CIR-LOK
FLUID SYSTEM SOLUTIONS

Diaphragm Valves

DV5 Series

- Suitable for ultrahigh-purity applications
- 316L VIM-VAR stainless steel body
- Low-pressure and high-pressure models
- Variety of end connections
- Manual or pneumatic actuation

Features

- 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

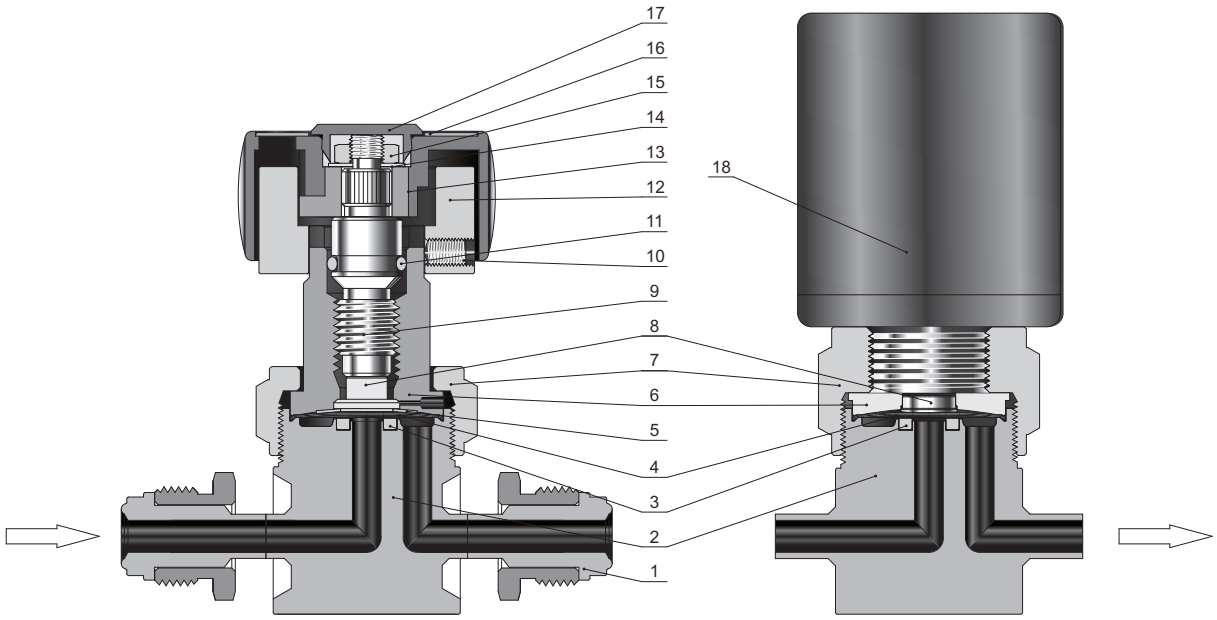
Technical Data

Sort	Max. Working Pressure psig (bar)	Working Temperature Range ℉(℃)	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

Materials of Construction



Item	Component	Material Grade/ASTM Specification	
		Low-Pressure	High-Pressure
1	Welded end connections	316 S.S./A479 or 316L S.S./A479 or 316L VIM-VAR S.S./SEMI F20	
2	Body	316 S.S./A479 or 316L S.S./A479 or 316L VIM-VAR S.S./SEMI F20	
3	Seat	PCTFE/D1430	
4	Diaphragm (2)	Elgiloy /AMS 5876	
5	Washer	—	S17700/A693
6	Bonnet	S17400/A564	
7	Bonnet nut	316 S.S./A479	
8	Button	316 S.S./A479	
9	Stem	316 S.S./A479	
10	Hexagon socket set	304 S.S.	
11	O-rings	NBR	
12	Actuator	316 SS/A276	
13	Manual Actuator	Round handle	ABS with stainless steel insert
		Directional handle	Nylon with stainless steel insert
		Integral lockout handle	Aluminum with anodic oxidation of surface
		Toggle handle	316 S.S. with epoxy coating
14	Gasket	65 Mn	
15	Nut	304 S.S.	
16	Lable	PVC	
17	Cap	ABS	
18	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-01Standard Cleaning and Packaging	FC-02Special Cleaning and Packaging	FC-03Ultrahigh-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 $1x10^{-9}$ std cm^3/s		
Packing	Individually bagged	Individually bagged	Valves are double bagged and vacuum sealed in cleanroom bags

