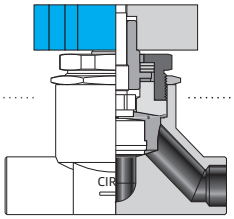
Diaphragm Valves

DV Series

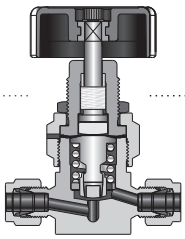
Contents

High-Flow Diaphragm Valves (DV1, DV2 and DV3 Series) 7-35



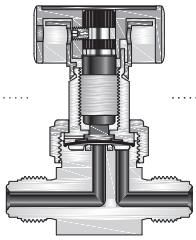
- Maximum working pressure: 300 psig (20.7 bar)
- Working temperature: -20°F to 300°F (-28°C to 148°C)
- Variety of end connections

High Pressure Diaphragm Valves (DV4 Series) 7-40



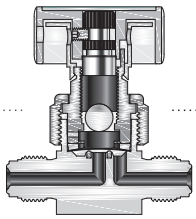
- Maximum working pressure: 3500 psig (241 bar)
- Working temperature: -100°F to 250°F (-73°C to 121°C)
- Variety of end connections

High Performance Diaphragm Valves (DV5 Series) 7-44



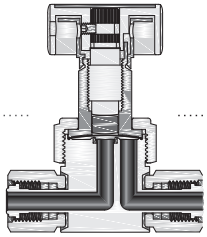
- Maximum working pressure: 3045 psig (210 bar)
- Working temperature: -10°F to 150°F (-23°C to 65°C)
- Variety of end connections

General-Purpose Diaphragm Valves (DV6 Series) 7-56



- Maximum working pressure: 3045 psig (210 bar)
- Working temperature: -10°F to 150°F (-23°C to 65°C)
- Variety of end connections

Diaphragm Valves (DV7 Series) 7-61



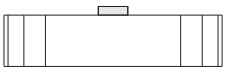
- Maximum working pressure: 300 psig (20.6 bar)
- Working temperature: -10°F to 150°F (-23°C to 65°C)
- Variety of end connections

High-Flow Diaphragm Valves

DV1, DV2 and DV3 Series

Features

- Maximum working pressure: 300 psig (20.7 bar)
- Working temperature: -20°F to 300°F (-28°C to 148°C)
- Variety of end connections
- Body material: Cast, forged and bar stock stainless steel
- No spring or thread within wetted area for cleaner operation
- Wetted surface finish machined to an average of 0.51 µm Ra for cast body, elctropolished to 0.25 µm Ra for forged and bar stock body
- PCTFE stem tip insert for leak-tight shutoff
- Unique bonnet design for safety
- Diaphragms welded to the stem for leak-tight performance
- Optimum combination of strength, flexibility and cycle life by three diaphragms
- The upper stem as a indicator of the valve position-open or closed



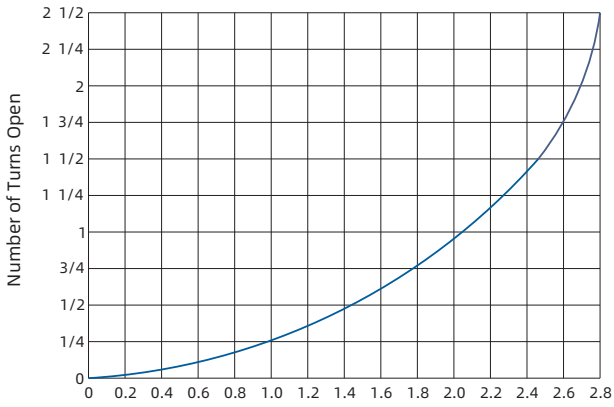
Open-upper stem visible above handle

Close-upper stem flush with top of handle

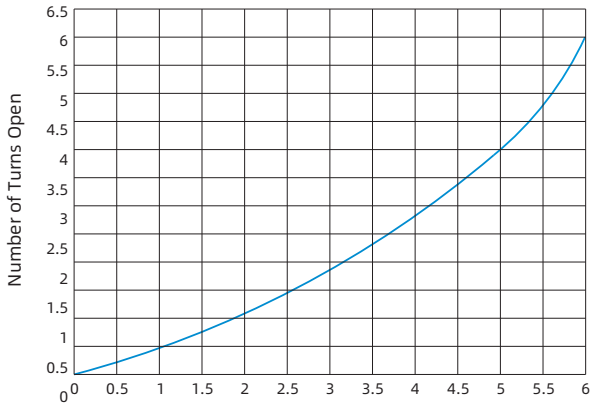
Pressure-Temperature Ratings

Body Material	Cast	Forged and Bar Stock
Temperature, °F(°C)	Working Pressure, psig(bar)	
-20(-28) to 100(37)	300(20.6)	300(20.6)
200(93)	265(18.2)	255(17.5)
300(148)	240(16.5)	230(15.8)

Flow Coefficient vs. Turns Open

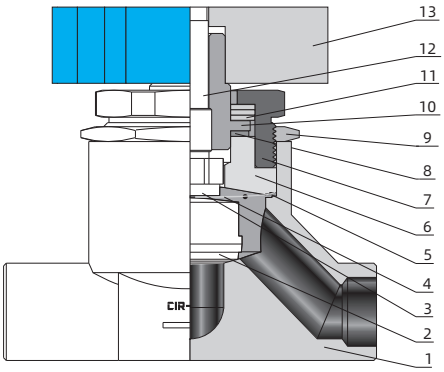


Flow Coefficient (Cv)
1/2" size, 0.5" (12.7 mm) orifice



Flow Coefficient (Cv)
1" size, 1.0" (25.4 mm) orifice

Standard Materials of Construction

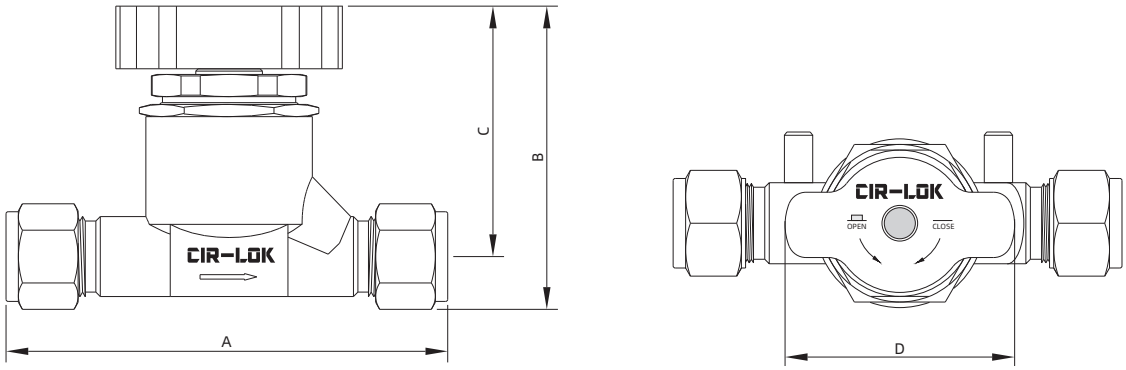


Component		Valve Body Material Grade/ASTM Specification		
		DV1 Series	DV2 Series	DV3 Series
1	Body	CF3M / A351	316L S.S. / A182	316L S.S. / A479
2	Tip Subassembly	PCTFE / AMS 3650 insert 316L S.S. / A479		
3	Gasket	PTFE-coated 316L S.S. / A240		
4	Diaphragm	316L S.S. / A240		
5	Clamp Ring	Brass / B16		
6	Bonnet	316 S.S. / A479		
7	Upper Stem	316 S.S. / A479		
8	Spring Washer	Alloy steel		
9	Actuator	416 S.S. / A582		
10	Bearing Subassembly	High-carbon chrome steel		
11	Lock Nut	17-4 PH powered metal		
12	Bonnet Nut	Silver-plated 316 S.S. / A479		
13	Handle	Polyester with 316 S.S. insert		

Dimensions

DV1 Series

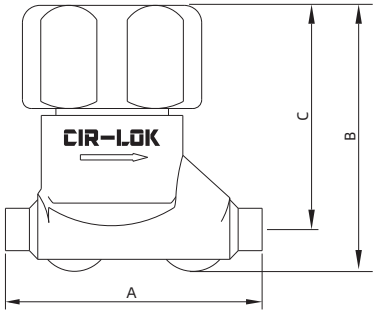
Cast-body

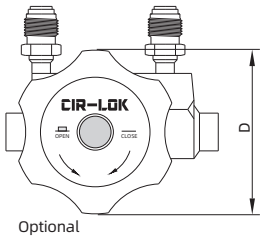


Basic Ordering Number	Connection Type and Size	Orifice in. (mm)	Cv	Dimension, in. (mm)			
				A	B	C	D
DV1-F8-13-	1/2" CIR-LOK	0.5 (12.7)	2.8	5.30 (135)	2.95 (74.9)	2.41 (61.2)	2.25 (57.2)
DV1-F12-25-	3/4" CIR-LOK	1.0 (25.4)	12.0	8.28 (210)	5.12 (130.0)	4.35 (110.0)	4.0 (102.0)
DV1-F16-25-	1" CIR-LOK	1.0 (25.4)	12.0	8.46 (215)	5.12 (130.0)	4.35 (110.0)	4.0 (102.0)
DV1-M12-13-	12 mm CIR-LOK	0.5 (12.7)	2.8	5.30 (135)	2.95 (74.9)	2.41 (61.2)	2.25 (57.2)
DV1-M25-25-	25 mm CIR-LOK	1.0 (25.4)	12.0	8.63 (219)	5.12 (130.0)	4.35 (110.0)	4.0 (102.0)
DV1-FNPT8-13-	1/2" Female NPT	0.5 (12.7)	2.8	5.61 (142)	2.95 (74.9)	2.41 (61.2)	2.25 (57.2)
DV1-FNPT16-25-	1" Female NPT	1.0 (25.4)	12.0	8.46 (215)	5.12 (130.0)	4.35 (110.0)	4.0 (102.0)
DV1-MBW12-13-	12 mm MBW	0.5 (12.7)	2.8	5.30 (135)	2.95 (74.9)	2.41 (61.2)	2.25 (57.2)
DV1-MBW25-25-	25 mm MBW	1.0 (25.4)	12.0	8.63 (219)	5.12 (130.0)	4.35 (110.0)	4.0 (102.0)
DV1-FBT8-13-	1/2" Female BSPT	0.5 (12.7)	2.8	5.61 (142)	2.95 (74.9)	2.41 (61.2)	2.25 (57.2)
DV1-FBT16-25-	1" Female BSPT	1.0 (25.4)	12.0	8.46 (215)	5.12 (130.0)	4.35 (110.0)	4.0 (102.0)
DV1-GFS8-13-	1/2" Male GFS	0.5 (12.7)	2.8	4.58 (116)	2.95 (74.9)	2.41 (61.2)	2.25 (57.2)
DV1-FT8-13-	1/2" X 0.049 " Fractional Tube	0.5 (12.7)	2.8	8.82 (224)	2.95 (74.9)	2.41 (61.2)	2.25 (57.2)
DV1-FT12-13-	3/4" X 0.065" Fractional Tube	0.5 (12.7)	2.8	8.79 (223)	2.95 (74.9)	2.41 (61.2)	2.25 (57.2)
DV1-FT16-25-	1" X 0.065" Fractional Tube	1.0 (25.4)	12.0	10.87 (276)	5.12 (130.0)	4.35 (110.0)	4.0 (102.0)
DV1-MT12-13-	12 X 1 mm Metric Tube	0.5 (12.7)	2.8	8.82 (224)	2.95 (74.9)	2.41 (61.2)	2.25 (57.2)
DV1-MT18-13-	18 X 1.5 mm Metric Tube	0.5 (12.7)	2.8	8.79 (223)	2.95 (74.9)	2.41 (61.2)	2.25 (57.2)
DV1-MT22-25-	22 X 1.5 mm Metric Tube	1.0 (25.4)	12.0	10.87 (276)	5.12 (130.0)	4.35 (110.0)	4.0 (102.0)
DV1-MT25-25-	25 X 1.5 mm Metric Tube	1.0 (25.4)	12.0	10.87 (276)	5.12 (130.0)	4.35 (110.0)	4.0 (102.0)

