316 stainless steel

# DSV Series

**GC Diaphragm Valve,  
Normally Closed,  
with Atmospheric Reference**



Available as:

- Stand-alone
- Surface mount modular (ANSI/ISA-76  $\mu$ MS<sup>3</sup>® sampling system)

The DSV Series<sup>1</sup> diaphragm valve is a GC module with two normally closed shut-off valves and an atmospheric reference. This series is available in two configurations: 1) stand-alone, and 2) ANSI/ISA-76 compliant configuration. It is also available as an integral piece of the DBA Series stream-switching valve manifold assembly (see page 29).

DSV Series valves are totally free of springs, bellows, packing, and lubricants in the process wetted area. Stand-alone DSV valve assemblies can be easily integrated into an ANSI/ISA-76 compliant system with the use of a simple adapter plate (see our  $\mu$ MS<sup>3</sup>® Modular Substrate System brochure CTMS3 for additional information).

## Features & Benefits

- GC fast loop with atmospheric reference
- Surface mount ANSI/ISA-76 compliant\*
- Metal-to-metal seals to atmosphere to prevent leakage
- Replaceable seats for extended service life
- Wide choice of materials for virtually all applications
- No dynamic o-rings, springs, or lubricant in wetted flow path to prevent sample contamination
- Stacked diaphragms for extended service life
- Very low internal volume 0.231 cc
- Pneumatic actuation (top actuation only)
- Pressures from vacuum (50 torr) to 500 psig (34 barg)
- Compact valve body (3" L x 2.6" H x 1.5" W)
- Interlocking pins between valve body and manifold baseplate to ensure 100% correct reassembly

\*  $\mu$ MS<sup>3</sup>® base adapter plate CT113561-[ ] required for non-CIRCOR Tech manufactured surface mount systems - consult factory

## Technical Data

<b>BODY</b>	316L stainless steel, Monel® or Hastelloy® C-276
<b>SEATS</b>	PCTFE or PEEK™
<b>DIAPHRAGMS</b>	Elgiloy® AMS 5876
<b>ORIFICE SIZE</b>	0.110" (2.8 mm)
<b>FLOW CAPACITY</b>	0.20 Cv
<b>VALVE INTERNAL VOLUME**</b>	0.231 cc
<b>EXTERNAL LEAKAGE</b>	1 x 10 <sup>-5</sup> cc/sec helium (inboard)
<b>ACTUATION PRESSURE</b>	50 psig (see chart page 27)

\*\* Internal volume is defined as area from the main analyzer isolation valve to the analyzer outlet port.

## Operating Pressures

<b>OPERATING PRESSURE</b>	Vacuum (50 torr) to 500 psig (34 barg)
<b>PROOF PRESSURE</b>	2000 psig (138 barg)
<b>BURST PRESSURE</b>	8000 psig (552 barg)

## Operating Temperatures

SEAT MATERIAL	TEMPERATURE	
PCTFE	-40° F to +212° F	-40° C to +100° C
PEEK™	0° F to +400° F	-18° C to +204° C

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<sup>1</sup> Patent pending

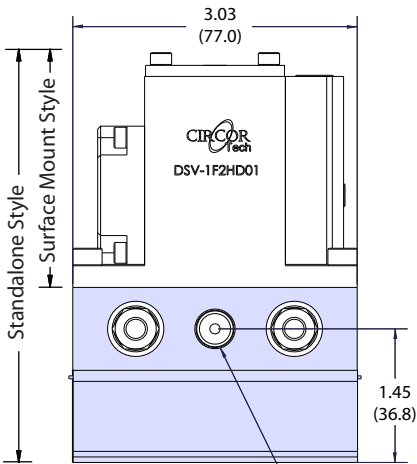
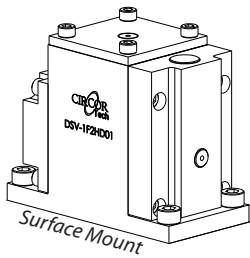
diaphragm valves

# DSV Series

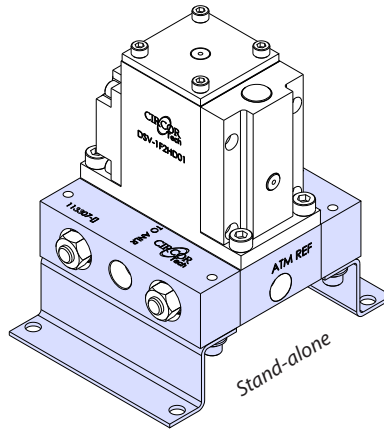
## Dimensions - All Styles

Dimensions are in inches (millimeters) for reference only and are subject to change.

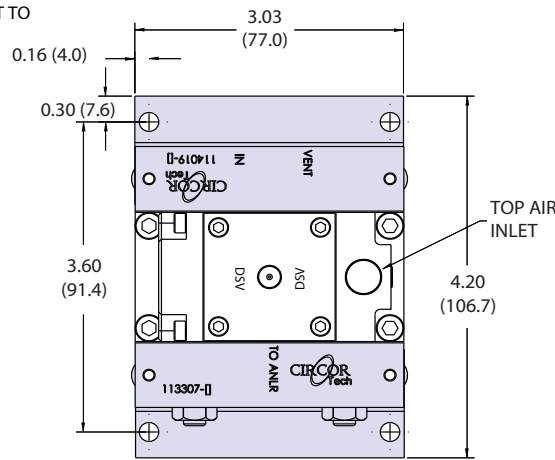
Shaded areas refer to parts and dimensions specific to stand-alone.



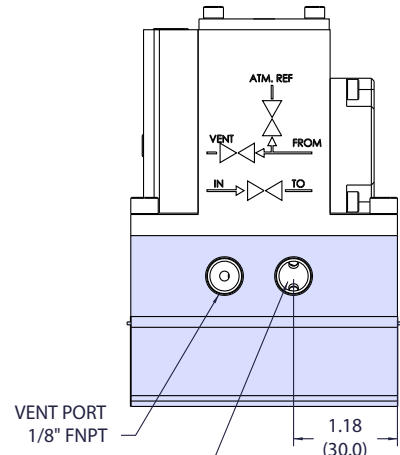
Front side view  
OUTLET PORT TO ANALYZER 1/8" FNPT



