

# 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 with high strength and corrosion resistance to ensure long cycle life
- ⦿ Different handle types available

### 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	$\leq 1 \times 10^{-9}$ std cm <sup>3</sup> /s
	External	$\leq 1 \times 10^{-9}$ std cm <sup>3</sup> /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

### Process Specification

Technology	Standard Cleaning and Packaging (FC-01)	Special Cleaning and Packaging (FC-02)	Ultra High Purity (FC-03)
Material/Specification	316L SS/ASTM A479		316L VAR/SEMI F20 316L VIM-VAR/SEMI F20
Wetted Surface Roughness	Ra 10 μin. (0.25 μm) <sup>①</sup>		Ra 5 μin. (0.13 μm)
Polishing Process	Machine finished <sup>①</sup>		Electropolished

① For valves with 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).

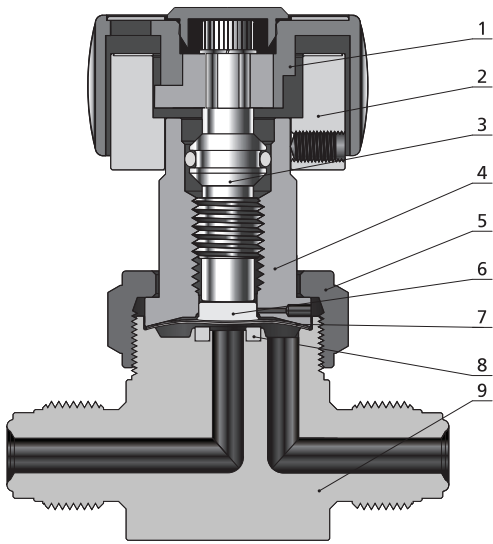
Note: Refer to page P-01 for a detailed description of Process Specification, and to page P-01 for Process Comparison.

## Major Materials of Construction

Fittings

Valves & Regulators

Process Specification



Round Handle Model

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		316L SS/ASTM A479 or 316L VAR/SEMI F20 or 316L VIM-VAR/SEMI F20

## Actuators

### Manual-Round Handle

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

### Manual-Integral Lockout Handle

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



OPEN

CLOSED

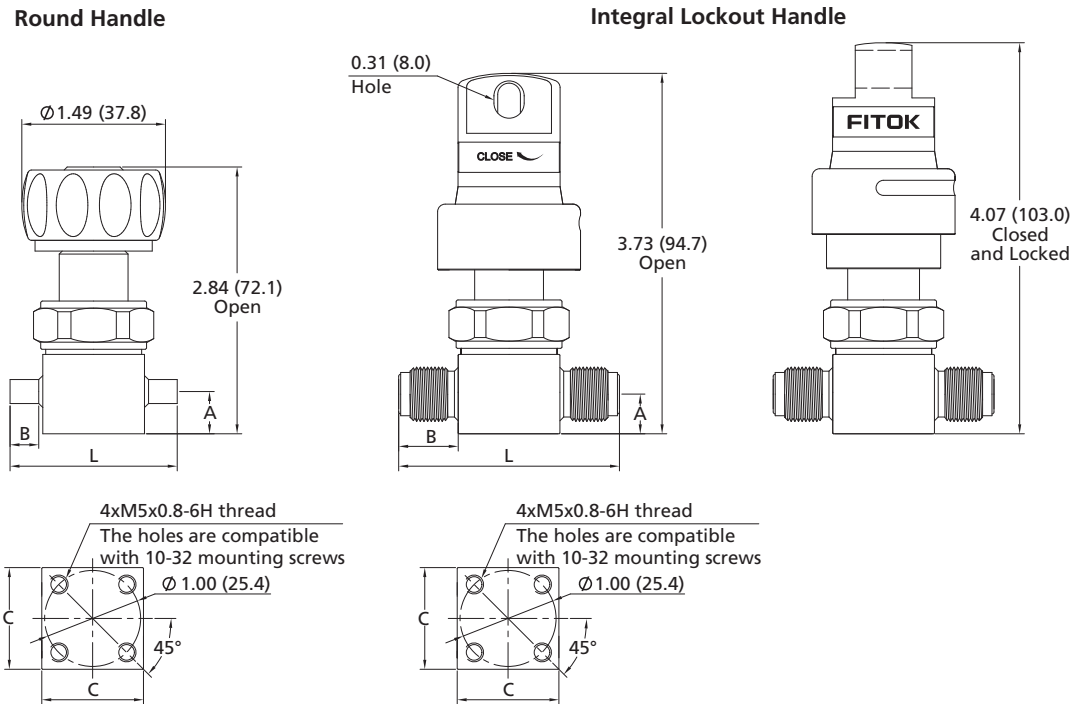


# Dimensions and Ordering Information

## Straight Type

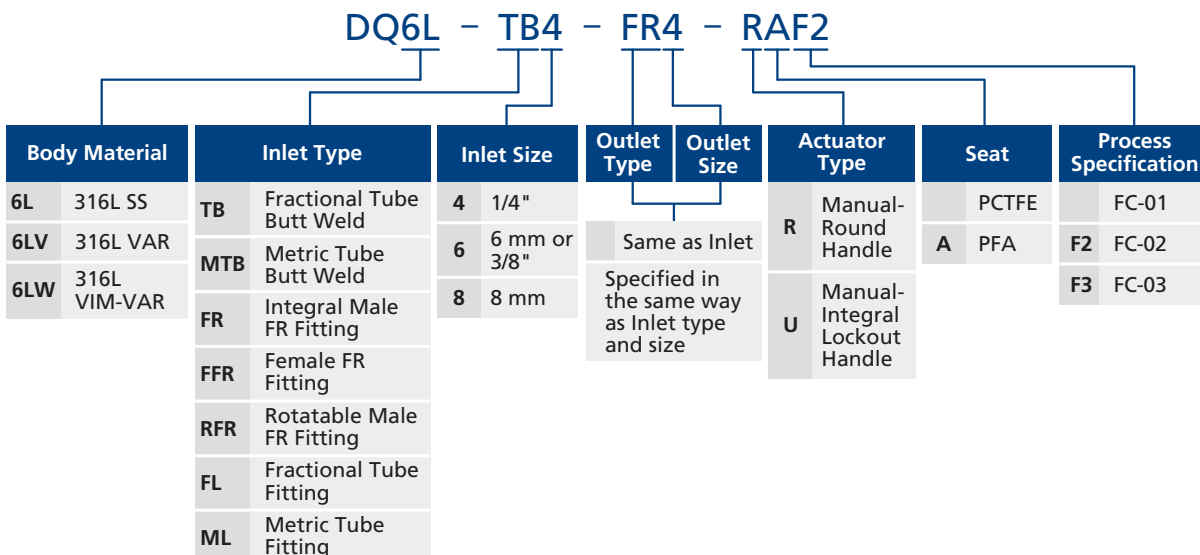
### Dimensions

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

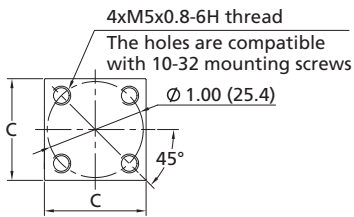
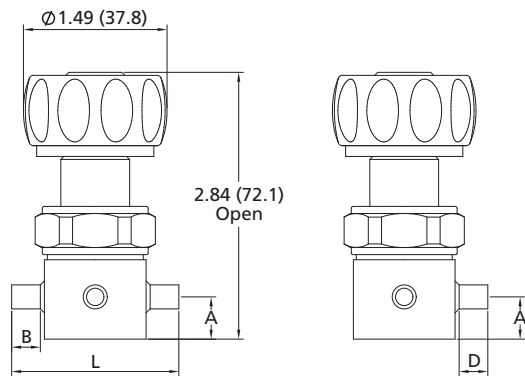


## Branch Type

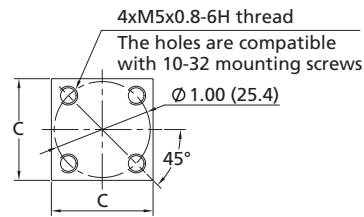
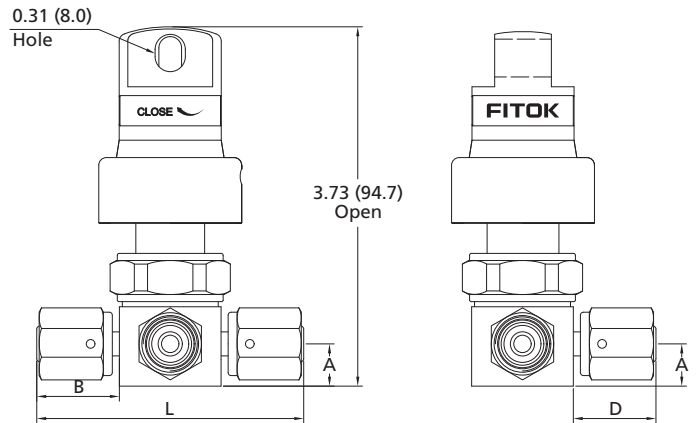
### Dimensions

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

Round Handle



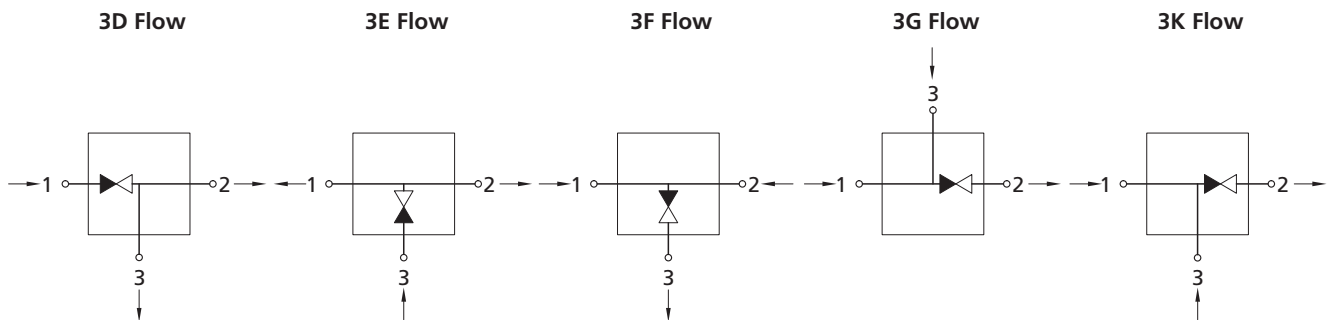
Integral Lockout Handle



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

**DQ6L - TB4 - FR4 - FFR4 - 3G - RAF2**

Body Material		Port 1 Type		Port 1 Size		Port 2/3 Type	Port 2/3 Size	Flow Path	Actuator Type		Process Specification							
6L	316L SS	TB	Fractional Tube Butt Weld	4	1/4"	Same as Port 1		3D	R	Manual-Round Handle	FC-01							
6LV	316L VAR	MTB	Metric Tube Butt Weld	6	6 mm or 3/8"			3E			F2 FC-02							
6LW	316L VIM-VAR	FR	Integral Male FR Fitting	8	8 mm	Specified in the same way as Port 1 type and size		3F			F3 FC-03							
		FFR	Female FR Fitting					3G	U	Manual-Integral Lockout Handle	<table border="1"> <thead> <tr> <th colspan="2">Seat</th> </tr> </thead> <tbody> <tr> <td></td> <td>PCTFE</td> </tr> <tr> <td>A</td> <td>PFA</td> </tr> </tbody> </table>		Seat			PCTFE	A	PFA
Seat																		
	PCTFE																	
A	PFA																	
		RFR	Rotatable Male FR Fitting					3K										
		FL	Fractional Tube Fitting															
		ML	Metric Tube Fitting															

Fittings

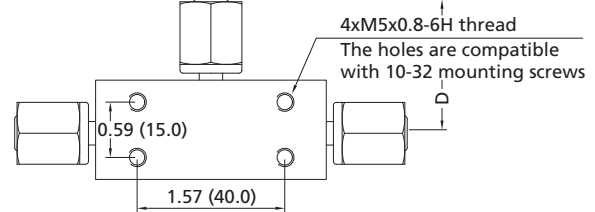
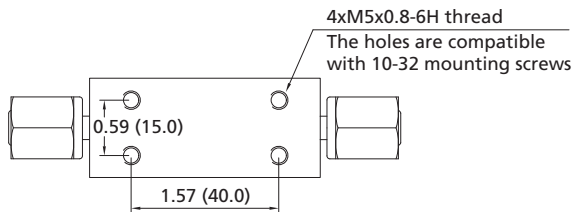
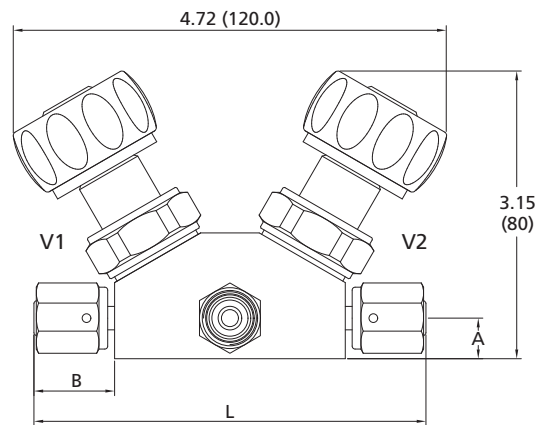
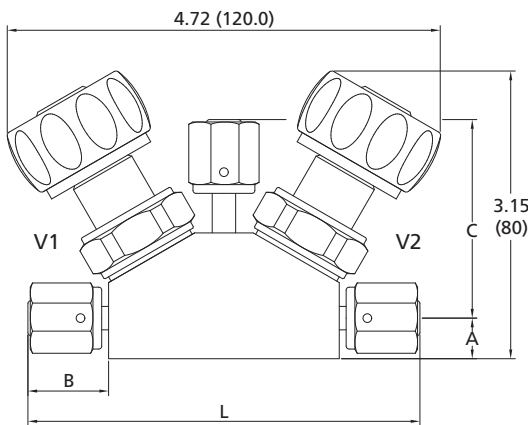
Valves & Regulators

Process Specification

2-Valve 3-Way Block Type

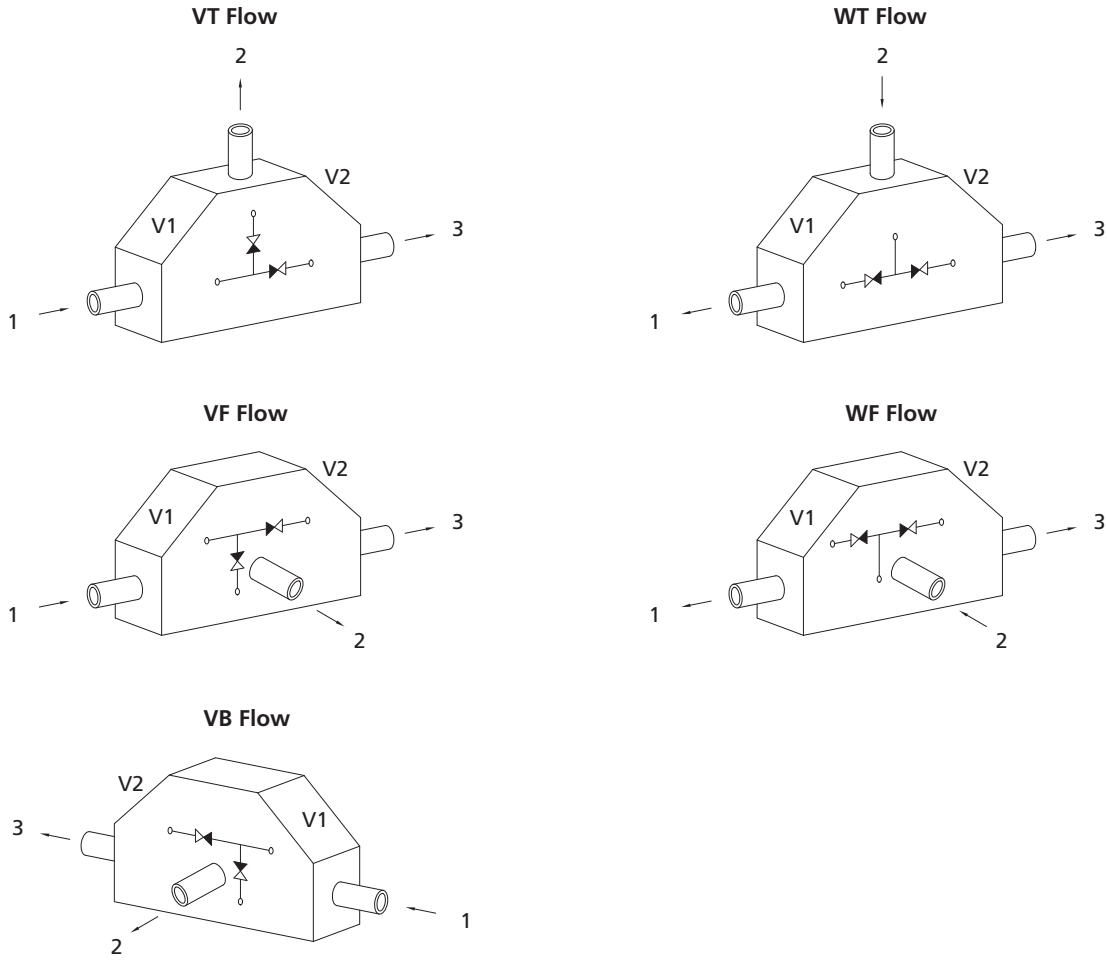
Dimensions

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)