DV2 Series

Forged-body





Optional
Purge Ports

Basic Ordering Number	Connection Type and Size	Orifice in. (mm)	Cv	Dimension, in. (mm)			
				A	B	C	D
DV2-F8-13-	1/2" CIR-LOK	0.5(12.7)	2.8	5.30(135)	3.03(77.0)	2.54(64.5)	2.25(57.2)
DV2-M12-13-	12 mm CIR-LOK			5.30(135)			
DV2-FBW6-13-	3/8" FBW			2.88(73.2)			
DV2-FBW8-13-	1/2" FBW			2.88(73.2)			
DV2-FGFS8-13-	1/2" Female GFS Fitting			4.09(104)			
DV2-RGFS8-13-	1/2" Rotatable Male GFS Fitting			5.43(138)			
DV2-FT6-13-	3/8" X 0.049" Fractional Tube			8.86(225)			
DV2-FT8-13-	1/2" X 0.049" Fractional Tube			8.86(225)			

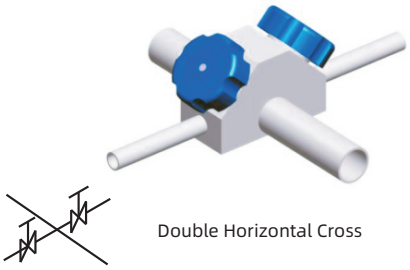
How to Order

DV1 — FGFS8 — FGFS4 — 13 — D — E — 316L

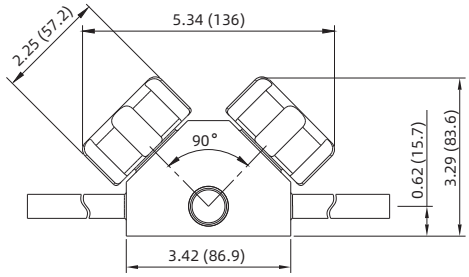
Series	Inlet Type	Inlet Size	Outlet Type / Outlet Size	Orifice Size	Purge Port	Handle Color	Body Material
DV1 **DV2**	**FNPT** Female NPT **NPT** Male NPT **FBT** Female BSPT **FBP** Female BSPP **MBP** Male BSPP (for BG) **FSW** Fractional Tube Socket Weld **MSW** Metric Tube Socket Weld **FBW** Fractional Tube Butt Weld **MBW** Metric Tube Butt Weld **F** Fractional Tube Fitting **M** Metric Tube Fitting **FGFS** Female FR Fitting **GFS** Male FR Fitting **RGFS** Rotatable Male FR Fitting **FTE** 3" Fractional Tube Extension **MTE** 3" Metric Tube Extension	**2** 1/8 in. **4** 1/4 in. **6** 3/8 in. or 6 mm **8** 1/2 in. or Φ1/2 x 0.049" or 8 mm **10** 10 mm **12** 3/4 in. or Φ3/4 x 0.065" 12 mm or M12 x 1 **14** 14 mm **16** 1 in. or 16 mm **18** 18 mm or Φ18 x 1.5 **20** 1 1/4 in. or 20 mm or M20 x 1.5 **22** 22 mm **25** 25 mm	Same as inlet type and inlet size If outlet and inlet are the same, eliminate the outlet designator	**13** 0.5 in. (12.7 mm) **25** 1 in. (25.4 mm)	None **U** Upstream **D** Downstream **UD** Upstream and Downstream	Blue **C** Red **G** Gold **E** Green **B** Black **P** Purple **O** Orange **I** Pink **R** Brown **S** Silver **W** White **Y** Yellow	**316** 316 S.S. **316L** 316L S.S.

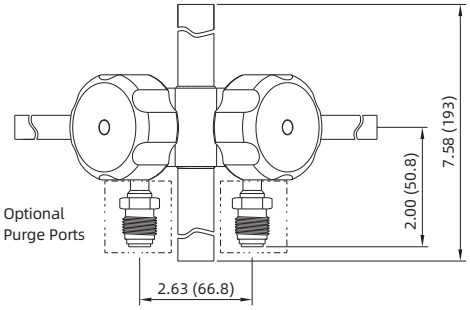
DV3D Series

Bar Stock-body



Double Horizontal Cross

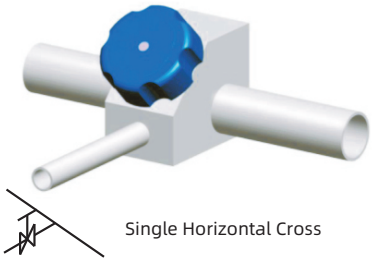




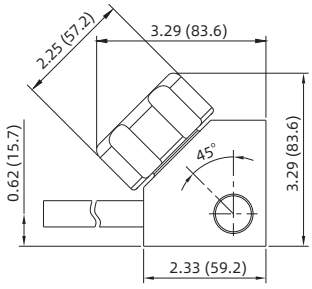
Basic Ordering Number	Tube Size		Orifice in.(mm)	Cv
	Main	Branch		
DV3D-8-8-	1/2" x 0.049"	1/2" x 0.049"	0.5 (12.7)	2.8
DV3D-8-RGFS8-	1/2" x 0.049"	1/2" rotatable male GFS fitting		
DV3D-12-8-	3/4" x 0.065"	1/2" x 0.049"		
DV3D-12-RGFS8-	3/4" x 0.065"	1/2" rotatable male GFS fitting		
DV3D-16-8-	1" x 0.065"	1/2" x 0.049"		
DV3D-16-RGFS8-	1" x 0.065"	1/2" rotatable male GFS fitting		

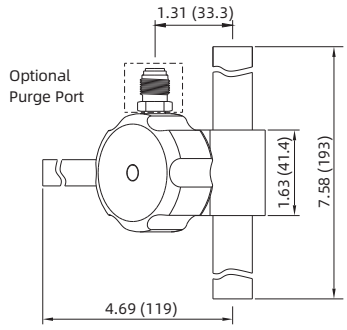
DV3S Series

Bar Stock-body



Single Horizontal Cross





Basic Ordering Number	Tube Size		Orifice in.(mm)	Cv
	Main	Branch		
DV3S-8-4-	1/2" x 0.049"	1/4" x 0.035"	0.5 (12.7)	2.8
DV3S-8-8-	1/2" x 0.049"	1/2" x 0.049"		
DV3S-8-RGFS4-	1/2" x 0.049"	1/4" rotatable male GFS fitting		
DV3S-8-RGFS8-	1/2" x 0.049"	1/2" rotatable male GFS fitting		
DV3S-12-8-	3/4" x 0.065"	1/2" x 0.049"		
DV3S-12-RGFS8-	3/4" x 0.065"	1/2" rotatable male GFS fitting		
DV3S-16-8-	1" x 0.065"	1/2" x 0.049"		
DV3S-16-RGFS8-	1" x 0.065"	1/2" rotatable male GFS fitting		

High Pressure Diaphragm Valves

DV4 Series

Features

- ❖ Maximum working pressure: 3500 psig (241 bar)
- ❖ Working temperature: -100℉ to 250℉ (−73℃ to 121℃)
- ❖ Repetitive shutoff with fully contained softseat stem tip
- ❖ Position indicator ring for lever handle
- ❖ Manual or penumatic actuation
- ❖ Aluminum piston accelerated open/close speed
- ❖ Helium leak tested, maximum leak rate of 4^{-9}x10 std cm^3/s
- ❖ Different handle types and colors are available
- ❖ Can be used in vacuum applications

Technical Data

Sort	Max. Working Pressure psig (bar)	Working Temperature Range℉(℃)	Flow Coefficient (Cv)	Orifice in. (mm)	Operating
Lever handle	3500 (241)	-100 to 250 (-73 to 121)	0.14	0.156 (4.0)	Approximately one quarter turn to operate from fully open to closed
Round handle			0.30		Approximately one and one-half turns to operate from fully open to closed

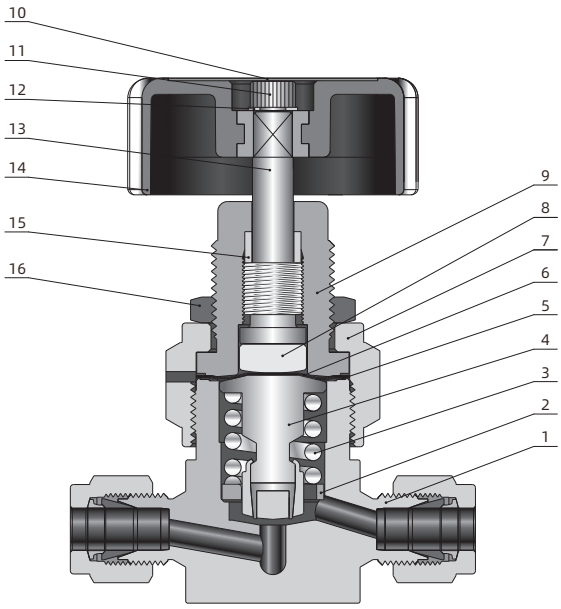
Flow Data

Pressure Drop to Atmosphere ΔP (bar)	Lever handle Cv=0.14		Round handle Cv=0.30	
	Air std L/min	Water L/min	Air std L/min	Water L/min
0.68	49	1.6	100	3.5
3.4	130	3.9	270	8.0
6.8	240	5.4	490	11.4

Pressure-Temperature Ratings

Temperature,℉(℃)	Working Pressure, psig(bar)
-73(-100) to 100(37)	3500(241)
200(93)	2950(203)
250(121)	2800(192)