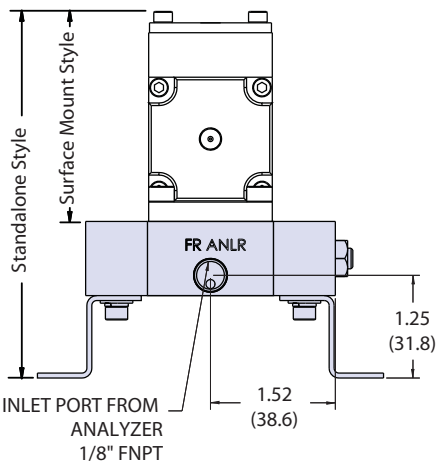
Stand-alone



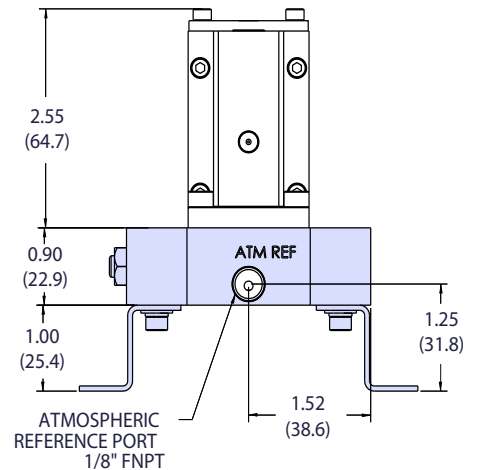
Top view



Back side view



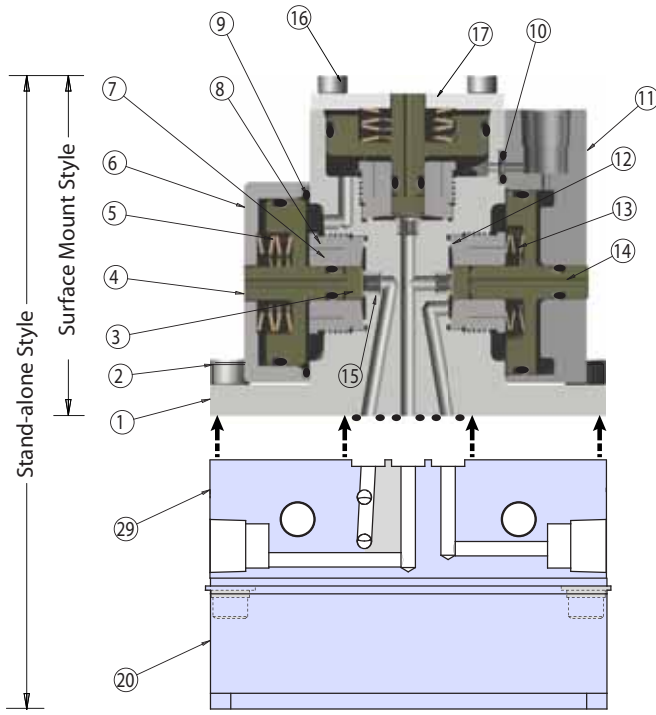
Left end view



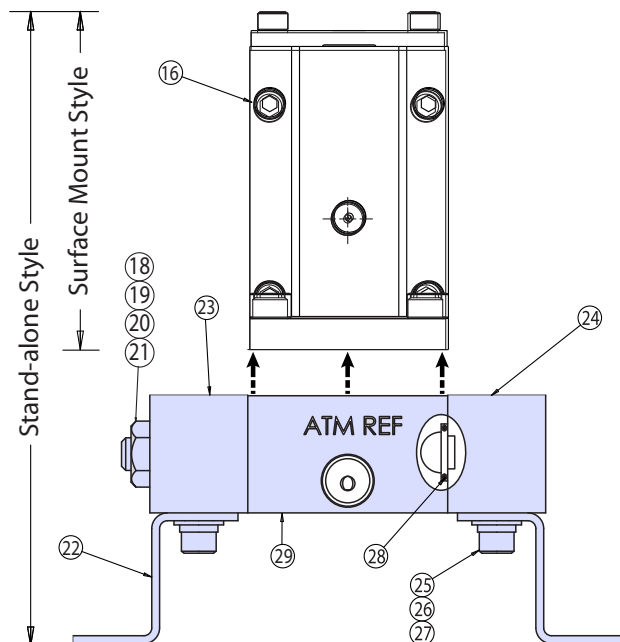
Right end view

# DSV Series

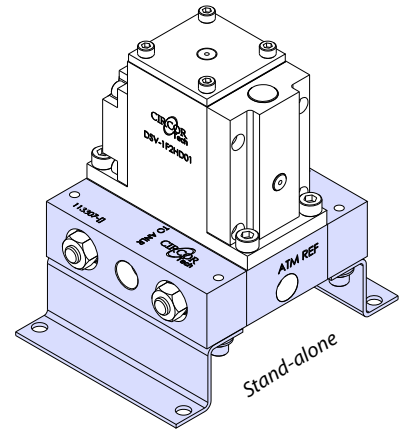
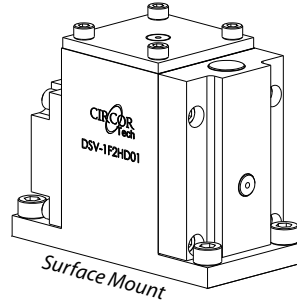
## Materials of Construction



Front side view



Right end view



### Both Styles - Valve Body

#	PART	MATERIALS
1	Body*	316L stainless steel, Monel® & Hastelloy® C-276
2	10-32 x .50 screw	18-8 stainless steel
3	Thrust plug	Delrin® or PEEK™
4	N. C. piston	Delrin® or PEEK™
5	N. C. spring stack	18-8 stainless steel
6	N. C. cap	316L stainless steel
7	Compression collet	316L stainless steel
8	Retainer nut	316L stainless steel
9	O-ring	Viton®
10	O-ring	Viton®
11	N. O. cap	316L stainless steel
12	Diaphragm*	Elgiloy®
13	N. O. spring stack	18-8 stainless steel
14	N. O. piston	Delrin® or PEEK™
15	Seat*	PCTFE or PEEK™
16	6-32 x .375 HSC screw	18-8 stainless steel
17	Top cap	316L stainless steel