Manual Actuators

Round

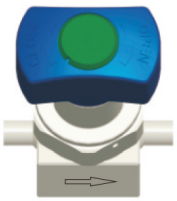
- Quick,quarter-turn actuation
- Handle with window provides visual indication of open and closed positions

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

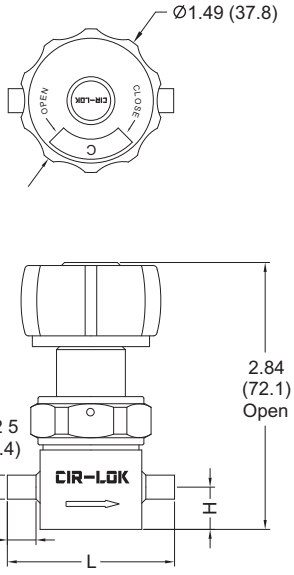
Low-Pressure Pneumatic Actuator

- Normally open, " N.O." marked on the top of the cylinder
- Normally close, " N.C." marked on the top of the cylinder

Dimension

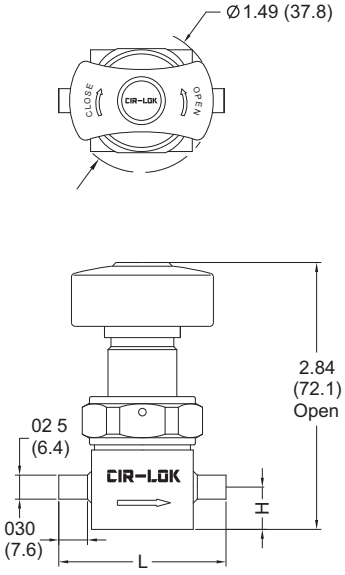
Low-Pressure Valves

Round Handle



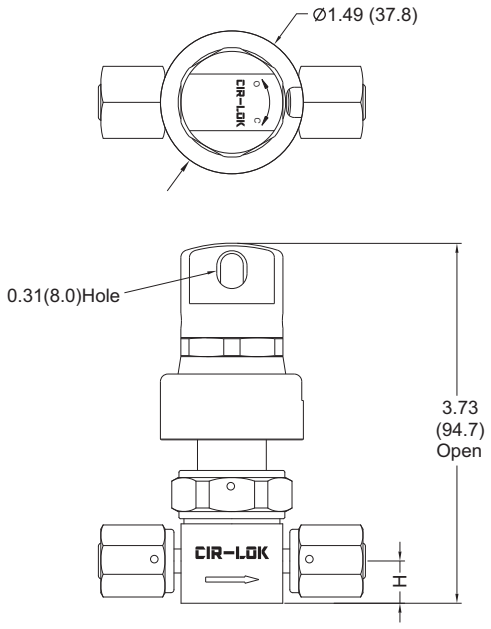
Tube Butt Weld Ends

Directional Handle