Standard Materials of Construction



Item	Component		Material Grade/ASTM Specification
			Manual
1	Body		316 S.S. / A479 / 316L S.S. / A479
2	Guide		Electropolished 316 S.S. / A479
3	Spring		316 S.S. / A313
4	Stem assembly	Stem plug	316L S.S. / A479
		Stem insert	PCTFE / D1430
		Stem container	316L S.S. / A479
		Stem	316L S.S. / A479
5	Gasket		PTFE-coated 316L S.S. / A240
6	Diaphragms		Elgiloy / AMS 5876
7	Bonnet nut		316 S.S. / A479
8	Actuator Button		C36000 / B16
9	Bonnet		316 S.S. / A479
10	Lable		PVC
11	Set Screw		304 S.S.
12	Gasket		65Mn
13	Actuator		416S.S. / A582
14	Round Handle		ABS
15	Wipe Ring		PTFE
16	Panel mount nut		316 S.S. / A479

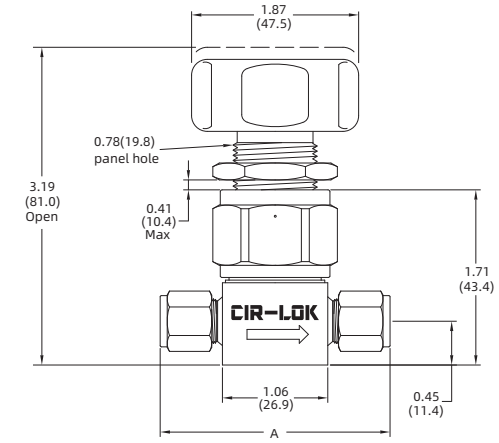
Product technology grade

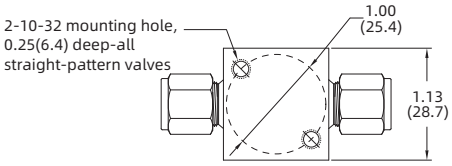
Grade	General purpose	Special Cleaning and Packaging	Ultrahigh-purity
Material	316 S.S. or 316L S.S.		
Wetted Surface Roughness	Ra 25 μin. (0.64 μm)	Ra 10 μin. (0.25 μm)	
Process	Machine finished	Electropolished	
Process Specification	FC-01 Standard Cleaning and Packaging	FC-02 Special Cleaning and Packaging	FC-03 Ultrahigh-Purity Process Specification
Cleaning	Thrice degreasinga ultrasonic cleaning	Special cleaning with non-ozone-depleting chemicals	Ultrahigh-purity cleaning with a continuously monitored, deionized water, ultrasonic cleaning system
Assembly	At atmosphere	Performed in specially cleaned areas	Performed in ISO Class 4 work areas
Testing	Inboard helium leak tested to maximum leak rate of $4x10^{-9}$ std cm^3/s		
Packing	Individually bagged	Individually bagged	Valves are double bagged and vacuum sealed in cleanroom bags

Dimensions

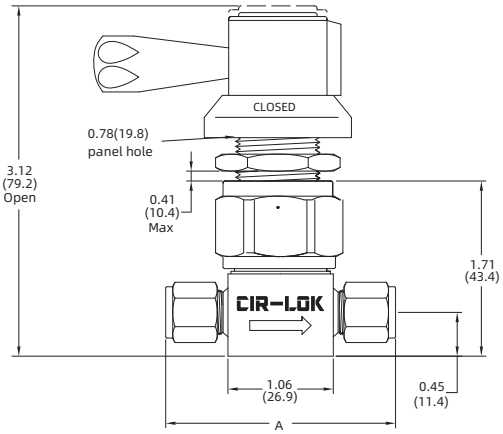
Straight Patterns

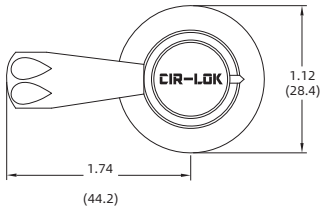
Round Handle



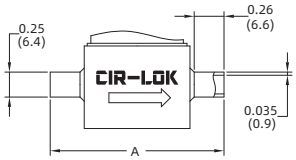


Lever Handle



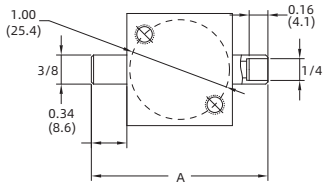


Tube fitting



Tube butt weld

Tube fitting

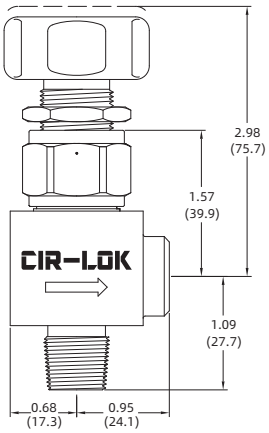


Tube butt / Tube socket weld

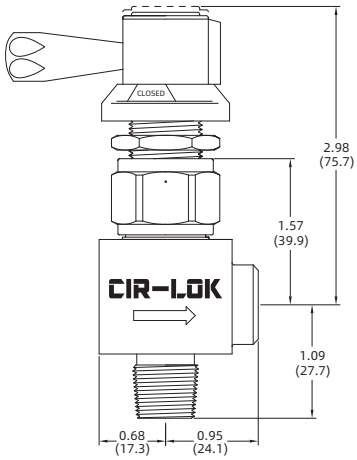
Basic Ordering Number	Connection Type and Size	Dimension, in. (mm)	Orifice in. (mm)
		A	
DV4-F4-	1/4" CIR-LOK	2.46(62.5)	
DV4-F6-	3/8" CIR-LOK	2.58(65.5)	
DV4-M6-	6 mm CIR-LOK	2.46(62.5)	
DV4-M8-	8 mm CIR-LOK	2.53(64.3)	
DV4-FBW4-	1/4" Tube butt weld	1.74(44.2)	
DV4-FBW6-	3/8" Tube butt weld	1.74(44.2)	
DV4-FBW6FSW4	3/8" Tube butt weld to 1/4" tube socket weld	1.75(44.4)	0.156(4.0)
DV4-FBW8FSW6	1/2" Tube butt weld to 3/8" tube socket weld	1.81(46.0)	
DV4-NPT4-	1/4" Male NPT	2.46(62.5)	
DV4-FNPT4-	1/4" Female NPT	2.46(62.5)	
DV4-GFS4-	1/4" Male GFS	2.30(58.4)	
DV4-FGFS4-	1/4" Female GFS	2.76(70.1)	
DV4-FGFS4-GFS4-	1/4" Female GFS to 1/4" Male GFS	2.54(64.5)	
DV4-GFS4-FGFS4-	1/4" Male GFS to 1/4" Female GFS	2.54(64.5)	

Angle Patterns

Round Handle



Lever Handle



Basic Ordering Number	Connection Type and Size	
	Inlet	Outlet
DV4-NPT4-FNPT4-	1/4" Male NPT	1/4" Female NPT

How to Order

DV4 — FGFS4 — GFS4 — T — EA — LH — 316L

Series	Inlet Type	Inlet Size	Outlet Type / Outlet Size	Stem Tip Material	Handle Color	Flow Pattern	Actuator	Body Material
DV4	**F** Fractional Tube Fitting **M** Metric Tube Fitting **FBW** Fractional Tube Butt Weld **MBW** Metric Tube Butt Weld **GFS** Male GFS Fitting **FGFS** Female GFS Fitting **NPT** Male NPT **FNPT** Female NPT	**2** 1/8 in. **4** 1/4 in. **6** 6 mm **8** 1/2 in.	Same as inlet type and inlet size If outlet and inlet are the same, eliminate the outlet designator	PCTFE **T** PTFE **V** Polyimide	Blue **C** Red **G** Gold **E** Green **B** Black **P** Purple **O** Orange **I** Pink **R** Brown **S** Silver **W** White **Y** Yellow	Straight **A** Angle	Round Handle **LH** Lever Handle	**316** 316 S.S. **316L** 316L S.S.

High Performance Diaphragm Valves

DV5 Series

Features

- Maximum working pressure: 3045 psig (210 bar)
- Working temperature: -10°F to 150°F (-23°C to 65°C)
- 316L VIM-VAR stainless steel body is available
- Suitable for ultrahigh-purity applications
- Elgiloy material for strength and corrosion resistance for long cycle life
- Fully contained PCTFE seat design provides excellent resistance to swelling and contamination
- Wetted Surface Electropolished, Roughness Ra finished to an average of Ra5 μin.(0.13 μm)
- Helium leak tested, maximum leak rate of $1x10^{-9}$ std cm^3/s
- Low-pressure and high-pressure models
- Manual or pneumatic actuation
- Aluminum piston accelerated open/close speed
- Different handle types are available
- Can be used in vacuum applications

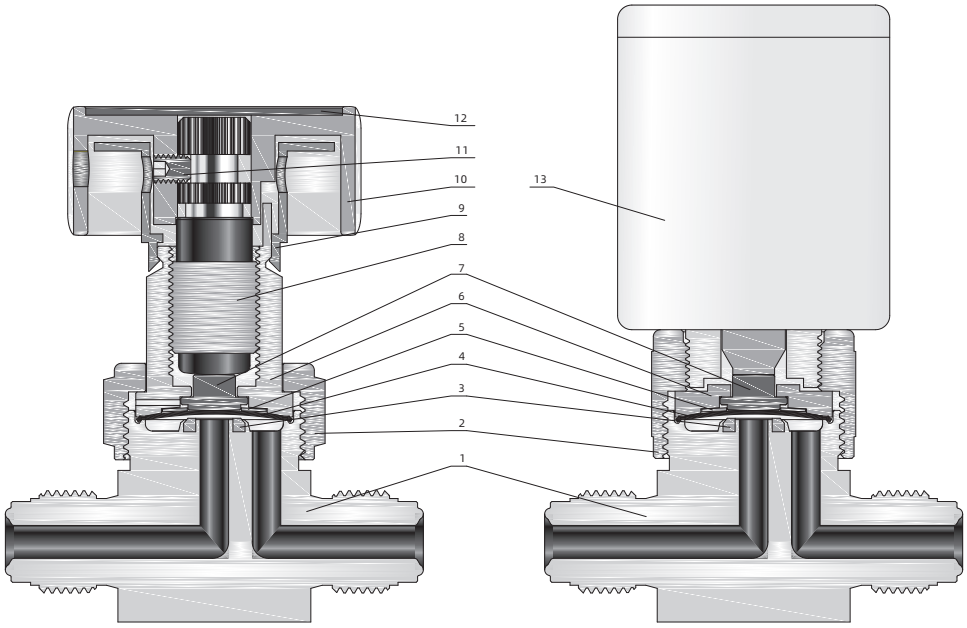
Technical Data

Sort	Max. Working Pressure psig (bar)	Working Temperature Range °F(°C)	Flow Coefficient (Cv)	Orifice in.(mm)	Pneumatic Actuator Operating Pressure psig (bar)
Low-pressure	250(17.2)	-10 to 150 (-23 to 65)	0.27	0.16 (4.1)	60 to 120 (4.2 to 8.2)
High-pressure	3045(210)		0.20		70 to 120 (4.9 to 8.2)