Flow Paths



Ordering Number Description

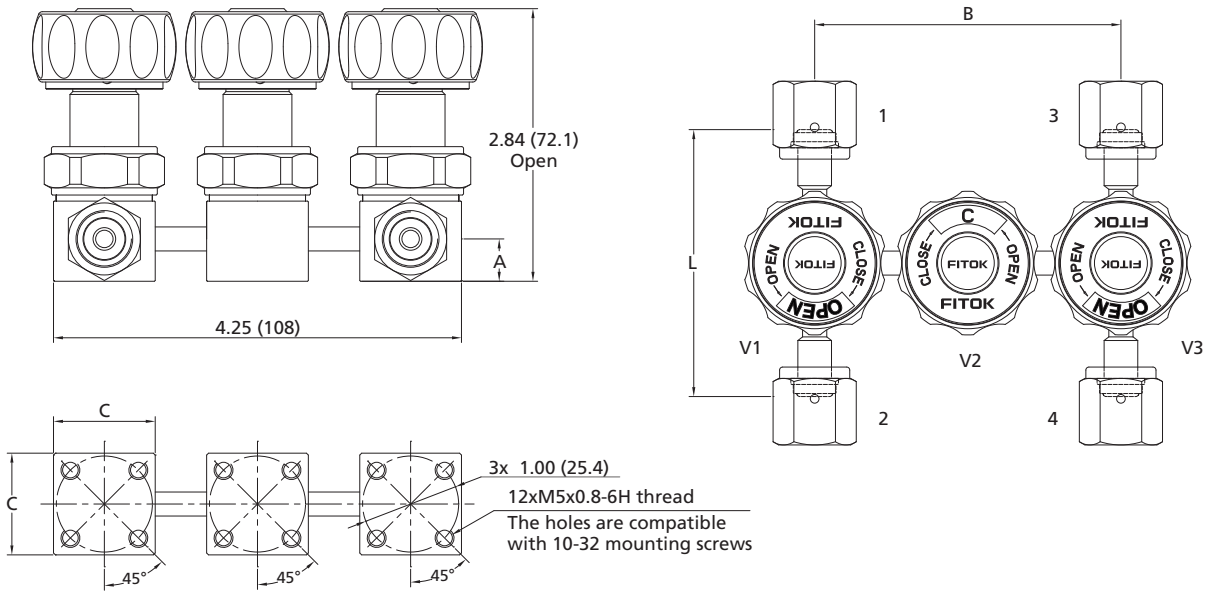
DQ236L - FFR4 - RFR4 - FFR4 - VF - RAF2

Type	Body Material	Port 1 Type	Port 1 Size	Port 2/3 Type	Port 2/3 Size	Flow Path	Seat	Process Specification
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	FC-01
	6LV 316L VAR	RFR Rotatable Male FR Fitting				VF	A PFA	F2 FC-02
	6LW 316L VIM-VAR	RFR Rotatable Male FR Fitting			VB	<b>Actuator Type</b>	F3 FC-03	
				WT	R Manual-Round Handle			
				WF	U Manual-Integral Lockout Handle			

### 3-Valve 4-Way Block Type

#### Dimensions

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

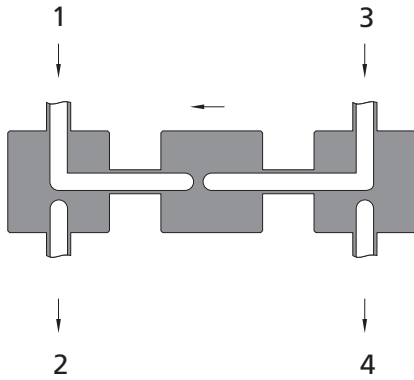


Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)			
		A	B	C	L
DQ34□□-FFR4-	1/4" Female FR	0.44 (11.2)	3.19 (81.0)	1.06 (26.9)	2.78 (70.6)
DQ34□□-RFR4-	1/4" Rotatable Male FR	0.44 (11.2)	3.19 (81.0)	1.06 (26.9)	2.78 (70.6)

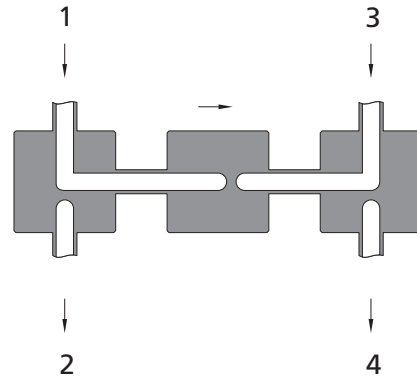


**Flow Paths**

☉ 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	Actuator Type	Process Specification
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	Same as Port 1	GK	R Manual-Round Handle U Manual-Integral Lockout Handle	FC-01
	6LV 316L VAR	RFR Rotatable Male FR Fitting				F2 FC-02		
	6LW 316L VIM-VAR	RFR Rotatable Male FR Fitting				F3 FC-03		
								<b>Seat</b>
								PCTFE
								A PFA

Fittings

Valves & Regulators

Process Specification

# 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 with high strength and corrosion resistance to ensure long cycle life
- ⦿ Long cycle life with high speed actuation
- ⦿ Internally threadless and springless
- ⦿ Fully functional under vacuum conditions
- ⦿ Position sensors available assembled on normally closed pneumatically actuated 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)	
Temperature	PCTFE: -10~150°F (-23~65°C) PFA: -10~302°F (-23~150°C)	
Leak Rate (Helium)	Internal	$\leq 1 \times 10^{-9}$ std cm <sup>3</sup> /s
	External	$\leq 1 \times 10^{-9}$ std cm <sup>3</sup> /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

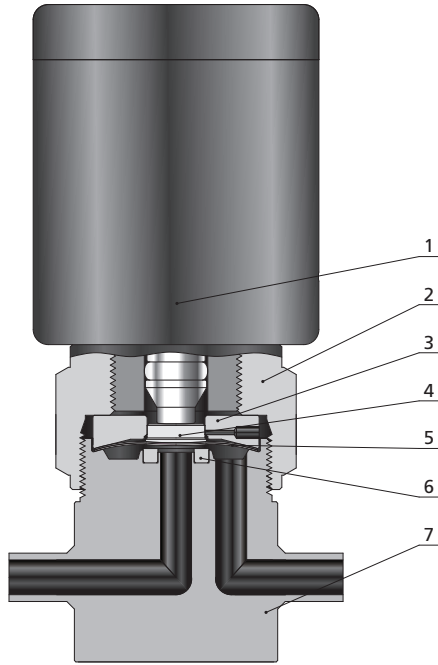
### Process Specification

Technology	Standard Cleaning and Packaging (FC-01)	Special Cleaning and Packaging (FC-02)	Ultra High Purity (FC-03)
Material/Specification	316L SS/ASTM A479		316L VAR/SEMI F20 316L VIM-VAR /SEMI F20
Wetted Surface Roughness	Ra 10 μin. (0.25 μm) <sup>①</sup>		Ra 5 μin. (0.13 μm)
Polishing Process	Machine finished <sup>①</sup>		Electropolished

① For valves with 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)

Note: Refer to page P-01 for a detailed description of Process Specification, and to page P-01 for Process Comparison..

## Major Materials of Construction

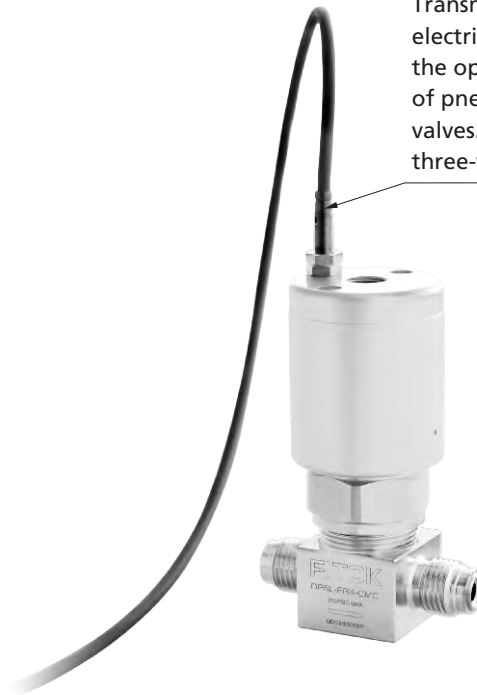


Normally Closed Model

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	316L SS/ASTM A479 or 316L VAR/SEMI F20 or 316L VIM-VAR/SEMI F20

## Pneumatic Actuators

- ☉ Normally open, "N.O." marked on the top of the actuator
- ☉ Normally closed, "N.C." marked on the top of the actuator



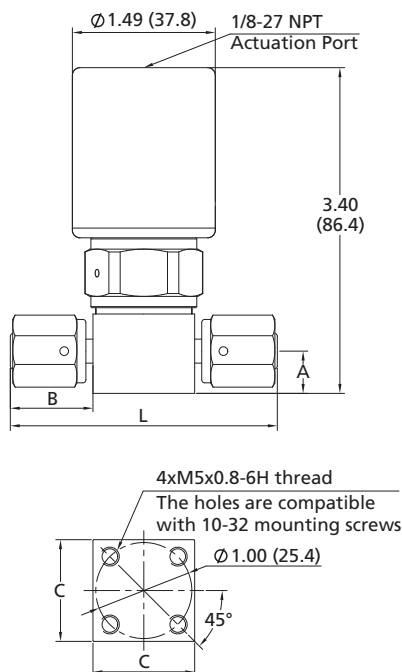
Position Sensors  
Transmit a signal to an electrical device indicating the open and closed position of pneumatically actuated valves. Voltage 10-30VDC, three-wire PNP output

## Dimensions and Ordering Information

### Straight Type

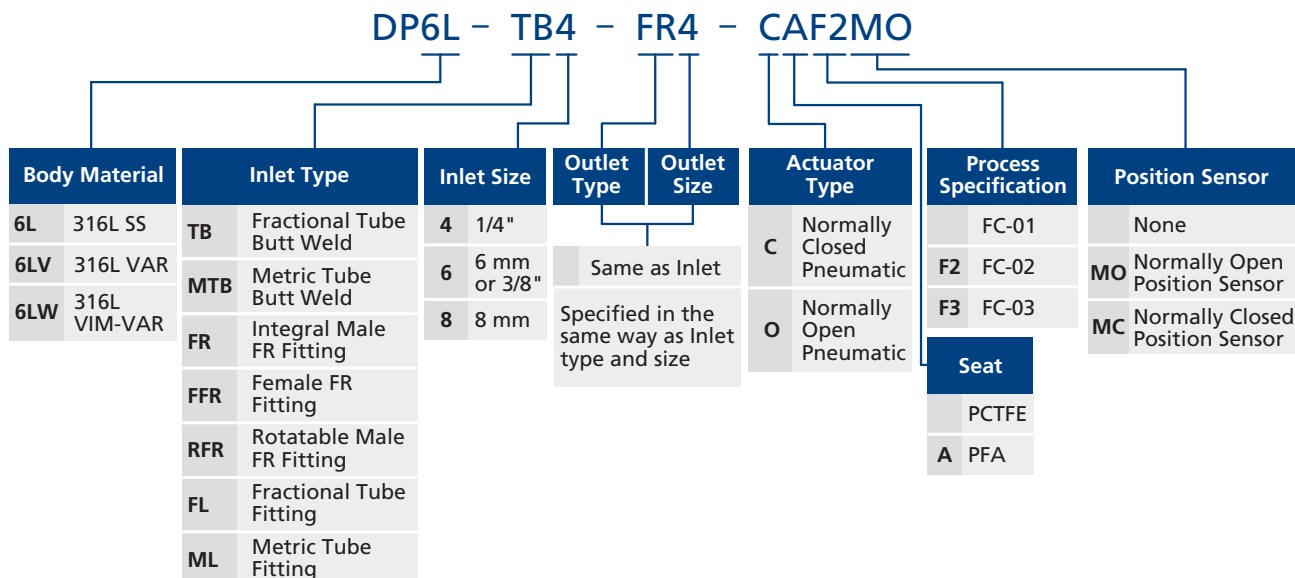
#### Dimensions

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)

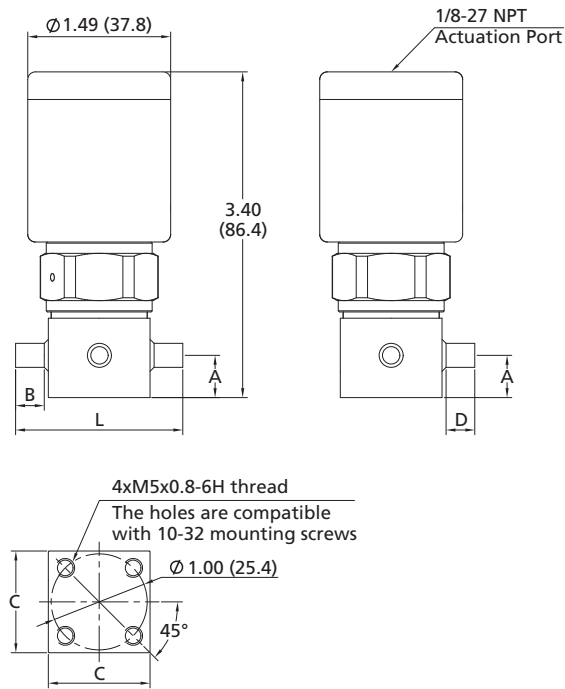
#### Ordering Number Description



## Branch Type

### Dimensions

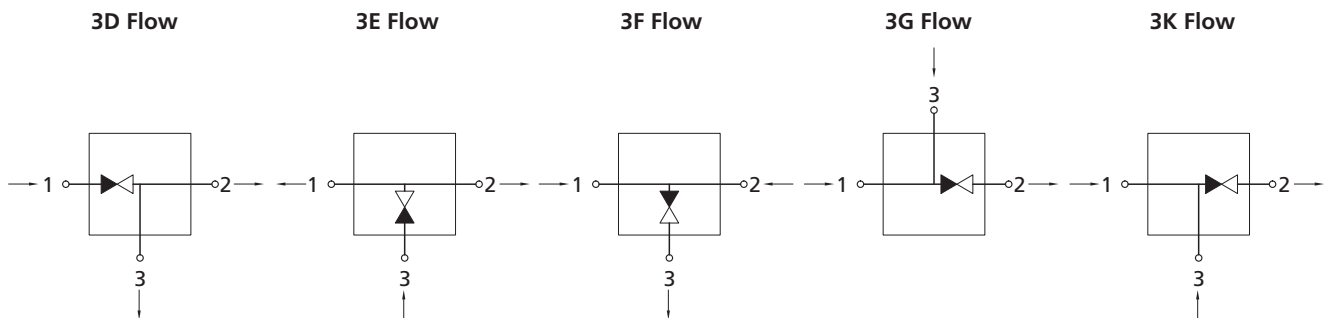
Dimensions, in inches (millimeters), are for reference only.



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 - CAF2MO

Body Material		Port 1 Type		Port 1 Size		Port 2/3 Type	Port 2/3 Size	Flow Path	Actuator Type		Process Specification			
6L	316L SS	TB	Fractional Tube Butt Weld	4	1/4"	Same as Port 1	Specified in the same way as Port 1 type and size	3D	C	Normally Closed Pneumatic	FC-01			
6LV	316L VAR	MTB	Metric Tube Butt Weld	6	6 mm or 3/8"			3E			F2	FC-02		
6LW	316L VIM-VAR	FR	Integral Male FR Fitting	8	8 mm			3F	O	Normally Open Pneumatic	F3	FC-03		
		FFR	Female FR Fitting					3G			Position Sensor			
		RFR	Rotatable Male FR Fitting					3K			None			
		FL	Fractional Tube Fitting									MO	Normally Open Position Sensor	
		ML	Metric Tube Fitting									MC	Normally Closed Position Sensor	
												Seat		
												PCTFE		
												A		PFA

