

Diaphragm Valves

DQ, DP, DH, DM, DS, DR, DV, DL and DF Series



Diaphragm Valves

DQ Series Low Pressure Manual Diaphragm Valves

Features

- ⦿ Low internal volume, fully swept flow path
- ⦿ Contained seat to provide excellent resistance to swelling and contamination
- ⦿ Elgiloy diaphragm to provide high strength and corrosion resistance to ensure long cycle life
- ⦿ Different handle types available
- ⦿ Suitable for ultra high purity applications

Technical Data

Port Size	1/4" to 3/8" or 6 mm to 8 mm	
Flow Coefficient (Cv)	0.27	
Orifice Size	0.16 in. (4.1 mm)	
Max. Working Pressure	250 psig (17.2 bar)	
Temperature	PCTFE: -10~150°F (-23~65°C) PFA: -10~302°F (-23~150°C)	
Leak Rate (Helium)	Internal	$\leq 1 \times 10^{-9}$ mbar l/s
	External	$\leq 1 \times 10^{-9}$ mbar l/s

Flow Data

Air @ 70°F (21°C)
Water @ 60°F (16°C)

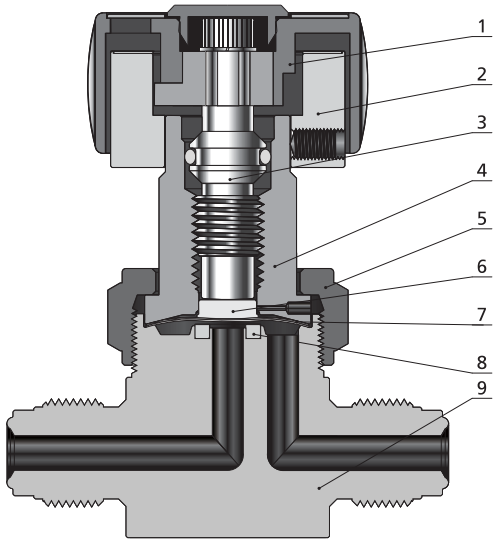
Pressure Drop to Atmosphere psi (bar)	Air (l/min)	Water (l/min)
10 (0.68)	86	3.2
50 (3.4)	230	7.2
100 (6.8)	410	10.2

Product Technology Grade

Product Grade Technology	General Purpose	Special Cleaning and Packaging (F2)	Ultra High Purity (F3)
Material/Specification	316L SS/ASTM A479		316L VAR/SEMI F20 316L VIM-VAR /SEMI F20
Wetted Surface Roughness	Ra 10 μ m. (0.25 μ m) ^①		Ra 5 μ m. (0.13 μ m)
Polishing Process	Machine finished ^①		Electropolished
Process Specification	FC-01 Standard Cleaning and Packaging	FC-02 Special Cleaning and Packaging	FC-03 Ultra High Purity Process Specification
Cleaning	Thrice degreasing ultrasonic cleaning	Special cleaning with non-ozone-depleting chemicals	Ultra high purity cleaning in continuously monitored ultrasonic cleaning system with deionized water
Assembly Environment	At atmosphere	In specially cleaned areas	In ISO Class 5/Federal Class 100 cleanroom
Packaging	Individually bagged	Double bagged	Double bagged and vacuum sealed in cleanroom

① For FR connections and tube butt connections, the standard polishing process is electropolishing and the internal surface roughness is finished to an average of Ra 5 μ m. (0.13 μ m).

Major Materials of Construction



Item	Component		Material/Specification
1	Handle	Round	ABS
		Integral Lockout	Aluminum
2	Actuator		Aluminum
3	Stem		316 SS/ASTM A479
4	Bonnet		S17400/ASTM A564
5	Bonnet Nut		316 SS/ASTM A479
6	Button		316 SS/ASTM A479
7	Diaphragm (2)		Elgiloy/AMS 5876
8	Seat		PCTFE/ASTM D1430 or PFA/ASTM D3307
9	Body		316 SS/ASTM A479 or 316L SS/ASTM A479 or 316L VIM-VAR/SEMI F20

Round Handle Model

Manual Actuators

Round Handle

- ⦿ Quick, quarter-turn actuation
- ⦿ Handle with window to visually indicate open and closed states

Integral Lockout Handle

- ⦿ Quick, quarter-turn actuation
- ⦿ Lockable in the closed position for safety



OPEN

CLOSED

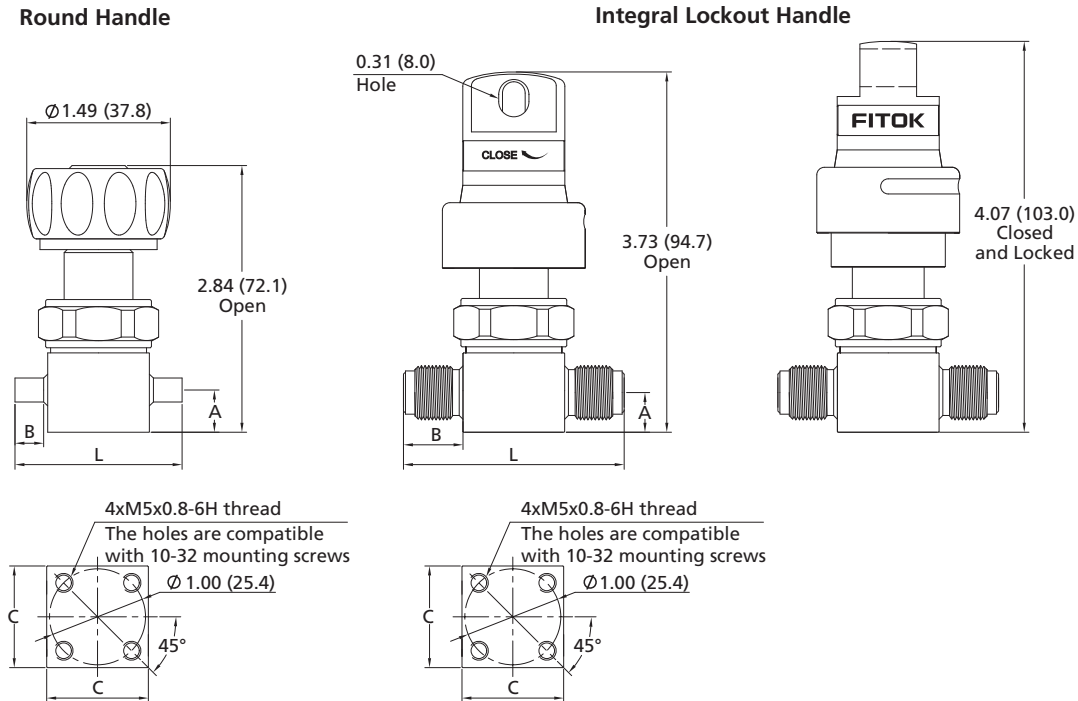


Dimensions and Ordering Information

Straight Type

Dimensions

Dimensions, in inches (millimeters), are for reference only.



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)			
		A	B	C	L
DQ□□-TB4-	1/4" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.06 (26.9)	1.74 (44.2)
DQ□□-TB6-	3/8" Tube Butt Weld	0.44 (11.2)	0.26 (6.6)	1.06 (26.9)	1.74 (44.2)
DQ□□-FFR4-	1/4" Female FR	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	2.78 (70.6)
DQ□□-RFR4-	1/4" Rotatable Male FR	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	2.78 (70.6)
DQ□□-FR4-	1/4" Integral Male FR	0.44 (11.2)	0.62 (15.7)	1.06 (26.9)	2.30 (58.4)

Ordering Number Description

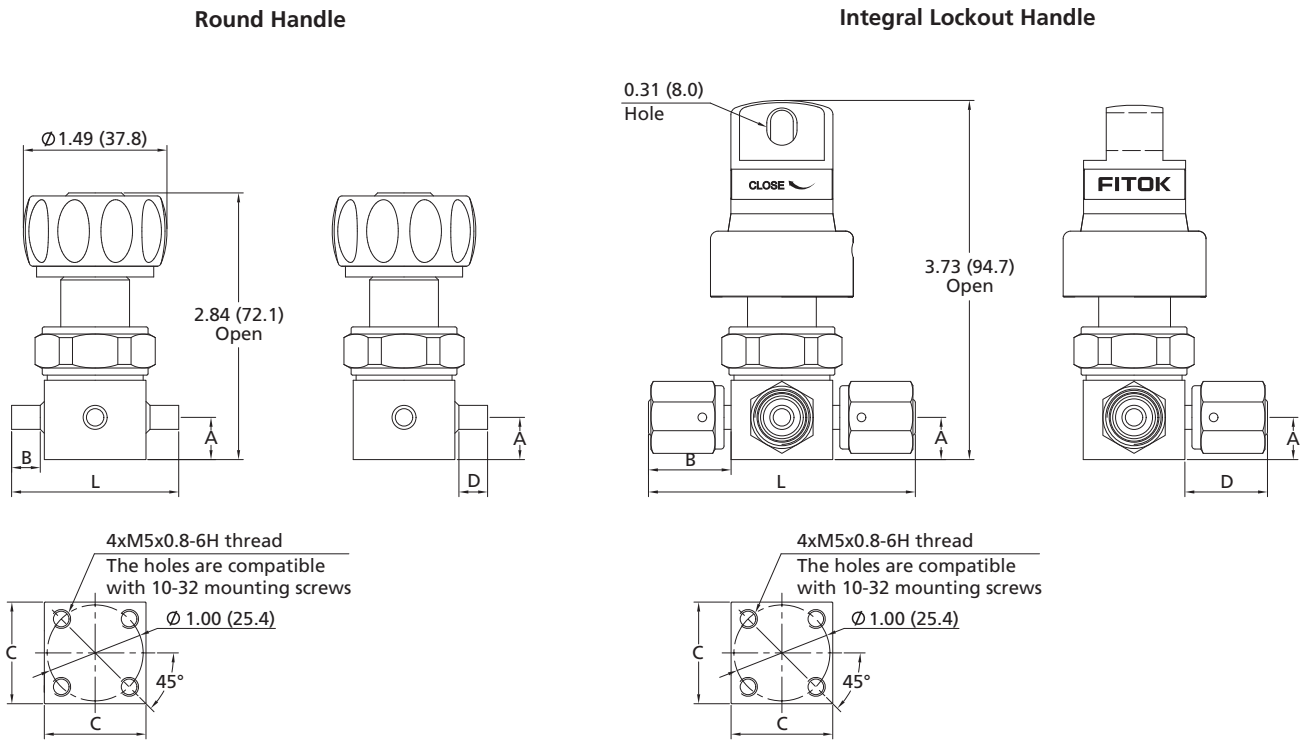
DQ6L - TB4 - FR4 - RAF2

Body Material		Inlet Type		Inlet Size		Outlet Type	Outlet Size	Handle Type		Seat		Technology Grade	
6L	316L SS	TB	Fractional Tube Butt Weld	4	1/4"	Same as Inlet Specified in the same way as Inlet type and size		R	Round	PCTFE		General Purpose	
6LV	316L VAR	MTB	Metric Tube Butt Weld	6	6 mm or 3/8"			U	Integral Lockout	A PFA		F2 Special Cleaning and Packaging	
6LW	316L VIM-VAR	FR	Integral Male FR Fitting	8	8 mm							F3 Ultra High Purity	
		FFR	Female FR Fitting										
		RFR	Rotatable Male FR Fitting										
		FL	Fractional Tube Fitting										
		ML	Metric Tube Fitting										

Branch Type

Dimensions

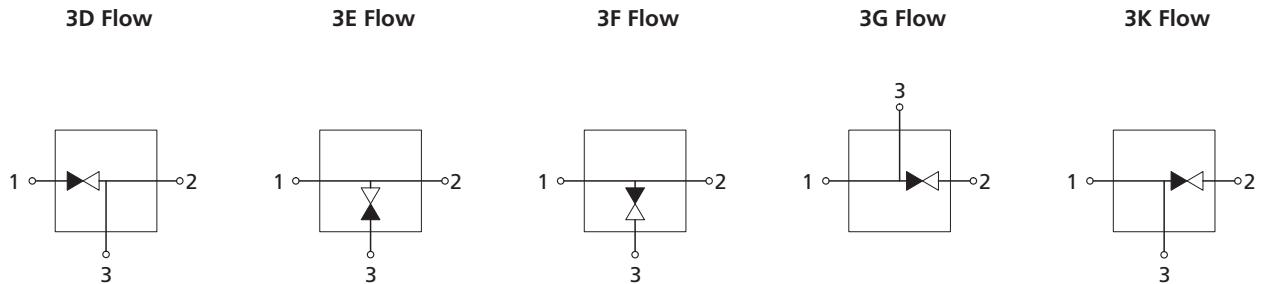
Dimensions, in inches (millimeters), are for reference only.



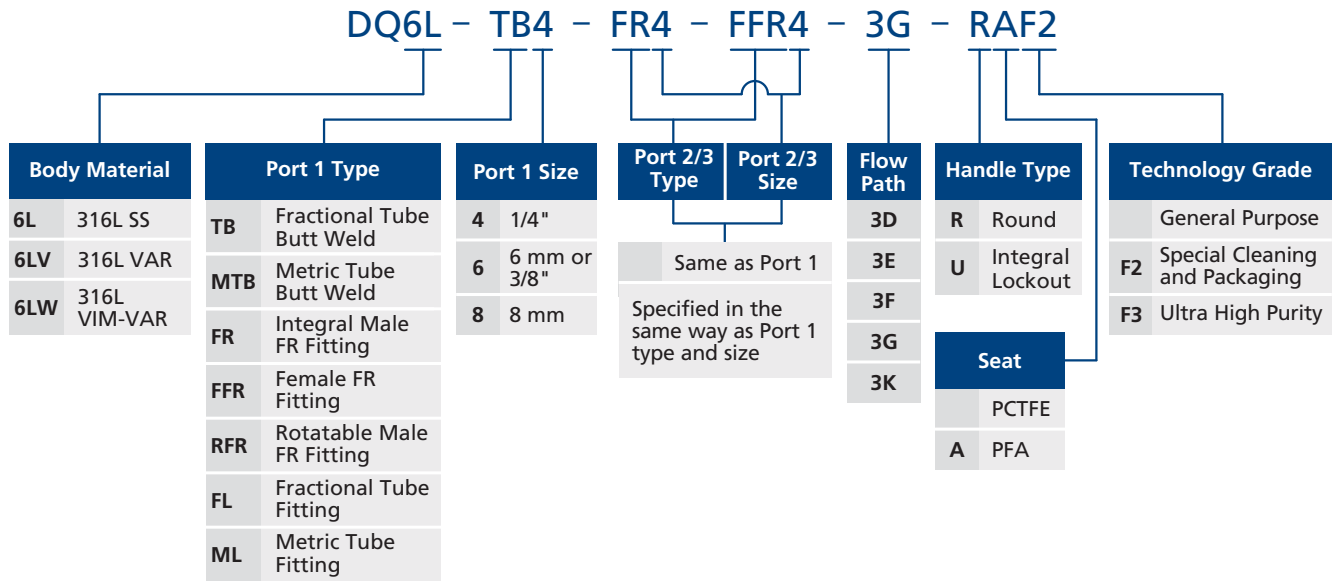
Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	C	D	L
DQ□□-TB4-	1/4" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.06 (26.9)	0.30 (7.6)	1.74 (44.2)
DQ□□-TB6-	3/8" Tube Butt Weld	0.44 (11.2)	0.26 (6.6)	1.06 (26.9)	0.26 (6.6)	1.74 (44.2)
DQ□□-FFR4-	1/4" Female FR	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	0.86 (21.8)	2.78 (70.6)
DQ□□-RFR4-	1/4" Rotatable Male FR	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	0.86 (21.8)	2.78 (70.6)
DQ□□-FR4-	1/4" Integral Male FR	0.44 (11.2)	0.62 (15.7)	1.06 (26.9)	0.62 (15.7)	2.30 (58.4)

Flow Paths

☉ Flow paths as viewed from the top



Ordering Number Description



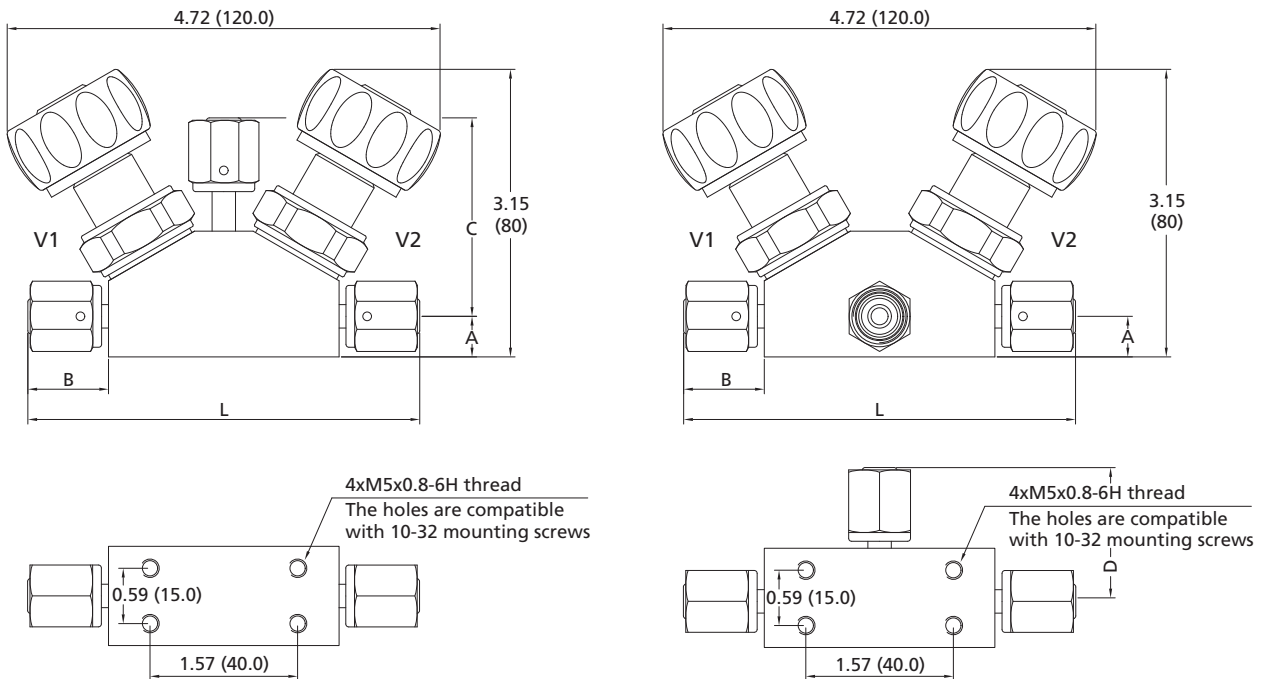
Fittings

Valves & Regulators

2-Valve 3-Way Block Type

Dimensions

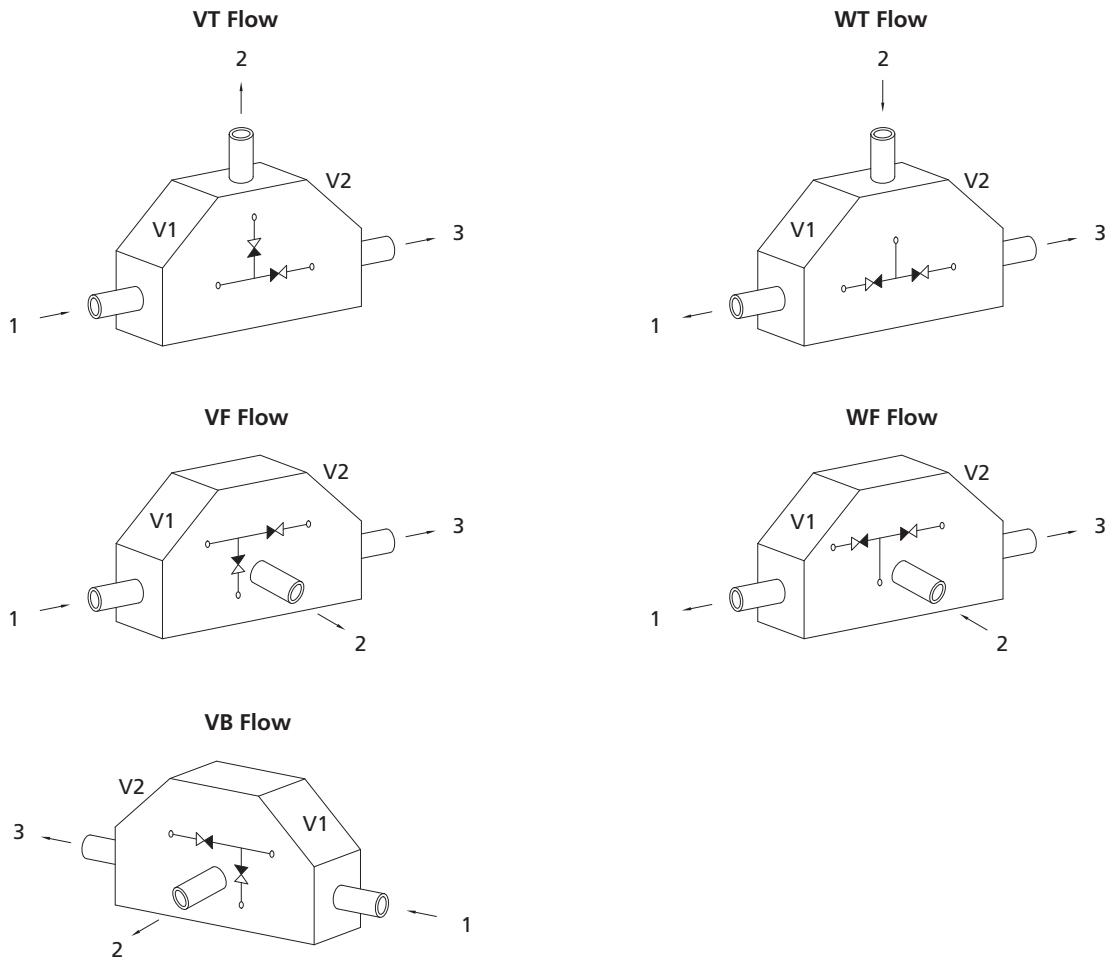
Dimensions, in inches (millimeters), are for reference only.