Flow Data

Pressure Drop to Atmosphere bar	Low-Pressure Models Cv=0.27		High-Pressure Models Cv=0.20	
	Air std L/min	Water L/min	Air std L/min	Water L/min
0.68	86	3.2	64	2.4
3.4	230	7.2	170	5.4
6.8	410	10.2	300	7.6

Standard Materials of Construction



Component		Material Grade / ASTM Specification	
		Low-Pressure	High-Pressure
1	Body	316 S.S. / A479 or 316L S.S. / A479 or 316L VIM-VAR S.S. / SEMI F20	
2	Bonnet nut	316 S.S. / A479	
3	Seat	PCTFE / D1430	
4	Diaphragm	Elgiloy / AMS 5876	
5	Washer	—	S17700 / A693
6	Button	316 S.S. / A479	
7	Bonnet		
8	Stem		
9	Indicator ring	PC	
10	Handle	Round handle	Aluminum with anodic oxidation of surface
		Directional handle	
		Integral lockout handle	
		Toggle handle	316 S.S. with epoxy coating
11	Screw	304 S.S.	
12	Lable	PVC	
13	Pneumatic Actuator	Aluminum	

Product technology grade

Grade	General purpose	Special Cleaning and Packaging	Ultrahigh-purity
Material	316S.S. or 316L S.S. or 316L VIM-VAR S.S. / SEMI F20		
Wetted Surface Roughness	Ra 10 µin. (0.25 µm)	Ra 5 µin. (0.13 µm)	
Process	Machine finished	Electropolished	
Process Specification	FC-01 Standard Cleaning and Packaging	FC-02 Special Cleaning and Packaging	FC-03 Ultrahigh-Purity Process Specification
Cleaning	Thrice degreasing ultrasonic cleaning	Special cleaning with non-ozone-depleting chemicals	Ultrahigh-purity cleaning with a continuously monitored, deionized water, ultrasonic cleaning system
Assembly	At atmosphere	Performed in specially cleaned areas	Performed in ISO Class 4 work areas
Testing	Inboard helium leak tested to maximum leak rate of $1x10^{-9}$ std cm^3/s		
Packing	Individually bagged	Individually bagged	Valves are double bagged and vacuum sealed in cleanroom bags

Manual Actuators

Round

- Quick, quarter-turn actuation
- Handle with window provides visual indication of open and closed positions

OPEN

CLOSED

Directional

- Quick, quarter-turn actuation
- Handle shape provides visual indication of open and closed position

OPEN

CLOSED

Integral Lockout

- Quick, quarter-turn actuation
- Lockable in the CLOSED position for safety
- Handle shape and window indicator provides visual indication of OPEN and CLOSED position

Toggle

- Spring-loaded toggle design quick actuation
- Lockable in the CLOSED position for safety
- Handle position provides visual indication of OPEN and CLOSED positions
- Narrow handle profile allows close parallel mounting of valves
- Only for low-pressure models

Pneumatic Actuators

High-Pressure Pneumatic Actuator

- ❖ Normally open, “N.O.” marked on the top of the cylinder
- ❖ Normally close, “N.C.” marked on the top of the cylinder

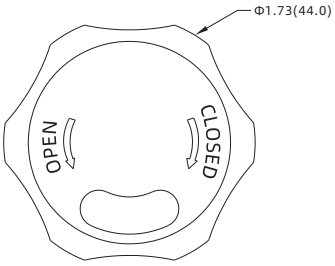
Low-Pressure Pneumatic Actuator

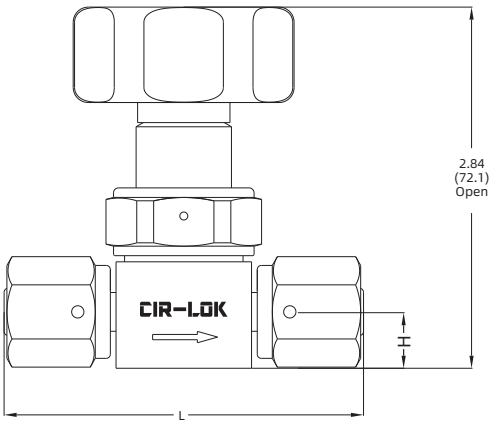
- ❖ Normally open, “N.O.” marked on the top of the cylinder
- ❖ Normally close, “N.C.” marked on the top of the cylinder