### Stand-alone Style

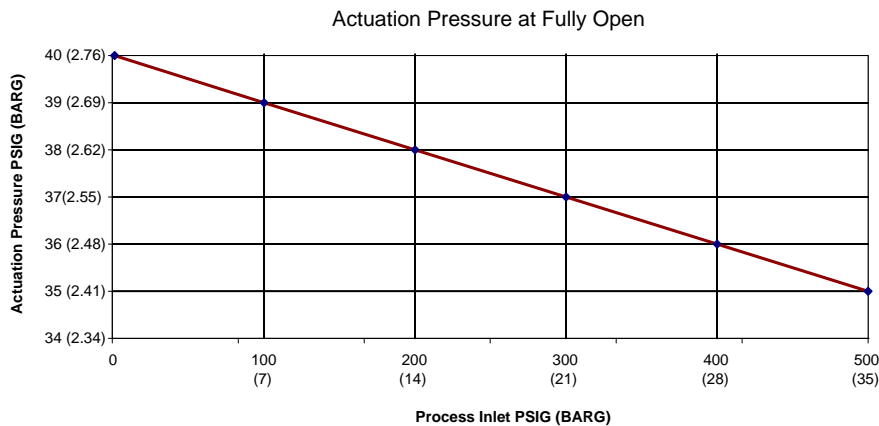
18	Threaded rod	18-8 stainless steel
19	.25" flat washer	301 stainless steel
20	.25" lock washer	18-8 stainless steel
21	.25" hex nut	18-8 stainless steel
22	Mounting bracket	316 stainless steel
23	Left end plate*	316L stainless steel, Monel® or Hastelloy® C-276
24	Right end plate*	316L stainless steel, Monel® or Hastelloy® C-276
25	8-32 x .50 SHCS screw	18-8 stainless steel
26	#8 flat washer	18-8 stainless steel
27	#8 lock washer	18-8 stainless steel
28	O-ring*	Viton® or Kalrez®
29	Manifold baseplate*	316L stainless steel, Monel® or Hastelloy® C-276

\* Wetted components

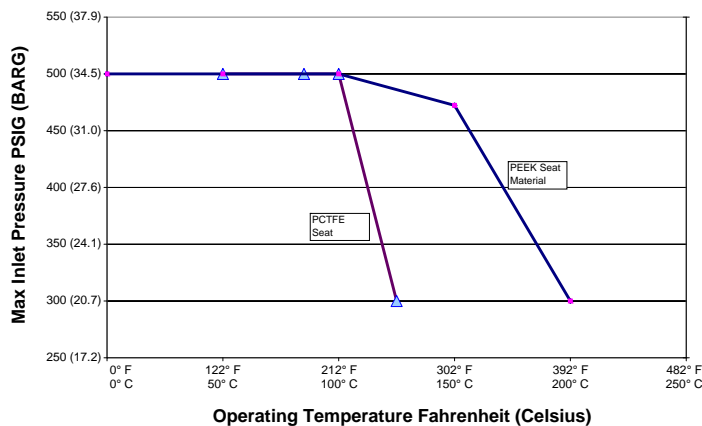


# DSV Series

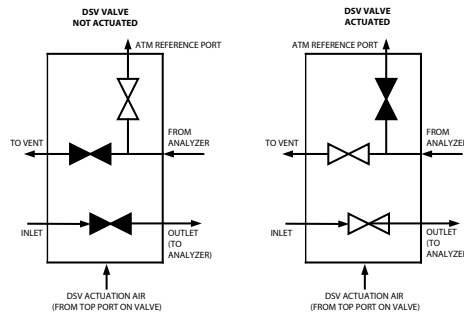
## Actuation Pressure Curve



## Pressure Temperature Curves



## Typical Flow Schematic



## How to Order

**STANDARD ITEMS IN BOLD.** Consult Customer Service for pricing and lead times for non-standard items.

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

### BODY MATERIAL

- 1** 316L stainless steel
- 4 Monel®
- 6 Hastelloy® C-276

### CONNECTION TYPE

- 00 Surface mount only
- F2** 1/8" female NPT

### SEAT MATERIAL

- H** PCTFE (Delrin® pistons)
- Q PEEK™ (PEEK pistons)

### OPTIONS

- 0** None
- 1 Cleaned for oxygen service
- 5 Silcosteel® passivated\*\*
- 9 Sulfinert® passivated\*\*

### O-RING MATERIAL

- D** Viton®
  - F Teflon®\*
  - K Kalrez®
  - X Surface mount o-ring\*\*\*
- (supplied with valve, Viton® standard)

\* Available as special (not suitable for all applications, consult factory)

\*\* Restek Corp. coatings

\*\*\* Required for surface mount units

## DSS Series

*GC Diaphragm Valve,  
Normally Open,  
with Atmospheric Reference*



- Available as:
- Stand-alone
  - Surface mount modular (ANSI/ISA-76  $\mu$ MS<sup>3</sup>® analyzer system)

The DSS Series<sup>1</sup> diaphragm valve is a GC module with two normally open shut-off valves and an atmospheric reference. This series is available in two configurations: 1) stand-alone, and 2) ANSI/ISA-76 compliant surface mount style. Stand-alone DSS valve assemblies can be easily integrated into an ANSI/ISA-76 compliant system with the use of a simple adapter plate (see our  $\mu$ MS<sup>3</sup>® Modular Substrate System brochure CTMS3 for additional information).

### Features & Benefits

- GC fast loop with atmospheric reference
- Surface mount ANSI/ISA-76 compliant\*
- Metal-to-metal seals to atmosphere to prevent leakage
- Wide choice of materials for virtually all applications
- Replaceable seats for extended service life
- No dynamic o-rings, springs, or lubricant in wetted flow path to eliminate sample contamination
- Very low internal volume 0.231 cc
- Stacked diaphragms for extended service life
- Pneumatic actuation (top actuation only)
- Pressures from vacuum (50 torr) to 500 psig (34 barg)
- Compact package (3" L x 2.6" H x 1.5" W)
- Interlocking pins between valve body and manifold baseplate to ensure 100% correct reassembly

\*  $\mu$ MS<sup>3</sup>® base adapter plate required for non-CIRCOR Tech manufactured surface mount systems

### Technical Data

<b>BODY</b>	316L stainless steel, Monel® or Hastelloy® C-276
<b>SEATS</b>	PCTFE or PEEK™
<b>DIAPHRAGMS</b>	Elgiloy® AMS 5876
<b>ORIFICE SIZE</b>	0.110" (2.8 mm)
<b>FLOW CAPACITY</b>	0.20 Cv
<b>VALVE INTERNAL VOLUME**</b>	0.231 cc
<b>EXTERNAL LEAKAGE</b>	1 x 10 <sup>-5</sup> cc/sec helium (inboard)
<b>ACTUATION PRESSURE</b>	50 psig (3 barg) (see chart page 37)

### Operating Pressures

<b>OPERATING PRESSURE</b>	Vacuum (50 torr) to 500 psig (34 barg)
<b>PROOF PRESSURE</b>	2000 psig (138 barg)
<b>BURST PRESSURE</b>	8000 psig (552 barg)

### Operating Temperatures

SEAT MATERIAL	TEMPERATURE	
PCTFE	-40° F to +212° F	-40° C to +100° C
PEEK™	0° F to +400° F	-18° C to +204° C

\*\* Internal volume is defined as area from the main analyzer isolation valve to the analyzer outlet port.