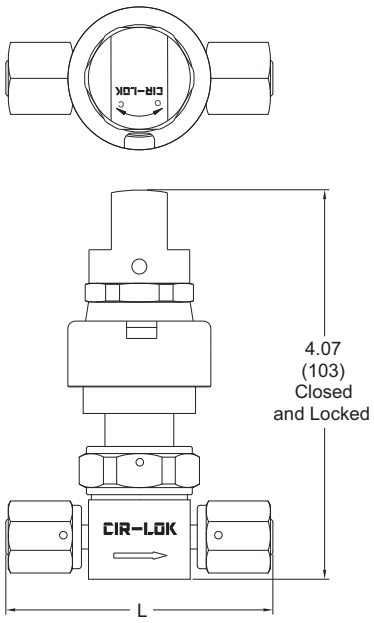
Tube Butt Weld Ends

Integral Lockout



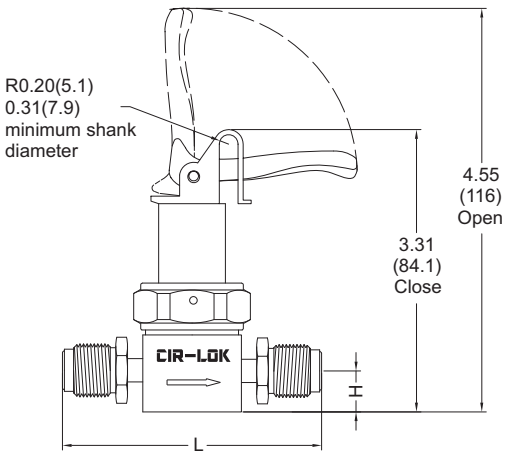
Female GFS Fittings

Handle



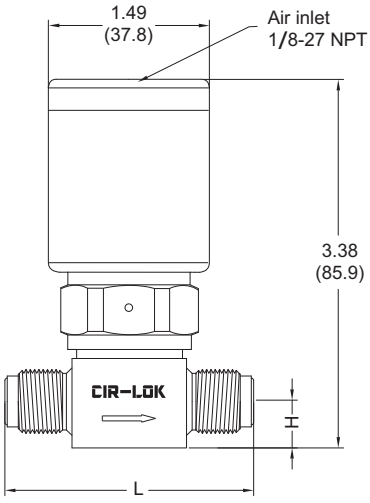
Female GFS Fittings

Toggle Handle



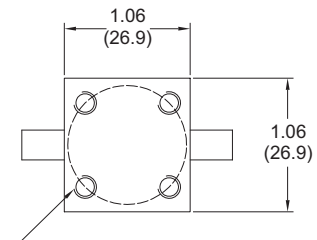
Rotatable Male GFS Fittings

Pneumatic Actuator



Integral Male GFS Fittings

Bottom

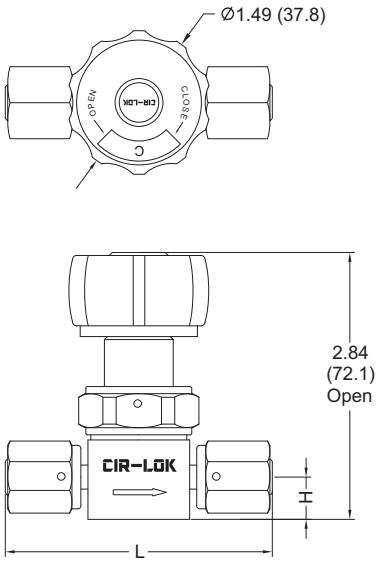


Four mounting holes,M5×0.8-6H thread, 0.25(6.4) deep, 45° from center line, on a 1.00(25.4) bolt circle. M5×0.8-6H holes are compatible with 10-32 mounting screws.

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)

