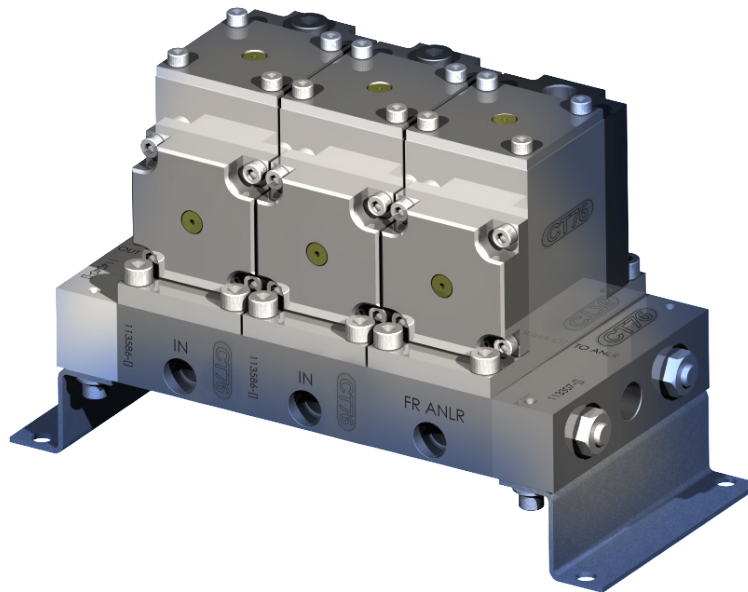
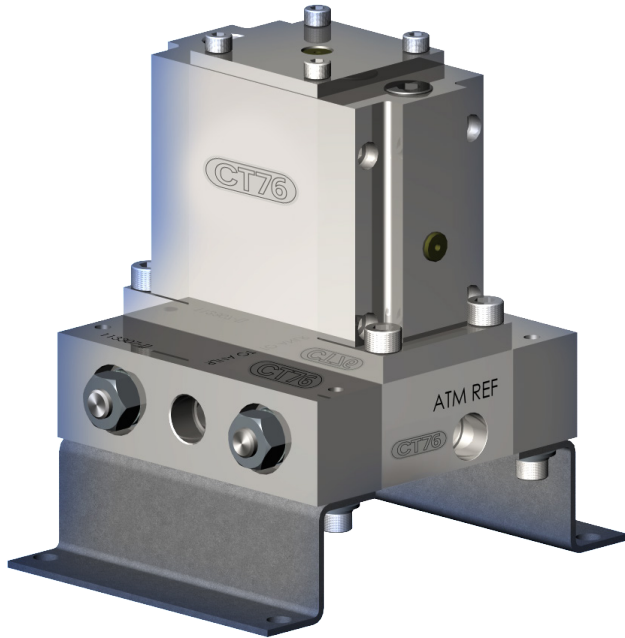




# Diaphragm Valves

## Index

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2-Way Diaphragm Valves	
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Double Block and Bleed Diaphragm Valves	
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diaphragm valves



Crane Instrumentation & Sampling

**FOR YOUR SAFETY**

It is solely the responsibility of the system designer and user to select products suitable for their specific application requirements and to ensure proper installation, operation, and maintenance of these products. When selecting products, the total system design must be considered to ensure safe, trouble-free performance. Material compatibility, product ratings and application details should be considered in the selection. Improper selection or use of products described herein can cause personal injury or property damage. Contact your authorized HOKE® sales and service representative for information about additional sizes and special alloys.

**SAFETY WARNING**

HOKE® products are designed for installation only by professional suitably qualified licensed system installers experienced in the applications and environments for which the products are intended. These products are intended for integration into a system. Where these products are to be used with flammable or hazardous media, precautions must be taken by the system designer and installer to ensure the safety of persons and property. Flammable or hazardous media pose risks associated with fire or explosion, as well as burning, poisoning or other injury or death to persons and/or destruction of property. The system designer and installer must provide for the capture and control of such substances from any vents in the product(s). The system installer must not permit any leakage or uncontrolled escape of hazardous or flammable substances. The system operator must be trained to follow appropriate precautions and must inspect and maintain the system and its components including the product(s) and at regular intervals in accordance with timescales recommended by the supplier to prevent unacceptable wear or failure.



## 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 CT76 website ([www.CT76.com](http://www.CT76.com)).

<sup>1</sup> Patent pending

### Features & Benefits

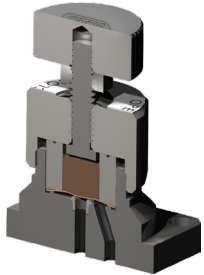
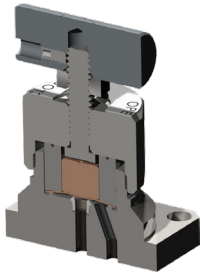
- 2-Way on/off control
- Metal-to-metal seals to atmosphere to prevent leakage
- Wide choice of materials for virtually all applications
- No dynamic o-rings, springs, or lubricant in wetted flow path to eliminate sample contamination
- Very low internal volume (0.16 cc) for low purge time
- Replaceable 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



Crane Instrumentation & Sampling

## 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).

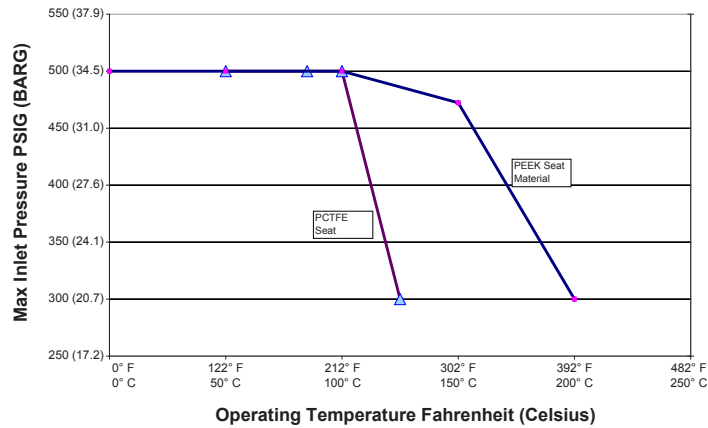
### Operating Temperatures

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

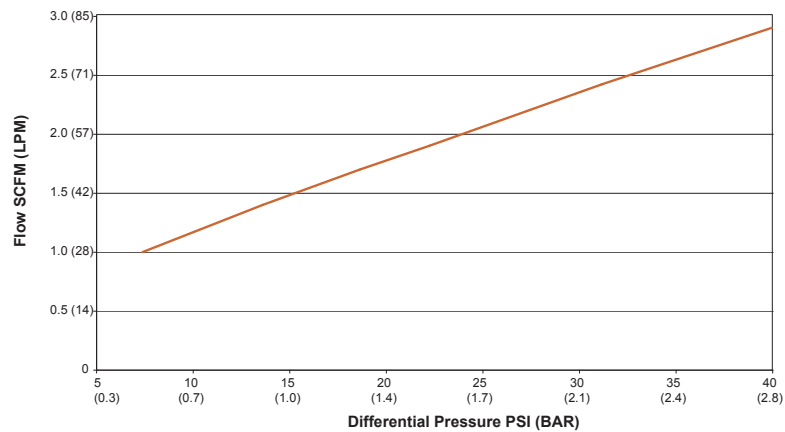
### Operating Pressures

<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



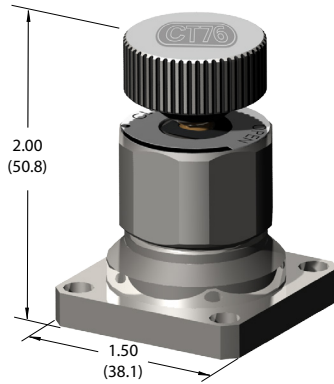
## PRESSURE VS. FLOW CURVE



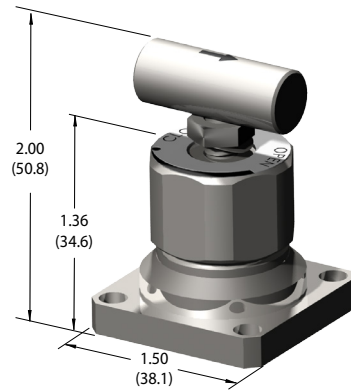
## DIMENSIONS

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**

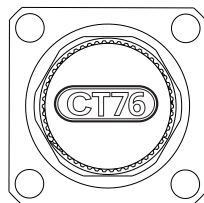
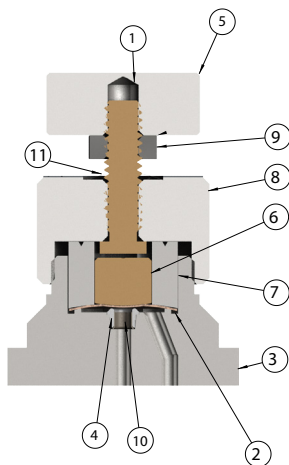


## MATERIALS OF CONSTRUCTION

#	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

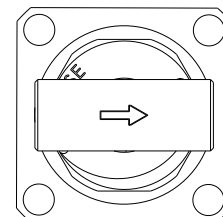
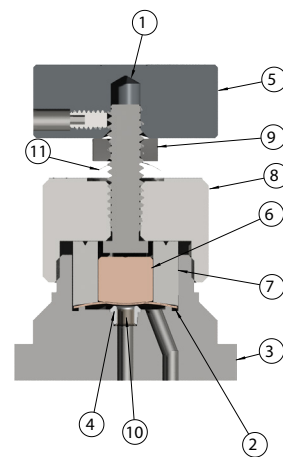
\* Wetted components

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



Top view

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



Top view

## 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 Rating

	SMALL DIAMETER	MEDIUM DIAMETER	LARGE DIAMETER
<b>VALVE WORKING PRESSURE*</b> (INLET)	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

### 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

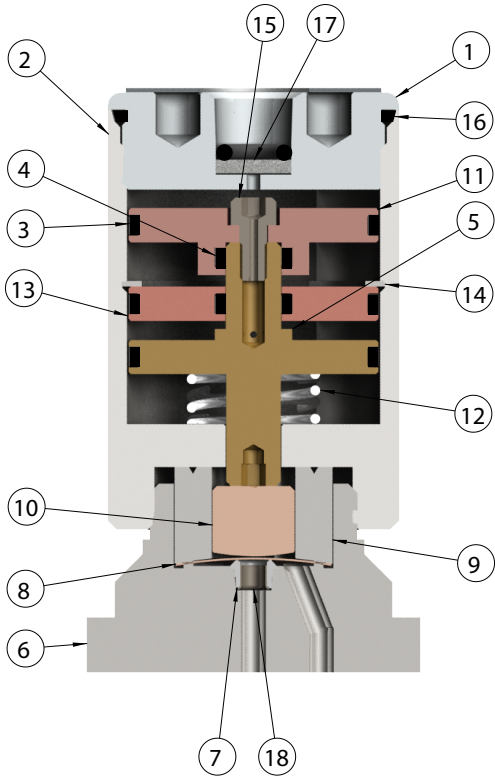
psig nominal

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) (251–500 psig process pressure)	40 psig (3 bar) (0–250 psig process pressure)  40 psig (3 bar) (251–500 psig process pressure)  40 psig (3 bar) (501–800 psig process pressure)	50 psig (0–3600 psig process pressure)
Actuation Pressure Normally Open	40 psig (3 bar) (500 psig process pressure)	40 psig (3 bar) (800 psig process pressure)	N/A