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<sup>1</sup> Patent pending

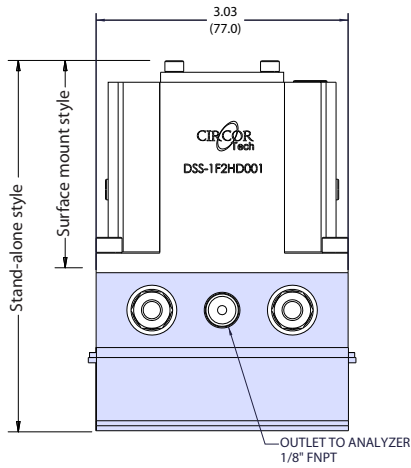
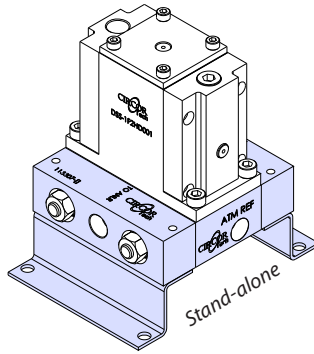
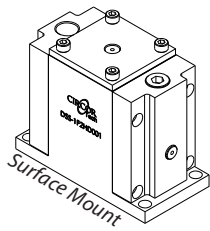
diaphragm valves

# DSS Series

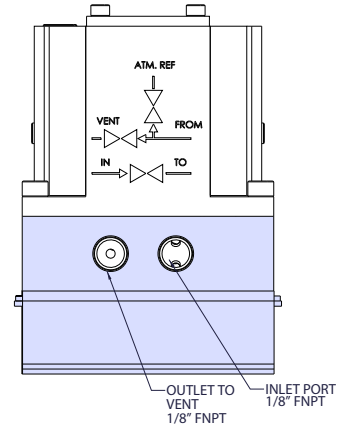
## Dimensions – All Styles

Dimensions are in inches (millimeters) for reference only and are subject to change.

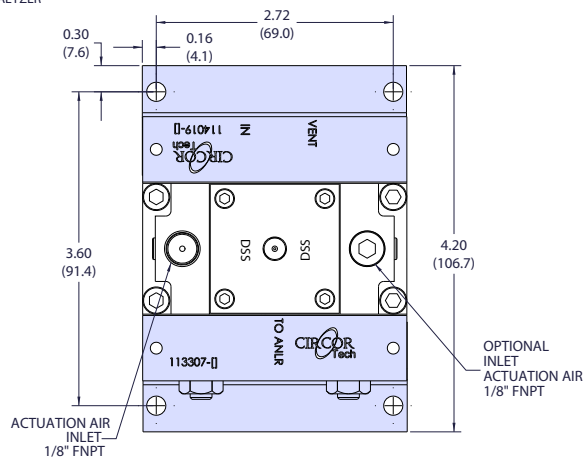
Shaded areas refer to parts and dimensions specific to stand-alone.



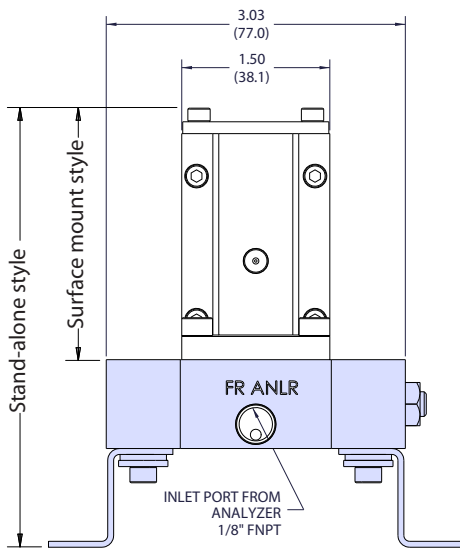
Front side view



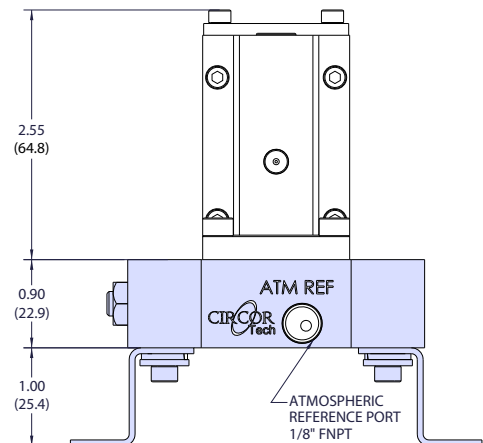
Back side view



Top view



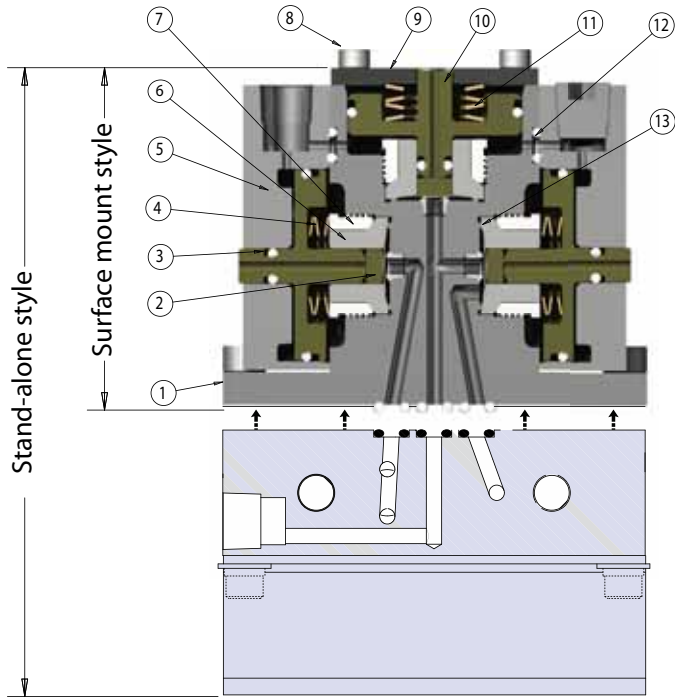
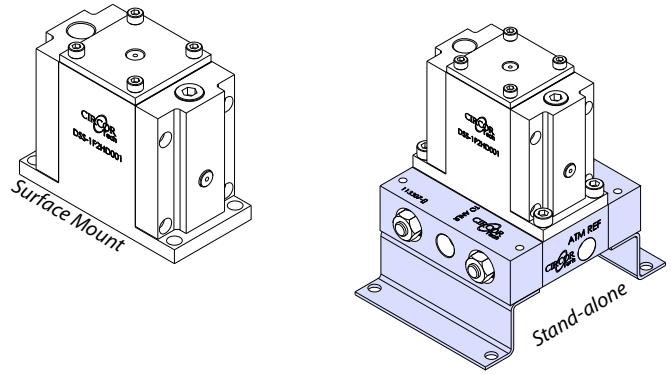
Left end view