Dimensions

Low-Pressure Valves

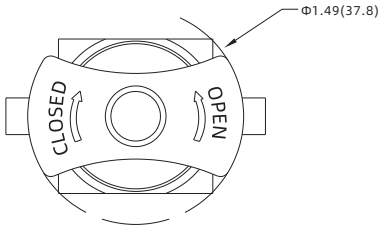
Round Handle

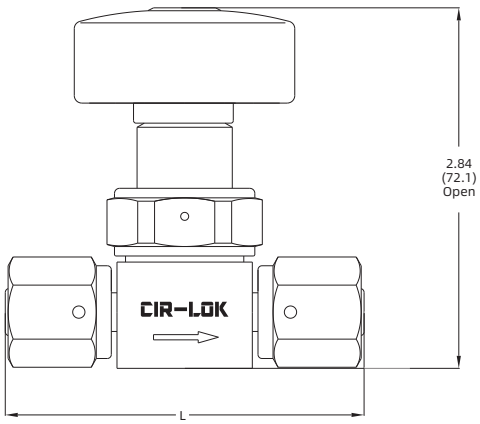




Female GFS Fittings

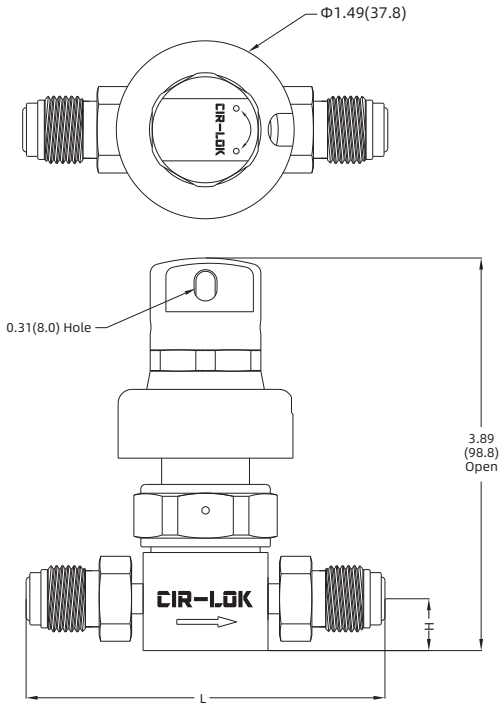
Directional Handle





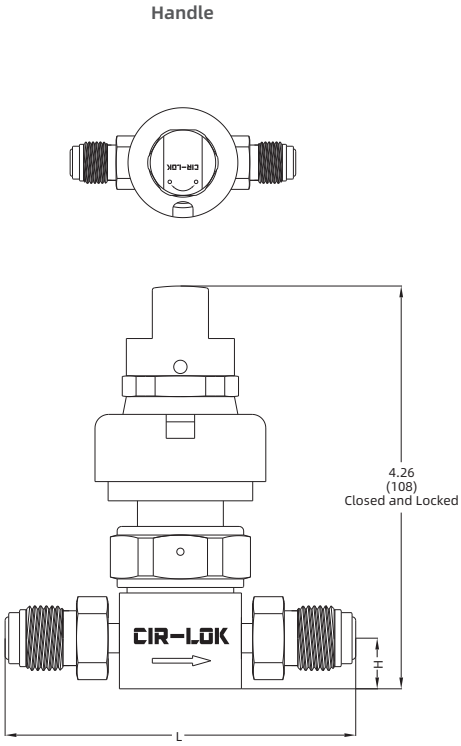
Female GFS Fittings

Integral Lockout



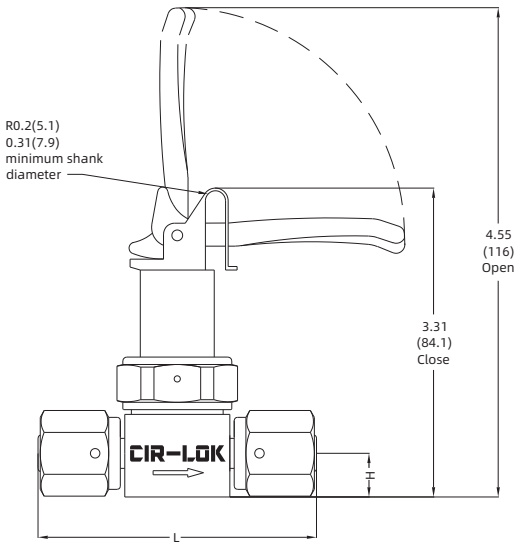
Rotatable male GFS Fittings

Handle



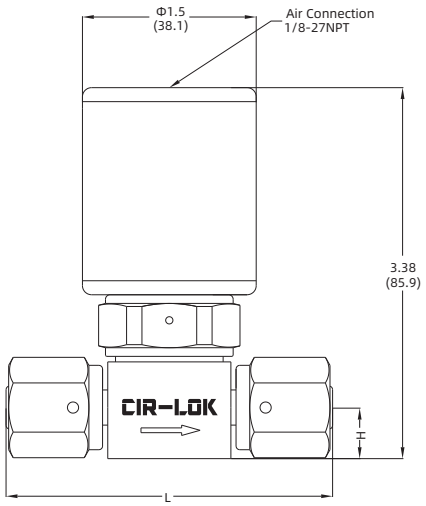
Rotatable male GFS Fittings

Toggle Handle



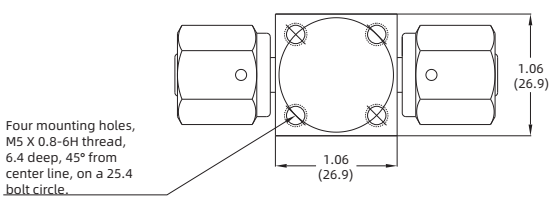
Female GFS Fittings

Pneumatic Actuator



Female GFS Fittings

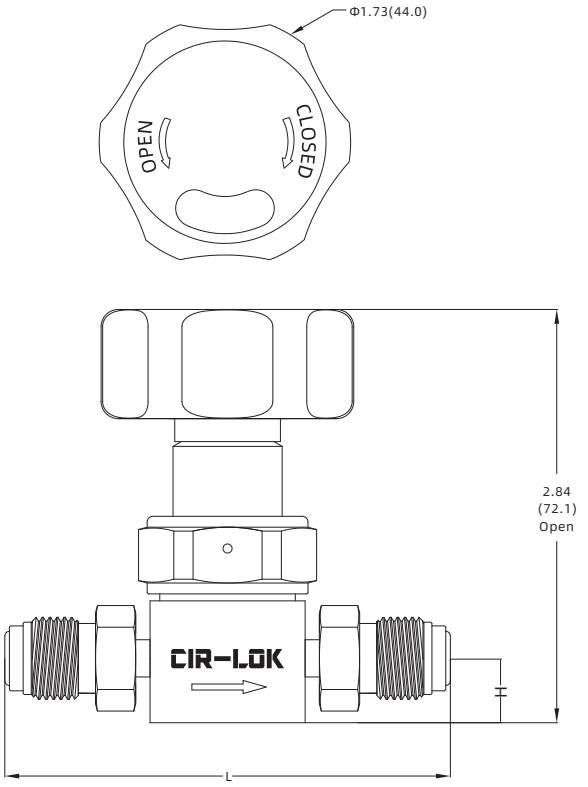
Bottom



Basic Ordering Number	Connection Type and Size	Dimension, in.(mm)	
		L	H
DV5-FBW4-L-	1/4" tube butt weld 0.30"(7.6 mm) tube stub, 0.035"(0.89 mm) wall	1.74(44.2)	0.44(11.2)
DV5-FBW4S-L-	1/4" tube butt weld 0.26"(6.6 mm) tube stub, 0.035"(0.89 mm) wall	1.61(40.9)	0.44(11.2)
DV5-MBW6-L-	6 mm tube butt weld, 1 mm wall	1.74(44.2)	0.44(11.2)
DV5-FGFS4-L-	1/4" female GFS fitting	2.78(70.6)	0.44(11.2)
DV5-RGFS4-L-	1/4" rotatable male GFS fitting		
DV5-GFS4-L-	1/4" integral male GFS fitting	2.30(58.4)	0.44(11.2)
DV5-F4-L-	1/4" CIR-LOK tube fittings	2.46(62.5)	0.44(11.2)
DV5-M6-L-	6 mm CIR-LOK tube fittings	2.45(62.2)	0.44(11.2)

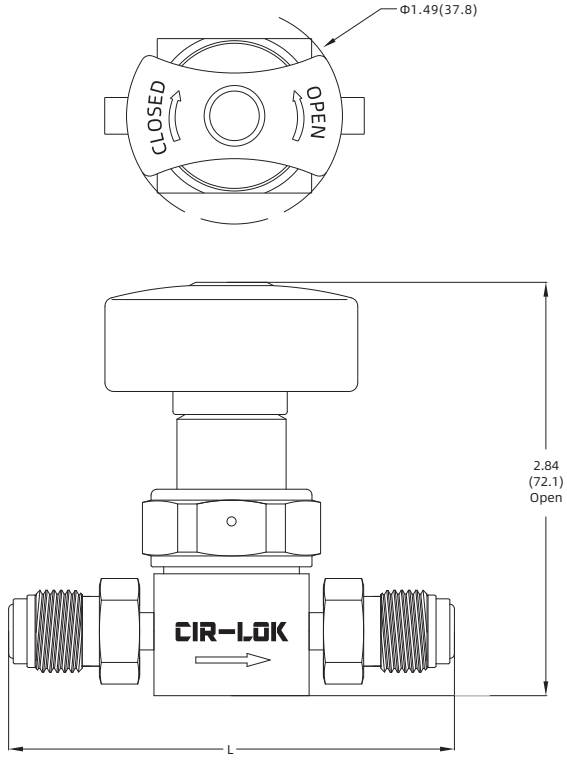
High-Pressure Valves

Round Handle



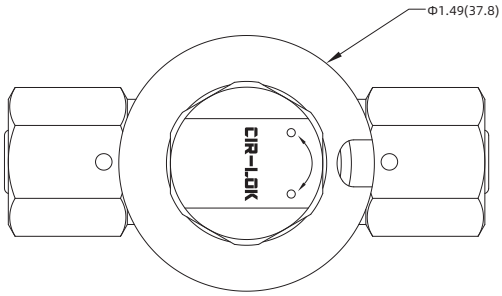
Rotatable male GFS Fittings

Directional Handle

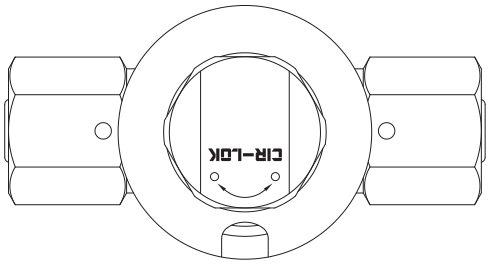


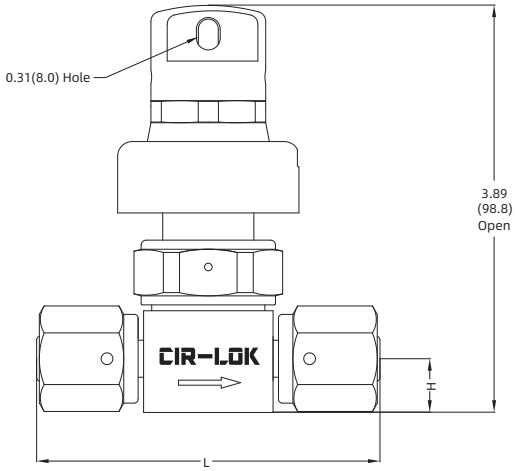
Rotatable male GFS Fittings

Integral Lockout

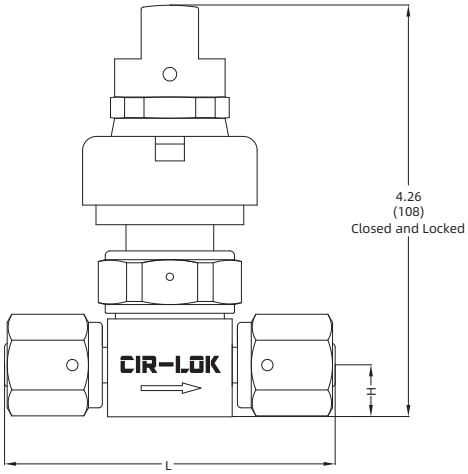


Handle



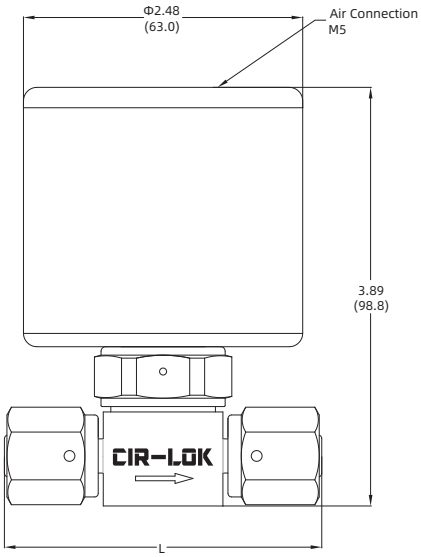


Female GFS fitting



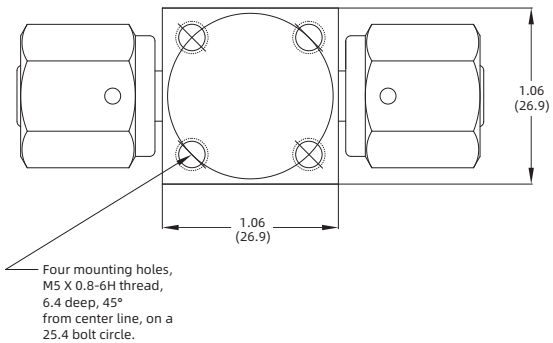
Female GFS fitting

Pneumatic Actuator



Female GFS Fittings

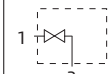
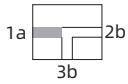
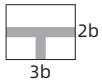
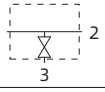
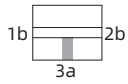
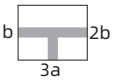
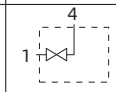
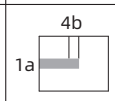
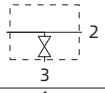
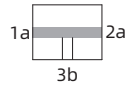
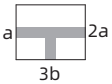
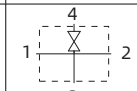
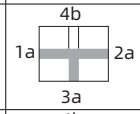
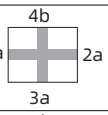
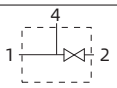
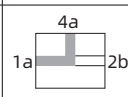
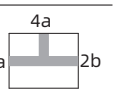
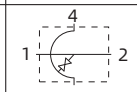
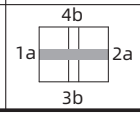
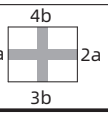
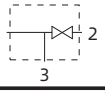
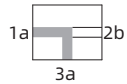
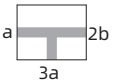
Bottom



Basic Ordering Number	Connection Type and Size	Dimension, in. (mm)	
		L	H
DV5-FBW4-H-	1/4" tube butt weld 0.30"(7.6 mm) tube stub, 0.035" (0.89 mm) wall	1.74(44.2)	0.44(11.2)
DV5-FBW4S-H-	1/4" tube butt weld 0.26"(6.6 mm) tube stub, 0.035" (0.89 mm) wall	1.61(40.9)	0.44(11.2)
DV5-MBW6-H-	6 mm tube butt weld, 1 mm wall	1.74(44.2)	0.44(11.2)
DV5-FGFS4-H-	1/4" female GFS fitting	2.78(70.6)	0.44 (11.2)
DV5-RGFS4-H-	1/4" rotatable holes are male GFS fitting		
DV5-GFS4-H-	1/4" integral male GFS fitting	2.30(58.4)	0.44(11.2)
DV5-F4-H-	1/4" CIR-LOK tube fittings	2.46(62.5)	0.44(11.2)
DV5-M6-H-	6 mm CIR-LOK tube fittings	2.45(62.2)	0.44(11.2)

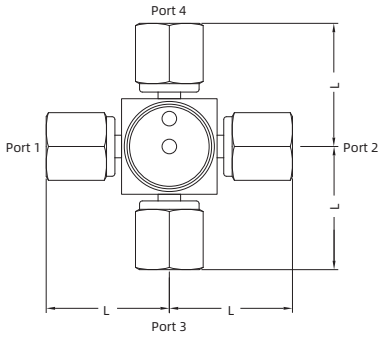
Multiport and Elbow Valves

- Slect a flow path as viewed from the top of the valve
- A a next to the port number indicates inlet of the valve
- A b next to the port number indicates outlet of the valve

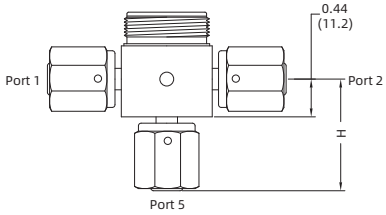
Designator	Schematic	Flow Path		Designator	Schematic	Flow Path	
		Closed	Open			Closed	Open
2A				3D			
2B				3E			
2C				3F			
4M				3G			
4N				3K			

End Connections and Dimentions

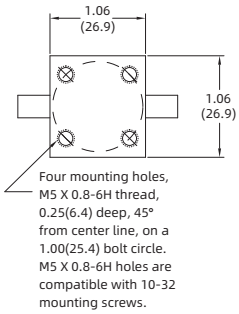
Top



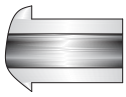
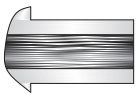
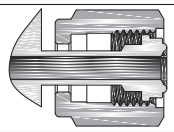
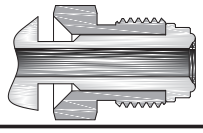
Side



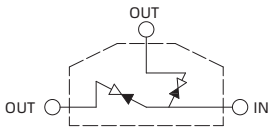
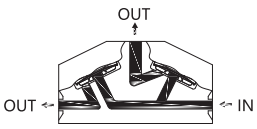
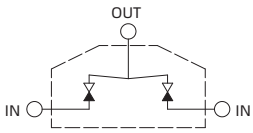
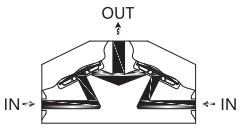
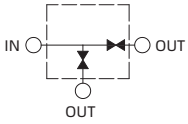
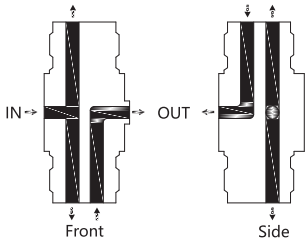
Bottom



Note: 2B body, no mounting holes.