Fittings

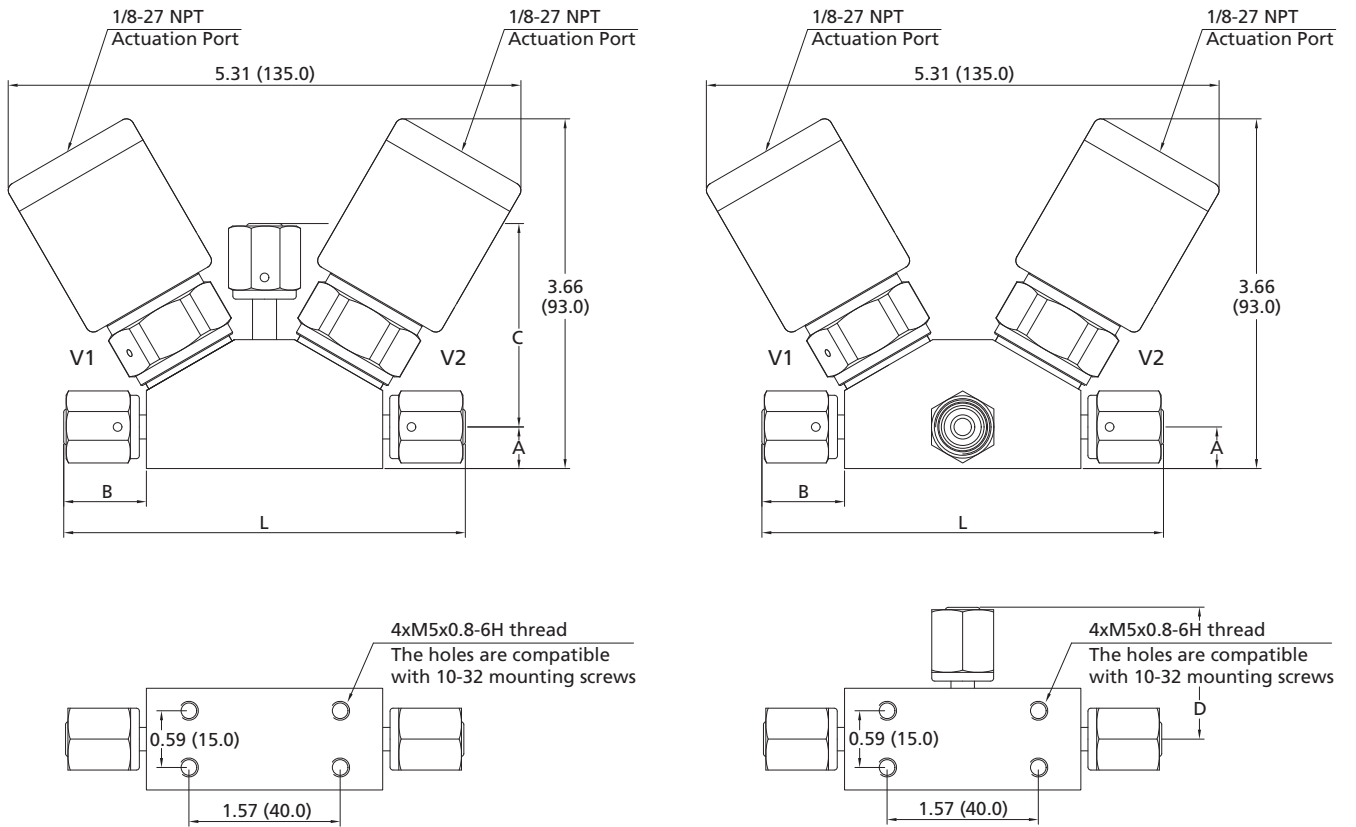
Valves & Regulators

Process Specification

## 2-Valve 3-Way Block Type

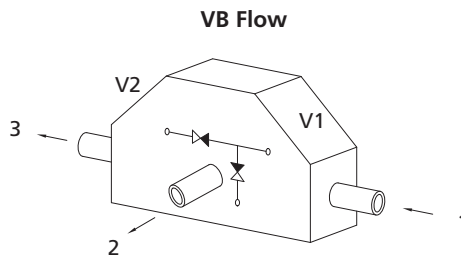
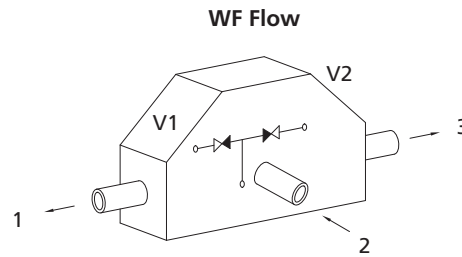
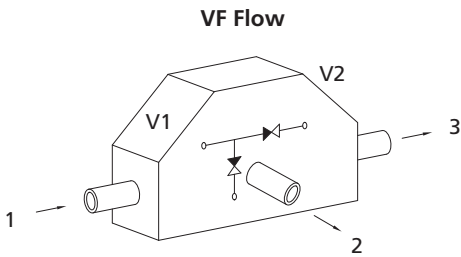
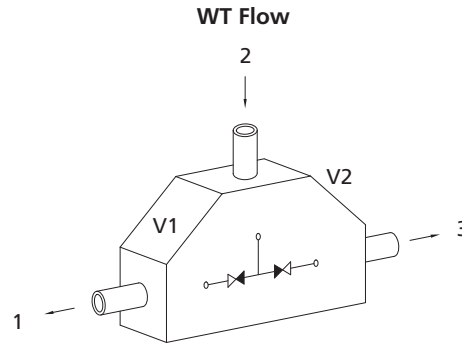
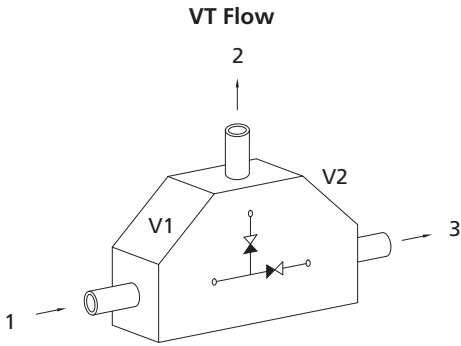
### Dimensions

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



Fittings

Valves & Regulators

Process Specification

Ordering Number Description

DP236L - FFR4 - RFR4 - FFR4 - VF - COAF2MO

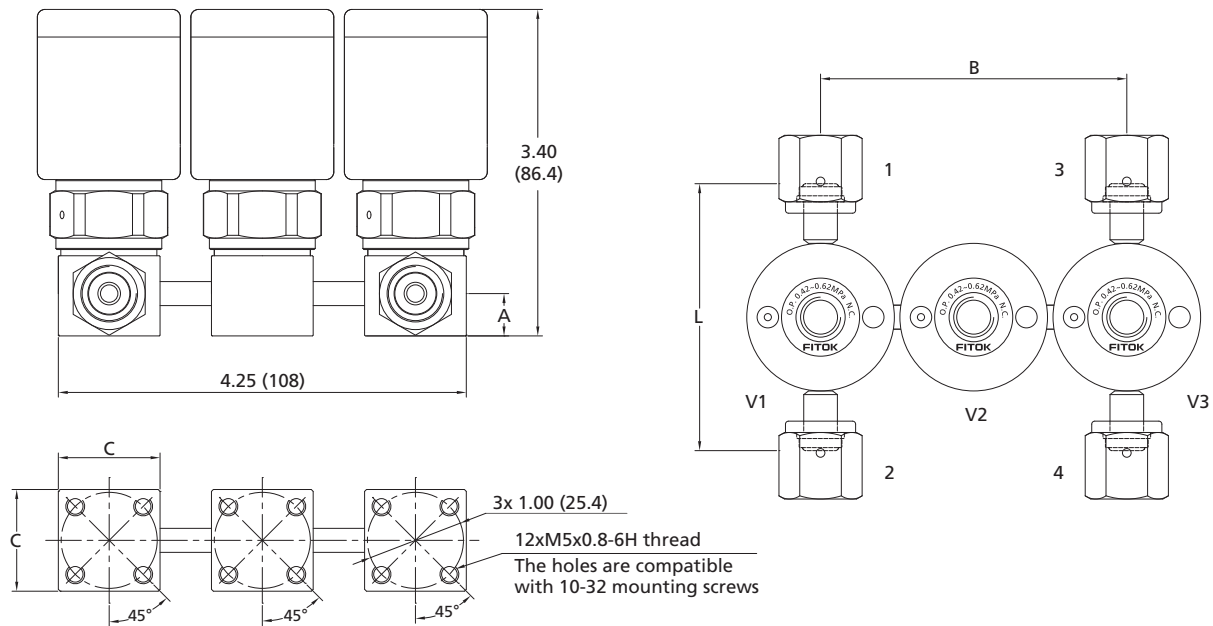
Type	Body Material	Port 1 Type	Port 2/3 Type	Port 2/3 Size	Actuator Type (V1 and V2)	Process Specification
23 2 Valves and 3 Ports	6L 316L SS 6LV 316L VAR 6LW 316L VIM-VAR	FFR Female FR Fitting RFR Rotatable Male FR Fitting	Same as Port 1	Specified in the same way as Port 1 type and size	C V1 Normally Closed Pneumatic V2 Normally Closed Pneumatic O V1 Normally Open Pneumatic V2 Normally Open Pneumatic CO V1 Normally Closed Pneumatic V2 Normally Open Pneumatic OC V1 Normally Open Pneumatic V2 Normally Closed Pneumatic	FC-01 F2 FC-02 F3 FC-03
		Port 1 Size 4 1/4"				Position Sensor None MO Normally Open Position Sensor MC Normally Closed Position Sensor
				Flow Path VT VF VB WT WF	Seat PCTFE A PFA	



### 3-Valve 4-Way Block Type

#### Dimensions

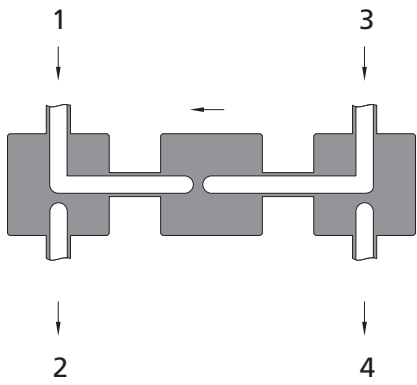
Dimensions, in inches (millimeters), are for reference only.



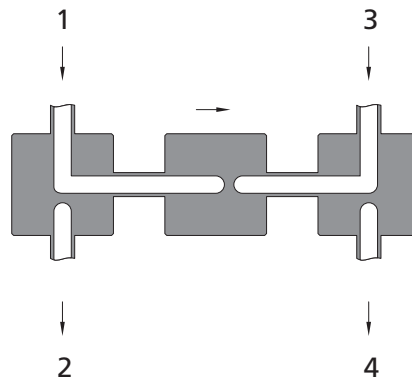
Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)			
		A	B	C	L
DP34□□-FFR4-	1/4" Female FR	0.44 (11.2)	3.19 (81.0)	1.06 (26.9)	2.78 (70.6)
DP34□□-RFR4-	1/4" Rotatable Male FR	0.44 (11.2)	3.19 (81.0)	1.06 (26.9)	2.78 (70.6)

**Flow Paths**

☉ Flow paths as viewed from the top



GK Flow



KG Flow

**Ordering Number Description**

**DP346L - FFR4 - RFR4 - FFR4 - FFR4 - GK - CAF3MO**

Type	Body Material	Port 1 Type	Port 1 Size	Port 2/3/4 Type	Port 2/3/4 Size	Flow Path	Seat	Process Specification
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	PCTFE	FC-01
	6LV 316L VAR	RFR Rotatable Male FR Fitting				KG	A PFA	F2 FC-02
	6LW 316L VIM-VAR							F3 FC-03
						<b>Actuator Type</b>	<b>Position Sensor</b>	
						C Normally Closed Pneumatic	None	
						O Normally Open Pneumatic	MO Normally Open Position Sensor	
							MC Normally Closed Position Sensor	

# Diaphragm Valves

## DH Series High Pressure Springless Diaphragm Valves

### Features

- ⦿ Metal-to-metal diaphragm seal
- ⦿ Elgiloy diaphragm with high strength and corrosion resistance to ensure long cycle life
- ⦿ Long cycle life in high pressure application
- ⦿ Manual and pneumatic actuators available
- ⦿ Position sensors available assembled on pneumatically actuated valves
- ⦿ Normally open and normally closed position sensors 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) VESPEL: 50~300°F (10~150°C)	
Leak rate (Helium)	Internal	$\leq 1 \times 10^{-9}$ std cm <sup>3</sup> /s
	External	$\leq 1 \times 10^{-9}$ std cm <sup>3</sup> /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

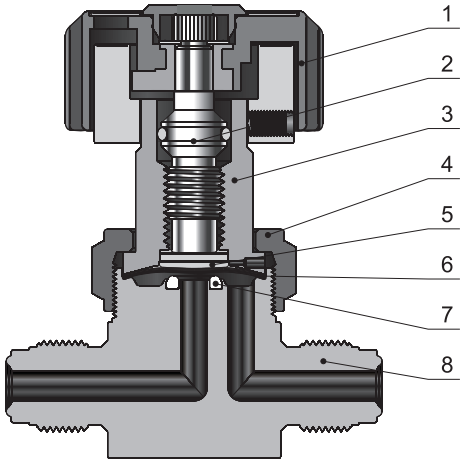
### Process Specification

Technology	Standard Cleaning and Packaging (FC-01)	Special Cleaning and Packaging (FC-02)	Ultra High Purity (FC-03)
Material/Specification	316L SS/ASTM A479		316L VAR/SEMI F20 316L VIM-VAR /SEMI F20
Wetted Surface Roughness	Ra 10 $\mu$ m. (0.25 $\mu$ m) <sup>①</sup>		Ra 5 $\mu$ m. (0.13 $\mu$ m)
Polishing Process	Machine finished <sup>①</sup>		Electropolished

① For valves with 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  $\mu$ m. (0.13  $\mu$ m).

Note: Refer to page P-01 for a detailed description of Process Specification, and to page P-01 for Process Comparison.

## 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	316L SS/ASTM A479 or 316L VAR/SEMI F20 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 actuator
- ⦿ Normally closed, "N.C." marked on the top of the actuator



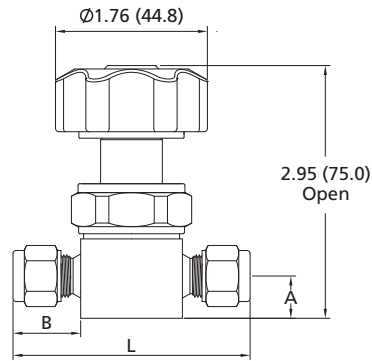
# Dimensions and Ordering Information

## Straight Type

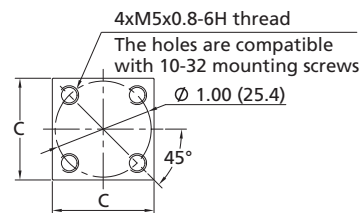
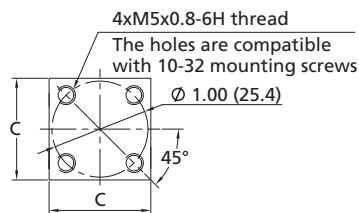
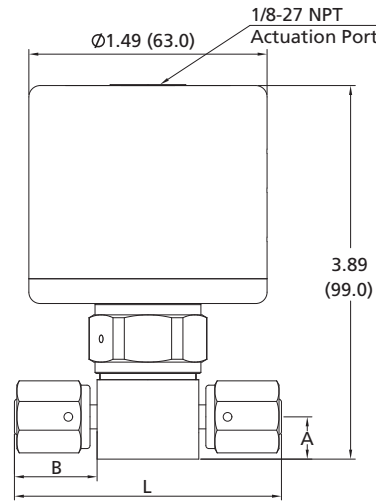
### Dimensions

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 - CVF2MO

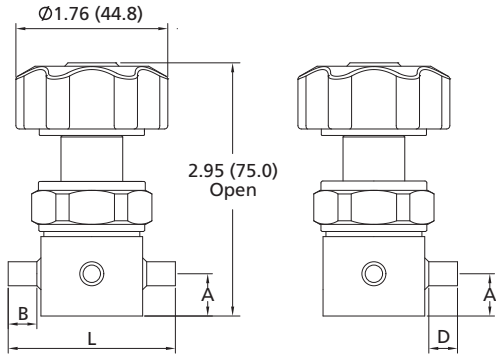
Body Material		Inlet Type		Outlet Type	Outlet Size	Actuator Type	Seat	Process Specification	
6L	316L SS	TB	Fractional Tube Butt Weld	Same as Inlet	Specified in the same way as Inlet type and size	R	PCTFE	FC-01	
6LV	316L VAR	MTB	Metric Tube Butt Weld			C	V	F2	FC-02
6LW	316L VIM-VAR	FR	Integral Male FR Fitting			O		F3	FC-03
		FFR	Female FR Fitting						
		RFR	Rotatable Male FR Fitting						
		FL	Fractional Tube Fitting						
		ML	Metric Tube Fitting						
				Inlet Size					
				4	1/4"				
				6	6 mm or 3/8"				
				8	8 mm				
								Position Sensor	
								None	
								MO Normally Open Position Sensor	
								MC Normally Closed Position Sensor	

## Branch Type

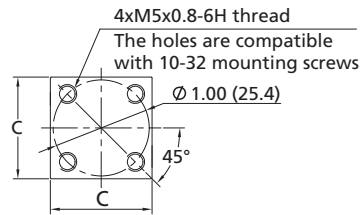
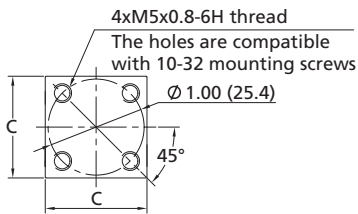
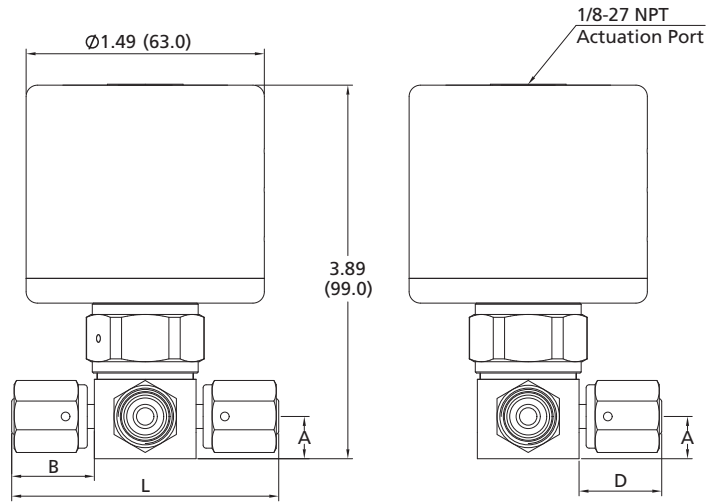
### Dimensions