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	C	D	L
DQ23□□-FFR4-	1/4" Female FR	0.44 (11.2)	0.86 (21.8)	2.12 (53.8)	—	4.24 (107.6)
DQ23□□-FFR4-	1/4" Female FR	0.44 (11.2)	0.86 (21.8)	—	1.37 (34.8)	4.24 (107.6)
DQ23□□-RFR4-	1/4" Rotatable Male FR	0.44 (11.2)	0.86 (21.8)	2.12 (53.8)	—	4.24 (107.6)
DQ23□□-RFR4-	1/4" Rotatable Male FR	0.44 (11.2)	0.86 (21.8)	—	1.37 (34.8)	4.24 (107.6)

V-07 Diaphragm Valves

Flow Paths



Ordering Number Description

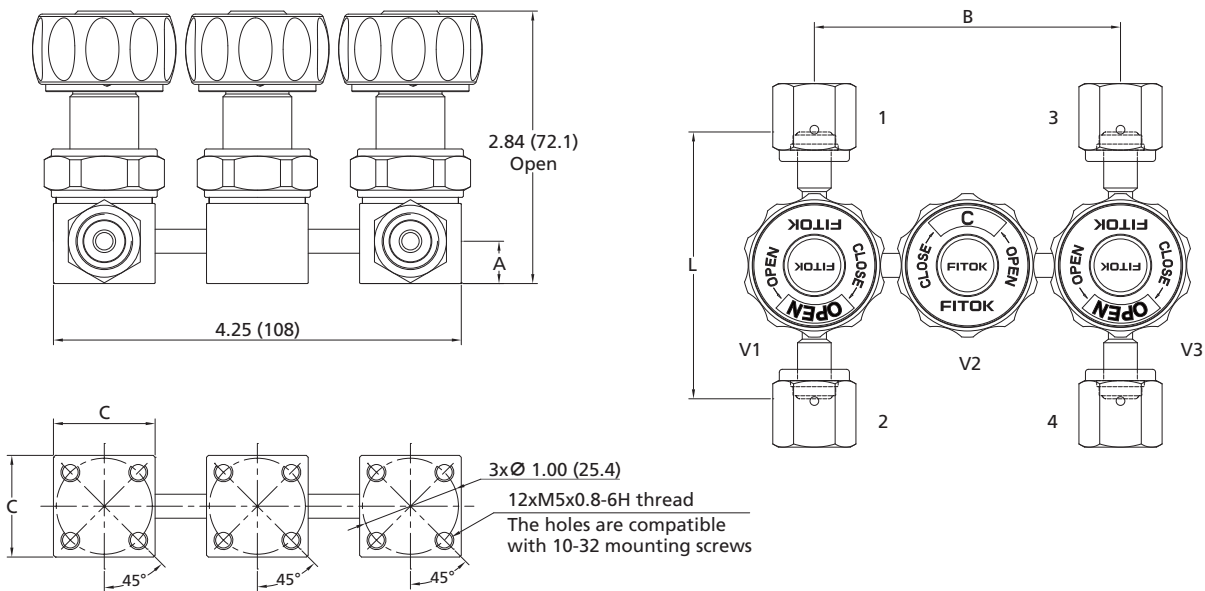
DQ236L - FFR4 - RFR4 - FFR4 - VF - RAF2

Type	Body Material	Port 1 Type	Port 1 Size	Port 2/3 Type	Port 2/3 Size	Flow Path	Seat	Technology Grade
23 2 Valves and 3 Ports	6L 316L SS	FFR Female FR Fitting	4 1/4"	Same as Port 1 Specified in the same way as Port 1 type and size		VT	PCTFE	General Purpose
	6LV 316L VAR	RFR Rotatable Male FR Fitting				VF	A PFA	F2 Special Cleaning and Packaging
	6LW 316L VIM-VAR					VB	Handle Type	
						WT	R Round	
						WF	U Integral Lockout	F3 Ultra High Purity

3-Valve 4-Way Block Type

Dimensions

Dimensions, in inches (millimeters), are for reference only.

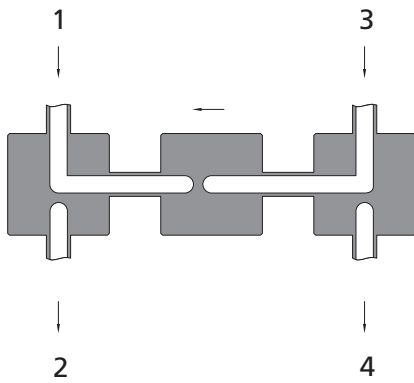


Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)			
		A	B	C	L
DQ34□□-FFR4-	1/4" Female FR	0.44 (11.2)	3.19 (81.0)	1.06 (26.9)	2.78 (70.6)
DQ34□□-RFR4-	1/4" Rotatable Male FR	0.44 (11.2)	3.19 (81.0)	1.06 (26.9)	2.78 (70.6)

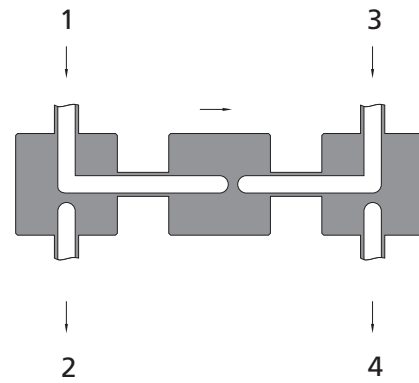
V-09 Diaphragm Valves

Flow Paths

☉ Flow paths as viewed from the top



GK Flow



KG Flow

Ordering Number Description

DQ346L - FFR4 - RFR4 - FFR4 - FFR4 - GK - RAF3

Type	Body Material	Port 1 Type	Port 1 Size	Port 2/3/4 Type	Port 2/3/4 Size	Flow Path	Handle Type	Technology Grade
3 Valves and 4 Ports 34	6L 316L SS	FFR Female FR Fitting	4 1/4"	Same as Port 1	Specified in the same way as Port 1 type and size	GK	R Round	General Purpose
	6LV 316L VAR	RFR Rotatable Male FR Fitting					U Integral Lockout	F2 Special Cleaning and Packaging
	6LW 316L VIM-VAR						Seat	F3 Ultra High Purity
							PCTFE	
							A PFA	

Diaphragm Valves

DP Series Low Pressure Pneumatic Diaphragm Valves

Features

- ⦿ Minimum particle generation and dead space
- ⦿ Fully contained seat to provide excellent resistance to swelling and contamination
- ⦿ Elgiloy diaphragm to provide high strength and corrosion resistance
- ⦿ Long cycle life with high speed actuation
- ⦿ Internally threadless and springless
- ⦿ Fully functional under vacuum conditions
- ⦿ Indicator switch available assembled on normally closed valves, transmitting a signal to an electrical device to indicated either the open or closed position of the valves

Technical Data

Port Size	1/4" to 3/8" or 6 mm to 8 mm	
Flow Coefficient (Cv)	0.27	
Orifice Size	0.16 in. (4.1 mm)	
Max. Working Pressure	250 psig (17.2 bar)	
Pneumatic Actuator Operating Pressure	60 to 90 psig (4.2 to 6.2 bar)	
	70 psig (4.8 bar) for actuator with indicator switch	
Temperature	PCTFE: -10~150°F (-23~65°C) PFA: -10~302°F (-23~150°C)	
Leak Rate (Helium)	Internal	≤ 1x10 ⁻⁹ mbar l/s
	External	≤ 1x10 ⁻⁹ mbar l/s

Flow Data

Air @ 70°F (21°C)

Water @ 60°F (16°C)

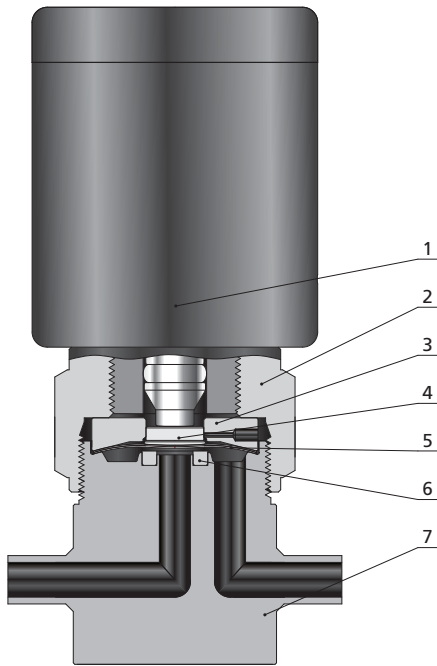
Pressure Drop to Atmosphere psi (bar)	Air (l/min)	Water (l/min)
10 (0.68)	86	3.2
50 (3.4)	230	7.2
100 (6.8)	410	10.2

Product Technology Grade

Product Grade Technology	General Purpose	Special Cleaning and Packaging (F2)	Ultra High Purity (F3)
Material/Specification	316L SS/ASTM A479		316L VAR/SEMI F20 316L VIM-VAR /SEMI F20
Wetted Surface Roughness	Ra 10 μin. (0.25 μm) ^①		Ra 5 μin. (0.13 μm)
Polishing Process	Machine finished ^①		Electropolished
Process Specification	FC-01 Standard Cleaning and Packaging	FC-02 Special Cleaning and Packaging	FC-03 Ultra High Purity Process Specification
Cleaning	Thrice degreasing ultrasonic cleaning	Special cleaning with non-ozone-depleting chemicals	Ultra high purity cleaning in continuously monitored ultrasonic cleaning system with deionized water
Assembly Environment	At atmosphere	In specially cleaned areas	In ISO Class 5/Federal Class 100 cleanroom
Packaging	Individually bagged	Double bagged	Double bagged and vacuum sealed in cleanroom

① For FR connections and tube butt connections, the standard polishing process is electropolishing and the internal surface roughness is finished to an average of Ra 5 μin. (0.13 μm).

Major Materials of Construction



Normally Closed Model

Item	Component	Material/Specification
1	Actuator	Aluminum
2	Bonnet Nut	316 SS/ASTM A479
3	Bonnet	S17400/ASTM A564
4	Button	316 SS/ASTM A479
5	Diaphragm (2)	Elgiloy/AMS 5876
6	Seat	PCTFE/ASTM D1430 or PFA/ASTM D3307
7	Body	316 SS/ASTM A479 or 316L SS/ASTM A479 or 316L VIM-VAR/SEMI F20

Pneumatic Actuators

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

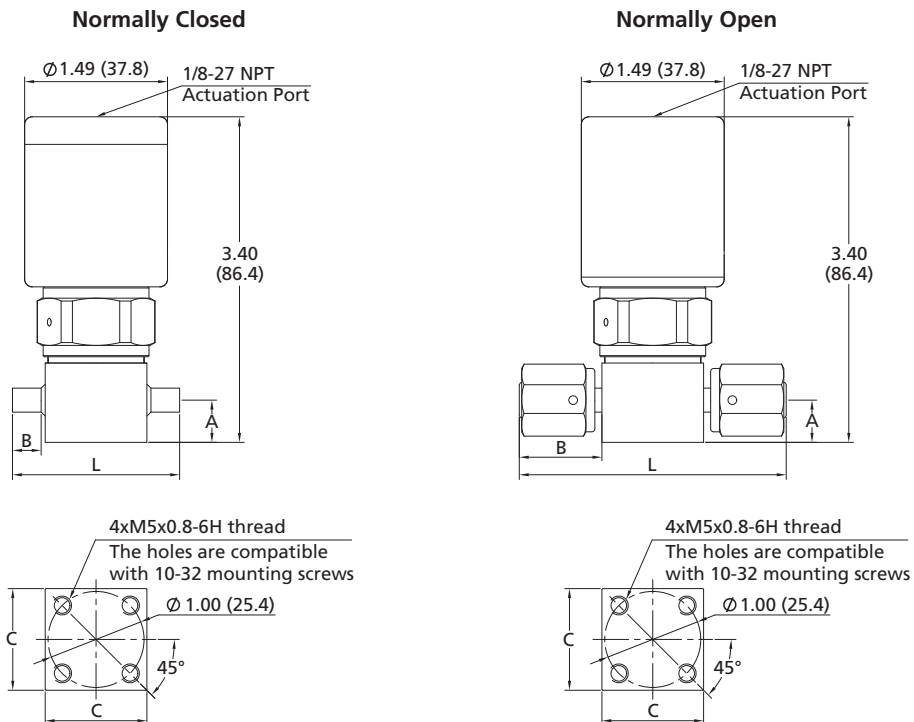


Dimensions and Ordering Information

Straight Type

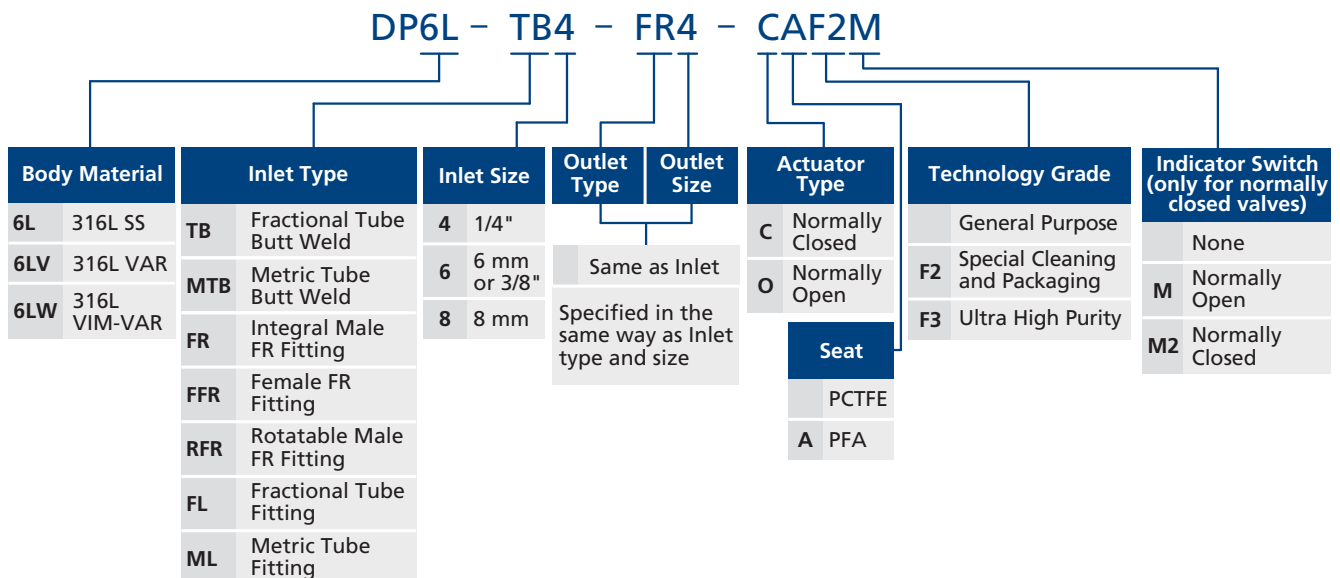
Dimensions

Dimensions, in inches (millimeters), are for reference only.



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)			
		A	B	C	L
DP□□-TB4-	1/4" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.06 (26.9)	1.74 (44.2)
DP□□-TB6-	3/8" Tube Butt Weld	0.44 (11.2)	0.26 (6.6)	1.06 (26.9)	1.74 (44.2)
DP□□-FFR4-	1/4" Female FR	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	2.78 (70.6)
DP□□-RFR4-	1/4" Rotatable Male FR	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	2.78 (70.6)
DP□□-FR4-	1/4" Integral Male FR	0.44 (11.2)	0.62 (15.7)	1.06 (26.9)	2.30 (58.4)

Ordering Number Description

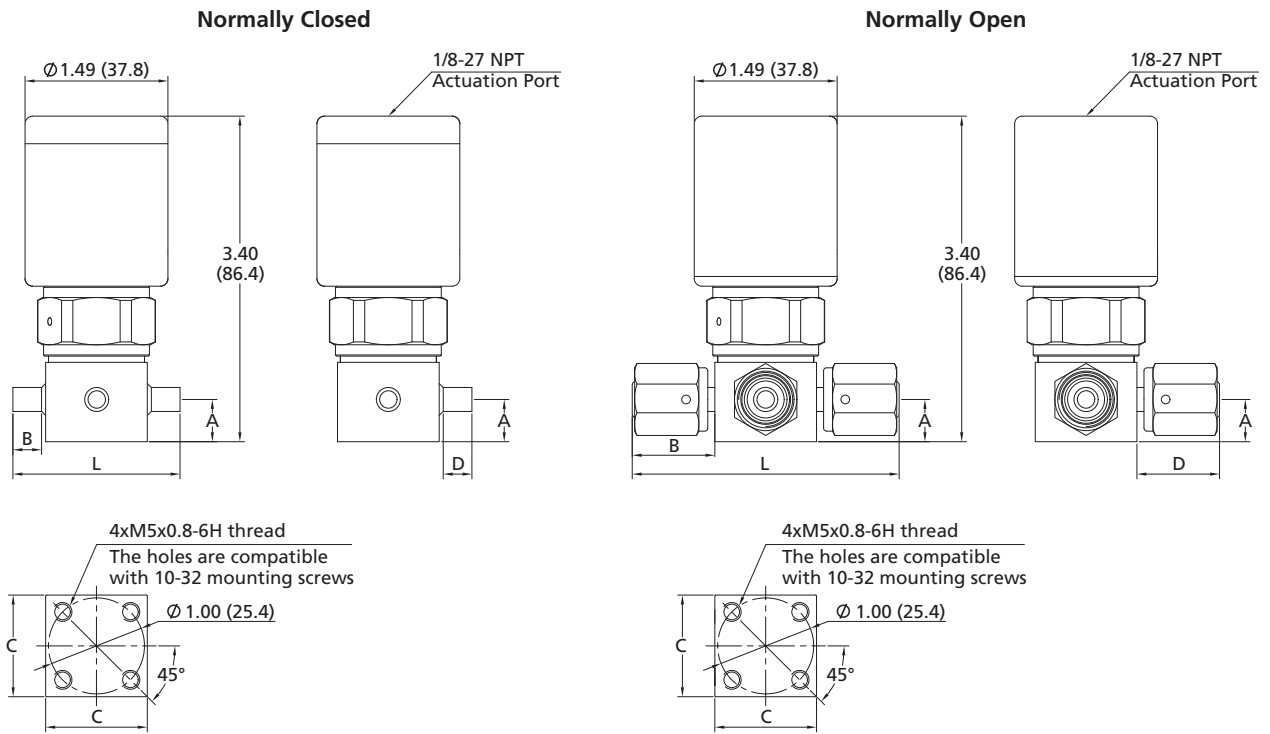


V-13 Diaphragm Valves

Branch Type

Dimensions

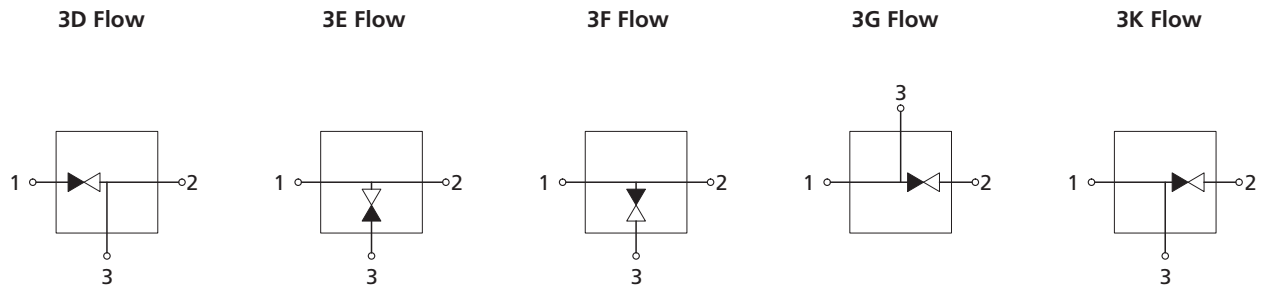
Dimensions, in inches (millimeters), are for reference only.