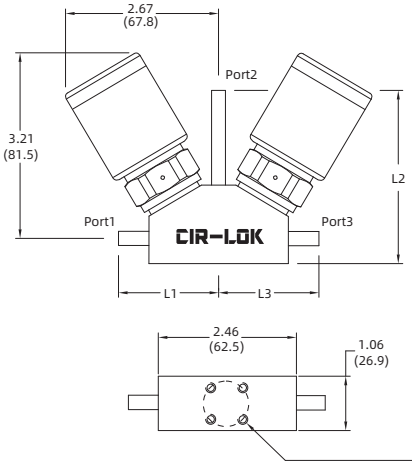
Designator	End Connection		Dimension, in. (mm)	
			L	H
FBW4	1/4" tube butt weld 0.30"(7.6 mm) tube stub, 0.035"(0.89 mm) wall		0.87(22.1)	0.76(19.3)
FBW4S	1/4" tube butt weld 0.26"(6.6 mm) tube stub, 0.035" (0.89 mm) wall		0.81(20.6)	0.70(17.8)
MBW6	6mm tube butt weld , 1 mm wall		0.87(22.1)	0.76(19.3)
FGFS4	1/4" female GFS fitting		1.39(35.3)	1.28(32.5)
RGFS4	1/4" rotatable male GFS fitting		1.39(35.3)	1.28(32.5)

Multivalve Manifolds

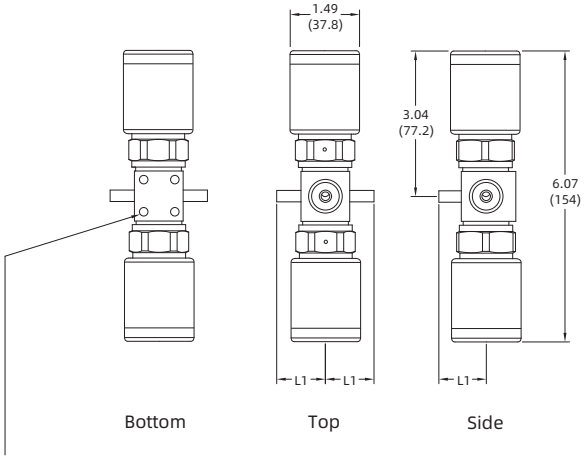
Designator	Schematic	Flow Path
V		
W		
D		

End Connections and Dimentions

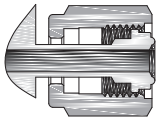
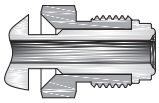
V and W Multivalve Manifolds



D Multivalve Manifold

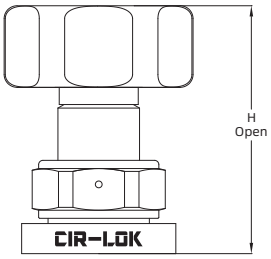


Four bottom mounting holes, M5 X 0.8-6H thread, 0.25 (6.4) deep, located 45° form center line, on a 1.00 (25.4) bolt circle.
M5 X 0.8-6H holes are compatible with 10-32 mounting screws.

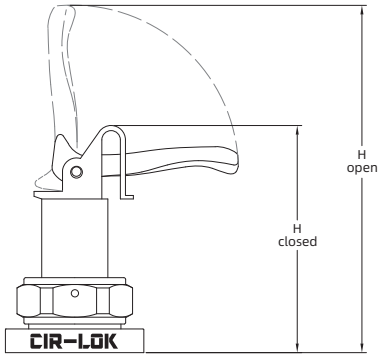
Designator	End Connection		Dimentions, in. (mm)				
			V and W Multivalve Manifolds				D Multivalve Manifold
			L1	L2		L3	L1
				Low-pressure	High-pressure		
FBW4	1/4" tube butt weld 0.30"(7.6 mm) tube stub, 0.035"(0.89 mm) wall		1.81(46.0)	2.79(70.9)	4.04(103)	1.81(46.0)	0.87(22.1)
FGFS4	1/4" female GFS fitting		2.03(51.6)	2.66(67.6)	3.91(99.3)	2.03(51.6)	1.39(35.3)
RGFS4	1/4" rotatable male GFS fitting		2.39(60.7)	3.35(85.1)	4.60(117)	2.39(60.7)	

IGS Modular Suface-Mount Valves

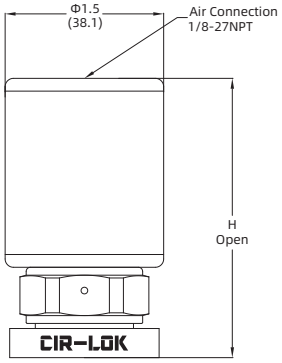
Directional and Roud Handles



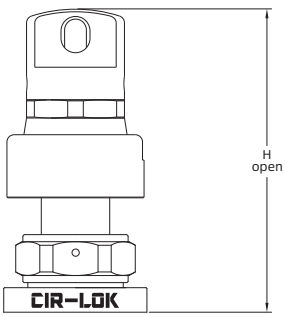
Toggle Handle

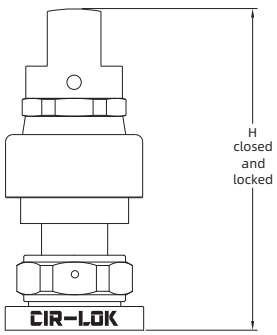


Pneumatic Actuator

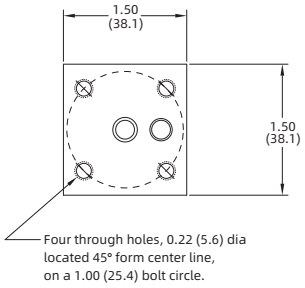


Integral Lockout Handle





Bottom



Handle Type	Dimensions, in.(mm)			
	Low-Pressure		High-Pressure	
	H Open	H Closed	H Open	H Closed
Directional and Roud	2.36(59.9)	2.34(59.4)	2.36(59.9)	2.34(59.4)
Integral Lockout	3.25(82.6)	3.59(91.2)	3.41(86.6)	3.78(96.0)
Toggle	2.83(71.9)	4.04(103)	————	

Notice: Toggle Handle and Pneumatic Actuator are not used for high pressure system.

How to Order

DV5 — FBW6 — FBW4 — H — R3A — NO — 316LVV

Series	Port 1 Type	Port 1 Size	Port 2/3/4/5 Type	Port 2/3/4/5 Size	Pressure Type	Colour	Flow Path	Actuator/Handle	Body Material
DV5	F Fractional Tube Fitting M Metric Tube Fitting FBW Fractional Tube Butt Weld MBW Metric Tube Butt Weld GFS Male GFS Fitting FGFS Female GFS Fitting RGFS Rotatable Male GFS Fitting	2 1/8 in. 4 1/4 in. 6 6 mm	Same as port 1 Specify in the same way as port 1 type and port 1 size		H High-Pressure Valves L Low-Pressure Valves	Blue B Black W White Y Yellow G Green R Red	Straight 2A 2B 2C 3D 3E 3F 3G 3K 4M 4N M1V M1W M1D	Round Handle DH Directional Handle IH Integral Lockout Handle TH Toggle Handle NC Pneumatic, Normally closed NO Pneumatic, Normally open	316 316 S.S. 316L 316L S.S. 316LV 316 VAR S.S. 316LVV 316L VIM-VARS.S

General-Purpose Diaphragm Valves

DV6 Series

Features

- Maximum working pressure: 3045 psig (210 bar)
- Working temperature: -10°Fto 150°F (-23℃ to 65℃)
- 316L VIM-VAR stainless steel body is available
- Suitable for ultrahigh-purity applications
- Elgiloy material for strength and corrosion resistance forlong cycle life
- Fully contained PCTFE seat design provides excellentresistance to swelling and contamination
- Ball drive design reduces operating torque
- Wetted Surface Electropolished , Roughness Ra finishedto an average of Ra5 μin (0.13 μm)
- Helium leak tested . maximum leak rate of $1x10^{-9}$ std cm^3/s
- Low-pressure and high-pressure models
- Manual or pneumatic actuation
- Aluminum piston accelerated open / close speed
- Different handle types are available
- Can be used in vacuum applications

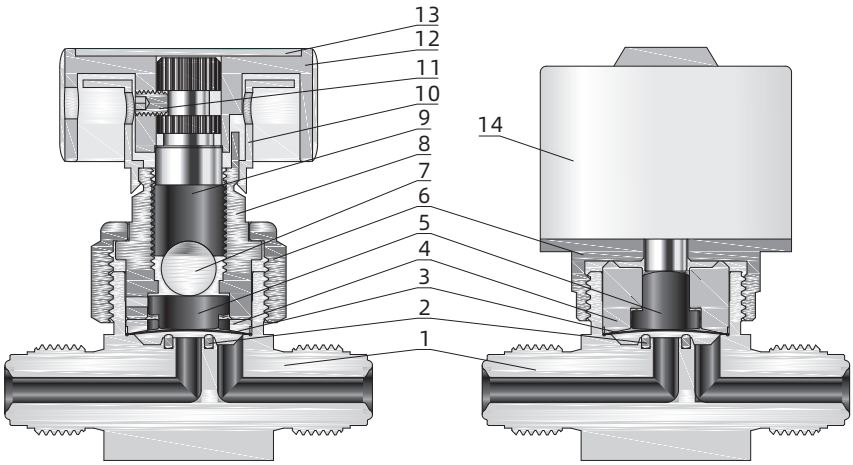
Technical Data

Sort	Max.Working Pressure psig(bar)	Working Temperature Range °F(°C)	Flow Coefficient (Cv)	Orifice in.(mm)	Pneumatic Actuator Operating Pressure psig (bar)
Low-pressure	250(17.2)	-10 to 150 (-23 to 65)	0.27	0.16 (4.1)	58 to 87 (4.0 to 6.0)
High-pressure	3045(210)		0.20		—
Low-pressure	145(10)		0.70	0.27 (7.0)	58 to 87 (4.0 to 6.0)

