

# Diaphragm Valves



Fittings

Valves

Regulators

Filters

Tubing

Integrated Systems

Other Products

Technical Information

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# Atomic Layer Deposition Diaphragm Valves

## ALD Series

### Introduction

FITOK ALD Series Atomic Layer Deposition Diaphragm Valves are ideal for the atomic layer deposition processes. They deliver ultra-high precision, cleanliness, consistency, and long cycle life, ensuring accurate gas dosing for technological processes.



### Features

- ⦿ Ultra long cycle life
- ⦿ No dead space in the flow path
- ⦿ High Cv consistency and stability
- ⦿ Quick response to offer a total opening / closing response time of less than 15 ms
- ⦿ Standard, thermal and thermal immersion models optional
- ⦿ For the valve fitted with a solenoid valve, the solenoid valve is circularly rotatable along the actuator for easy position adjustment

### Technical Data

<b>Port Size</b>	1/4" to 3/8", 6 mm to 8 mm, 1.125" or 1.5" surface-mount	3/8" to 1/2", 10 mm to 12 mm, or 1.5" surface-mount	
<b>Flow Coefficient (Cv)<sup>①</sup></b>	Standard and thermal model: 0.27	Standard and thermal model: 0.62	
	Thermal immersion model: 0.3 <sup>②</sup>	Thermal immersion model: 0.62 <sup>③</sup>	
<b>Orifice Size</b>	0.16" (4.1 mm)	0.23" (5.9 mm)	
<b>Working Pressure</b>	Standard and thermal models: Vacuum to 145 psig (10 bar)		
	Thermal immersion model: Vacuum to 70 psig (4.8 bar)		
<b>Actuator Operating Pressure</b>	60 ~ 90 psig (4.2 ~ 6.2 bar)		
<b>Working Temperature</b>	<b>Body</b>	Standard model: 32 ~ 248 °F (0 ~ 120 °C)	
		Thermal model: 32 ~ 392 °F (0 ~ 200 °C)	
		Thermal immersion model: 70 ~ 428 °F (20 ~ 220 °C)	
	<b>Actuator</b>	Standard and thermal models: 32 ~ 248 °F (0 ~ 120 °C)	
Thermal immersion model: 70 ~ 428 °F (20 ~ 220 °C)			
<b>Solenoid Valve</b>	-0.4 ~ 122 °F (-18 ~ 50 °C)		
<b>Sensor</b>	-13 ~ 158 °F (-25 ~ 70 °C)		
<b>Leak Rate (Helium)</b>	<b>Internal</b>	≤1×10 <sup>-9</sup> std-cm <sup>3</sup> /s	≤1×10 <sup>-8</sup> std-cm <sup>3</sup> /s
	<b>External</b>	≤1×10 <sup>-9</sup> std-cm <sup>3</sup> /s	≤1×10 <sup>-9</sup> std-cm <sup>3</sup> /s

① Cv is adjustable and may vary with temperature. The value shown is the default at room temperature before shipment and can be adjusted upon customer request. For more details, please contact FITOK.

② Cv = 0.21 at 428 °F (220 °C)

③ Cv = 0.4 at 428 °F (220 °C)

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## Flow Data

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

Orifice Size in. (mm)	Pressure Drop to Atmosphere psig (bar)	Air (l/min)	Water (l/min)
0.16 (4.1)	10 (0.68)	86	3.2
	50 (3.4)	230	7.2
	100 (6.8)	410	10.2
0.23 (5.9)	10 (0.68)	199	7.4
	50 (3.4)	530	16.6
	100 (6.8)	945	23.6

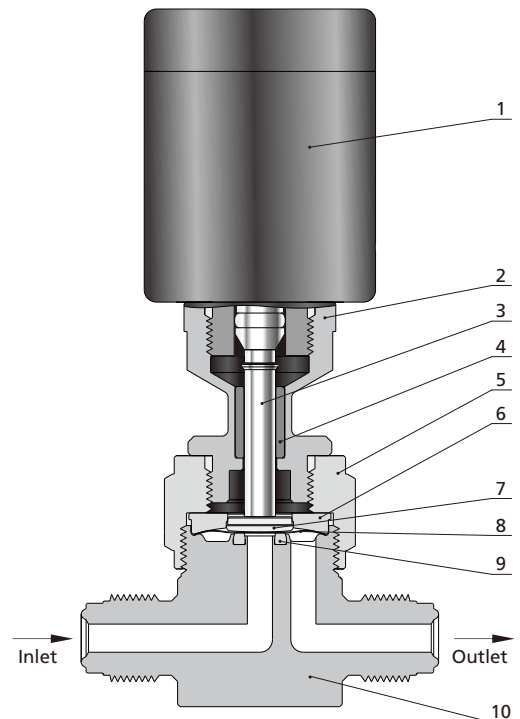
## Process Specification

Process Specification		Ultra High Purity Process (FC-03)
Item		
Material		316L SS, 316L SS VAR, 316L SS VIM-VAR
Wetted Surface Roughness		Ra 5 µin. (0.13 µm)
Polishing Process		Electropolished
Cleaning		Ultra high purity cleaning in continuously monitored ultrasonic cleaning system with deionized water
Assembly Environment		ISO 4 (FS 209E 10 equivalent) cleanroom
Packaging		Double bagged in cleanroom

Notes: Refer to page P-01 for a detailed description of Process Specification.

## Major Materials of Construction

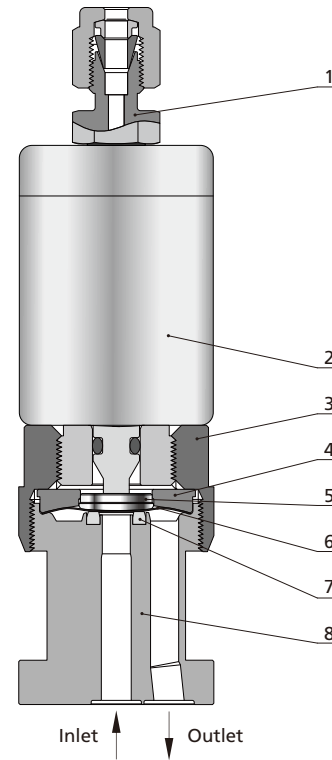
Item	Component	Material/Specification
1	Actuator	Aluminum
2	Thermal Isolation Coupling Housing (Thermal Model Only)	316 SS/ASTM A479
3	Thermal Isolation Coupling Stem (Thermal Model Only)	S17400/ASTM A564
4	Guide (Thermal Model Only)	PTFE/ASTM D1710
5	Bonnet Nut	316 SS/ASTM A479
6	Bonnet	S17400/ASTM A564
7	Button	316 SS/ASTM A479
8	Diaphragm	Cobalt Alloy/AMS 5876
9	Seat	PFA/ASTM D3307
10	Body	316L SS or 316L SS VAR



Normally Closed Thermal Actuator

Item	Component	Material/Specification
1	Fitting	316 SS/ASTM A479
2	Actuator <sup>①</sup>	316 SS/ASTM A479
3	Bonnet Nut	316 SS/ASTM A479
4	Bonnet	S17400/ASTM A564
5	Button	316 SS/ASTM A479
6	Diaphragm	Cobalt Alloy/AMS 5876
7	Seat	PFA/ASTM D3307
8	Body	316L SS or 316L SS VAR

① 1/8" tube fittings by default.

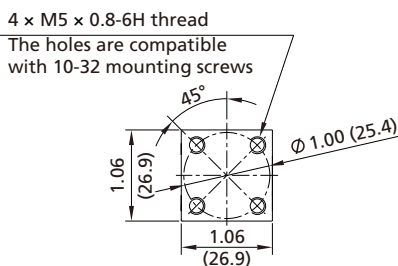
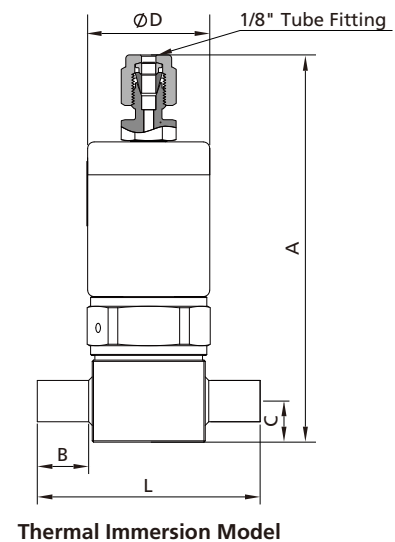
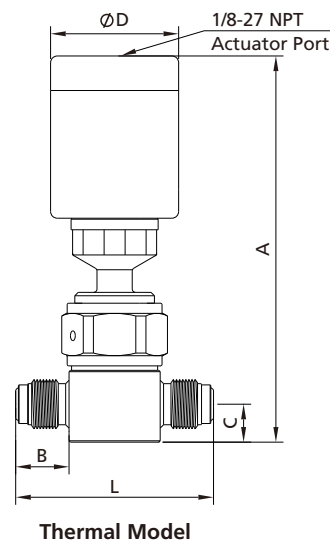
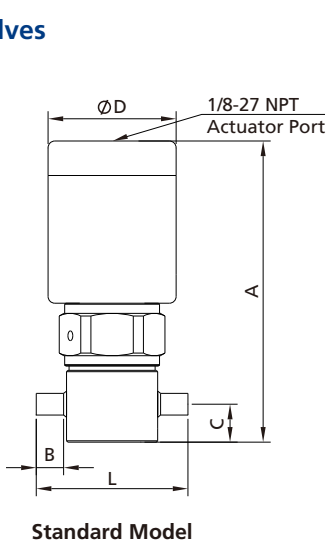


Normally Closed Thermal Immersion Actuator

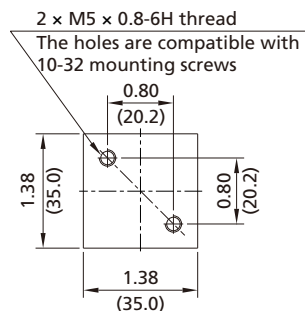
## Dimensions and Ordering Information

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

### 2-Port Valves



Orifice 0.16 in. (4.1 mm) Bottom



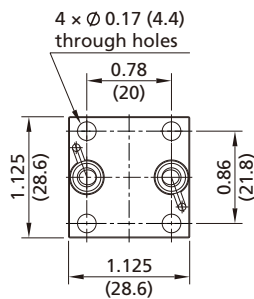
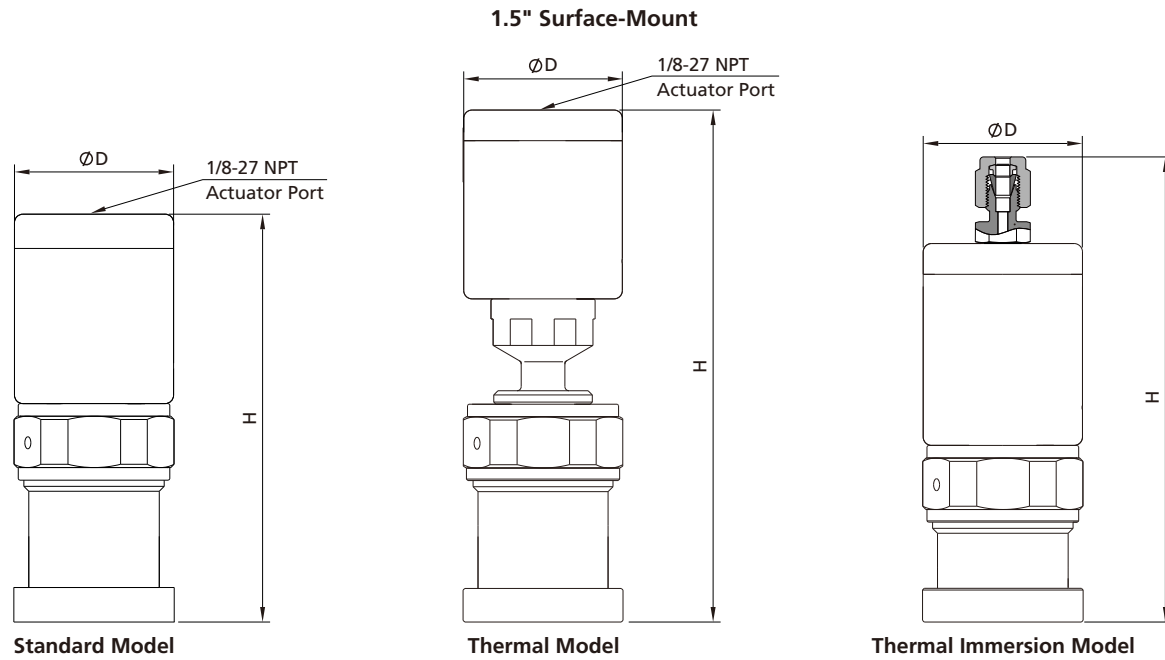
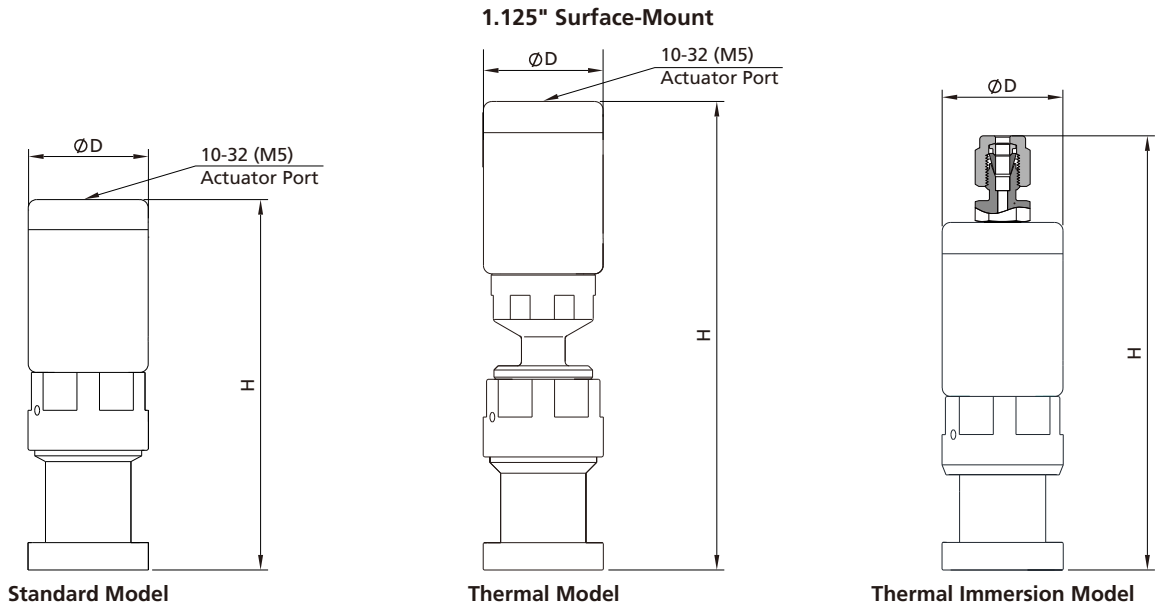
Orifice 0.23 in. (5.9 mm) Bottom

- Fittings
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- Technical Information

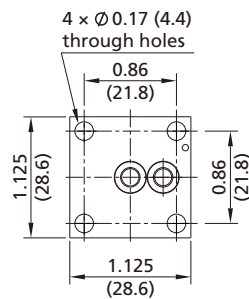
V-07 Diaphragm Valves

	Orifice Size in. (mm)	Valve Type	Basic Ordering Number	Connection Type and Size	Dimensions, in. (mm)					
					A	B	C	D	L	
Fittings	0.16 (4.1)	Standard	ALD□□-TB4-4-	1/4" Tube Butt Weld	3.50 (88.9)	0.30 (7.6)	0.44 (11.2)	1.49 (37.8)	1.74 (44.2)	
			ALD□□-TB6-4-	3/8" Tube Butt Weld		0.26 (6.6)				
			ALD□□-FFR4-4-	1/4" Rotatable Female FR Fitting		0.86 (21.8)				
			ALD□□-RFR4-4-	1/4" Rotatable Male FR Fitting		0.62 (15.7)				
			ALD□□-FR4-4-	1/4" Integral Male FR Fitting						
Valves		Thermal	ALD□□-TB4-4-HT-	1/4" Tube Butt Weld	4.50 (114.0)	0.30 (7.6)	0.44 (11.2)	1.49 (37.8)	1.74 (44.2)	
			ALD□□-TB6-4-HT-	3/8" Tube Butt Weld		0.26 (6.6)				
			ALD□□-FFR4-4-HT-	1/4" Rotatable Female FR Fitting		0.86 (21.8)				
			ALD□□-RFR4-4-HT-	1/4" Rotatable Male FR Fitting		0.62 (15.7)				
			ALD□□-FR4-4-HT-	1/4" Integral Male FR Fitting						
Regulators	Thermal Immersion	ALD□□-TB4-4-HJ-	1/4" Tube Butt Weld	4.02 (102.1)	0.30 (7.6)	0.44 (11.2)	1.12 (28.5)	1.74 (44.2)		
		ALD□□-TB6-4-HJ-	3/8" Tube Butt Weld		0.26 (6.6)					
		ALD□□-FFR4-4-HJ-	1/4" Rotatable Female FR Fitting		0.86 (21.8)					
		ALD□□-RFR4-4-HJ-	1/4" Rotatable Male FR Fitting		0.62 (15.7)					
		ALD□□-FR4-4-HJ-	1/4" Integral Male FR Fitting							
Filters	0.23 (5.9)	Standard	ALD□□-TB6-6-	3/8" Tube Butt Weld	3.55 (93)	0.67 (17.0)	0.50 (12.7)	1.49 (37.8)	2.72 (69.0)	
			ALD□□-TB8-6-	1/2" Tube Butt Weld		0.94 (24.0)				
			ALD□□-FFR8-6-	1/2" Rotatable Female FR Fitting						0.81 (20.6)
			ALD□□-RFR8-6-	1/2" Rotatable Male FR Fitting						0.71 (18.1)
			ALD□□-FR8-6-	1/2" Integral Male FR Fitting						0.94 (23.8)
			ALD□□-FHFR4-6-	1/4" Rotatable Female FR Fitting						0.71 (18.1)
		ALD□□-RHFR4-6-	1/4" Rotatable Male FR Fitting	0.94 (23.8)						
		Thermal	ALD□□-FHFR4-6-HT-		1/4" Rotatable Female FR Fitting	4.54 (118.1)	0.67 (17.0)	0.50 (12.7)	1.49 (37.8)	2.72 (69.0)
			ALD□□-RHFR4-6-HT-	1/4" Rotatable Male FR Fitting	0.94 (24.0)					
			ALD□□-TB6-6-HT-	3/8" Tube Butt Weld			0.81 (20.6)			
ALD□□-TB8-6-HT-	1/2" Tube Butt Weld		0.71 (18.1)							
ALD□□-FFR8-6-HT-	1/2" Rotatable Female FR Fitting		0.94 (23.8)							
ALD□□-RFR8-6-HT-	1/2" Rotatable Male FR Fitting		0.81 (20.6)							
ALD□□-FR8-6-HT-	1/2" Integral Male FR Fitting									
Tubing	Thermal Immersion	ALD□□-FHFR4-6-HJ-	1/4" Rotatable Female FR Fitting	4.45 (113.1)	0.71 (18.1)	0.50 (12.7)	1.49 (37.8)	2.72 (69.0)		
		ALD□□-RHFR4-6-HJ-	1/4" Rotatable Male FR Fitting		0.94 (24.0)					
		ALD□□-TB6-6-HJ-	3/8" Tube Butt Weld						0.81 (20.6)	
		ALD□□-TB8-6-HJ-	1/2" Tube Butt Weld						0.71 (18.1)	
		ALD□□-FFR8-6-HJ-	1/2" Rotatable Female FR Fitting						0.94 (23.8)	
		ALD□□-RFR8-6-HJ-	1/2" Rotatable Male FR Fitting						0.81 (20.6)	
ALD□□-FR8-6-HJ-	1/2" Integral Male FR Fitting									
Integrated Systems	0.23 (5.9)	Thermal Immersion	ALD□□-FHFR4-6-HJ-	1/4" Rotatable Female FR Fitting	4.45 (113.1)	0.71 (18.1)	0.50 (12.7)	1.49 (37.8)	2.72 (69.0)	
			ALD□□-RHFR4-6-HJ-	1/4" Rotatable Male FR Fitting		0.94 (24.0)				
			ALD□□-TB6-6-HJ-	3/8" Tube Butt Weld						0.81 (20.6)
			ALD□□-TB8-6-HJ-	1/2" Tube Butt Weld						0.71 (18.1)
			ALD□□-FFR8-6-HJ-	1/2" Rotatable Female FR Fitting						0.94 (23.8)
			ALD□□-RFR8-6-HJ-	1/2" Rotatable Male FR Fitting						0.81 (20.6)
ALD□□-FR8-6-HJ-	1/2" Integral Male FR Fitting									
Other Products	0.23 (5.9)	Thermal Immersion	ALD□□-FHFR4-6-HJ-	1/4" Rotatable Female FR Fitting	4.45 (113.1)	0.71 (18.1)	0.50 (12.7)	1.49 (37.8)	2.72 (69.0)	
			ALD□□-RHFR4-6-HJ-	1/4" Rotatable Male FR Fitting		0.94 (24.0)				
			ALD□□-TB6-6-HJ-	3/8" Tube Butt Weld						0.81 (20.6)
			ALD□□-TB8-6-HJ-	1/2" Tube Butt Weld						0.71 (18.1)
			ALD□□-FFR8-6-HJ-	1/2" Rotatable Female FR Fitting						0.94 (23.8)
			ALD□□-RFR8-6-HJ-	1/2" Rotatable Male FR Fitting						0.81 (20.6)
ALD□□-FR8-6-HJ-	1/2" Integral Male FR Fitting									
Technical Information	0.23 (5.9)	Thermal Immersion	ALD□□-FHFR4-6-HJ-	1/4" Rotatable Female FR Fitting	4.45 (113.1)	0.71 (18.1)	0.50 (12.7)	1.49 (37.8)	2.72 (69.0)	
			ALD□□-RHFR4-6-HJ-	1/4" Rotatable Male FR Fitting		0.94 (24.0)				
			ALD□□-TB6-6-HJ-	3/8" Tube Butt Weld						0.81 (20.6)
			ALD□□-TB8-6-HJ-	1/2" Tube Butt Weld						0.71 (18.1)
			ALD□□-FFR8-6-HJ-	1/2" Rotatable Female FR Fitting						0.94 (23.8)
			ALD□□-RFR8-6-HJ-	1/2" Rotatable Male FR Fitting						0.81 (20.6)
ALD□□-FR8-6-HJ-	1/2" Integral Male FR Fitting									

Modular Surface-Mount Valves



**1.125" W-Seal Bottom**



**1.125" C-Seal Bottom**

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# V-09 Diaphragm Valves

Fittings

Valves

Regulators

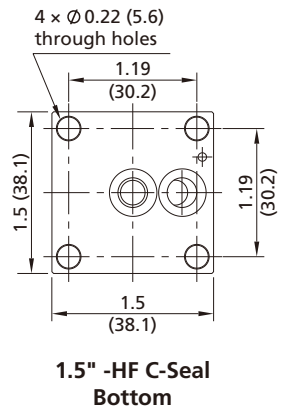
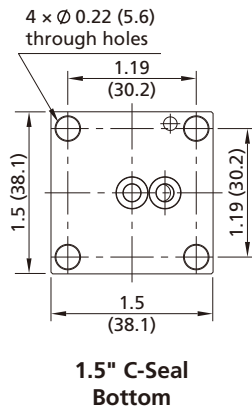
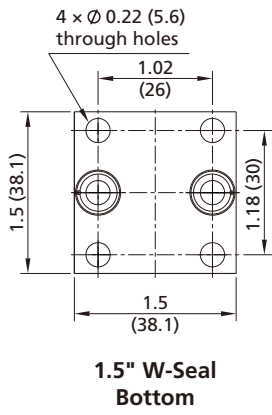
Filters

Tubing

Integrated Systems

Other Products

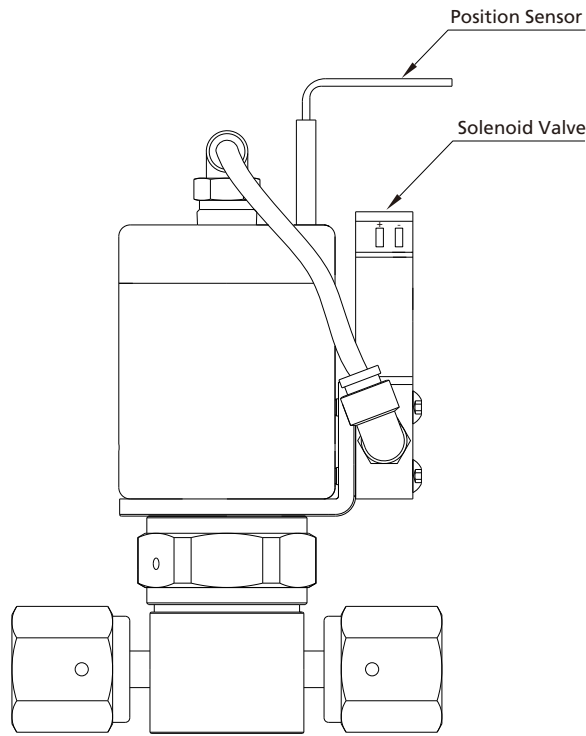
Technical Information



Orifice Size in. (mm)	Valve Type	Basic Ordering Number	Connection Type and Size	Dimension, in. (mm)	
				H	ØD
0.16 (4.1)	Standard	ALD□□-WS11-4-	1.125" W-Seal	3.40 (86.4)	1.12 (28.5)
		ALD□□-CS11-4-	1.125" C-Seal		
		ALD□□-CS15-4-	1.5" C-Seal	2.9 (73.6)	
	Thermal	ALD□□-WS11-4-HT-	1.125" W-Seal	4.39 (111.5)	
		ALD□□-CS11-4-HT-	1.125" C-Seal		
		ALD□□-CS15-4-HT-	1.5" C-Seal	3.89 (98.7)	
	Thermal Immersion	ALD□□-WS11-4-HJ-	1.125" W-Seal	4.02 (102)	
		ALD□□-CS11-4-HJ-	1.125" C-Seal		
		ALD□□-CS15-4-HJ-	1.5" C-Seal	3.69 (93.7)	
0.23 (5.9)	Standard	ALD□□-WS15-6-	1.5" W-Seal	3.81 (96.9)	1.49 (37.8)
		ALD□□-CS15-6-	1.5" C-Seal		
		ALD□□-CS15-HF-6-	1.5" C-Seal (High Flow)		
	Thermal	ALD□□-WS15-6-HT-	1.5" W-Seal	4.80 (122.0)	
		ALD□□-CS15-6-HT-	1.5" C-Seal		
		ALD□□-CS15-HF-6-HT-	1.5" C-Seal (High Flow)		
	Thermal Immersion	ALD□□-WS15-6-HJ-	1.5" W-Seal	3.81 (117)	
		ALD□□-CS15-6-HJ-	1.5" C-Seal		
		ALD□□-CS15-HF-6-HJ-	1.5" C-Seal (High Flow)	3.54 (110)	

## Options and Accessories

Position sensors and solenoid valves are optional. Valve bodies can be equipped with heater cartridge and thermocouple holes.



Normally Closed Standard Actuator

### Position Sensors

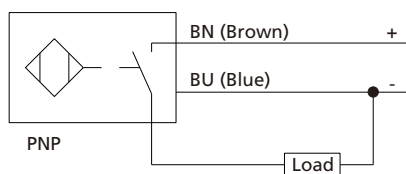
Transmit a signal to an electrical device indicating the open and closed position of pneumatically actuated valves

#### Technical Information

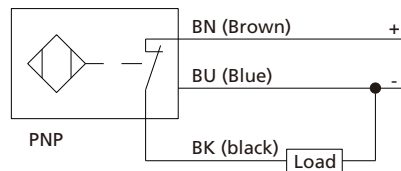
<b>Output</b>	3-wire V (dc), PNP
<b>Output Function</b>	Normally open or normally closed
<b>Voltage</b>	10 ~ 30 V (dc)
<b>Operating Temperature</b>	-13 ~ 158 °F (-25 ~ 70 °C)
<b>Standard Sensor</b>	Grey cable with a diameter of 3.3 mm and a length of 2 m

#### Wiring Diagram

##### Normally Open Position Sensor



##### Normally Closed Position Sensor



#### Note:

1. For normally closed pneumatic actuator valves, when fitted with normally open sensors, the sensors transmit signals with indicators illuminated when the valves are open. Conversely, when fitted with normally closed sensors, the sensors transmit signals with indicators illuminated when the valves are closed.
2. For normally open pneumatic actuator valves, when fitted with normally open sensors, the sensors transmit signals with indicators illuminated when the valves are open. Conversely, when fitted with normally closed sensors, the sensors transmit signals with indicators illuminated when the valves are closed.

## V-11 Diaphragm Valves

### Explosion-proof Position Sensors

Transmit a signal to an electrical device, indicating the open and closed positions of pneumatically actuated valves.

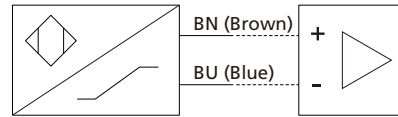
Equipment Group II under ATEX Certification. The output complies with DIN EN 6094 7-5-6 (NAMUR) and the sensor should be used with an isolation amplifier.

#### Technical Information

<b>Output</b>	2 Wires DC
<b>Voltage</b>	8.2 V (dc)
<b>Working Temperature</b>	-13 ~ 158 °F (-25 ~ 70 °C)
<b>Explosion-Proof Sensor</b>	Blue cable with a diameter of 3.0 mm and a length of 2 m

#### Wiring Diagram

Normally Open Position Sensor



### Solenoid Valve Assemblies

With fast-acting and high-flow features, the solenoid valve reduces overall response time. The solenoid valve assembly includes tubing, fittings, and a rotatable mounting bracket, offering flexibility for adjusting the solenoid valve position.

#### Technical Information

<b>Solenoid Valve</b>	<b>Voltage/Power</b>	24 V (dc)/4.0 W
	<b>Electrical Connection</b>	Black cable with a diameter of 1.6 mm and a length of 0.45 m
	<b>Temperature Range</b>	-0.4 ~ 122 °F (-18 ~ 50 °C)
	<b>Port</b>	M5 × 0.8-6H thread, compatible with 10-32 screws
<b>Fitting</b>	<b>Material</b>	316 SS
<b>Tubing</b>		Polyurethane
<b>Bracket</b>		304 SS
<b>O-Ring</b>		Fluorocarbon FKM

### Pneumatic Fittings

The pneumatic fitting connects the gas source (via tubing or hose) to a pneumatic actuator, ensuring a reliable gas supply for efficient operation.

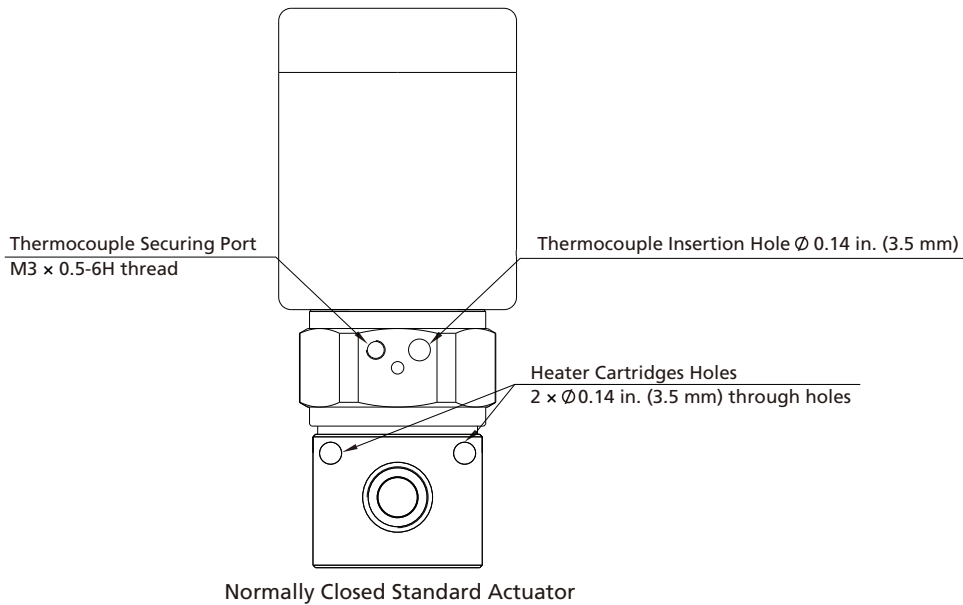
#### Technical Information

<b>Code</b>	EM4	UM4
<b>Description</b>	90° union elbow for 4 mm tube	Straight fitting for 4 mm tube
<b>Major Materials</b>	316 SS, FKM	
<b>Max. Working Pressure</b>	1 MPa	
<b>Working Temperature</b>	23 ~ 302 °F (-5 ~ 150 °C)	

Note: For additional pneumatic fitting options, please contact FITOK.