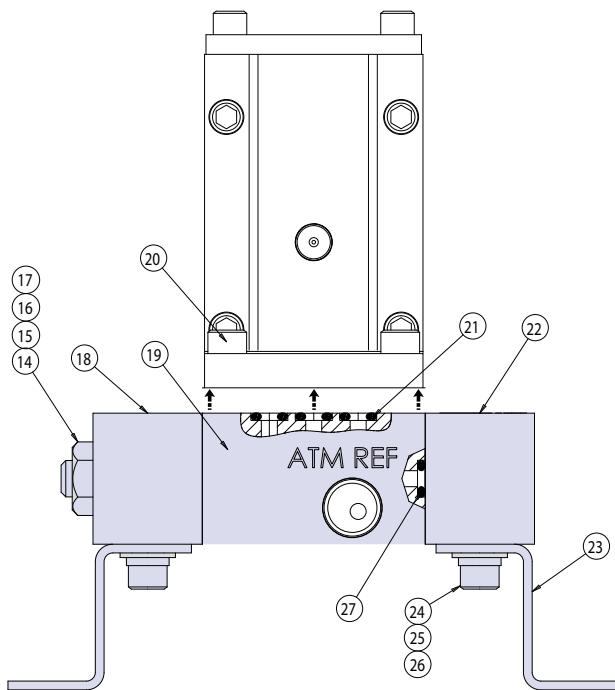
Right end view

# DSS Series

## Materials of Construction



Right side view



Right end view

### All Styles – Valve Body

#	PART	MATERIALS
1	Body*	316L stainless steel, Monel® or Hastelloy® C-276
2	Thrust plug	316L stainless steel, Monel® or Hastelloy® C-276
3	N.O. piston	Delrin® or PEEK™
4	N.O. spring stack	18-8 stainless steel
5	N.O. cap	316L stainless steel
6	Compression collet	316L stainless steel
7	Retainer nut	316L stainless steel
8	6-32 x .375 SHC screw	18-8 stainless steel
9	Top cap	316L stainless steel
10	N.C. piston	Delrin® or PEEK™
11	N.C. spring stack	18-8 stainless steel
12	O-ring	Viton®
13	Diaphragm*	Elgiloy®

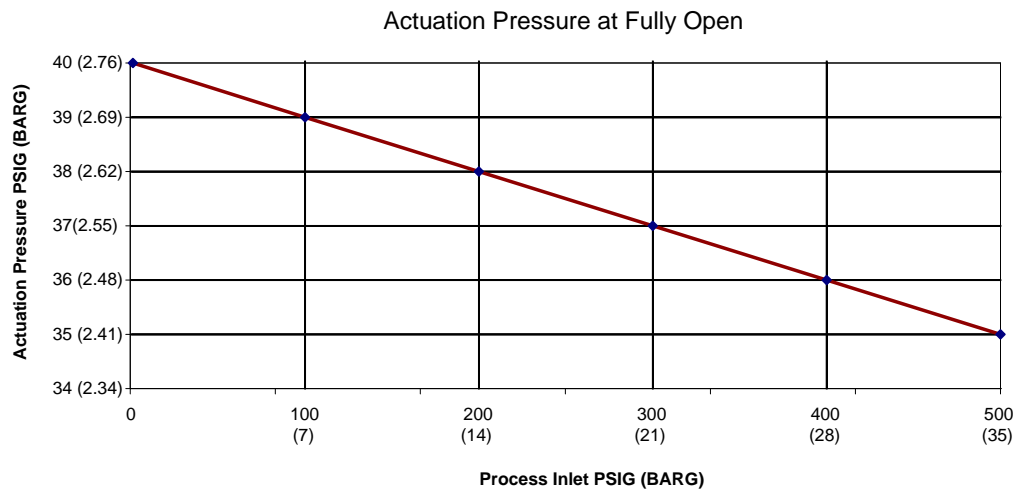
### Stand-Alone and Multi-stream manifold styles

14	Threaded rod	18-8 stainless steel
15	1/4" flat washer	301, 302 stainless steel
16	1/4" flat washer	18-8 stainless steel
17	Hex nut 1/4-28	18-8 stainless steel
18	Left end plate*	316L stainless steel, Monel® or Hastelloy® C-276
19	Manifold base plate*	316L stainless steel, Monel® or Hastelloy® C-276
20	10-32 x .437 SHC screw	18-8 stainless steel
21	O-ring	Viton® or Kalrez®
22	Right end plate*	316L stainless steel, Monel® or Hastelloy® C-276
23	Mounting bracket	316 stainless steel
24	8-32 x .437 SHC screw	18-8 stainless steel
25	#8 flat washer	18-8 stainless steel
26	#8 lock washer	18-8 stainless steel
27	O-ring*	Viton® or Kalrez®

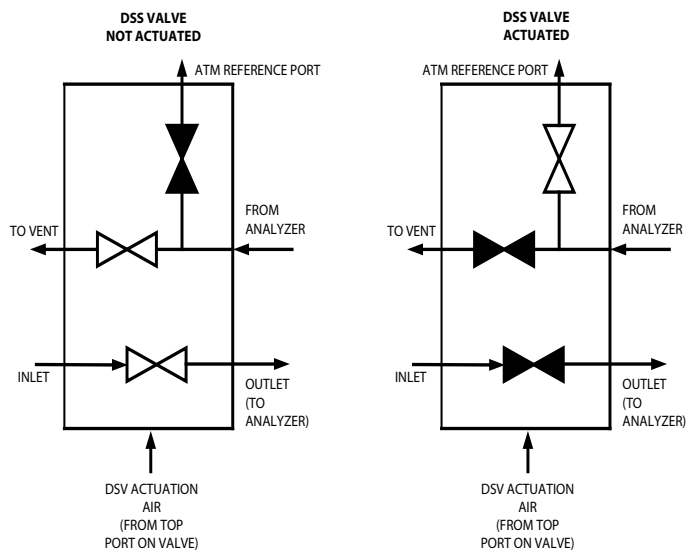
\* Wetted components

# DSS Series

## Actuation Pressure Curve



## Typical Flow Schematic



## How to Order - All DSS Valves

**STANDARD ITEMS IN BOLD.** Consult Customer Service for pricing and lead times for non-standard items.

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

### BODY MATERIAL

- 1** 316L stainless steel
- 4 Monel®
- 6 Hastelloy® C-276

### CONNECTION TYPE

- 00 Surface mount only\*\*
- F2** 1/8" female NPT

### SEAT MATERIAL

- H** PCTFE (Delrin® pistons)
- Q PEEK™ (PEEK pistons)

### OPTIONS

- 0** None
- 1 Cleaned for oxygen service
- 5 Silcosteel® passivated\*\*\*
- 9 Sulfinert™ passivated\*\*\*

### O-RING MATERIAL

- D** Viton®
- F Teflon®\*
- K Kalrez®
- X Surface mount o-rings\*\* (8 supplied with valve, Viton® standard)

\* Available as special (not suitable for all applications, consult factory)

\*\* Required for surface mount units.