## DIMENSIONS & MATERIALS OF CONSTRUCTION

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

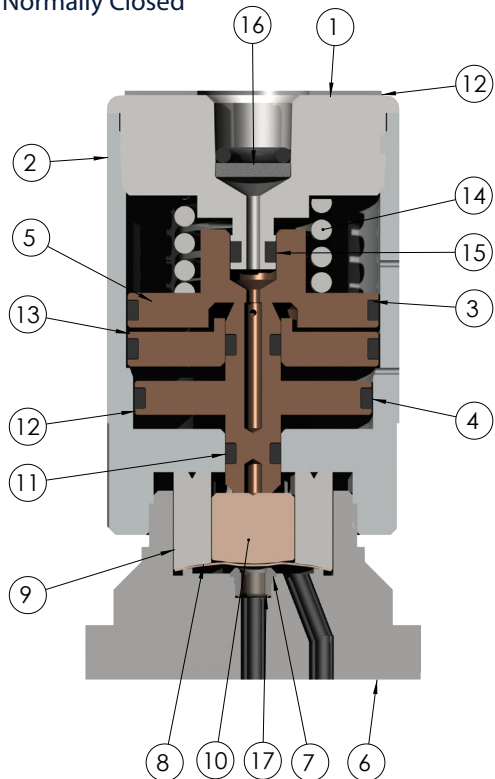
### Normally Open



#	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

## HOW TO ORDER

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

Product Family	Material Designator	Actuation Method	Actuator Size	Actuator Material	Max Process Pressure	Inlet Outlet Conditions	Seat Material	Options	Description
DV1	-								2 way diaphragm valve
	1								SST
	4								Montel
	6								Hastelloy
		C							Air actuated - Normally closed
		M							Manual round handle
		O							Air actuated - Normally open
		T							Manual T-handle
			X						Manual
			1						Air actuated (500 PSI max)
			2						Air actuated (800 PSI max)
			3						Air actuated (3,600 PSI max)
				X					Manually operated
				1					316 Stainless Steel
				5					Aluminum
					A				250 psig (17 bar)
					B				500 psig (34 bar)
					C				800 psig (55 bar)
					D				3600 psig (248 bar)
						SMSM			Surface mount inlet/outlet connection (ANSI/ISA-76)*1
							H		PCTFE seat
							Q		PEEK seat
								0	None
								1	Cleaned for oxygen service
								5	SilcoSteel Coating*2
								9	Sulfinert Coating*2

## PART NUMBER EXAMPLE CONFIGURATION

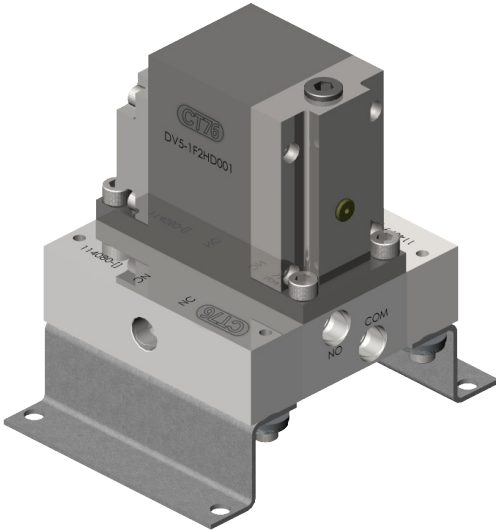
Part Number	Description
DV1-1015BSMSMQ0	Normally open air actuated DV1 valve with maximum operating pressure of 500 psig, aluminum actuator and Peek seat.
Note *1	Other DV1 connection options are available upon request, please consult with <a href="http://www.goreg.com">www.goreg.com</a> or the factory.
Note *2	Provided by Silconert Coatings





## DV5 SERIES

### 3-Way Switching Diaphragm Valves



Available as...

- Stand-alone
- Multi-stream manifold
- Surface mount modular (ANSI/ISA-76 CT76 sampling system)

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 CT76 website at [www.76.com](http://www.76.com).

<sup>1</sup> Patent pending

#### **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)

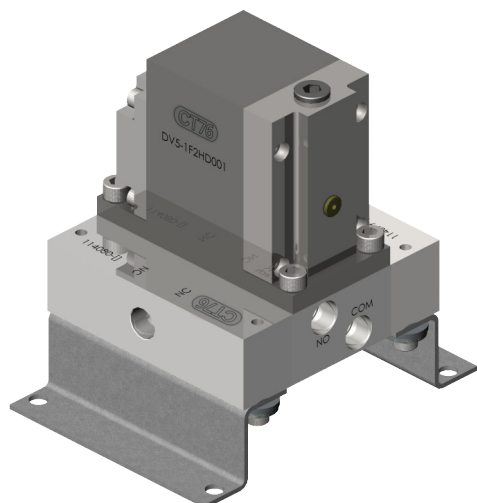
\* CT76 Base adapter plate required for non-CT76 manufactured surface mount systems-consult factory

diaphragm valves



Crane Instrumentation & Sampling

## TECHNICAL DATA



<b>BODY</b>	316L stainless steel, Monel® and Hastelloy® C-276
<b>SEATS</b>	PCTFE and PEEK™
<b>DIAPHRAGMS</b>	Elgiloy® 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 × 10 <sup>-5</sup> cc/sec helium (inboard)
<b>MIN. ACTUATION PRESSURE</b>	50 psig @ 50 psig process

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

### Operating Temperatures

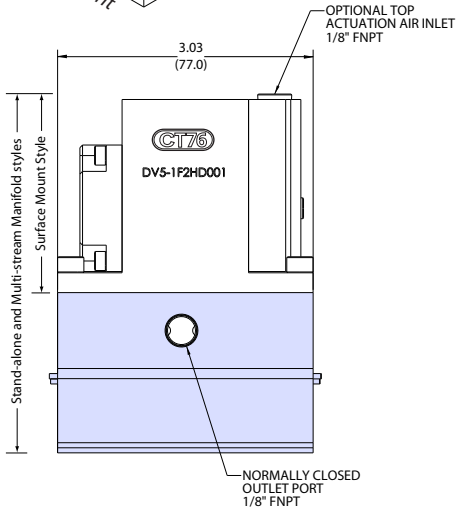
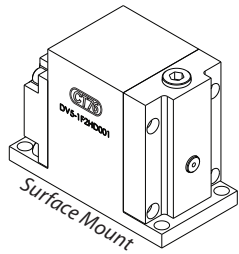
SEAT MATERIAL	TEMPERATURE	
PCTFE	-40° F to +212° F	-40° C to +100° C
PEEK™	0° F to +400° F	-18° C to +204° C

### Operating Pressures

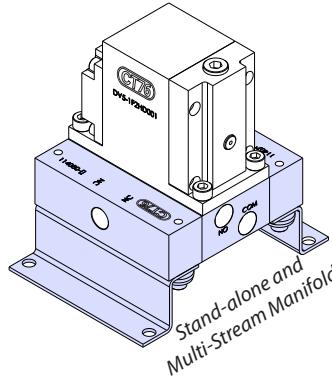
<b>OPERATING PRESSURE</b>	Vacuum (50 torr) to 500 psi (34 bar)
<b>PROOF PRESSURE</b>	2000 psig (138 barg)
<b>BURST PRESSURE</b>	8000 psig (552 barg)

## DIMENSIONS-ALL STYLES

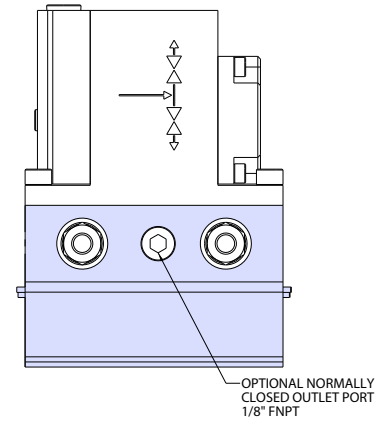
Dimensions are in inches (millimeters) for reference only and are subject to change.