### Heater Cartridge and Thermocouple Insertion Hole

Heater cartridges holes: 2-port and 3-port modular surface-mounted valves have 1 Hole, while other 2-port valves feature 2 Holes. Thermocouple Insertion Hole: 2-port and 3-port valves have 1 Thermocouple Insertion Hole and 1 Thermocouple Securing Port.



### Part Number Description

**ALD6LV - CS11 - 4 - HT - 3P - CF3MOVBCEM4 - CE**

<table border="1"> <thead> <tr><th colspan="2">Body Material</th></tr> </thead> <tbody> <tr><td>6L</td><td>316L SS</td></tr> <tr><td>6LV</td><td>316L SS VAR</td></tr> <tr><td>6LW</td><td>316L SS VIM-VAR</td></tr> </tbody> </table>	Body Material		6L	316L SS	6LV	316L SS VAR	6LW	316L SS VIM-VAR	<table border="1"> <thead> <tr><th colspan="2">Port Size</th></tr> </thead> <tbody> <tr><td>4</td><td>1/4"</td></tr> <tr><td>6</td><td>3/8" or 6 mm</td></tr> <tr><td>8</td><td>1/2" or 8 mm</td></tr> <tr><td>10</td><td>10 mm</td></tr> <tr><td>12</td><td>12 mm</td></tr> <tr><td>11</td><td>1.125"</td></tr> <tr><td>15</td><td>1.5"</td></tr> <tr><td>15-HF</td><td>1.5" High Flow</td></tr> </tbody> </table>	Port Size		4	1/4"	6	3/8" or 6 mm	8	1/2" or 8 mm	10	10 mm	12	12 mm	11	1.125"	15	1.5"	15-HF	1.5" High Flow	<table border="1"> <thead> <tr><th colspan="2">Orifice Size</th></tr> </thead> <tbody> <tr><td>4</td><td>0.16" (4.1 mm)</td></tr> <tr><td>6</td><td>0.23" (5.9 mm)</td></tr> </tbody> </table>	Orifice Size		4	0.16" (4.1 mm)	6	0.23" (5.9 mm)	<table border="1"> <thead> <tr><th colspan="2">Actuator Type</th></tr> </thead> <tbody> <tr><td>C</td><td>Normally Closed</td></tr> <tr><td>O</td><td>Normally Open</td></tr> </tbody> </table>	Actuator Type		C	Normally Closed	O	Normally Open	<table border="1"> <thead> <tr><th colspan="2">Heater Cartridge Holes and Thermocouple Holes</th></tr> </thead> <tbody> <tr><td></td><td>None</td></tr> <tr><td>BC</td><td>Heater Cartridge Holes and Thermocouple Holes</td></tr> </tbody> </table>	Heater Cartridge Holes and Thermocouple Holes			None	BC	Heater Cartridge Holes and Thermocouple Holes				
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Notes:  
 1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available, Should you have any questions, please contact FITOK Group or our authorized distributors.  
 2. For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

- Fittings
- Valves
- Regulators
- Filters
- Tubing
- Integrated Systems
- Other Products
- Technical Information

# Low Pressure Manual Diaphragm Valves

## DQ Series

### Introduction

DQ Series Low Pressure Manual Diaphragm Valves are suitable for high purity and ultra high purity applications. These valves offer enhanced reliability, a wide temperature range, and excellent medium compatibility, making them applicable to a vast majority of working conditions.



### Features

- Low internal volume, fully swept flow path
- Contained seat to provide excellent resistance to swelling and contamination
- Cobalt alloy 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)	
Working Pressure	Vacuum to 250 psig (17.2 bar)	
Temperature	PCTFE: -10 ~ 176 °F (-23 ~ 80 °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 psig (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

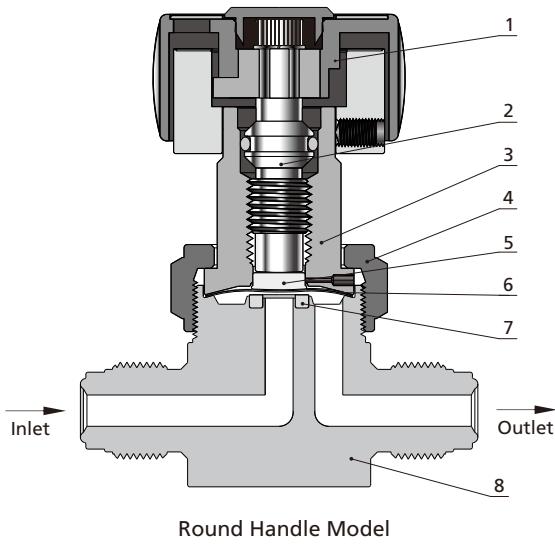
### Process Specification

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

Notes: Refer to page P-01 for a detailed description of Process Specification.

<sup>①</sup> Wetted surface roughness of valves with FR Series metal gasket face seal connections and tube butt weld connections.

## Major Materials of Construction



Item	Component	Material/Specification
1	Round	ABS
	Integral Lockout (LOTO)	Aluminum
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 (2)	Cobalt Alloy/AMS 5876
7	Seat	PCTFE/ASTM D1430 or PFA/ASTM D3307
8	Body	316L SS or 316L SS VAR

## Handles

### Manual-Round Handle

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



### Manual-Integral Lockout (LOTO) Handle

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



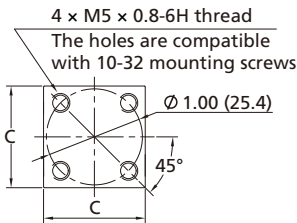
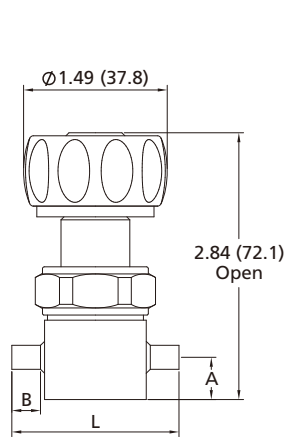
## Dimensions and Ordering Information

### Straight Type

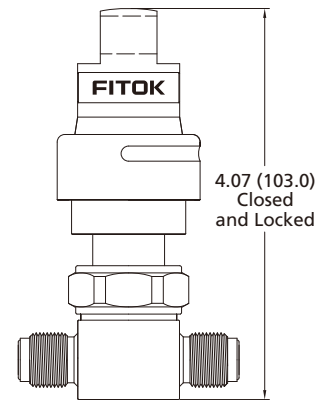
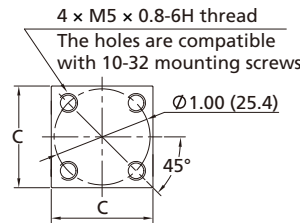
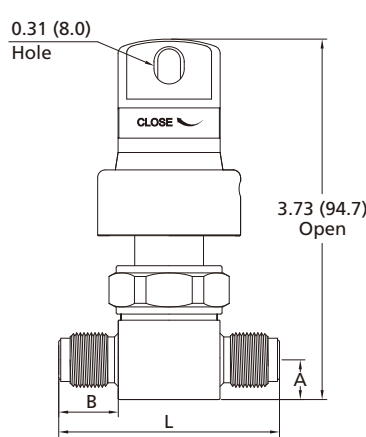
#### Dimensions

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

Round Handle



Integral Lockout (LOTO) Handle



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)			
		A	B	C	L
DQ□□-TB4-	1/4" x 0.035" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.06 (26.9)	1.74 (44.2)
DQ□□-TB6-	3/8" x 0.035" Tube Butt Weld		0.26 (6.6)		
DQ□□-FFR4-	1/4" Rotatable Female FR Fitting		0.86 (21.8)		2.78 (70.6)
DQ□□-RFR4-	1/4" Rotatable Male FR Fitting		0.62 (15.7)		
DQ□□-FR4-	1/4" Integral Male FR Fitting		2.30 (58.4)		

#### Ordering Number Description

DQ6L - TB4 - FR4 - RAF2

Body Material		Inlet Type		Inlet Size		Outlet Type	Outlet Size	Handle Type		Process Specification	
6L	316L SS	TB	Fractional Tube Butt Weld	4	1/4" or 1/4" x 0.035"	Same as Inlet		R	Manual-Round Handle	FC-01	
6LV	316L SS VAR	MTB	Metric Tube Butt Weld	6	6 mm or 3/8" x 0.035"	Specified in the same way as Inlet		U	Manual-Integral Lockout (LOTO) Handle	F2	FC-02
		FR	Integral Male FR Fitting	8	8 mm					F3	FC-03
		FFR	Rotatable Female FR Fitting								
		RFR	Rotatable Male FR Fitting								
		FL	Fractional Tube Fitting								
		ML	Metric Tube Fitting								
										Seat	
										PCTFE	
										A PFA	

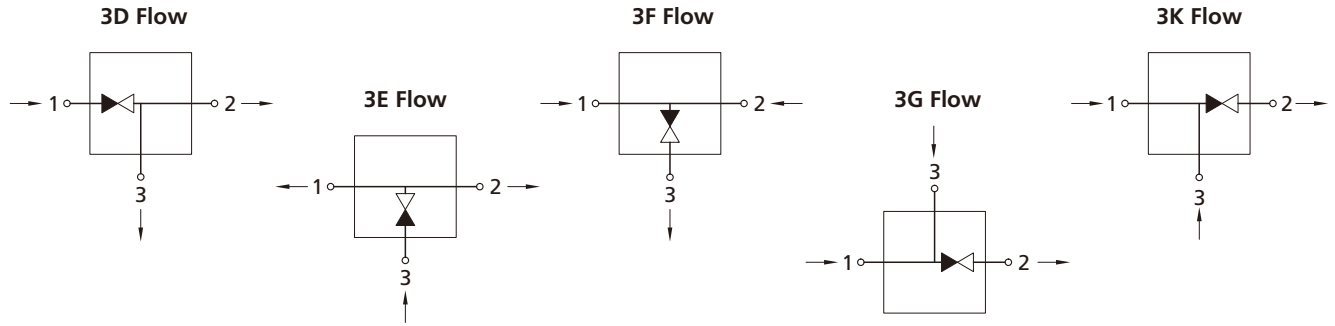
Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number.

Not all combinations are available.; Should you have any questions, please contact FITOK or our authorized distributors.

## Branch Type

### Flow Paths

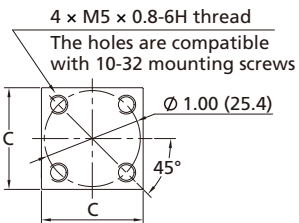
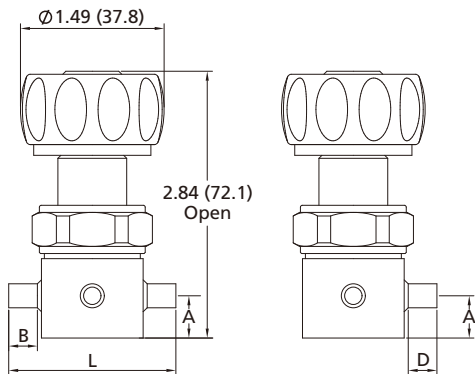
☉ Flow paths as viewed from the top



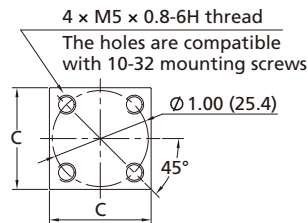
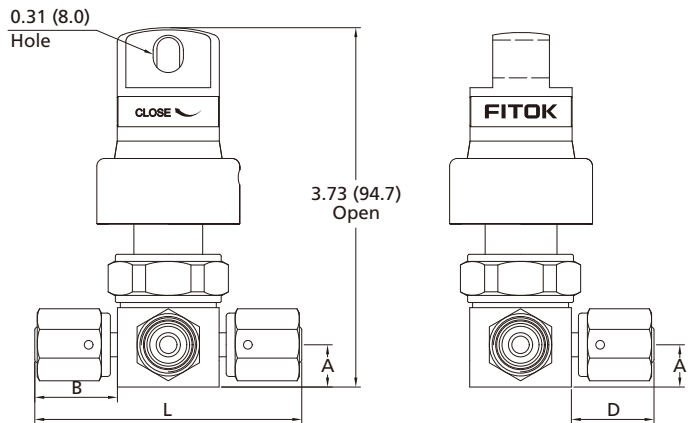
### Dimensions

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

#### Round Handle



#### Integral Lockout (LOTO) Handle



Fittings

Valves

Regulators

Filters

Tubing

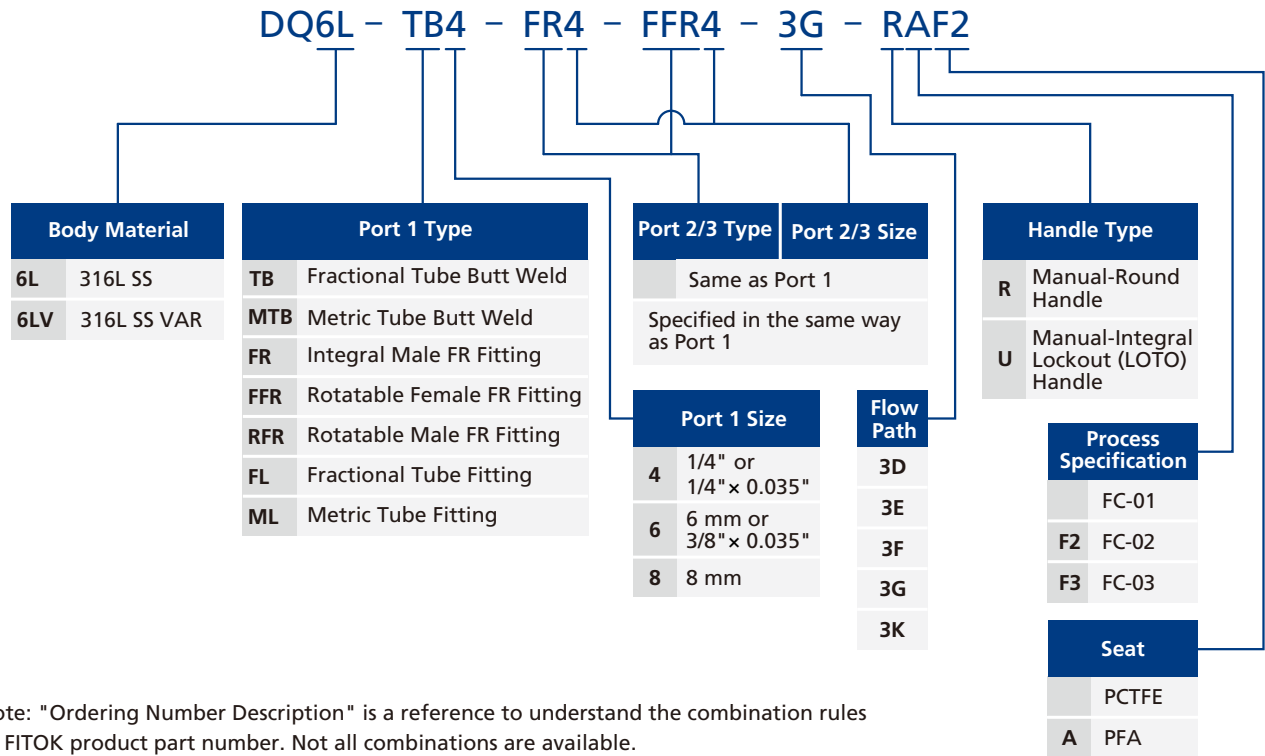
Integrated Systems

Other Products

Technical Information

Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	C	D	L
DQ□□-TB4-	1/4" x 0.035" 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" x 0.035" Tube Butt Weld		0.26 (6.6)		0.26 (6.6)	
DQ□□-FFR4-	1/4" Rotatable Female FR Fitting		0.86 (21.8)		0.86 (21.8)	2.78 (70.6)
DQ□□-RFR4-	1/4" Rotatable Male FR Fitting		0.62 (15.7)		0.62 (15.7)	2.30 (58.4)
DQ□□-FR4-	1/4" Integral Male FR Fitting					

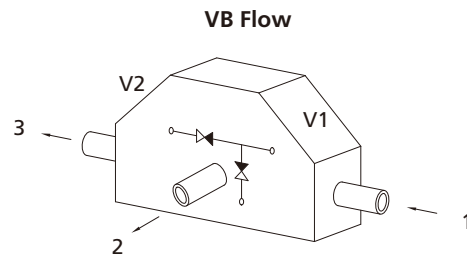
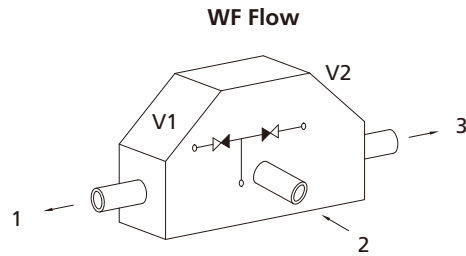
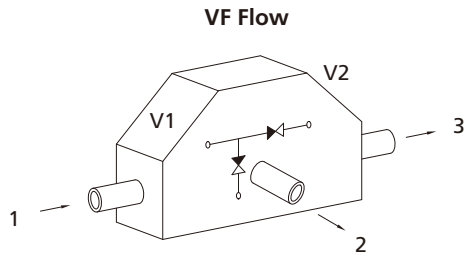
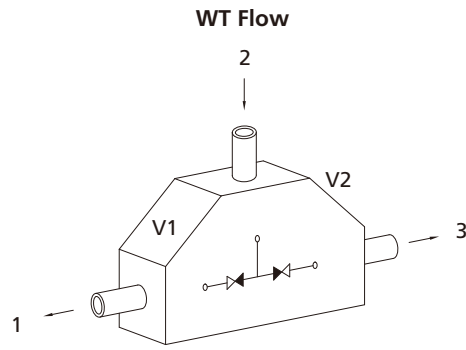
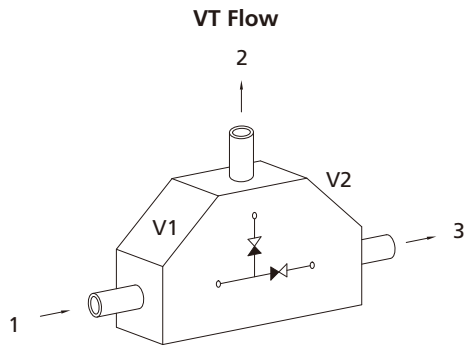
Ordering Number Description



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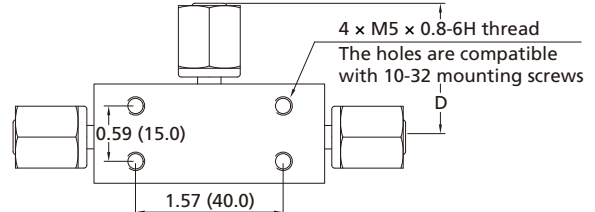
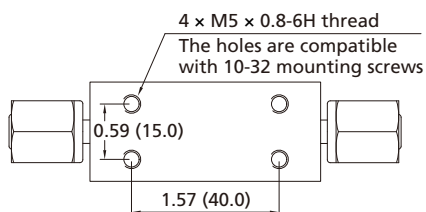
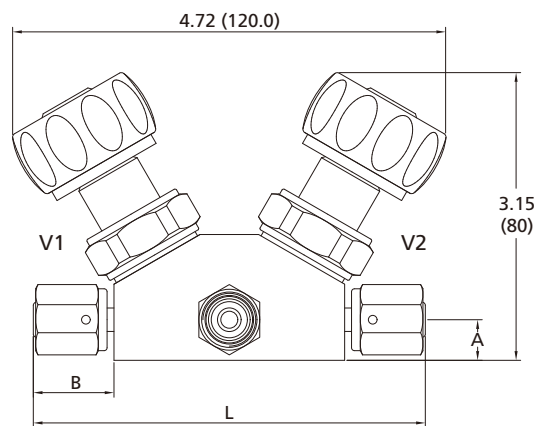
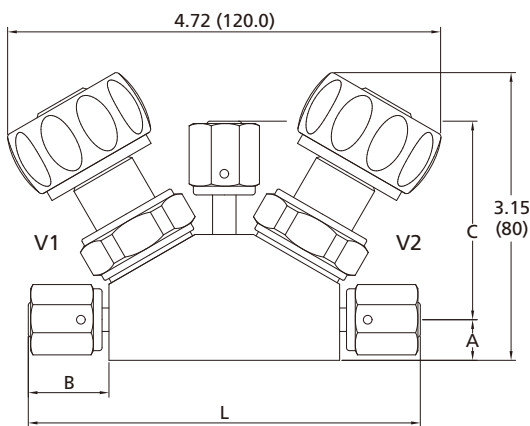
## 2-Valve 3-Way Block Type

### Flow Paths



### Dimensions

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

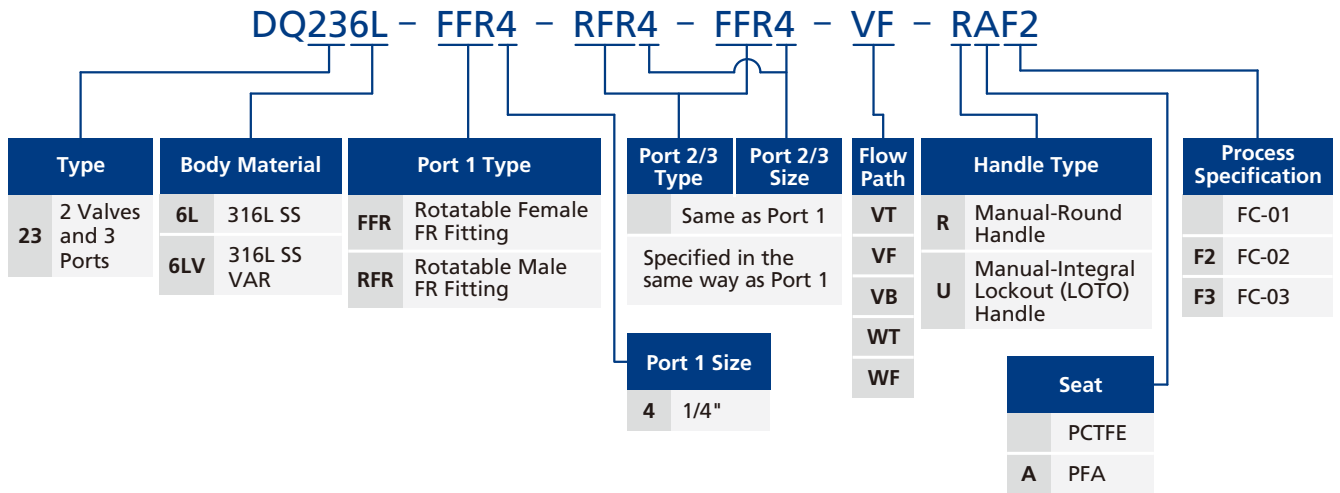


Fittings
Valves
Regulators
Filters
Tubing
Integrated Systems
Other Products
Technical Information

# V-19 Diaphragm Valves

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

## Ordering Number Description

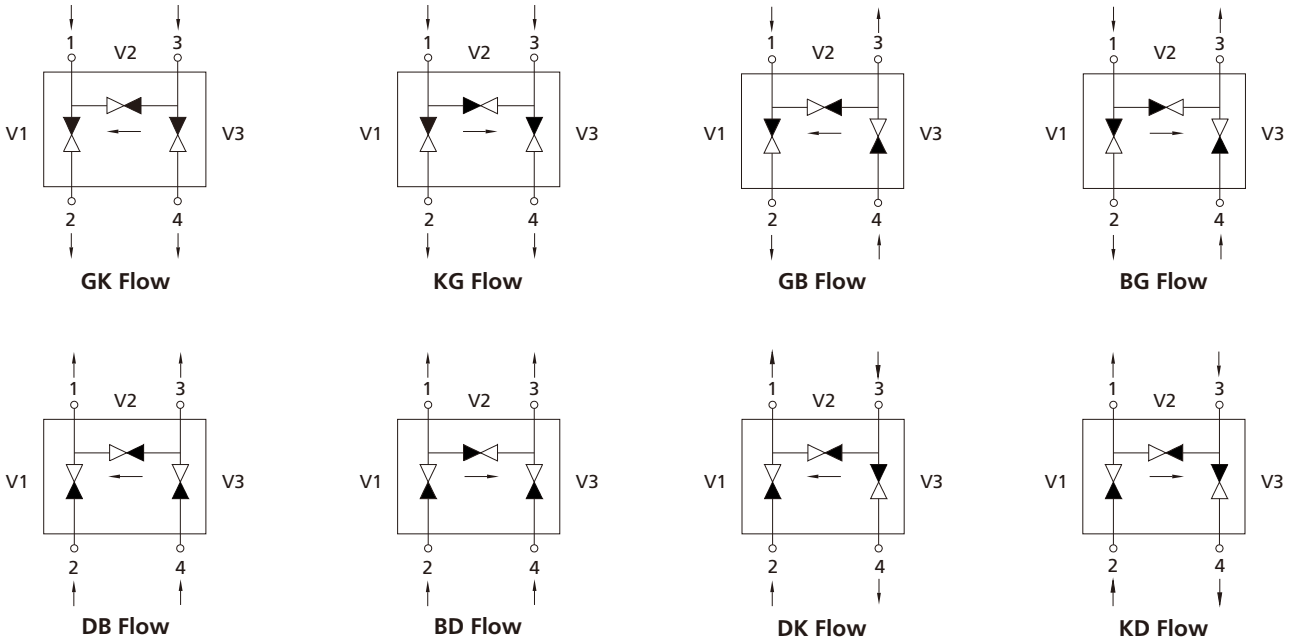


Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available. Should you have any questions, please contact FITOK Group or our authorized distributors.

### 3-Valve 4-Way Block Type

#### Flow Paths

☉ Flow paths as viewed from the top



#### Dimensions

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



Fittings

Valves

Regulators

Filters

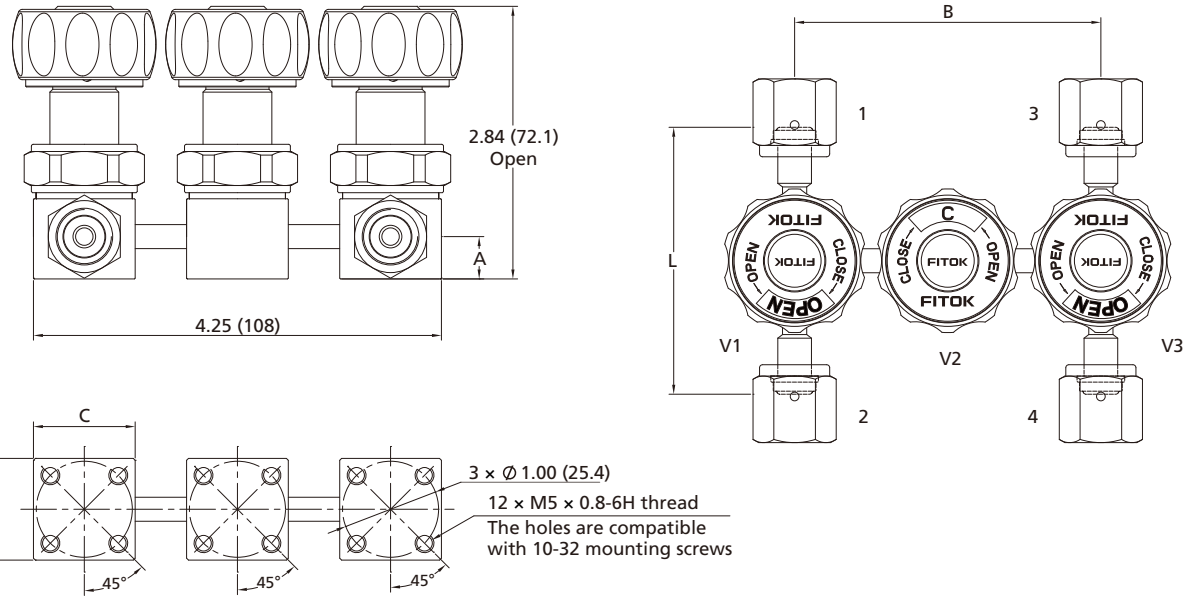
Tubing

Integrated Systems

Other Products

Technical Information

# V-21 Diaphragm Valves



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

## Ordering Number Description

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

Type	Body Material	Port 1 Type	Port 2/3/4 Type	Port 2/3/4 Size	Flow Path	Handle Type	Process Specification
34 3 Valves and 4 Ports	6L 316L SS	FFR Rotatable Female FR Fitting	Same as Port 1	Specified in the same way as Port 1	GK	R Manual-Round Handle	FC-01
	6LV 316L SS VAR	RFR Rotatable Male FR Fitting					FC-02
						U Manual-Integral Lockout (LOTO) Handle	FC-03
							<b>Seat</b>
							PCTFE
							A PFA

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available. Should you have any questions, please contact FITOK Group or our authorized distributors.

# Replaceable-Seat Diaphragm Valves

## DQX Series

### Introduction

Replaceable-Seat Diaphragm Valves are suitable for applications requiring frequent valve maintenance and seat replacement, such as precursor containers and canisters. Their easy operation, long cycle life, and excellent sealing performance help to reduce costs for customers.

### Features

- ◎ Easily replaceable valve seat, without need for special tools. Service kits are available
- ◎ Valve seat assembly with perfectly symmetrical structure to eliminate need to distinguish the orientation of seats
- ◎ Black handle for easy identification of replaceable-seat valves.