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	C	D	L
DP□□-TB4-	1/4" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.06 (26.9)	0.30 (7.6)	1.74 (44.2)
DP□□-TB6-	3/8" Tube Butt Weld	0.44 (11.2)	0.26 (6.6)	1.06 (26.9)	0.26 (6.6)	1.74 (44.2)
DP□□-FFR4-	1/4" Female FR	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	0.86 (21.8)	2.78 (70.6)
DP□□-RFR4-	1/4" Rotatable Male FR	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	0.86 (21.8)	2.78 (70.6)
DP□□-FR4-	1/4" Integral Male FR	0.44 (11.2)	0.62 (15.7)	1.06 (26.9)	0.62 (15.7)	2.30 (58.4)

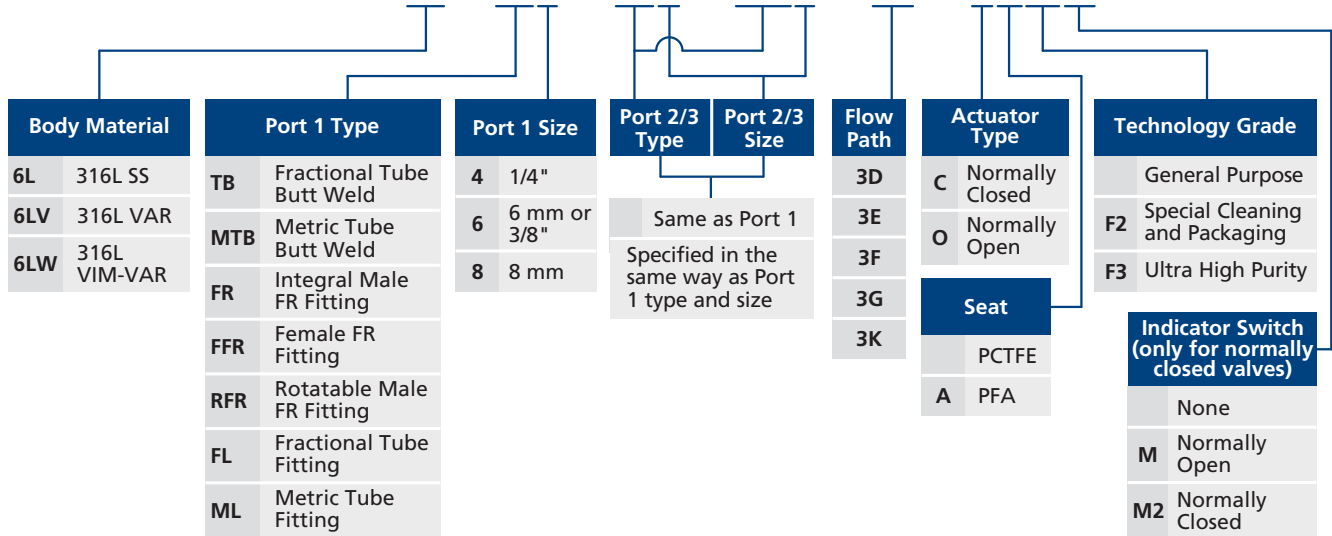
Flow Paths

⊙ Flow paths as viewed from the top



Ordering Number Description

DP6L - TB4 - FR4 - FFR4 - 3G - CAF2M



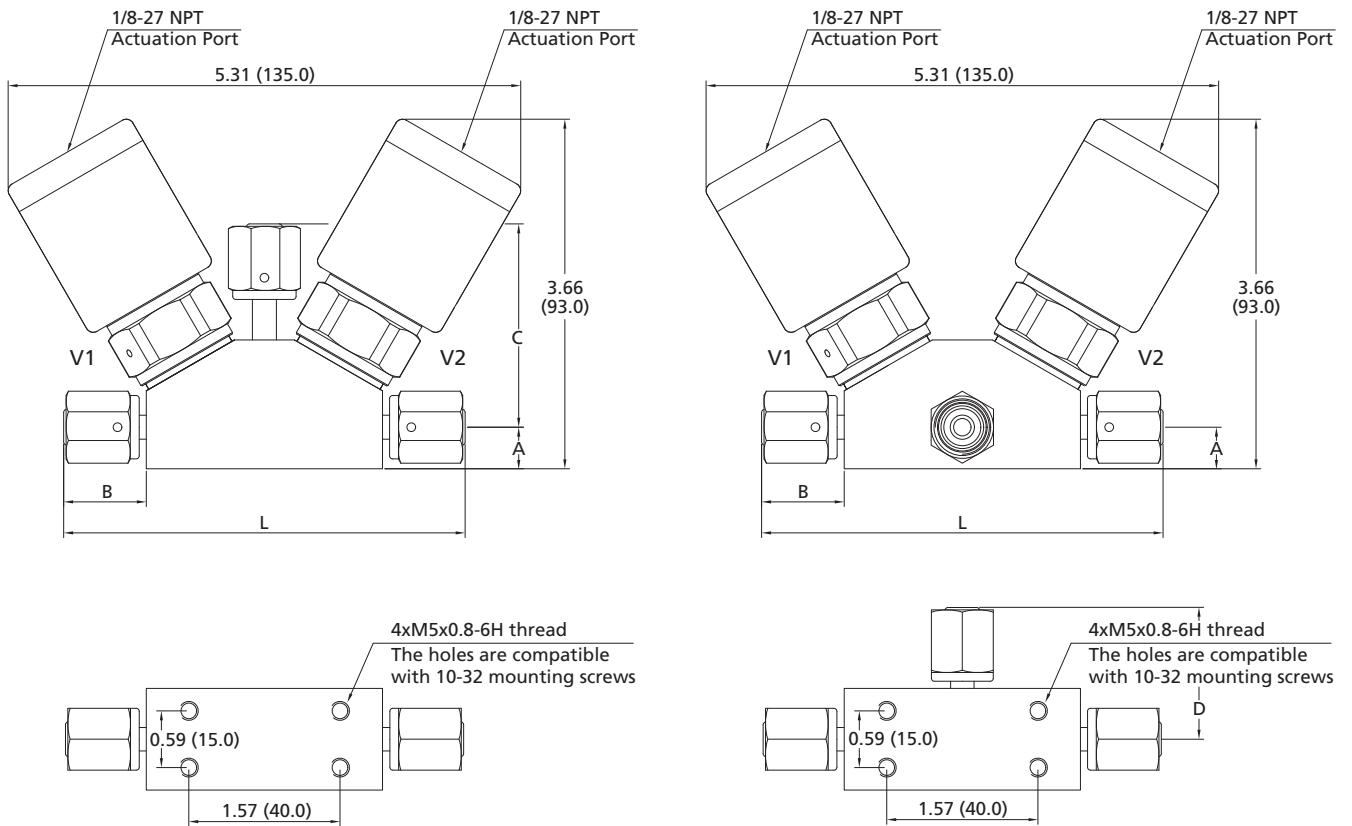
Fittings

Valves & Regulators

2-Valve 3-Way Block Type

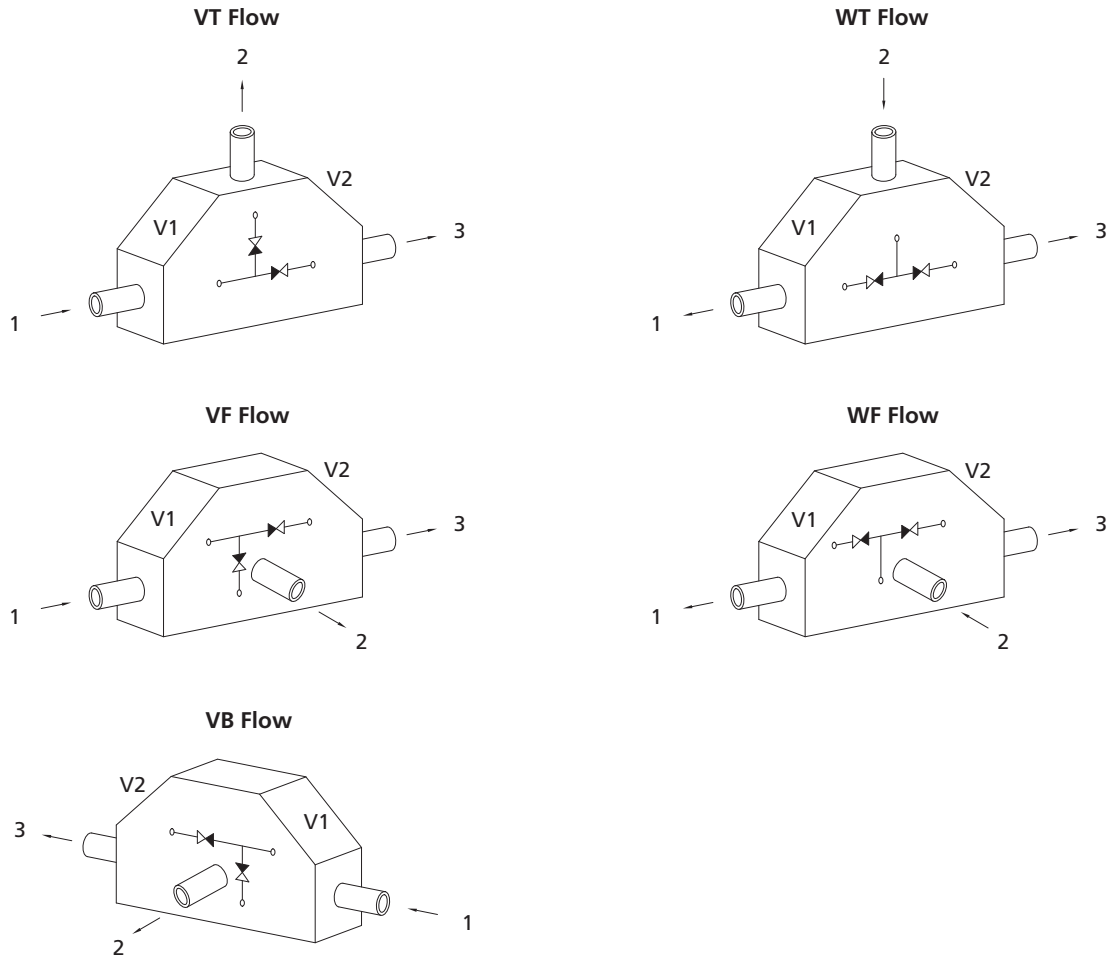
Dimensions

Dimensions, in inches (millimeters), are for reference only.



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	C	D	L
DP23□□-FFR4-	1/4" Female FR	0.44 (11.2)	0.86 (21.8)	2.12 (53.8)	—	4.24 (107.6)
DP23□□-FFR4-	1/4" Female FR	0.44 (11.2)	0.86 (21.8)	—	1.37 (34.8)	4.24 (107.6)
DP23□□-RFR4-	1/4" Rotatable Male FR	0.44 (11.2)	0.86 (21.8)	2.12 (53.8)	—	4.24 (107.6)
DP23□□-RFR4-	1/4" Rotatable Male FR	0.44 (11.2)	0.86 (21.8)	—	1.37 (34.8)	4.24 (107.6)

Flow Paths



Ordering Number Description

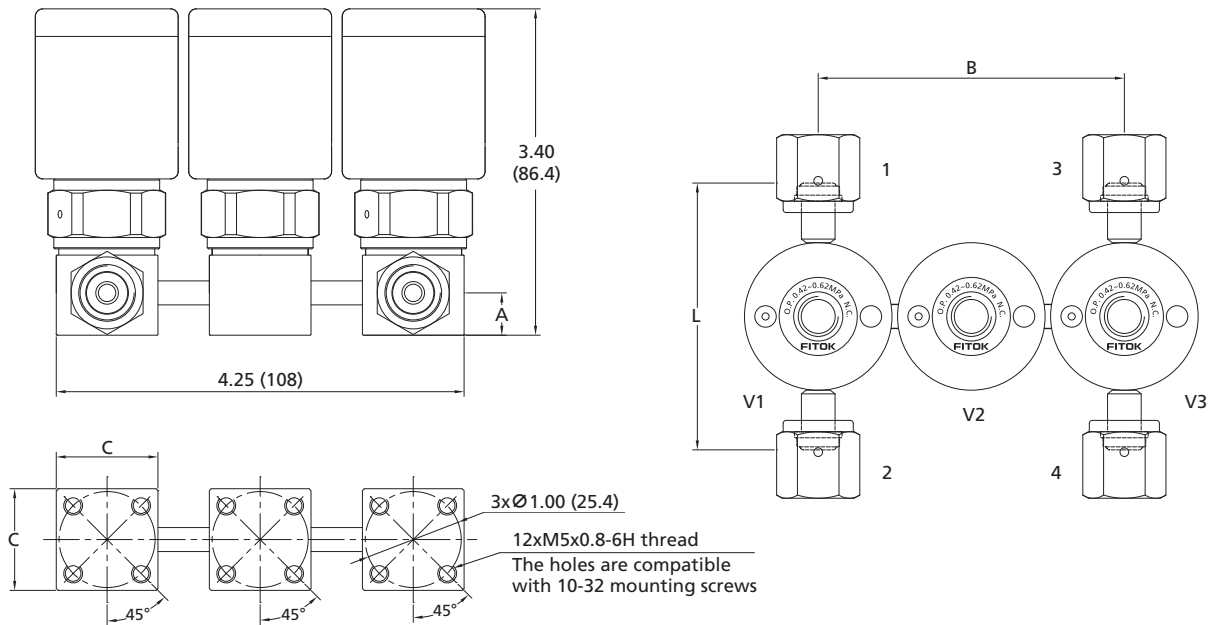
DP236L - FFR4 - RFR4 - FFR4 - VF - COAF2M

Type	Body Material	Port 1 Type	Port 2/3 Type	Port 2/3 Size	Flow Path	Actuator Type V1 and V2	Technology Grade
23 2 Valves and 3 Ports	6L 316L SS 6LV 316L VAR 6LW 316L VIM-VAR	FFR Female FR Fitting RFR Rotatable Male FR Fitting	Same as Port 1	Specified in the same way as Port 1 type and size	VT VF VB WT WF	C V1 Closed V2 Closed O V1 Open V2 Open CO V1 Closed V2 Open OC V1 Open V2 Closed	General Purpose F2 Special Cleaning and Packaging F3 Ultra High Purity
		Port 1 Size 4 1/4"				Seat PCTFE A PFA	Indicator Switch (only for normally closed valves) None M Normally Open M2 Normally Closed

3-Valve 4-Way Block Type

Dimensions

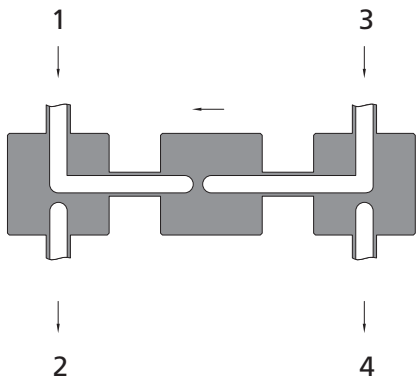
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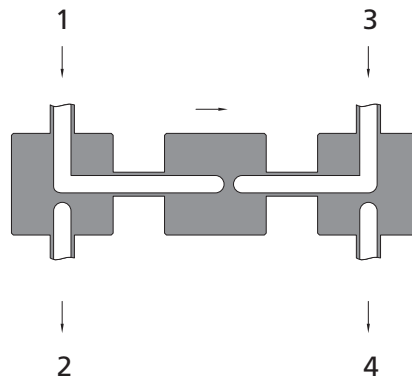
Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)			
		A	B	C	L
DP34□□-FFR4-	1/4" Female FR	0.44 (11.2)	3.19 (81.0)	1.06 (26.9)	2.78 (70.6)
DP34□□-RFR4-	1/4" Rotatable Male FR	0.44 (11.2)	3.19 (81.0)	1.06 (26.9)	2.78 (70.6)

Flow Paths

☉ Flow paths as viewed from the top



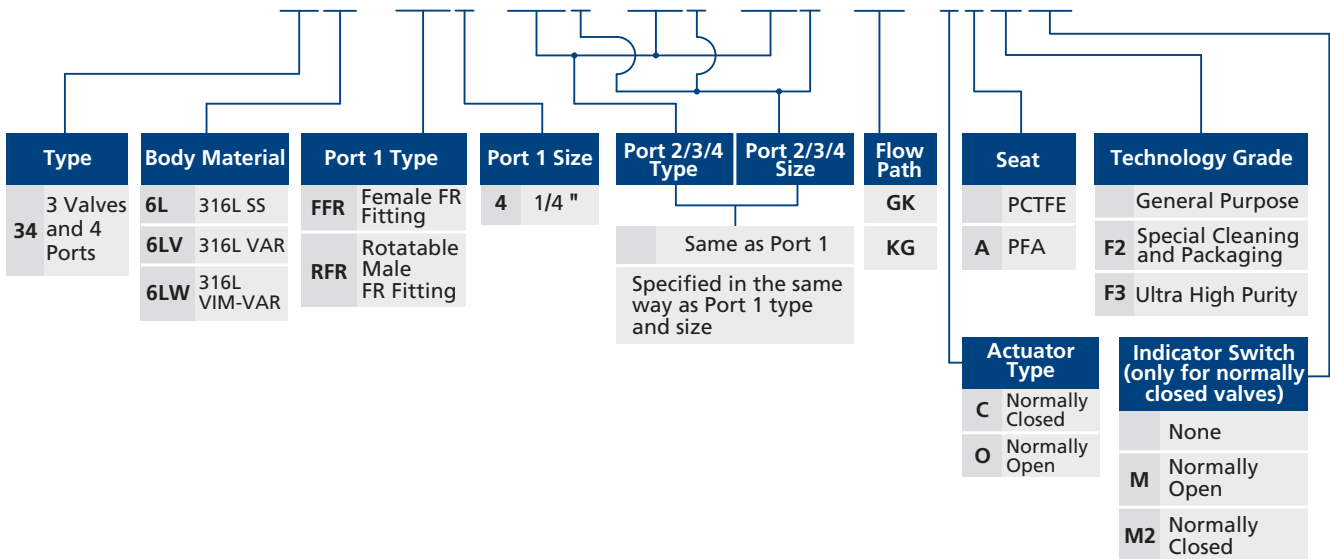
GK Flow



KG Flow

Ordering Number Description

DP346L - FFR4 - RFR4 - FFR4 - FFR4 - GK - CAF3M



Diaphragm Valves

DH Series High Pressure Springless Diaphragm Valves

Features

- ⦿ Metal-to-metal diaphragm seal
- ⦿ Elgiloy diaphragm to provide high strength and corrosion resistance
- ⦿ Long cycle life in high pressure application
- ⦿ Manual and pneumatic actuators available
- ⦿ Indicator switch available assembled on pneumatic valves, transmitting a signal to an electrical device to indicated either the open or closed position of the valves
- ⦿ Normally open and normally closed indicator switches optional

Technical Data

Port Size	1/4" to 3/8" or 6 mm to 8 mm	
Flow Coefficient (Cv)	0.20	
Orifice Size	0.16 in. (4.1 mm)	
Max. Working Pressure	3000 psig (206 bar)	
Pneumatic Actuator Operating Pressure	60 to 90 psig (4.2 to 6.2 bar)	
Temperature	PCTFE: -10~150°F (-23~65°C)	
Leak rate (Helium)	Internal	≤1x10 ⁻⁹ mbar l/s
	External	≤1x10 ⁻⁹ mbar l/s

Flow Data

Air @ 70°F (21°C)
Water @ 60°F (16°C)

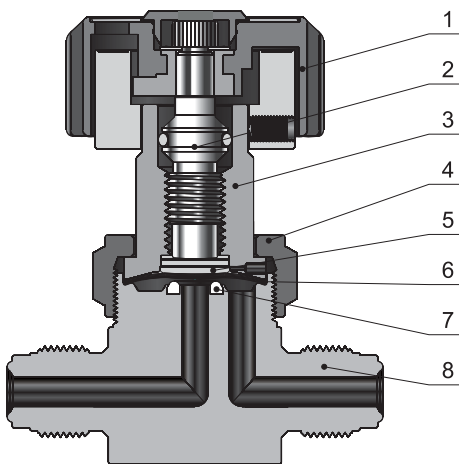
Pressure Drop to Atmosphere psi (bar)	Air (l/min)	Water (l/min)
10 (0.68)	64	2.4
50 (3.4)	170	5.4
100 (6.8)	300	7.6

Product Technology Grade

Product Grade Technology	General Purpose	Special Cleaning and Packaging (F2)	Ultra High Purity (F3)
Material/Specification	316L SS/ASTM A479		316L VAR/SEMI F20 316L VIM-VAR /SEMI F20
Wetted Surface Roughness	Ra 10 μin. (0.25 μm) ^①		Ra 5 μin. (0.13 μm)
Polishing Process	Machine finished ^①		Electropolished
Process Specification	FC-01 Standard Cleaning and Packaging	FC-02 Special Cleaning and Packaging	FC-03 Ultra High Purity Process Specification
Cleaning	Thrice degreasing ultrasonic cleaning	Special cleaning with non-ozone-depleting chemicals	Ultra high purity cleaning in continuously monitored ultrasonic cleaning system with deionized water
Assembly Environment	At atmosphere	In specially cleaned areas	In ISO Class 5/Federal Class 100 cleanroom
Packaging	Individually bagged	Double bagged	Double bagged and vacuum sealed in cleanroom

① For FR connections and tube butt connections, the standard polishing process is electropolishing and the internal surface roughness is finished to an average of Ra 5 μin. (0.13 μm).

Major Materials of Construction



Round Handle Model

Item	Component	Material/Specification
1	Handle	ABS
2	Stem	316 SS/ASTM A479
3	Bonnet	S17400/ASTM A564
4	Bonnet Nut	316 SS/ASTM A479
5	Button	316 SS/ASTM A479
6	Diaphragm (5)	Elgiloy(3)/AMS 5876 + C17200(2)/ASTM B194
7	Seat	PCTFE/ASTM D1430
8	Body	316 SS/ASTM A479 or 316L SS/ASTM A479 or 316L VIM-VAR/SEMI F20

Actuators

Manual - Round Handle

- ⦿ Quick, quarter-turn actuation
- ⦿ Handle with window to visually indicate open and closed states



Pneumatic

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



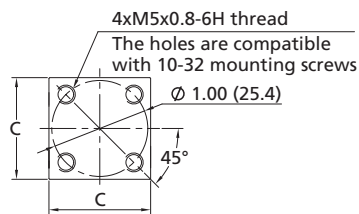
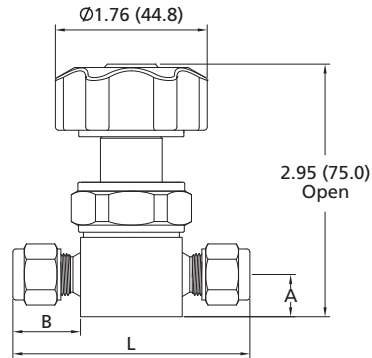
Dimensions and Ordering Information

Straight Type

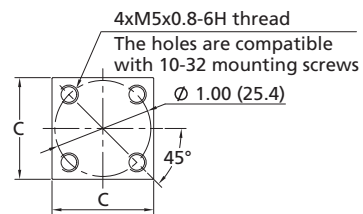
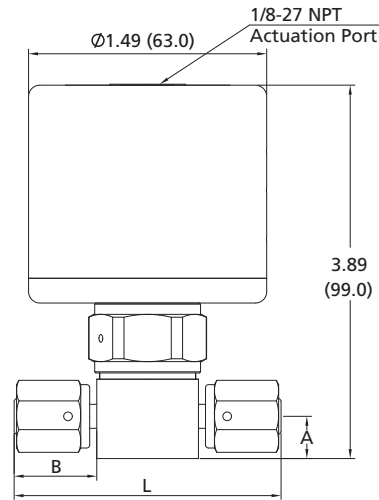
Dimensions

Dimensions, in inches (millimeters), are for reference only.