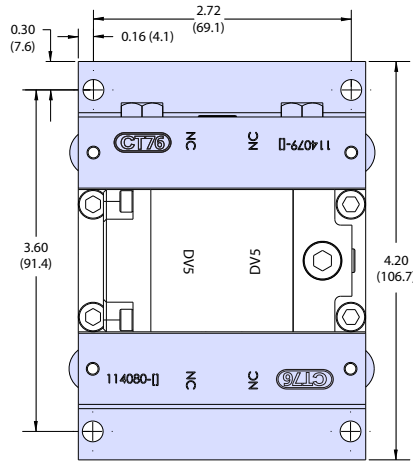
Front side view



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

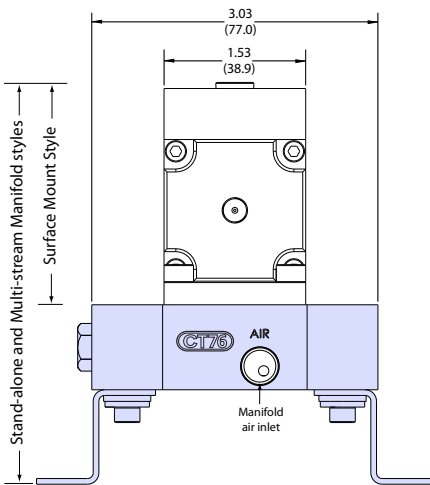


Back side view

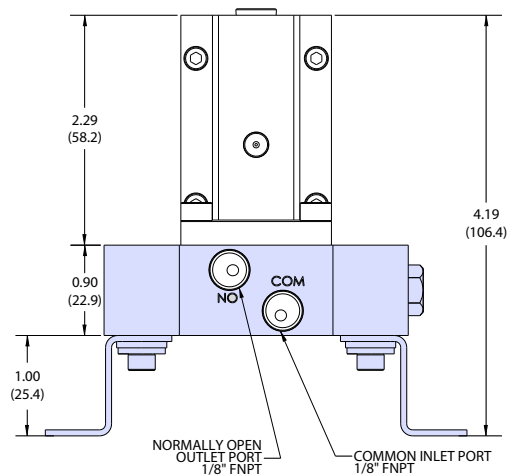


Top view

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



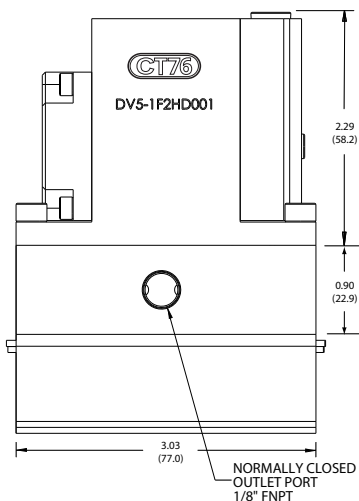
Left end view



Right end view

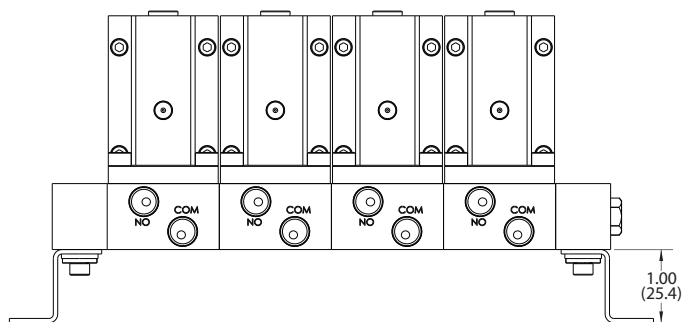
## DIMENSIONS- MULTI-STREAM MANIFOLD

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

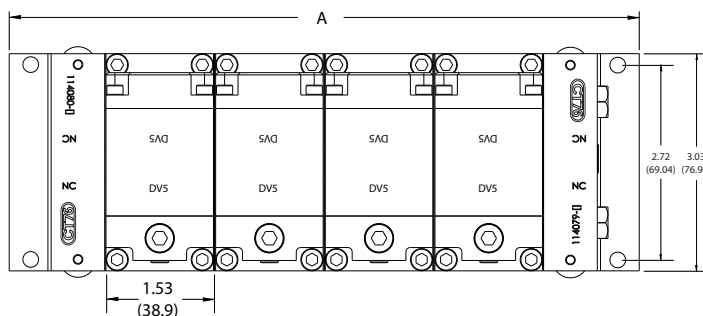


Front side view

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



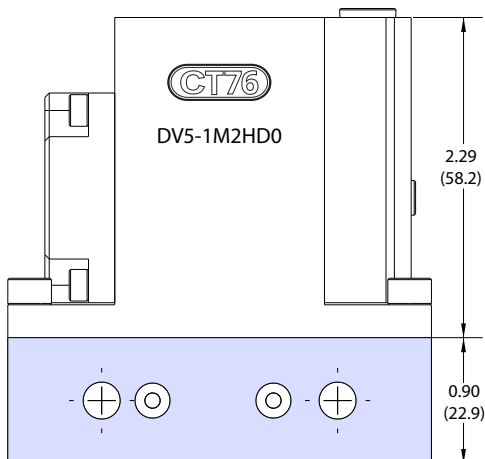
Right end view



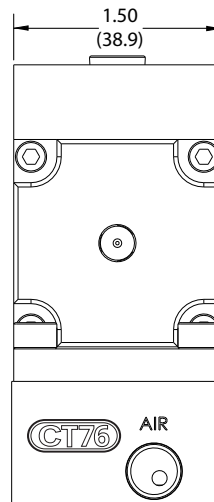
Top view

## 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.

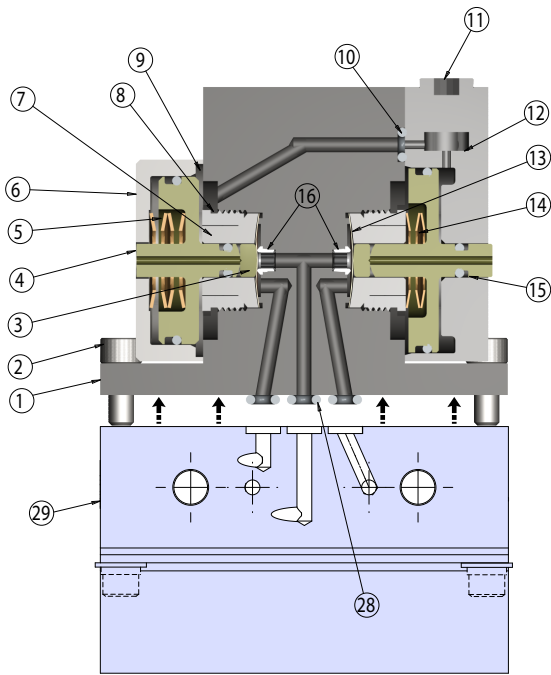


Front side view



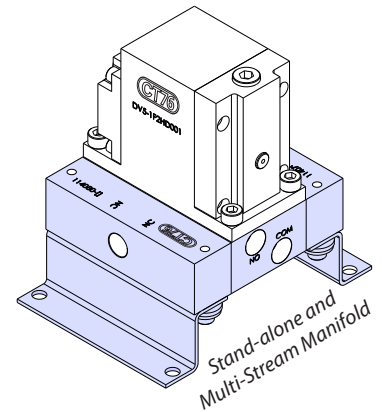
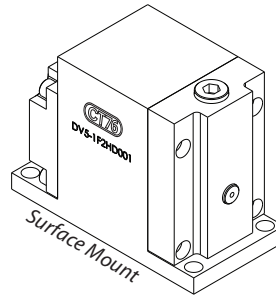
Left end view

# MATERIALS OF CONSTRUCTION-ALL STYLES



Front side view, sectioned

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



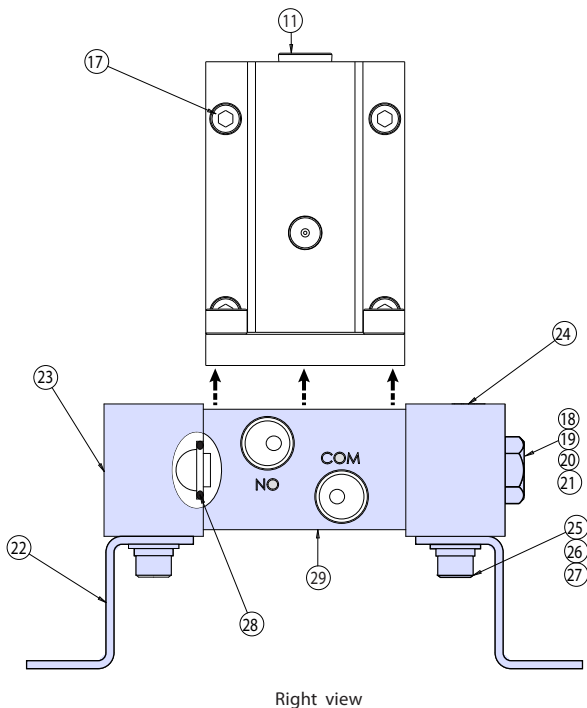
## All Styles – Valve Body

#	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

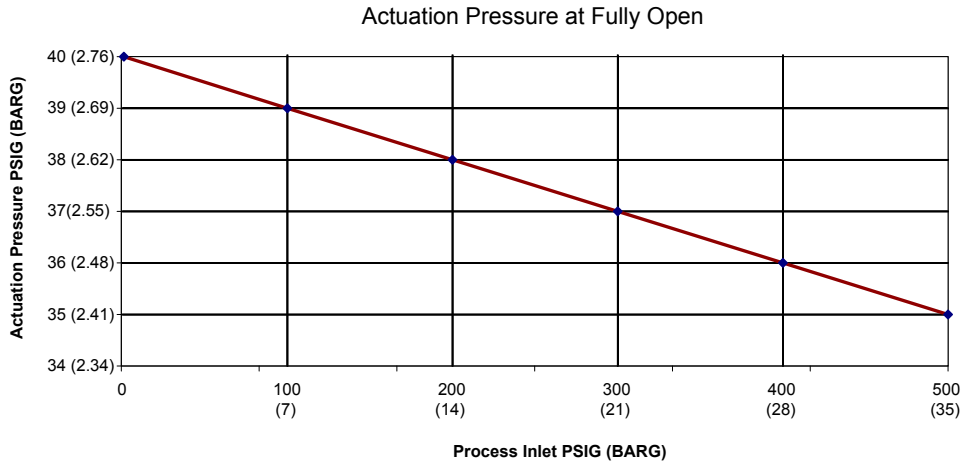


Right view

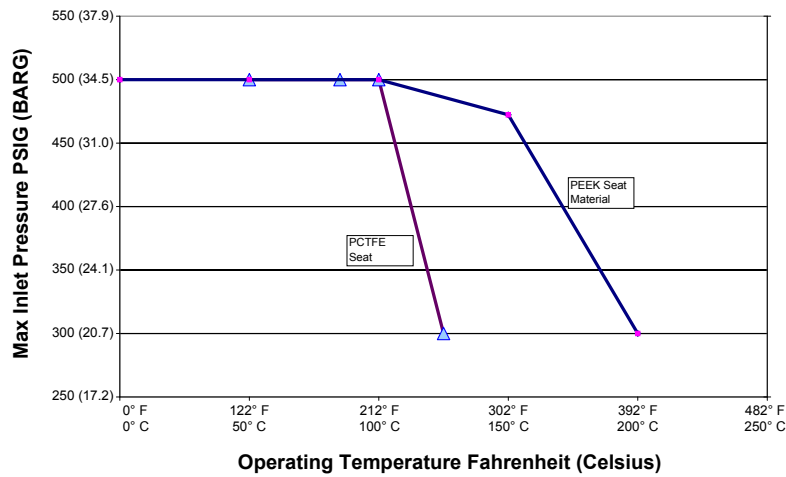
## DV5 SERIES

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

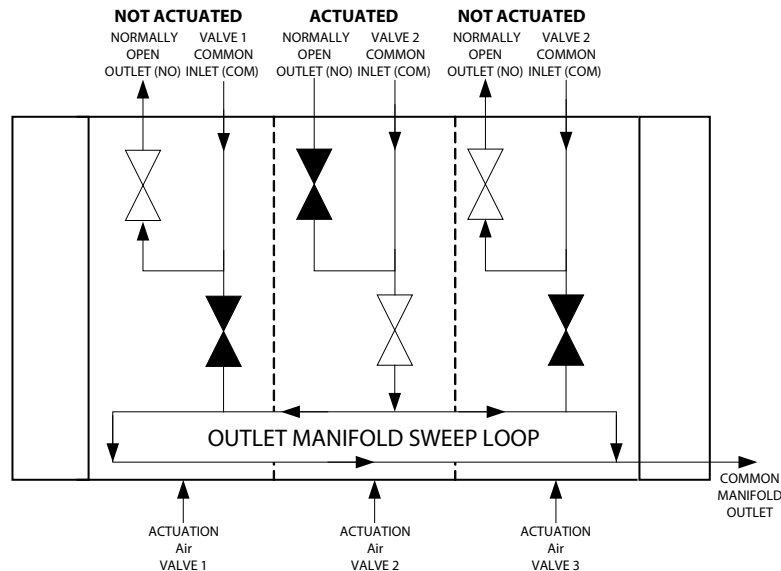
### ACTUATION PRESSURE CURVE



### PRESSURE TEMPERATURE CURVE



### TYPICAL FLOW SCHEMATIC FOR 3-VALVE STACK



## HOW TO ORDER

**STANDARD ITEMS IN BOLD.** Consult Customer Service for pricing and lead times for non-standard items. To order manifold components, see page 16.

Product Family	Material Designator	Process Connection Type	Seat Material	Process O-Ring Material	Surface Treatment	# of Streams	Description
DV5	-						3 - Way valve
	1						SST
	4						Monel
	6						Hastelloy
		00					Modular mount valve *1
		F2					1/8" FNPT process connection option
			H				Kel-F Seat
			Q				Peek Seat
				X			Surface mount valve
				D			Viton® o-rings
				K			Perfluoroelastomer (Kalrez®) o-rings
				F			PTFE o-rings *2
					0		Finish as processed
					1		Cleaned for O2
					5		Silco Steel coated
					9		Sulfinert coated
						01	1 Valve stack
						02	2 Valve stack
						03	3 Valve stack
						04	4 Valve stack
						05	5 Valve stack
						06	6 Valve stack
						07	7 Valve stack
						08	8 Valve stack
						09	9 Valve stack
						10	10 Valve stack
						11	11 Valve stack
						12	12 Valve stack

## PART NUMBER EXAMPLE CONFIGURATION

Part Number	Description
DV5-1F2HD001	3 stream DV5 stack with 1/8" FNPT process connection, Kel-F seats, and Viton process o-rings
DV5-100HX0	Surface mount DV5 valve with Kel-F seats, and Viton process o-rings
Note *1	The -100 part number designator is used to identify a surface mount valve. This valve will not contain the 1/8" FNPT connection or manifold. The only acceptable process o-ring selection for the -100 version of the DV5 valve is X.
Note *2	PTFE o-rings are available however over time they exhibit some element of cold flow under the pressure of sealing which can potentially lead to flow restrictions or envelope leakage. If PTFE o-rings are desired it is suggested by CT76 that the valves be placed on an o-ring replacement preventative maintenance program to help offset unplanned down time due to the sample valves.