### Technical Data

<b>Port Size</b>		1/4" to 3/8" or 6 mm to 8 mm
<b>Flow Coefficient (Cv)</b>		0.3
<b>Orifice Size</b>		0.16 in. (4.1 mm)
<b>Working Pressure</b>		Vacuum to 250 psig (17.2 bar)
<b>Working Temperature</b>		PCTFE: -10 ~ 176 °F (-23 ~ 80 °C) PFA: -10 ~ 302 °F (-23 ~ 150 °C)
<b>Leak Rate (Helium)</b>	<b>Internal</b>	$\leq 1 \times 10^{-9}$ std·cm <sup>3</sup> /s
	<b>External</b>	$\leq 1 \times 10^{-9}$ std·cm <sup>3</sup> /s

### Process Specification

Item	Process Specification	Standard Cleaning and Packaging Process (FC-01) Special Cleaning and Packaging Process (FC-02)	Ultra High Purity Process (FC-03)
		<b>Material</b>	316L SS
<b>Wetted Surface Roughness</b>		Ra 5 μin. (0.13 μm)	
<b>Polishing Process</b>		Electropolishing	

Note: Refer to Page P-01 for a detailed description of Process Specification.



open



close

### Flow Data

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

Pressure Drop to Atmosphere psig (bar)	Air (l/min)	Water (l/min)
10 (0.68)	96	3.6
50 (3.4)	250	7.9
100 (6.8)	450	11.0

Fittings

Valves

Regulators

Filters

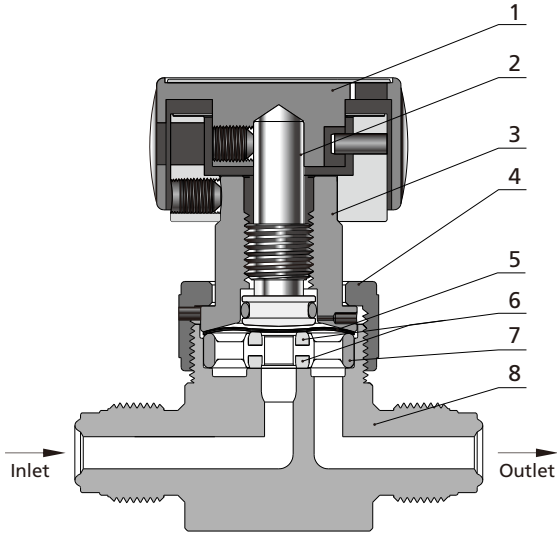
Tubing

Integrated Systems

Other Products

Technical Information

## Major Materials of Construction

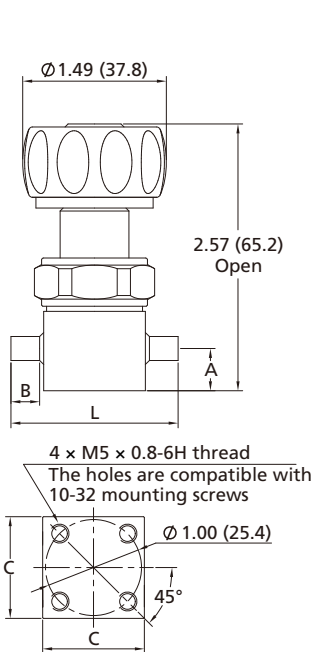


Item	Component	Material/Specification
1	Round Handle	Aluminum
	Integral Lockout (LOTO) Handle	Aluminum
2	Stem	316 SS/ASTM A479
3	Bonnet	S17400/ASTM A564
4	Bonnet Nut	316 SS/ASTM A479
5	Diaphragm (2)	Cobalt Alloy/AMS 5876
6	Seat	PCTFE/ASTM D1430 or PFA/ASTM D3307
7	Seat Retainer	316L SS or 316L SS VAR
8	Body	316L SS or 316L SS VAR

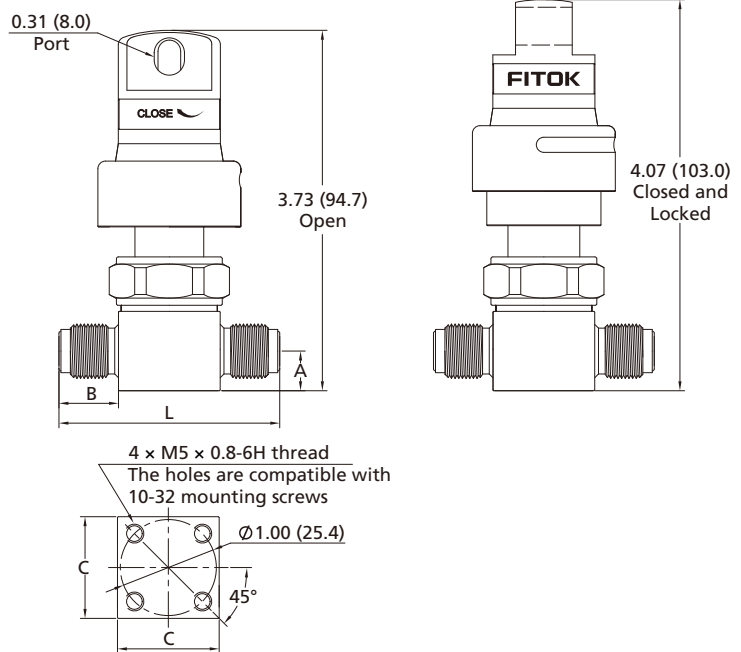
## Dimensions and Ordering Information

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

Round Handle



Integral Lockout (LOTO) Handle



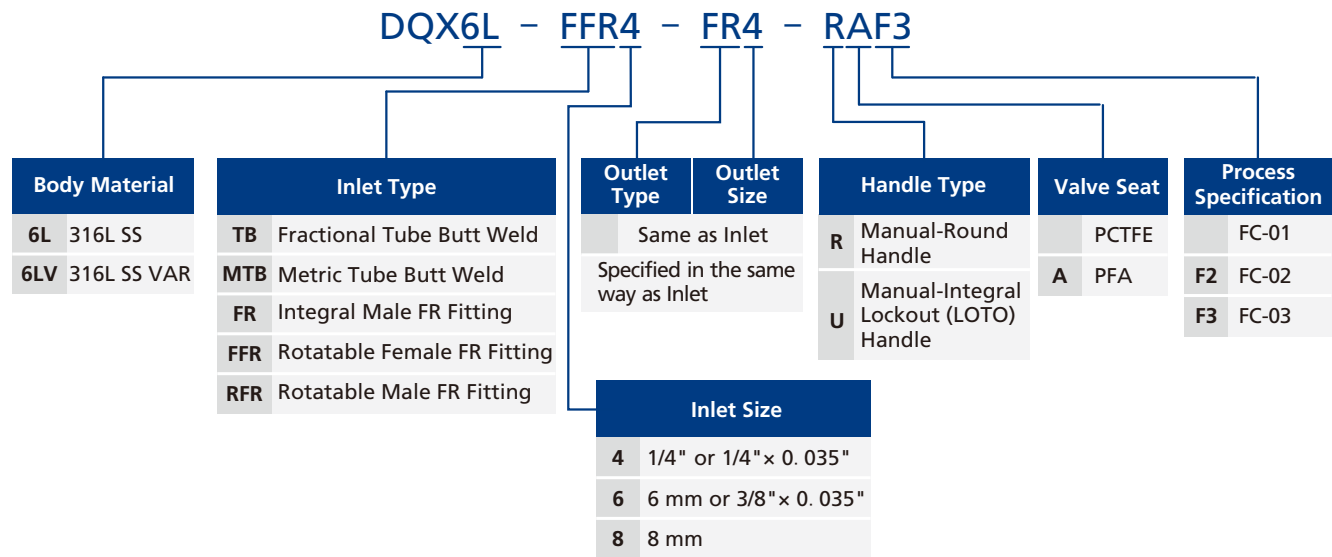
Basic Ordering Number	Connection Type and Size	Dimension, in. (mm)			
		A	B	C	L
DQX□□-TB4-	1/4" x 0.035" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.06 (26.9)	1.74 (44.2)
DQX□□-TB6-	3/8" x 0.035" Tube Butt Weld		0.26 (6.6)		
DQX□□-FFR4-	1/4" Rotatable Female FR Fitting		0.86 (21.8)		2.78 (70.6)
DQX□□-RFR4-	1/4" Rotatable Male FR Fitting		0.62 (15.7)		
DQX□□-FR4-	1/4" Integral Male FR Fitting				2.30 (58.4)

## Service Kit Ordering Information

Basic Ordering Information	Description	Remarks
<input type="checkbox"/> <input type="checkbox"/> DQX-KIT	Includes 1 piece of seat assembly (seat material: PCTFE), 2 pieces of cobalt alloy diaphragms, and maintenance instructions	Applies to replaceable-seat diaphragm valves
<input type="checkbox"/> <input type="checkbox"/> DQX-A-KIT	Includes 1 piece of seat assembly (seat material: PFA), 2 pieces of cobalt alloy diaphragms, and maintenance instructions	



## Ordering Number Description



Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available. Should you have any questions, please contact FITOK Group or our authorized distributors.

Fittings

Valves

Regulators

Filters

Tubing

Integrated Systems

Other Products

Technical Information

# Low Pressure Pneumatic Diaphragm Valves

## DP Series

### Introduction

DP Series Low Pressure Pneumatic Diaphragm Valves are suitable for high purity and ultra high purity applications. These valves offer enhanced reliability, a wide temperature range, and excellent medium compatibility, making them applicable to a vast majority of working conditions.



### Features

- ⦿ Minimal particle generation and minimal dead space
- ⦿ Fully contained seat to provide excellent resistance to swelling and contamination
- ⦿ Cobalt alloy diaphragm with high strength and corrosion resistance to ensure long cycle life
- ⦿ Long cycle life with high speed actuation
- ⦿ No internally wetted threads or springs which minimizes particle generation and particle entrapment for high purity.
- ⦿ Functional under vacuum conditions
- ⦿ Normally closed or normally open position sensors are optional for pneumatically actuated valves

### Technical Data

<b>Port Size</b>	1/4" to 3/8" or 6 mm to 8 mm	
<b>Flow Coefficient (Cv)</b>	0.27, 0.5	
<b>Orifice Size</b>	0.16 in. (4.1 mm), 0.20 in. (5.1 mm)	
<b>Working Pressure</b>	Vacuum to 250 psig (17.2 bar)	
<b>Pneumatic Actuator Operating Pressure</b>	60 to 90 psig (4.2 to 6.2 bar)	
<b>Temperature</b>	PCTFE: -10 ~ 176 °F (-23 ~ 80 °C) PFA: -10 ~ 302 °F (-23 ~ 150 °C)	
<b>Leak Rate (Helium)</b>	<b>Internal</b>	$\leq 1 \times 10^{-9}$ std·cm <sup>3</sup> /s
	<b>External</b>	$\leq 1 \times 10^{-9}$ std·cm <sup>3</sup> /s

### Flow Data

Air @ 70 °F (21 °C)

Water @ 60 °F (16 °C)

Pressure Drop to Atmosphere psig (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

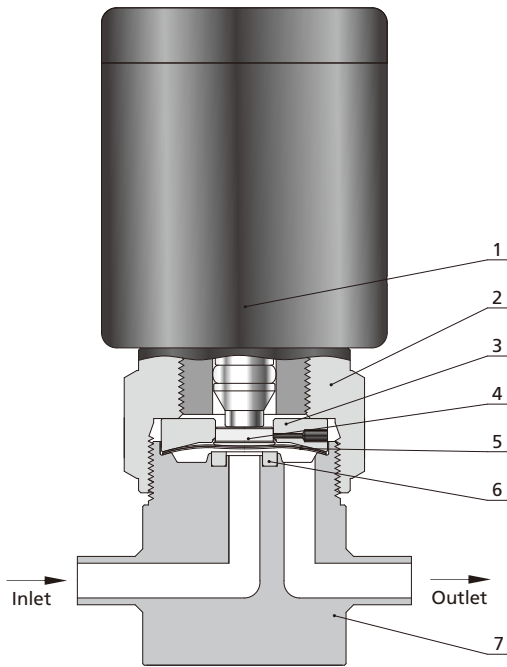
### Process Specification

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

Notes: Refer to page P-01 for a detailed description of Process Specification.

① Wetted surface roughness of valves with FR Series metal gasket face seal connections and tube butt weld connections.

## Major Materials of Construction



Normally Closed Pneumatic 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)	Cobalt Alloy/AMS 5876
6	Seat	PCTFE/ASTM D1430 or PFA/ASTM D3307
7	Body	316L SS or 316L SS VAR

## 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



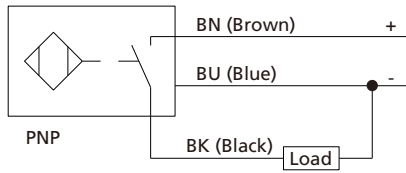
### Technical Information

Output	3-wire V (dc), PNP
Output Function	Normally open or normally closed
Voltage	10 ~ 30 V (dc)
Working Temperature	-13 ~ 158 °F (-25 ~ 70 °C)

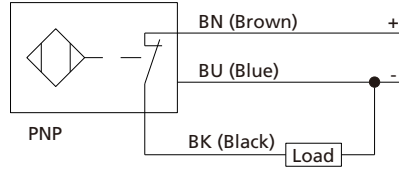
# V-27 Diaphragm Valves

## Wiring Diagram

### Normally open position sensors



### Normally closed position sensors



#### Notes:

1. For normally closed pneumatically actuated valves, when fitted with normally open sensors, the sensors transmit signals with indicators illuminated when the valves are open. Conversely, when fitted with normally closed sensors, the sensors transmit signals with indicators illuminated when the valves are closed.
2. For normally open pneumatically actuated valves, when fitted with normally open sensors, the sensors transmit signals with indicators illuminated when the valves are open. Conversely, when fitted with normally closed sensors, the sensors transmit signals with indicators illuminated when the valves are closed.

## Explosion-proof Position Sensors

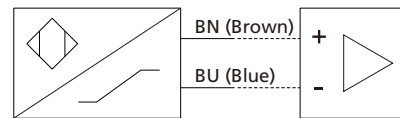
Transmit a signal to an electrical device, indicating the open and closed positions of pneumatically actuated valves.

Equipment Group II under ATEX Certification. The output complies with DIN EN 6094 7-5-6 (NAMUR) and the sensor should be used with an isolation amplifier.

### Technical Information

<b>Output</b>	2 Wires DC
<b>Voltage</b>	8.2 V (dc)
<b>Working Temperature</b>	-13 ~ 158 °F (-25 ~ 70 °C)

### Wiring Diagram

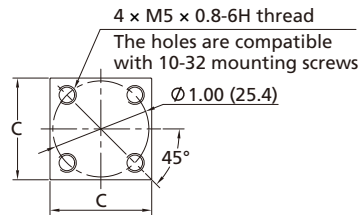
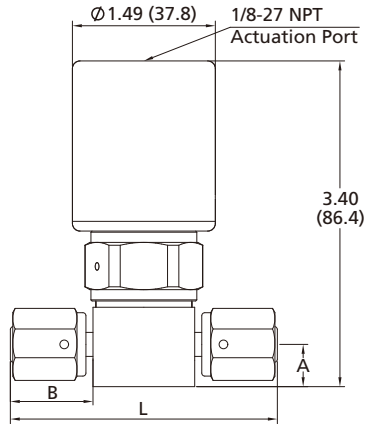


## Dimensions and Ordering Information

### 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" x 0.035" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.06 (26.9)	1.74 (44.2)
DP□□-TB6-	3/8" x 0.035" Tube Butt Weld		0.26 (6.6)		
DP□□-FFR4-	1/4" Rotatable Female FR Fitting		0.86 (21.8)		2.78 (70.6)
DP□□-RFR4-	1/4" Rotatable Male FR Fitting		0.62 (15.7)		2.30 (58.4)
DP□□-FR4-	1/4" Integral Male FR Fitting				

Fittings

Valves

Regulators

Filters

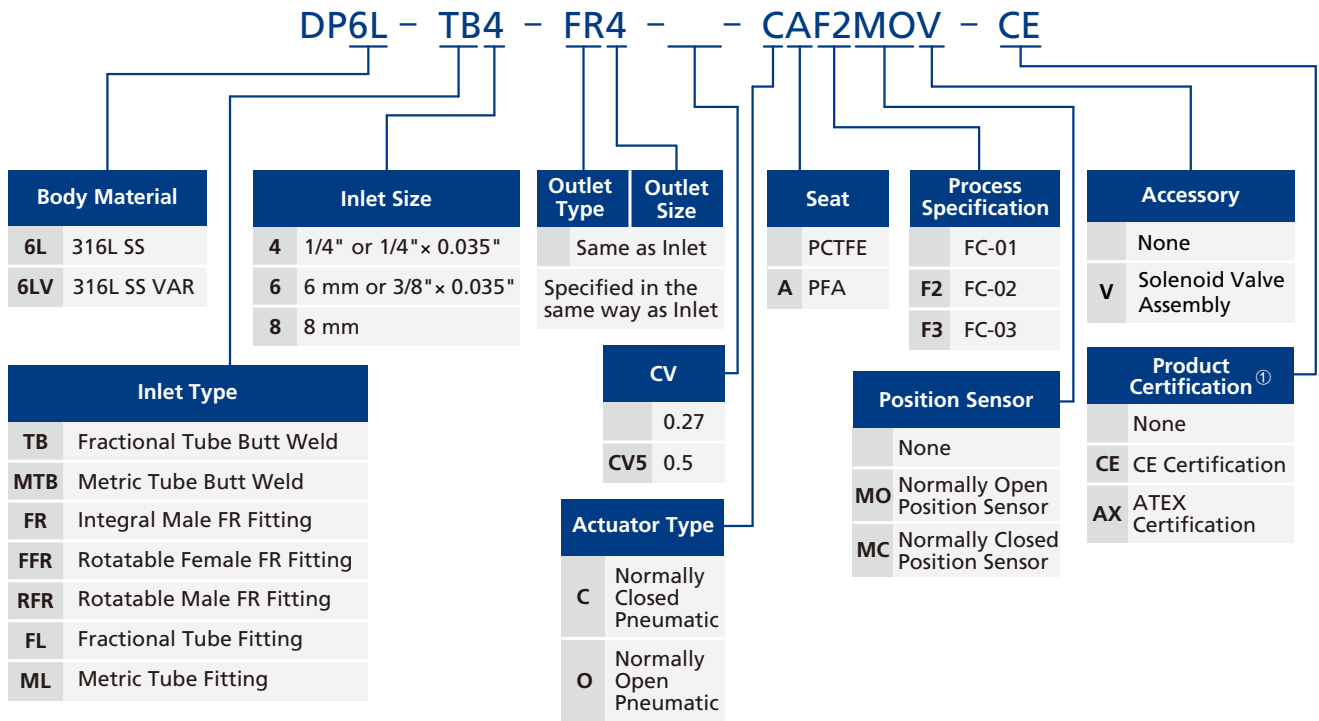
Tubing

Integrated Systems

Other Products

Technical Information

Ordering Number Description



① The solenoid valve assembly is not available with CE or ATEX certifications. When selecting a solenoid valve assembly as an option, the part number must not include "CE" or "AX".

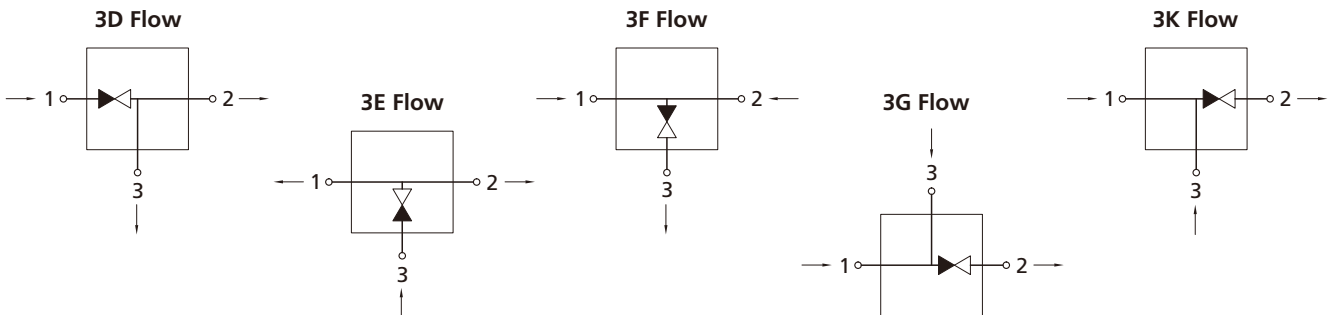
Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available, Should you have any questions, please contact FITOK Group or our authorized distributors.
- For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

Branch Type

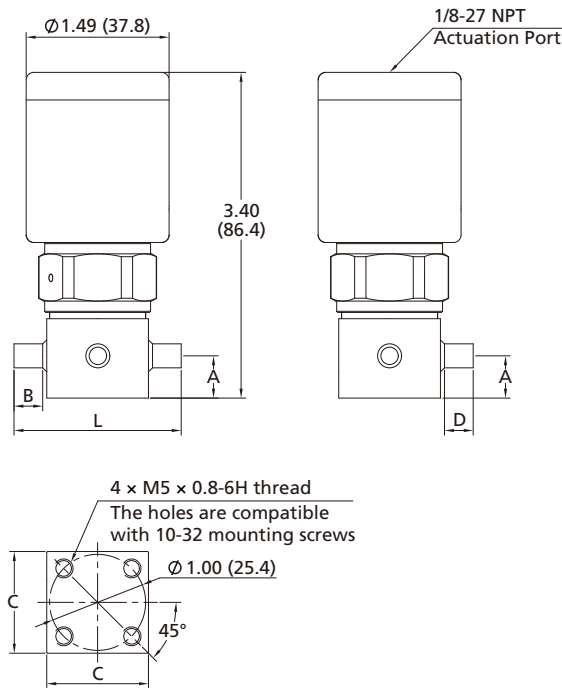
Flow Paths

☉ Flow paths as viewed from the top



**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" x 0.035" 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" x 0.035" Tube Butt Weld		0.26 (6.6)		0.26 (6.6)	
DP□□-FFR4-	1/4" Rotatable Female FR Fitting		0.86 (21.8)		0.86 (21.8)	2.78 (70.6)
DP□□-RFR4-	1/4" Rotatable Male FR Fitting		0.62 (15.7)		0.62 (15.7)	
DP□□-FR4-	1/4" Integral Male FR Fitting					

Fittings

Valves

Regulators

Filters

Tubing

Integrated Systems

Other Products

Technical Information

Ordering Number Description

**DP6L - TB4 - FR4 - FFR4 - - 3G - CAF2MO - CE**

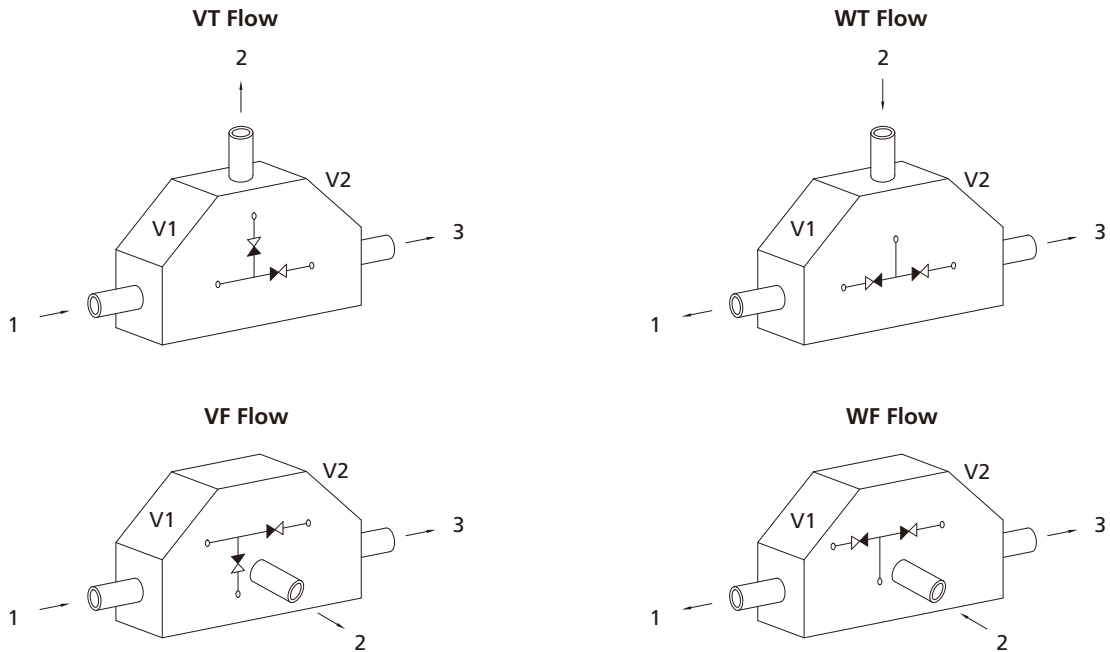
Body Material		Port 1 Type		Port 2/3 Type	Port 2/3 Size	CV	Actuator Type		Process Specification	
6L	316L SS	TB	Fractional Tube Butt Weld		Same as Port 1	0.27	C	Normally Closed Pneumatic	FC-01	
6LV	316L SS VAR	MTB	Metric Tube Butt Weld		Specified in the same way as Port 1	CV5 0.5	O	Normally Open Pneumatic	F2 FC-02	
		FR	Integral Male FR Fitting						F3 FC-03	
		FFR	Rotatable Female FR Fitting							
		RFR	Rotatable Male FR Fitting							
		FL	Fractional Tube Fitting							
		ML	Metric Tube Fitting							
				Port 1 Size			Flow Path			
				4	1/4" or 1/4" x 0.035"		3D			
				6	6 mm or 3/8" x 0.035"		3E			
				8	8 mm		3F			
							3G			
							3K			
								Seat		
								PCTFE		
								A PFA		
									Position Sensor	
									MO	Normally Open Position Sensor
									MC	Normally Closed Position Sensor
									Product Certification	
										None
									CE	CE Certification
									AX	ATEX Certification

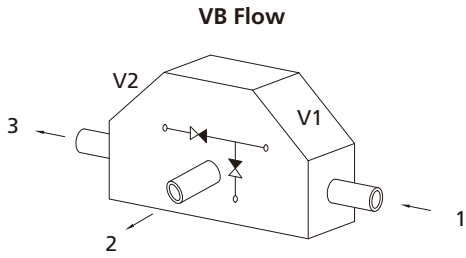
Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available. Should you have any questions, please contact FITOK Group or our authorized distributors.
- For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

2-Valve 3-Way Block Type

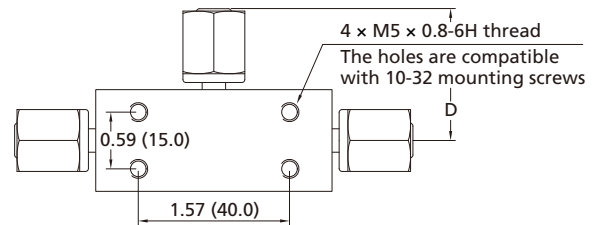
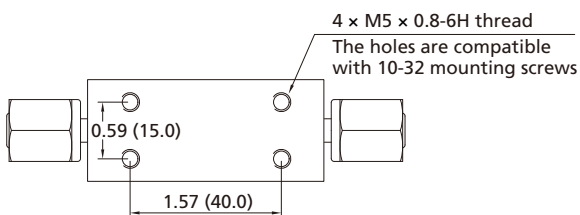
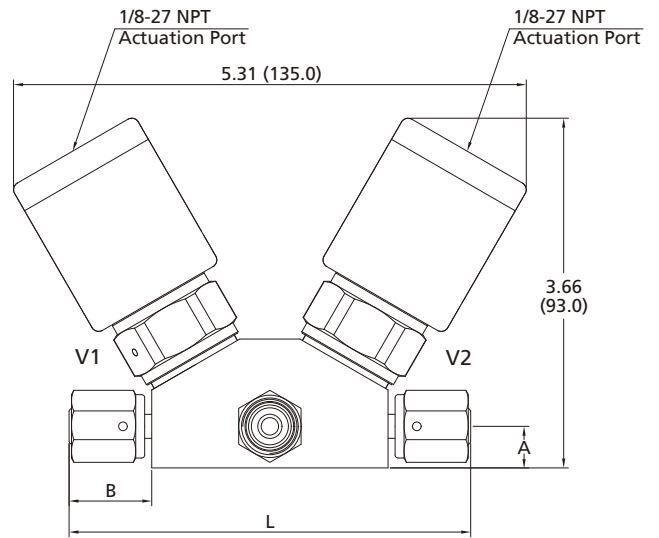
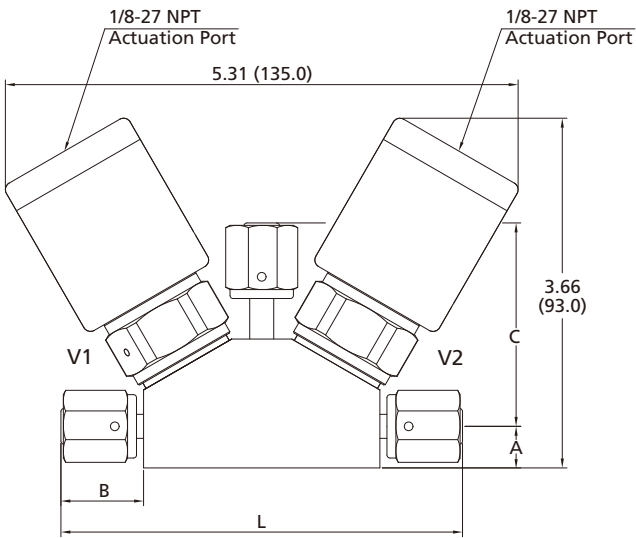
Flow Paths





**Dimensions**

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



Fittings

Valves

Regulators

Filters

Tubing

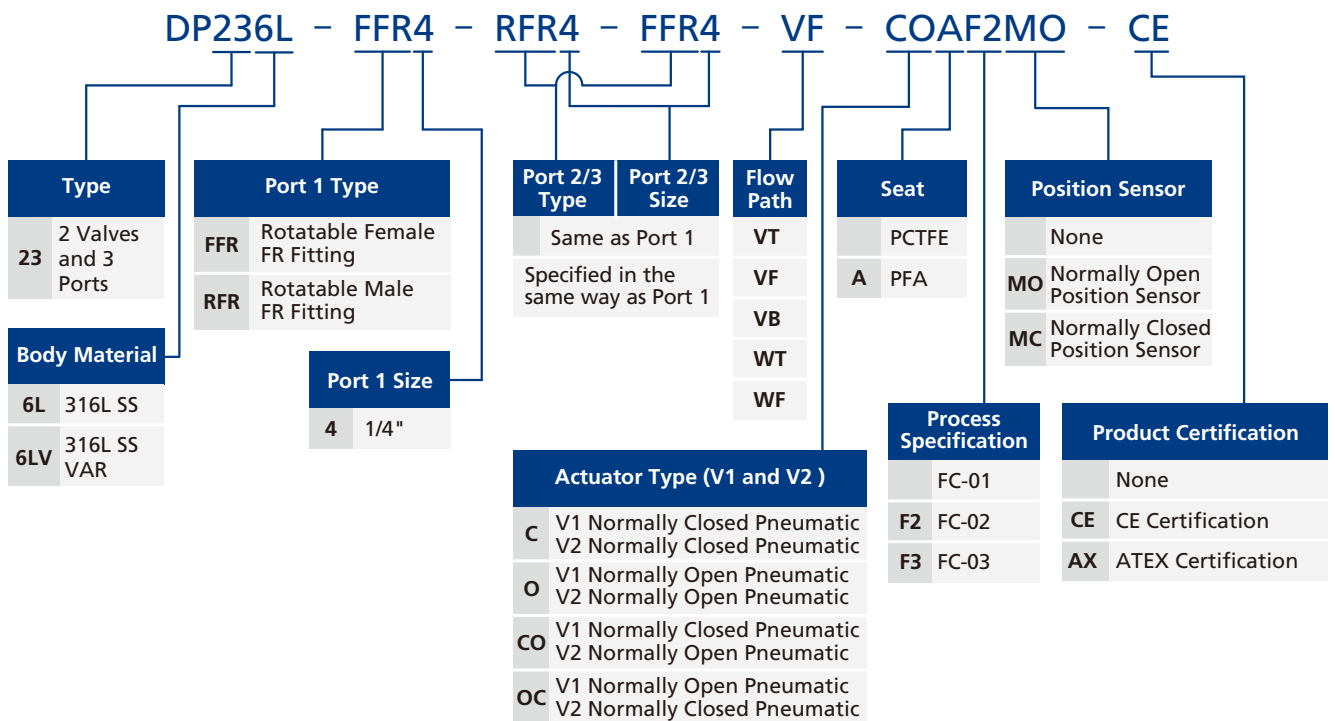
Integrated Systems

Other Products

Technical Information

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

Ordering Number Description



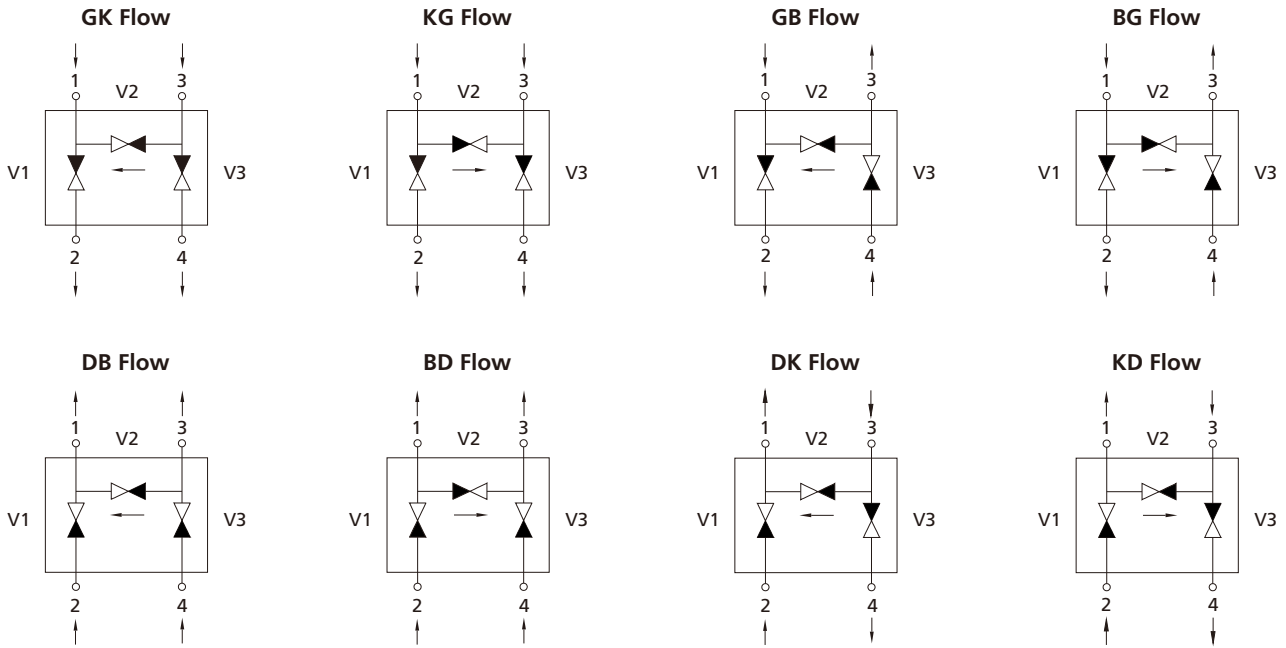
Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available, Should you have any questions, please contact FITOK Group or our authorized distributors.
- For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