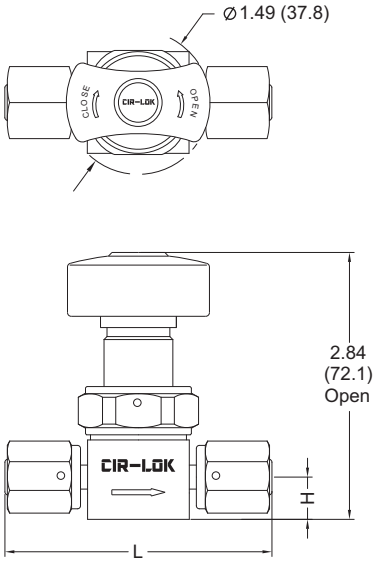
High-Pressure Valves

Round Handle



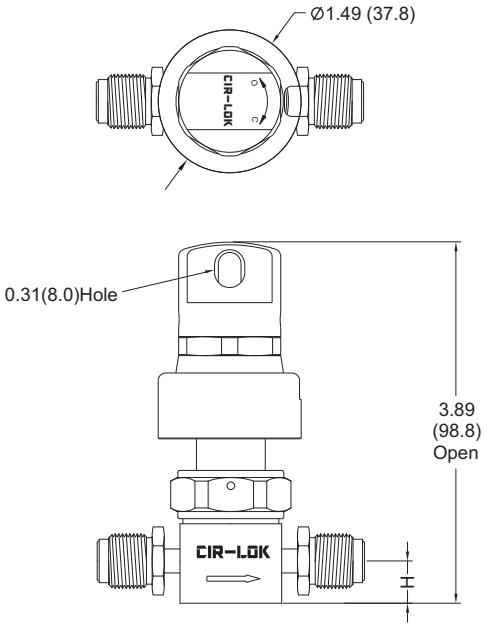
Female GFS Fittings

Directional Handle



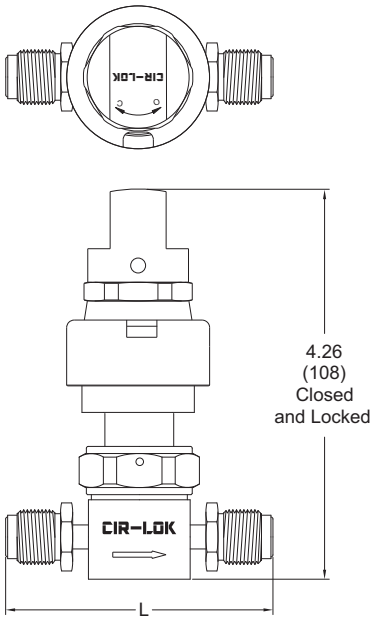
Female GFS Fittings

Integral Lockout



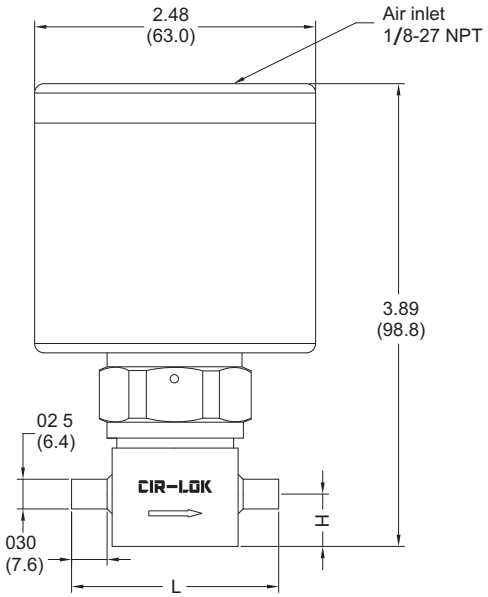
Rotatable Male GFS Fittings

Handle



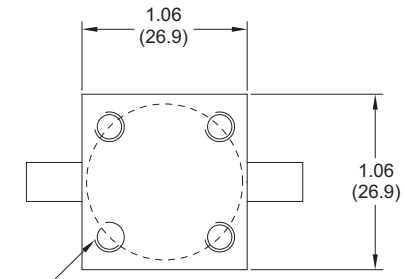
Rotatable Male GFS Fittings

Pneumatic Actuator



Tube Butt Weld Ends

Bottom

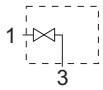
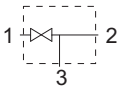
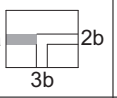
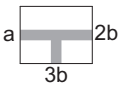
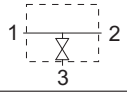
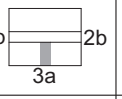
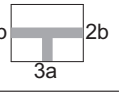
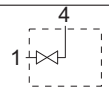
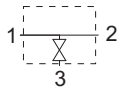
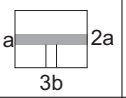
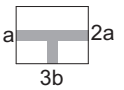
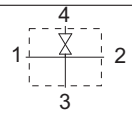
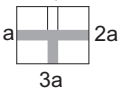
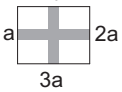
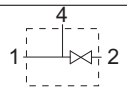
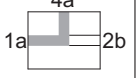
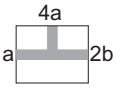
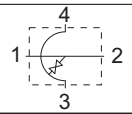
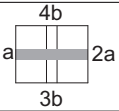
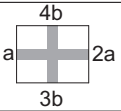
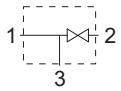
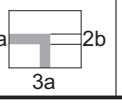
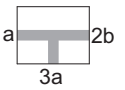


Four mounting holes,
M5×0.8-6Hthread,
0.25(6.4) deep, 45°
from center line, on a
1.00(25.4) bolt circle.
M5×0.8-6H holes are
compatible with 10-32
mounting screws.