## DV5 SERIES

### DV5 Manifold Parts

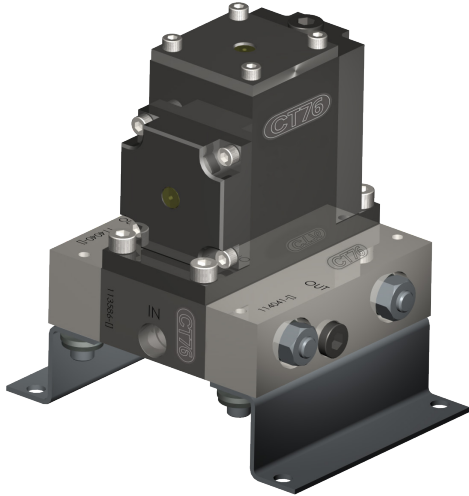
IMAGE	DESCRIPTION	PART NUMBER	MATERIAL
<p>NC COM NO AIR Top view</p>	Manifold baseplate with pins	CT114085-[]	-1: 316L stainless steel -4: Monel® -6: Hastelloy® C-276
<p>Front side view</p>	Right end plate	CT114079-[]	-1: 316L stainless steel -4: Monel® -6: Hastelloy® C-276
<p>Top view</p>	Left end plate	CT114080-[]	-1: 316L stainless steel -4: Monel® -6: Hastelloy® C-276
<p>A</p>	Threaded rod: • 2-module • 3-module • 4-module • 5-module • 6-module • 7-module • 8-module • 9-module • 10-module • 11-module • 12-module	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 CT76 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 CT76 *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)

\*  $\mu$ MS3<sup>®</sup> base adapter plate CT11358-[ ] required for non-CT76 manufactured surface mount systems - consult factory

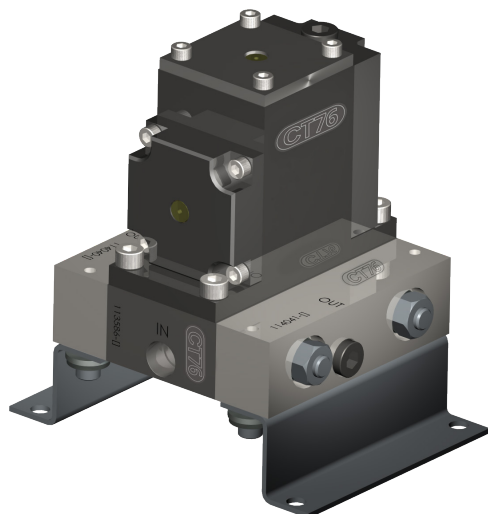
<sup>1</sup> Patent pending



Crane Instrumentation & Sampling

diaphragm valves

## TECHNICAL DATA



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

\*\* Internal volume between double block valves.

### Operating Temperatures

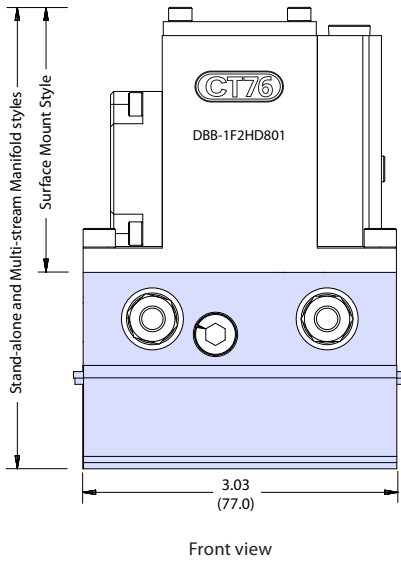
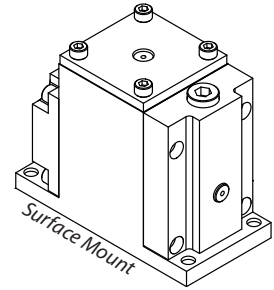
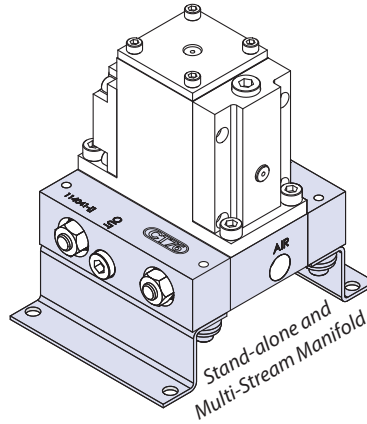
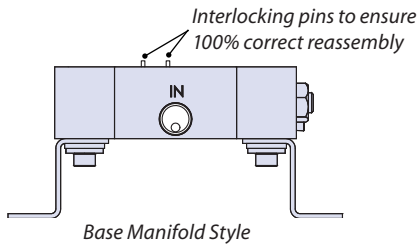
SEAT MATERIAL	TEMPERATURE	
PCTFE	-40° F to +212° F	-40° C to +100° C
PEEK™	0° F to +400° F	-18° C to +204° C

### Operating Pressures

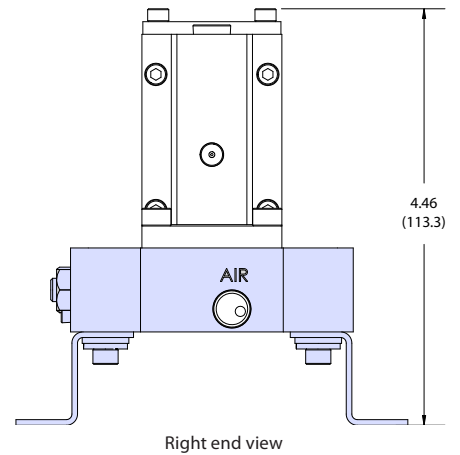
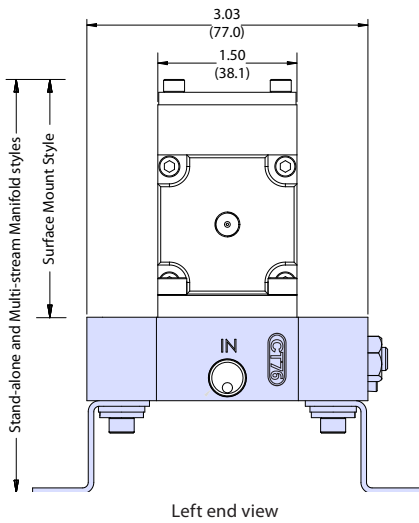
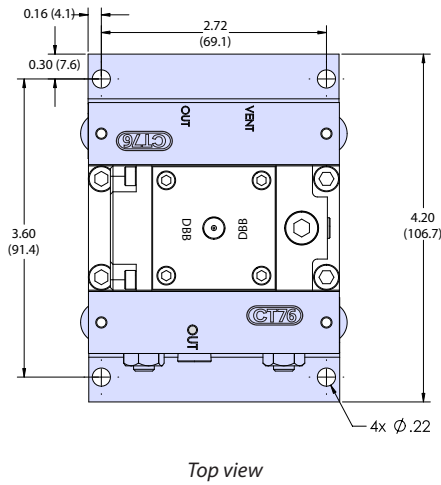
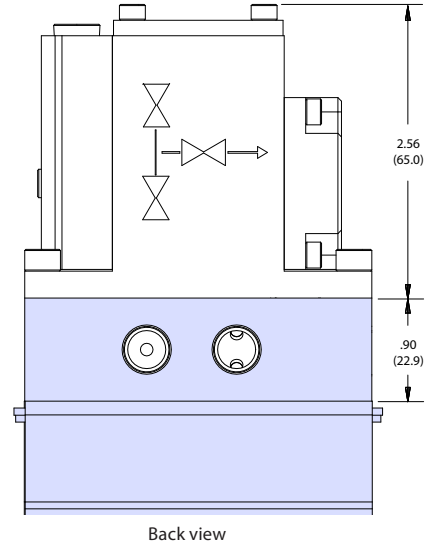
OPERATING PRESSURE	Vacuum (50 torr) to 500 psi (34 bar)
PROOF PRESSURE	2000 psig (138 barg)
BURST PRESSURE	8000 psig (552 barg)

## DIMENSIONS—ALL STYLES

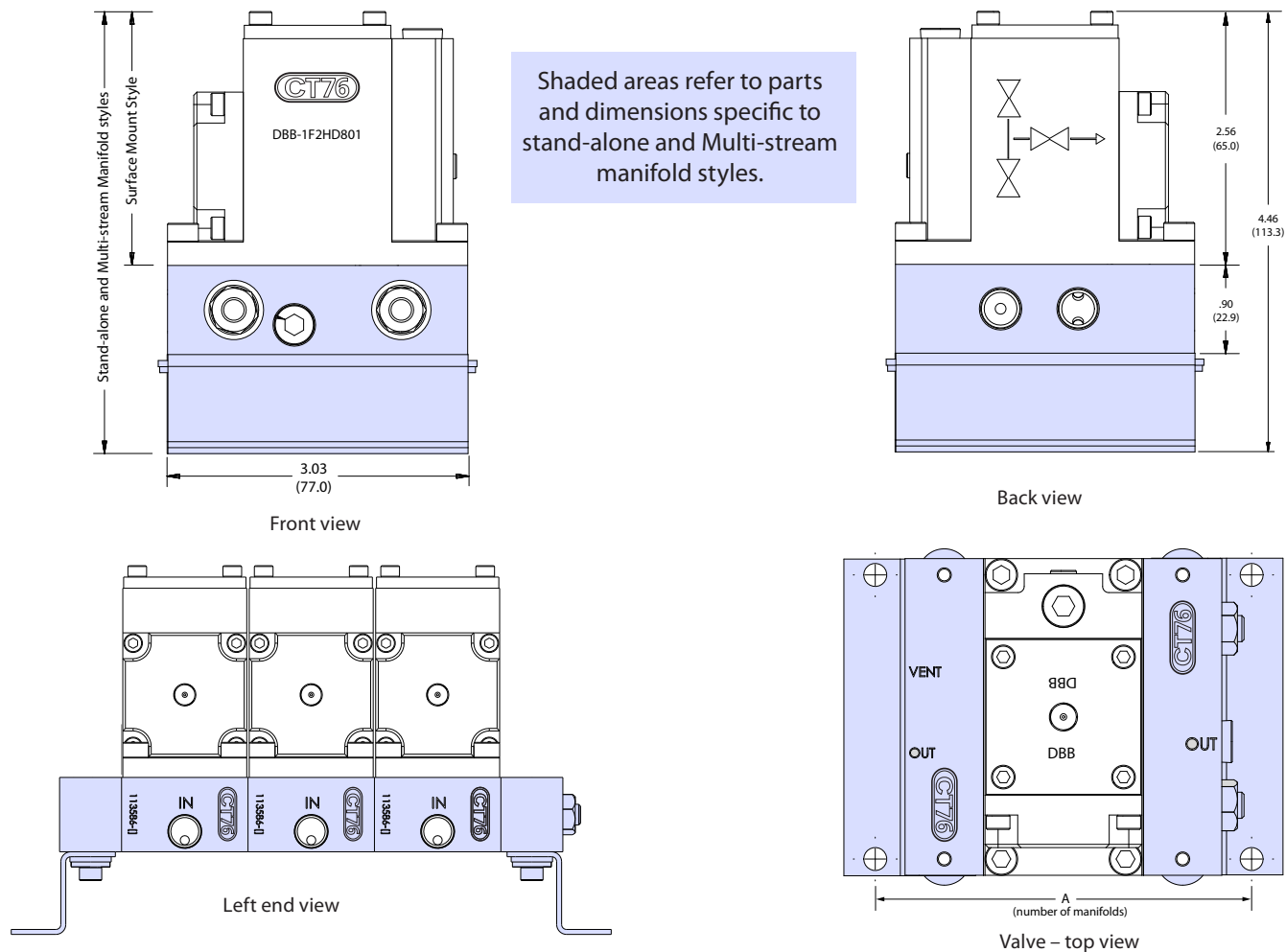
Dimensions are inches (millimeters) for reference only and are subject to change.