\*\*\* Restek Corp. coatings

# DBA Series

## GC Manifold Assembly with DBB and DSV Series



Combines:

- Multiple DBB Series (Double-Block-and-Bleed Diaphragm Valve)
- One DSV Series (GC Diaphragm Valve, normally closed, with atmospheric reference)

Available as:

- Multi-stream manifold

The DBA Series<sup>1</sup> diaphragm valve is a modular, stream-switching, manifold assembly containing double-block-and-bleed valves and a fast loop shut-off with an atmospheric reference. The DBA Series consists of DBB Series valves stacked with a single DSV Series valve. The individual valves can easily be integrated into an ANSI/ISA-76 compliant system with the use of a simple adapter plate (see our  $\mu$ MS<sup>3</sup>® Modular Substrate System brochure CTMS3 for additional information).

### Features & Benefits

- Stream select manifold assembly
- Surface mount ANSI/ISA-76 compliant\*
- Metal-to-metal seals to atmosphere to prevent leakage
- Wide choice of materials for virtually all applications
- Replaceable seats for extended service life
- No dynamic o-rings, springs, or lubricant in wetted flow path to eliminate sample contamination
- Stacked diaphragms for extended service life
- Integrated sweep loop in manifold
- Pneumatic actuation (DSV valve is top air only)
- Pressures from vacuum (50 torr) to 500 psig (34 barg)
- Compact package (3" L x 2.6" H x 1.5" W)

\*  $\mu$ MS<sup>3</sup>® base adapter plate required for non-CIRCOR Tech manufactured surface mount systems

### Technical Data

<b>BODY</b>	316L stainless steel, Monel® or Hastelloy® C-276
<b>SEATS</b>	PCTFE or PEEK™
<b>DIAPHRAGMS</b>	Elgiloy® AMS 5876
<b>WORKING PRESSURE RANGE</b>	Vacuum (50 torr) to 500 psig (34 bar)
<b>ORIFICE SIZE</b>	0.110" (2.8 mm)
<b>EXTERNAL LEAKAGE</b>	1x10 <sup>-5</sup> cc/sec helium (inboard)
<b>ACTUATION PRESSURE</b>	50 psig

### Operating Pressures

<b>OPERATING PRESSURE</b>	Vacuum (50 torr) to 500 psig (34 barg)
<b>PROOF PRESSURE</b>	2000 psig (138 barg)
<b>BURST PRESSURE</b>	8000 psig (552 barg)

### Operating Temperatures

SEAT MATERIAL	TEMPERATURE	
PCTFE	-40° F to +212° F	-40° C to +100° C
PEEK™	0° F to +400° F	-18° C to +204° C

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<sup>1</sup> Patent pending

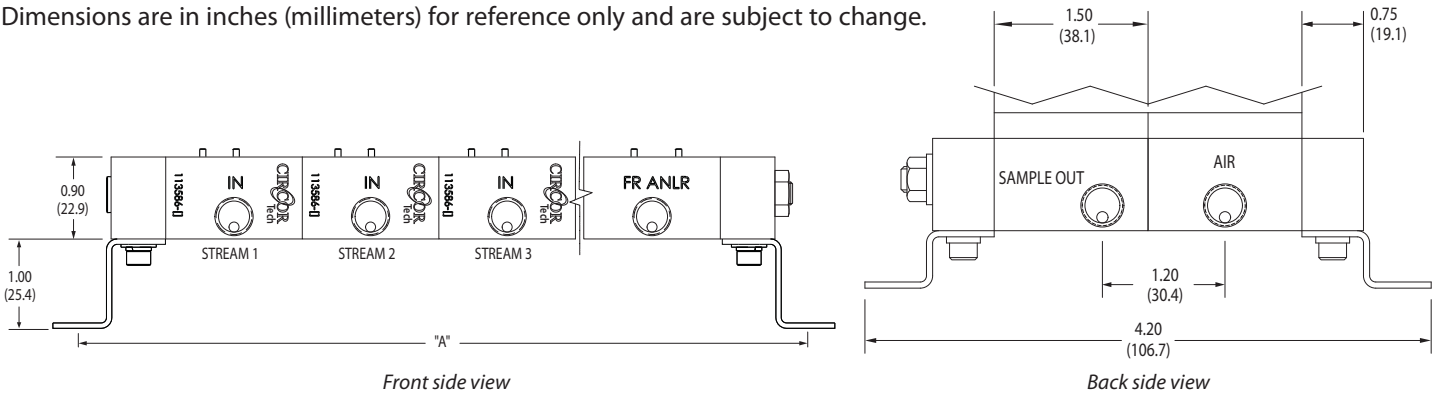
diaphragm valves

# DBA Series

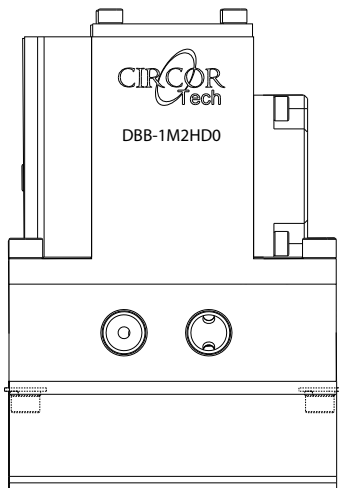
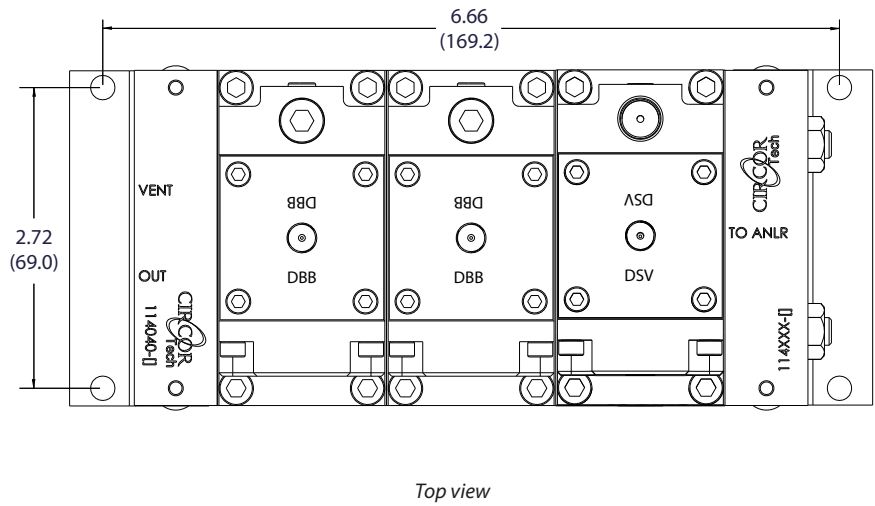
Multi-stream Manifold Assembly (with Mounting Brackets)