Flow Data

Pressure Drop to Atmosphere ΔP(bar)	Low-Pressure Models Cv=0.27		High-Pressure Models Cv=0.2		Low-Pressure Models Cv=0.7	
	Air std L/min	Water std L/min	Air std L/min	Water std L/min	Air std L/min	Water std L/min
0.68	86	3.2	64	2.4	224	8.4
3.4	230	7.2	170	5.4	595	18.7
6.8	410	10.2	300	7.6	1056	26.5

Materials of Construction



Item	Component	Material Grade / ASTM Specification
1	Body	316 S.S. / A479 or 316L S.S. / A479 or 316L VIM-VAR S.S. / SEMI F20
2	Seat	PCTFE / D1430
3	Diaphragm	Elgiloy / AMS 5876
4	Bonnet	316 S.S. / A479
5	Button	
6	Bonnet nut	
7	Ball	440C / A276
8	Drive	316 S.S. / A479
9	Stem	
10	Indicator ring	PC
11	Screw	304 S.S.
12	Handle	Aluminum
13	Lable	PVC
14	Pneumatic Actuator	Aluminum

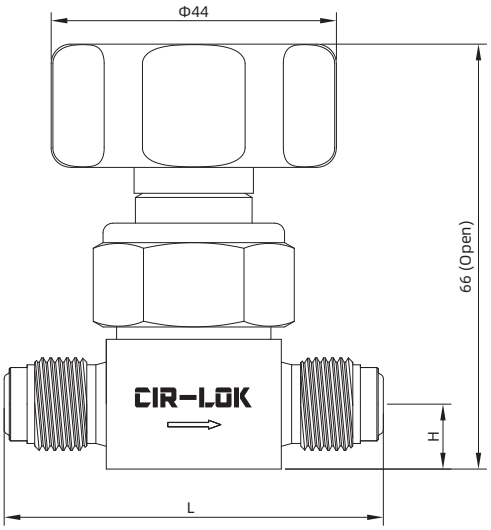
Product Technology Grade

Grade	General purpose	Special Cleaning and Packaging	Ultrahigh-purity
Material	316 S.S. or 316L S.S. or 316L VIM-VAR S.S. / SEMI F20		
Wetted Surface Roughness	Ra 10 µin. (0.25 µm)	Ra 5 µin. (0.13 µm)	
Process	Machine finished	Electropolished	
Process Specification	FC-01 and Packaging Standard Cleaning	FC-02 Packaging Special Cleaning and	FC-03 Specification Ultrahigh-Purity Process
Cleaning	Thrice degreasinga ultrasonic cleaning	Special cleaning with non-ozone-depleting chemicals	Ultrahigh-purity cleaning with a continuously monitored, deionized water, ultrasonic cleaning system
Assembly	At atmosphere	Performed in specially cleaned areas	Performed in ISO Class 4 work areas
Testing	Inboard helium leak tested to maximum leak rate of $1x10^{-9}$ std cm^3/s		
Packing	Individually bagged	Individually bagged	Valves are double bagged and vacuum sealed in cleanroom bags

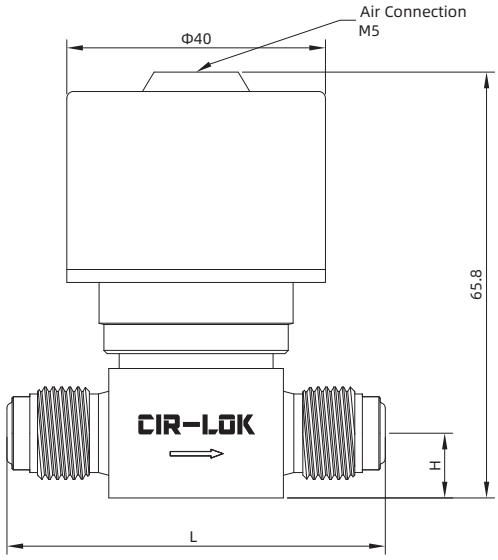
Dimensions

Low-Pressure Valves

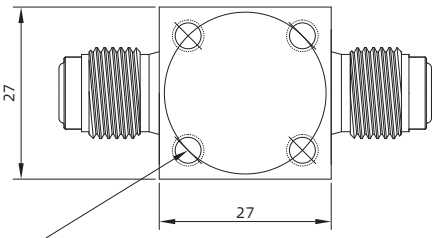
Round Handle



Pneumatic Actuator



Bottom

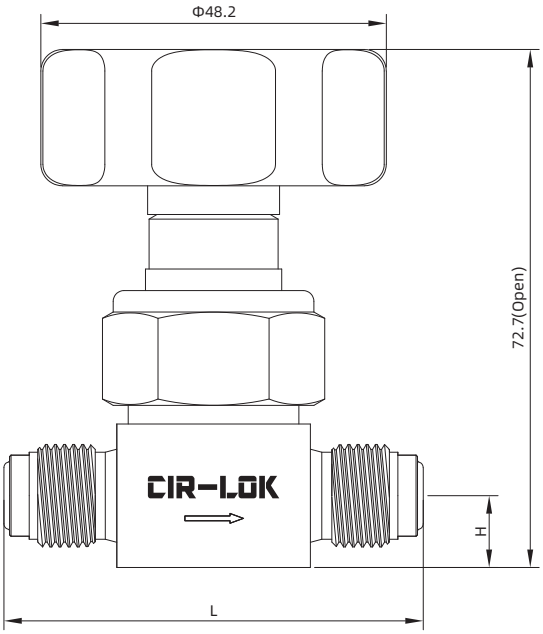


Four mounting holes,
M5 3 0.8-6H thread,
6.4 deep, 45°
from center line, on a
25.4 bolt circle.

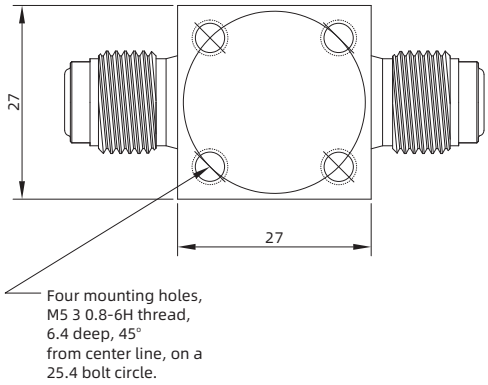
Basic Ordering Number	Connection Type and Size	Dimension,in.(mm)	
		L	H
DV6-FBW4-L	1/4" tube butt weld 0.30"(7.6 mm) tube stub, 0.035"(0.89 mm)wall	1.74(44.2)	0.44(11.2)
DV6-MBW6-L	6 mm tube butt weld, 1 mm wall		
DV6-FGFS4-L	1/4" female GFS fitting	2.78(70.6)	0.44(11.2)
DV6-RGFS4-L	1/4" rotatable male GFS fitting		
DV6-GFS4-L	1/4" integral male GFS fitting	2.30(58.4)	0.44(11.2)
DV6-F4-L	1/4" CIR-LOK tube fittings	2.46(62.5)	0.44(11.2)
DV6-M6-L	6 mm CIR-LOK tube fittings	2.45(62.2)	0.44(11.2)

High-Pressure Valves

Round Handle



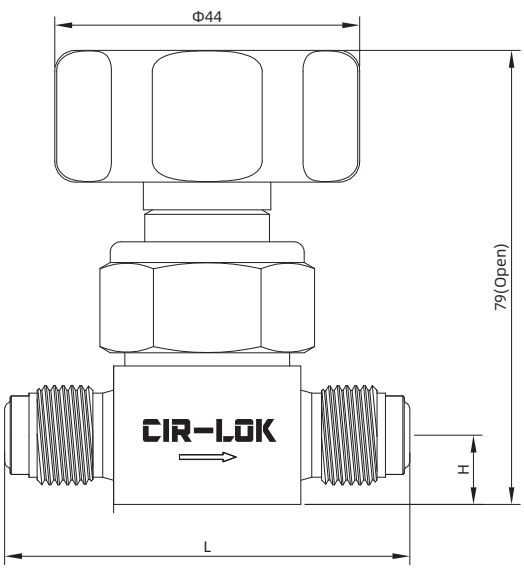
Bottom



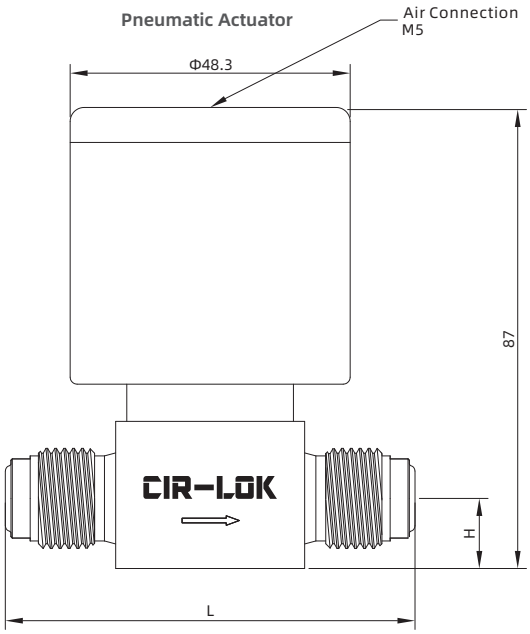
Basic Ordering Number	Connection Type and Size	Dimension,in.(mm)	
		L	H
DV6-FBW4-H	1/4" tube butt weld 0.30"(7.6 mm) tube stub, 0.035"(0.89 mm)wall	1.74(44.2)	0.44(11.2)
DV6-MBW6-H	6 mm tube butt weld, 1 mm wall		
DV6-FGFS4-H	1/4" female GFS fitting	2.78(70.6)	0.44(11.2)
DV6-RGFS4-H	1/4" rotatable male GFS fitting		
DV6-GFS4-H	1/4" integral male GFS fitting	2.30(58.4)	0.44(11.2)
DV6-F4-H	1/4" CIR-LOK tube fittings	2.46(62.5)	0.44(11.2)
DV6-M6-H	6 mm CIR-LOK tube fittings	2.45(62.2)	0.44(11.2)

Low-Pressure Valves

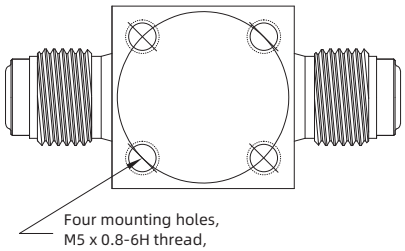
Round Handle



Pneumatic Actuator



Bottom



Four mounting holes, M5 x 0.8-6H thread, 6.4 deep, 45° from center line, on a 28 bolt circle.