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



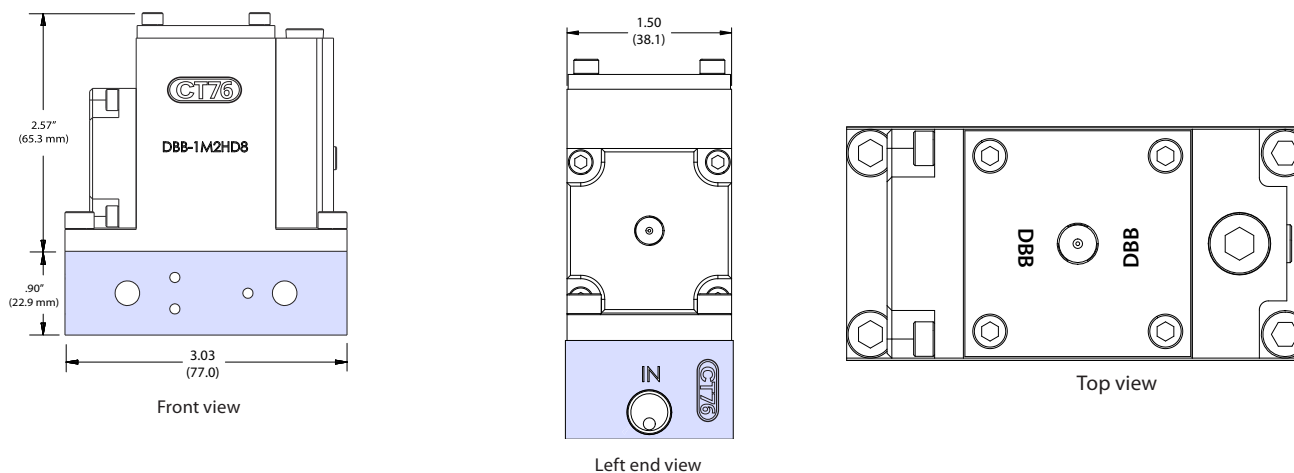
## DIMENSIONS – MULTI-STREAM MANIFOLD & BASE MANIFOLD STYLES



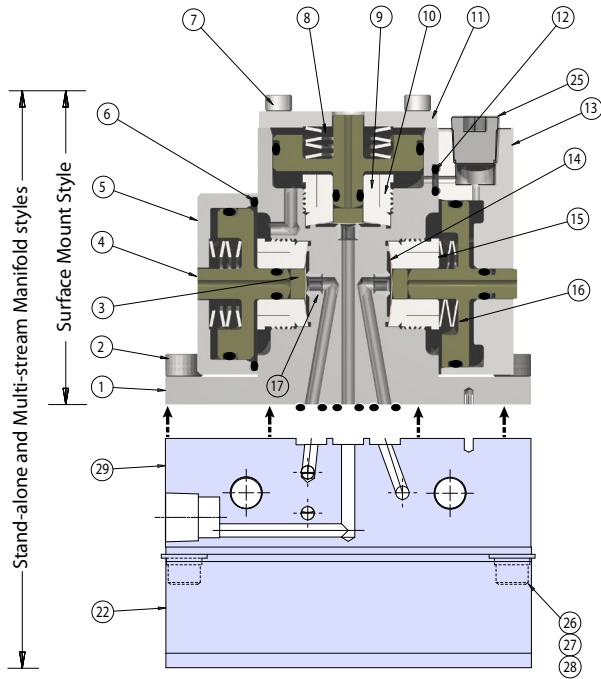
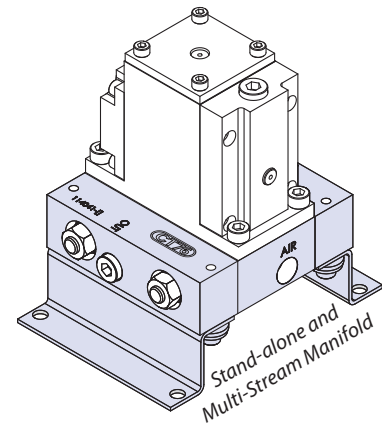
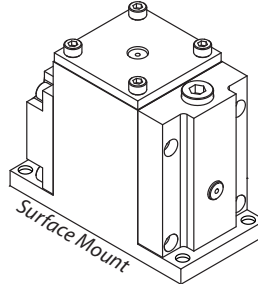
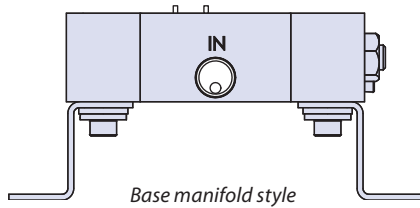
NUMBER OF MANIFOLDS		2	3	4	5	6	7	8	9	10	11	12
A	inches	5.13	6.66	8.19	9.72	11.25	12.78	14.31	15.84	17.37	18.90	20.43
	mm	130.3	169.2	208.0	246.9	285.8	324.6	363.5	402.3	441.2	480.1	518.9

## 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.



# MATERIALS OF CONSTRUCTION-ALL STYLES



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

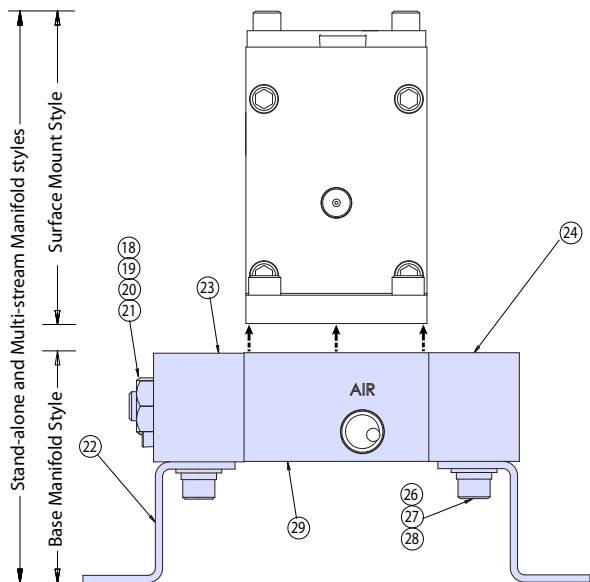
### All Styles – Valve Body

#	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

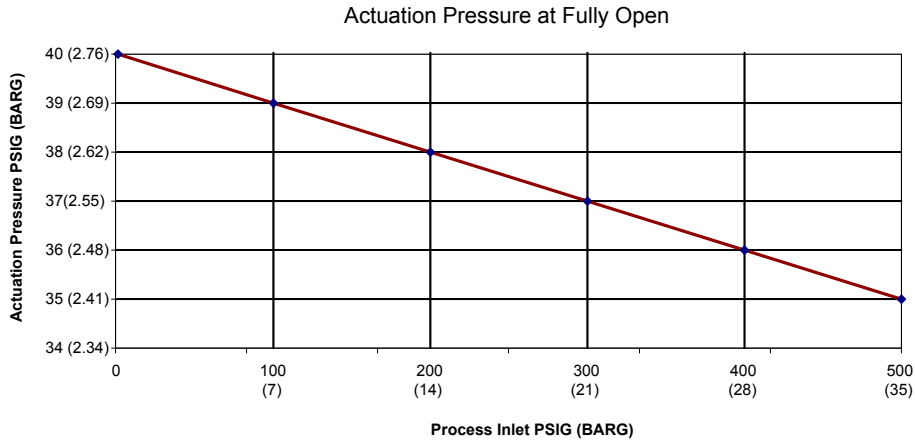
18	Threaded rod	18-8 stainless steel
19	.25" flat washer	301 stainless steel
20	.25" lock washer	18-8 stainless steel
21	.25" hex nut	18-8 stainless steel
22	Mounting bracket	316 stainless steel
23	Left end plate*	316L stainless steel, Monel® or Hastelloy® C-276
24	Right end plate*	316L stainless steel, 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



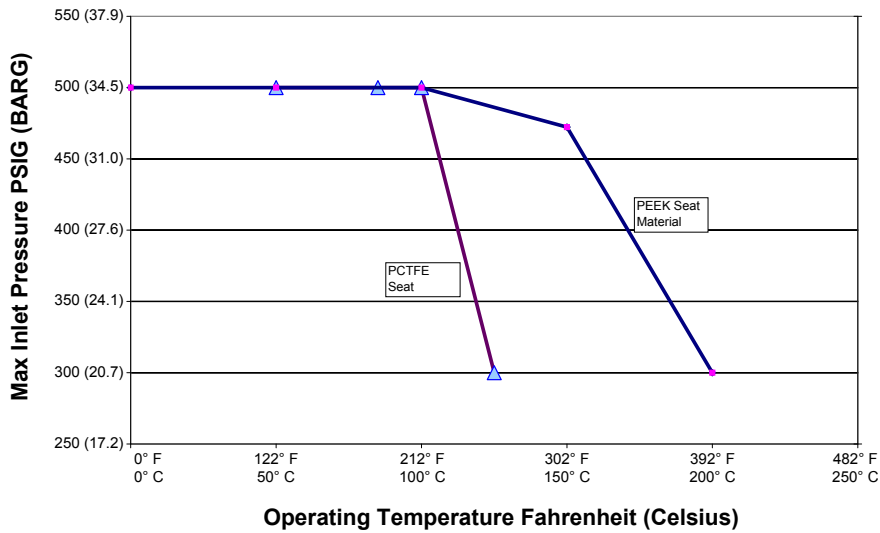
## DBB SERIES

### ACTUATION PRESSURE CURVE

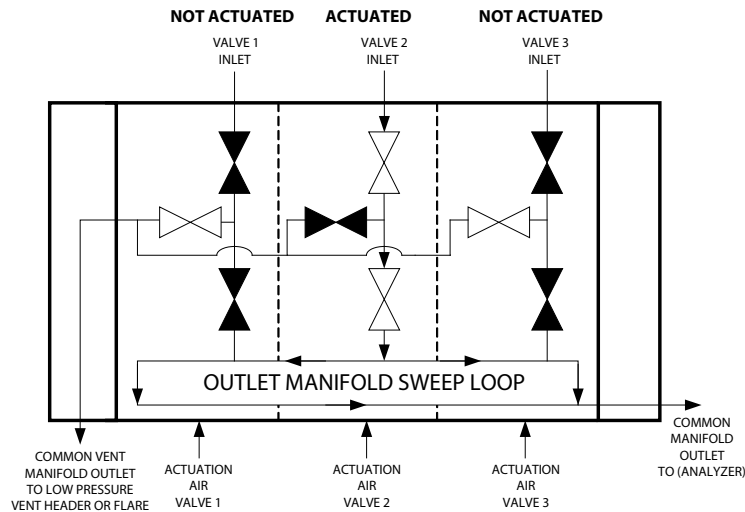


### PRESSURE TEMPERATURE CURVE

Pressures in psig (barg)



### TYPICAL FLOW SCHEMATICS



## HOW TO ORDER

**STANDARD ITEMS IN BOLD.** Consult Customer Service for pricing and lead times for non-standard items. To order manifold components, see page 16.

Product Family	Material Designator	Process Connection Type	Seat Material	Process O-Ring Material	Surface Treatment	# of Streams	Description
DBB	-						Double Block and Bleed valve
	1						SST
	4						Monel
	6						Hastelloy
		00					Modular mount valve *1
		F2					1/8" FNPT process connection option
			H				Kel-F Seat
			Q				Peek Seat
				X			Surface mount valve
				D			Viton® o-rings
				K			Perfluoroelastomer (Kalrez®) o-rings
				F			PTFE o-rings *2
					0		Finish as processed
					1		Cleaned for O2
					5		Silco Steel coated
					9		Sulfinert coated
						01	1 Valve stack
						02	2 Valve stack
						03	3 Valve stack
						04	4 Valve stack
						05	5 Valve stack
						06	6 Valve stack
						07	7 Valve stack
						08	8 Valve stack
						09	9 Valve stack
						10	10 Valve stack
						11	11 Valve stack
						12	12 Valve stack

## PART NUMBER EXAMPLE CONFIGURATION

Part Number	Description
DBB-1F2HD003	3 stream DBB stack with 1/8" FNPT process connection, Kel-F seats, and Viton process o-rings
DBB-100HD005	5 stream DBB stack with 1/4" tube stub connection, Kel-F seats, and Viton process o-rings
DBB-100HX0	Surface mount DBB valve with Kel-F seats, and Viton process o-rings
Note *1	The -100 part number designator is used to identify valves that will not contain the 1/8" FNPT connection for the valve. The valve can be purchased in stacks and is configured later in the part number starting with process o-ring material. If this value is anything but an X, the rest of the part number must be configured using the surface treatment as well as the # of streams. If this value is an X, the # of streams should be left blank.
Note *2	PTFE o-rings are available however over time they exhibit some element of cold flow under the pressure of sealing which can potentially lead to flow restrictions or envelope leakage. If PTFE o-rings are desired it is suggested by CT76 that the valves be placed on an o-ring replacement preventative maintenance program to help offset unplanned down time due to the sample valves.