## Dimensions

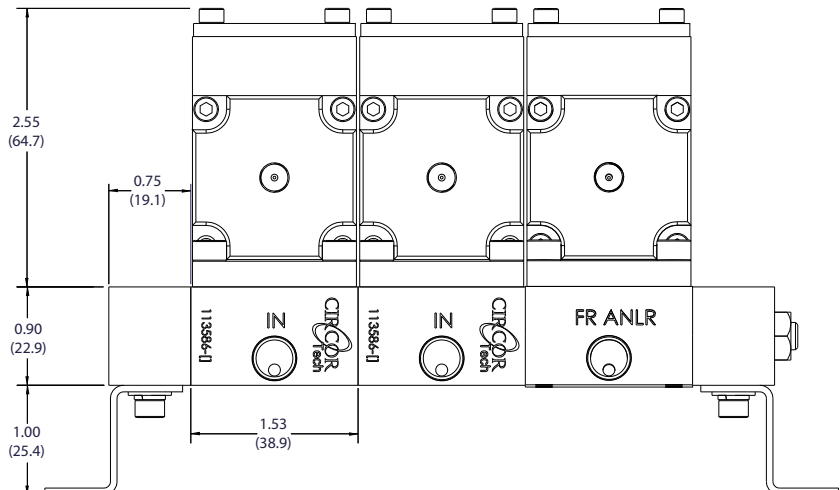
Dimensions are in inches (millimeters) for reference only and are subject to change.



NUMBER OF MANIFOLDS		2	3	4	5	6	7	8	9	10	11	12
A	inches	5.13	6.66	8.19	9.72	11.25	12.78	14.31	15.84	17.37	18.90	20.43
	mm	135	169	208	247	286	325	364	402	441	480	519



Front side view



Right end view

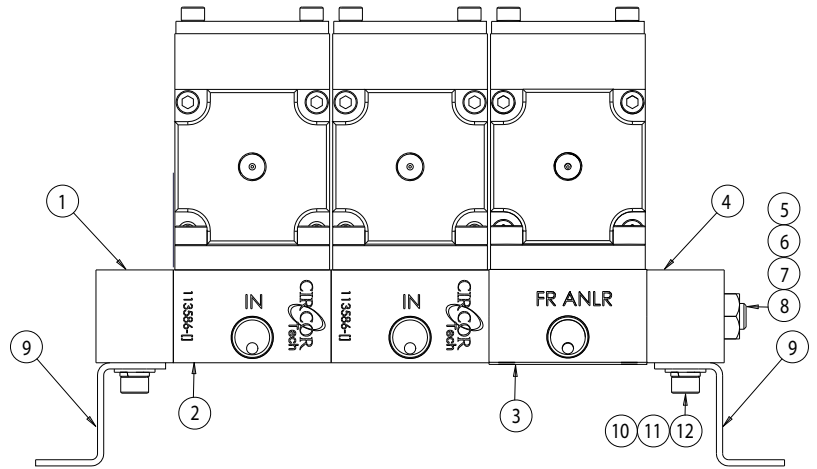
# DBA Series

Multi-stream Manifold Assembly (with Mounting Brackets)

## Materials of Construction

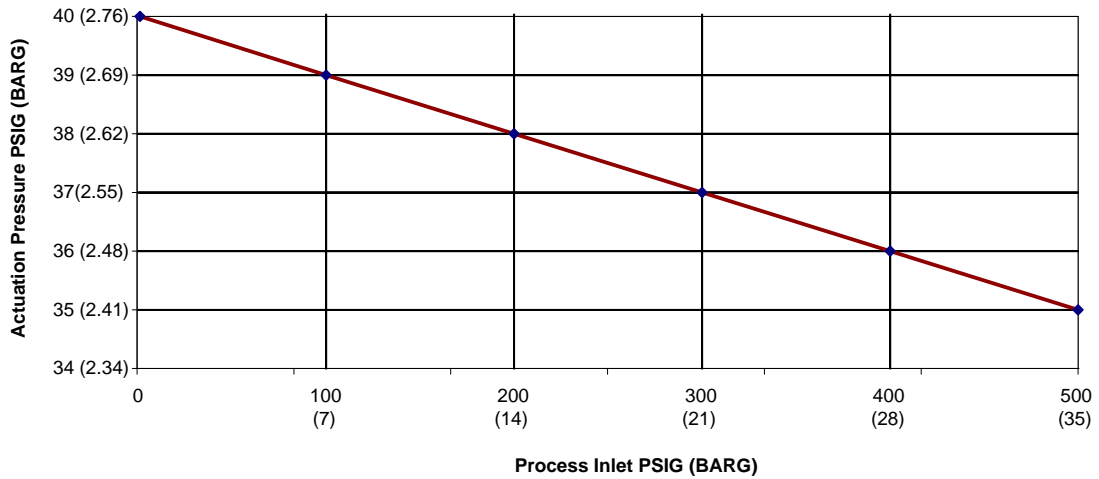
#	PART	MATERIALS
1	End plate*	316L stainless steel, Monel®, or Hastelloy® C-276
2	Manifold baseplate (DBB)*	316L stainless steel, Monel®, or Hastelloy® C-276
3	Manifold baseplate (DSV)*	316L stainless steel, Monel®, or Hastelloy® C-276
4	End plate to analyzer	316L stainless steel, Monel®, or Hastelloy® C-276
5	Flat washer	18-8 stainless steel
6	Lock washer	18-8 stainless steel
7	Nut	18-8 stainless steel
8	Threaded rod	18-8 stainless steel
9	Mounting bracket	316 stainless steel
10	Screw	18-8 stainless steel
11	Flat washer	18-8 stainless steel
12	Lock washer	18-8 stainless steel