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

#### Manual - Round Handle



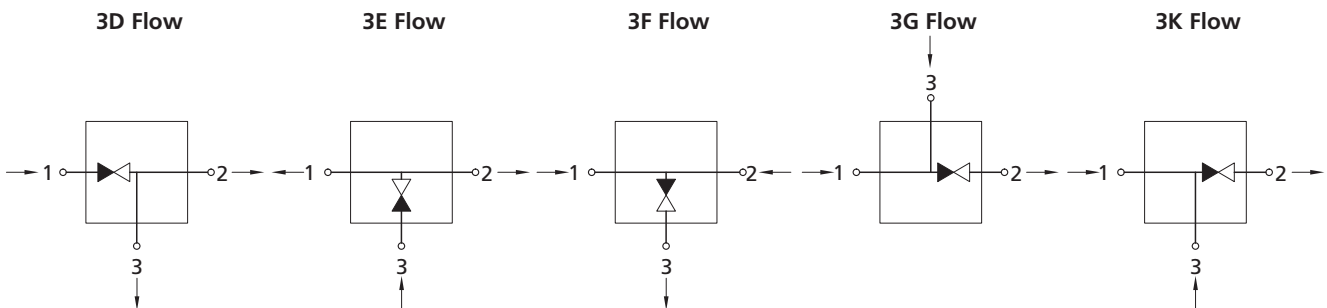
#### Pneumatic



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



Ordering Number Description

DH6L - TB4 - TB4 - FR4 - 3F - CVF2MO

Fittings

Valves & Regulators

Process Specification

Body Material		Port 1 Type		Port 1 Size		Port 2/3 Type	Port 2/3 Size	Flow Path	Actuator Type		Seat	Process Specification		
6L	316L SS	TB	Fractional Tube Butt Weld	4	1/4"	Same as Port 1		3D	R	Manual-Round Handle	PCTFE	FC-01		
6LV	316L VAR	MTB	Metric Tube Butt Weld	6	6 mm or 3/8"			3E	C	Normally Closed Pneumatic	V Vespel	F2	FC-02	
6LW	316L VIM-VAR	FR	Male FR Fitting	8	8 mm	Specified in the same way as Port 1 type and size		3F	O	Normally Open Pneumatic		F3	FC-03	
		FFR	Female FR Fitting					3G						
		RFR	Rotatable Male FR Fitting					3K		Note: For butt weld connection, pneumatic actuator is not recommended unless it causes no interference to welding.				
		FL	Fractional Tube Fitting											
		ML	Metric Tube Fitting											
												<b>Position Sensor</b>		
													None	
												MO	Normally Open Position Sensor	
												MC	Normally Closed Position Sensor	

# 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 indicates open and closed states
- ⊙ Reduced seat volume
- ⊙ Fully functional under vacuum conditions
- ⊙ Different manual and pneumatic actuators available
- ⊙ Position sensors available assembled on pneumatically actuated valves
- ⊙ Normally open and normally closed position sensors optional

### Technical Data

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

- ① Differential back pressure is equal to the outlet pressure minus the inlet pressure. When the differential back pressure is greater than 1500 psig (103 bar), the valve will not open even being loosen after tightening the handle. As the force of the differential back pressure acting on the valve stem is downward when closing and is greater than the spring force, the valve stem cannot be lifted. A17-7 SS spring can be used to increase the max. differential back pressure to 2500psig 172bar. To place an order, please contact FITOK Group or FITOK 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

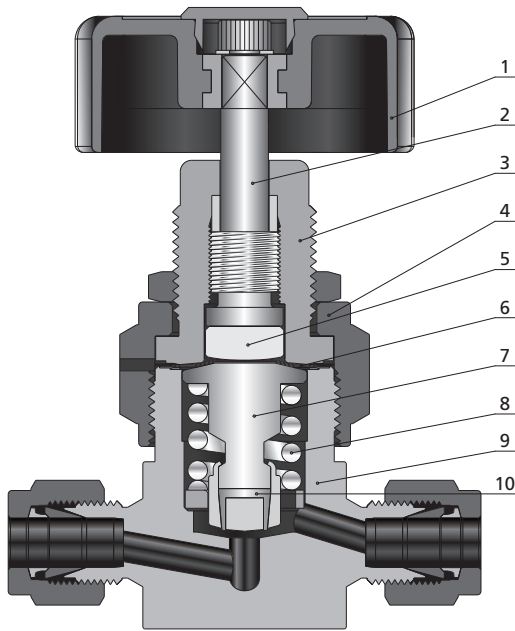


## Process Specification

Technology	Process Specification	Standard Cleaning and Packaging (FC-01)	Special Cleaning and Packaging (FC-02)	Ultra High Purity (FC-03)
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

Note: Refer to page P-01 for a detailed description of Process Specification, and to page P-01 for Process Comparison.

## Major Materials of Construction



Round Handle Model

Item	Component	Material/Specification
1	Handle	Aluminum
2	Actuator	316 SS/ASTM A479
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 actuator
- ⦿ Normally closed, "N.C." marked on the top of the actuator



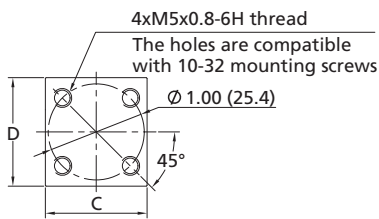
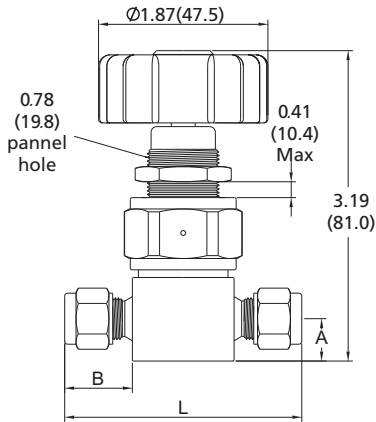
## Dimensions and Ordering Information

### Straight Type

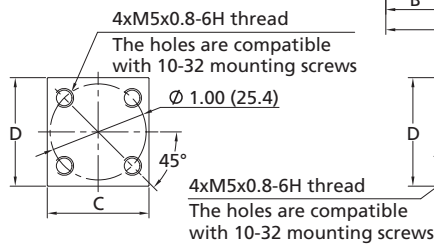
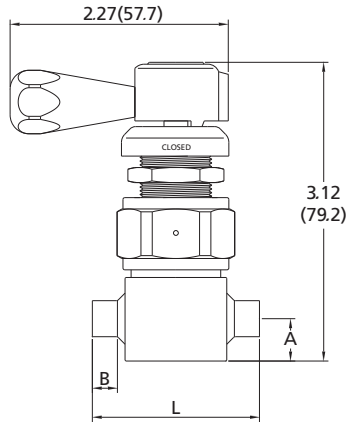
#### Dimensions

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

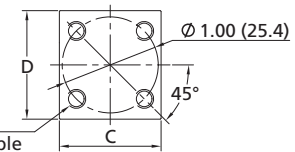
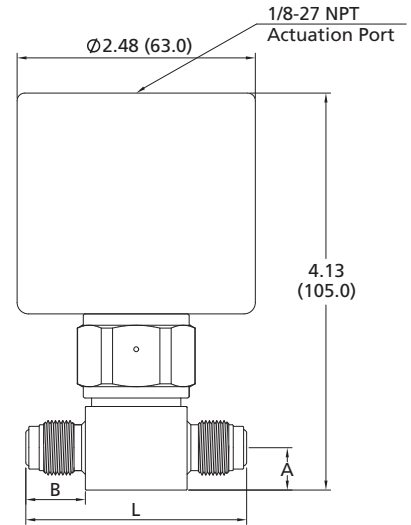
Manual - Round Handle



Manual - Lever Handle



Pneumatic



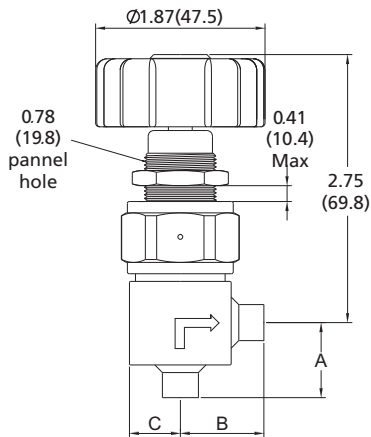
Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	C	D	L
DM□□-FL4-	1/4" FITOK Tube Fitting	0.44 (11.2)	0.69 (17.6)	1.06 (26.9)	1.13 (28.7)	2.47 (62.1)
DM□□-FL6-	3/8" FITOK Tube Fitting	0.44 (11.2)	0.76 (19.3)	1.06 (26.9)	1.13 (28.7)	2.58 (65.5)
DM□□-ML6-	6 mm FITOK Tube Fitting	0.44 (11.2)	0.70 (17.9)	1.06 (26.9)	1.13 (28.7)	2.47 (62.8)
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

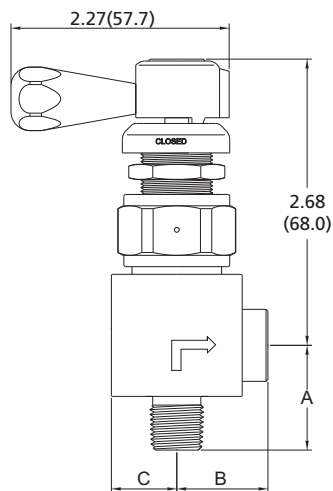
### Dimensions

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

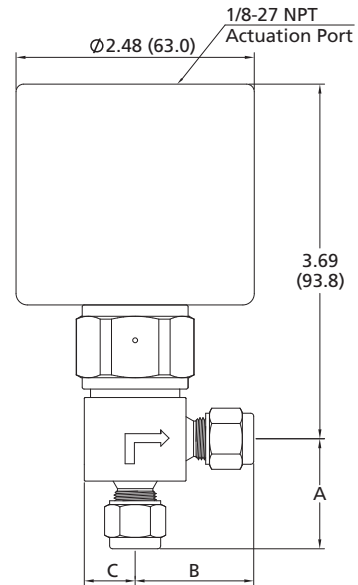
Manual - Round Handle



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 - CVF2MO

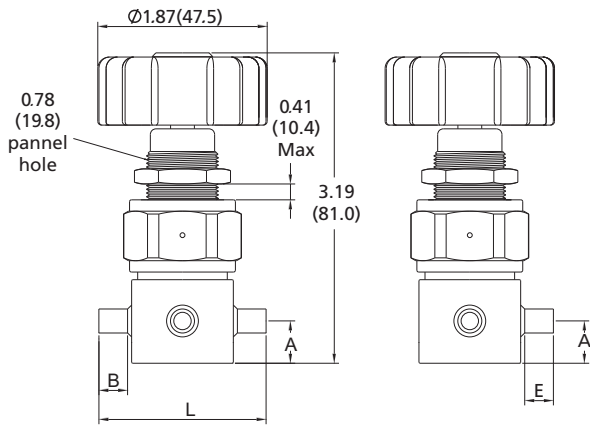
Body Material		Inlet Type		Outlet Type	Outlet Size	Actuator Type		Seat	Process Specification	
6L	316L SS	TB	Fractional Tube Butt Weld	Same as Inlet	Specified in the same way as Inlet type and size	R	Manual-Round Handle	PCTFE	FC-01	<b>Position Sensor</b> None MO Normally Open Position Sensor MC Normally Closed Position Sensor
SS	316 SS	MTB	Metric Tube Butt Weld			L	Manual-Lever Handle	V	Vespel	
		FR	Integral Male FR Fitting	C	Normally Closed Pneumatic			F3 FC-03		
		FFR	Female FR Fitting			O	Normally Open Pneumatic			
		FL	Fractional Tube Fitting	<b>Inlet Size</b>	<b>Flow Path</b>	Note: For butt weld connection, pneumatic actuator is not recommended unless it causes no interference to welding.				
		ML	Metric Tube Fitting	4	1/4"					
		NS	Male NPT	6	6 mm or 3/8"					
		FNS	Female NPT	8	8 mm or 1/2"					

## Branch Type

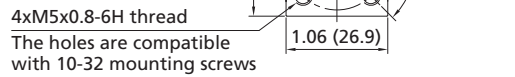
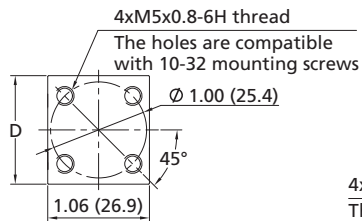
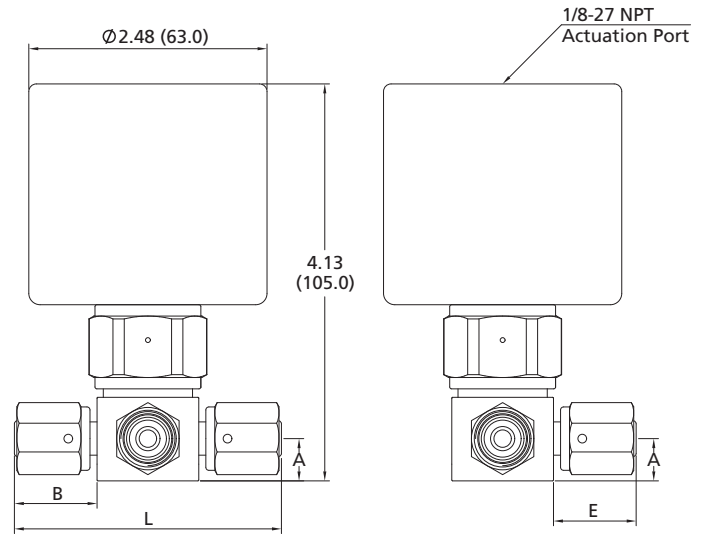
### Dimensions

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

Manual - Round Handle



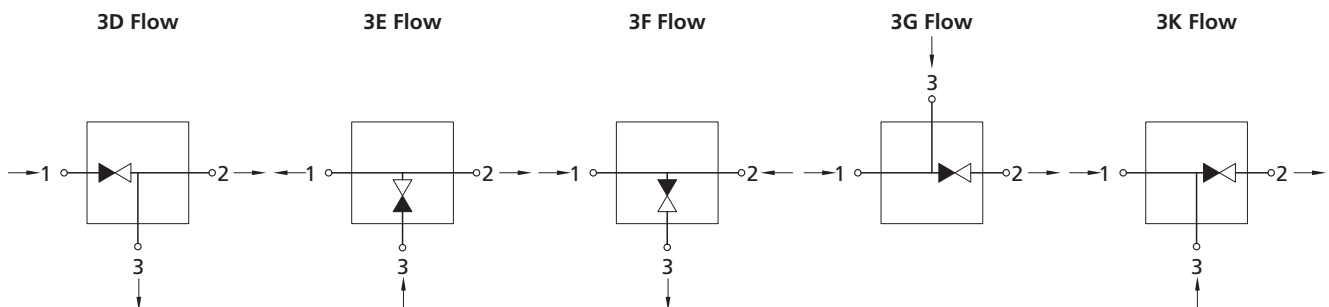
Pneumatic



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)

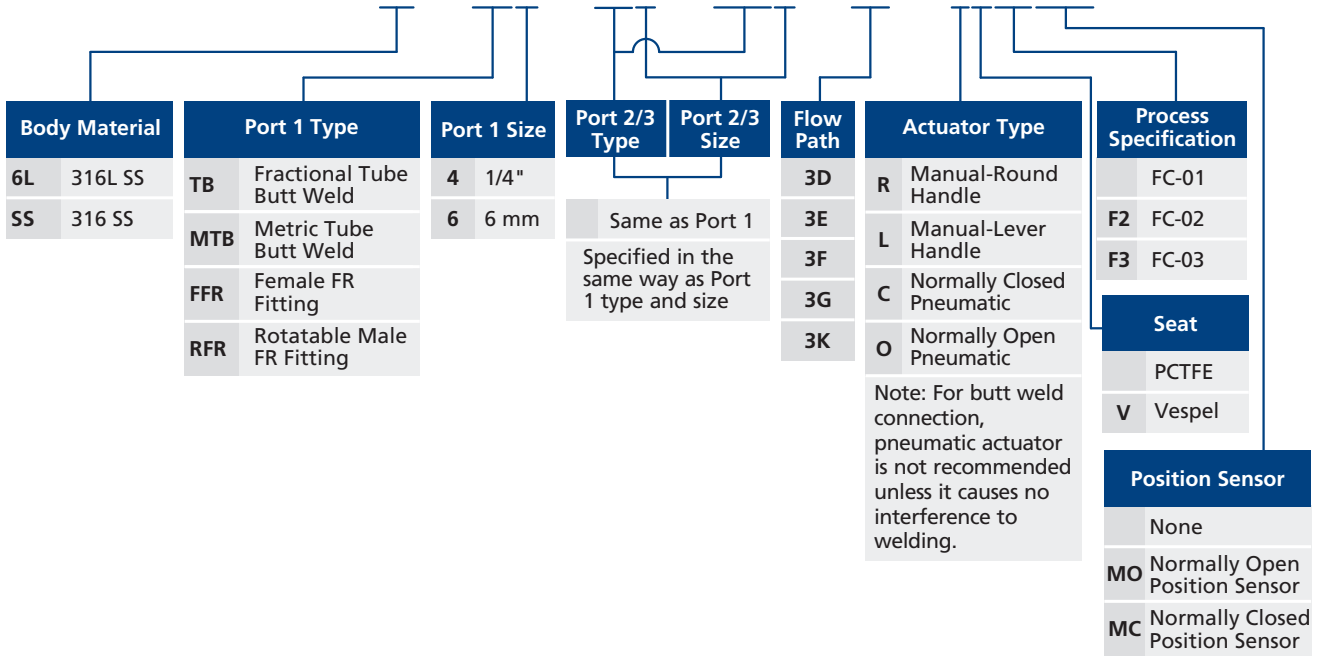
### Flow Paths

☉ Flow paths as viewed from the top



Ordering Number Description

DMSS - TB4 - TB4 - FFR4 - 3F - CVF2MO



Fittings

Valves & Regulators

Process Specification

# 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

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

### Flow Data

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

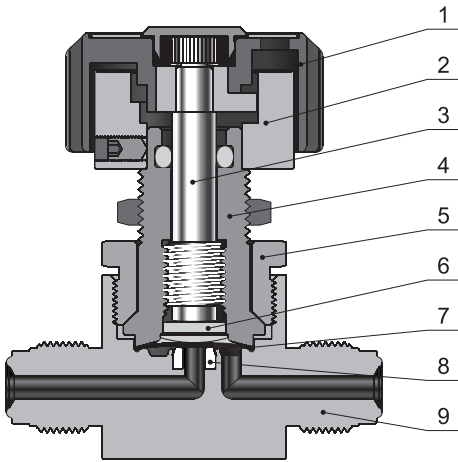
<b>Pressure Drop to Atmosphere psi (bar)</b>	<b>Air (l/min)</b>	<b>Water (l/min)</b>
10 (0.68)	55	1.9
50 (3.4)	150	4.5
100 (6.8)	260	6.4

### Process Specification

<b>Technology</b>	<b>Process Specification</b>	<b>Standard Cleaning and Packaging (FC-01)</b>	<b>Special Cleaning and Packaging (FC-02)</b>	<b>Ultra High Purity (FC-03)</b>
<b>Material/Specification</b>		316 SS/ASTM A479 316L SS/ASTM A479		316L VAR/SEMI F20 316L VIM-VAR /SEMI F20
<b>Wetted Surface Roughness</b>		Ra 20 μin. (0.51 μm)		Ra 10 μin. (0.25 μm)
<b>Polishing Process</b>		Machine finished		Electropolished

Note: Refer to page P-01 for a detailed description of Process Specification, and to page P-01 for Process Comparison.