## DBB SERIES

Stand-alone Valve with Mounting Brackets

### SPARE PARTS FOR BASE MANIFOLDS

IMAGE	DESCRIPTION	PART NUMBER	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: 316L stainless steel -4: Monel® -6: Hastelloy® C-276
<p>A</p>	Threaded rod: • 2-module • 3-module • 4-module • 5-module • 6-module • 7-module • 8-module • 9-module • 10-module • 11-module • 12-module	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 Normally Open

## DSS SERIES

GC Diaphragm Valve Normally Open, with Atmospheric Reference Normally Closed



Available as:

- Stand-alone
- Surface mount modular (ANSI/ISA-76 CT76 analyzer system)

The DSV Series<sup>1</sup> diaphragm valve is a GC module with two normally closed shut-off valves and an atmospheric reference.

The DSS Series<sup>1</sup> diaphragm valve is a GC module with two normally open shut-off valves and an atmospheric reference.

This valve is available as stand-alone.

For ANSI/ISA-76 systems please contact the factory.

<sup>1</sup> Patent pending

### 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 × 2.6" H × 1.5" W)
- Interlocking pins between valve body and manifold baseplate to ensure 100% correct reassembly

\* CT-76 base adapter plate required for non-CT-76 manufactured surface mount systems



Crane Instrumentation & Sampling

diaphragm valves

**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 × 10 <sup>-5</sup> cc/sec helium (inboard)
<b>MIN. ACTUATION PRESSURE</b>	50 psig (3 barg)

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

**Operating Temperatures**

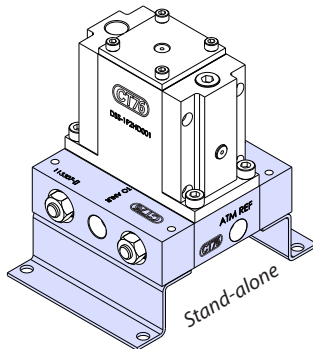
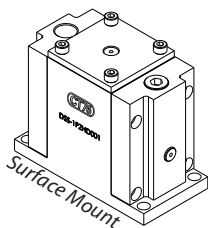
SEAT MATERIAL	TEMPERATURE	
PCTFE	-40° F to +212° F	-40° C to +100° C
PEEK™	0° F to +400° F	-18° C to +204° C

**Operating Pressures**

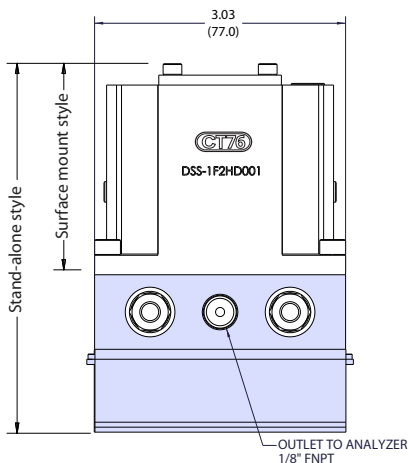
<b>OPERATING PRESSURE</b>	Vacuum (50 torr) to 500 psig (34 barg)
<b>PROOF PRESSURE</b>	2000 psig (138 barg)
<b>BURST PRESSURE</b>	8000 psig (552 barg)

## DIMENSIONS-ALL STYLES

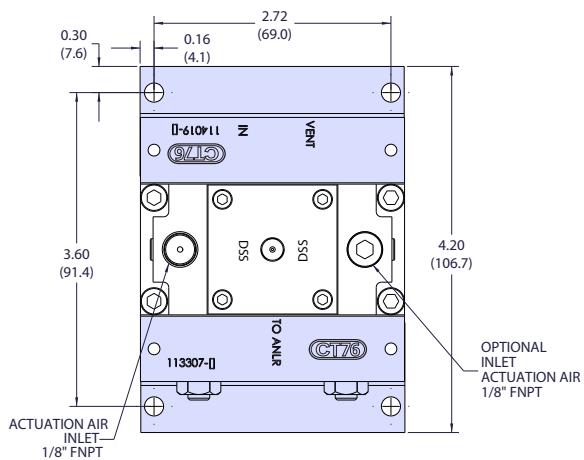
Dimensions are inches (millimeters) for reference only and are subject to change.



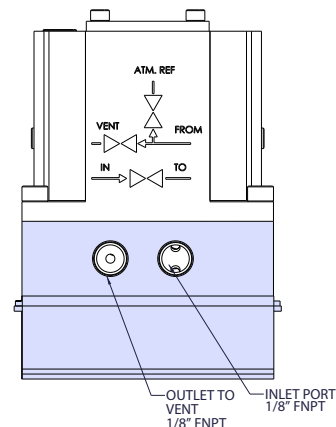
Shaded areas refer to parts and dimensions specific to stand-alone.



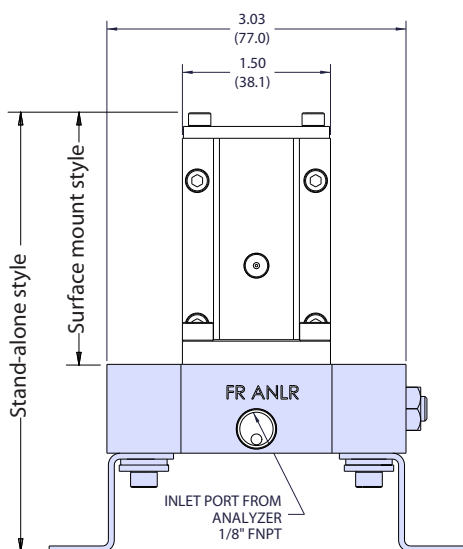
Front side view



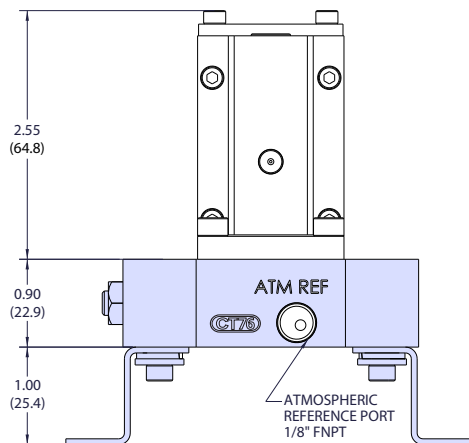
Top view



Back side view

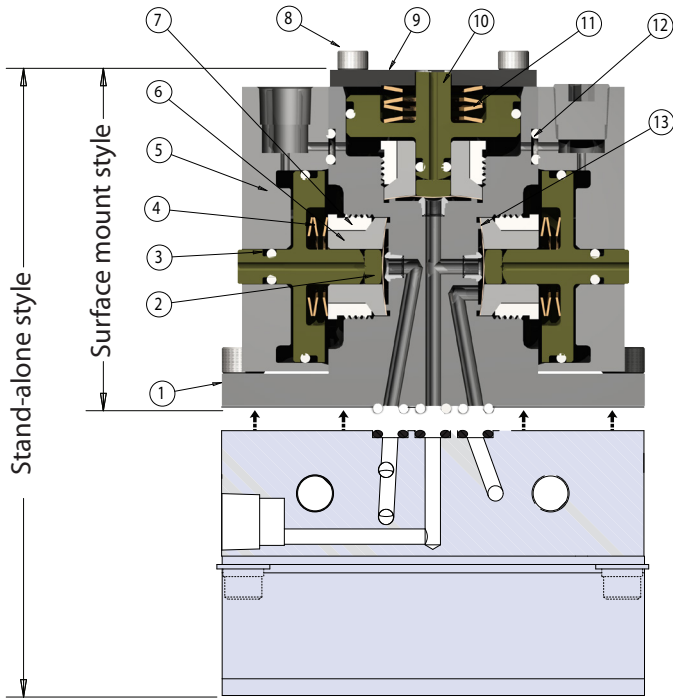


Left end view

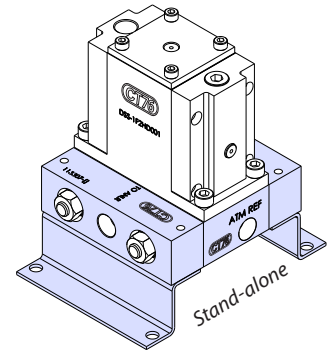
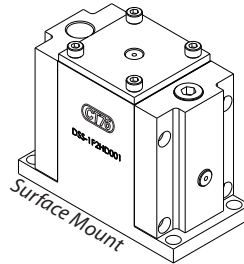


Right end view

# MATERIALS OF CONSTRUCTION



Right side view



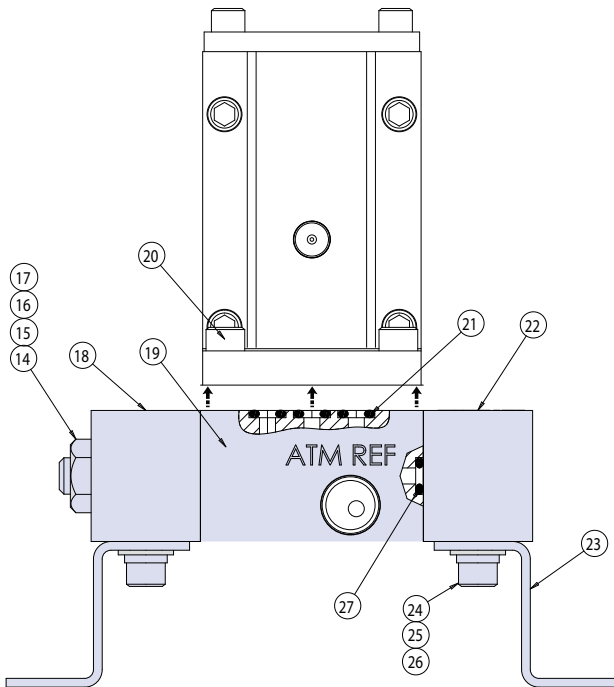
## All Styles – Valve Body

#	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	¼" flat washer	301, 302 stainless steel
16	¼" flat washer	18-8 stainless steel
17	Hex nut ¼-28	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®