Manual - Round Handle



Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)			
		A	B	C	L
DH□□-TB4-	1/4" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.06 (26.9)	1.74 (44.2)
DH□□-TB6-	3/8" Tube Butt Weld	0.44 (11.2)	0.26 (6.6)	1.06 (26.9)	1.74 (44.2)
DH□□-FFR4-	1/4" Female FR	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	2.78 (70.6)
DH□□-RFR4-	1/4" Rotatable Male FR	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	2.78 (70.6)
DH□□-FR4-	1/4" Integral Male FR	0.44 (11.2)	0.62 (15.7)	1.06 (26.9)	2.30 (58.4)
DH□□-ML6-	6 mm FITOK Tube Fitting	0.44 (11.2)	0.70 (17.9)	1.06 (26.9)	2.47 (62.7)

Ordering Number Description

DH6L - FL4 - ML6 - CF2M

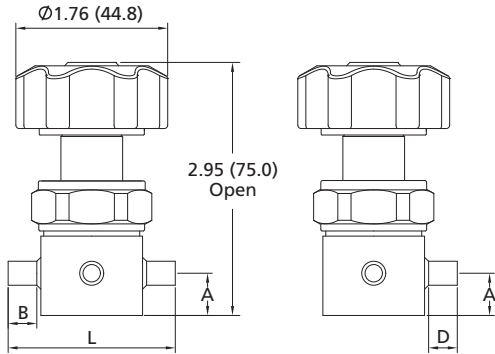
Body Material		Inlet Type		Inlet Size		Outlet Type	Outlet Size	Actuator Type		Technology Grade			
6L	316L SS	TB	Fractional Tube Butt Weld	4	1/4"	Same as Inlet	Specified in the same way as Inlet type and size	R	Handle	General Purpose			
6LV	316L VAR	MTB	Metric Tube Butt Weld	6	6 mm or 3/8"			C	Pneumatic Normally Closed	F2	Special Cleaning and Packaging		
6LW	316L VIM-VAR	FR	Integral Male FR Fitting	8	8 mm	Note: For butt weld connection, pneumatic actuator is not recommended unless it causes no interference to welding.		O	Pneumatic Normally Open	F3	Ultra High Purity		
		FFR	Female FR Fitting									Indicator Switch (only for pneumatic valves)	
		RFR	Rotatable Male FR Fitting									None	
		FL	Fractional Tube Fitting									M Normally Open	
		ML	Metric Tube Fitting							M2 Normally Closed			

Branch Type

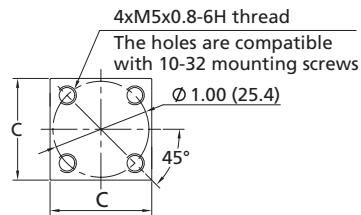
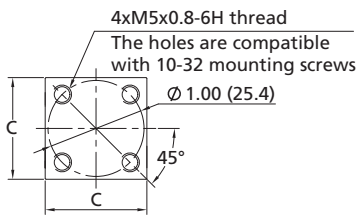
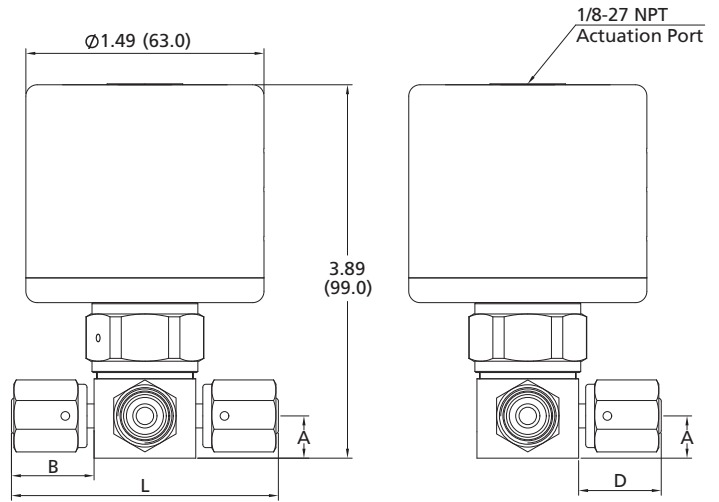
Dimensions

Dimensions, in inches (millimeters), are for reference only.

Manual - Round Handle



Pneumatic

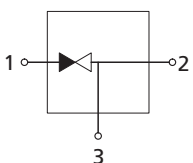


Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	C	D	L
DH□□-TB4-	1/4" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.06 (26.9)	0.30 (7.6)	1.74 (44.2)
DH□□-TB6-	3/8" Tube Butt Weld	0.44 (11.2)	0.26 (6.6)	1.06 (26.9)	0.26 (6.6)	1.74 (44.2)
DH□□-FFR4-	1/4" Female FR	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	0.86 (21.8)	2.78 (70.6)
DH□□-RFR4-	1/4" Rotatable Male FR	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	0.86 (21.8)	2.78 (70.6)
DH□□-FR4-	1/4" Integral Male FR	0.44 (11.2)	0.62 (15.7)	1.06 (26.9)	0.62 (15.7)	2.30 (58.4)
DH□□-FL4-	1/4" FITOK Tube Fitting	0.44 (11.2)	0.70 (17.9)	1.06 (26.9)	0.70 (17.9)	2.47 (62.7)

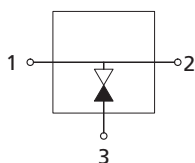
Flow Paths

☉ Flow paths as viewed from the top

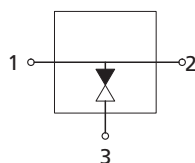
3D Flow



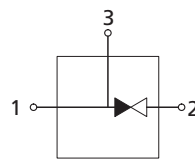
3E Flow



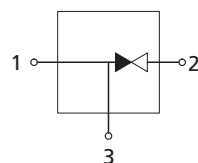
3F Flow



3G Flow



3K Flow



Ordering Number Description

DH6L - TB4 - TB4 - FR4 - 3F - CF2M

Body Material		Port 1 Type		Port 1 Size		Port 2/3 Type	Port 2/3 Size	Flow Path	Actuator Type		Technology Grade			
6L	316L SS	TB	Fractional Tube Butt Weld	4	1/4"	Same as Port 1		3D	R	Handle	General Purpose			
6LV	316L VAR	MTB	Metric Tube Butt Weld	6	6 mm or 3/8"			Specified in the same way as Port 1 type and size		3E	C	Pneumatic Normally Closed	F2	Special Cleaning and Packaging
6LW	316L VIM-VAR	FR	Male FR Fitting	8	8 mm	3F	3G			O	Pneumatic Normally Open	Note: For butt weld connection, pneumatic actuator is not recommended unless it causes no interference to welding.	F3	Ultra High Purity
		FFR	Female FR Fitting	Indicator Switch (only for pneumatic valves)										
		RFR	Rotatable Male FR Fitting		None									
		FL	Fractional Tube Fitting	M	Normally Open									
ML	Metric Tube Fitting	M2	Normally Closed											

Diaphragm Valves

DM Series High Pressure Spring Diaphragm Valves

Features

- ⦿ All-metal containment, packless
- ⦿ Repetitive shutoff with fully contained soft-seat stem tip
- ⦿ Position indicator ring for lever handle
- ⦿ Reduced seat volume
- ⦿ Fully functional under vacuum conditions
- ⦿ Different handle types and pneumatic actuators available
- ⦿ Indicator switch available assembled on pneumatic valves, transmitting a signal to an electrical device to indicated either the open or closed position of the valves
- ⦿ Normally open and normally closed indicator switches optional

Technical Data

Port Size		1/4" to 3/8" or 6 mm to 8 mm
Flow Coefficient (Cv)	Lever Handle	0.14
	Round Handle	0.30
	Pneumatic Actuator	0.20
Orifice Size		0.16 in. (4.1 mm)
Max. Working Pressure		3500 psig (241 bar)
Max. Differential Back Pressure ^①		1500 psig (103 bar)
Pneumatic Actuator Operating Pressure		60 to 90 psig (4.2 to 6.2 bar)
Temperature		PCTFE: -100~250°F (-73~121°C) Vespel: -100~320°F (-73~160°C)
Leak Rate (Helium)	Internal	≤4x10 ⁻⁹ mbar l/s
	External	≤4x10 ⁻⁹ mbar l/s

① A 17-7 stainless steel spring is available to increase the rating to 2500 psig (172 bar). To order, please contact FITOK group or our authorized distributors.

Flow Data

Air @ 70°F (21°C)

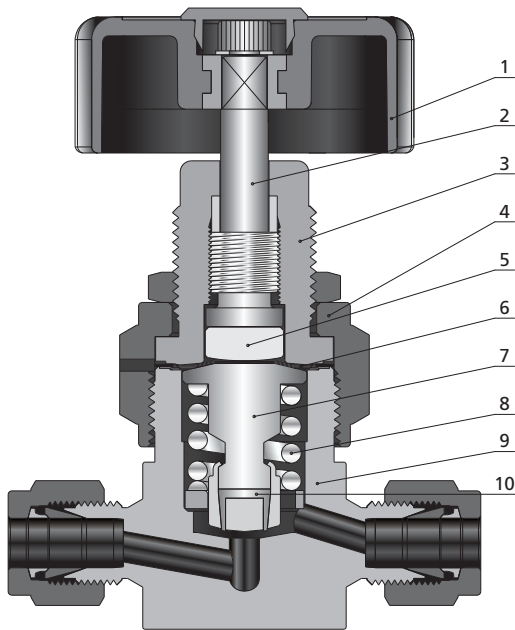
Water @ 60°F (16°C)

Pressure Drop to Atmosphere psi (bar)	Lever Handle		Round Handle		Pneumatic Actuator	
	Air (l/min)	Water (l/min)	Air (l/min)	Water (l/min)	Air (l/min)	Water (l/min)
10 (0.68)	49	1.6	100	3.5	64	2.4
50 (3.4)	130	3.9	270	8.0	170	5.4
100 (6.8)	240	5.4	490	11.4	300	7.6

Product Technology Grade

Product Grade	General Purpose	Special Cleaning and Packaging (F2)	Ultra High Purity (F3)
Material/Specification	316 SS/ASTM A479 or 316L SS/ASTM A479		316L SS/ASTM A479
Wetted Surface Roughness	Ra 20 µin. (0.51 µm)		Ra 10 µin. (0.25 µm)
Polishing Process	Machine finished		Electropolished
Process Specification	FC-01 Standard Cleaning and Packaging	FC-02 Special Cleaning and Packaging	FC-03 Ultra High Purity Process Specification
Cleaning	Thrice degreasing ultrasonic cleaning	Special cleaning with non-ozone-depleting chemicals	Ultra high purity cleaning in continuously monitored ultrasonic cleaning system with deionized water
Assembly Environment	At atmosphere	In specially cleaned areas	In ISO Class 5/Federal Class 100 cleanroom
Packaging	Individually bagged	Double bagged	Double bagged and vacuum sealed in cleanroom

Major Materials of Construction



Round Handle Model

Item	Component	Material/Specification
1	Handle	ABS or Aluminum
2	Actuator	416 SS/ASTM A582
3	Bonnet	316 SS/ASTM A479
4	Bonnet Nut	316 SS/ASTM A479
5	Button	C36000/ASTM B16
6	Diaphragm (3)	Elgiloy/AMS 5876
7	Stem	316L SS/ASTM A479
8	Spring	316 SS/ASTM A313
9	Body	316 SS/ASTM A479 or 316L SS/ASTM A479
10	Seat	PCTFE/ASTM D1430 or Vespel

Actuators

Manual - Lever Handle

- ⦿ Quick, quarter-turn actuation
- ⦿ Position indicator ring to visually indicate open and closed states



Manual - Round Handle

- ⦿ One and a half turns to operate from fully open to closed



Pneumatic

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



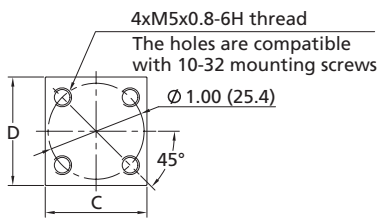
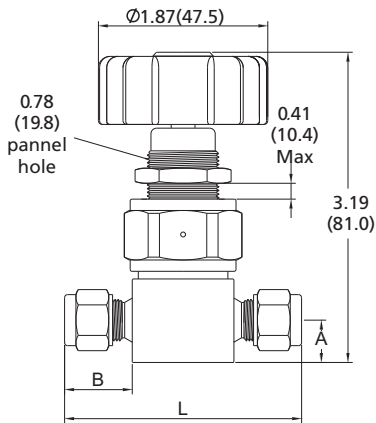
Dimensions and Ordering Information

Straight Type

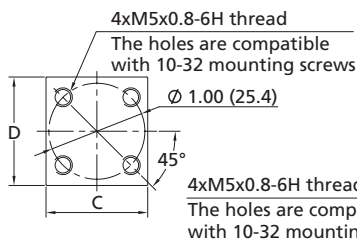
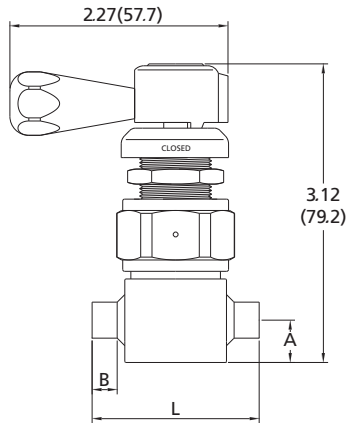
Dimensions

Dimensions, in inches (millimeters), are for reference only.

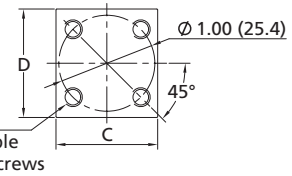
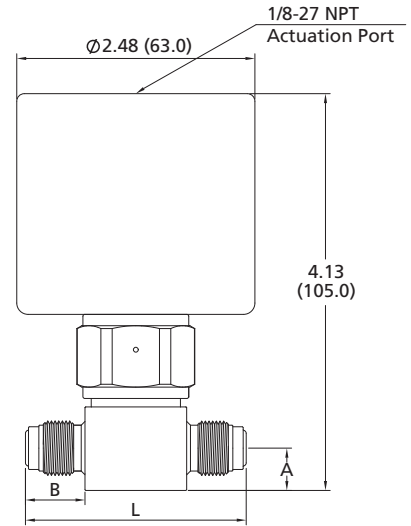
Manual - Round Handle



Manual - Lever Handle



Pneumatic



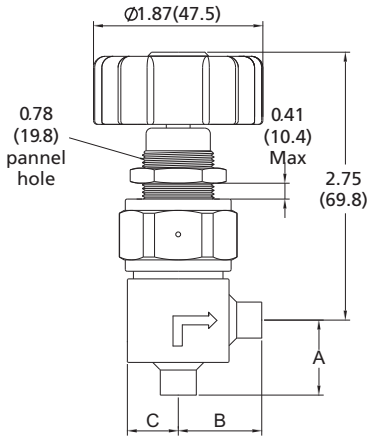
Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	C	D	L
DM□□-FL4-	1/4" FITOK Tube Fitting	0.44 (11.2)	0.70 (17.9)	1.06 (26.9)	1.13 (28.7)	2.46 (62.5)
DM□□-FL6-	3/8" FITOK Tube Fitting	0.44 (11.2)	0.76 (19.3)	1.06 (26.9)	1.13 (28.7)	2.58 (65.5)
DM□□-ML6-	6 mm FITOK Tube Fitting	0.44 (11.2)	0.70 (17.9)	1.06 (26.9)	1.13 (28.7)	2.46 (62.5)
DM□□-ML8-	8 mm FITOK Tube Fitting	0.44 (11.2)	0.74 (18.7)	1.06 (26.9)	1.13 (28.7)	2.53 (64.3)
DM□□-TB4-	1/4" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.06 (26.9)	1.13 (28.7)	1.74 (44.2)
DM□□-TB6-	3/8" Tube Butt Weld	0.44 (11.2)	0.26 (6.6)	1.06 (26.9)	1.13 (28.7)	1.74 (44.2)
DM□□-NS4-	1/4" Integral Male FR	0.44 (11.2)	—	1.06 (26.9)	1.13 (28.7)	2.46 (62.5)
DM□□-FNS4-	1/4" Female NPT	0.44 (11.2)	—	1.06 (26.9)	1.13 (28.7)	2.46 (62.5)
DM□□-FR4-	1/4" Male FR	0.44 (11.2)	0.62 (15.7)	1.06 (26.9)	1.13 (28.7)	2.30 (58.4)
DM□□-FFR4-	1/4" Female FR	0.44 (11.2)	0.85 (21.6)	1.06 (26.9)	1.13 (28.7)	2.76 (70.1)
DM□□-FO4-	1/4" Male FO	0.44 (11.2)	0.47 (11.9)	1.06 (26.9)	1.13 (28.7)	2.00 (50.8)

Angle Type

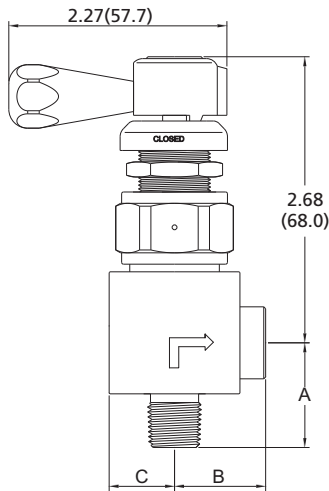
Dimensions

Dimensions, in inches (millimeters), are for reference only.

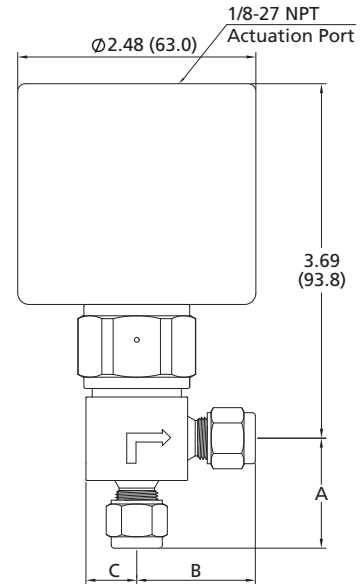
Manual - Round Handle



Manual - Lever Handle



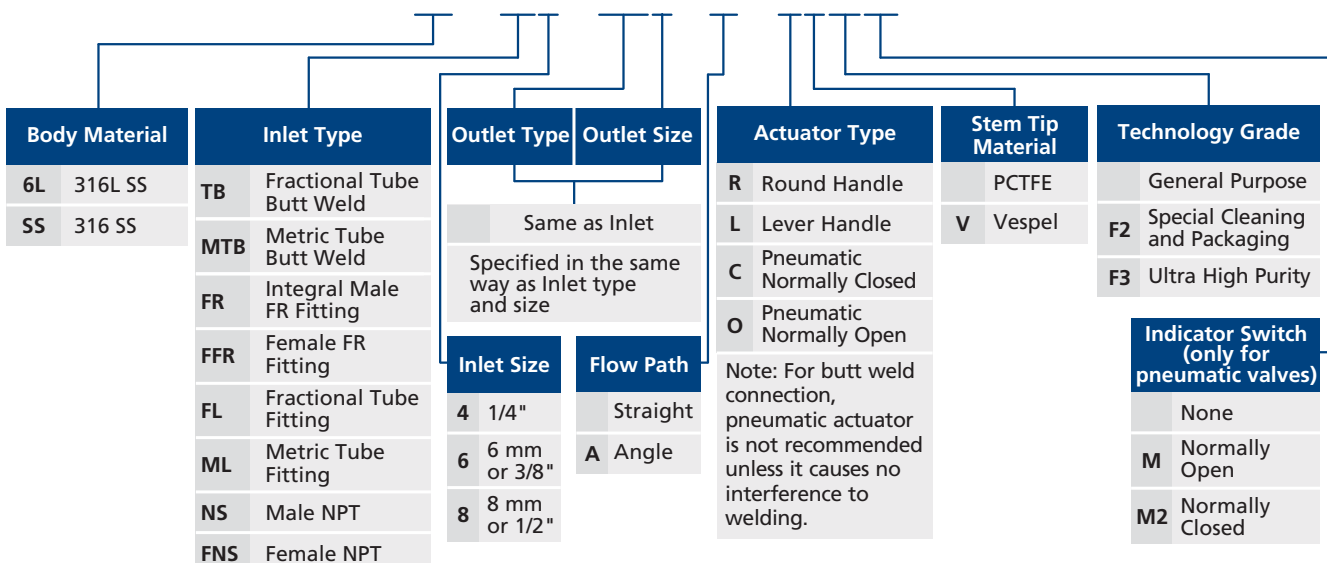
Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)		
		A	B	C
DM□□-FL4-	1/4" FITOK Tube Fitting	1.14 (29.1)	1.23 (31.3)	0.53 (13.4)
DM□□-ML6-	6 mm FITOK Tube Fitting	1.14 (29.1)	1.23 (31.3)	0.53 (13.4)
DM□□-TB6-	3/8" Tube Butt Weld	0.78 (19.8)	0.87 (22.0)	0.53 (13.4)
DM□□-NS4-FNS4	Inlet 1/4" Male NPT	1.09 (27.7)	0.95 (24.1)	0.68 (17.3)
	Outlet 1/4" Female NPT			

Ordering Number Description

DMSS - FL4 - ML6 - A - CVF2M

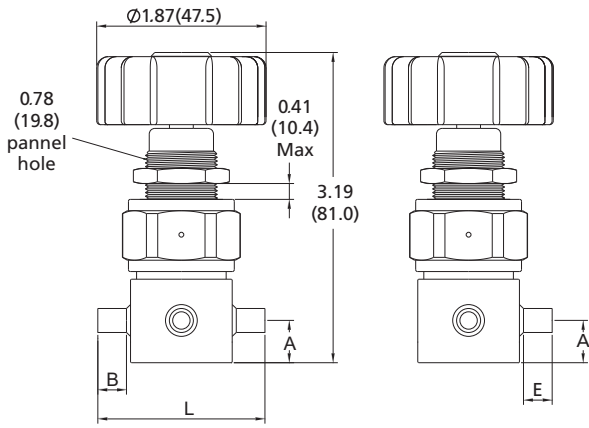


Branch Type

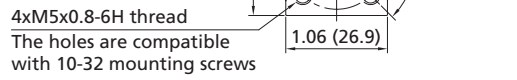
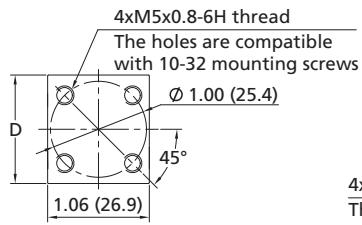
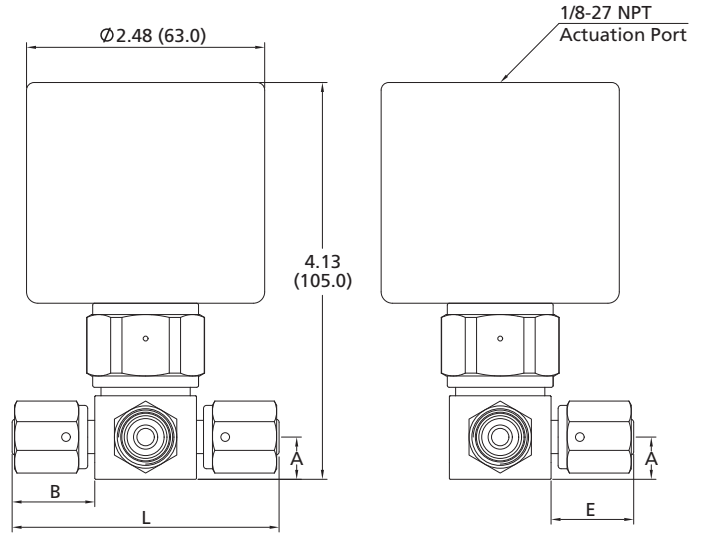
Dimensions

Dimensions, in inches (millimeters), are for reference only.