### 3-Valve 4-Way Block Type

#### Flow Paths

☉ Flow paths as viewed from the top



#### Dimensions

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



Fittings

Valves

Regulators

Filters

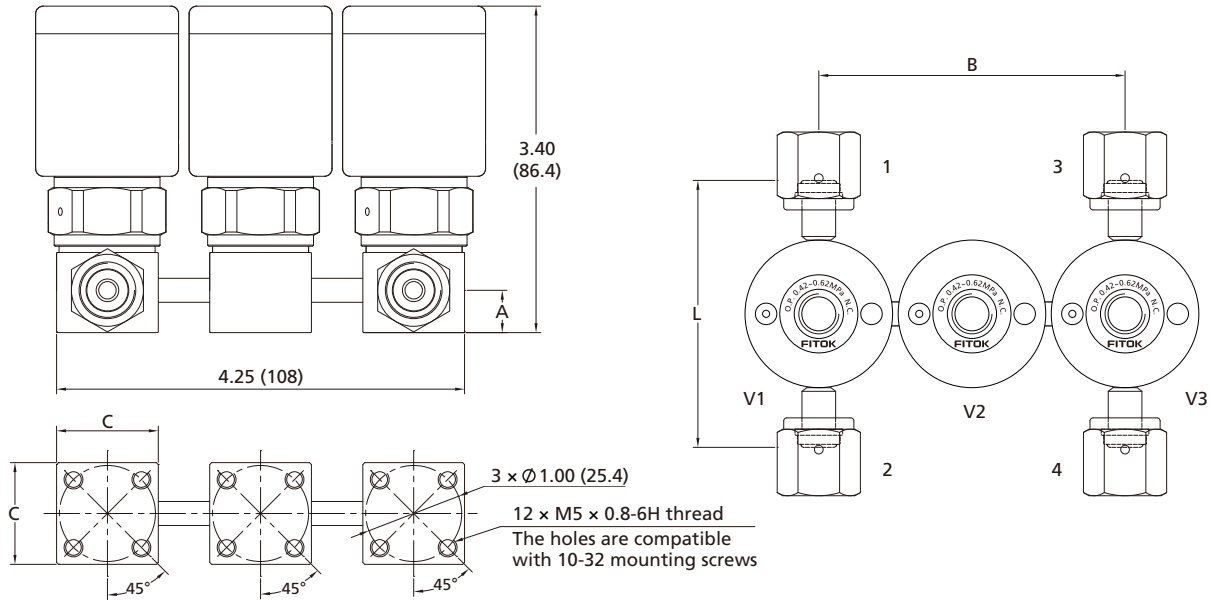
Tubing

Integrated Systems

Other Products

Technical Information

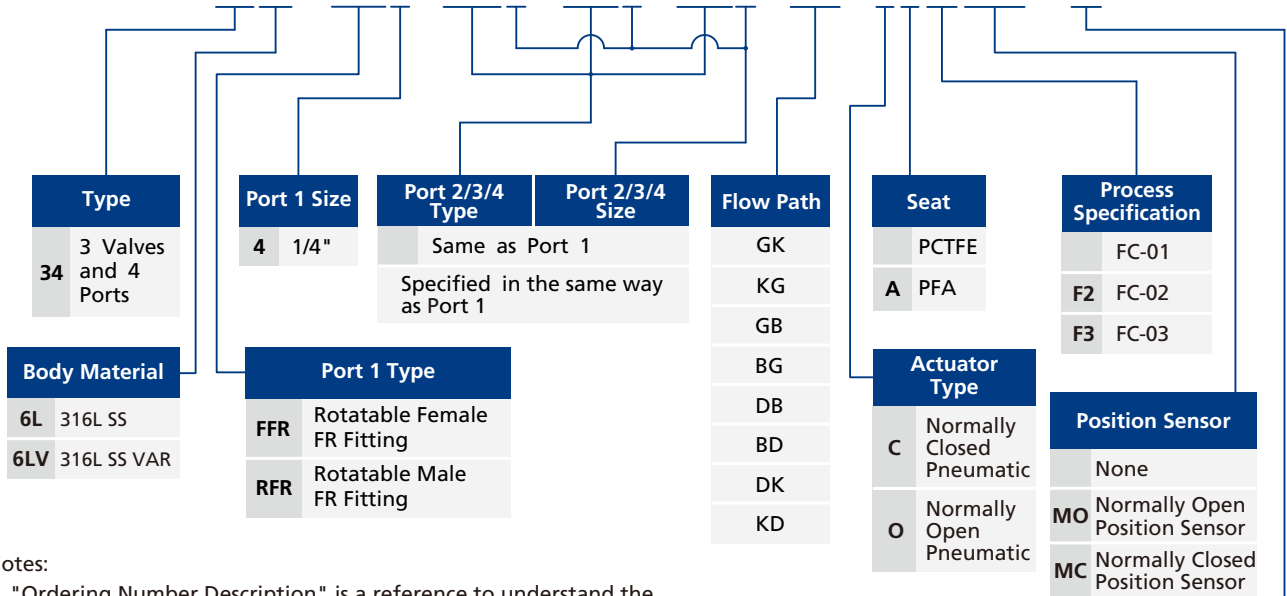
# V-35 Diaphragm Valves



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

## Ordering Number Description

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



### Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available. Should you have any questions, please contact FITOK Group or our authorized distributors.
- For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

Product Certification	
	None
CE	CE Certification
AX	ATEX Certification

## 3-Valve 5-Way Block Type

### Introduction

3-valve, 5-way purge blocks are designed for gas supply systems handling high purity, corrosive, toxic gases, or multi-component gas mixtures. The unit integrates multiple functions—including gas supply, purging, and exhaust—into a single assembly. A port is available for connection to a pressure sensor to monitor abnormal pressure conditions within the pipeline.

### Technical Data

Port Size	1/4"	
Flow Coefficient (Cv)	0.27	
Orifice Size	0.16 in. (4.1 mm)	
Working Pressure	Vacuum to 300 psig (20.7 bar)	
Pneumatic Actuator Operating Pressure	60 ~ 90 psig (4.2 ~ 6.2 bar)	
Temperature	PCTFE: -40 ~ 160 °F (-40 ~ 71 °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

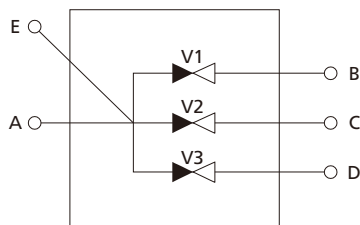
Air @ 70 °F (21 °C)

Water @ 60 °F (16 °C)

Orifice in. (mm)	Pressure Drop to Atmosphere psig (bar)	Air (l/min)	Water (l/min)
0.16 (4.1)	10 (0.68)	93	3.5
	50 (3.4)	246	7.8
	100 (6.8)	437	11.0

### Flow Paths

☉ Flow paths as viewed from the top



Note: C and D serve as purge ports, while A and B serve as the main flow paths.

Fittings

Valves

Regulators

Filters

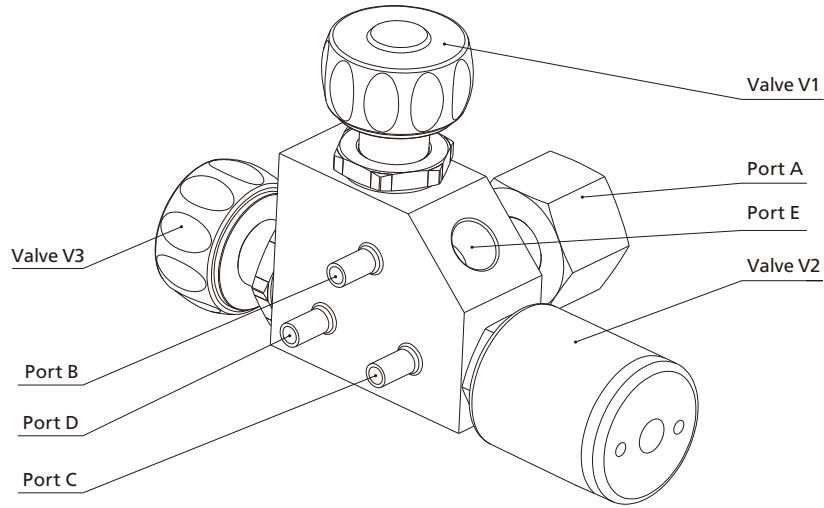
Tubing

Integrated Systems

Other Products

Technical Information

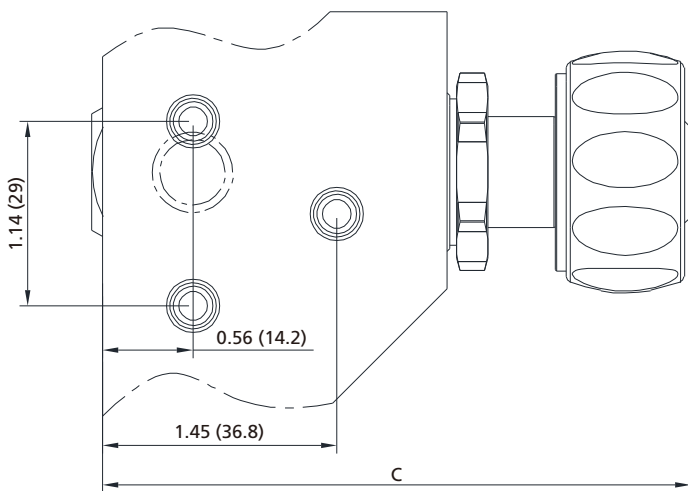
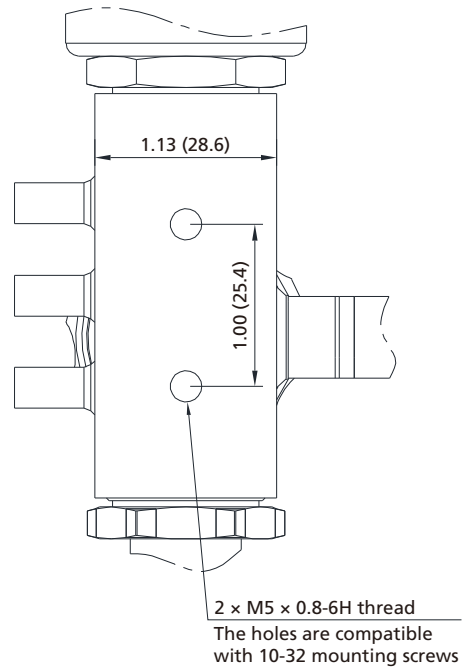
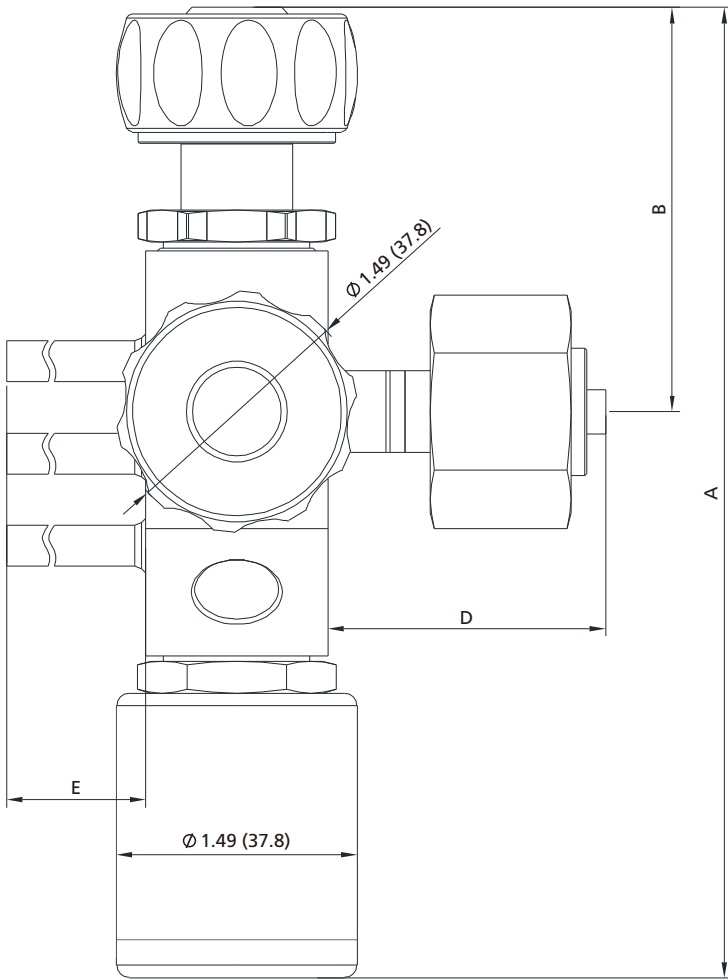
Fittings
Valves
Regulators
Filters
Tubing
Integrated Systems
Other Products
Technical Information



### Dimensions and Ordering Information

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

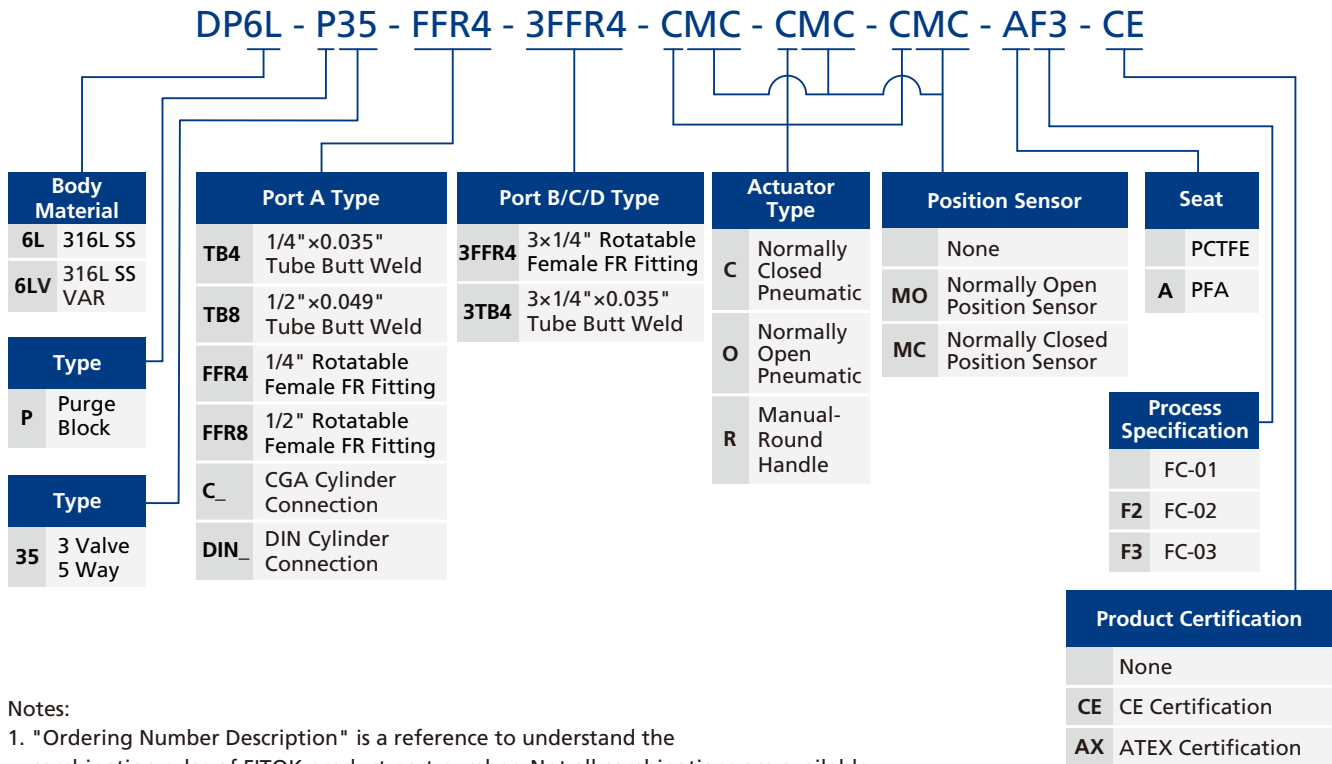




Technical Information	Other Products	Integrated Systems	Tubing	Filters	Regulators	Valves	Fittings
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Ordering Number Description



Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available. Should you have any questions, please contact FITOK Group or our authorized distributors.
- For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

- Fittings
- Valves
- Regulators
- Filters
- Tubing
- Integrated Systems
- Other Products
- Technical Information

# Replaceable-Seat Pneumatic Diaphragm Valves

## DPX Series

### Introduction

Replaceable-Seat Pneumatic Diaphragm Valves are suitable for applications requiring frequent valve maintenance and replacement, such as precursor containers and canisters. Their easy operation, long cycle life, and excellent sealing performance help to reduce costs for customers.



### Features

- ⦿ Easily replaceable valve seat without the need for special tools. Service kits are available
- ⦿ Valve seat assembly with perfectly symmetrical structure to eliminate need to distinguish the orientation of seats
- ⦿ Black actuator cylinder plate for easy identification of replaceable-seat valves

### Technical Data

Port Size	1/4" to 3/8" or 6 mm to 8 mm	
Flow Coefficient (Cv)	0.3	
Orifice Size	0.16 in. (4.1 mm)	
Working Pressure	Vacuum to 250 psig (17.2 bar)	
Pneumatic Actuator Working Pressure	60 ~ 90 psig (4.2 ~ 6.2 bar)	
Working Temperature	PCTFE: -10 ~ 176 °F (-23 ~ 80 °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)

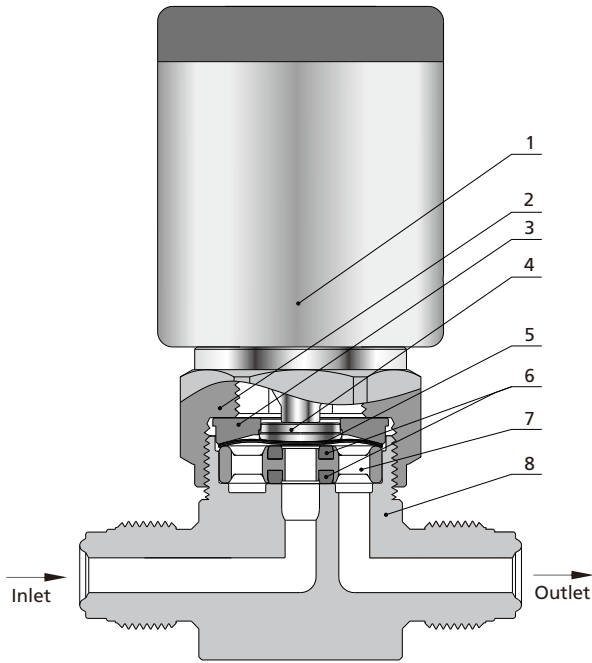
Pressure Drop to Atmosphere psig (bar)	Air (l/min)	Water (l/min)
10 (0.68)	96	3.6
50 (3.4)	250	7.9
100 (6.8)	450	11.0

### Process Specification

Item	Process Specification	Standard Cleaning and Packaging Process (FC-01) Special Cleaning and Packaging Process (FC-02)	Ultra High Purity Process (FC-03)
	Material		316L SS
Wetted Surface Roughness		Ra 5 μin. (0.13 μm)	
Polishing Process		Electropolished	

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

## Major Materials of Construction

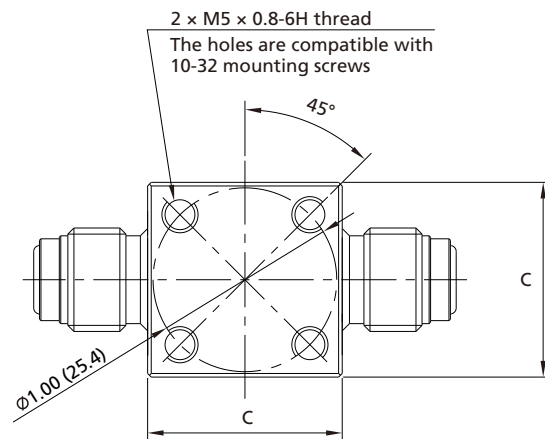
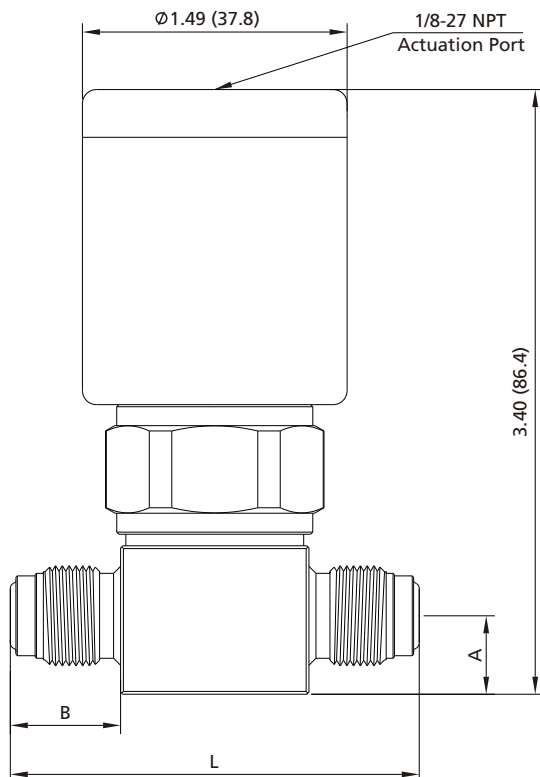


Normally Closed Pneumatic Model  
(Replaceable-Seat Type)

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)	Cobalt Alloy/AMS 5876
6	Seat	PCTFE/ASTM D1430 or PFA/ASTM D3307
7	Seat Retainer	316L SS or 316L SS VAR
8	Body	316L SS or 316L SS VAR

## Dimensions and Ordering Information

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



Basic Ordering Number	Connection Type and Size	Dimension, in. (mm)			
		A	B	C	L
DPX□□-TB4-	1/4" × 0.035" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.06 (26.9)	1.74 (44.2)
DPX□□-TB6-	3/8" × 0.035" Tube Butt Weld		0.26 (6.6)		
DPX□□-FFR4-	1/4" Rotatable Female FR Fitting		0.86 (21.8)		2.78 (70.6)
DPX□□-RFR4-	1/4" Rotatable Male FR Fitting		0.62 (15.7)		
DPX□□-FR4-	1/4" Integral Male FR Fitting				

## Service Kit Ordering Information

Basic Ordering Information	Description	Remarks
<input type="checkbox"/> DPX-KIT	Includes 1 piece of seat assembly (seat material: PCTFE), 2 pieces of cobalt alloy diaphragms, and maintenance instructions	Applies to replaceable-seat diaphragm valves
<input type="checkbox"/> DPX-A-KIT	Includes 1 piece of seat assembly (seat material: PFA), 2 pieces of cobalt alloy diaphragms, and maintenance instructions	



## Ordering Number Description

DPX6L - FFR4 - FR4 - CAF3

Body Material		Inlet Type		Inlet Size		Outlet Type	Outlet Size	Actuator Type	Valve Seat	Process Specification
6L	316L SS	TB	Fractional Tube Butt Weld	4	1/4" or 1/4" × 0.035"	Same as Inlet	Specified in the same way as Inlet	C	PCTFE	FC-01
6LV	316L SS VAR			6	6 mm or 3/8" × 0.035"					F2
		MTB	Metric Tube Butt Weld	8	8 mm	Normally Closed Pneumatic	A	PFA	F3	
		FR	Integral Male FR Fitting							Normally Open Pneumatic
		FFR	Rotatable Female FR Fitting							
		RFR	Rotatable Male FR Fitting							

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available, Should you have any questions, please contact FITOK Group or our authorized distributors.

# Two-Step Pneumatic Diaphragm Valves

## DPT Series

### Introduction

DPT series two-step pneumatic diaphragm valves, designed for high purity and ultra high purity applications, provide a “soft start” for equipment by rapidly switching between low and high flow modes. This prevents pressure surges in the cavity and avoids scattering of particles that could contaminate the process equipment cavity as a result of the rapid flow of media into the process equipment cavity.

### Features

- ⦿ Fast switching between low and high flow rates
- ⦿ Minimal particle generation and minimal dead space
- ⦿ Cobalt alloy diaphragm with high strength and corrosion resistance to ensure long cycle life
- ⦿ No internally wetted threads or springs which minimizes particle generation and particle entrapment for high purity
- ⦿ Valve Cv values in low-flow mode can be preset at the factory according to customer specifications or adjusted by customers themselves

### Technical Data

Port Size	1/4"		
Flow Coefficient (Cv)	High-Flow (HF) Port: 0.27 Low-Flow (LF) Port: 0.02 ~ 0.12 <sup>①</sup>		
Orifice Size	0.16 in. (4.1 mm)		
Working Pressure	Vacuum to 145 psig (10 bar)		
Pneumatic Actuator Working Pressure	60 ~ 90 psig (4.2 ~ 6.2 bar)		
Working Temperature	PFA: 14 ~ 302 °F (-10 ~ 150 °C) PCTFE: 14 ~ 176 °F (-10 ~ 80 °C)		
Leak Rate (Helium)	Internal	≤1×10 <sup>-9</sup> std·cm <sup>3</sup> /s	
	External	≤1×10 <sup>-9</sup> std·cm <sup>3</sup> /s	

① Note: Valve Cv values in low-flow mode can be preset at the factory according to customer specifications or adjusted by customers themselves. For detailed operating instructions, please refer to page V-46.

### Flow Data

Air @ 70 °F (21 °C)

Water @ 60 °F (16 °C)

Orifice in. (mm)	Pressure Drop to Atmosphere psig (bar)	Air (l/min)	Water (l/min)
0.16 (4.1)	10 (0.68)	86	3.2
	50 (3.4)	230	7.2
	100 (6.8)	410	10.2



Fittings

Valves

Regulators

Filters

Tubing

Integrated Systems

Other Products

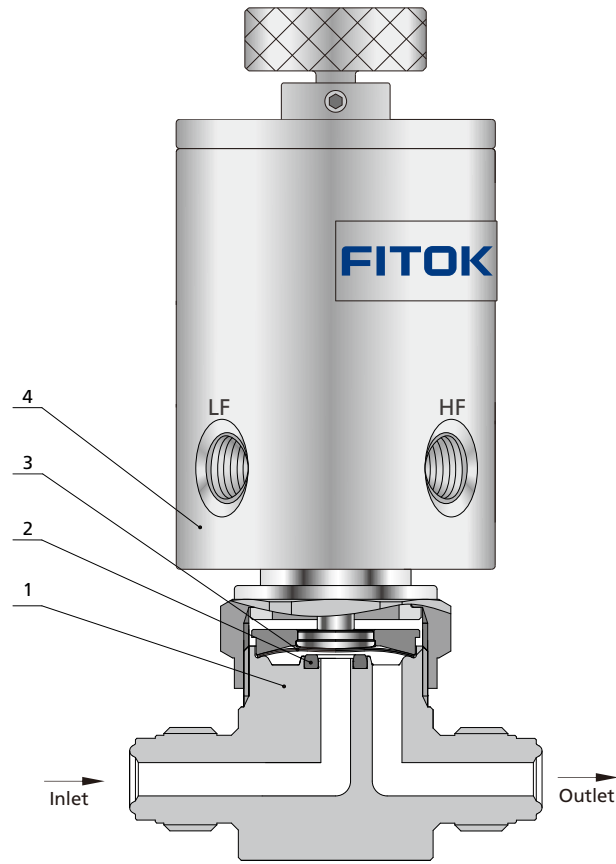
Technical Information

## Process Specification

Item	Process Specification	Ultra High Purity Process (FC-03)
Material		316L SS or 316L SS VAR
Wetted Surface Roughness		Ra 5 µin. (0.13 µm)
Polishing Process		Electropolished
Cleaning		Ultra high purity cleaning in continuously monitored ultrasonic cleaning system with deionized water
Assembly Environment		ISO 4 (FS 209E 10 equivalent) cleanroom
Packaging		Double bagged, packaged in the cleanroom

Notes: Refer to page P-01 for a detailed description of Process Specification.

## Major Materials of Construction

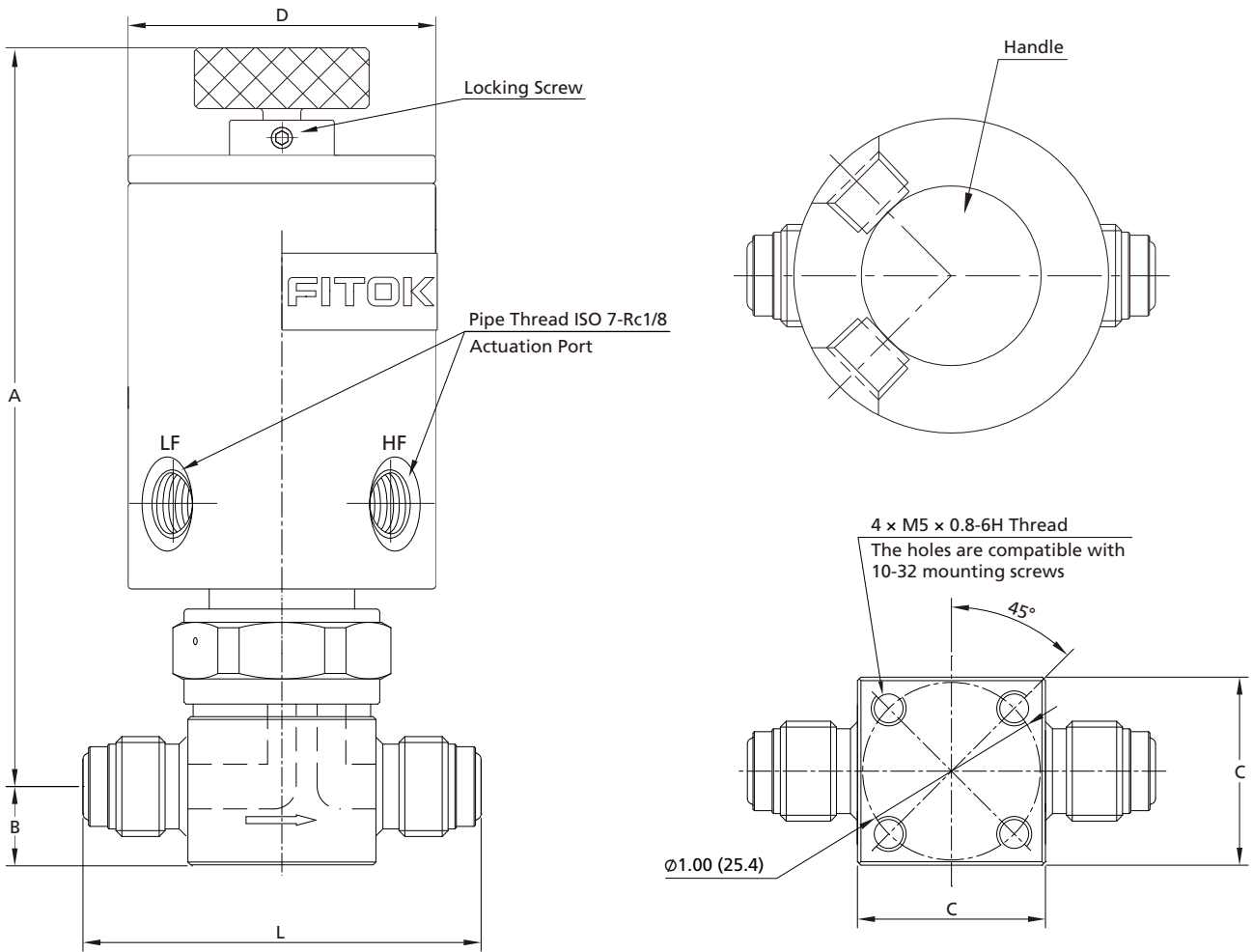


Nomally Closed Pneumatic Actuator

Item	Component	Material/Specification
1	Body	316L SS or 316L SS VAR
2	Seat	PCTFE/ASTM D1430 or PFA/ASTM D3307
3	Diaphragm (2)	Cobalt Alloy/AMS 5876
4	Actuator	Aluminium

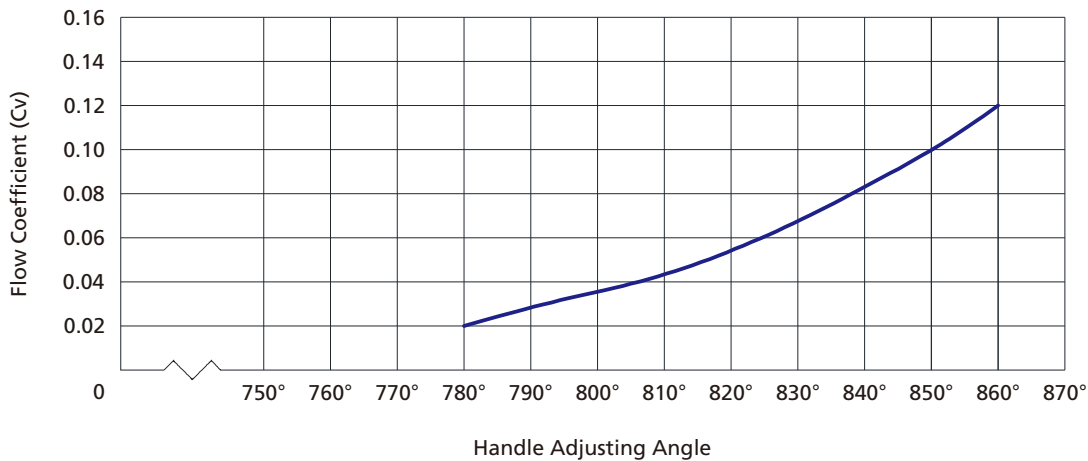
## Dimensions and Ordering Information

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



### Flow Adjustment Instructions for Low-Flow Mode:

Loosen the locking screws and turn the handle clockwise to the end. Then, rotate the handle counterclockwise until the desired Cv value is reached (see below relationship between Cv and handle adjusting angle). Once the desired Cv is achieved, tighten the locking screws.