## 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 actuator
- ⦿ Normally closed, "N.C." marked on the top of the actuator



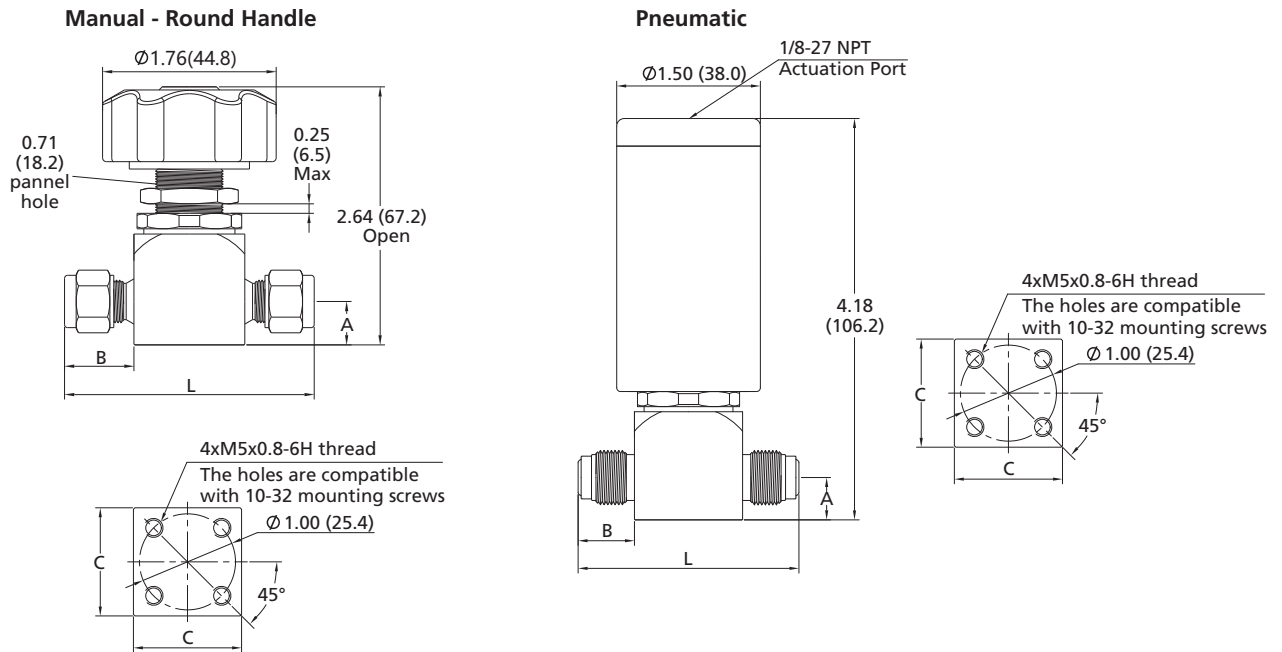


# Dimensions and Ordering Information

## Straight Type

### Dimensions

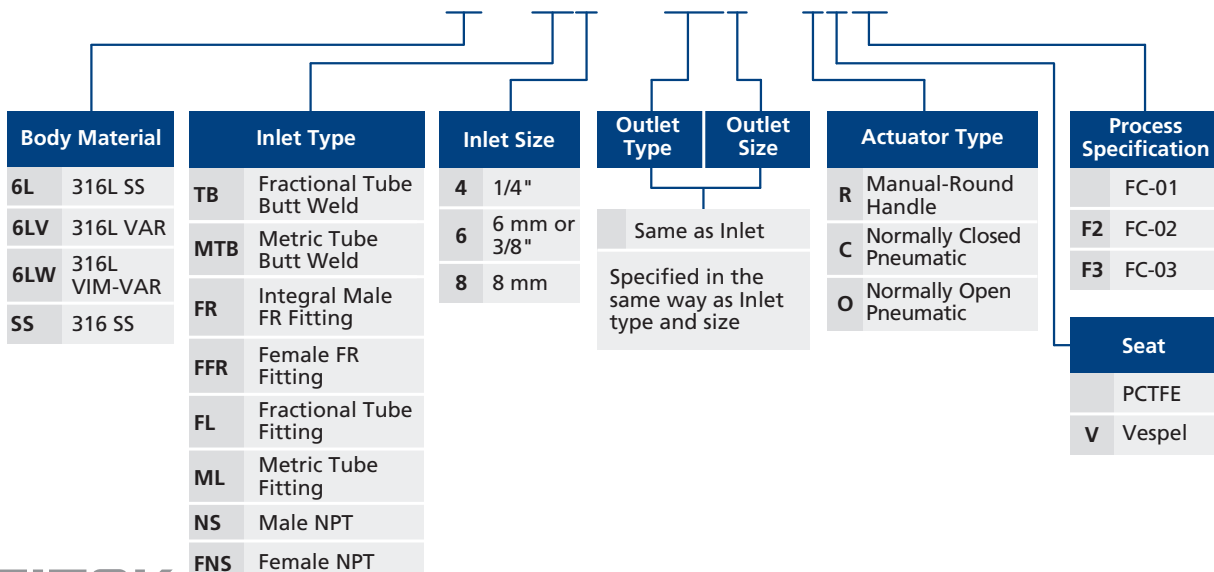
Dimensions, in inches (millimeters), are for reference only.



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)	0.34 (8.6)	1.12 (28.6)	1.81 (45.9)
DS□□-TB6-	3/8" Tube Butt Weld	0.44 (11.2)	0.34 (8.6)	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

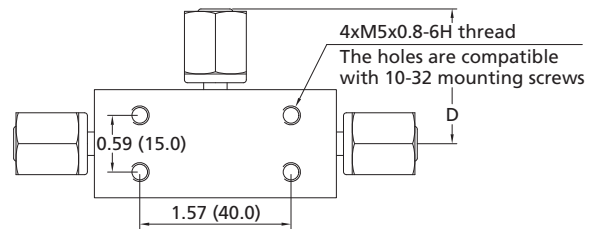
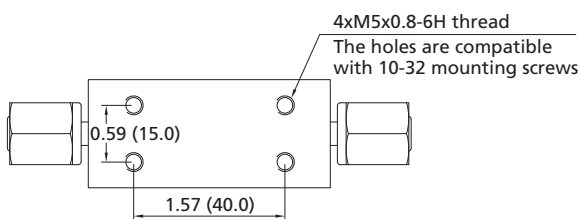
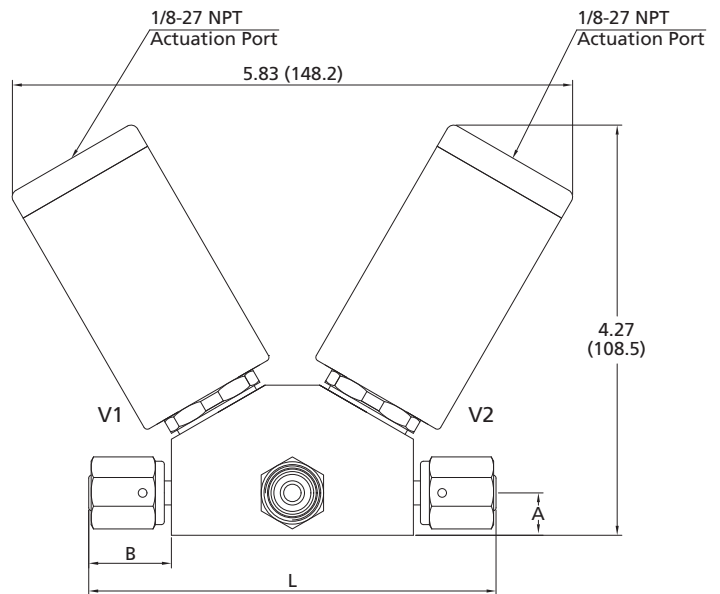
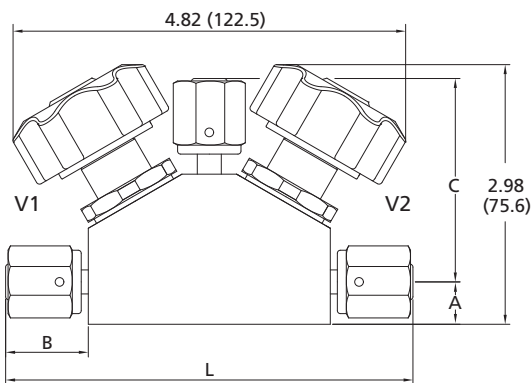
### Dimensions

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



Manual - Round Handle

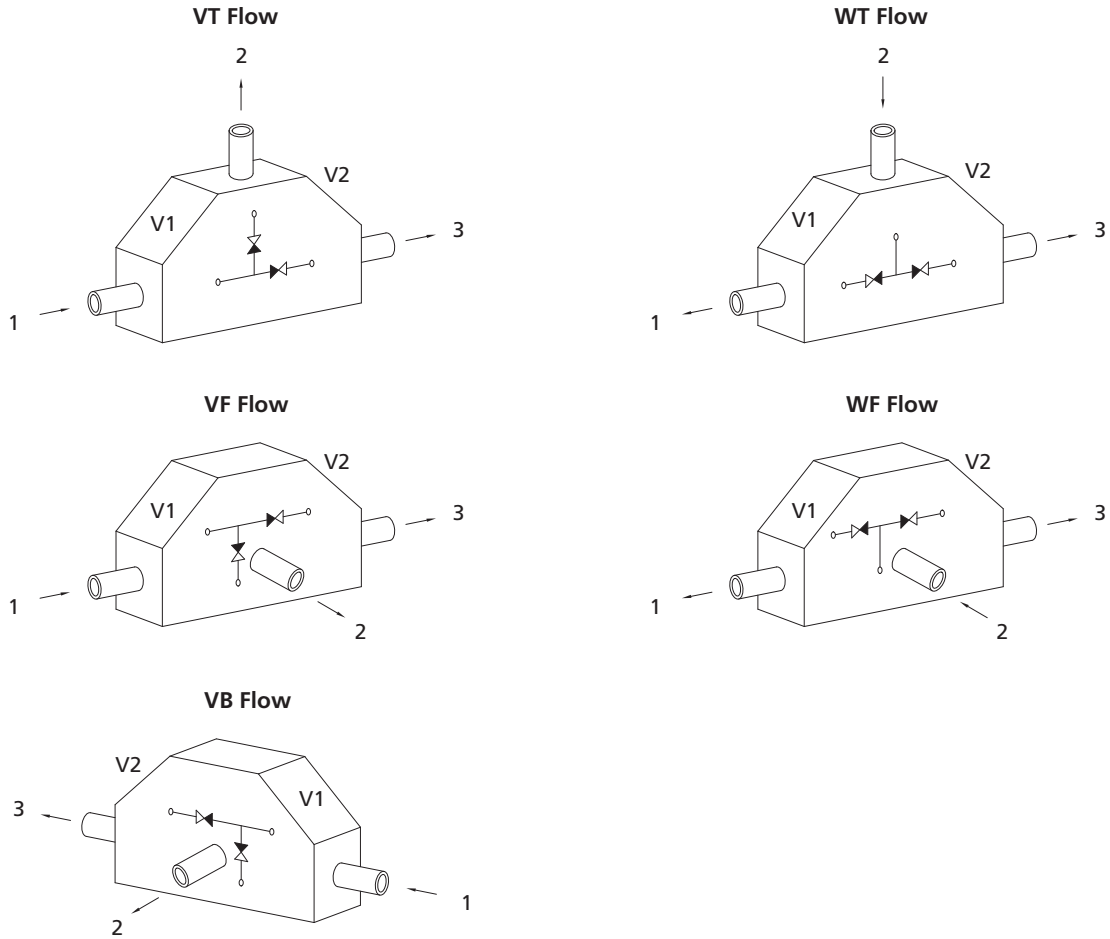
Pneumatic



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 - FFR4 - RFR4 - FFR4 - VF - COVF2

Type	Port 1 Type	Port 2/3 Type	Port 2/3 Size	Flow Path	Actuator Type (V1 and V2)	Process Specification
23	FFR Female FR Fitting	Same as Port 1	Specified in the same way as Port 1 type and size	VT	R V1 Handle V2 Handle	FC-01
	RFR Rotatable Male FR Fitting			VF	C V1 Normally Closed Pneumatic V2 Normally Closed Pneumatic	F2 FC-02
	FNS Female NPT			VB	O V1 Normally Open Pneumatic V2 Normally Open Pneumatic	F3 FC-03
				WT	RC V1 Handle V2 Normally Closed Pneumatic	
				WF	RO V1 Handle V2 Normally Open Pneumatic	
					CR V1 Normally Closed Pneumatic V2 Handle	
					OR V1 Normally Open Pneumatic V2 Handle	
					CO V1 Normally Closed Pneumatic V2 Normally Open Pneumatic	
					OC V1 Normally Open Pneumatic V2 Normally Closed Pneumatic	

Body Material		Port 1 Size	Seat
6L	316L SS	4 1/4"	PCTFE
6LV	316L VAR		V Vespel
6LW	316L VIM-VAR		
SS	316 SS		

# 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 with high strength and corrosion resistance to ensure long cycle life
- ⦿ Manual and pneumatic actuators available
- ⦿ Position sensors available assembled on normally closed pneumatically actuated 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	$\leq 1 \times 10^{-9}$ std cm <sup>3</sup> /s
	External	$\leq 1 \times 10^{-9}$ std cm <sup>3</sup> /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

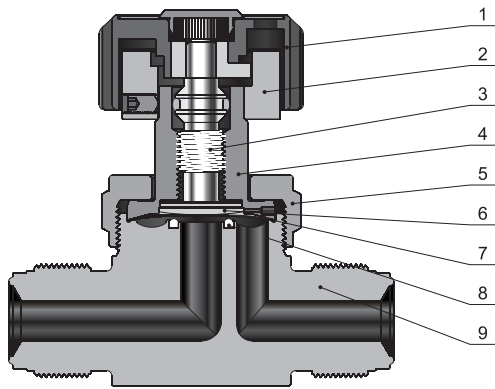
### Process Specification

Technology	Standard Cleaning and Packaging (FC-01)	Special Cleaning and Packaging (FC-02)	Ultra High Purity (FC-03)
Material/Specification	316L SS/ASTM A479		316L VAR/SEMI F20 316L VIM-VAR /SEMI F20
Wetted Surface Roughness	Ra 10 $\mu$ m. (0.25 $\mu$ m) <sup>①</sup>		Ra 5 $\mu$ m. (0.13 $\mu$ m)
Polishing Process	Machine finished <sup>①</sup>		Electropolished

① For valves with 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  $\mu$ m. (0.13  $\mu$ m).

Note: Refer to page P-01 for a detailed description of Process Specification, and to page P-01 for Process Comparison.