Manual - Round Handle



Pneumatic

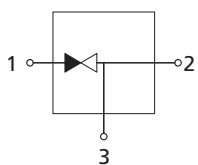


Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	D	E	L
DM□□-TB4-	1/4" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.13 (28.7)	0.30 (7.6)	1.74 (44.2)
DM□□-MTB6-	6 mm Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.13 (28.7)	0.30 (7.6)	1.74 (44.2)
DM□□-FFR4-	1/4" Female FR	0.44 (11.2)	0.85 (21.6)	1.13 (28.7)	0.85 (21.6)	2.76 (70.1)
DM□□-RFR4-	1/4" Rotatable Male FR	0.44 (11.2)	1.21 (30.7)	1.13 (28.7)	1.21 (30.7)	3.48 (88.4)

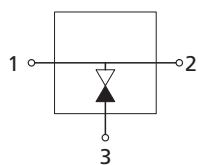
Flow Paths

☉ Flow paths as viewed from the top

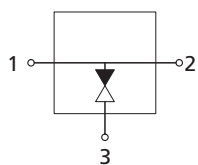
3D Flow



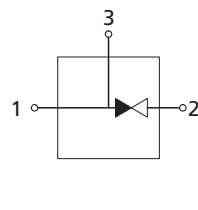
3E Flow



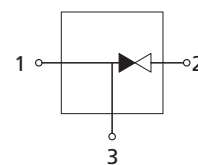
3F Flow



3G Flow

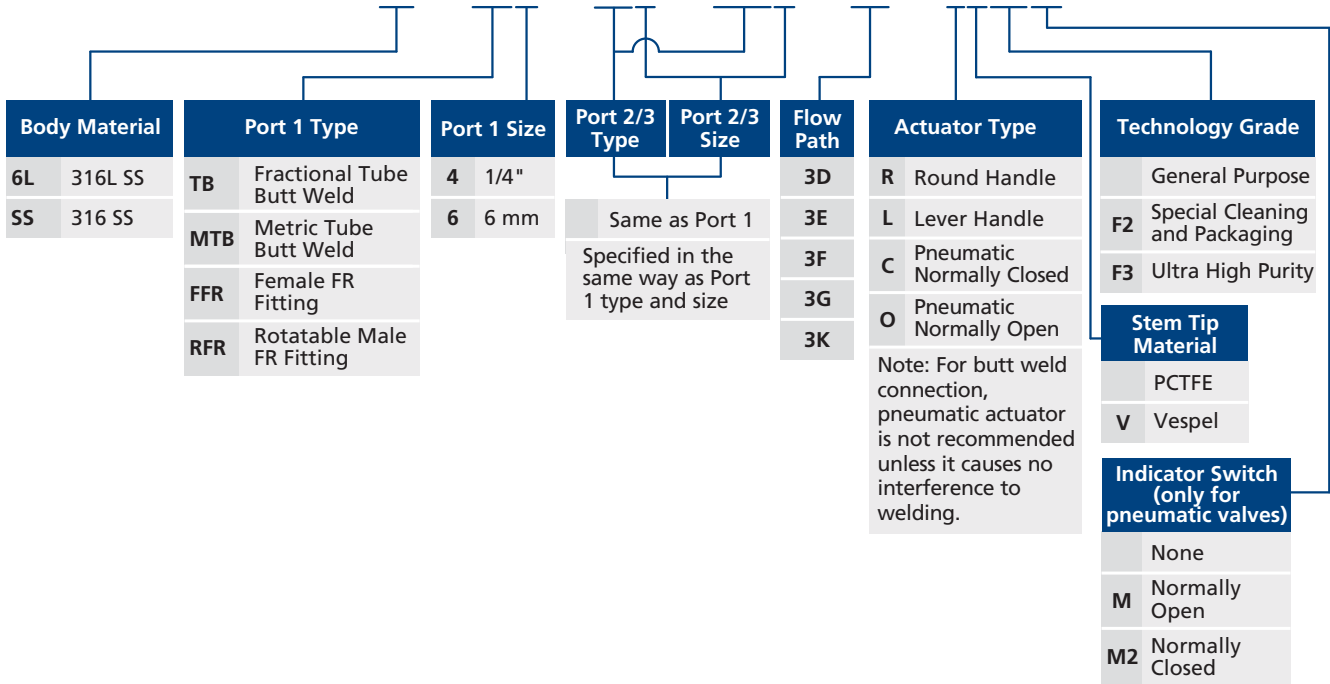


3K Flow



Ordering Number Description

DMSS - TB4 - TB4 - FFR4 - 3F - LVF2M



Fittings

Valves & Regulators

Diaphragm Valves

DS Series High Pressure Compact Diaphragm Valves

Features

- Reduced inner volume
- Packless diaphragm seal to ensure high purity
- Minimized number of components
- Manual and pneumatic actuators available
- Aluminum piston to increase operation speed

Technical Data

Port Size		1/4" to 3/8" or 6 mm to 8 mm
Flow Coefficient (Cv)		0.17
Orifice Size		0.12 in. (3.0 mm)
Max. Working Pressure	Manual	4500 psig (310 bar)
	Pneumatic	3000 psig (206 bar)
Pneumatic Actuator Operating Pressure		60 to 90 psig (4.2 to 6.2 bar)
Temperature		PCTFE: -10~150°F (-23~65°C) Vespel: -10~250°F (-23~121°C)
Leak Rate (Helium)	Internal	≤1x10 ⁻⁹ mbar l/s
	External	≤1x10 ⁻⁹ mbar l/s

Flow Data

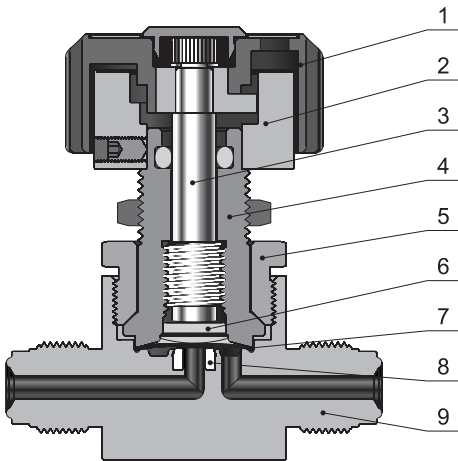
Air @ 70°F (21°C)
Water @ 60°F (16°C)

Pressure Drop to Atmosphere psi (bar)	Air (l/min)	Water (l/min)
10 (0.68)	55	1.9
50 (3.4)	150	4.5
100 (6.8)	260	6.4

Product Technology Grade

Product Grade Technology	General Purpose	Special Cleaning and Packaging (F2)	Ultra High Purity (F3)
Material/Specification	316 SS/ASTM A479 316L SS/ASTM A479		316L VAR/SEMI F20 316L VIM-VAR /SEMI F20
Wetted Surface Roughness	Ra 20 µin. (0.51 µm)		Ra 10 µin. (0.25 µm)
Polishing Process	Machine finished		Electropolished
Process Specification	FC-01 Standard Cleaning and Packaging	FC-02 Special Cleaning and Packaging	FC-03 Ultra High Purity Process Specification
Cleaning	Thrice degreasing ultrasonic cleaning	Special cleaning with non-ozone-depleting chemicals	Ultra high purity cleaning in continuously monitored ultrasonic cleaning system with deionized water
Assembly Environment	At atmosphere	In specially cleaned areas	In ISO Class 5/Federal Class 100 cleanroom
Packaging	Individually bagged	Double bagged	Double bagged and vacuum sealed in cleanroom

Major Materials of Construction



Round Handle Model

Item	Component	Material/Specification
1	Handle	ABS
2	Actuator	Aluminum
3	Stem	316 SS/ASTM A479
4	Bonnet	S17400/ASTM A564
5	Bonnet Nut	316 SS/ASTM A479
6	Button	C36000/B16
7	Diaphragm (5)	Elgiloy (3) /AMS 5876 + C17200 (2) /ASTM B194
8	Seat	PCTFE/ASTM D1430 or Vespel
9	Body	316 SS/ASTM A479 or 316L SS/ASTM A479 or 316L VIM-VAR/SEMI F20

Actuators

Manual - Round Handle

- ⦿ Quick, quarter-turn actuation
- ⦿ Handle with window to visually indicate open and closed states



Pneumatic

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

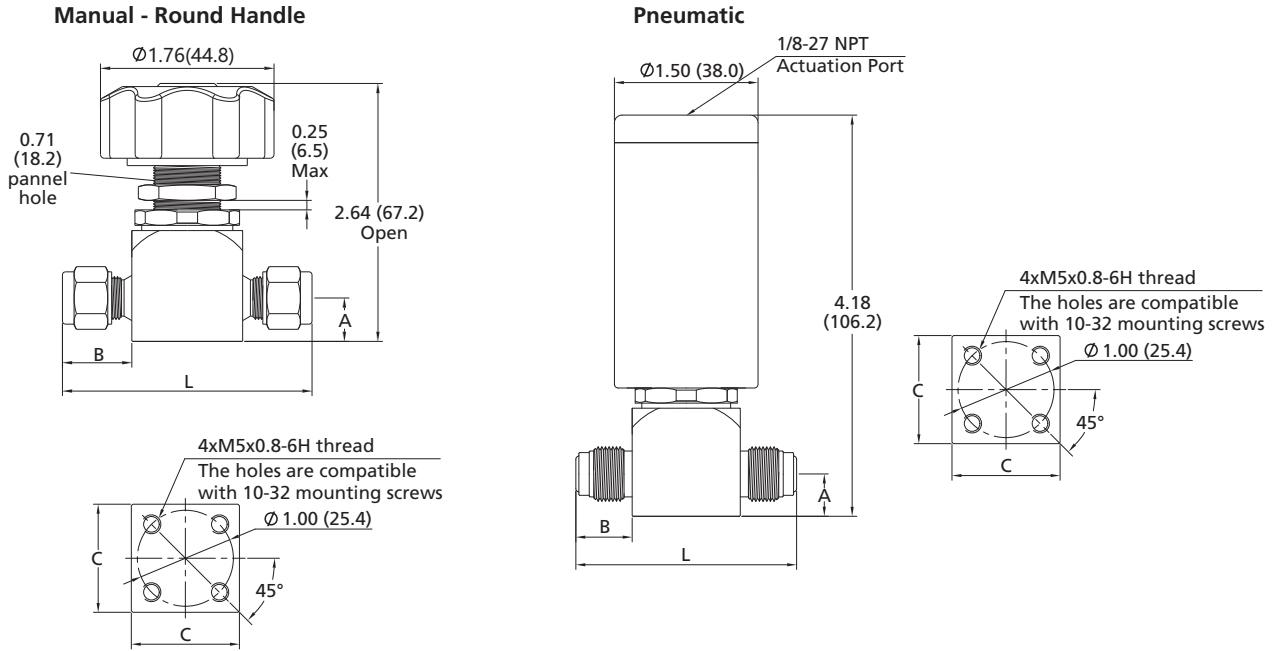


Dimensions and Ordering Information

Straight Type

Dimensions

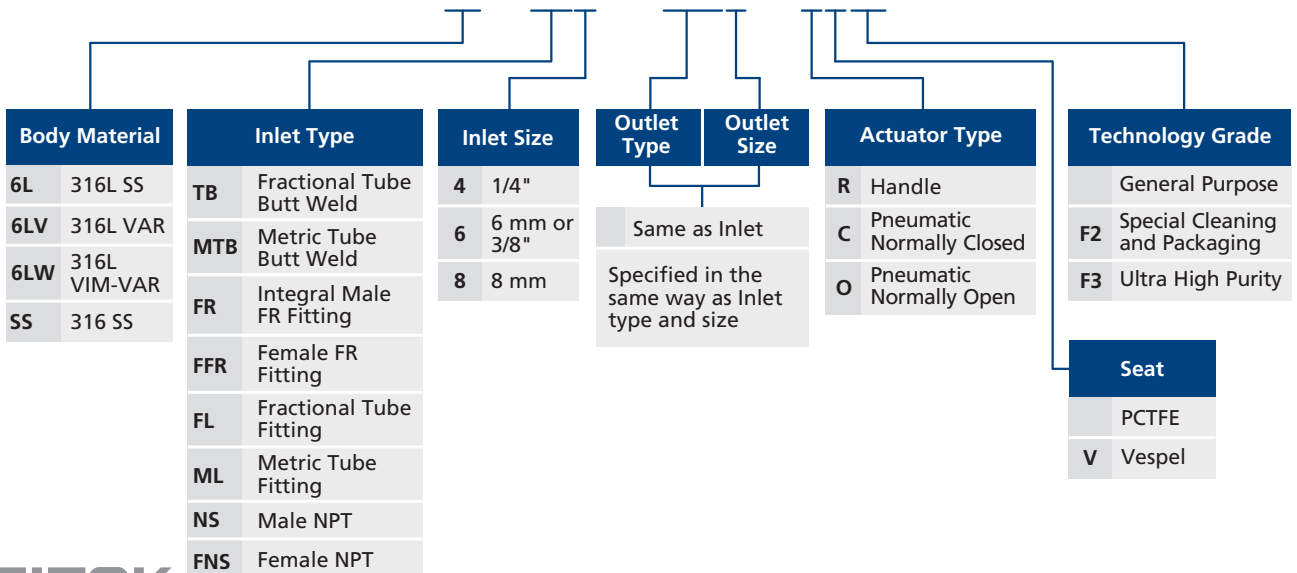
Dimensions, in inches (millimeters), are for reference only.



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)			
		A	B	C	L
DS□□-TB4-	1/4" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.12 (28.6)	1.81 (45.9)
DS□□-TB6-	3/8" Tube Butt Weld	0.44 (11.2)	0.26 (6.6)	1.12 (28.6)	1.81 (45.9)
DS□□-FFR4-	1/4" Female FR	0.44 (11.2)	0.86 (21.8)	1.12 (28.6)	2.85 (72.3)
DS□□-FR4-	1/4" Integral Male FR	0.44 (11.2)	0.58 (14.9)	1.12 (28.6)	2.30 (58.4)
DS□□-FL4-	1/4" FITOK Tube Fitting	0.44 (11.2)	0.70 (17.9)	1.12 (28.6)	2.54 (64.4)
DS□□-NS4-	1/4" Male NPT	0.44 (11.2)	0.56 (14.2)	1.12 (28.6)	2.24 (57.0)
DS□□-FNS4-	1/4" Female NPT	0.44 (11.2)	—	1.12 (28.6)	2.36 (60.0)

Ordering Number Description

DS6L - NS4 - FNS4 - RVF2



2-Valve 3-Way Block Type

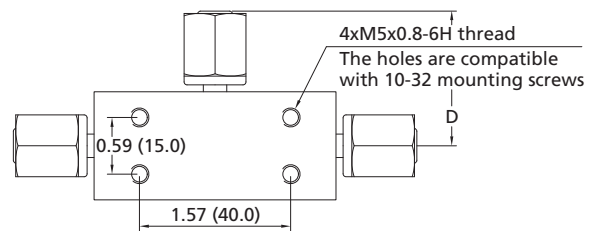
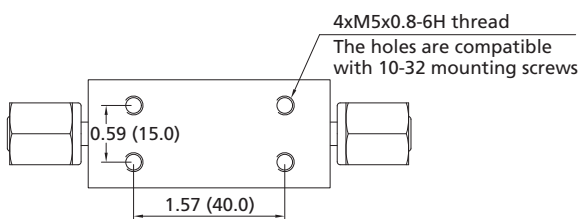
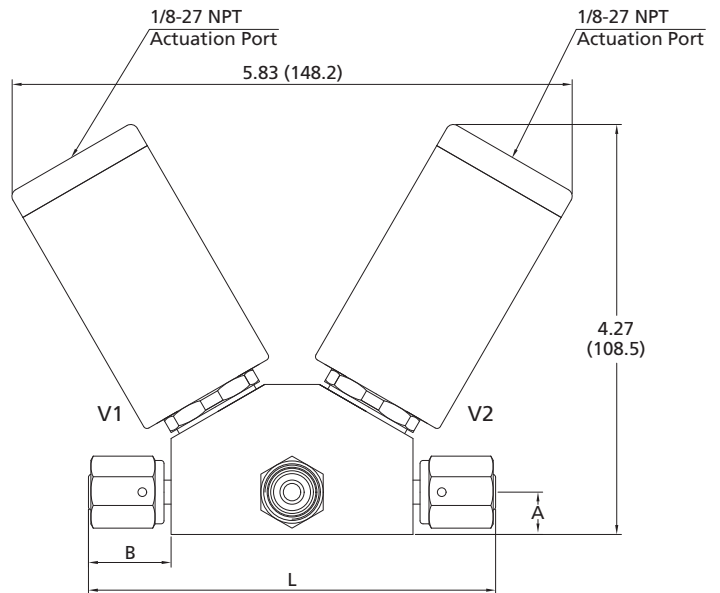
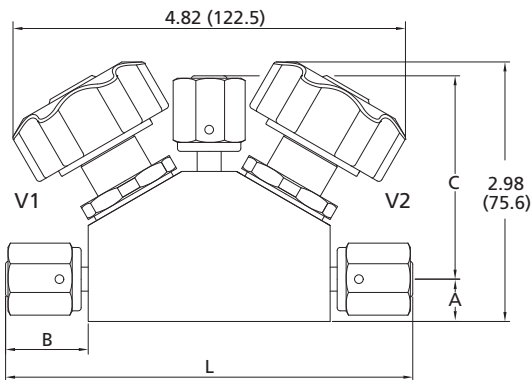
Dimensions

Dimensions, in inches (millimeters), are for reference only.