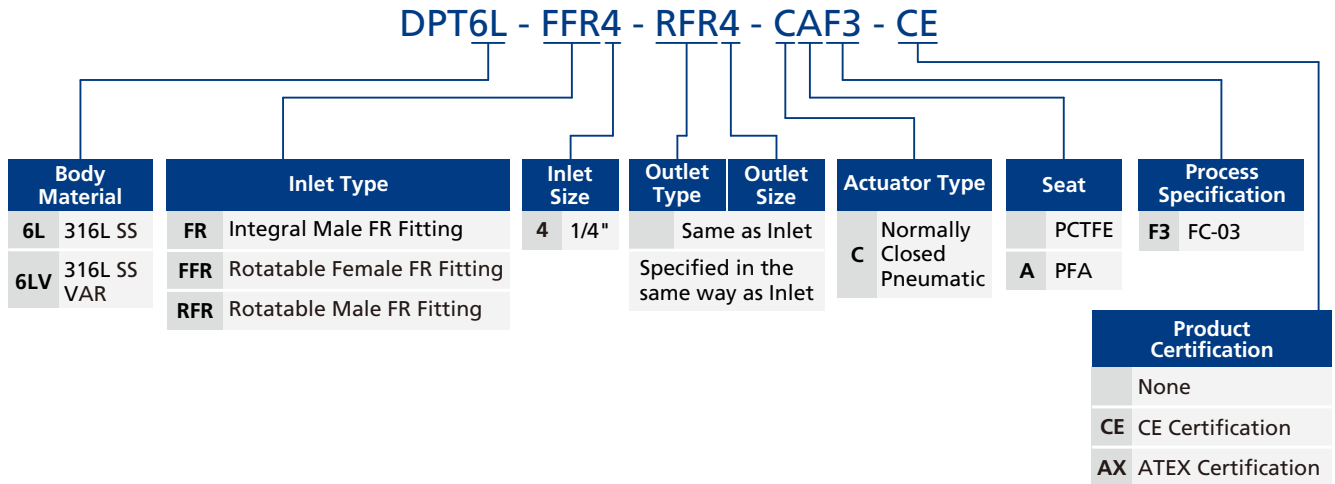


Note: The rotation angle for turning the handle counterclockwise by one complete turn is 360°. Consequently, two complete turns equal 720°, and this pattern continues accordingly for additional turns.

Fittings
Valves
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Technical Information

Basic Ordering Number	Connection Type and Size	Dimensions, in. (mm)				
		A	B	C	D	L
DPT6L-FR4-CAF3	1/4" Integral Male FR Fitting	4.15 (105.5)	0.44 (11.2)	1.06 (26.9)	1.73 (44.0)	2.24 (57.0)
DPT6L-FFR4-CAF3	1/4" Rotatable Female FR Fitting					2.78 (70.6)

## Ordering Number Description



**Notes:**

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available, Should you have any questions, please contact FITOK Group or our authorized distributors.
- For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

# High Pressure Springless Diaphragm Valves

## DH Series



### Introduction

DH Series High Pressure Springless Diaphragm Valves are suitable for high purity and ultra high purity applications. Featuring an internally springless flow path, these valves ensure high cleanliness and offer multiple flow path options, providing exceptional versatility.

### Features

- Cobalt alloy diaphragm with high strength and corrosion resistance to ensure long cycle life
- Manual and pneumatic actuators available
- Pneumatic actuators available in both standard and compact designs, configurable with optional NC/NO position sensors

### Technical Data

<b>Port Size</b>	1/4" to 3/8" or 6 mm to 8 mm	
<b>Flow Coefficient (Cv)</b>	0.20	
<b>Orifice Size</b>	0.16 in. (4.1 mm)	
<b>Working Pressure</b>	Vacuum to 3000 psig (207 bar)	
<b>Pneumatic Actuator Operating Pressure</b>	Standard: 75 to 105 psig (5.2 to 7.2 bar)	
	Compact: 60 to 90 psig (4.2 to 6.2 bar)	
<b>Temperature</b>	PCTFE: -10 ~ 150 °F (-23 ~ 65 °C) Polyimide: 50 ~ 302 °F (10 ~ 150 °C)	
<b>Leak Rate (Helium)</b>	<b>Internal</b>	≤ 1×10 <sup>-9</sup> std·cm <sup>3</sup> /s
	<b>External</b>	≤ 1×10 <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)	Air (l/min)	Water (l/min)
10 (0.68)	64	2.4
50 (3.4)	170	5.4
100 (6.8)	300	7.6

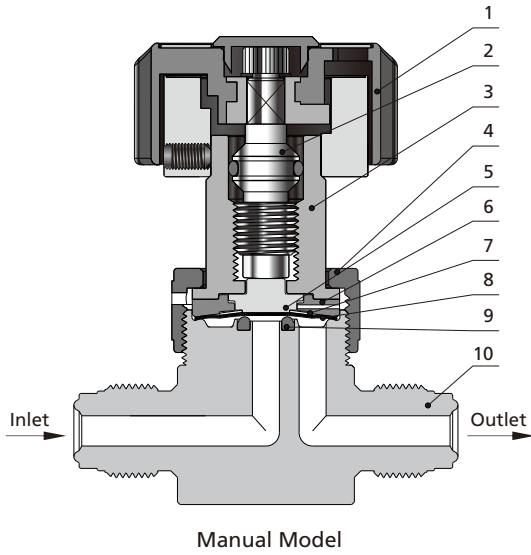
### Process Specification

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

Notes: Refer to page P-01 for a detailed description of Process Specification.

① Wetted surface roughness of valves with FR Series metal gasket face seal connections and tube butt weld connections.

## Major Materials of Construction



Item	Component	Material/Specification
1	Handle	ABS
2	Stem	316 SS/ASTM A479
3	Bonnet Retainer	S17400/ASTM A564
4	Bonnet Nut	316 SS/ASTM A479
5	Button	316 SS/ASTM A479
6	Bonnet	S17400/ASTM A564
7	Seal	S17700
8	Diaphragm (3)	Cobalt Alloy /AMS 5876
9	Seat	PCTFE/ASTM D1430 or Polyimide
10	Body	316L SS or 316L SS VAR

## Handles and 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



### Compact Pneumatic

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



Fittings  
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### Position Sensors

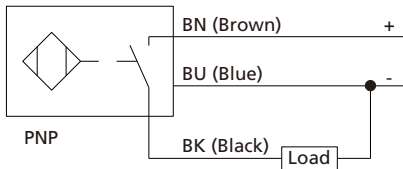
Transmit a signal to an electrical device indicating the open and closed position of pneumatically actuated valves

#### Technical Information

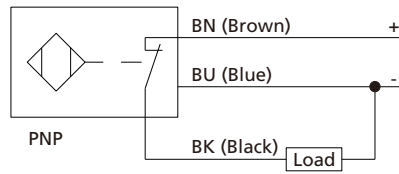
<b>Output</b>	3-wire V (dc), PNP
<b>Output Function</b>	Normally open or normally closed
<b>Voltage</b>	10 ~ 30 V (dc)
<b>Working Temperature</b>	-13 ~ 158 °F (-25 ~ 70 °C)

#### Wiring Diagram

Normally open position sensors



Normally closed position sensors



Notes:

Pneumatic, Normally Open (NO):

1. Standard Model:

With NO sensor: signal output, indicator ON when valve closes

With NC sensor: signal output, indicator ON when valve opens

2. Compact Model

With NO sensor: signal output, indicator ON when valve opens

With NC sensor: signal output, indicator ON when valve closes

Pneumatic, Normally Closed (NC):

With NO sensor: signal output, indicator ON when valve opens

With NC sensor: signal output, indicator ON when valve closes

### Explosion-proof Position Sensors

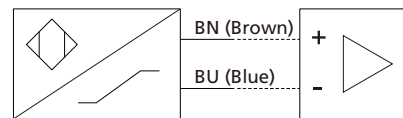
Transmit a signal to an electrical device, indicating the open and closed positions of pneumatically actuated valves.

Equipment Group II under ATEX Certification. The output complies with DIN EN 6094 7-5-6 (NAMUR) and the sensor should be used with an isolation amplifier.

#### Technical Information

<b>Output</b>	2 Wires DC
<b>Voltage</b>	8.2 V (dc)
<b>Working Temperature</b>	-13 ~ 158 °F (-25 ~ 70 °C)

#### Wiring Diagram



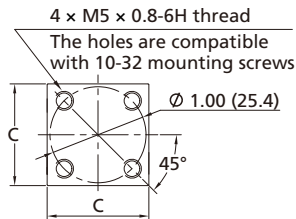
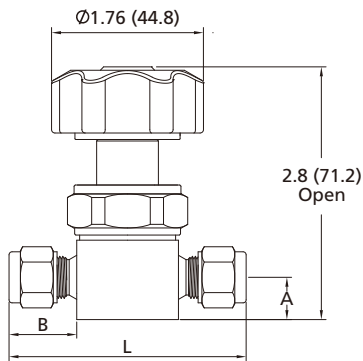
## Dimensions and Ordering Information

### Straight Type

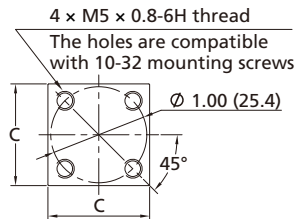
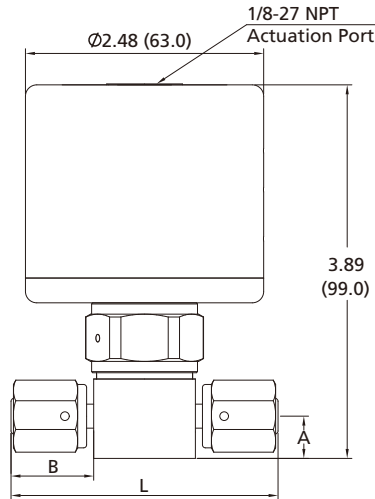
#### Dimensions

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

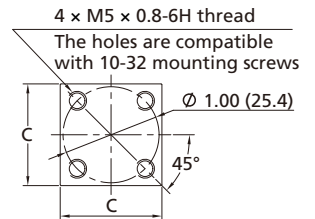
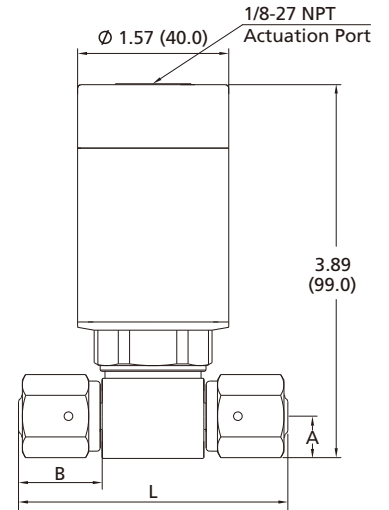
#### Manual - Round Handle



#### Pneumatic



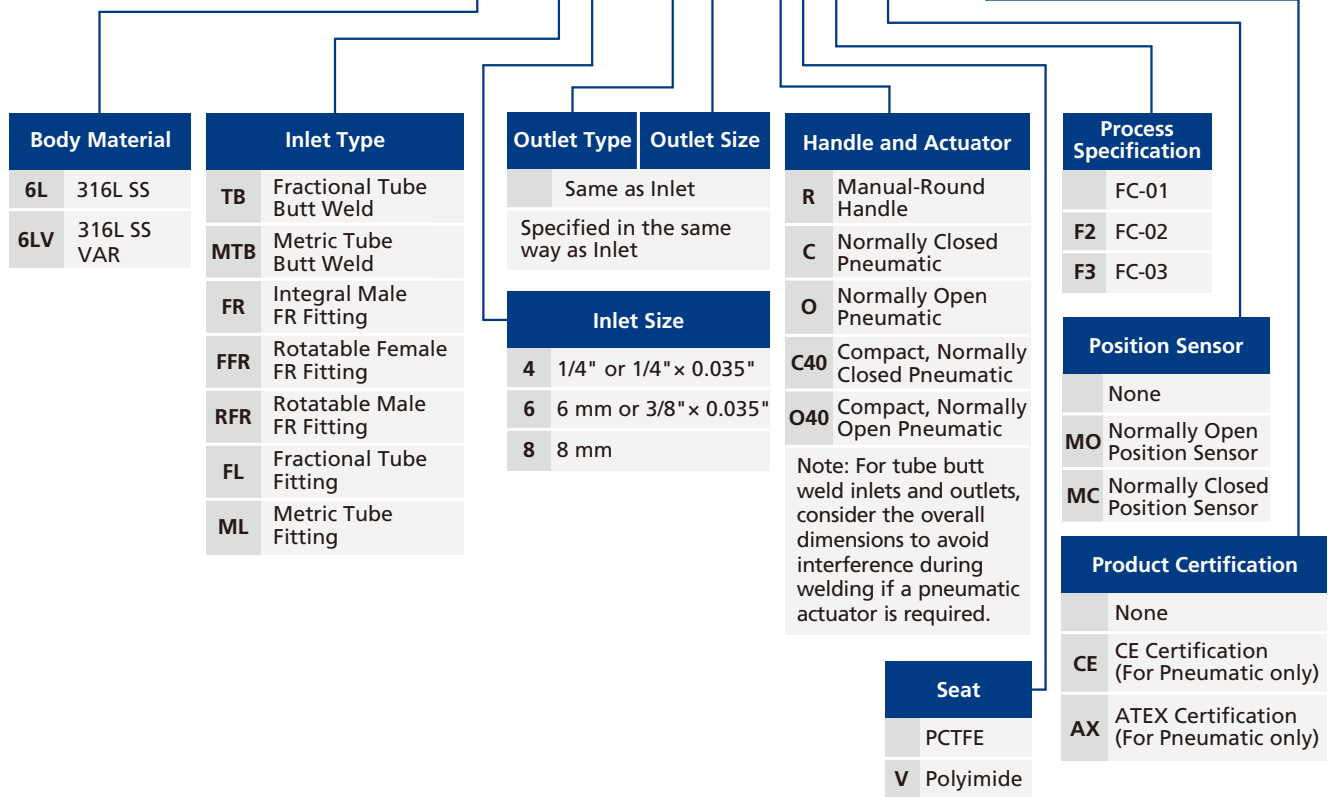
#### Compact Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	C	L	
DH□□-TB4-	1/4" x 0.035" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.06 (26.9)	1.74 (44.2)	
DH□□-TB6-	3/8" x 0.035" Tube Butt Weld		0.26 (6.6)			
DH□□-FFR4-	1/4" Rotatable Female FR Fitting		0.86 (21.8)		2.78 (70.6)	
DH□□-RFR4-	1/4" Rotatable Male FR Fitting		0.62 (15.7)			
DH□□-FR4-	1/4" Integral Male FR Fitting		0.70 (17.9)			2.30 (58.4)
DH□□-ML6-	6 mm FITOK Tube Fitting		0.70 (17.9)			

Ordering Number Description

DH6L - FL4 - ML6 - CVF2MO - CE



Notes:

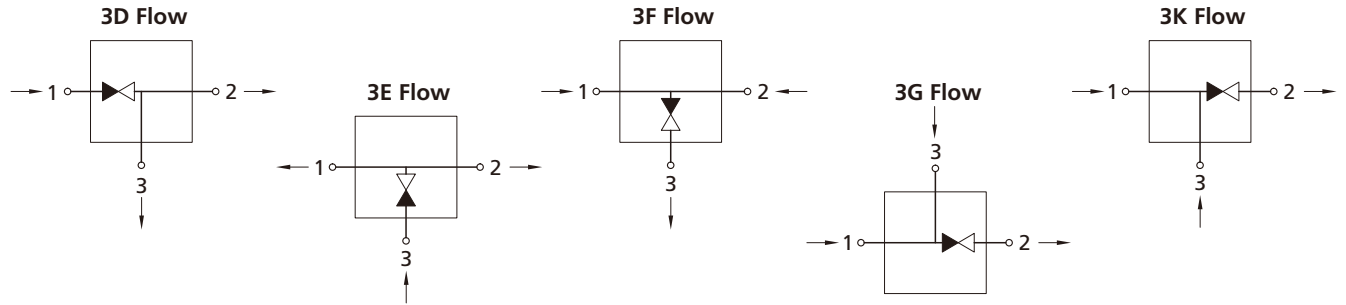
- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available; Should you have any questions, please contact FITOK Group or our authorized distributors.
- For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

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## Branch Type

### Flow Paths

☉ Flow paths as viewed from the top

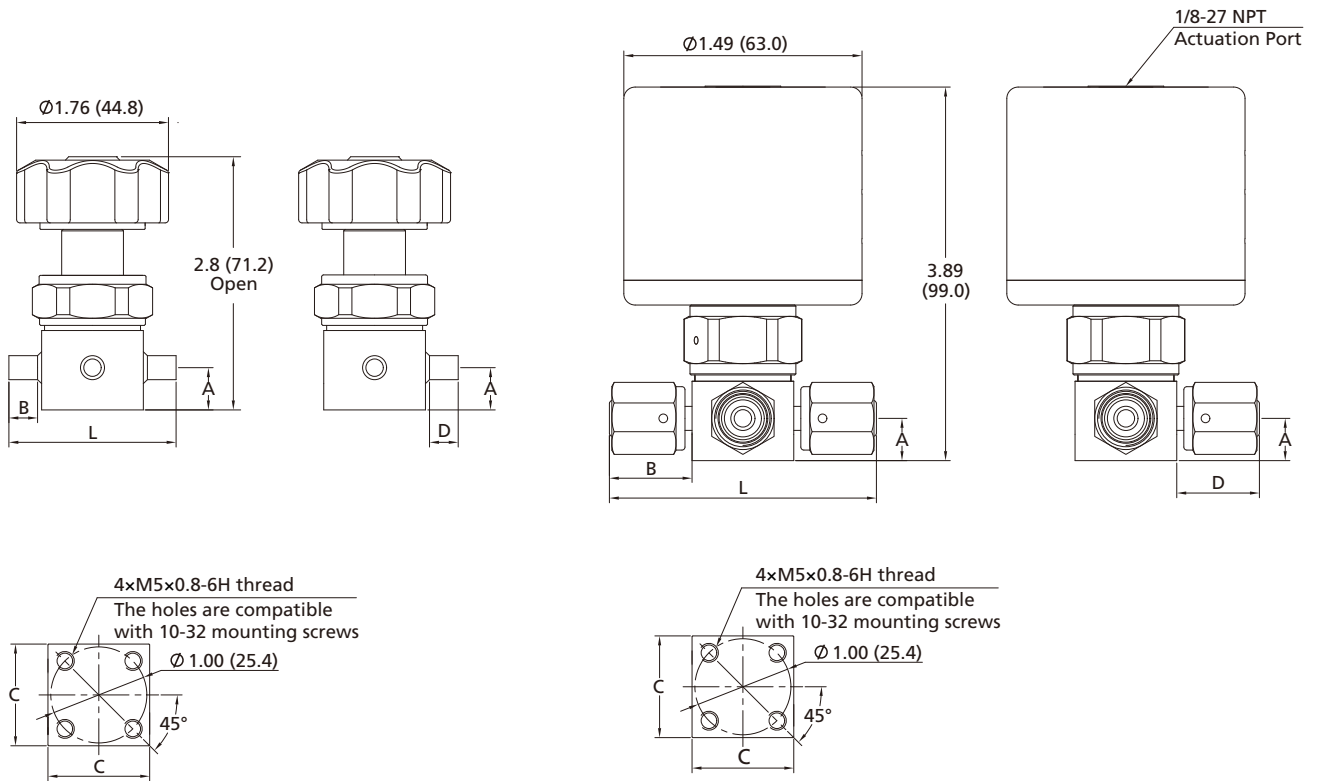


### Dimensions

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

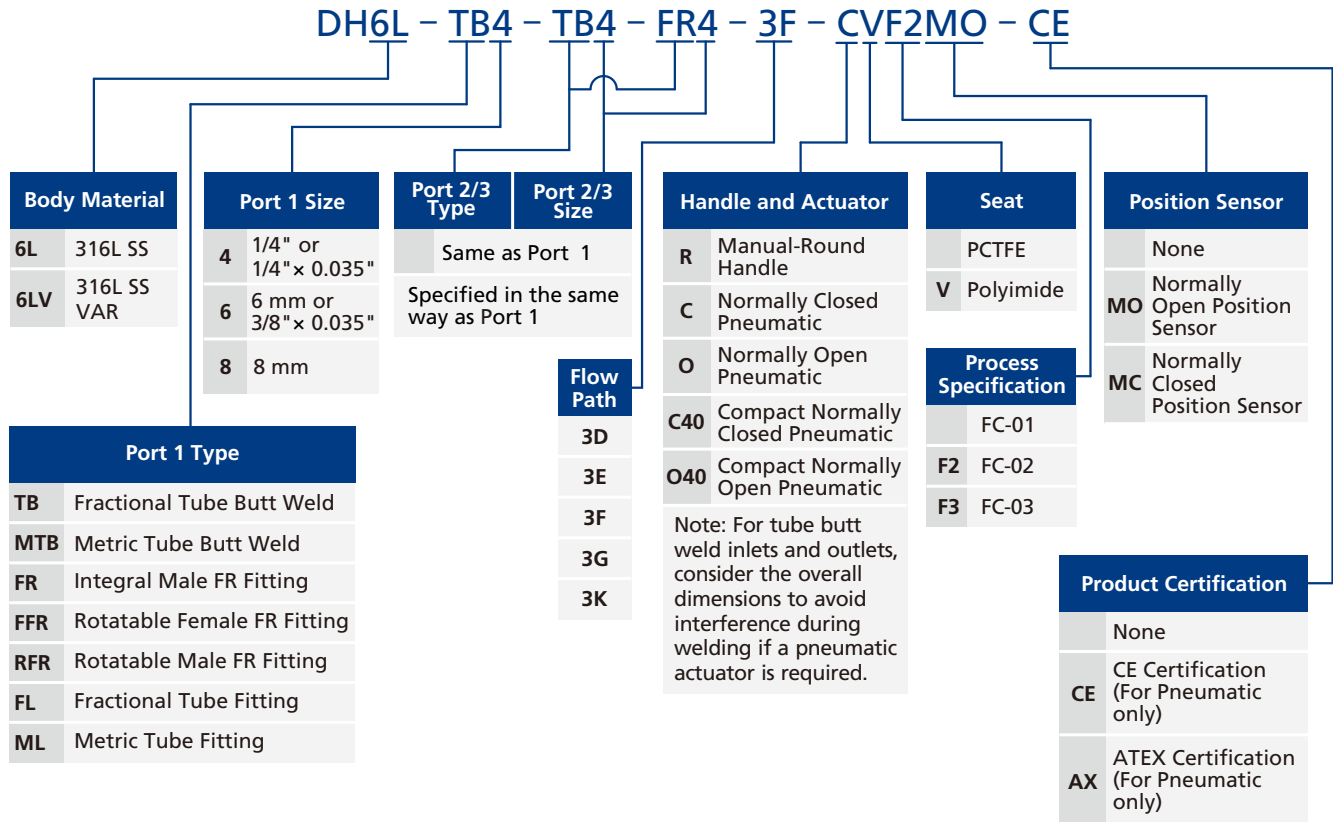
#### Manual - Round Handle

#### Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	C	D	L
DH□□-TB4-	1/4" x 0.035" 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" x 0.035" Tube Butt Weld		0.26 (6.6)		0.26 (6.6)	
DH□□-FFR4-	1/4" Rotatable Female FR Fitting		0.86 (21.8)		0.86 (21.8)	2.78 (70.6)
DH□□-RFR4-	1/4" Rotatable Male FR Fitting		0.86 (21.8)		0.86 (21.8)	
DH□□-FR4-	1/4" Integral Male FR Fitting		0.62 (15.7)		0.62 (15.7)	
DH□□-FL4-	1/4" FITOK Tube Fitting		0.70 (17.9)		0.70 (17.9)	2.47 (62.7)

Ordering Number Description



Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available; Should you have any questions, please contact FITOK Group or our authorized distributors.
- For the –CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

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# High Pressure Spring Diaphragm Valves

## DM Series

### Introduction

DM Series High Pressure Spring Diaphragm Valves are suitable for high purity and ultra high purity applications. These valves offer a small seat sealing surface, a wide working temperature range, and an easily replaceable seat, with an maximum pressure rating of 3500 psig.



### Features

- ⦿ Repetitive shutoff with fully contained soft-seat stem tip
- ⦿ Position indicator ring for lever handle indicates open and closed states
- ⦿ Reduced seat volume
- ⦿ Functional under vacuum conditions
- ⦿ Different manual and pneumatic actuators available
- ⦿ Normally closed or normally open position sensors are optional for pneumatically actuated valves

### 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>Working Pressure</b>		Vacuum to 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) Polyimide: -100 ~ 320 °F (-73 ~ 160 °C)
<b>Leak Rate (Helium)</b>	<b>Internal</b>	≤4×10 <sup>-9</sup> std-cm <sup>3</sup> /s
	<b>External</b>	≤4×10 <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. A17-7 SS spring can be used to increase the max. differential back pressure 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)

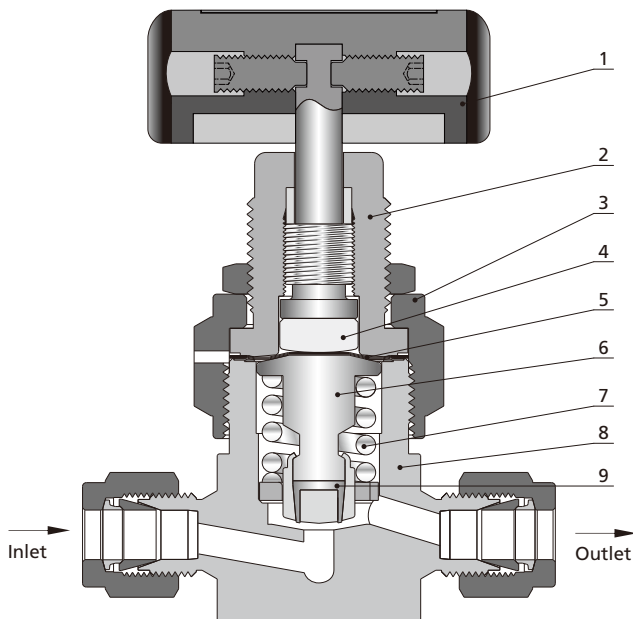
Pressure Drop to Atmosphere psig (bar)	Lever Handle		Round Handle		Pneumatic Actuator	
	Air (l/min)	Water (l/min)	Air (l/min)	Water (l/min)	Air (l/min)	Water (l/min)
10 (0.68)	49	1.6	100	3.5	64	2.4
50 (3.4)	130	3.9	270	8.0	170	5.4
100 (6.8)	240	5.4	490	11.4	300	7.6

## Process Specification

Item	Standard Cleaning and Packaging Process (FC-01) Special Cleaning and Packaging Process (FC-02)	Ultra High Purity Process (FC-03)
Material	316L SS	316L SS, 316L SS VAR
Wetted Surface Roughness	Ra 20 µin. (0.5 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.

## Major Materials of Construction



Round Handle Model

Item	Component	Material/Specification
1	Handle	Aluminum
2	Bonnet	316 SS/ASTM A479
3	Bonnet Nut	316 SS/ASTM A479
4	Button	316 SS/ASTM A479
5	Diaphragm (3)	Cobalt Alloy/AMS 5876
6	Stem	316L SS or 316L SS VAR
7	Spring	316 SS/ASTM A313
8	Body	316L SS or 316L SS VAR
9	Seat	PCTFE/ASTM D1430 or Polyimide

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## Handles and 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



### Position Sensors

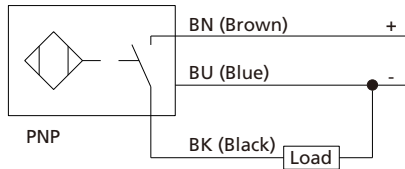
Transmit a signal to an electrical device indicating the open and closed position of pneumatically actuated valves

### Technical Information

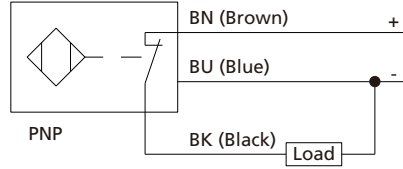
Output	3-wire V (dc), PNP
Output Function	Normally open or normally closed
Voltage	10 ~ 30 V (dc)
Working Temperature	-13 ~ 158 °F (-25 ~ 70 °C)

**Wiring Diagram**

**Normally open position sensors**



**Normally closed position sensors**



**Notes:**

1. For normally closed pneumatically actuated valves, when fitted with normally open sensors, the sensors transmit signals with indicators illuminated when the valves are open. Conversely, when fitted with normally closed sensors, the sensors transmit signals with indicators illuminated when the valves are closed.
2. For normally open pneumatically actuated valves, when fitted with normally open sensors, the sensors transmit signals with indicators illuminated when the valves are closed. Conversely, when fitted with normally closed sensors, the sensors transmit signals with indicators illuminated when the valves are open.

**Explosion-proof Position Sensors**

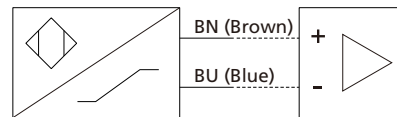
Transmit a signal to an electrical device, indicating the open and closed positions of pneumatically actuated valves.

Equipment Group II under ATEX Certification. The output complies with DIN EN 6094 7-5-6 (NAMUR) and the sensor should be used with an isolation amplifier.