## 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	316L SS/ASTM A479 or 316L VAR/SEMI F20 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 actuator
- ⦿ Normally closed, "N.C." marked on the top of the actuator



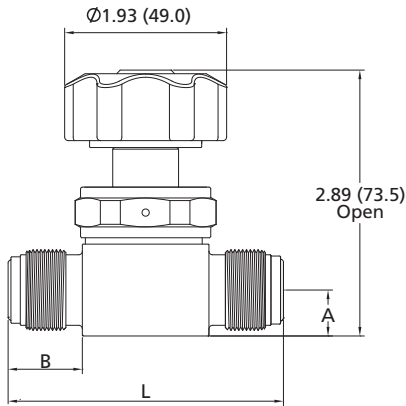
# Dimensions and Ordering Information

## Straight Type

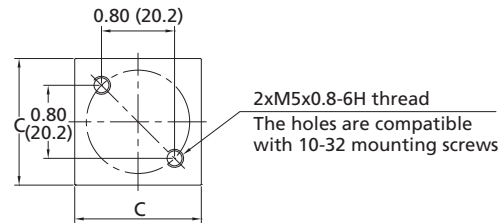
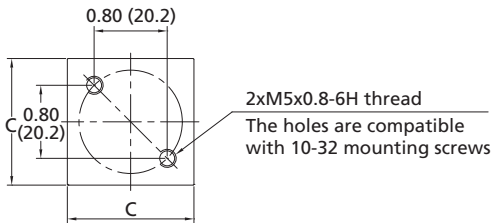
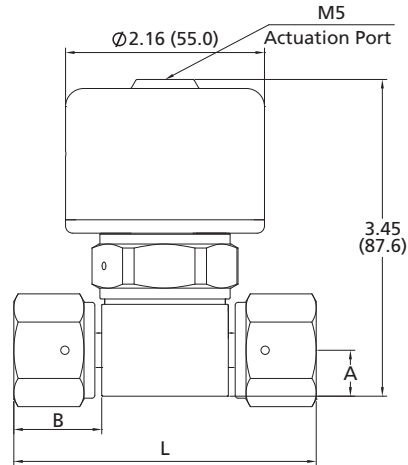
### Dimensions

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

**Manual - Round Handle**



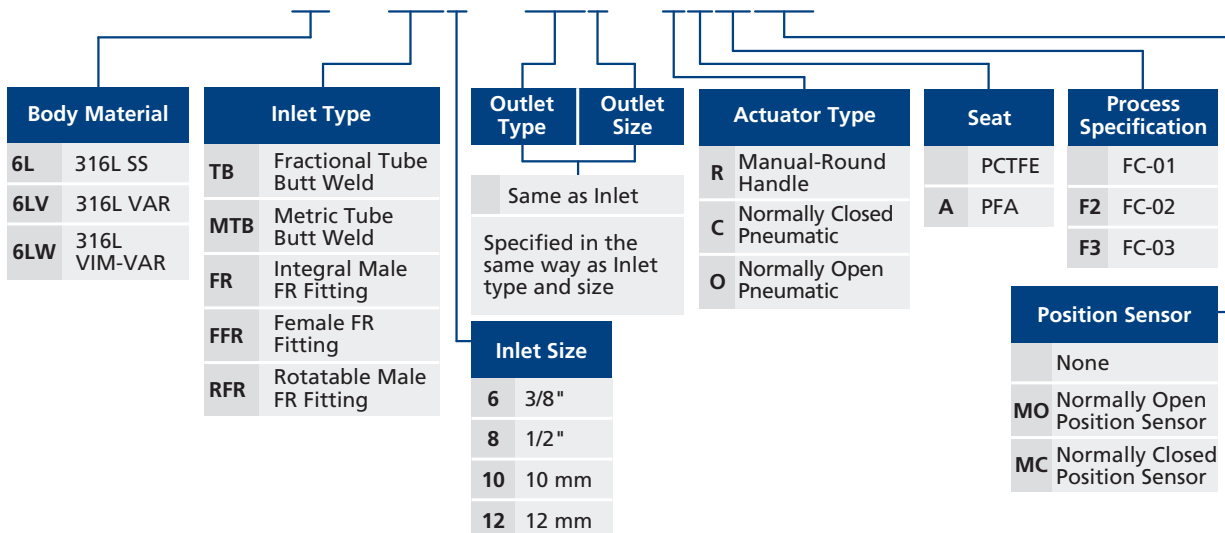
**Pneumatic**



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 - CAF3MO

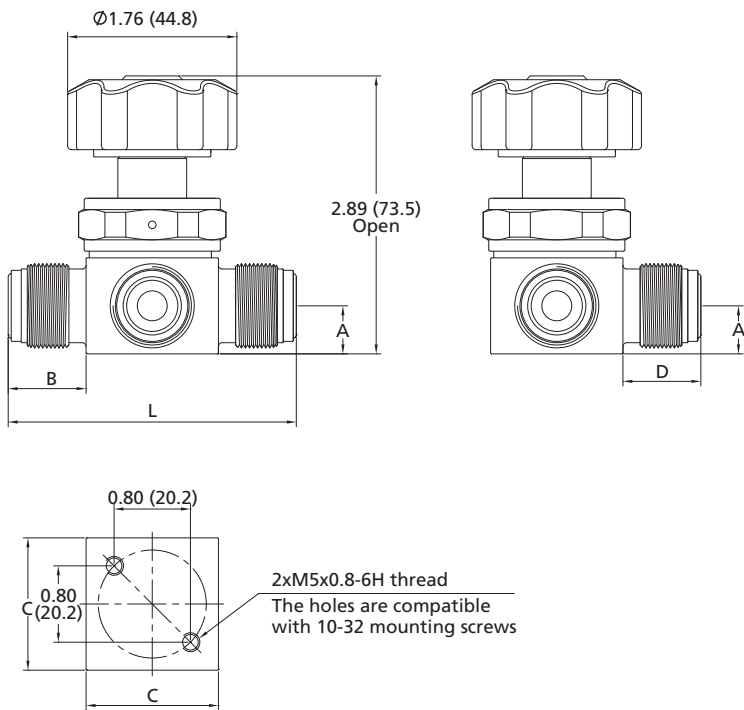


## Branch Type

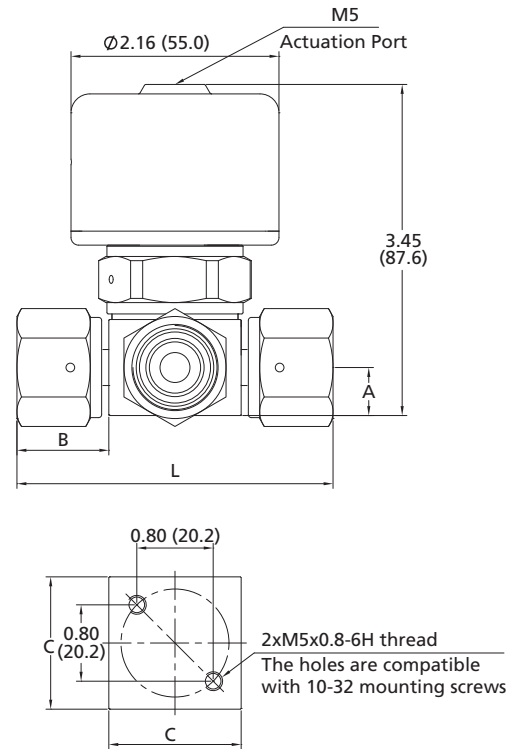
### Dimensions

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

Manual - Round Handle



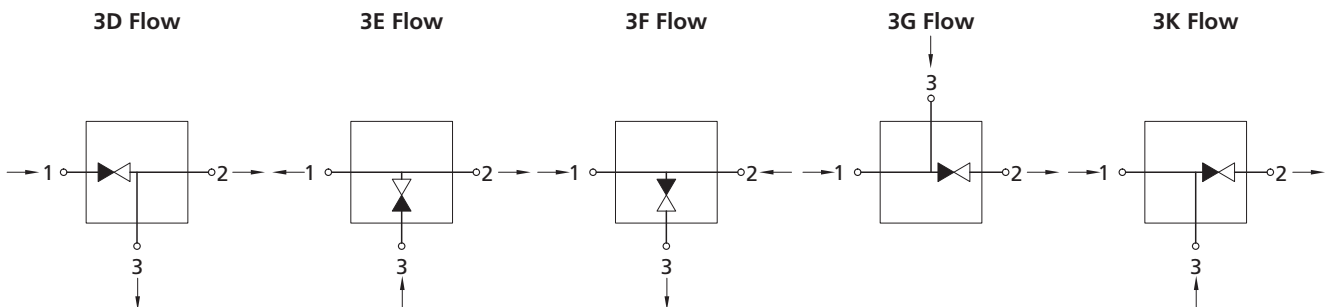
Pneumatic



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)	1.34 (34.0)	1.38 (35.0)	1.34 (34.0)	4.05 (103.0)
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)

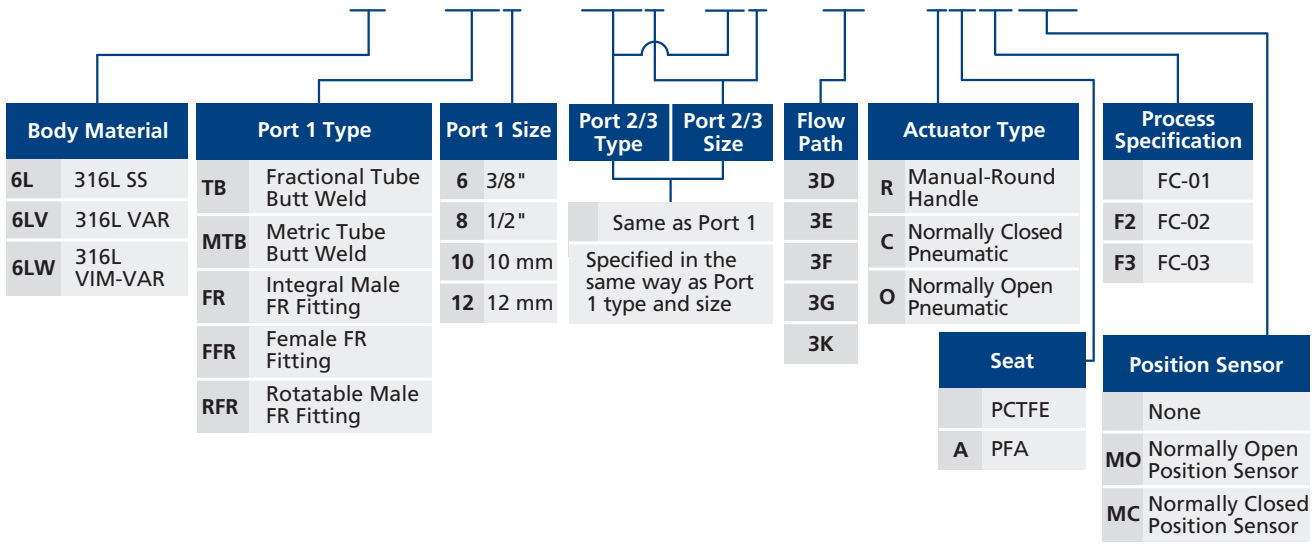
### Flow Paths

☉ Flow paths as viewed from the top



Ordering Number Description

DR6L - FFR8 - RFR8 - FR8 - 3D - CAF3MO



Fittings

Valves & Regulators

Process Specification



# 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
- ⦿ Manual and pneumatic actuators available
- ⦿ Position sensors available assembled on normally closed valves

### Technical Data

<b>Port Size</b>		1/2" to 1" or 12 mm to 18 mm
<b>Flow Coefficient (Cv)</b>	<b>Manual</b>	2.8
	<b>Pneumatic</b>	2.4
<b>Orifice Size</b>		0.5 in. (12.7 mm)
<b>Max. Working Pressure</b>	<b>Manual</b>	300 psig (20.6 bar)
	<b>Pneumatic</b>	145 psig (10 bar)
<b>Pneumatic actuator operating pressure</b>		60 to 90 psig (4.2 to 6.2 bar)
<b>Temperature</b>		PCTFE: -10~150°F (-23~65°C) Vespel: -10~250°F (-23~121°C)
<b>Leak Rate (Helium)</b>	<b>Internal</b>	≤1x10 <sup>-9</sup> std cm <sup>3</sup> /s
	<b>External</b>	≤1x10 <sup>-9</sup> std cm <sup>3</sup> /s

### Flow Data

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

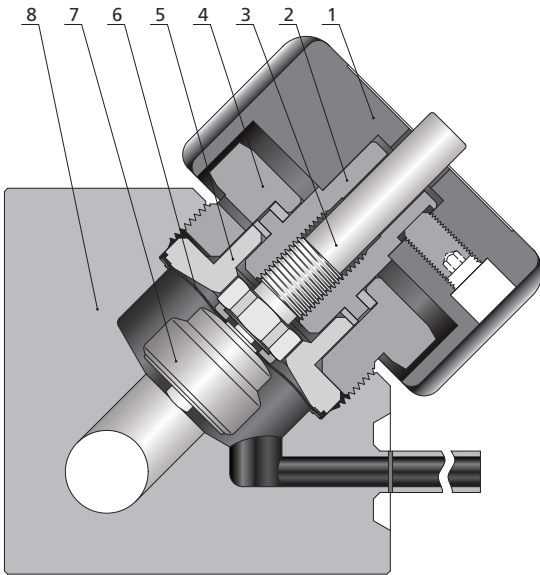
Pressure Drop to Atmosphere psig (bar)	Manual		Pneumatic	
	Air (l/min)	Water (l/min)	Air (l/min)	Water (l/min)
10 (0.68)	870	34	780	29
50 (3.4)	2300	75	2050	64
100 (6.8)	4100	100	3650	91

### Process Specification

Technology	Standard Cleaning and Packaging (FC-01)	Special Cleaning and Packaging (FC-02)	Ultra High Purity (FC-03)
<b>Material/Specification</b>	316 SS/ASTM A479 or 316L SS/ASTM A479		316L SS/ASTM A479
<b>Wetted Surface Roughness</b>	Ra 10 μin. (0.25 μm)		Ra 5 μin. (0.13 μm)
<b>Polishing Process</b>	Machine finished		Electropolished

Note: Refer to page P-01 for a detailed description of Process Specification, and to page P-01 for Process Comparison.

## Major Materials of Construction



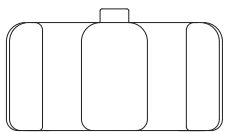
Item	Component	Material/Specification
1	Handle	Aluminum
2	Actuator	316 SS/ASTM A479
3	Upper Stem	S17400/ASTM A564
4	Bonnet Nut	316 SS/ASTM A479
5	Bonnet	S17400/ASTM A564
6	Diaphragm (3)	Elgiloy/AMS 5876
7	Stem Subassembly	316L SS/ASTM A479 and PCTFE/ASTM D1430 or 316L SS/ASTM A479 and Vespel
8	Body	316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

### Manual Actuation - Branch Type

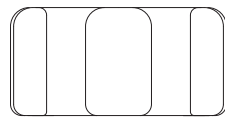
## Actuators

### 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.

### Pneumatic

- ☉ Normally open, "N.O." marked on the top of the actuator
- ☉ Normally closed, "N.C." marked on the top of the actuator



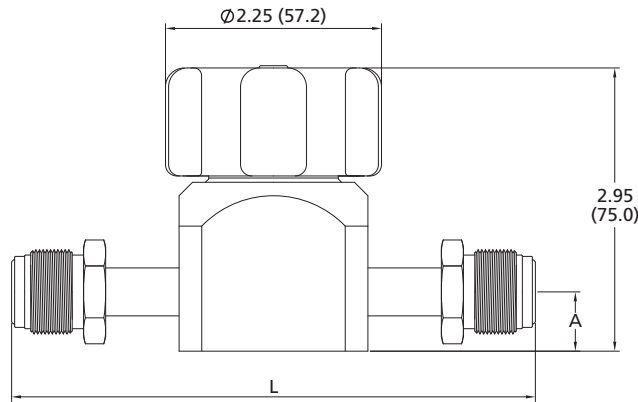
## Dimensions and Ordering Information

### Straight Type

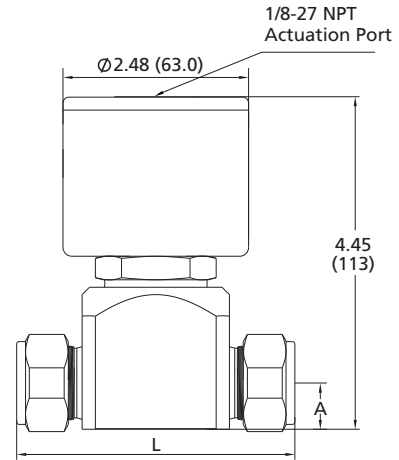
#### Dimensions

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

Manual - Round Handle

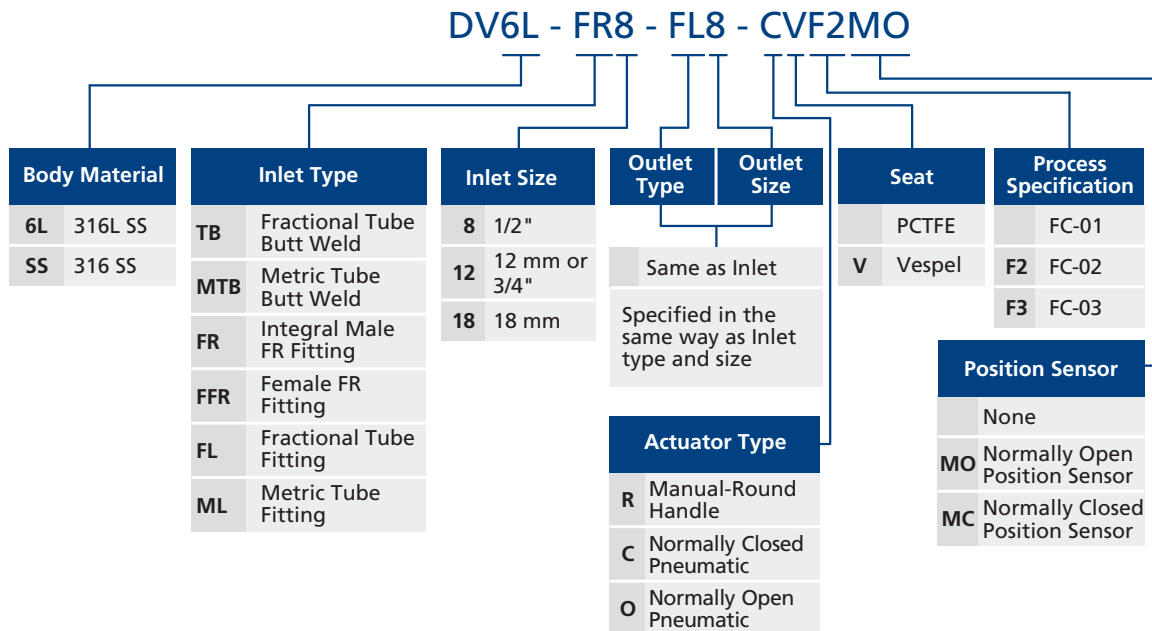


Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)	
		A	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)	5.47 (138.9)
DV□□-FFR8-	1/2" Female FR	0.62 (15.7)	5.47 (138.9)
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)