Manual - Round Handle

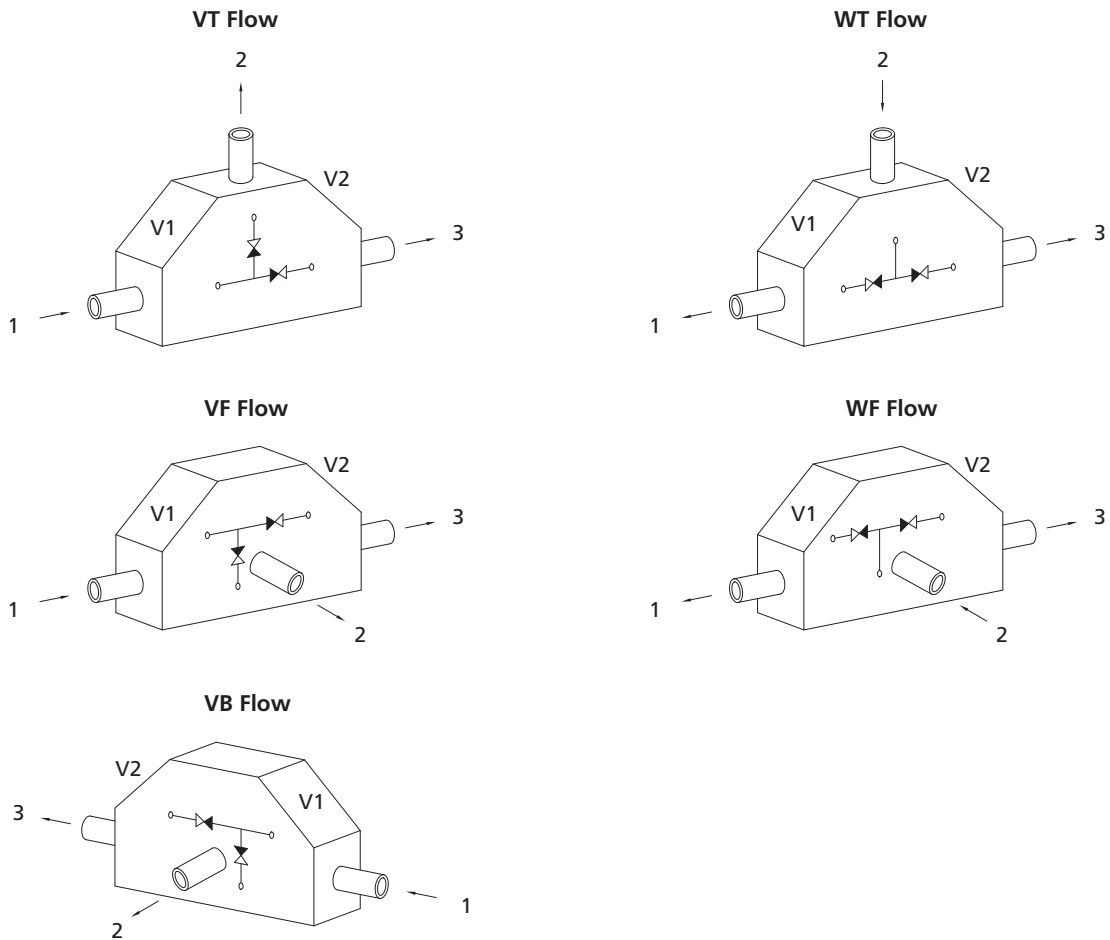
Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	C	D	L
DS23□□-FFR4-	1/4" Female FR	0.44 (11.2)	0.86 (21.8)	2.59 (65.7)	—	4.24 (107.6)
DS23□□-FFR4-	1/4" Female FR	0.44 (11.2)	0.86 (21.8)	—	1.54 (39.1)	4.24 (107.6)
DS23□□-FNS4-	1/4" Female NPT	0.44 (11.2)	—	—	0.68 (17.3)	3.07 (78.0)

V-35 Diaphragm Valves

Flow Paths



Ordering Number Description

DS236L - FFR4RFR4 - FFR4 - VF - COVF2

Type	Port 1 Type	Port 2/3 Type	Port 2/3 Size	Flow Path	Actuator Type V1 and V2	Technology Grade
23 2 Valves and 3 Ports	FFR Female FR Fitting RFR Rotatable Male FR Fitting FNS Female NPT	Same as Port 1	Specified in the same way as Port 1 type and size	VT VF VB WT WF	R All Handles C Pneumatic all Closed O Pneumatic all Open RC V1 Handle V2 Closed RO V1 Handle V2 Open CR V1 Closed V2 Handle OR V1 Open V2 Handle CO V1 Closed V2 Open OC V1 Open V2 Closed	General Purpose F2 Special Cleaning and Packaging F3 Ultra High Purity
Body Material	Port 1 Size				Seat	
6L 316L SS 6LV 316L VAR 6LW 316L VIM-VAR SS 316 SS	4 1/4"				PCTFE V Vespel	

Diaphragm Valves

DR Series Low Pressure/Medium Flow Diaphragm Valves

Features

- ⦿ For medium flow applications
- ⦿ Minimum particle generation and dead space
- ⦿ Fully contained seat to provide excellent resistance to swelling and contamination
- ⦿ Elgiloy diaphragm to provide high strength and corrosion resistance to ensure long cycle life
- ⦿ Manual and pneumatic actuators available
- ⦿ Indicator switch available assembled on normally closed valves, transmitting a signal to an electrical device to indicated either the open or closed position of the valves

Technical Data

Port Size	3/8" to 1/2" or 10 mm to 12 mm	
Flow Coefficient (Cv)	0.70	
Orifice Size	0.31 in. (7.9 mm)	
Max. Working Pressure	145 psig (10 bar)	
Pneumatic Actuator Operating Pressure	60 to 90 psig (4.2 to 6.2 bar)	
Temperature	PCTFE: -10~150°F (-23~65°C) PFA: -10~302°F (-23~150°C)	
Leak Rate (Helium)	Internal	≤1x10 ⁻⁹ mbar l/s
	External	≤1x10 ⁻⁹ mbar l/s

Flow Data

Air @ 70°F (21°C)

Water @ 60°F (16°C)

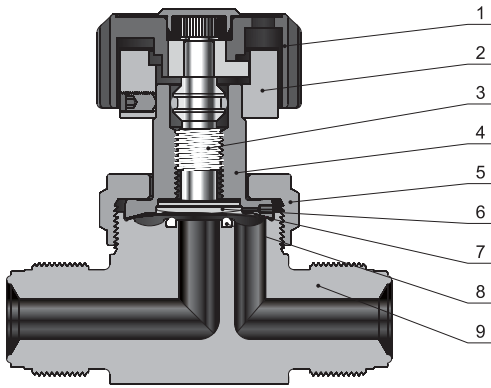
Pressure Drop to Atmosphere psi (bar)	Air (l/min)	Water (l/min)
10 (0.68)	240	8.4
50 (3.4)	630	18.6
100 (6.8)	1120	26.6

Product Technology Grade

Product Grade	General Purpose	Special Cleaning and Packaging (F2)	Ultra High Purity (F3)
Material/Specification	316L SS/ASTM A479		316L VAR/SEMI F20 316L VIM-VAR /SEMI F20
Wetted Surface Roughness	Ra 10 μin. (0.25 μm) ^①		Ra 5 μin. (0.13 μm)
Polishing Process	Machine finished ^①		Electropolished
Process Specification	FC-01 Standard Cleaning and Packaging	FC-02 Special Cleaning and Packaging	FC-03 Ultra High Purity Process Specification
Cleaning	Thrice degreasing ultrasonic cleaning	Special cleaning with non-ozone-depleting chemicals	Ultra high purity cleaning in continuously monitored ultrasonic cleaning system with deionized water
Assembly Environment	At atmosphere	In specially cleaned areas	In ISO Class 5/Federal Class 100 cleanroom
Packaging	Individually bagged	Double bagged	Double bagged and vacuum sealed in cleanroom

① For FR connections and tube butt connections, the standard polishing process is electropolishing and the internal surface roughness is finished to an average of Ra 5 μin. (0.13 μm).

Major Materials of Construction



Round Handle Model

Item	Component	Material/Specification
1	Handle	ABS
2	Actuator	Aluminum
3	Stem	316 SS/ASTM A479
4	Bonnet	S17400/ASTM A564
5	Bonnet Nut	316 SS/ASTM A479
6	Button	316 SS/ASTM A479
7	Diaphragm (2)	Elgiloy/AMS 5876
8	Seat	PCTFE/ASTM D1430 or PFA/ASTM D3307
9	Body	316 SS/ASTM A479 or 316L SS/ASTM A479 or 316L VIM-VAR/SEMI F20

Actuators

Manual - Round Handle

- ⦿ Quick, quarter-turn actuation
- ⦿ Handle with windows to visually indicate open and closed states

Pneumatic

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



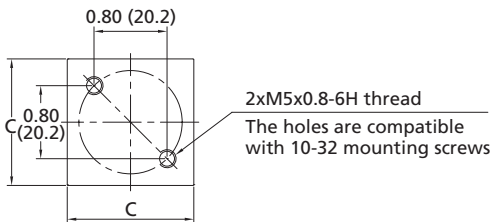
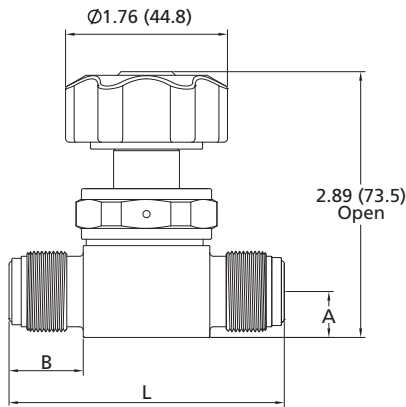
Dimensions and Ordering Information

Straight Type

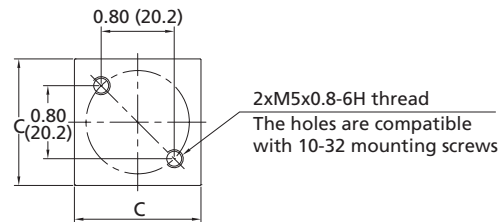
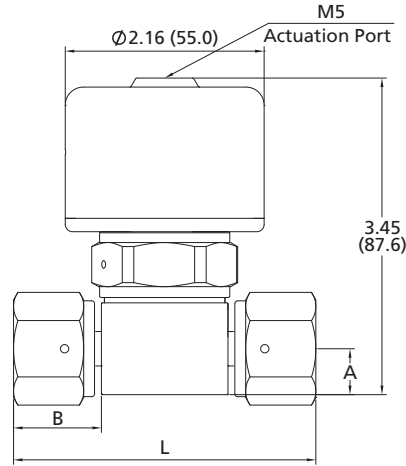
Dimensions

Dimensions, in inches (millimeters), are for reference only.

Manual - Round Handle



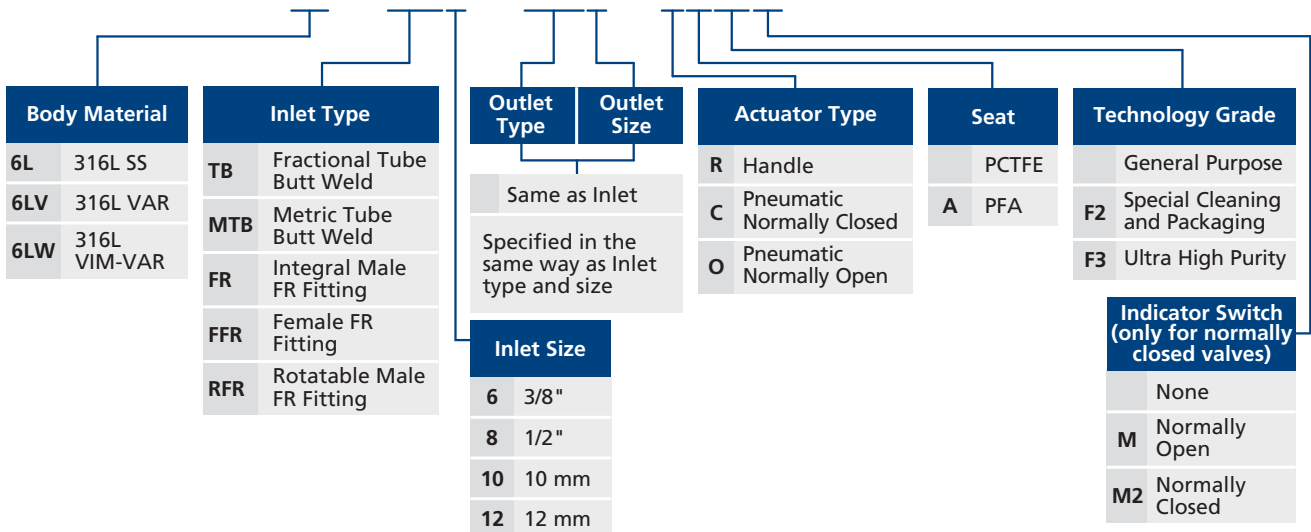
Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)			
		A	B	C	L
DR□□-TB6-	3/8" Tube Butt Weld	0.50 (12.7)	0.67 (17.0)	1.38 (35.0)	2.72 (69.0)
DR□□-TB8-	1/2" Tube Butt Weld	0.50 (12.7)	0.67 (17.0)	1.38 (35.0)	2.72 (69.0)
DR□□-FFR8-	1/2" Female FR	0.50 (12.7)	0.94 (24.0)	1.38 (35.0)	3.27 (83.0)
DR□□-FR8-	1/2" Integral Male FR	0.50 (12.7)	0.81 (20.6)	1.38 (35.0)	3.00 (76.2)

Ordering Number Description

DR6L - FFR8 - RFR8 - RAF3M

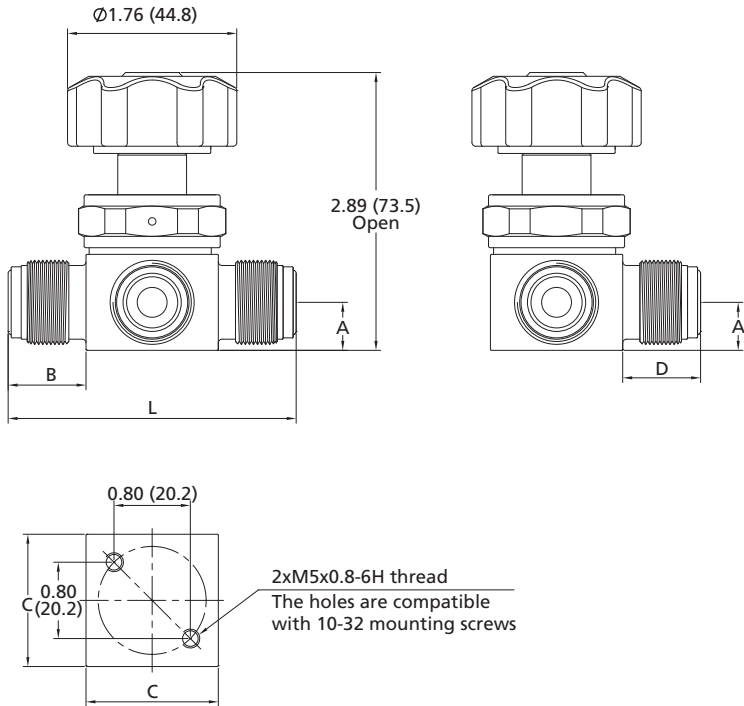


Branch Type

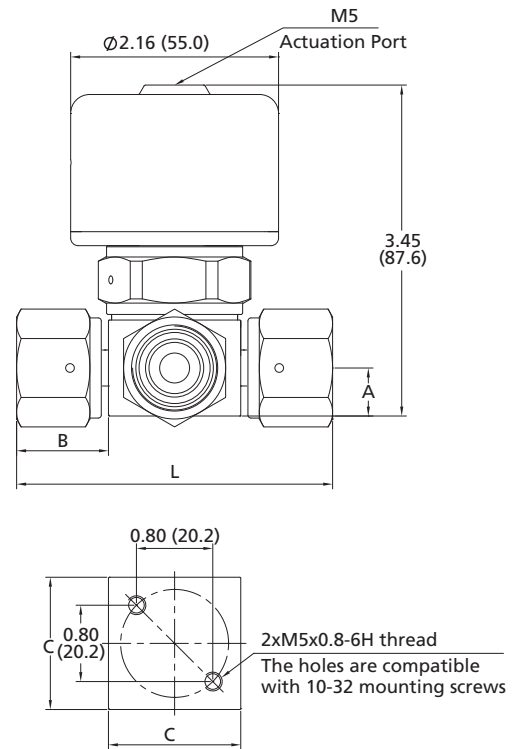
Dimensions

Dimensions, in inches (millimeters), are for reference only.

Manual - Round Handle



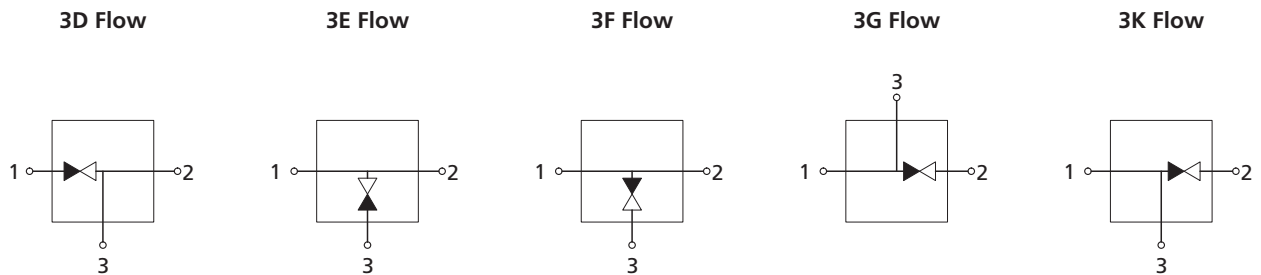
Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	C	D	L
DR□□-TB6-	3/8" Tube Butt Weld	0.50 (12.7)	0.67 (17.0)	1.38 (35.0)	0.67 (17.0)	2.72 (69.0)
DR□□-TB8-	1/2" Tube Butt Weld	0.50 (12.7)	0.67 (17.0)	1.38 (35.0)	0.67 (17.0)	2.72 (69.0)
DR□□-FFR8-	1/2" Female FR	0.50 (12.7)	0.94 (24.0)	1.38 (35.0)	0.94 (24.0)	3.27 (83.0)
DR□□-RFR8-	1/2" Rotatable Male FR	0.50 (12.7)	0.94 (24.0)	1.38 (35.0)	0.94 (24.0)	3.27 (83.0)
DR□□-FR8-	1/2" Integral Male FR	0.50 (12.7)	0.81 (20.6)	1.38 (35.0)	0.81 (20.6)	3.00 (76.2)

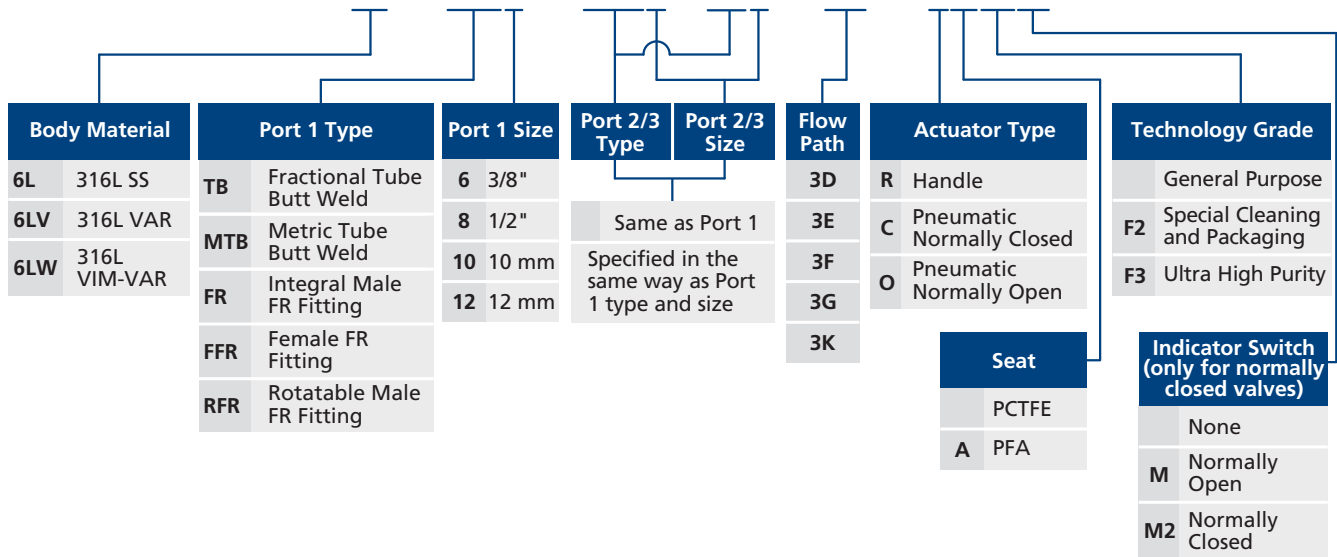
Flow Paths

☉ Flow paths as viewed from the top



Ordering Number Description

DR6L - FFR8 - RFR8 - FR8 - 3D - RAF3M



Diaphragm Valves

DV Series Low Pressure/High Flow Diaphragm Valves

Features

- ⦿ Ideal for high flow applications
- ⦿ Metal-to-metal seal
- ⦿ Tide-diaphragm design to provide positive stem retraction
- ⦿ No springs or threads in wetted areas to ensure clean operation

Technical Data

Port Size	1/2" to 1" or 12 mm to 18 mm	
Flow Coefficient (Cv)	2.8	
Orifice Size	0.5 in. (12.7 mm)	
Max. Working Pressure	300 psig (20.6 bar)	
Temperature	PCTFE: -10~150°F (-23~65°C) Vespel: -10~250°F (-23~121°C)	
Leak Rate (Helium)	Internal	$\leq 1 \times 10^{-9}$ mbar l/s
	External	$\leq 1 \times 10^{-9}$ mbar l/s

Flow Data

Air @ 70°F (21°C)

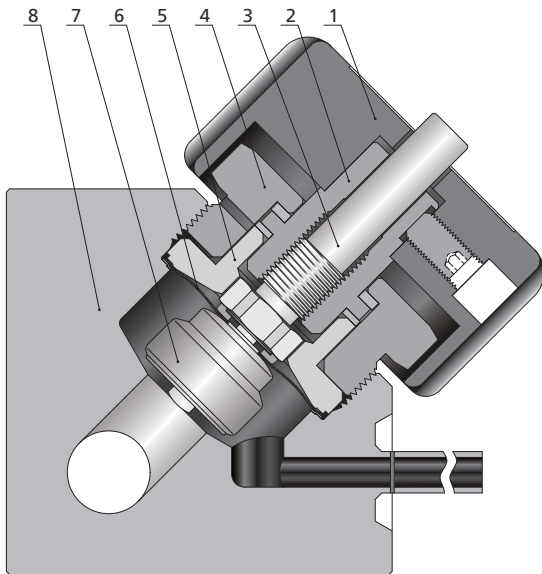
Water @ 60°F (16°C)

Pressure Drop to Atmosphere psi (bar)	Air (l/min)	Water (l/min)
10 (0.68)	870	34
50 (3.4)	2300	75
100 (6.8)	4100	100

Product Technology Grade

Product Grade	General Purpose	Special Cleaning and Packaging (F2)	Ultra High Purity (F3)
Material/Specification	316 SS/ASTM A479 or 316L SS/ASTM A479		316L SS/ASTM A479
Wetted Surface Roughness	Ra 10 µin. (0.25 µm)		Ra 5 µin. (0.13 µm)
Polishing Process	Machine finished		Electropolished
Process Specification	FC-01 Standard Cleaning and Packaging	FC-02 Special Cleaning and Packaging	FC-03 Ultra High Purity Process Specification
Cleaning	Thrice degreasing ultrasonic cleaning	Special cleaning with non-ozone-depleting chemicals	Ultra high purity cleaning in continuously monitored ultrasonic cleaning system with deionized water
Assembly Environment	At atmosphere	In specially cleaned areas	In ISO Class 5/Federal Class 100 cleanroom
Packaging	Individually bagged	Double bagged	Double bagged and vacuum sealed in cleanroom

Major Materials of Construction

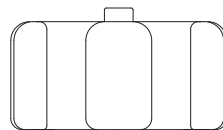


Item	Component	Material/Specification
1	Handle	Aluminum
2	Actuator	316 SS/ASTM A479
3	Upper Stem	316 SS/ASTM A479
4	Bonnet Nut	316 SS/ASTM A479
5	Bonnet	S17400/ASTM A564
6	Diaphragm (2)	Elgiloy/AMS 5876
7	Stem Subassembly	316L SS/ASTM A479 and PCTFE/ASTM D1430 or 316L SS/ASTM A479 and Vespel
8	Body	316 SS/ASTM A479 or 316L SS/ASTM A479

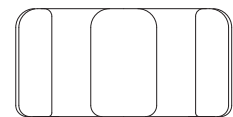
Actuators

Manual - Round Handle

© Upper stem position to indicate open and closed states



OPEN



CLOSED

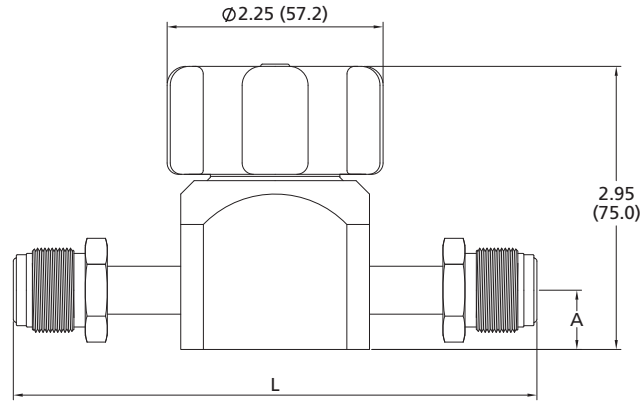
Notes: The upper stem protruding from the handle indicates open state.
The upper stem paralleling to or sinking into the handle indicates closed state.