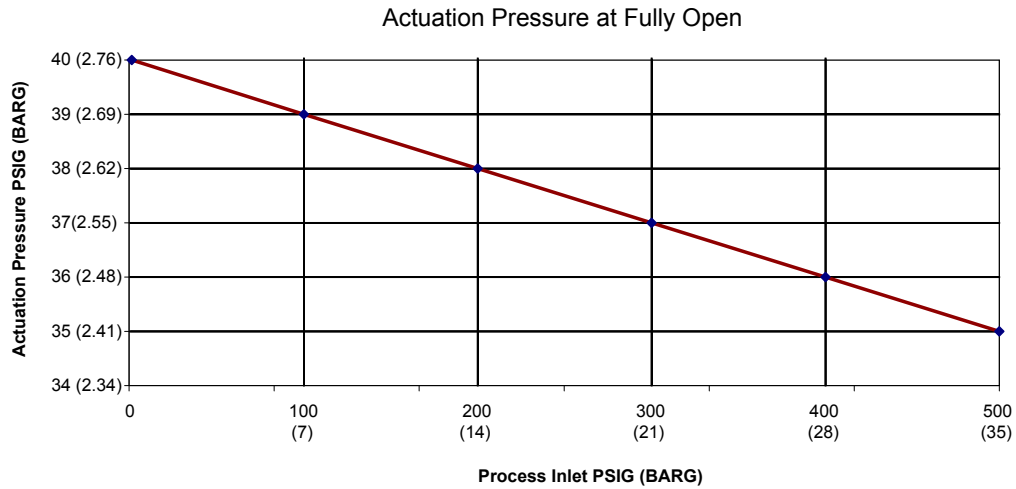
\* Wetted components



Right end view

## DSS SERIES

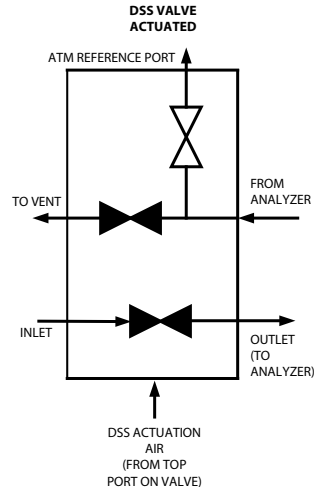
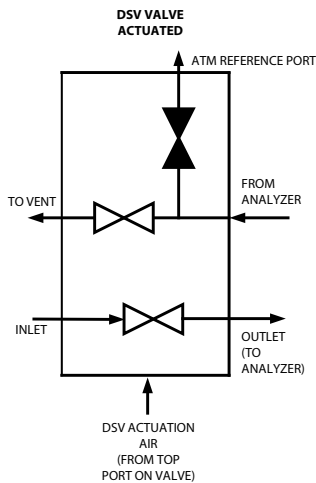
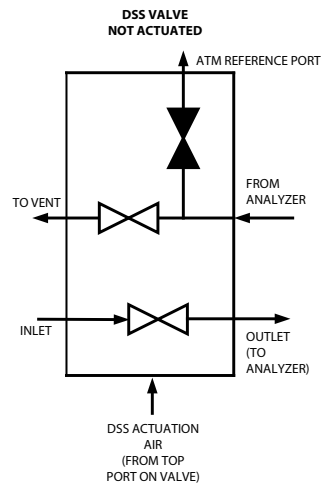
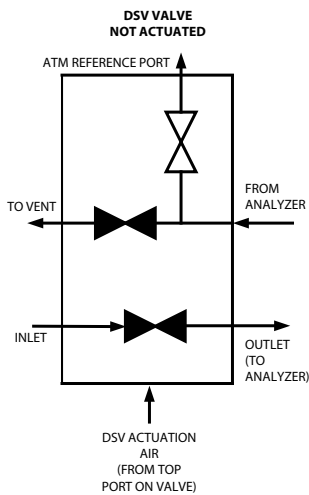
### ACTUATION PRESSURE CURVE



### TYPICAL FLOW SCHEMATICS

DSV

DSS



## HOW TO ORDER

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

Product Family	Material Designator	Process Connection Type	Seat Material	Process O-Ring Material	Surface Treatment	# of Streams	Description
DSV	-						GC Diaphragm Valve Normally Closed, with atmospheric reference Normally Open
/							
DSS							GC Diaphragm Valve Normally Open, with atmospheric reference Normally Closed
	1						SST
	4						Monel
	6						Hastelloy
		00					Surface mount valve *1
		F2					Stand alone valve with 1/8" FNPT
			H				Kel-F Seat
			Q				Peek Seat
				X			Surface mount valve
				D			Viton® o-rings
				K			Perfluoroelastomer (Kalrez®) o-rings
				F			PTFE o-rings *2
					0		Finish as processed
					1		Cleaned for O2
					5		Silco Steel coated
					9		Sulfinert coated
						01	1 Valve stack

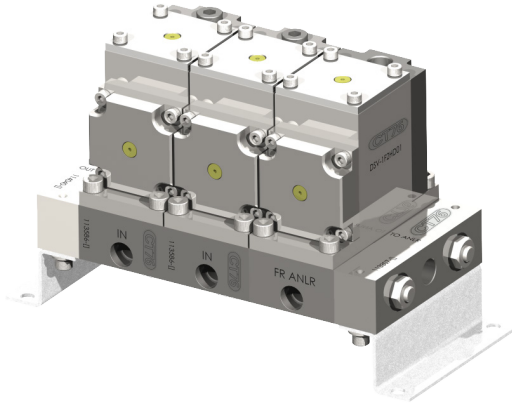
## PART NUMBER EXAMPLE CONFIGURATION

Part Number	Description
DSS-1F2HD001	GC Diaphragm Valve Normally Open, with atmospheric reference Normally Closed with 1/8" FNPT process connection, Kel-F seats, and Viton process o-rings
DSS-100HX0	Surface mount DSS valve with Kel-F seats, and Viton process o-rings
Note *1	The -100 part number designator is used to identify a surface mount valve. This valve will not contain the 1/8" FNPT connection or manifold. The only acceptable process o-ring selection for the -100 version of the DSS valve is X.
Note *2	PTFE o-rings are available however over time they exhibit some element of cold flow under the pressure of sealing which can potentially lead to flow restrictions or envelope leakage. If PTFE o-rings are desired it is suggested by CT76 that the valves be placed on an o-ring replacement preventative maintenance program to help offset unplanned down time due to the sample valves.



## DBA SERIES

GC Manifold Assembly with DBB and DSV Series Atmospheric Reference Valve



The DBA and DBC 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 DBC Series consists of DBB Series valves stacked with a single DSS Series valve. The individual valves can easily be integrated into an ANSI/ISA-76 compliant system.

<sup>1</sup> Patent pending

## DBC SERIES

GC Manifold Assembly with DBB and DSS Series Atmospheric Reference Valve

Combines:

- Multiple DBB Series (Double-Block-and-Bleed Diaphragm Valve)
- One DSV Series (GC Diaphragm Valve Normally Closed, with atmospheric reference Normally Open) or DSS Series (GC Diaphragm Valve Normally Open, with atmospheric reference Normally Closed)

Available as:

- Multi-stream manifold

### Features & Benefits

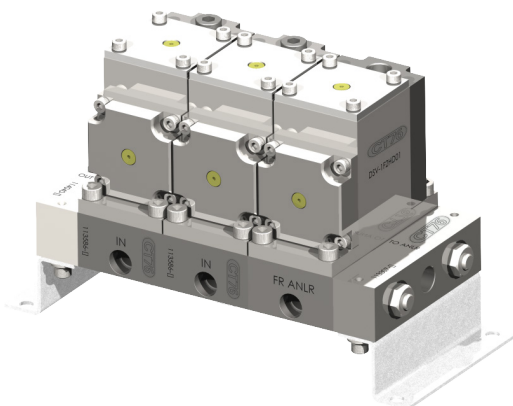
- Stream select manifold assembly
- Surface mount ANSI/ISA-76 compliant\*
- Metal-to-metal seals to atmosphere to prevent leakage
- Wide choice of materials for virtually all applications
- Replaceable seats for extended service life
- No dynamic o-rings, springs, or lubricant in wetted flow path to 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 × 2.6" H × 1.5" W)

\* CT-76 base adapter plate required for non-CT-76 manufactured surface mount systems



Crane Instrumentation & Sampling

diaphragm valves

**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 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

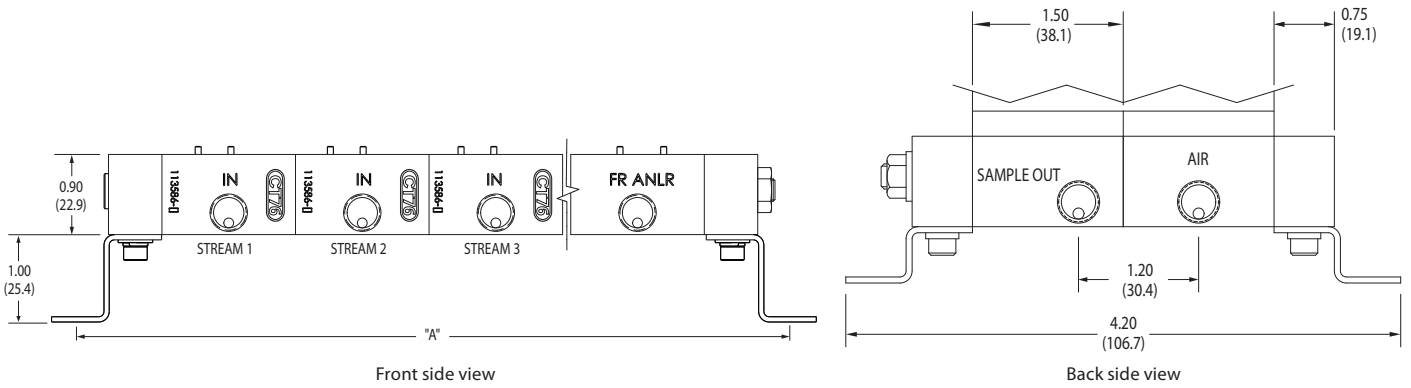
**Operating Pressures**

<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)

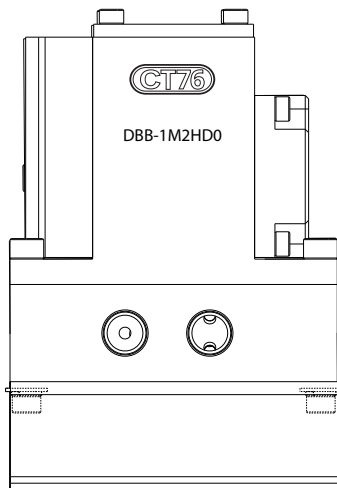
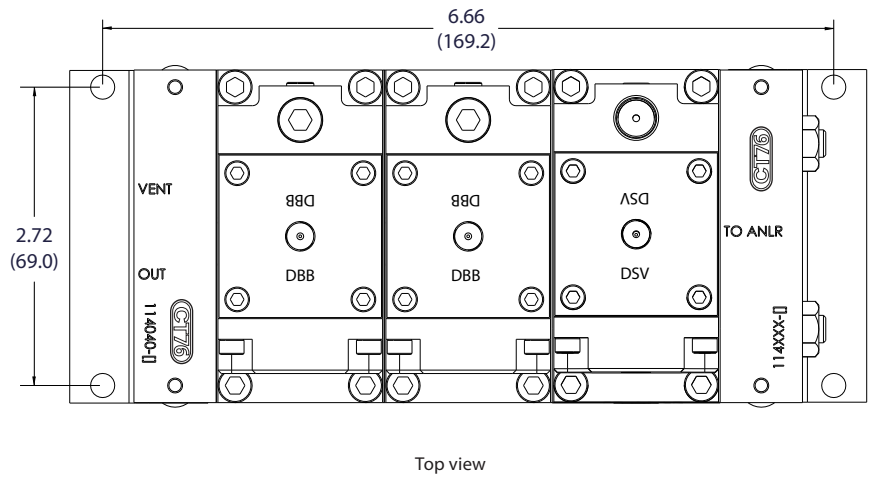


## DIMENSIONS

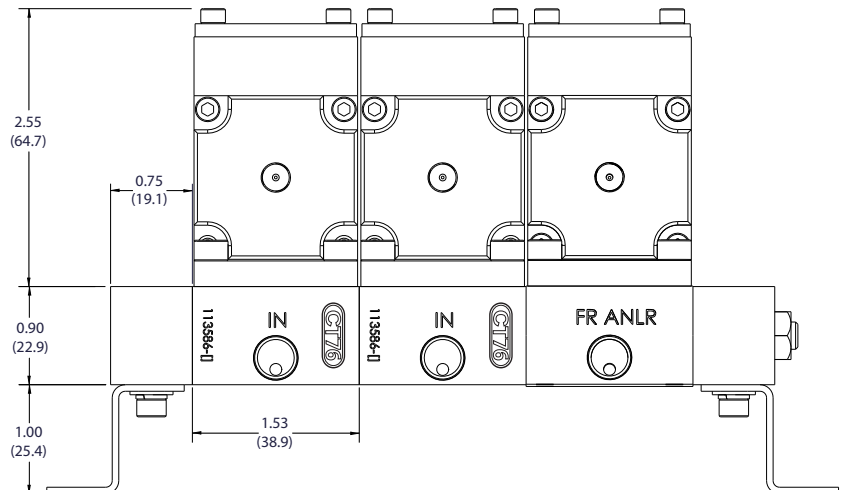
Dimensions are inches (millimeters) for reference only and are subject to change.