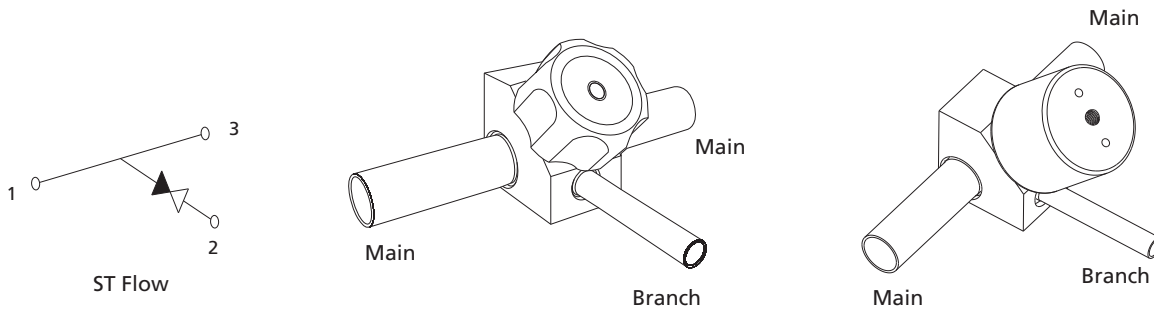
#### Ordering Number Description



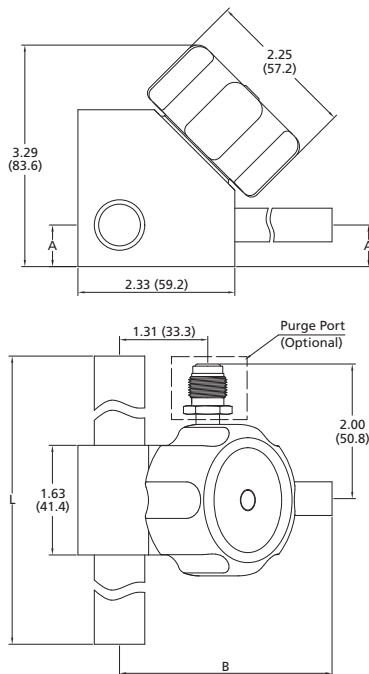
## Branch Type

### Dimensions

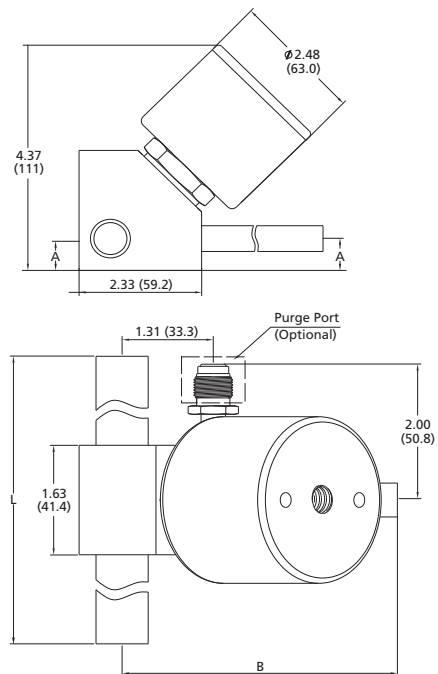
Dimensions, in inches (millimeters), are for reference only.



### Manual-Round Handle



### Pneumatic

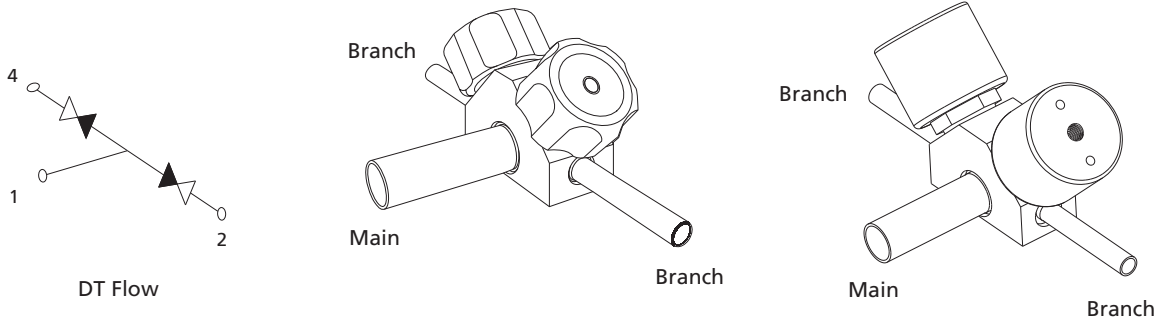


Basic Ordering Number	Connection Type and Size		Dimensions in. (mm)		
	Main	Branch	A	B	L
DV□□-TB8-TB4-	1/2" × 0.049"	1/4" × 0.035"	0.62 (15.7)	4.69 (119.0)	7.58 (193.0)
DV□□-TB8-TB8-	1/2" × 0.049"	1/2" × 0.049"	0.62 (15.7)	4.69 (119.0)	7.58 (193.0)
DV□□-TB8-RFR4-	1/2" × 0.049"	1/4" Rotatable Male FR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

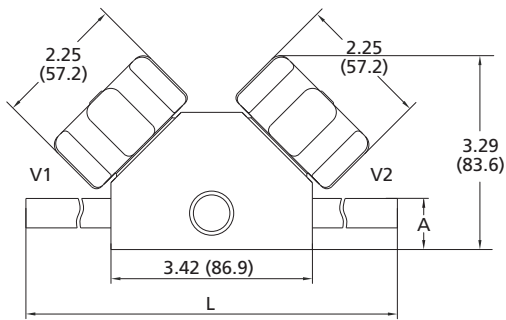
## Branch Type

### Dimensions

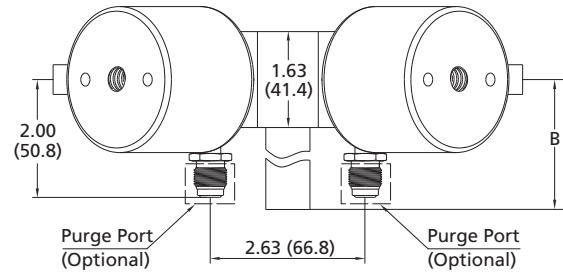
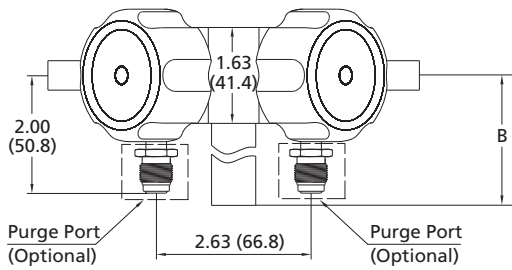
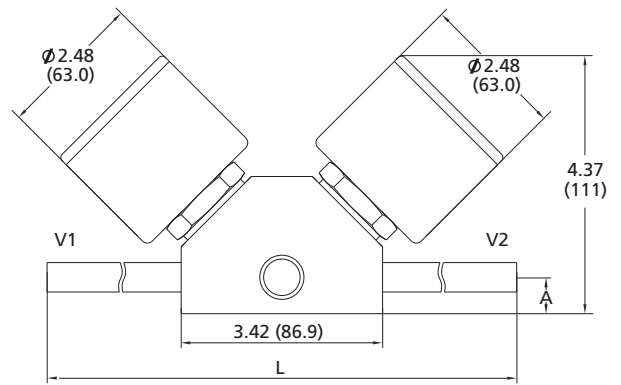
Dimensions, in inches (millimeters), are for reference only.



### Manual-Round Handle



### Pneumatic

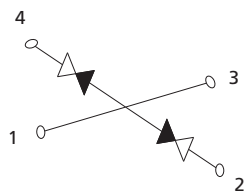


Basic Ordering Number	Connection Type and Size		Dimensions in. (mm)		
	Main	Branch	A	B	L
DV□□-TB12-TB8-	3/4" × 0.065"	1/2" × 0.049"	0.62 (15.7)	3.79 (96.3)	9.38 (238.0)
DV□□-TB12-RFR8-	3/4" × 0.065"	1/2" Rotatable Male FR	0.62 (15.7)	3.79 (96.3)	9.38 (238.0)
DV□□-TB16-TB8-	1" × 0.065"	1/2" × 0.049"	0.62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

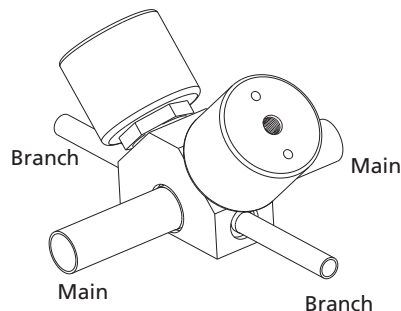
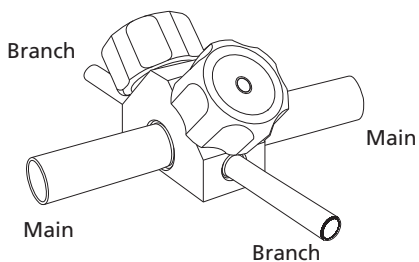
## Branch Type

### Dimensions

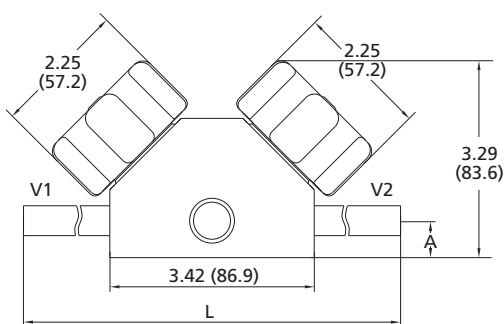
Dimensions, in inches (millimeters), are for reference only.



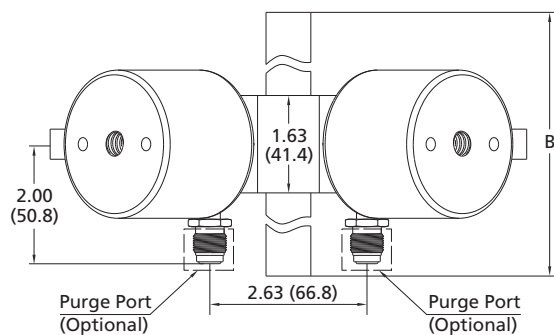
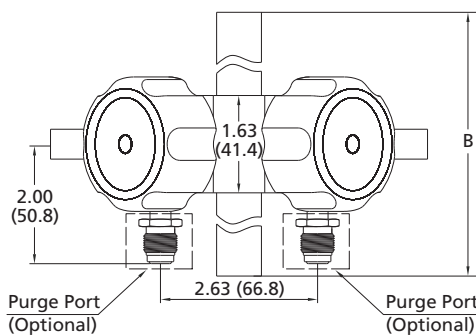
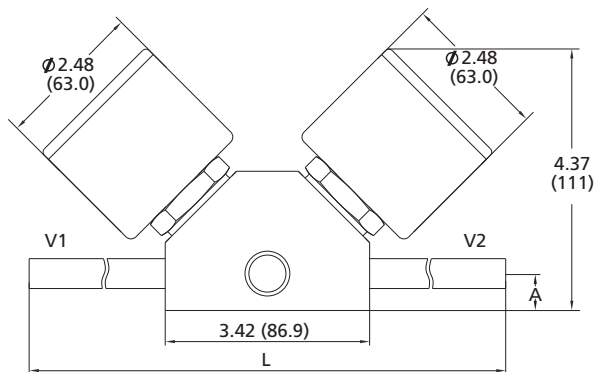
DC Flow



### Manual-Round Handle



### Pneumatic



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)

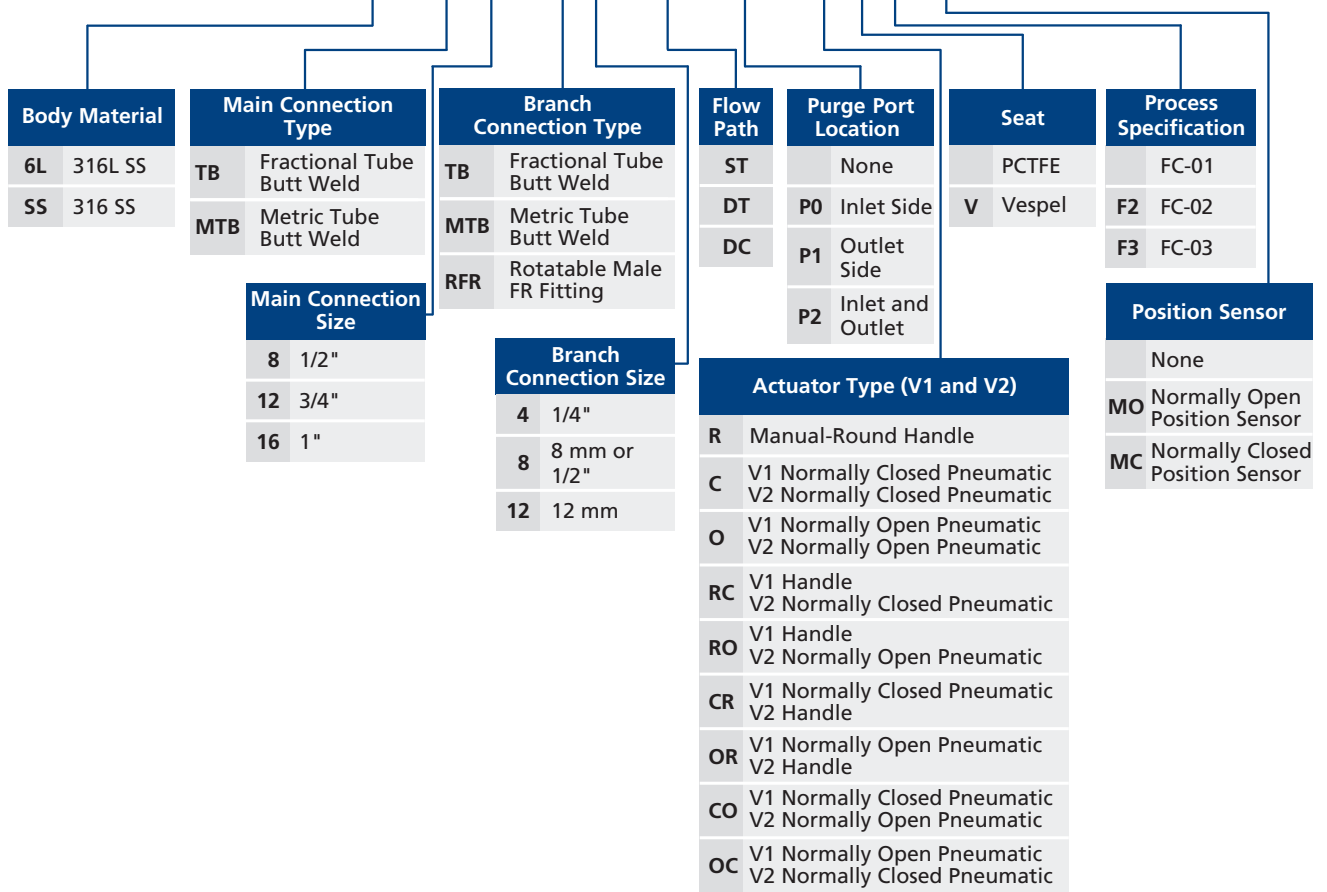
Ordering Number Description

DV6L - TB12 - TB8 - DC - P2 - COVF2MO

Fittings

Valves & Regulators

Process Specification



# 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

### Technical Data

Technical Data		
Port Size	3/4" to 1" or 23 mm to 25 mm	
Flow Coefficient (Cv)	Manual	13
	Pneumatic	6.5
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	$\leq 1 \times 10^{-9}$ std cm <sup>3</sup> /s
	External	$\leq 1 \times 10^{-9}$ std cm <sup>3</sup> /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

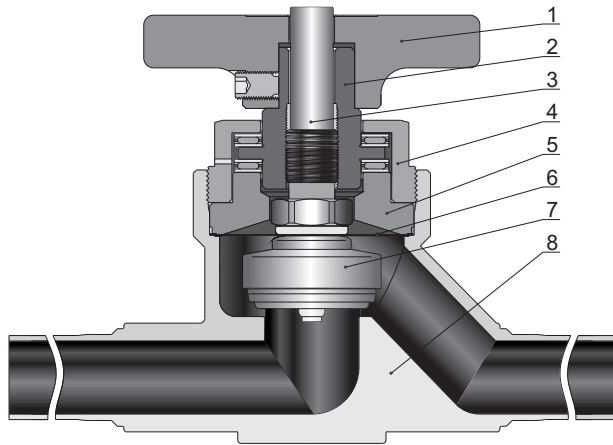
### Process Specification

Technology	Standard Cleaning and Packaging (FC-01)	Special Cleaning and Packaging (FC-02)	Ultra High Purity (FC-03)
Material/Specification	CF8M/ASTM A351, CF3M/ASTM A351, 316L SS/ASTM A479		
Wetted Surface Roughness	Ra 20 μin. (0.51 μm)		Ra 5 μin. (0.13 μm) (Bar stock) Ra 10 μin. (0.25 μm) (Cast body)
Polishing Process	Machine finished		Electropolished

Note: Refer to page P-01 for a detailed description of Process Specification, and to page P-01 for Process Comparison.



## 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	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

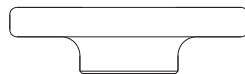
## Actuators

### Handle

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



OPEN



CLOSED

### Pneumatic

- ☉ Normally closed, "N.C." marked on the side of the actuator
- ☉ Actuator port 1/8-27 NPT

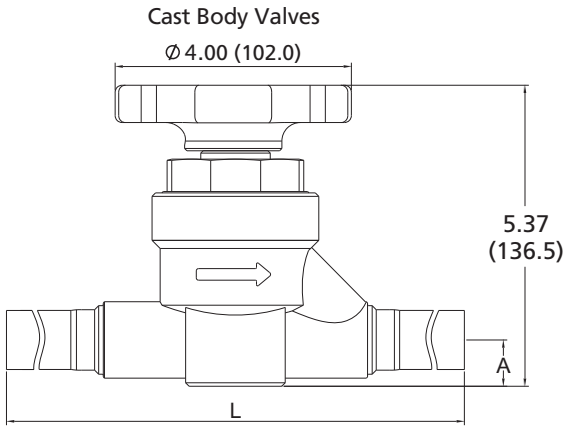


Notes: The upper stem protruding from the handle indicates open state.  
The upper stem paralleling to or sinking into the handle indicates closed state.