Dimensions and Ordering Information

Straight Type

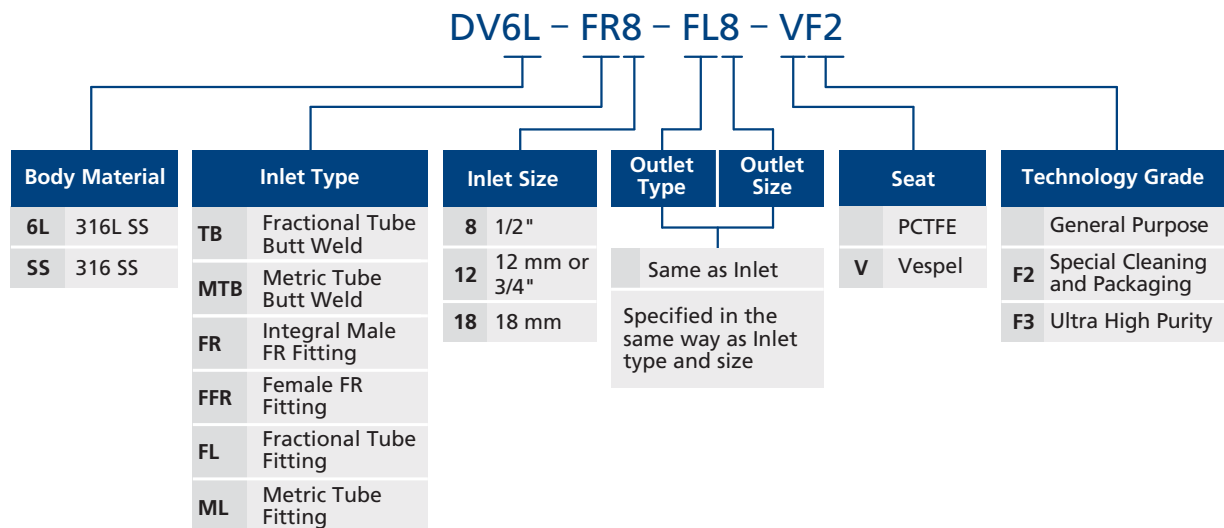
Dimensions

Dimensions, in inches (millimeters), are for reference only.



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)	
		A	L
DV□□-TB8-	1/2" Tube Butt Weld	0.62 (15.7)	5.91 (150.0)
DV□□-TB12-	3/4" Tube Butt Weld	0.62 (15.7)	5.91 (150.0)
DV□□-FR8-	1/2" Integral Male FR	0.62 (15.7)	5.46 (138.7)
DV□□-FFR8-	1/2" Female FR	0.62 (15.7)	5.46 (138.7)
DV□□-FL8-	1/2" FITOK Tube Fitting	0.62 (15.7)	3.71 (94.2)
DV□□-FL12-	3/4" FITOK Tube Fitting	0.62 (15.7)	3.72 (94.4)

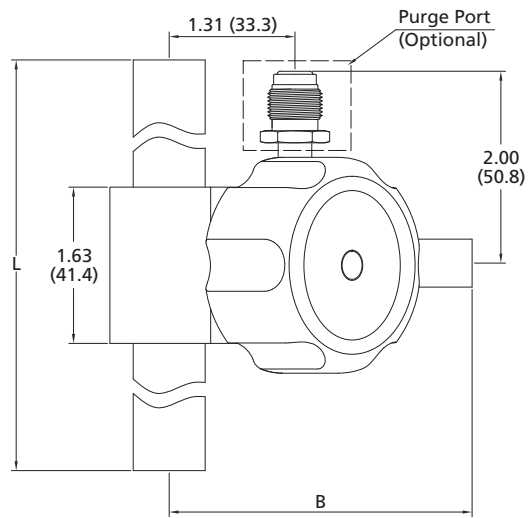
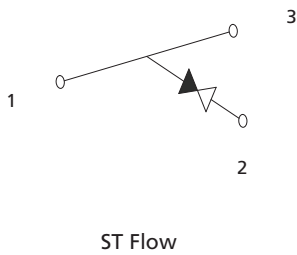
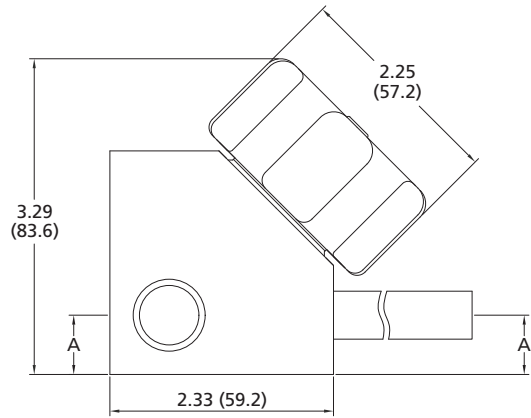
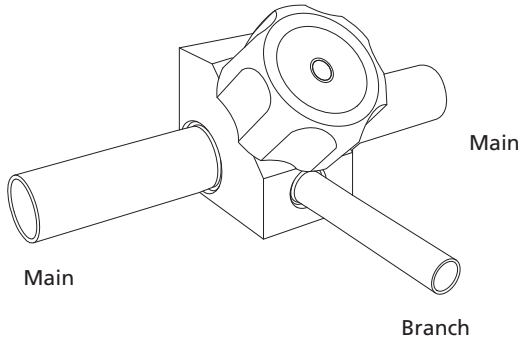
Ordering Number Description



Branch Type

Dimensions

Dimensions, in inches (millimeters), are for reference only.



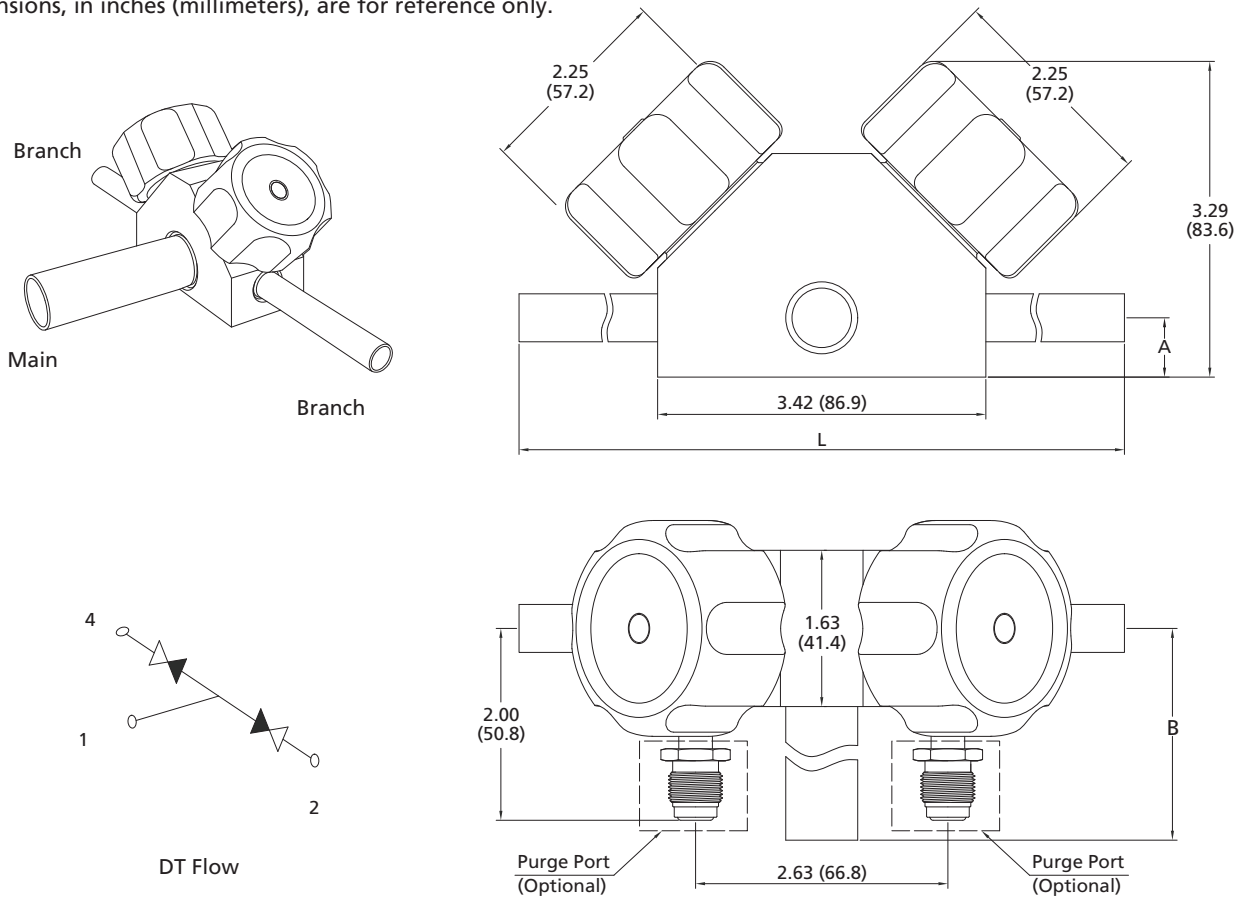
Basic Ordering Number	Connection Type and Size		Dimensions in. (mm)		
	Main	Branch	A	B	L
DV□□-TB8-TB4-	1/2" × 0.049"	1/4" × 0.035"	0.62 (15.7)	4.69 (119.0)	7.58 (193.0)
DV□□-TB8-TB8-	1/2" × 0.049"	1/2" × 0.049"	0.62 (15.7)	4.69 (119.0)	7.58 (193.0)
DV□□-TB8-RFR4-	1/2" × 0.049"	1/4" Rotatable Male FR	0.62 (15.7)	2.57 (65.0)	7.58 (193.0)
DV□□-TB8-RFR8-	1/2" × 0.049"	1/2" Rotatable Male FR	0.62 (15.7)	3.43 (87.0)	7.58 (193.0)
DV□□-TB12-TB8-	3/4" × 0.065"	1/2" × 0.049"	0.62 (15.7)	4.69 (119.0)	7.58 (193.0)
DV□□-TB12-RFR8-	3/4" × 0.065"	1/2" Rotatable Male FR	0.62 (15.7)	3.43 (87.0)	7.58 (193.0)
DV□□-TB16-TB8-	1" × 0.065"	1/2" × 0.049"	0.62 (15.7)	4.69 (119.0)	7.58 (193.0)
DV□□-TB16-RFR8-	1" × 0.065"	1/2" Rotatable Male FR	0.62 (15.7)	3.43 (87.0)	7.58 (193.0)

V-45 Diaphragm Valves

Block Type

Dimensions

Dimensions, in inches (millimeters), are for reference only.

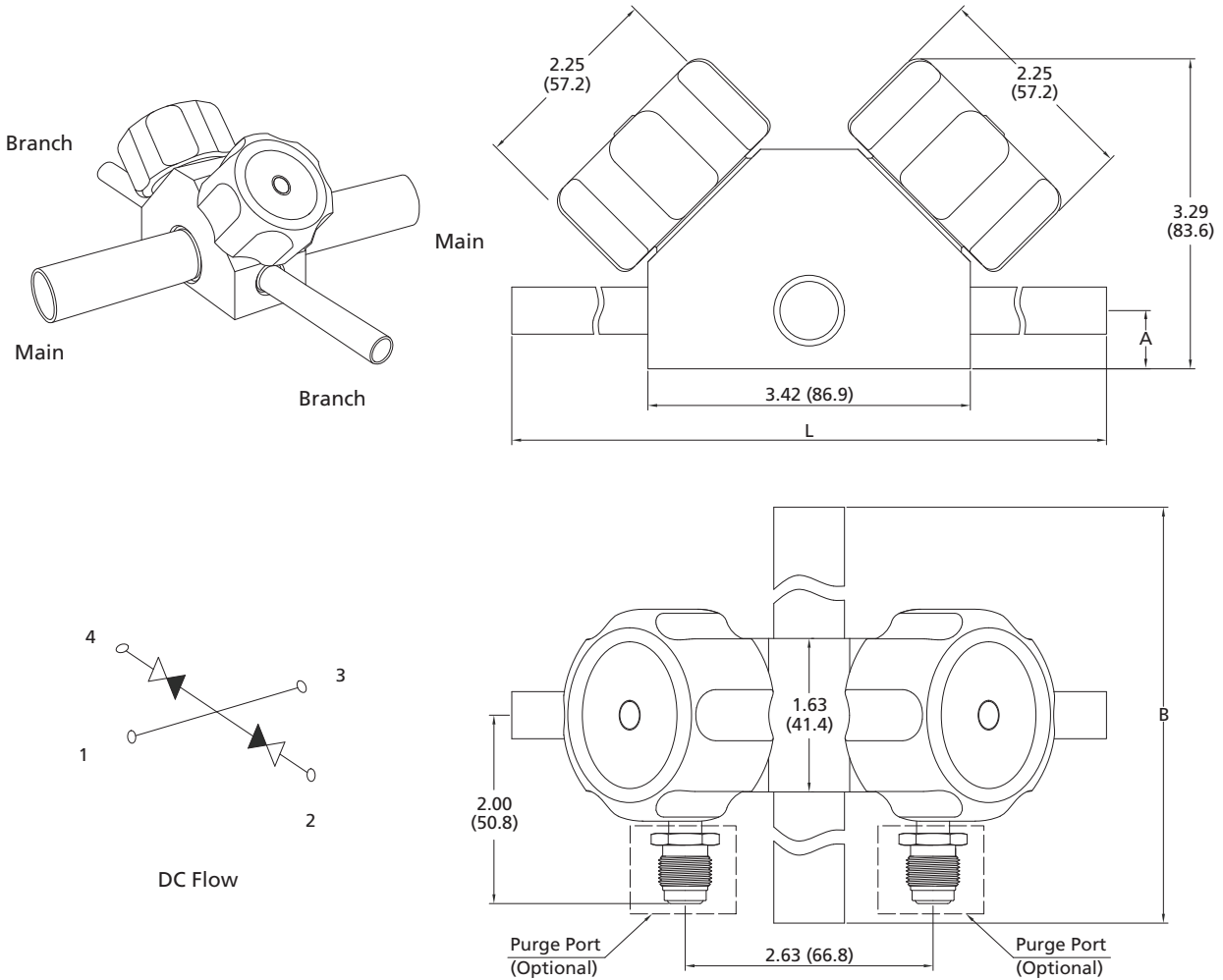


Basic Ordering Number	Connection Type and Size		Dimensions in. (mm)		
	Main	Branch	A	B	L
DV□□-TB12-TB8-	3/4" × 0.065"	1/2" × 0.049"	0.62 (15.7)	3.79 (96.3)	9.38 (238.0)
DV□□-TB12-RFR8-	3/4" × 0.065"	1/2" Rotatable Male FR	0.62 (15.7)	3.79 (96.3)	9.38 (238.0)
DV□□-TB16-TB8-	1" × 0.065"	1/2" × 0.049"	0.62 (15.7)	3.79 (96.3)	9.38 (238.0)
DV□□-TB16-RFR8-	1" × 0.065"	1/2" Rotatable Male FR	0.62 (15.7)	3.79 (96.3)	9.38 (238.0)

Block Type

Dimensions

Dimensions, in inches (millimeters), are for reference only.

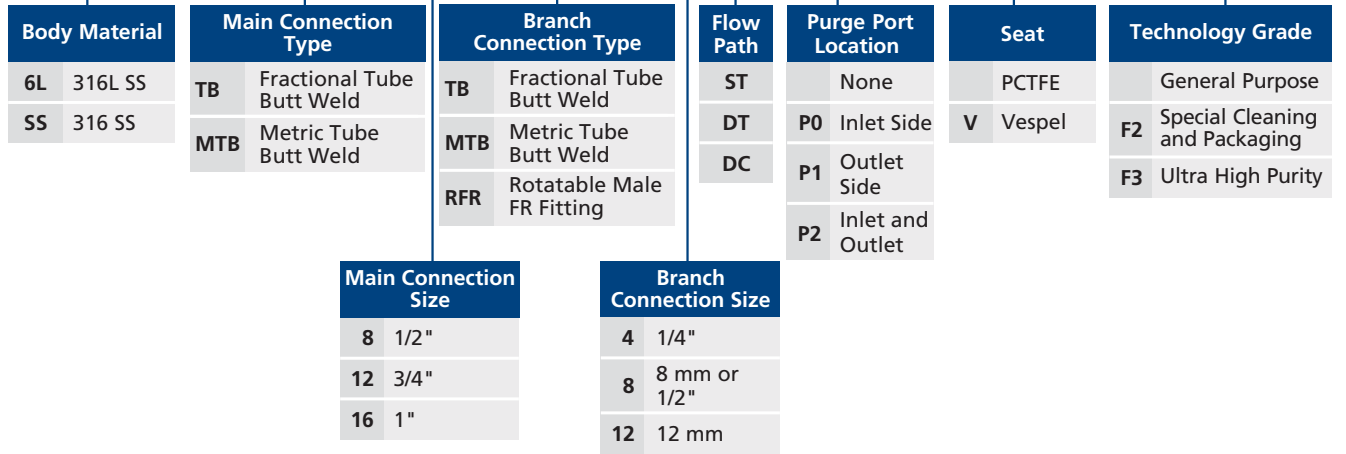


Basic Ordering Number	Connection Type and Size		Dimensions in. (mm)		
	Main	Branch	A	B	L
DV□□-TB8-TB8-	1/2" × 0.049"	1/2" × 0.049"	0.62 (15.7)	7.58 (193.0)	9.38 (238.0)
DV□□-TB8-RFR8-	1/2" × 0.049"	1/2" Rotatable Male FR	0.62 (15.7)	7.58 (193.0)	9.38 (238.0)
DV□□-TB12-TB8-	3/4" × 0.065"	1/2" × 0.049"	0.62 (15.7)	7.58 (193.0)	9.38 (238.0)
DV□□-TB12-RFR8-	3/4" × 0.065"	1/2" Rotatable Male FR	0.62 (15.7)	7.58 (193.0)	9.38 (238.0)
DV□□-TB16-TB8-	1" × 0.065"	1/2" × 0.049"	0.62 (15.7)	7.58 (193.0)	9.38 (238.0)
DV□□-TB16-RFR8-	1" × 0.065"	1/2" Rotatable Male FR	0.62 (15.7)	7.58 (193.0)	9.38 (238.0)

V-47 Diaphragm Valves

Ordering Number Description

DV6L - TB12 - TB8 - DC - P2 - VF2



Fittings

Valves & Regulators

Diaphragm Valves

DL Series Low Pressure/Ultra High Flow Diaphragm Valves

Features

- ⦿ Ideal for ultra high flow applications
- ⦿ Metal to metal sealed diaphragm to ensure excellent leak integrity
- ⦿ Internally threadless and springless
- ⦿ PCTFE stem tip insert for leak-tight shutoff
- ⦿ Upper stem position to indicate open and closed states

Technical Data

Port Size	3/4" to 1" or 23 mm to 25 mm	
Flow Coefficient (Cv)	13	
Orifice Size	1.125 in. (28.6 mm)	
Max. Working Pressure	300 psig (20.6 bar)	
Temperature	PCTFE: -10~150°F (-23~65°C) Vespel: -10~250°F (-23~121°C)	
Leak Rate (Helium)	Internal	≤1x10 ⁻⁹ mbar l/s
	External	≤1x10 ⁻⁹ mbar l/s

Flow Data

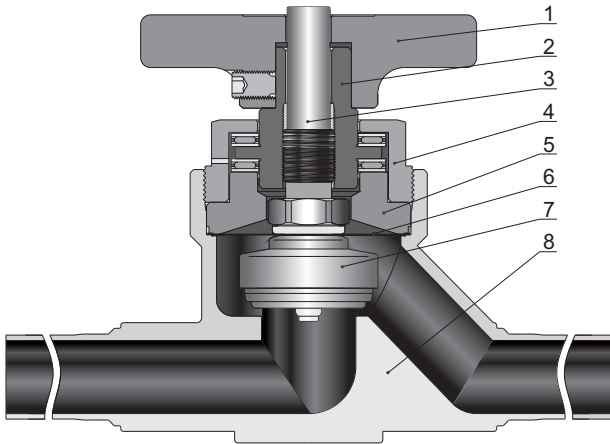
Air @ 70°F (21°C)
Water @ 60°F (16°C)

Pressure Drop to Atmosphere psi (bar)	Air (l/min)	Water (l/min)
10(0.68)	3900	150
50(3.4)	11000	340
100(6.8)	19500	490