\* Wetted components

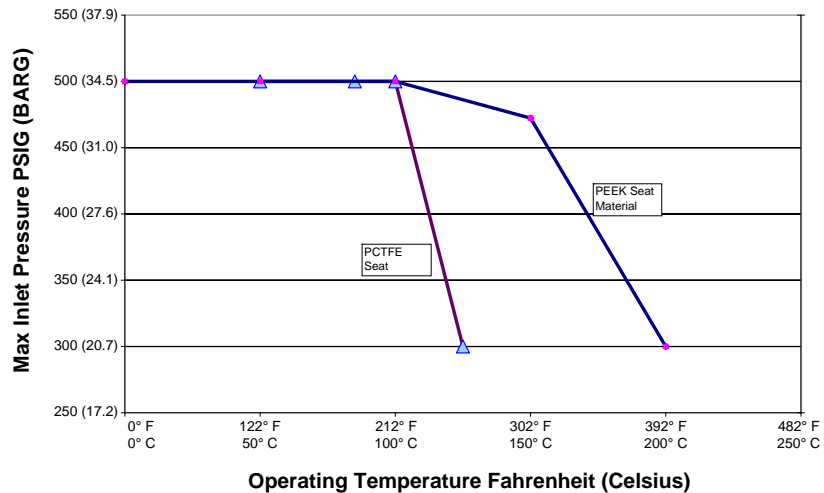


## Actuation Pressure Curve

Actuation Pressure at Fully Open



## Pressure Temperature Curve

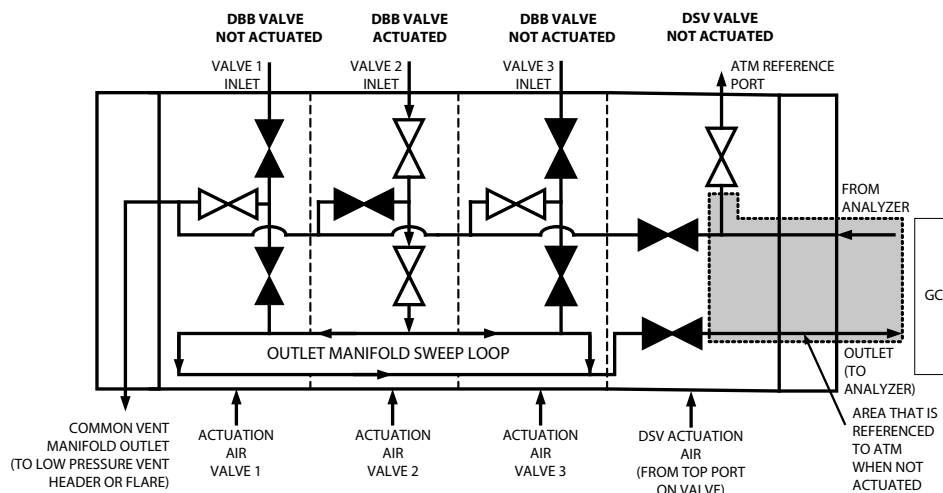
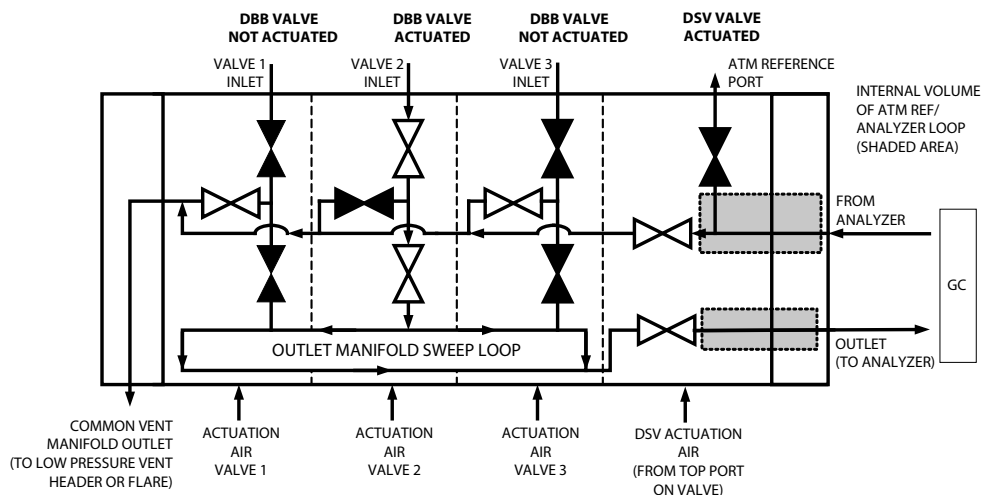




# DBA Series

## Typical Flow Schematic

### Multi-stream Manifold Assembly



## How to Order

**STANDARD ITEMS IN BOLD.** Consult Customer Service for pricing and lead times for non-standard items.

**DBA - 1 F2 H D 0 02**

### BODY MATERIAL

- 1** 316L stainless steel
- 4 Monel®
- 6 Hastelloy® C-276

### CONNECTION TYPE

**F2** 1/8" female NPT

### SEAT MATERIAL

- H** PCTFE (Delrin® pistons)
- Q PEEK™ (PEEK pistons)

### NUMBER OF VALVES\*\*\*

Specify from two manifolds (02) to twelve (12)

### OPTIONS

- 0** None
- 1 Cleaned for oxygen service
- 5 Silcosteel® passivated\*\*
- 9 Sulfinert® passivated\*\*

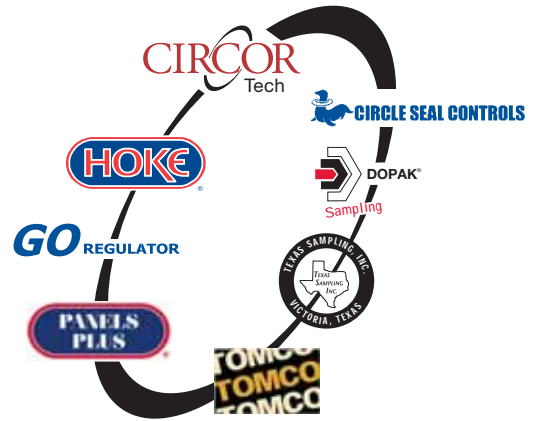
### O-RING MATERIAL

- D** Viton®
- F Teflon®\*
- K Kalrez®

\* Available as special (not suitable for all applications, consult factory)

\*\* Restek Corp. coatings

\*\*\* Example: three-manifold assembly consists of two (2) DBB valves and one (1) DSV valve



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Fax (909) 923-2550

[www.circor-panelsplus.com](http://www.circor-panelsplus.com)

## Texas Sampling, Inc

3706 Rio Grande

Victoria, Texas 77901

Tel (361) 575-8087

Fax (361) 575-8157

[www.texassampling.com](http://www.texassampling.com)

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Corona, CA 92880

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## CIRCOR Instrumentation Technologies

CIRCOR Instrumentation Technologies (CIT) is a product group of CIRCOR International (NYSE: CIR), specializing in fluid process control solutions with orifice sizes typically up to 1". Our main product lines include ball, needle, packless, diaphragm, solenoid, and metering valves, pressure regulators, quick couplers, Gyrolok® compression tube fittings, and fully integrated sampling systems.

CIT markets primarily to the petrochemical, refining, power generation, food and beverage, semiconductor, and pharmaceutical industries, and to OEM's. CIT separates itself from the competition by offering highly engineered components manufactured to exacting standards and a variety of custom options.