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
	mm	135	169	208	247	286	325	364	402	441	480	519

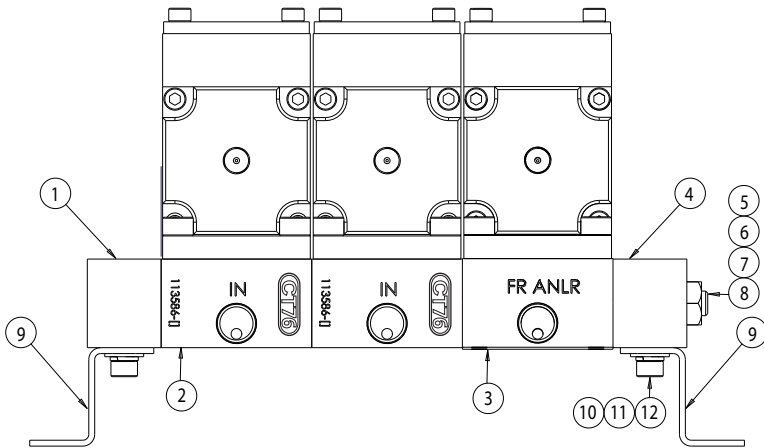


Front side view



Right end view

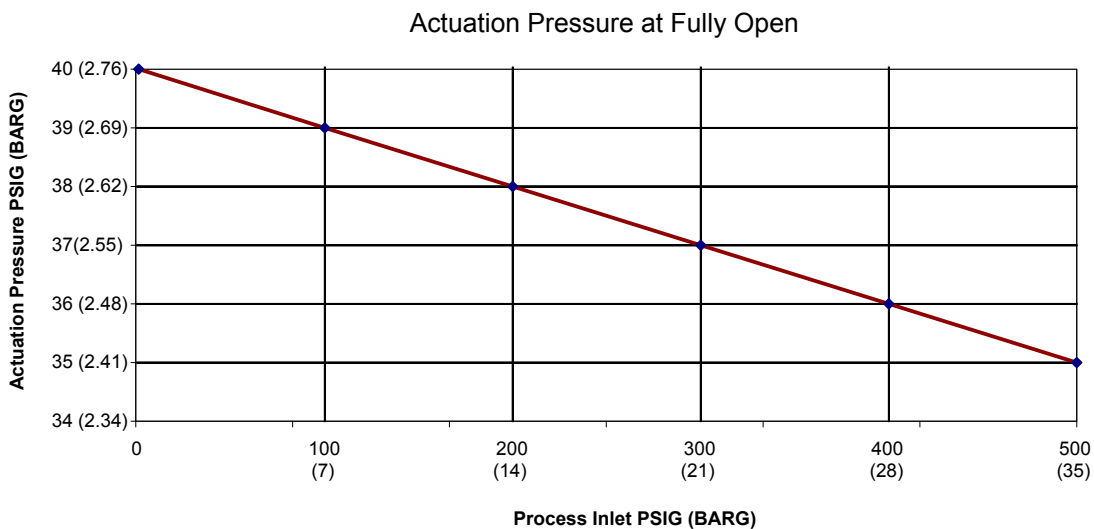
## MATERIALS OF CONSTRUCTION



#	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	18-8 stainless steel
10	Screw	18-8 stainless steel
11	Flat washer	18-8 stainless steel
12	Lock washer	18-8 stainless steel

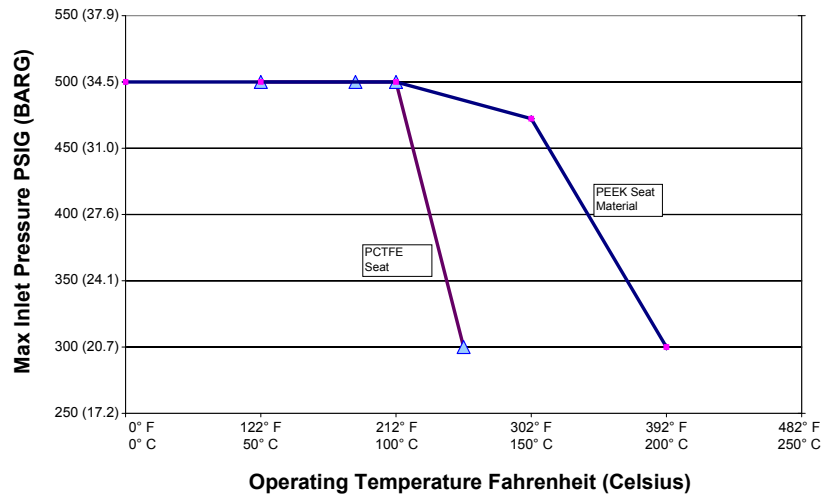
\* Wetted components

## ACTUATION PRESSURE CURVE



## DBA SERIES

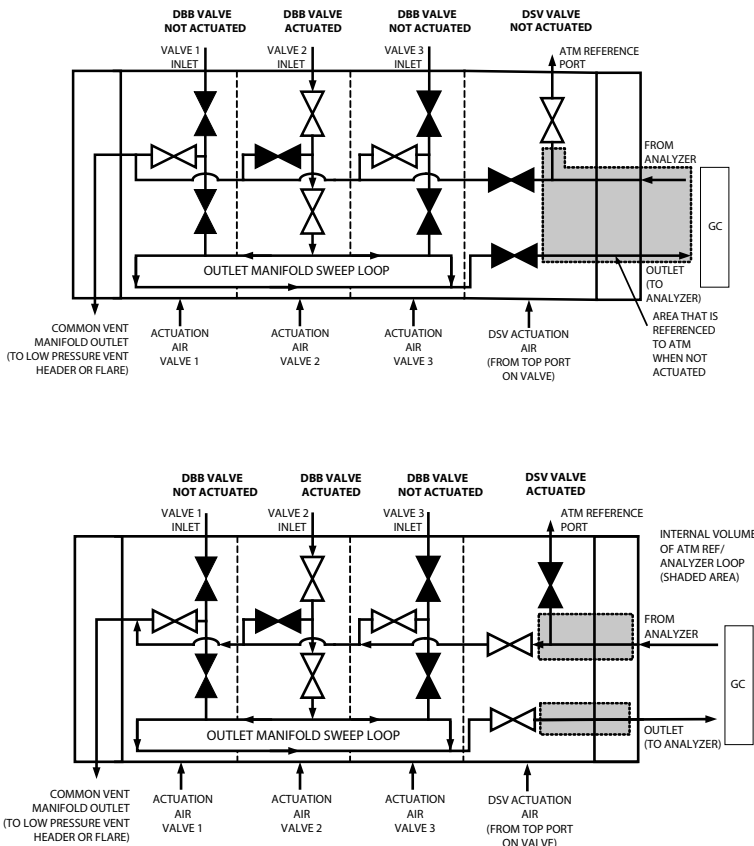
### PRESSURE TEMPERATURE CURVE



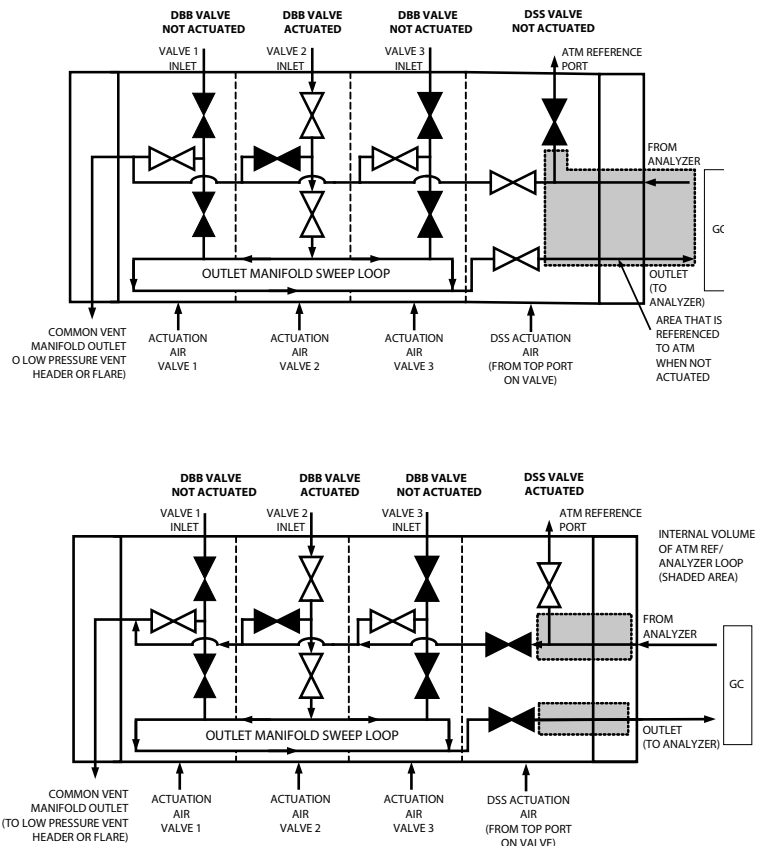
### TYPICAL FLOW SCHEMATICS

Pressures in psig (barg)

DBA



DBC



## HOW TO ORDER

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

Product Family	Material Designator	Process Connection Type	Seat Material	Process O-Ring Material	Surface Treatment	# of Streams	Description
DBA	-						Double Block and Bleed valve stack with DSV GC Valve
/							
DBC							Double Block and Bleed valve stack with DSS GC Valve
	1						316 Stainless Steel
	4						Monel
	6						Hastelloy
		F2					1/8" FNPT process connection option
			H				Kel-F Seat
			Q				Peek Seat
				D			Viton® o-rings
				K			Perfluoroelastomer (Kalrez®) o-rings
				F			PTFE o-rings *2
					0		Finish as processed
					1		Cleaned for O2
					5		Silco Steel coated
					9		Sulfinert coated
						01	1 DBB valve and 1 DSV or DSS valve
						02	2 DBB valves and 1 DSV or DSS valve
						03	3 DBB valves and 1 DSV or DSS valve
						04	4 DBB valves and 1 DSV or DSS valve
						05	5 DBB valves and 1 DSV or DSS valve
						06	6 DBB valves and 1 DSV or DSS valve
						07	7 DBB valves and 1 DSV or DSS valve
						08	8 DBB valves and 1 DSV or DSS valve
						09	9 DBB valves and 1 DSV or DSS valve
						10	10 DBB valves and 1 DSV or DSS valve
						11	11 DBB valves and 1 DSV or DSS valve
						12	12 DBB valves and 1 DSV or DSS valve

## PART NUMBER EXAMPLE CONFIGURATION

Part Number	Description
DBA-1F2HD003	3 stream DBB stack with DSV GC Valve, 1/8" FNPT process connection, Kel-F seats, and Viton process o-rings
Note *1	PTFE o-rings are available however over time they exhibit some element of cold flow under the pressure of sealing which can potentially lead to flow restrictions or envelope leakage. If PTFE o-rings are desired it is suggested by CT76 that the valves be placed on an o-ring replacement preventative maintenance program to help offset unplanned down time due to the sample valves.









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