**Technical Information**

<b>Output</b>	2 Wires DC
<b>Voltage</b>	8.2 V (dc)
<b>Working Temperatre</b>	-13 ~ 158 °F (-25 ~ 70 °C)

**Wiring Diagram**



Fittings

Valves

Regulators

Filters

Tubing

Integrated Systems

Other Products

Technical Information

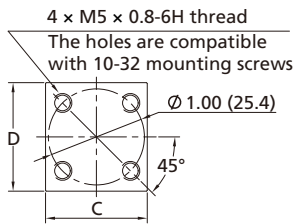
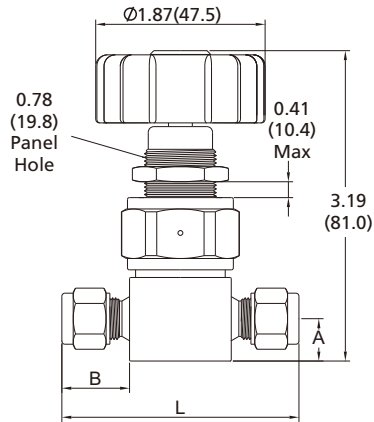
## Dimensions and Ordering Information

### Straight Type

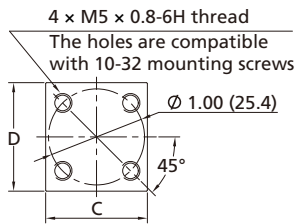
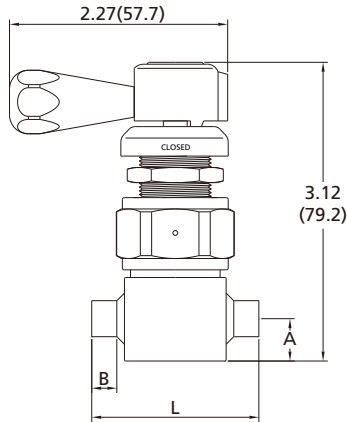
#### Dimensions

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

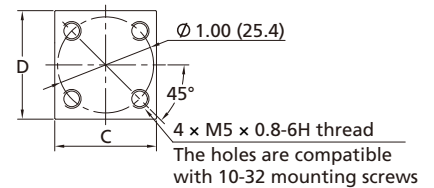
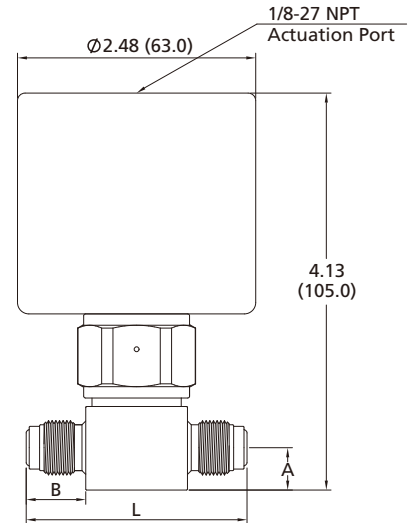
**Manual - Round Handle**



**Manual - Lever Handle**



**Pneumatic**



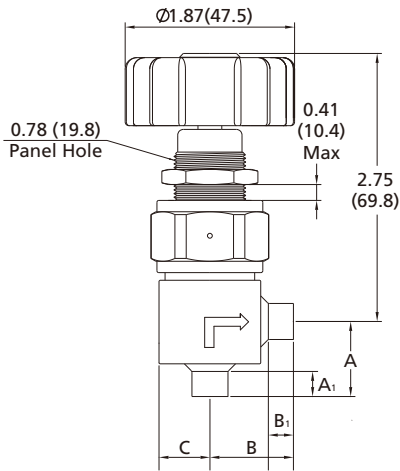
Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	C	D	L
DM□□-FL4-	1/4" FITOK Tube Fitting	0.44 (11.2)	0.69 (17.6)	1.06 (26.9)	1.13 (28.7)	2.47 (62.1)
DM□□-FL6-	3/8" FITOK Tube Fitting		0.76 (19.3)			2.58 (65.5)
DM□□-ML6-	6 mm FITOK Tube Fitting		0.70 (17.9)			2.47 (62.8)
DM□□-ML8-	8 mm FITOK Tube Fitting		0.74 (18.7)			2.53 (64.3)
DM□□-TB4-	1/4" x 0.035" Tube Butt Weld		0.30 (7.6)			1.74 (44.2)
DM□□-TB6-	3/8" x 0.049" Tube Butt Weld		0.26 (6.6)			1.74 (44.2)
DM□□-NS4-	1/4 Male NPT		—			2.46 (62.5)
DM□□-FNS4-	1/4 Female NPT		—			2.46 (62.5)
DM□□-FR4-	1/4" Integral Male FR Fitting		0.62 (15.7)			2.30 (58.4)
DM□□-FFR4-	1/4" Rotatable Female FR Fitting		0.85 (21.6)			2.76 (70.1)
DM□□-FO4-	1/4" Male FO	0.47 (11.9)	2.00 (50.8)			

## Angle Type

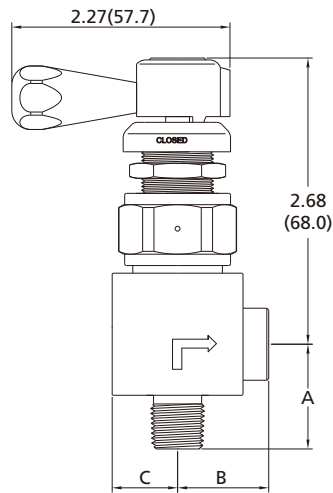
### Dimensions

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

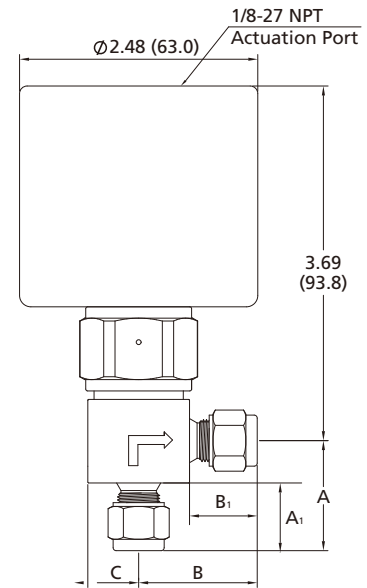
Manual - Round Handle



Manual - Lever Handle



Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	A <sub>1</sub>	B	B <sub>1</sub>	C
DM□□-FL4-	1/4" FITOK Tube Fitting	1.14 (29.1)	0.69 (17.6)	1.23 (31.3)	0.69 (17.6)	0.53 (13.4)
DM□□-ML6-	6 mm FITOK Tube Fitting		0.70 (17.9)		0.70 (17.9)	
DM□□-TB6-	3/8" x 0.049" Tube Butt Weld	0.78 (19.8)	0.26 (6.6)	0.87 (22.0)	0.26 (6.6)	
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					

Fittings

Valves

Regulators

Filters

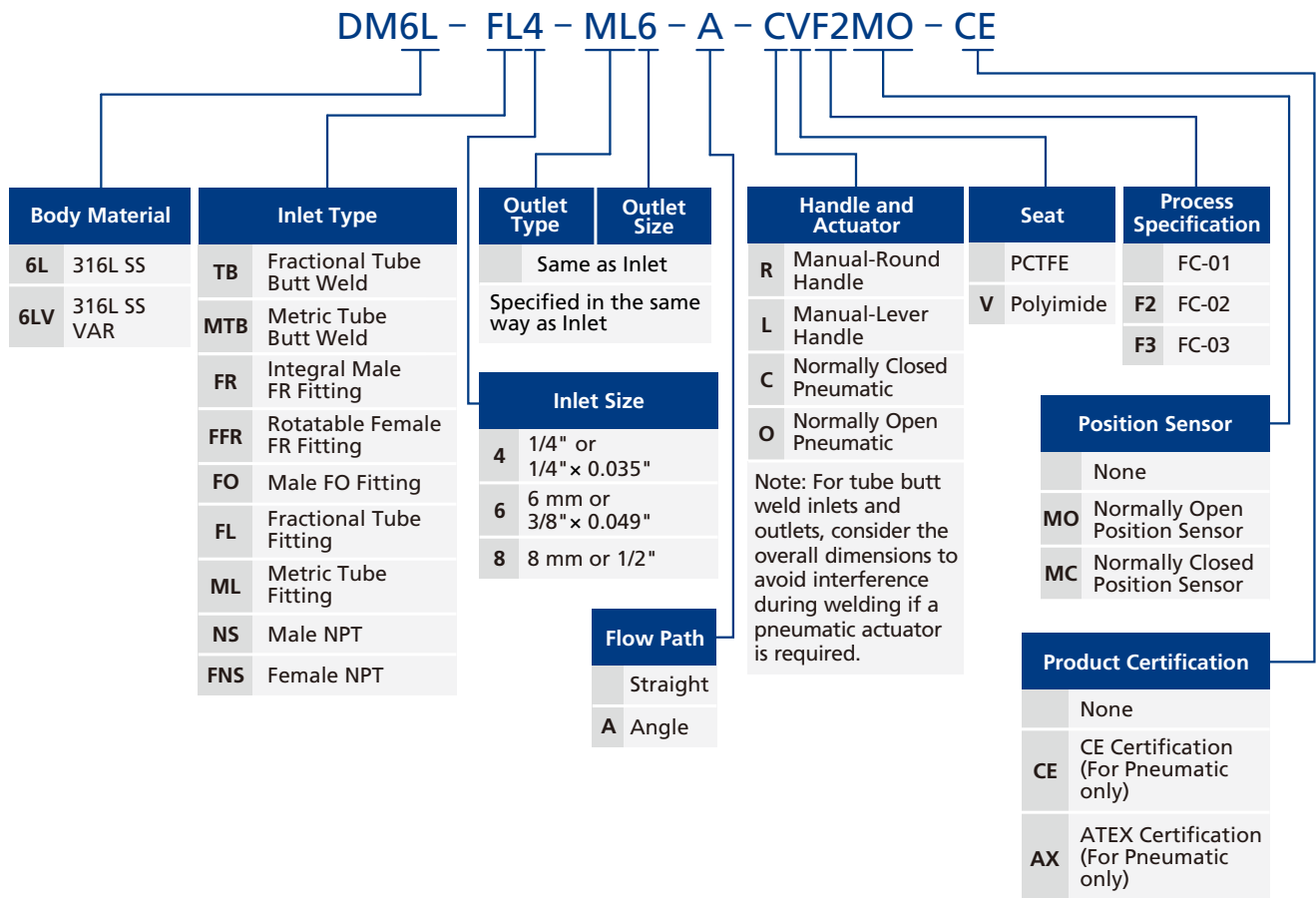
Tubing

Integrated Systems

Other Products

Technical Information

Ordering Number Description



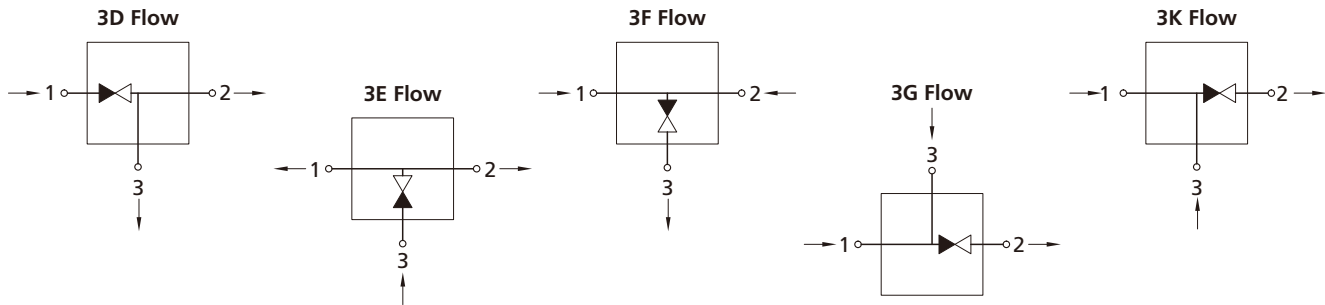
Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available; Should you have any questions, please contact FITOK Group or our authorized distributors.
- For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

## Branch Type

### Flow Paths

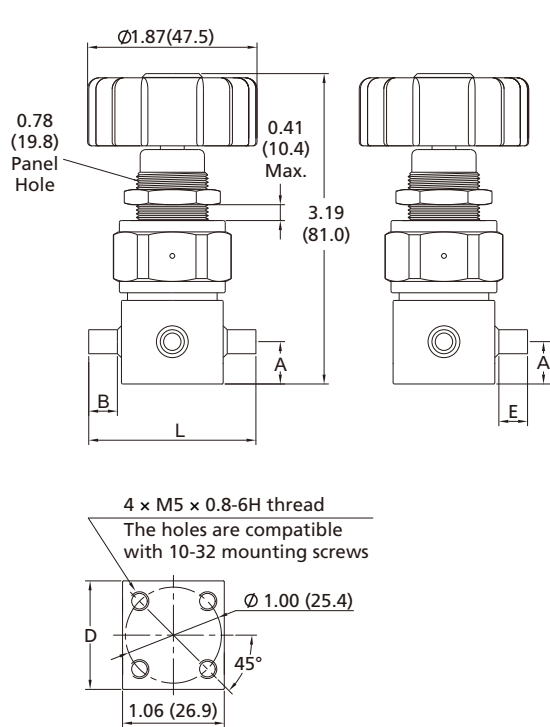
☉ Flow paths as viewed from the top



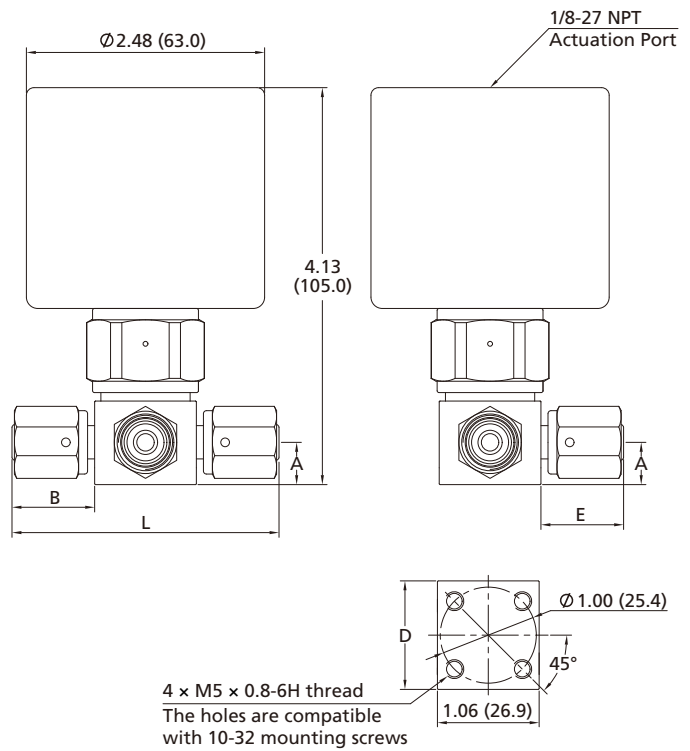
### Dimensions

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

#### Manual - Round Handle

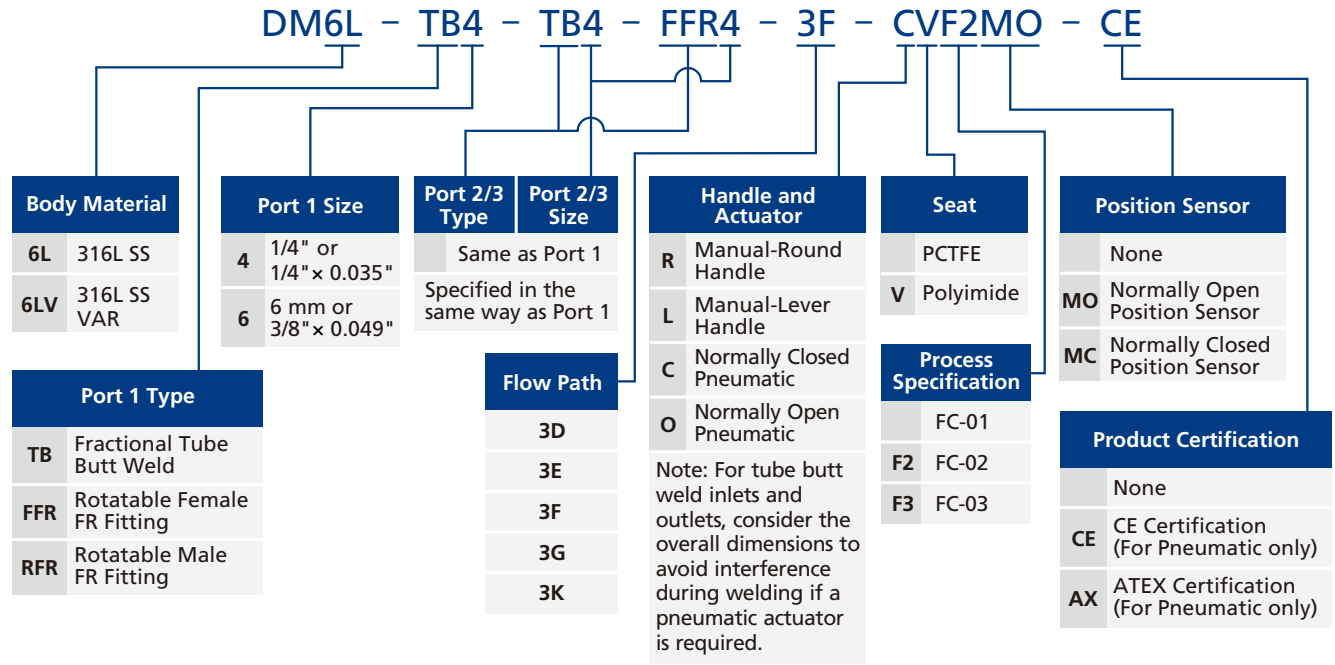


#### Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	D	E	L
DM□□-TB4-	1/4" × 0.035" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.13 (28.7)	0.30 (7.6)	1.74 (44.2)
DM□□-TB6-	3/8" × 0.049" Tube Butt Weld		0.85 (21.6)		0.85 (21.6)	2.76 (70.1)
DM□□-FFR4-	1/4" Rotatable Female FR Fitting		1.21 (30.7)		1.21 (30.7)	3.48 (88.4)
DM□□-RFR4-	1/4" Rotatable Male FR Fitting					

Ordering Number Description



Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available; Should you have any questions, please contact FITOK Group or our authorized distributors.
- For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

Fittings
Valves
Regulators
Filters
Tubing
Integrated Systems
Other Products
Technical Information

# High Pressure Compact Diaphragm Valves

## DS Series

### Introduction

DS Series High Pressure Compact Diaphragm Valves are designed for high purity and ultra-high purity applications. Featuring a springless internal flow path, these valves deliver exceptional cleanliness. The pneumatic models feature a compact design, making them ideal for space-constrained installations, while the manual models provide excellent pressure resistance to meet the demands of various high-pressure operating conditions.

### Features

- Reduced inner volume
- Minimized number of wetted components
- Manual and pneumatic actuators available
- Aluminum piston for faster operation

### 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)	
Working Pressure	Manual	Vacuum to 4500 psig (310 bar)
	Pneumatic	Vacuum to 3000 psig (207 bar)
Pneumatic Actuator Operating Pressure	60 to 90 psig (4.2 to 6.2 bar)	
Working Temperature	PCTFE: -10 ~ 150 °F (-23 ~ 65 °C) Polyimide: -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

### Process Specification

Item	Process Specification	Standard Cleaning and Packaging Process (FC-01) Special Cleaning and Packaging Process (FC-02)	Ultra High Purity Process (FC-03)
	Material		316L SS
Wetted Surface Roughness		Ra 20 μin. (0.5 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.



### Flow Data

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

Pressure Drop to Atmosphere psig (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

Fittings

Valves

Regulators

Filters

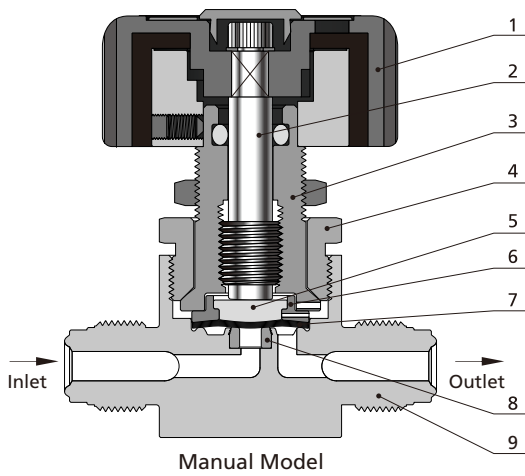
Tubing

Integrated Systems

Other Products

Technical Information

## Major Materials of Construction



Item	Component	Material/Specification
1	Handle	Aluminum
2	Stem	316 SS/ASTM A479
3	Bonnet Retainer	S17400/ASTM A564
4	Bonnet Nut	316 SS/ASTM A479
5	Button	316 SS/ASTM A479
6	Bonnet	S17400/ASTM A564
7	Diaphragm	Cobalt Alloy/AMS 5876
8	Seat	PCTFE/ASTM D1430 or Polyimide
9	Body	316L SS or 316L SS VAR

## Handles and 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



Fittings  
 Valves  
 Regulators  
 Filters  
 Tubing  
 Integrated Systems  
 Other Products  
 Technical Information

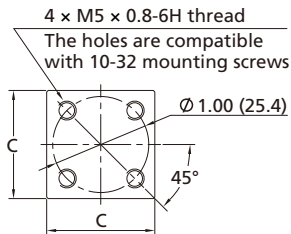
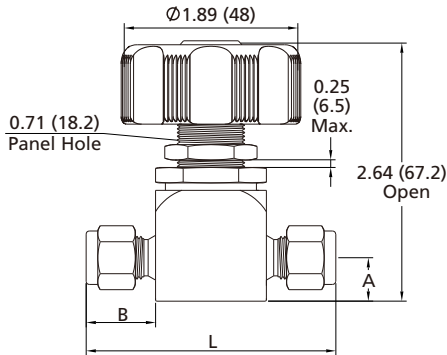
# Dimensions and Ordering Information

## Straight Type

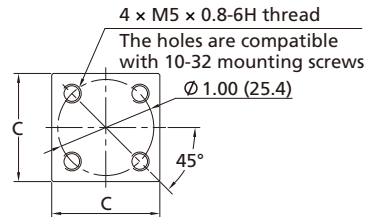
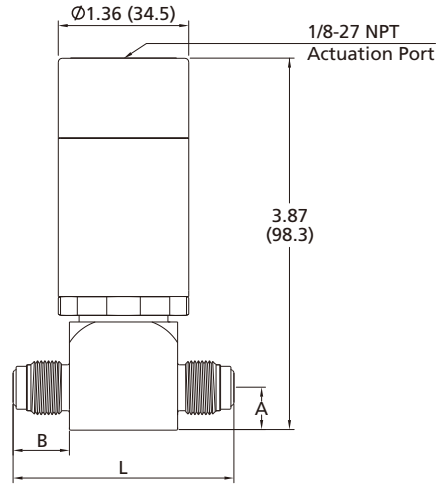
### Dimensions

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
DS□□-TB4-	1/4" x 0.035" Tube Butt Weld	0.44 (11.2)	0.34 (8.6)	1.12 (28.6)	1.81 (45.9)
DS□□-FFR4-	1/4" Rotatable Female FR Fitting		0.86 (21.8)		2.85 (72.3)
DS□□-FR4-	1/4" Integral Male FR Fitting		0.58 (14.9)		2.30 (58.4)
DS□□-FL4-	1/4" FITOK Tube Fitting		0.70 (17.9)		2.54 (64.4)
DS□□-NS4-	1/4 Male NPT		0.56 (14.2)		2.24 (57.0)
DS□□-FNS4-	1/4 Female NPT		—		2.36 (60.0)

Ordering Number Description

**DS6L - NS4 - FNS4 - CVF2 - CE**

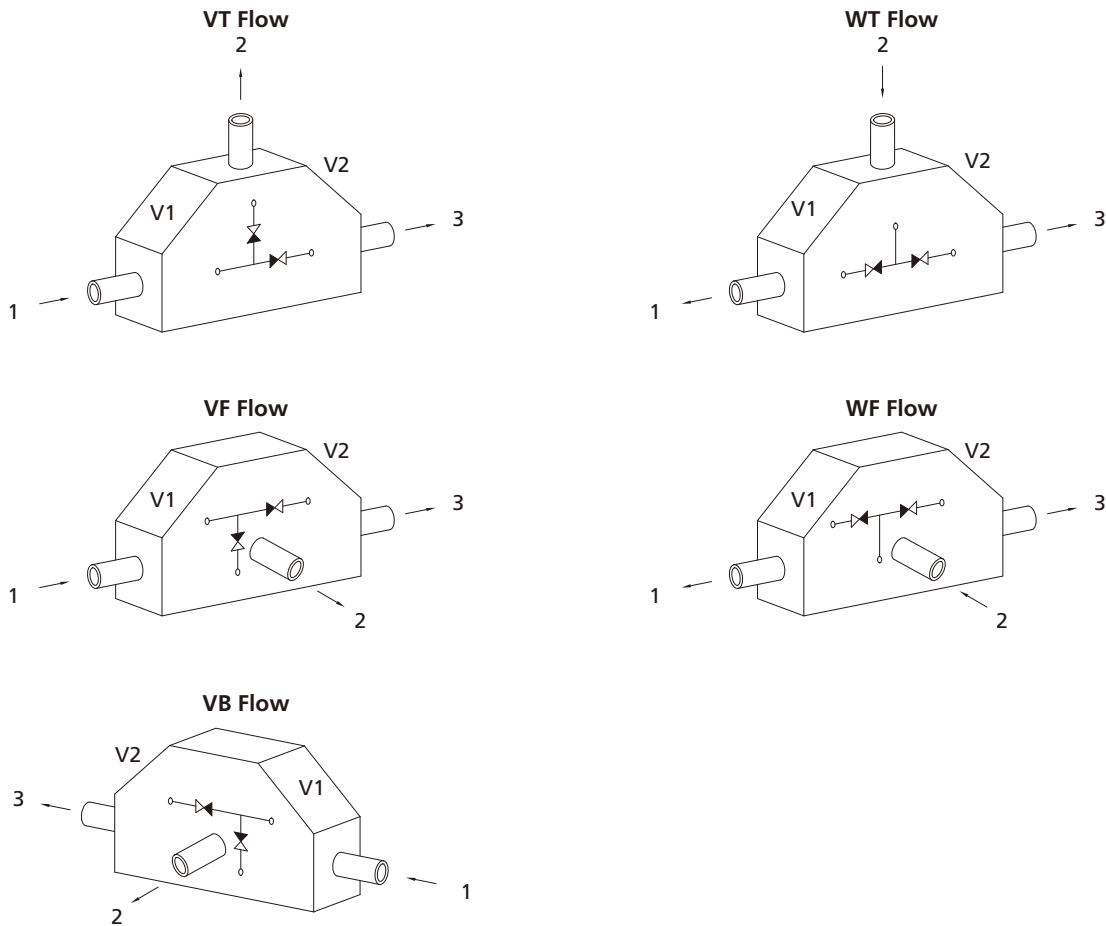
Body Material		Inlet Type		Outlet Type	Outlet Size	Handle and Actuator		Process Specification																					
6L	316L SS	TB	Fractional Tube Butt Weld	Same as Inlet	Specified in the same way as Inlet	R	Manual-Round Handle		FC-01																				
6LV	316L SS VAR	MTB	Metric Tube Butt Weld				C	Normally Closed Pneumatic	F2	FC-02																			
		FR	Integral Male FR Fitting			O	Normally Open Pneumatic	F3	FC-03																				
		FFR	Rotatable Female FR Fitting	<table border="1"> <thead> <tr> <th colspan="2">Inlet Size</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>1/4" or 1/4" x 0.035"</td> </tr> <tr> <td>6</td> <td>6 mm</td> </tr> <tr> <td>8</td> <td>8 mm</td> </tr> </tbody> </table>		Inlet Size		4	1/4" or 1/4" x 0.035"	6	6 mm	8	8 mm	<table border="1"> <thead> <tr> <th colspan="2">Seat</th> </tr> </thead> <tbody> <tr> <td></td> <td>PCTFE</td> </tr> <tr> <td>V</td> <td>Polyimide</td> </tr> </tbody> </table>		Seat			PCTFE	V	Polyimide	<table border="1"> <thead> <tr> <th colspan="2">Product Certification</th> </tr> </thead> <tbody> <tr> <td></td> <td>None</td> </tr> <tr> <td>CE</td> <td>CE Certification (For Pneumatic only)</td> </tr> </tbody> </table>		Product Certification			None	CE	CE Certification (For Pneumatic only)
Inlet Size																													
4	1/4" or 1/4" x 0.035"																												
6	6 mm																												
8	8 mm																												
Seat																													
	PCTFE																												
V	Polyimide																												
Product Certification																													
	None																												
CE	CE Certification (For Pneumatic only)																												
		FL	Fractional Tube Fitting																										
		ML	Metric Tube Fitting																										
		NS	Male NPT																										
		FNS	Female NPT																										

Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
- For -CE selections, products have "CE" lettering.

2-Valve 3-Way Block Type

Flow Paths



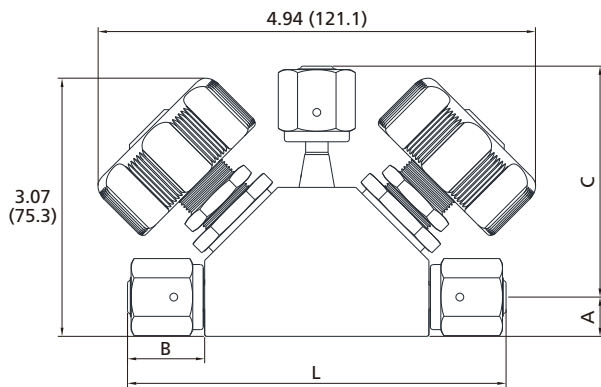
**Dimensions**

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

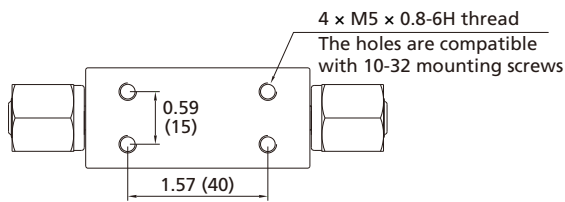
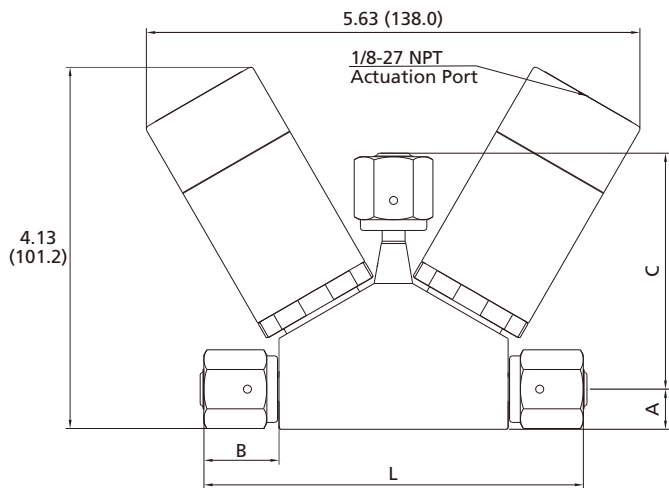


**VT/WT Flow**

**Manual - Round Handle**



**Pneumatic**



Fittings

Valves

Regulators

Filters

Tubing

Integrated Systems

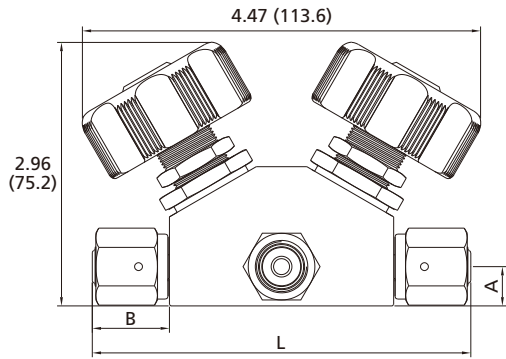
Other Products

Technical Information

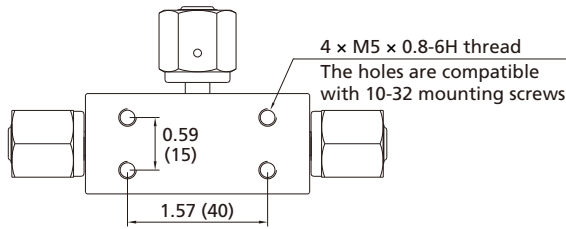
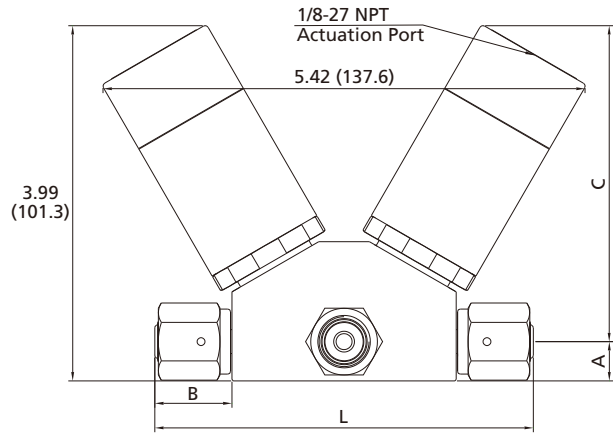
# V-69 Diaphragm Valves

## VF/VB Flow

**Manual - Round Handle**

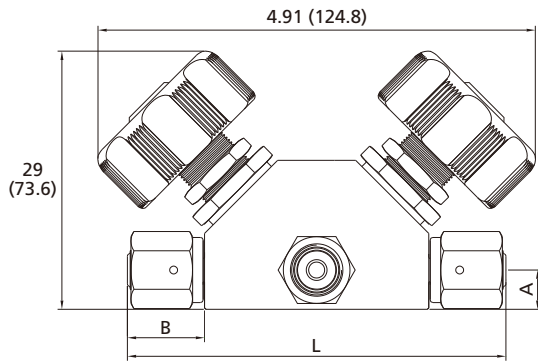


**Pneumatic**

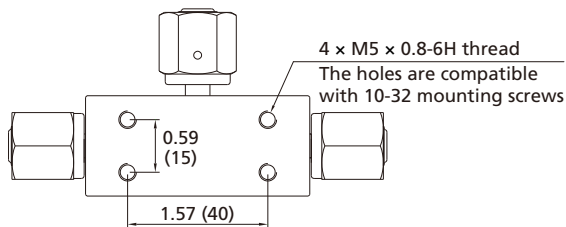
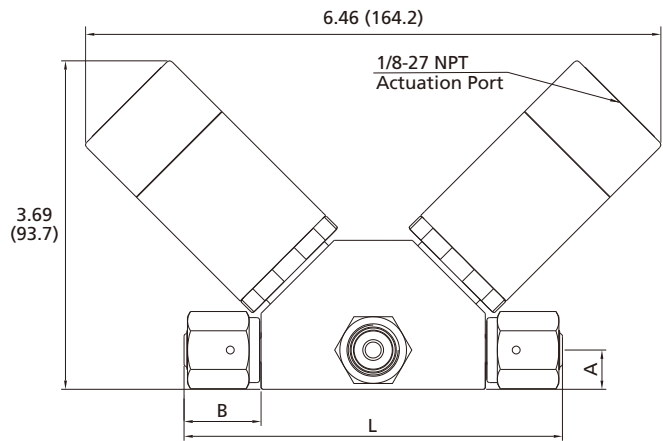


## WF Flow

**Manual - Round Handle**



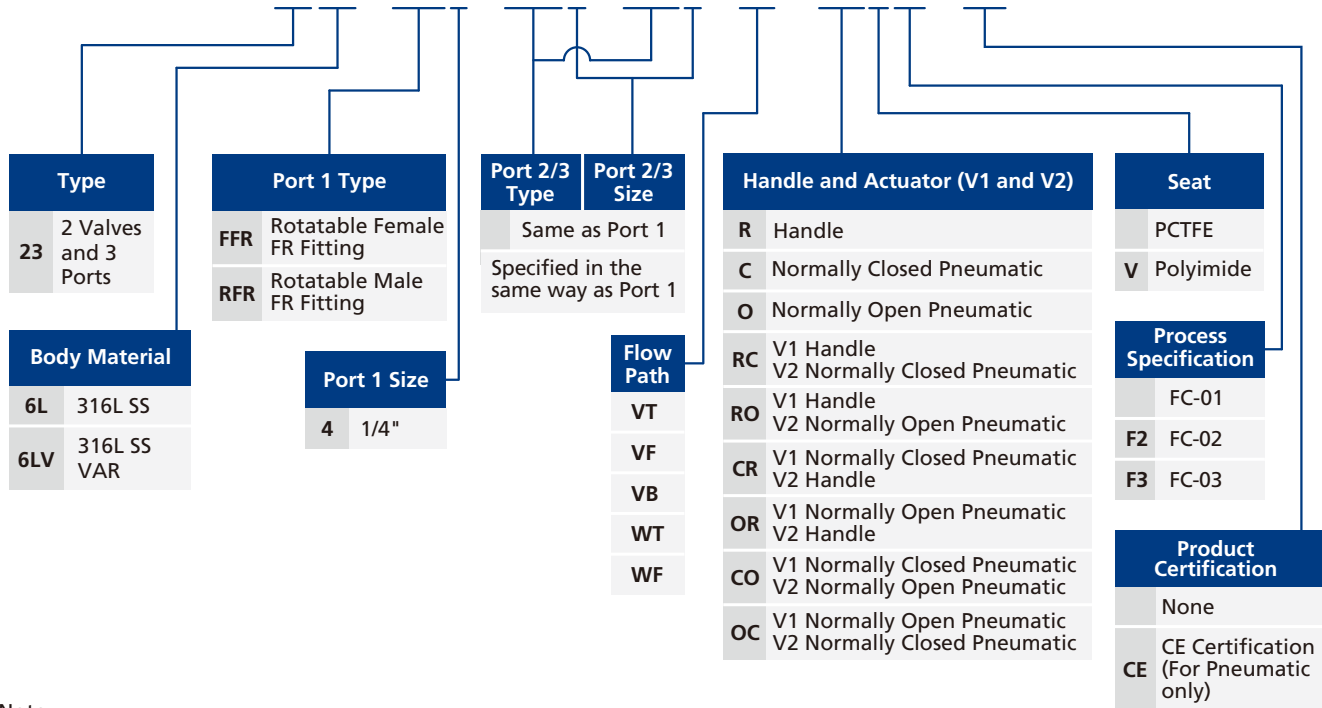
**Pneumatic**



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

Ordering Number Description

DS236L - FFR4 - RFR4 - FFR4 - VF - COVF2 - CE



Note:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
- For -CE selections, products have "CE" lettering.