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)

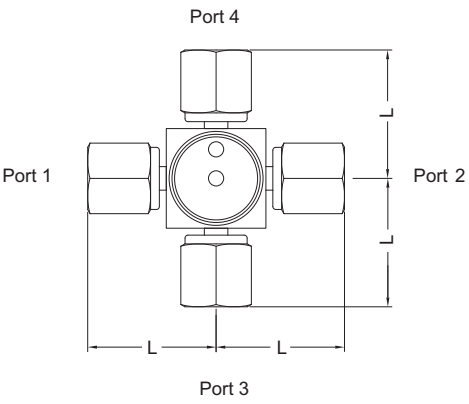
Multiport and Elbow Valves

- 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

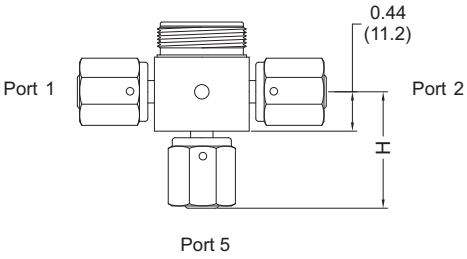
Designator	Schematic	Flow Path		Designator	Schematic	Flow Path	
		Closed	Open			Closed	Open
2A				3D			
2B				3E			
2C				3F			
4M				3G			
4N				3K			

End Connections and Dimentions

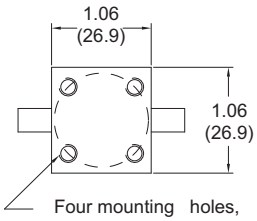
Top



Side

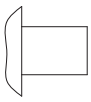
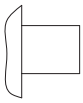
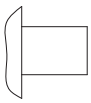
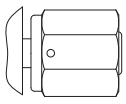
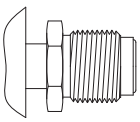


Bottom

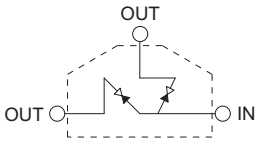
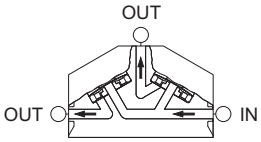
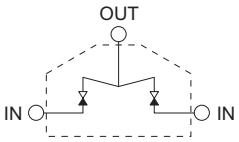
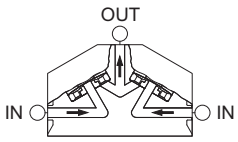
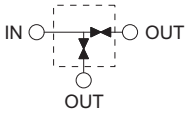
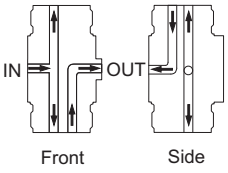


Four mounting holes, M5×0.8-6H thread, 0.25(6.4) deep, 45° from center line, on a 1.00(25.4) bolt circle. M5×0.8-6H holes are compatible with 10-32 mounting screws.

Note: 2B body, no mounting holes.

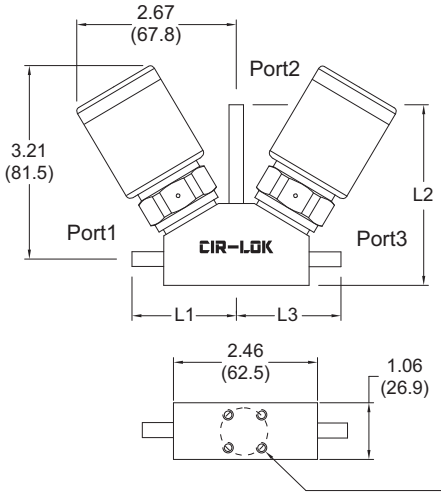
Designator	End Connection		Dimension, in. (mm)	
			L	H
FBW4	1/4" tube butt weld 0.30"(7.6 mm) tube stub, 0.035"(0.89 mm) wall		0.87 (22.1)	0.76 (19.3)
FBW4S	1/4" tube butt weld 0.26"(6.6 mm) tube stub, 0.035" (0.89 mm) wall		0.81 (20.6)	0.70 (17.8)
MBW6	6mm tube butt weld , 1 mm wall		0.87 (22.1)	0.76 (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)	1.63 (41.4)