Basic Ordering Number	Connection Type and Size	Dimension,in.(mm)	
		L	H
DV6-GFS8-L	1/2" integral male GFS fitting	3.03(77.0)	0.63(16.0)
DV6-FGFS8-L	1/2" female GFS fitting	4.12(104.6)	0.63(16.0)
DV6-F6-L	3/8" CIR-LOK tube fittings	3.25(82.5)	0.63(16.0)
DV6-F8-L	1/2" CIR-LOK tube fittings	3.55(90.2)	0.63(16.0)

How to Order

DV6 – F4 – M6 – L – R2C – NC – 316

Series	Port 1 Type	Port 1 Size	Port 2/3/4/5 Type	Port 2/3/4/5 Size	Pressure Type	Colour	Flow Path	Actuator/Handle	Body Material
DV6	F Fractional Tube Fitting M Metric Tube Fitting FBW Fractional Tube Butt Weld MBW Metric Tube Butt Weld GFS Male GFS Fitting FGFS Female GFS Fitting RGFS Rotatable Male GFS Fitting	2 1/8 in. 4 1/4 in. 6 3/8 in. or 6 mm 8 1/2 in.	Same as port 1 Specify in the same way as port 1 type and port 1 size		H High-Pressure Valves L Low-Pressure Valves	Blue B Black W White Y Yellow G Green R Red	Straight 2A 2B 2C 3D 3E 3F 3G 3K 4M 4N	Round Handle NC Pneumatic, Normally closed NO Pneumatic, Normally open	316 316 S.S. 316L 316L S.S. 316LV 316 VAR S.S. 316LVV 316L VIM-VARS.S

Diaphragm Valves

DV7 Series

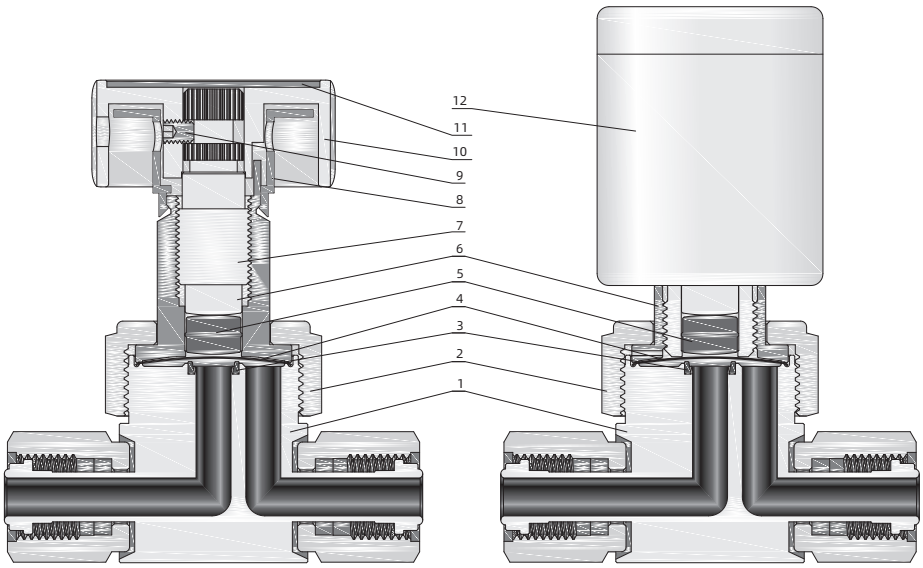
Features

- ❖ Maximum working pressure: 300 psig (20.6 bar)
- ❖ Working temperature: -10℉to 150℉ (-23℃ to 65℃)
- ❖ Flow coefficient of 0.62 meets high flow requirements
- ❖ 316L VIM-VAR stainless steel body is available
- ❖ Suitable for ultrahigh-purity applications
- ❖ Elgiloy material for strength and corrosion resistance forlong cycle life
- ❖ Fully contained PCTFE seat design provides excellentresistance to swelling and contamination
- ❖ Wetted Surface Electropolished , Roughness Ra finishedto an average of Ra5 μin (0.13 μm)
- ❖ Helium leak tested . maximum leak rate of $1x10^{-9}$ std $cm^3/3$
- ❖ Manual or pneumatic actuation
- ❖ Aluminum piston accelerated open / close speed
- ❖ Can be used in vacuum applications

Technical Data

Sort	Max. Working Pressure psig(bar)	Working Temperature Range °F(°C)	Flow Coefficient (Cv)	Orifice in.(mm)	Pneumatic Actuator Operating Pressure psig (bar)
Round handle	300 (20.6)	-10 to 150 (-23 to 65)	0.62	0.23 (5.8)	—
Pneumatic actuator	125 (8.6)				70 to 100 (4.9 to 6.8)

Materials of Construction



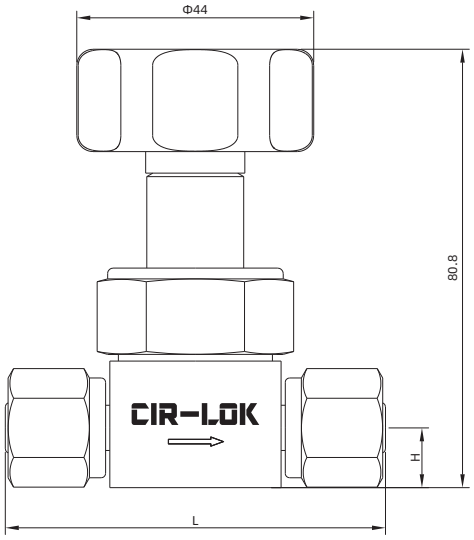
Item	Component	Material Grade/ASTM Specification
1	Body	316 S.S. / A479 or 316L S.S. / A479 or 316L VIM-VAR S.S. / SEMI F20
2	Bonnet nut	316 S.S. / A479
3	Seat	PCTFE / D1430
4	Diaphragm	Elgiloy / AMS 5876
5	Button	316 S.S. / A479
6	Bonnet	316 S.S. / A479
7	Stem	316 S.S. / A479
8	Indicator ring	PC
9	Screw	304 S.S.
10	Handle	Aluminum
11	Lable	PVC
12	Pneumatic Actuator	Aluminum

Product Technology Grade

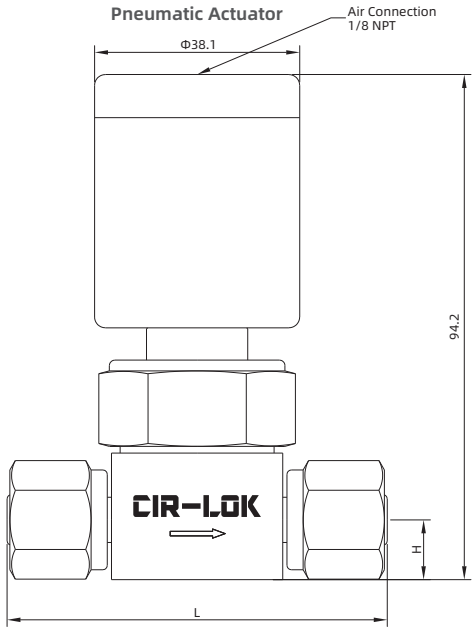
Grade	General purpose	Special Cleaning and Packaging	Ultrahigh-purity
Material	316 S.S. or 316L S.S. or 316L VIM-VAR S.S./SEMI F20		
Wetted Surface Roughness	Ra 10 µin. (0.25 µm)	Ra 5 µin. (0.13 µm)	
Process	Machine finished	Electropolished	
Process Specification	FC-01 and Packaging Standard Cleaning	FC-02 Packaging Special Cleaning and	FC-03 Specification Ultrahigh-Purity Process
Cleaning	Thrice degreasinga ultrasonic cleaning	Special cleaning with non-ozone-depleting chemicals	Ultrahigh-purity cleaning with a continuously monitored, deionized water, ultrasonic cleaning system
Assembly	At atmosphere	Performed in specially cleaned areas	Performed in ISO Class 4 work areas
Testing	Inboard helium leak tested to maximum leak rate of $1x10^{-9}$ std cm^3/s		
Packing	Individually bagged	Individually bagged	Valves are double bagged and vacuum sealed in cleanroom bags

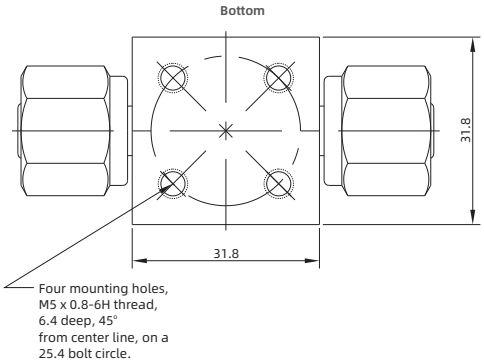
Dimensions

Round Handle



Pneumatic Actuator





Basic Ordering Number	Connection Type and Size	Dimension,in.(mm)	
		L	H
DV7-FGFS4-L	1/4" female GFS fitting	2.78(70.6)	0.44(11.2)
DV7-RGFS4-L	1/4" rotatable male GFS fitting	2.96(75.2)	
DV7-GFS4-L	1/4" integral male GFS fitting	2.49(63.3)	
DV7-FGFS8-L	1/2" female GFS fitting	4.16(106)	
DV7-RGFS8-L	1/2" rotatable male GFS fitting		
DV7-FBW6-L	3/8" tube butt weld, 0.035"(0.89mm)wall	2.25(57.1)	
DV7-FBW8-L	1/2" tube butt weld, 0.049"(1.24mm)wall		
DV7-MBW10-L	10 mm tube butt weld, 1 mm wall		
DV7-MBW12-L	12 mm tube butt weld, 1 mm wall		

How to Order

DV7 – FGFS4 – GFS4 – L – R2C – NC – 316

Series	Port 1 Type	Port 1 Size	Port 2/3/4/5 Type / Port 2/3/4/5 Size	Pressure Type	Colour	Flow Path	Actuator/Handle	Body Material
DV7	FBW Fractional Tube Butt Weld MBW Metric Tube Butt Weld GFS Male GFS Fitting FGFS Female GFS Fitting RGFS Rotatable Male GFS Fitting	4 1/4 in. 6 3/8 in. 8 1/2 in. 10 10 mm 12 12 mm	Same as port 1 Specify in the same way as port 1 type and port 1 size	L Low-Pressure Valves	Blue B Black W White Y Yellow G Green R Red	Straight 2A 2B 2C 3D 3E 3F 3G 3K 4M 4N	Round Handle NC Pneumatic, Normally closed NO Pneumatic, Normally open	316 316 S.S. 316L 316L S.S. 316LV 316 VAR S.S. 316LVV 316L VIM-VAR S.S.