### 3-Valve 5-Way Block Type

#### Introduction

3-valve, 5-way purge blocks are designed for gas supply systems handling high purity, corrosive, toxic gases, or multi-component gas mixtures. The unit integrates multiple functions—including gas supply, purging, and exhaust—into a single assembly. A port is available for connection to a pressure sensor to monitor abnormal pressure conditions within the pipeline.

#### Technical Data

<b>Port Size</b>		1/4"
<b>Flow Coefficient (Cv)</b>		0.17
<b>Orifice Size</b>		0.12 in. (3.0 mm)
<b>Working Pressure</b>		Vacuum to 3000 psig (207 bar)
<b>Pneumatic Actuator Operating Pressure</b>		60 ~ 90 psig (4.2 ~ 6.2 bar)
<b>Temperature</b>		PCTFE: -40 ~ 160 °F (-40 ~ 71 °C) PFA: -10 ~ 250 °F (-23 ~ 121 °C)
<b>Leak Rate (Helium)</b>	<b>Internal</b>	$\leq 1 \times 10^{-9}$ std·cm <sup>3</sup> /s
	<b>External</b>	$\leq 1 \times 10^{-9}$ std·cm <sup>3</sup> /s

#### Flow Data

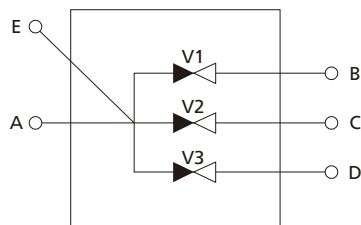
Air @ 70 °F (21 °C)

Water @ 60 °F (16 °C)

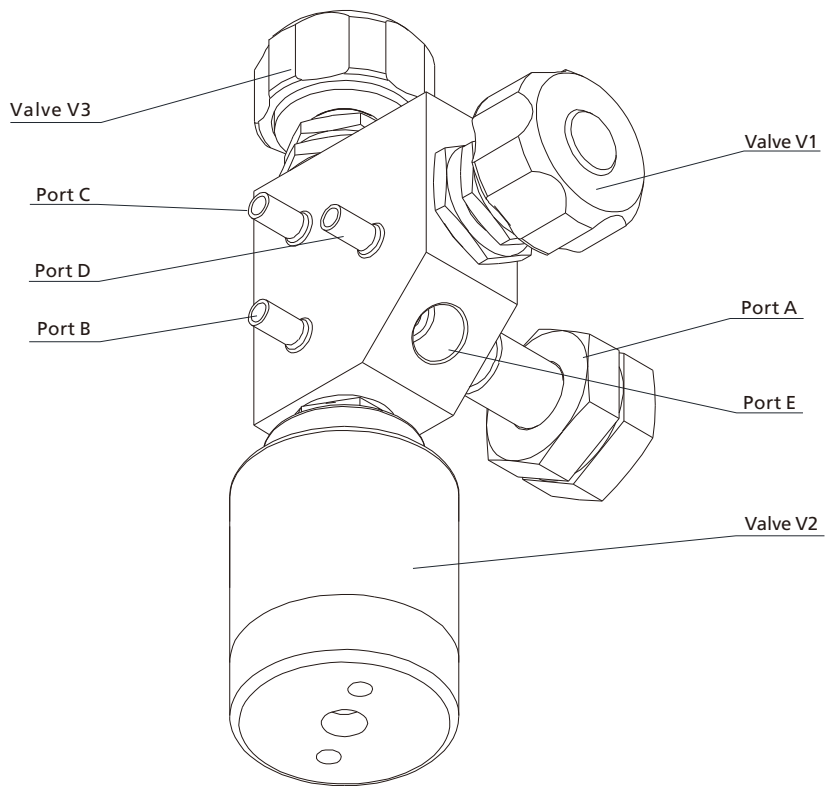
Orifice in. (mm)	Pressure Drop to Atmosphere psig (bar)	Air (l/min)	Water (l/min)
0.12 (3.0)	10 (0.68)	64	2.4
	50 (3.4)	170	5.4
	100 (6.8)	300	7.6

#### Flow Paths

☉ Flow paths as viewed from the top



Note: C and D serve as purge ports, while A and B serve as the main flow paths.



### Dimensions and Ordering Information

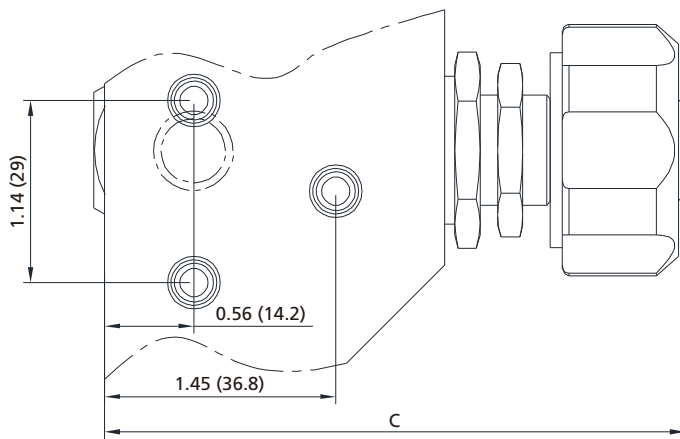
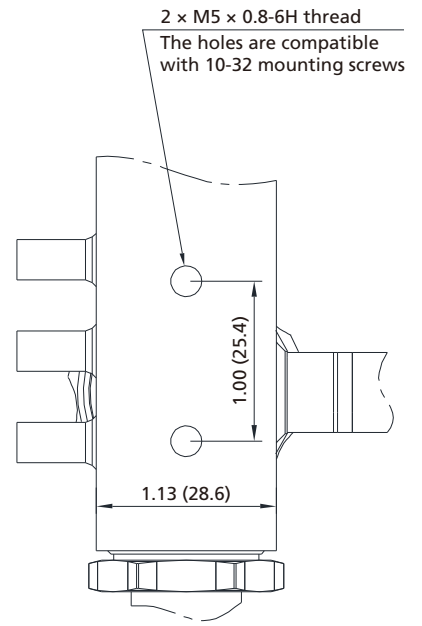
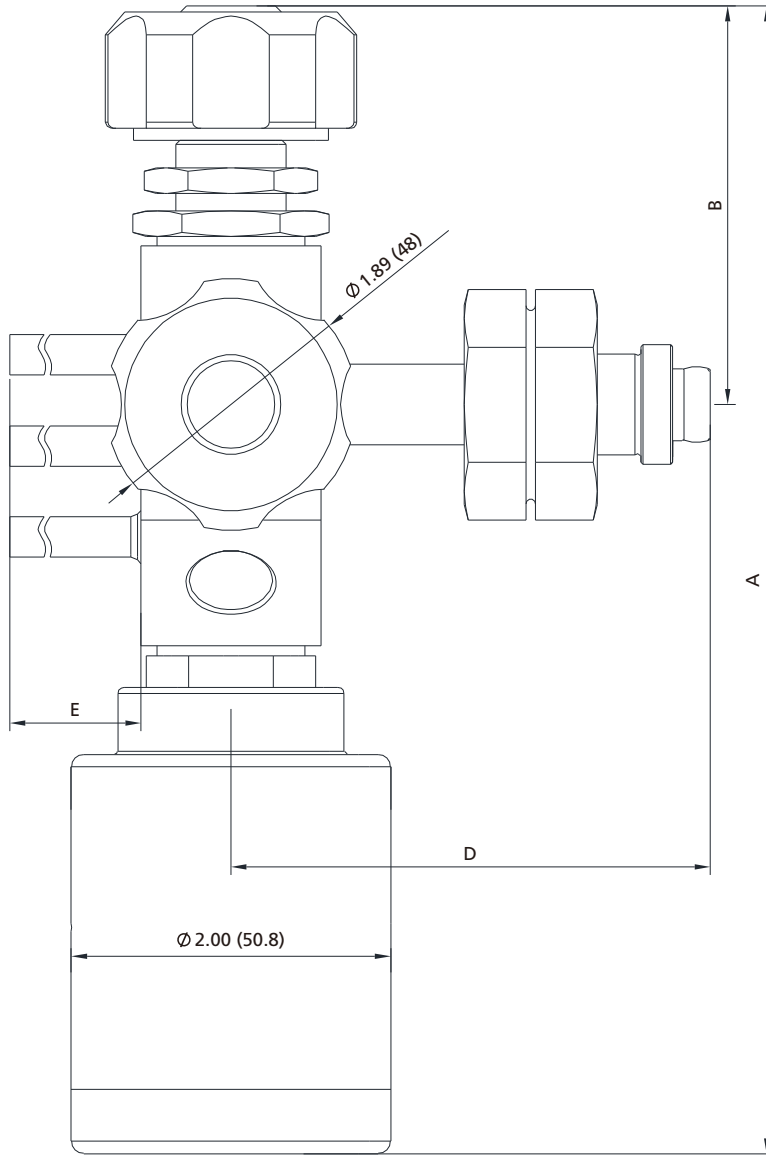
Dimensions, in inches (millimeters), are for reference only.



Fittings
Valves
Regulators
Filters
Tubing
Integrated Systems
Other Products
Technical Information

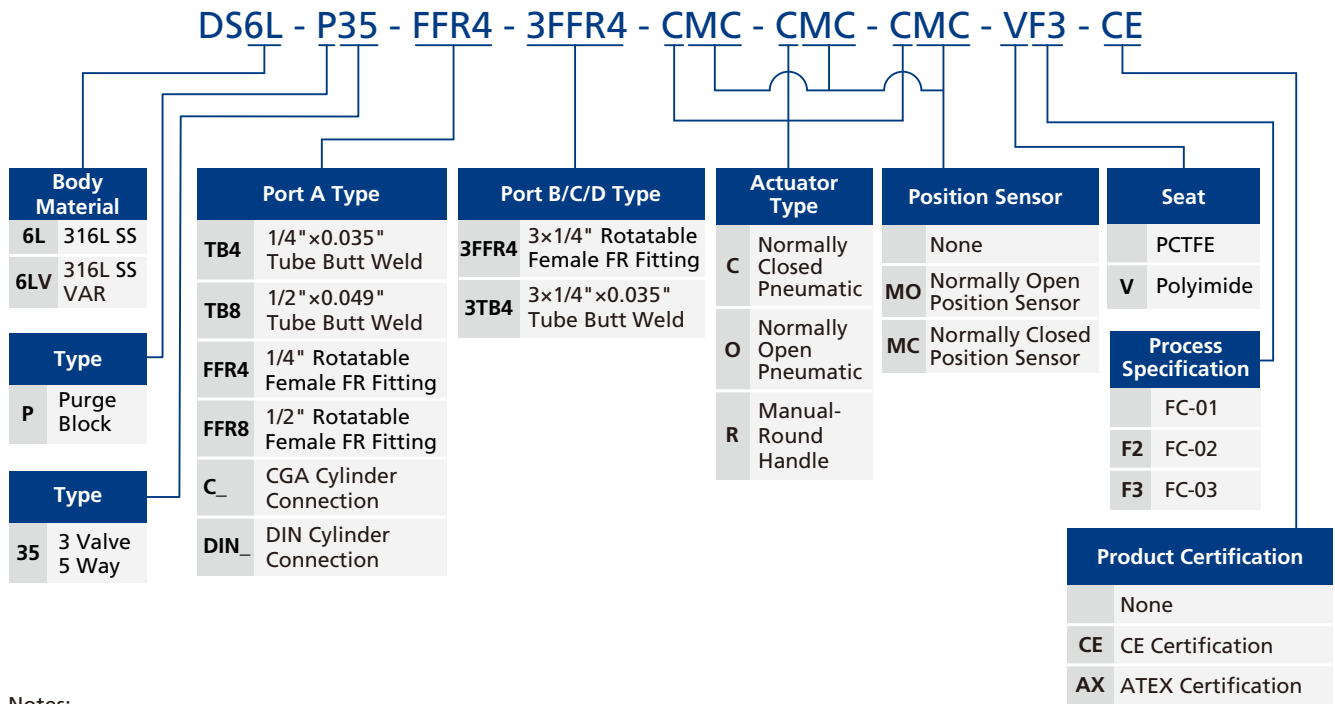
# V-73 Diaphragm Valves

Fittings	Valves	Regulators	Filters	Tubing	Integrated Systems	Other Products	Technical Information
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Ordering Number Description



Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available. Should you have any questions, please contact FITOK Group or our authorized distributors.
- For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

# Low Pressure/Medium Flow Diaphragm Valves

## DR Series

### Introduction

DR Series Low Pressure/Medium Flow Diaphragm Valves are suitable for high purity and ultra high purity applications. Featuring an internally springless flow path, these valves offer high cleanliness.

### Features

- ⦿ For medium flow applications
- ⦿ Minimal particle generation and minimal dead space
- ⦿ Fully contained seat to provide excellent resistance to swelling and contamination
- ⦿ Cobalt alloy diaphragm with high strength and corrosion resistance to ensure long cycle life
- ⦿ Manual and pneumatic actuators available
- ⦿ Normally closed or normally open position sensors are optional for pneumatically actuated valves
- ⦿ Optional manual locking mechanism, lockable in both open and closed positions

### 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)	
Working Pressure	Vacuum to 145 psig (10 bar)	
Pneumatic Actuator Operating Pressure	60 to 90 psig (4.2 to 6.2 bar)	
Working Temperature	PCTFE: -10 ~ 176 °F (-23 ~ 80 °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 psig (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

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

Notes: Refer to page P-01 for a detailed description of Process Specification.

① Wetted surface roughness of valves with FR Series metal gasket face seal connections and tube butt weld connections.



Fittings

Valves

Regulators

Filters

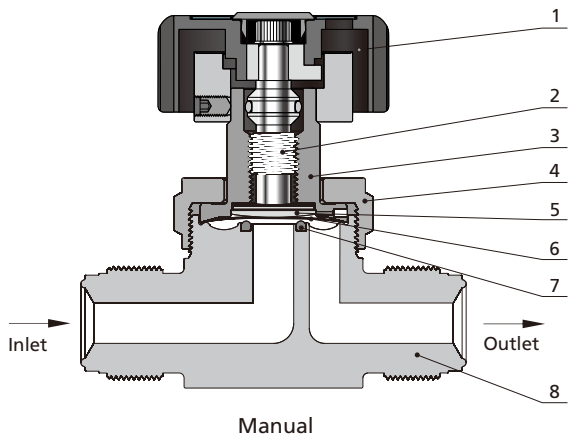
Tubing

Integrated Systems

Other Products

Technical Information

## Major Materials of Construction



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 (2)	Cobalt Alloy/AMS 5876
7	Seat	PCTFE/ASTM D1430 or PFA/ASTM D3307
8	Body	316L SS or 316L SS VAR

## Handles and Actuators

### Manual - Round Handle

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



### Manual - Two - Position Lockout (LOTO) Handle

- Lockable in both the fully open and fully closed positions
- The pull-to-rotate design for enhanced operational safety, rotate 1/4 turn to open or close the valve
- The handle is equipped with a visual window for direct observation of its opening and closing status



### Pneumatic

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



Fittings  
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### Position Sensors

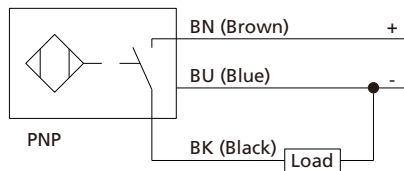
Transmit a signal to an electrical device indicating the open and closed position of pneumatically actuated valves

### Technical Information

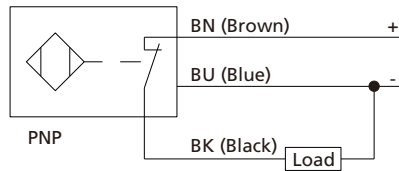
<b>Output</b>	3-wire V (dc), PNP
<b>Output Function</b>	Normally open or normally closed
<b>Voltage</b>	10 ~ 30 V (dc)
<b>Working Temperature</b>	-13 ~ 158 °F (-25 ~ 70 °C)

### Wiring Diagram

Normally open position sensors



Normally closed position sensors



Notes:

1. For normally closed pneumatically actuated valves, when fitted with normally open sensors, the sensors transmit signals with indicators illuminated when the valves are open. Conversely, when fitted with normally closed sensors, the sensors transmit signals with indicators illuminated when the valves are closed.
2. For normally open pneumatically actuated valves, when fitted with normally open sensors, the sensors transmit signals with indicators illuminated when the valves are closed. Conversely, when fitted with normally closed sensors, the sensors transmit signals with indicators illuminated when the valves are open.

### Explosion-proof Position Sensors

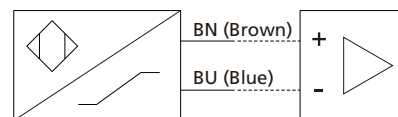
Transmit a signal to an electrical device, indicating the open and closed positions of pneumatically actuated valves.

Equipment Group II under ATEX Certification. The output complies with DIN EN 6094 7-5-6 (NAMUR) and the sensor should be used with an isolation amplifier.

### Technical Information

<b>Output</b>	2 Wires DC
<b>Voltage</b>	8.2 V (dc)
<b>Working Temperature</b>	-13 ~ 158 °F (-25 ~ 70 °C)

### Wiring Diagram



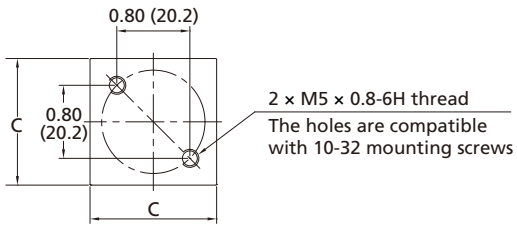
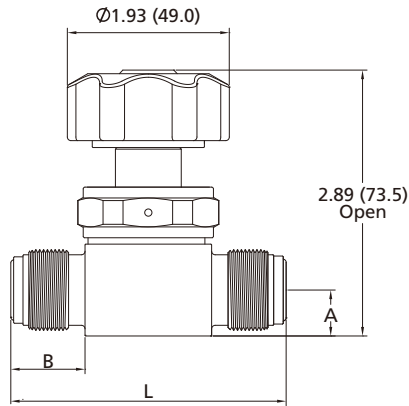
## Dimensions and Ordering Information

### Straight Type

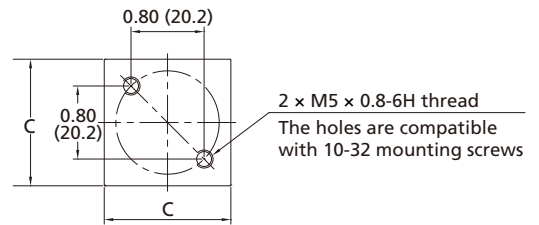
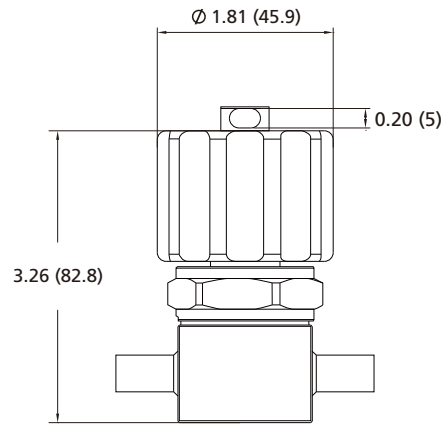
#### Dimensions

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

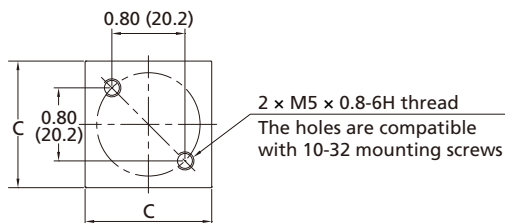
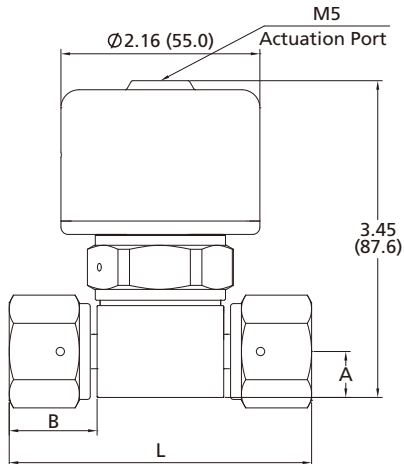
Manual - Round Handle



Manual - Two - position Lockout (LOTO) Handle

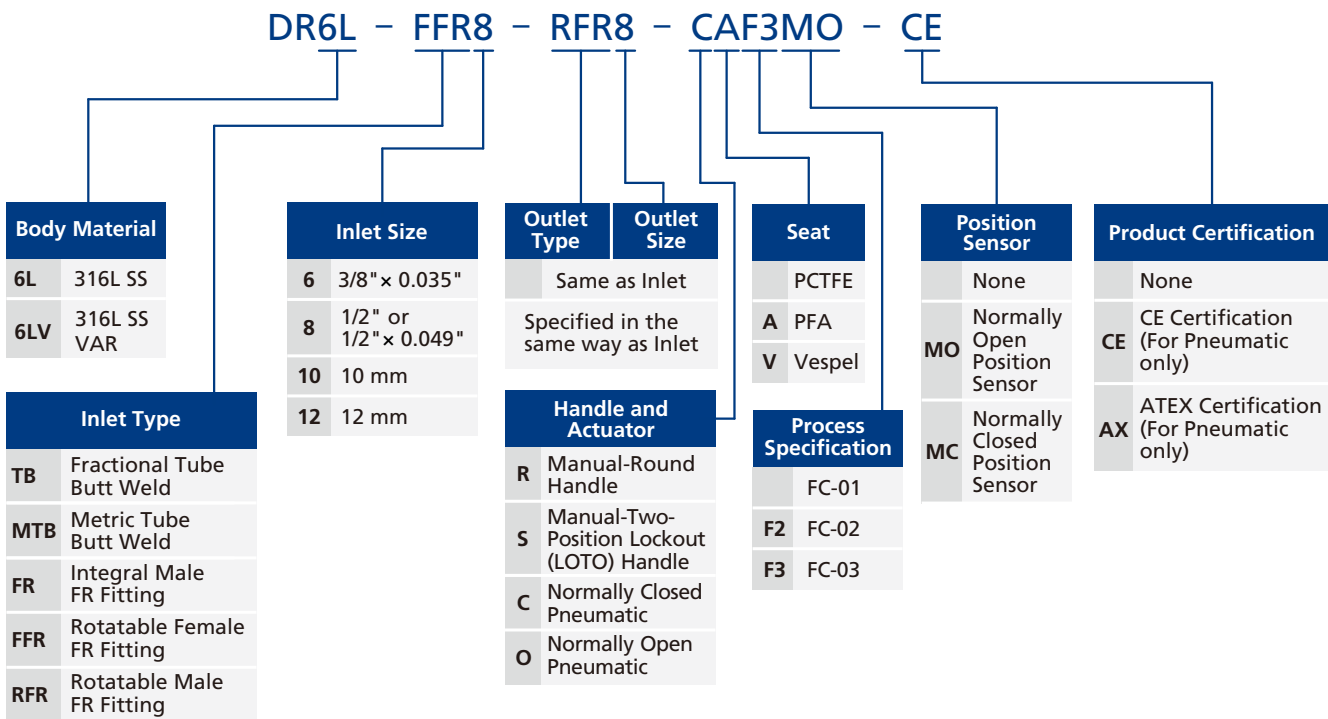


Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)			
		A	B	C	L
DR□□-TB6-	3/8" × 0.035" Tube Butt Weld	0.50 (12.7)	0.67 (17.0)	1.38 (35.0)	2.72 (69.0)
DR□□-TB8-	1/2" × 0.049" Tube Butt Weld		0.94 (24.0)		3.27 (83.0)
DR□□-FFR8-	1/2" Rotatable Female FR Fitting		0.81 (20.6)		3.00 (76.2)
DR□□-FR8-	1/2" Integral Male FR Fitting				

Ordering Number Description



Notes:

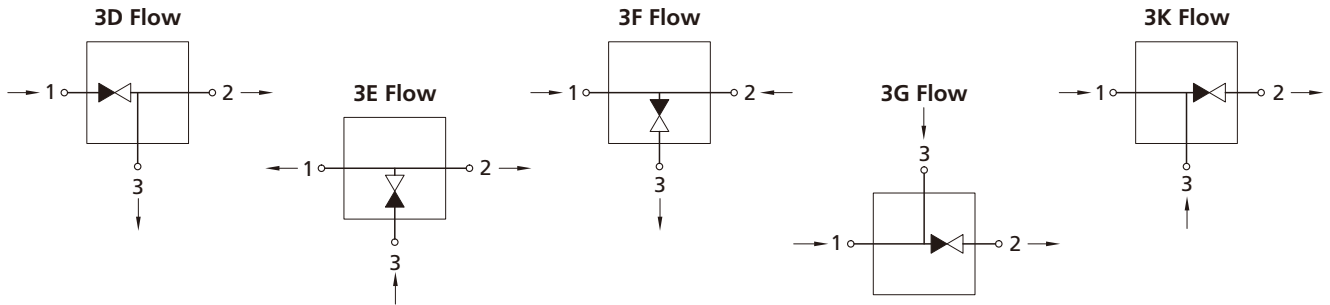
- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available; Should you have any questions, please contact FITOK Group or our authorized distributors.
- For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

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## Branch Type

### Flow Paths

☉ Flow paths as viewed from the top

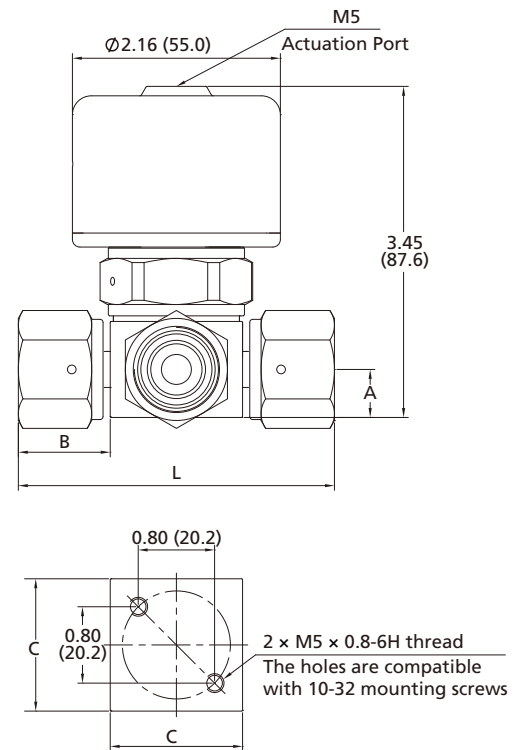
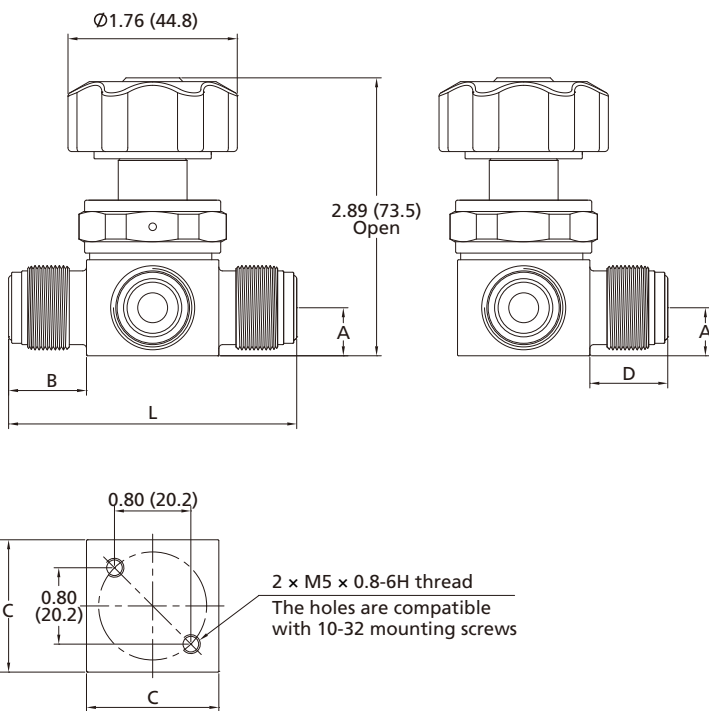


### Dimensions

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

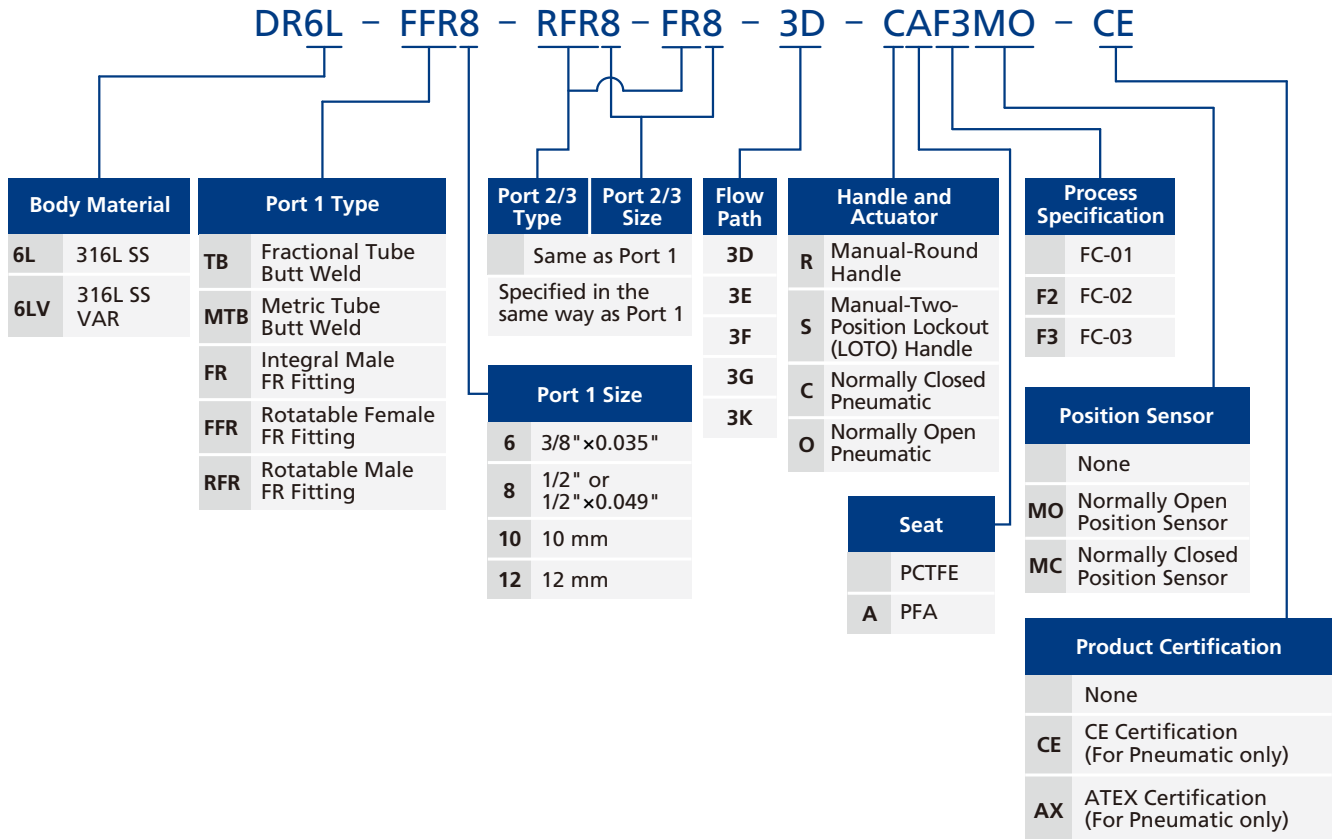
#### Manual - Round Handle

#### Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	C	D	L
DR□□-TB6-	3/8" x 0.035" 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" x 0.049" Tube Butt Weld		0.94 (24.0)		0.94 (24.0)	3.27 (83.0)
DR□□-FFR8-	1/2" Rotatable Female FR Fitting		1.34 (34.0)		1.34 (34.0)	4.05 (103.0)
DR□□-RFR8-	1/2" Rotatable Male FR Fitting		0.81 (20.6)		0.81 (20.6)	3.00 (76.2)
DR□□-FR8-	1/2" Integral Male FR Fitting					

Ordering Number Description



Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available; Should you have any questions, please contact FITOK Group or our authorized distributors.
- For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

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# Low Pressure/High Flow Diaphragm Valves

## DV Series

### Introduction

DV Series Low Pressure/High Flow Diaphragm Valves are suitable for high purity and ultra high purity applications. These valves feature a springless design, compact design, high flow capacity, and a variety of pipeline options.