Product Technology Grade

Product Grade Technology	General Purpose	Special Cleaning and Packaging (F2)	Ultra High Purity (F3)
Material/Specification	CF8M/ASTM A351, CF3M/ASTM A351, 316 SS/ASTM A479		316L SS/ASTM A479
Wetted Surface Roughness	Ra 20 μin. (0.51 μm)		Ra 5 μin. (0.13 μm)
Polishing Process	Machine finished		Electropolished
Process Specification	FC-01 Standard Cleaning and Packaging	FC-02 Special Cleaning and Packaging	FC-03 Ultra High Purity Process Specification
Cleaning	Thrice degreasing ultrasonic cleaning	Special cleaning with non-ozone-depleting chemicals	Ultra high purity cleaning in continuously monitored ultrasonic cleaning system with deionized water
Assembly Environment	At atmosphere	In specially cleaned areas	In ISO Class 5/Federal Class 100 cleanroom
Packaging	Individually bagged	Double bagged	Double bagged and vacuum sealed in cleanroom

Major Materials of Construction

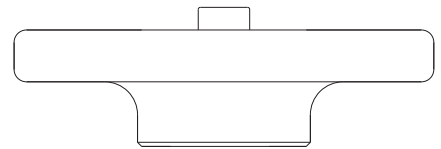


Item	Component	Material/Specification
1	Handle	Aluminum
2	Actuator	416 SS/ASTM A582
3	Upper stem	316 SS/ASTM A479
4	Bonnet nut	316 SS/ASTM A479
5	Bonnet	316 SS/ASTM A479
6	Diaphragm (3)	Elgiloy/AMS 5876
7	Stem subassembly	316L SS/ASTM A479 and PCTFE/ASTM D1430 or 316L SS/ASTM A479 and Vespel
8	Body	CF8M/ASTM A351, CF3M/ASTM A351 316 SS/ASTM A479 316L SS/ASTM A479

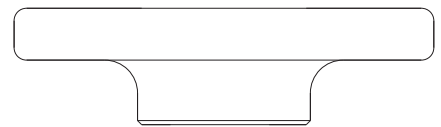
Actuators

Handle

- ⦿ Five turns and a half to operate from fully open to closed
- ⦿ Upper stem position to indicate open and closed states



OPEN

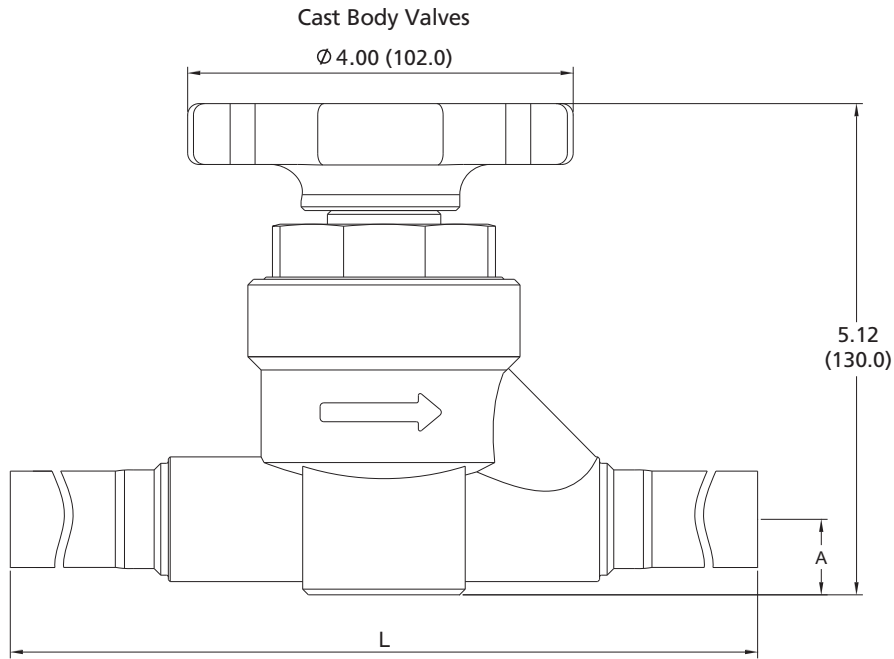


CLOSED

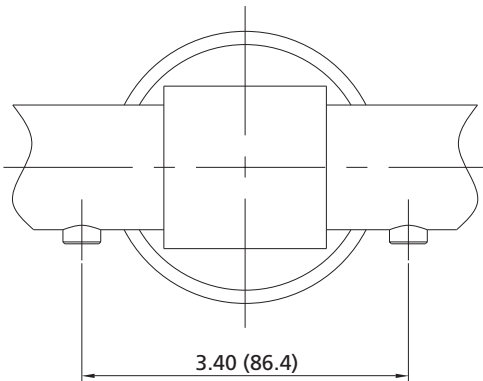
Notes: The upper stem protruding from the handle indicates open state.
The upper stem paralleling to or sinking into the handle indicates closed state.

Dimensions

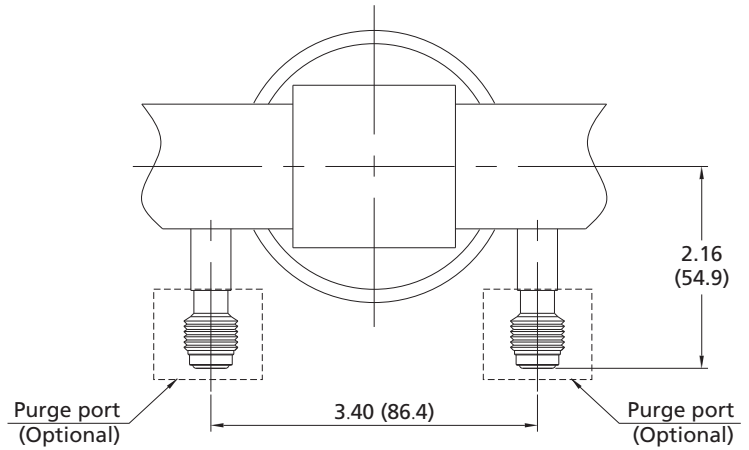
Dimensions, in inches (millimeters), are for reference only.



No purge ports



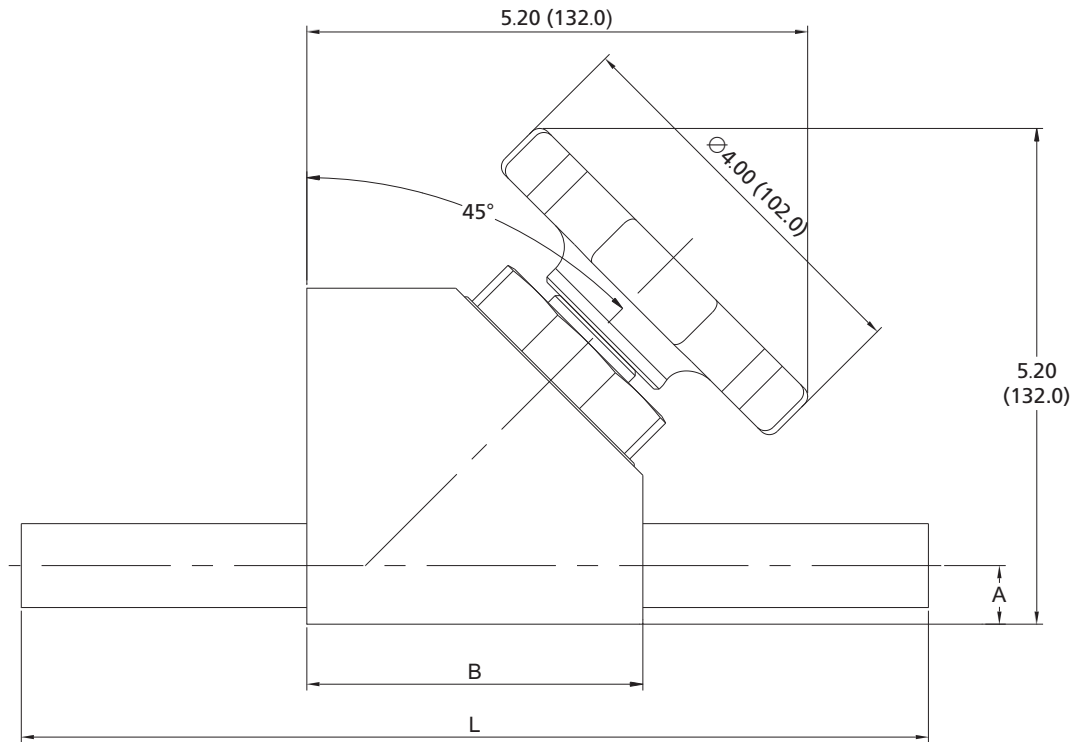
Integral 1/4" Male FR Fittings



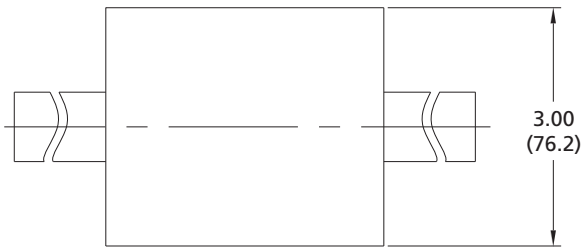
Basic Ordering Number	End Connections		Dimensions, in. (mm)	
	Type	Size	A	L
DL□□-FL12-	FITOK Tube Fitting	3/4"	0.79 (20.0)	8.27 (210.0)
DL□□-FL16-		1"		8.46 (215.0)
DL□□-ML25-		25 mm		8.63 (219.0)
DL□□-TB16-	Tube extension, 2.75 in. (69.8 mm) long	1" x 0.065"	0.79 (20.0)	10.90 (277.0)
DL□□-MTB23-		23 x 1.5 mm		
DL□□-MTB25-		25 x 1.5 mm		

V-51 Diaphragm Valves

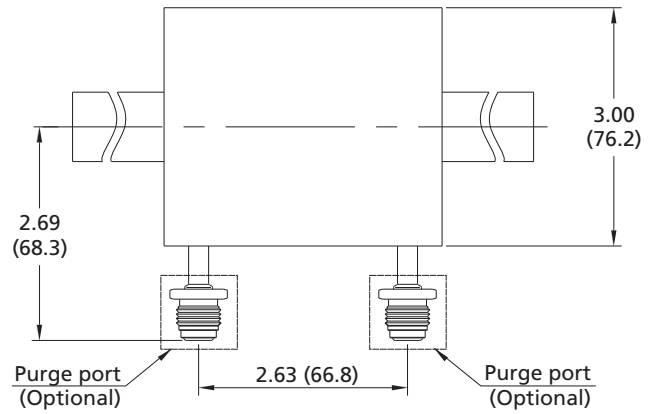
Bar Stock Valves



No purge ports



1/4" Rotatable Male FR Fittings



Basic Ordering Number	End Connections		Dimensions, in. (mm)		
	Type	Size	A	B	L
DL□□-TB12-B-	Tube Butt Weld	3/4" x 0.065"	0.61 (15.5)	3.50 (88.9)	9.46 (240.0)
DL□□-TB16-B-		1" x 0.065"			

Ordering Number Description

DL6L - TB16 - FL16 - BP2 - VF2

Body Material		Inlet Type		Inlet Size		Outlet Type	Outlet Size	Purge Port Location	Seat		Technology Grade		
6L	CF3M	FL	Fractional Tube Fitting	12	3/4"	Same as Inlet		None	PCTFE		General purpose		
	316L SS	ML	Metric Tube Fitting	16	1"			P0	Inlet Side	V	Vespel	F2	Special cleaning and Packaging
SS	CF8M	TB	Fractional Tube Butt Weld	23	23 mm	Specified in the same way as Inlet type and size		P1	Outlet Side		F3		Ultra High Purity
	316 SS	MTB	Metric Tube Butt Weld	25	25 mm			P2	Inlet and Outlet				
Valve Type													
Cast Body													
B Bar Stock													

Diaphragm Valves

DF Series High Pressure/High Flow Diaphragm Valves

Features

- ⦿ Ideal for high flow applications
- ⦿ Metal-to-metal seal
- ⦿ Spring type design
- ⦿ Elgiloy diaphragm to provide high strength and corrosion resistance to ensure long cycle life
- ⦿ Indicator switch available assembled on pneumatic valves, transmitting a signal to an electrical device to indicated either the open or closed position of the valves
- ⦿ Normally closed and normally open indicator switches optional

Technical Data

Port Size			3/8" to 1/2" or 8 mm to 12 mm
Flow Coefficient (Cv)			0.80
Orifice Size			0.31 in. (8.0 mm)
Max. Working Pressure	Handle	3500 psig (241 bar)	
	Pneumatic	3000 psig (206 bar)	
Max. Differential Back Pressure			150 psig (10.3 bar)
Pneumatic Actuator Operating Pressure			60 to 90 psig (4.2 to 6.2 bar)
Temperature			PCTFE: -10~150°F (-23~65°C) VespeI: -10~250°F (-23~121°C)
Leak Rate (Helium)	Internal	≤4x10 ⁻⁹ mbar l/s	
	External	≤4x10 ⁻⁹ mbar l/s	

Flow Data

Air @ 70°F (21°C)

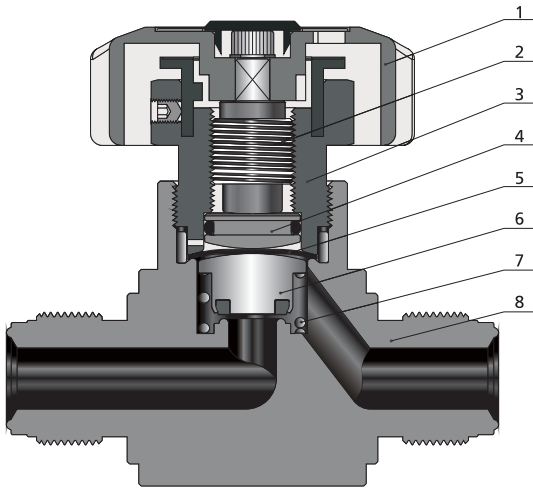
Water @ 60°F (16°C)

Pressure Drop to Atmosphere psi (bar)	Air (l/min)	Water (l/min)
10 (0.68)	274	9.5
50 (3.4)	733	21.5
100 (6.8)	1300	30.3

Product Technology Grade

Product Grade Technology	General Purpose	Special Cleaning and Packaging (F2)	Ultra High Purity (F3)
Material/Specification	316 SS/ASTM A479 or 316L SS/ASTM A479		316L SS/ASTM A479
Wetted Surface Roughness	Ra 20 μin. (0.51 μm)		Ra 10 μin. (0.25 μm)
Polishing Process	Machine finished		Electropolished
Process Specification	FC-01 Standard Cleaning and Packaging	FC-02 Special Cleaning and Packaging	FC-03 Ultra High Purity Process Specification
Cleaning	Thrice degreasing ultrasonic cleaning	Special cleaning with non-ozone-depleting chemicals	Ultra high purity cleaning in continuously monitored ultrasonic cleaning system with deionized water
Assembly Environment	At atmosphere	In specially cleaned areas	In ISO Class 5/Federal Class 100 cleanroom
Packaging	Individually bagged	Double bagged	Double bagged and vacuum sealed in cleanroom

Major Materials of Construction



Round Handle Model

Item	Component	Material/Specification
1	Handle	Aluminum
2	Actuator	316 SS/ASTM A479
3	Bonnet Nut	S17400/ASTM A564
4	Button	C36000/ASTM B16
5	Diaphragm (5)	Elgiloy (3) /AMS 5876 + C17200 (2) /ASTM B194
6	Stem Subassembly	316L SS/ASTM A479 and PCTFE/ASTM D1430 or 316L SS/ASTM A479 and Vespel
7	Spring	316 SS/ASTM A313
8	Body	316 SS/ASTM A479 or 316L SS/ASTM A479

Actuators

Manual - Round Handle

- ⦿ One-half turn to operate from fully open to closed
- ⦿ Handle with window to visually indicate open and closed states



Pneumatic

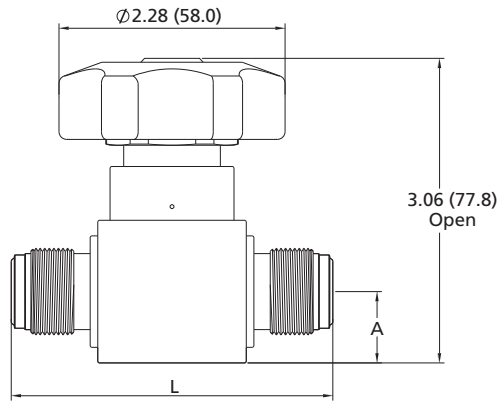
- ⦿ Normally open, "N.O." marked on the top of the cylinder
- ⦿ Normally closed, "N.C." marked on the top of the cylinder



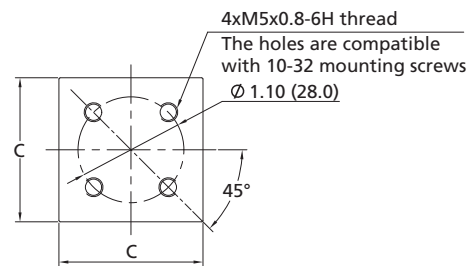
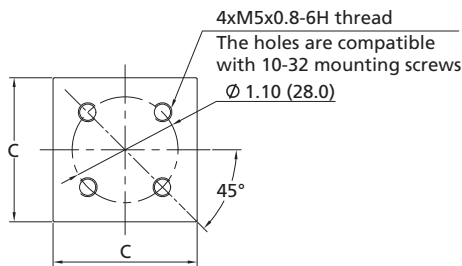
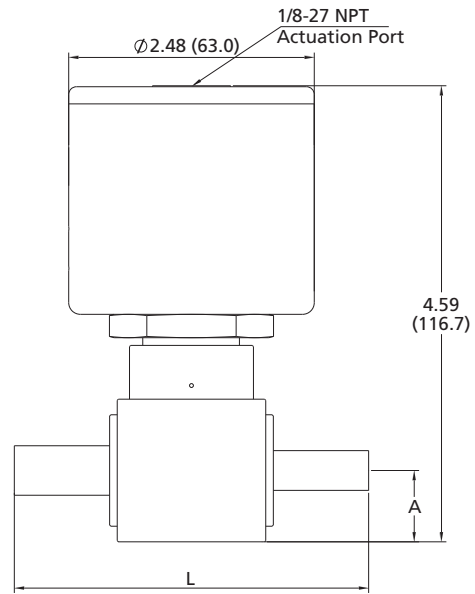
Dimensions

Dimensions, in inches (millimeters), are for reference only.

Manual - Round Handle

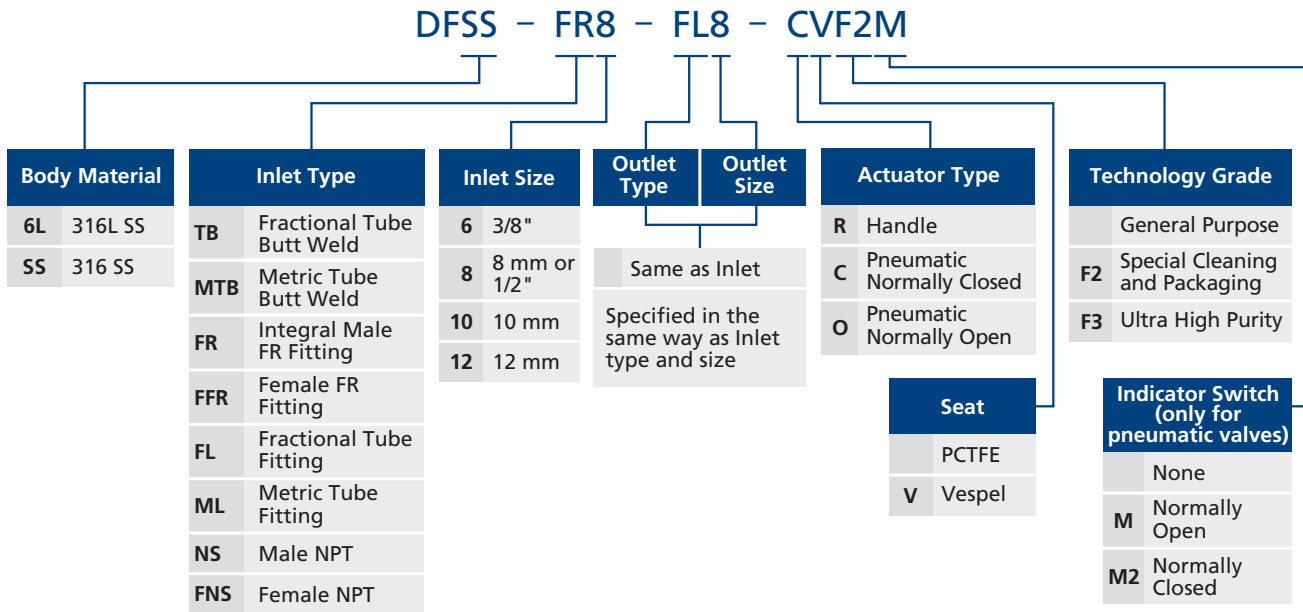


Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)		
		A	C	L
DF□□-TB6-	3/8" Tube Butt Weld	0.71 (18.0)	1.50 (38.1)	3.58 (90.9)
DF□□-TB8-	1/2" Tube Butt Weld	0.71 (18.0)	1.50 (38.1)	3.58 (90.9)
DF□□-FR8-	1/2" Integral Male FR	0.71 (18.0)	1.50 (38.1)	3.25 (82.5)
DF□□-FFR8-	1/2" Female FR	0.71 (18.0)	1.50 (38.1)	3.89 (98.8)
DF□□-FL6-	3/8" FITOK Tube Fitting	0.71 (18.0)	1.50 (38.1)	3.27 (83.0)
DF□□-FL8-	1/2" FITOK Tube Fitting	0.71 (18.0)	1.50 (38.1)	3.47 (88.2)
DF□□-FNS8-	1/2" Female NPT	0.71 (18.0)	1.50 (38.1)	3.30 (84.0)

Ordering Number Description



Fittings

Valves & Regulators