Multivalve Manifolds

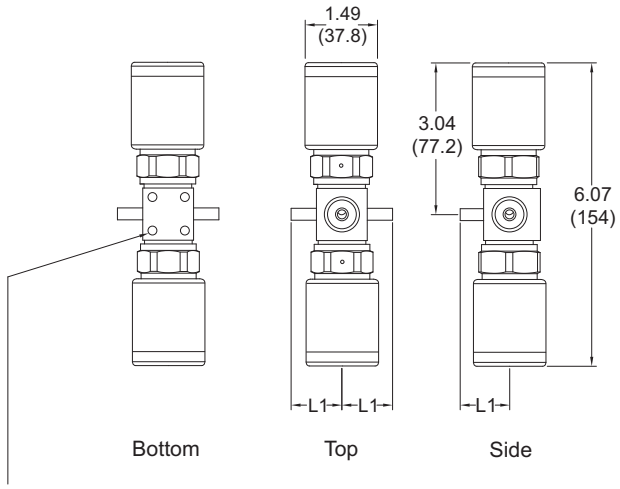
Designator	Schematic	Flow Path
V		
W		
D		

End Connections and Dimentions

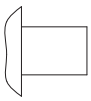
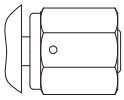
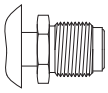
V and W Multivalve Manifolds



D Multivalve Manifold

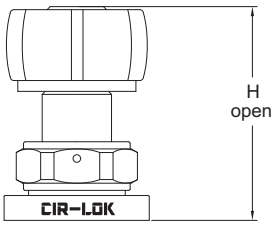


Four bottom mounting holes, M5 × 0.8-6H thread, 0.25 (6.4) deep, located 45° form center line, on a 1.00 (25.4) bolt circle.
M5×0.8-6H holes are compatible with 10-32 mounting screws.

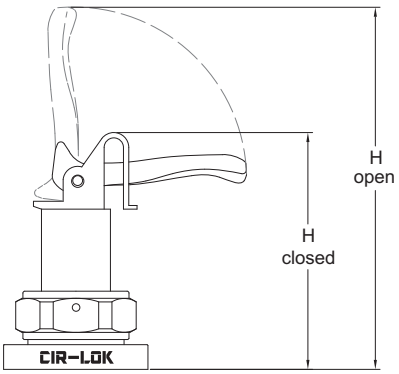
Designator	End Connection		Dimentions, in. (mm)				
			V and W Multivalve Manifolds				D Multivalve Manifold
			L1	L2		L3	L1
				Low-pressure	High-pressure		
FBW4	1/4" tube butt weld 0.30"(7.6 mm) tube stub, 0.035"(0.89 mm) wall		1.81 (46.0)	2.79 (70.9)	4.04 (103)	1.81 (46.0)	0.87 (22.1)
FGFS4	1/4" female 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

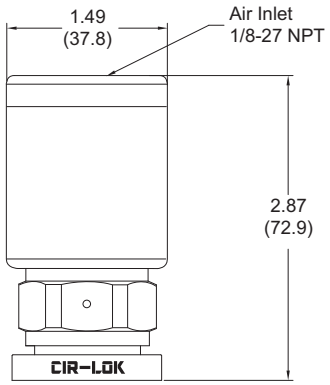
Directional and Roud Handles



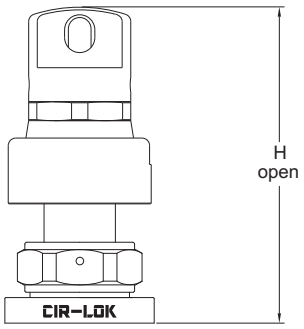
Toggle Handle

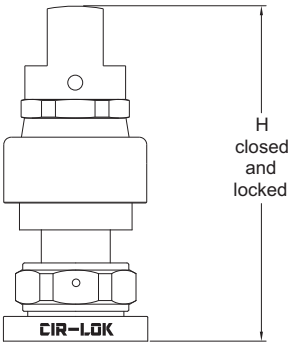


Pneumatic Actuator

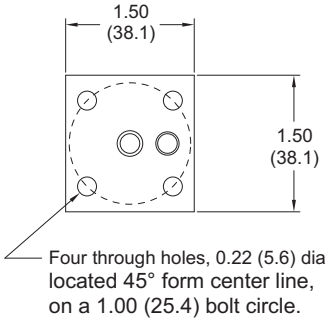


Integral Lockout Handle





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" **4** 1/4" **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 **2L** **2N** **2R** **3A** **3B** **3C** **3F** **3G** **4D** **4E** **M1V** **M2V** **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