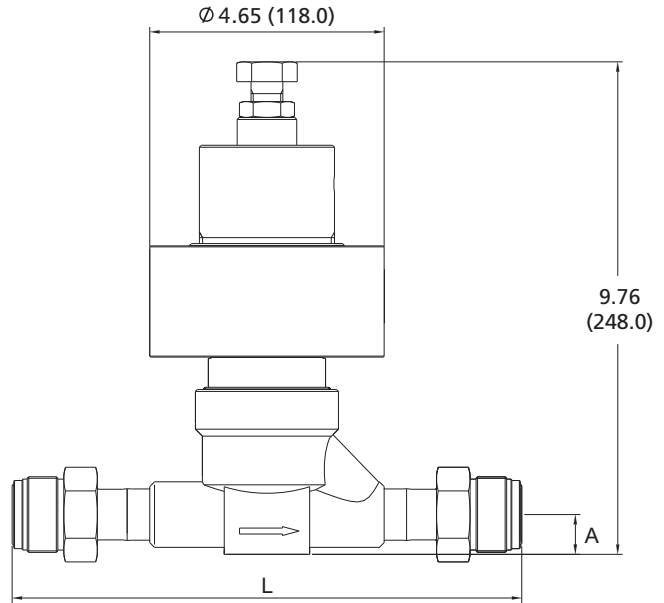
## Dimensions

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

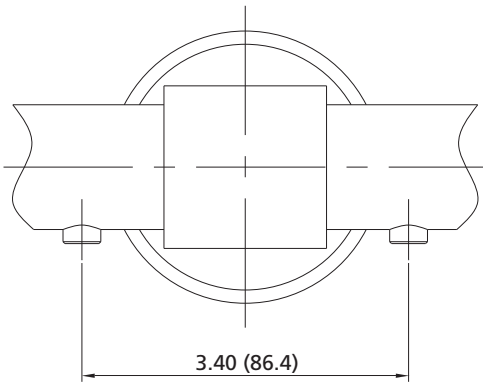
### Manual - Round Handle



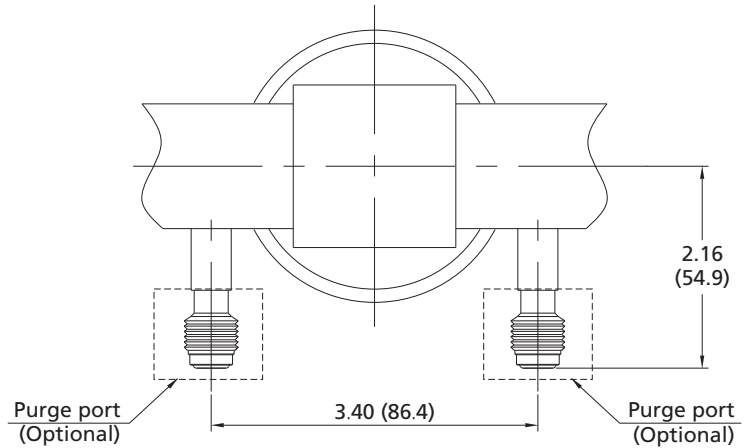
### Pneumatic



### No purge ports

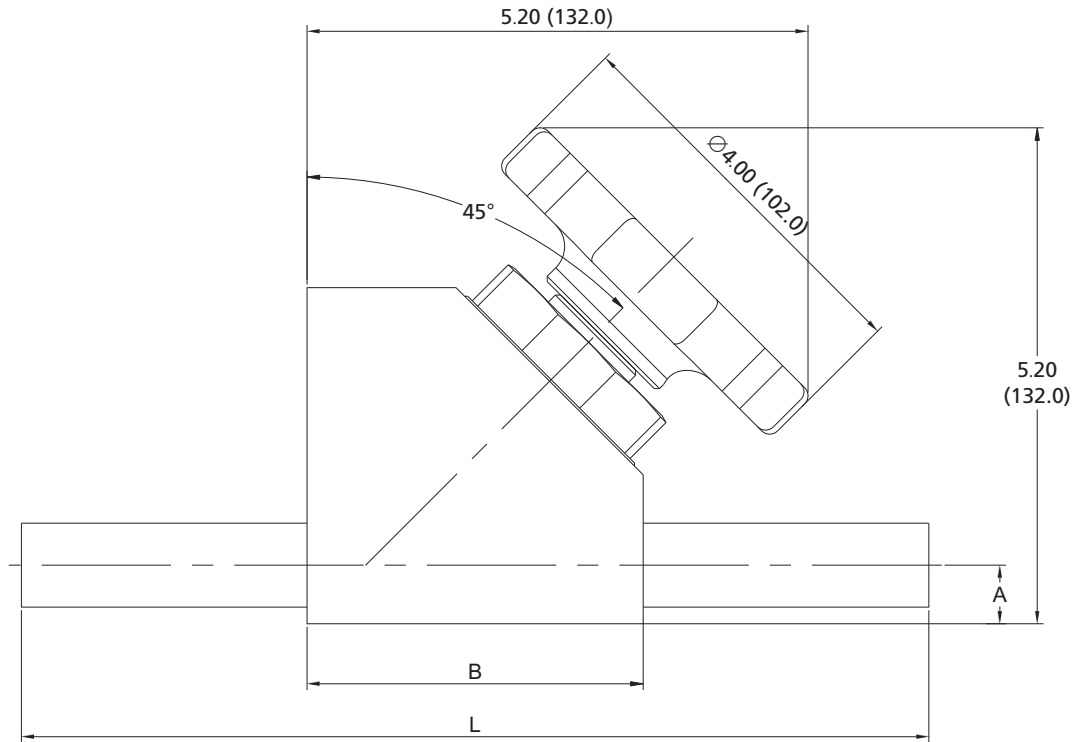


### Integral 1/4" Male FR Fittings

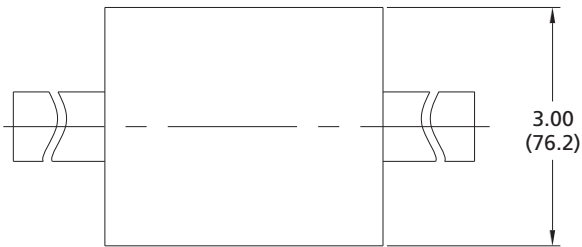


Basic Ordering Number	End Connections		Dimensions, in. (mm)	
	Type	Size	A	L
DL□□-FL12-	FITOK Tube Fitting	3/4"	0.79 (20.0)	8.27 (210.0)
DL□□-FL16-		1"		8.46 (215.0)
DL□□-ML25-		25 mm		8.63 (219.0)
DL□□-TB16-	Tube extension, 2.75 in. (69.8 mm) long	1" x 0.065"		10.90 (277.0)
DL□□-MTB23-		23 x 1.5 mm	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

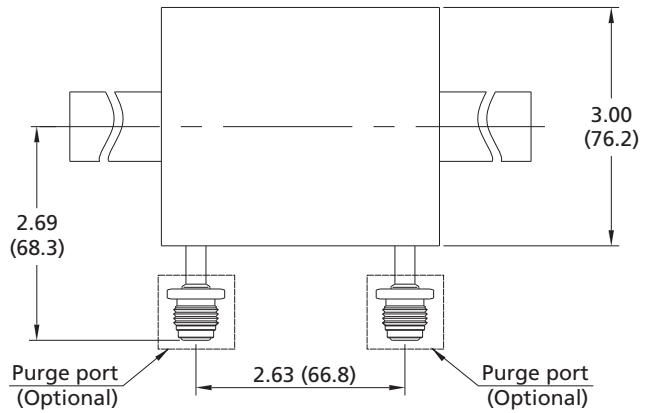
Bar Stock Valves



No purge ports

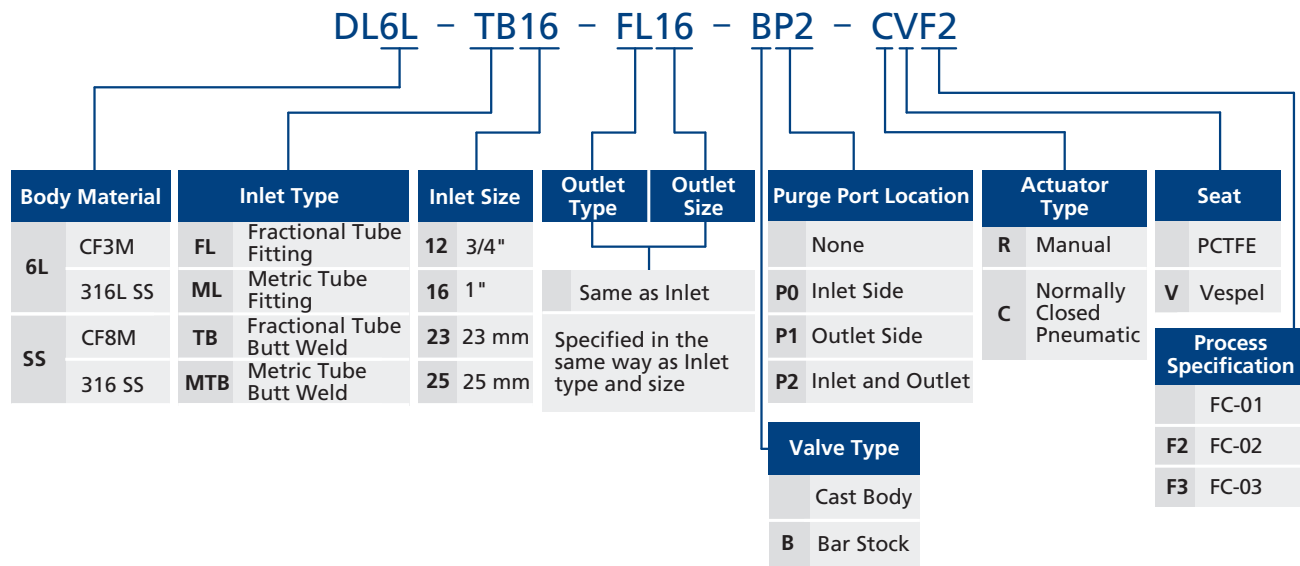


1/4" Rotatable Male FR Fittings



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



Fittings

Valves & Regulators

Process Specification

# 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 with high strength and corrosion resistance to ensure long cycle life
- ⊙ Position sensors available assembled on pneumatically actuated valves
- ⊙ Normally closed and normally open position sensors optional

### Technical Data

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

- ① Differential back pressure is equal to the outlet pressure minus the inlet pressure. When the differential back pressure is greater than 150 psig (10.3 bar), the valve will not open even being loosen after tightening the handle. As the force of the differential back pressure acting on the valve stem is downward when closing and is greater than the spring force, the valve stem cannot be lifted.

### Flow Data

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

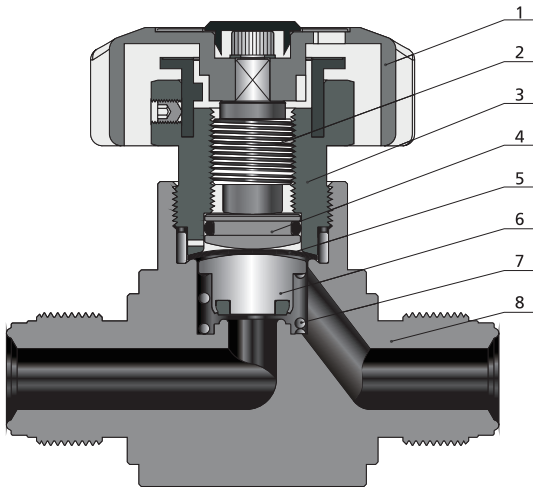
Pressure Drop to Atmosphere psi (bar)	Air (l/min)	Water (l/min)
10 (0.68)	274	9.5
50 (3.4)	733	21.5
100 (6.8)	1300	30.3

### Process Specification

Technology	Standard Cleaning and Packaging (FC-01)	Special Cleaning and Packaging (FC-02)	Ultra High Purity (FC-03)
<b>Material/Specification</b>	316 SS/ASTM A479 or 316L SS/ASTM A479		316L SS/ASTM A479
<b>Wetted Surface Roughness</b>	Ra 20 μin. (0.51 μm)		Ra 10 μin. (0.25 μm)
<b>Polishing Process</b>	Machine finished		Electropolished

Note: Refer to page P-01 for a detailed description of Process Specification, and to page P-01 for Process Comparison.

## 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	316 SS/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

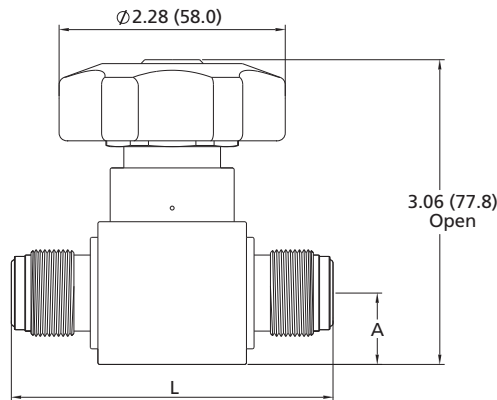
- ⦿ Normally open, "N.O." marked on the top of the actuator
- ⦿ Normally closed, "N.C." marked on the top of the actuator



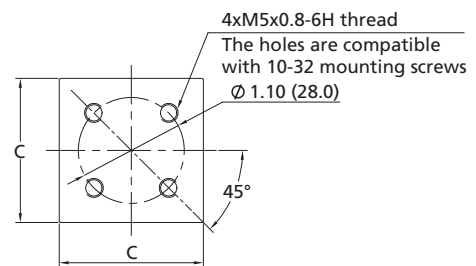
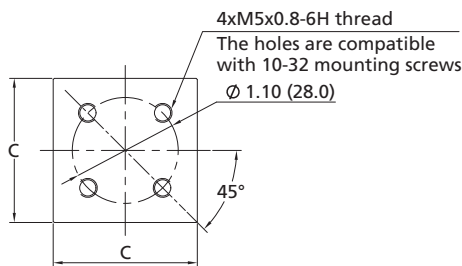
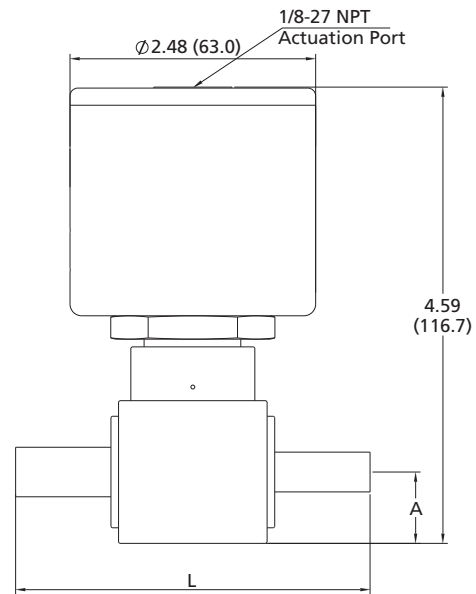
## Dimensions

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

**Manual - Round Handle**



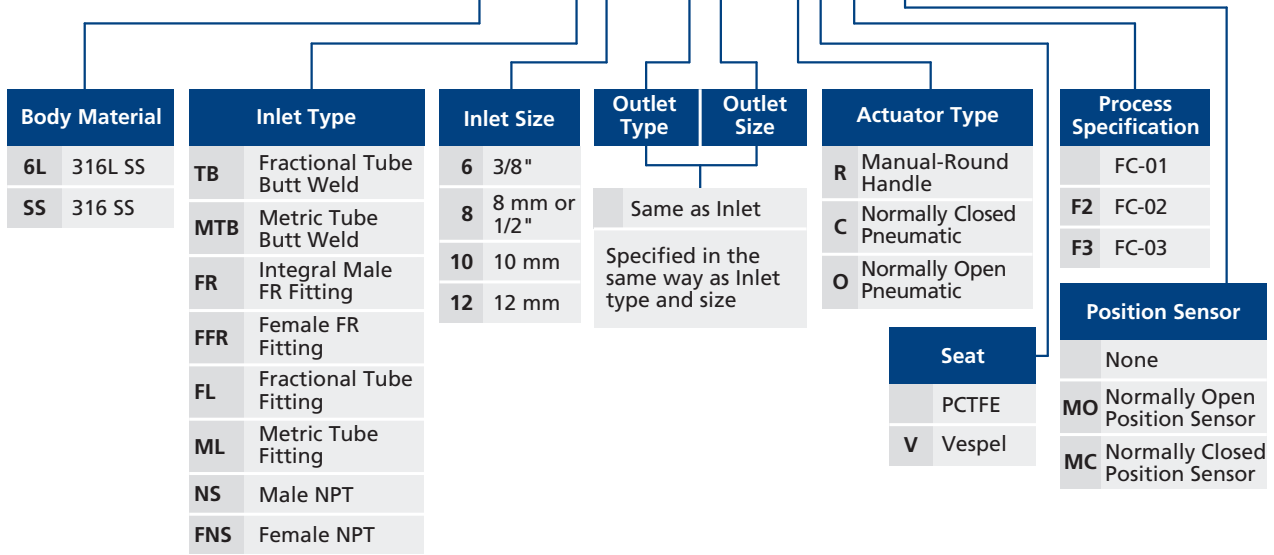
**Pneumatic**



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

DFSS - FR8 - FL8 - CVF2MO



Fittings

Valves & Regulators

Process Specification