### Features

- ⦿ Ideal for high flow applications
- ⦿ Metal-to-metal seal
- ⦿ Tied-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
- ⦿ Optional manual locking mechanism, lockable in both open and closed positions

### Technical Data

Technical Data		
Port Size	1/2" to 1" or 12 mm to 18 mm	
Flow Coefficient (Cv)	Manual	2.8
	Pneumatic	2.4
Orifice Size	0.5 in. (12.7 mm)	
Working Pressure	Manual	Vacuum to 300 psig (20.7 bar)
	Pneumatic	Vacuum to 145 psig (10 bar)
Pneumatic Actuator Operating Pressure	60 to 90 psig (4.2 to 6.2 bar)	
Working Temperature	PCTFE: -10 ~ 150 °F (-23 ~ 65 °C) Polyimide: -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)

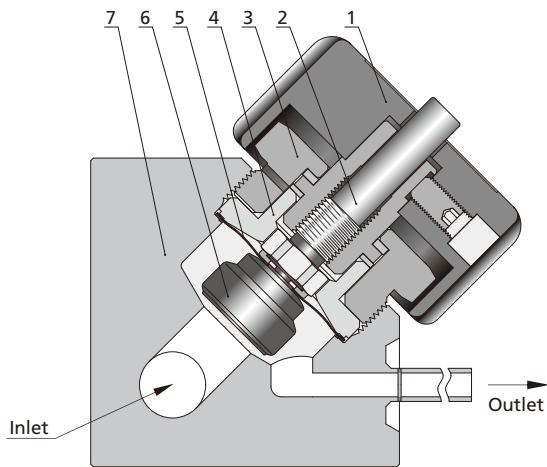
Pressure Drop to Atmosphere psig (bar)	Manual		Pneumatic	
	Air (l/min)	Water (l/min)	Air (l/min)	Water (l/min)
10 (0.68)	870	34	780	29
50 (3.4)	2300	75	2050	64
100 (6.8)	4100	100	3650	91

### Process Specification

Item	Process Specification	Standard Cleaning and Packaging Process (FC-01) Special Cleaning and Packaging Process (FC-02)	Ultra High Purity Process (FC-03)
	Material		316L SS, F316L SS
Wetted Surface Roughness		Ra 10 μin. (0.25 μm)	Ra 5 μin. (0.13 μm)
Polishing Process		Machine finished	Electropolished

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

## Major Materials of Construction



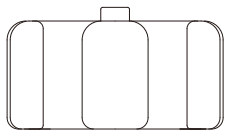
Manual Actuation - Branch Type

Item	Component	Material/Specification
1	Handle	Aluminum
2	Upper Stem	S17400/ASTM A564
3	Bonnet Nut	316 SS/ASTM A479
4	Bonnet	S17400/ASTM A564
5	Diaphragm (3)	Cobalt Alloy/AMS 5876
6	Stem Subassembly	316L SS or 316L SS VAR and PCTFE/ASTM D1430 or Polyimide
7	Body	316L SS or 316L SS VAR or F316L SS

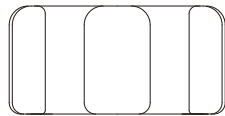
## Handles and Actuators

### 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.

### Manual - Two - Position Lockout (LOTO) Handle

- Lockable in both the fully open and fully closed positions
- The pull-to-rotate design for enhanced operational safety, rotate 3/4 turn to open or close the valve
- The handle is equipped with a visual window for direct observation of its opening and closing status



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# V-85 Diaphragm Valves

Fittings

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## Pneumatic

- 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

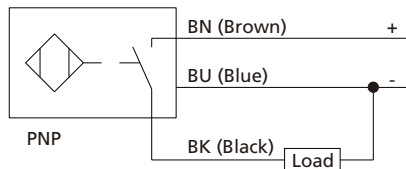
Note: Position sensors are applicable only to normally closed pneumatically actuated valves.

## Technical Information

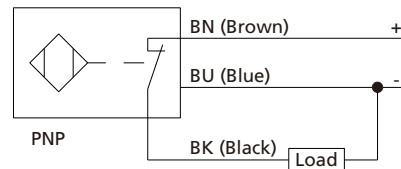
<b>Output</b>	3-wire V (dc), PNP
<b>Output Function</b>	Normally open or normally closed
<b>Voltage</b>	10 ~ 30 V (dc)
<b>Working Temperature</b>	-13 ~ 158 °F (-25 ~ 70 °C)

## Wiring Diagram

Normally open position sensors



Normally closed position sensors



Notes: For normally closed pneumatically actuated valves, when fitted with normally open sensors, the sensors transmit signals with indicators illuminated when the valves are open. Conversely, when fitted with normally closed sensors, the sensors transmit signals with indicators illuminated when the valves are closed.

## Explosion-proof Position Sensors

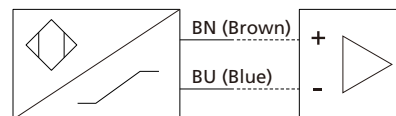
Transmit a signal to an electrical device, indicating the open and closed positions of pneumatically actuated valves.

Equipment Group II under ATEX Certification. The output complies with DIN EN 6094 7-5-6 (NAMUR) and the sensor should be used with an isolation amplifier.

## Technical Information

<b>Output</b>	2 Wires DC
<b>Voltage</b>	8.2 V (dc)
<b>Working Temperature</b>	-13 ~ 158 °F (-25 ~ 70 °C)

## Wiring Diagram



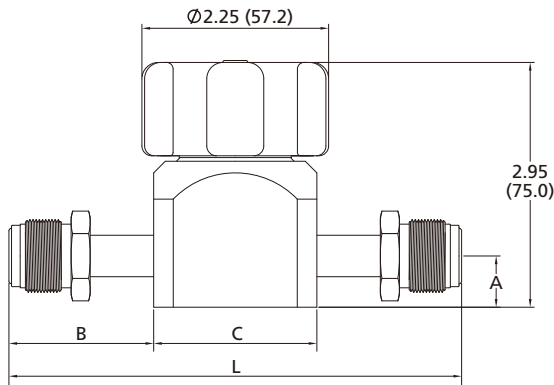
## Dimensions and Ordering Information

### Straight Type

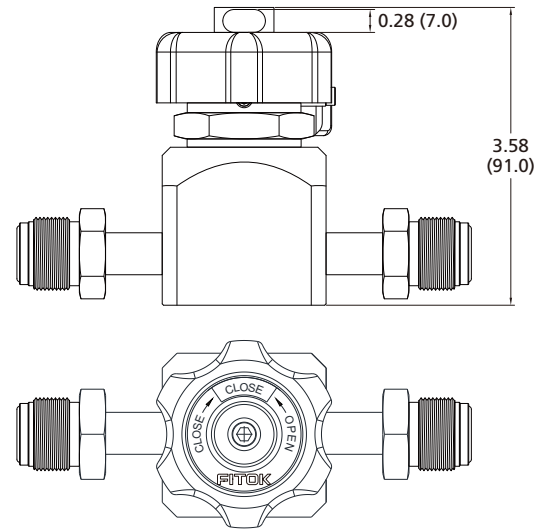
#### Dimensions

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

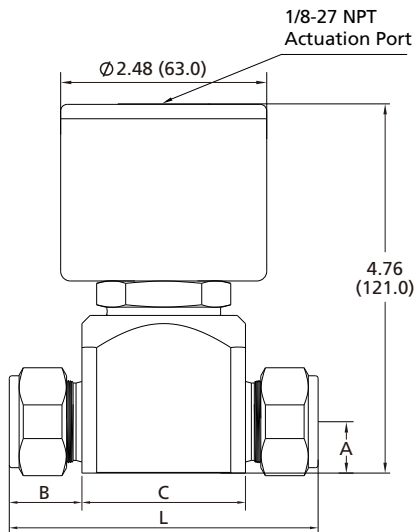
#### Manual - Round Handle



#### Manual - Two - Position Lockout (LOTO) Handle



#### Pneumatic

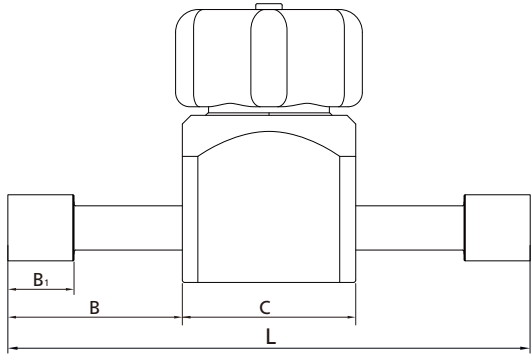


Note: The height in both the fully open and fully closed positions is approximately 91 mm. A round lock with a diameter of 3–7 mm is recommended. All other connection sizes are same as those of the standard DV Series.

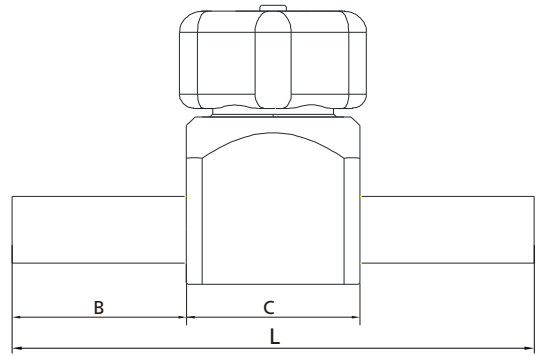
Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)					
		A	B	B <sub>1</sub>	C	L	
DV□□-TB8-	1/2" × 0.049" Tube Butt Weld	0.62 (15.7)	1.97 (50)	-	1.97 (50)	5.91 (150.0)	
DV□□-TB12-	3/4" × 0.049" Tube Butt Weld (Reducing Port)			0.75 (19)			
DV□□-TB12U-	3/4" × 0.049" Tube Butt Weld (Non-Reducing Port)			-			
DV□□-FR8-	1/2" Integral Male FR Fitting		1.75 (44.5)	-		5.47 (138.9)	
DV□□-FFR8-	1/2" Rotatable Female FR Fitting			-			
DV□□-FL8-	1/2" FITOK Tube Fitting		0.87 (22.1)	-			3.71 (94.2)
DV□□-FL12-	3/4" FITOK Tube Fitting		0.87 (22.2)	-			3.72 (94.4)

# V-87 Diaphragm Valves

Outline Diagram of TB12 Reducing Port  
(Example: DV6L-TB12-R)



Outline Diagram of TB12U Non-Reducing Port  
(Example: DV6L-TB12U-R)



## Ordering Number Description

DV6L - FR8 - TB12U - CVF2MO - CE

Body Material	Inlet Size	Outlet Type	Outlet Size	Seat	Position Sensor
6L 316L SS	8 1/2" or 1/2" x 0.049"	Same as Inlet		PCTFE	None
6LV 316L SS VAR	12 12 mm or 3/4" or 3/4" x 0.049"	Specified in the same way as Inlet		V Polyimide	MO Normally Open Position Sensor
	18 18 mm				MC Normally Closed Position Sensor

Inlet Type	Port Type ①	Process Specification
TB Fractional Tube Butt Weld	None	FC-01
MTB Metric Tube Butt Weld	U Non-Reducing Port	F2 FC-02
FR Integral Male FR Fitting		F3 FC-03
FFR Rotatable Female FR Fitting		
FL Fractional Tube Fitting		
ML Metric Tube Fitting		

Handle and Actuator	Product Certification
R Manual-Round Handle	None
S Manual-Two-Position Lockout (LOTO) Handle	CE CE Certification (For Pneumatic only)
C Normally Closed Pneumatic	AX ATEX Certification (For Pneumatic only)
O Normally Open Pneumatic	

Note: MO and MC sensors are only applicable to normally closed pneumatically actuated valves.

① "Connection Type" applies only to weld end connections (e.g., TB, MTB). Among these, only the TB8 connection is non-reducing by default and therefore does not require the "U" suffix. Other weld connections provide both reducing and non-reducing options: TB12 indicates a reducing weld connection, while TB12U indicates a non-reducing weld connection.

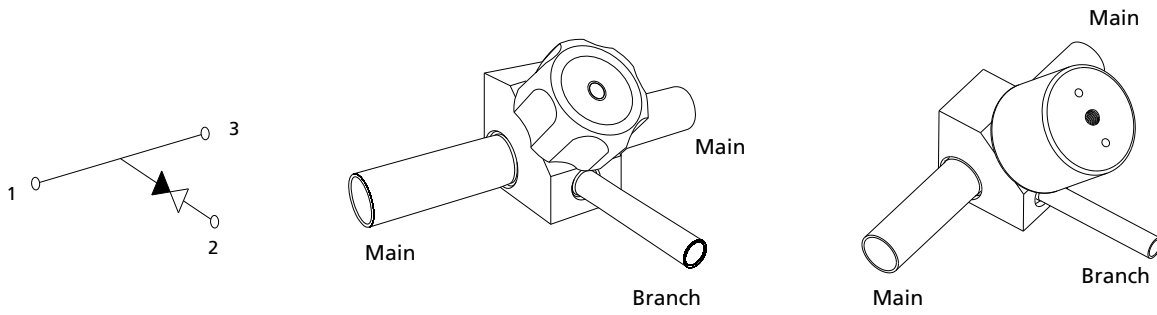
Notes:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available; Should you have any questions, please contact FITOK Group or our authorized distributors.
- For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

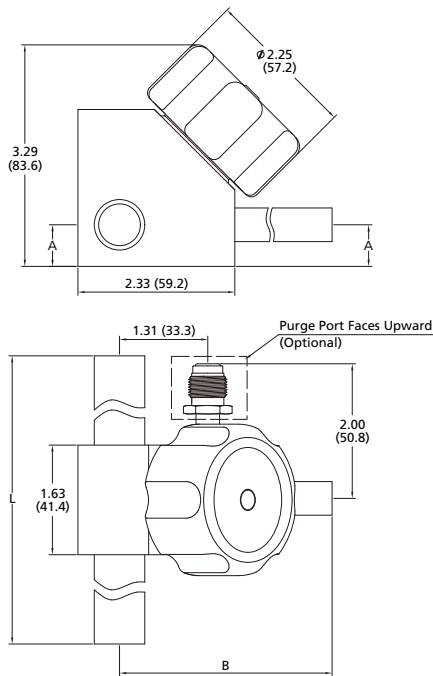
## ST Flow

### Dimensions

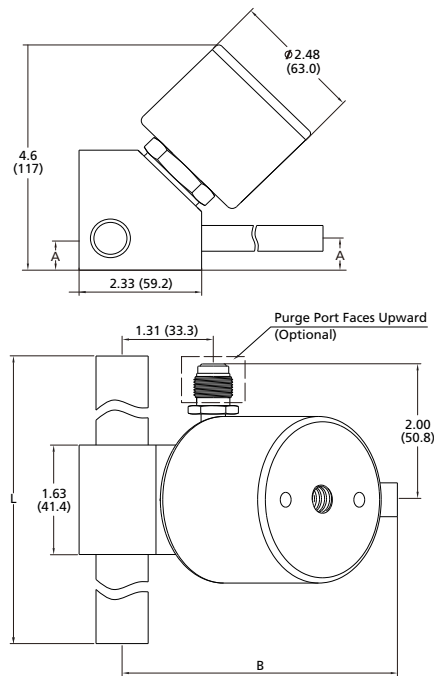
Dimensions, in inches (millimeters), are for reference only.



### Manual-Round Handle



### Pneumatic

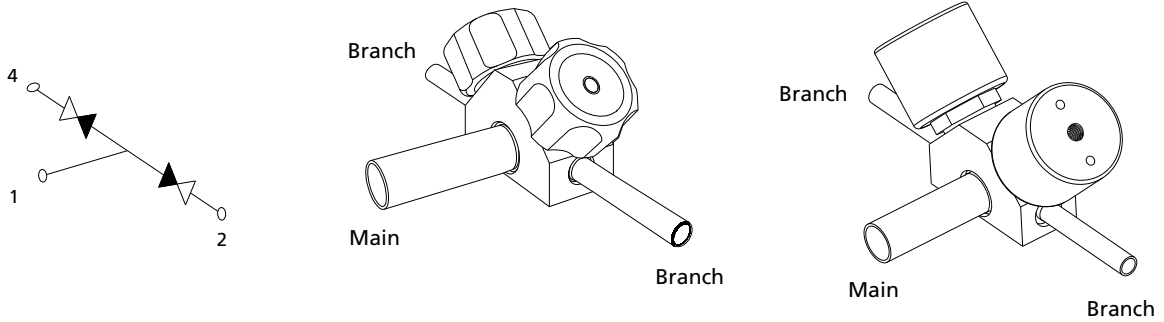


Basic Ordering Number	Connection Type and Size		Dimensions in. (mm)		
	Main	Branch	A	B	L
DV□□-TB8-TB4-ST-	1/2" x 0.049" Tube Butt Weld	1/4" x 0.035" Tube Butt Weld	0.62 (15.7)	4.69 (119.0)	7.58 (193.0)
DV□□-TB8-TB8-ST-	1/2" x 0.049" Tube Butt Weld	1/2" x 0.049" Tube Butt Weld			
DV□□-TB8-RFR4-ST-	1/2"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

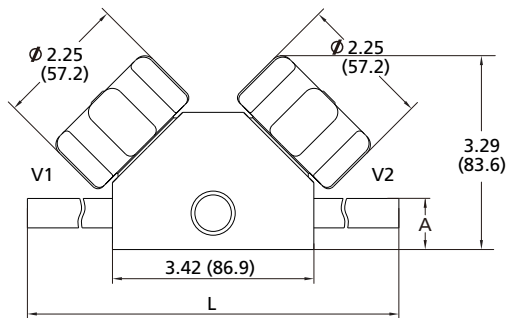
**DT Flow**

**Dimensions**

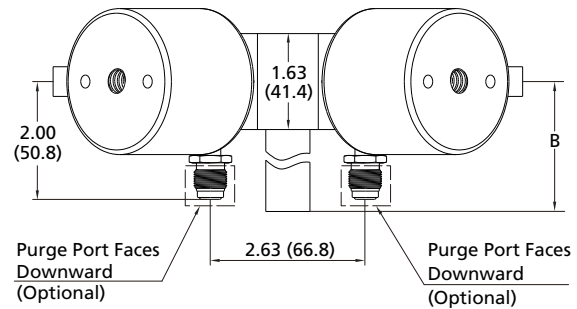
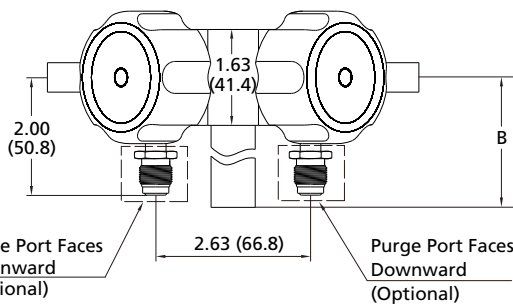
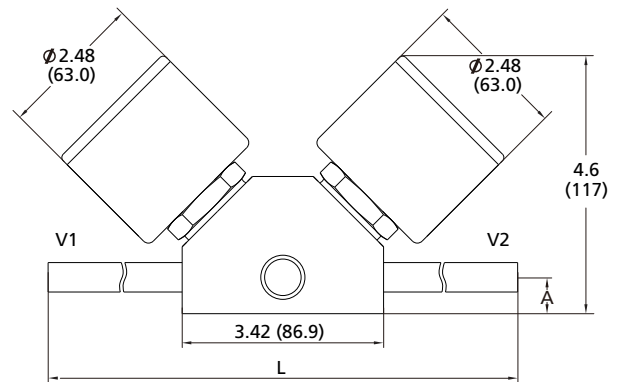
Dimensions, in inches (millimeters), are for reference only.



**Manual-Round Handle**



**Pneumatic**

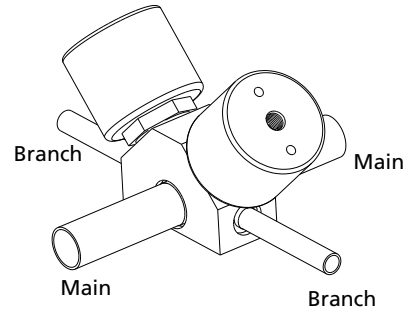
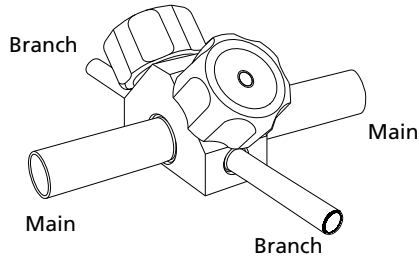
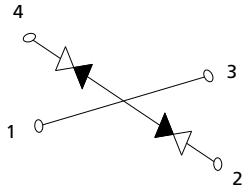


Basic Ordering Number	Connection Type and Size		Dimensions in. (mm)		
	Main	Branch	A	B	L
DV□□-TB12-TB8-DT-	3/4" x 0.049" Tube Butt Weld	1/2" x 0.049" Tube Butt Weld	0.62 (15.7)	3.79 (96.3)	9.38 (238.0)
DV□□-TB12-RFR8-DT-	3/4" x 0.049" Tube Butt Weld	1/2" Rotatable Male FR Fitting			
DV□□-TB16-TB8-DT-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

DC Flow

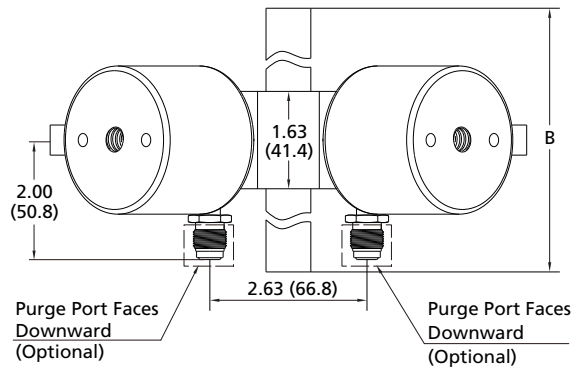
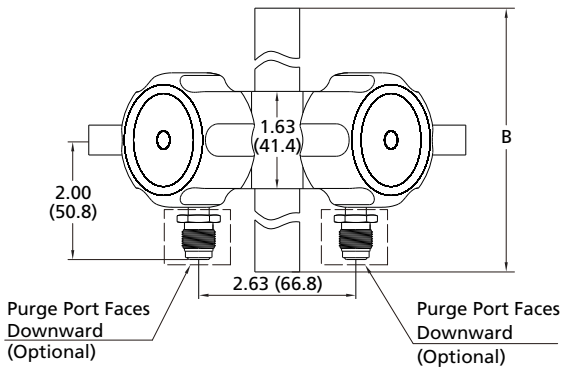
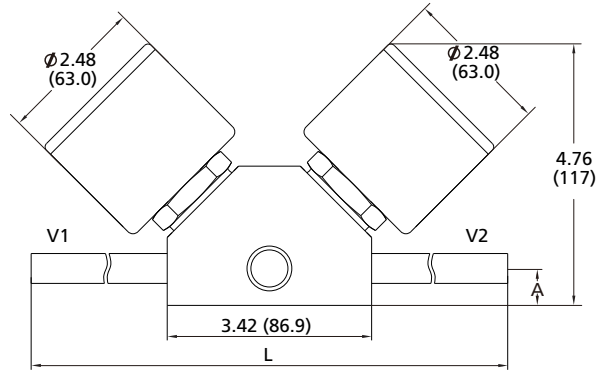
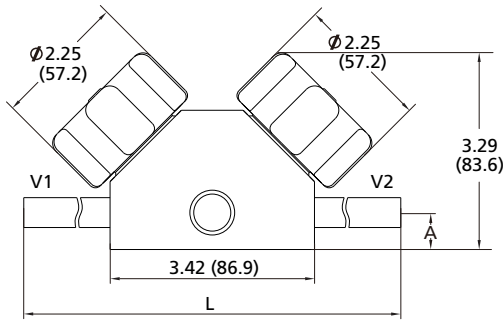
Dimensions

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-TB8-DC-	1/2" x 0.049" Tube Butt Weld	1/2" x 0.049" Tube Butt Weld	0.62 (15.7)	7.58 (193.0)	9.38 (238.0)
DV□□-TB8-RFR8-DC-	1/2" x 0.049" Tube Butt Weld	1/2" Rotatable Male FR Fitting			
DV□□-TB12-TB8-DC-	3/4" x 0.049" Tube Butt Weld	1/2" x 0.049" Tube Butt Weld			
DV□□-TB12-RFR8-DC-	3/4" x 0.049" Tube Butt Weld	1/2" Rotatable Male FR Fitting			
DV□□-TB16-TB8-DC-	1" x 0.065" Tube Butt Weld	1/2" x 0.049" Tube Butt Weld			
DV□□-TB16-RFR8-DC-	1" x 0.065" Tube Butt Weld	1/2" Rotatable Male FR Fitting			

Fittings  
 Valves  
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 Filters  
 Tubing  
 Integrated Systems  
 Other Products  
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Ordering Number Description

Fittings

Valves

Regulators

Filters

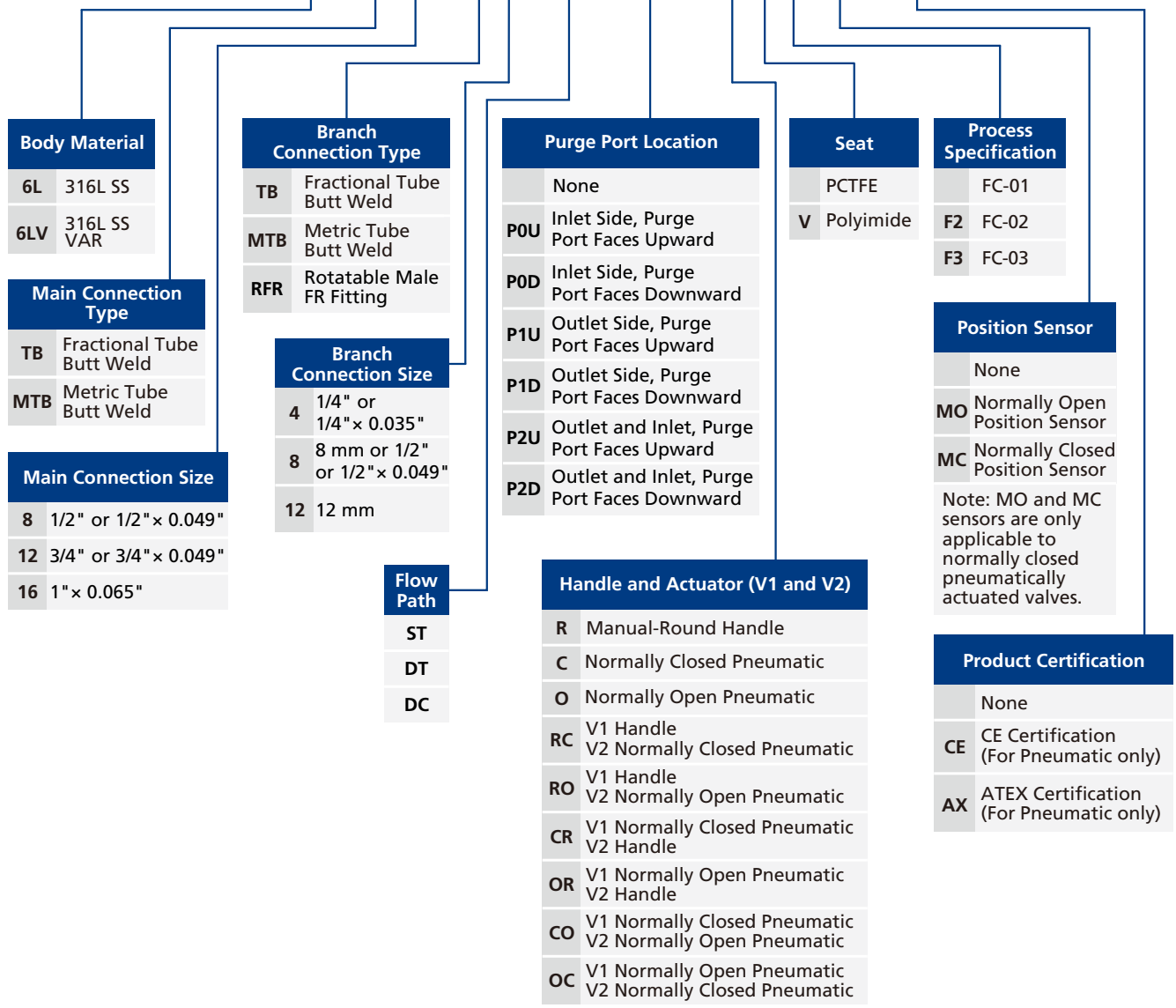
Tubing

Integrated Systems

Other Products

Technical Information

DV6L - TB12 - TB8 - DC - P2U - COVF2MO - CE



- Notes:
- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available; Should you have any questions, please contact FITOK Group or our authorized distributors.
  - For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.
  - The orientation of the purge port follows the dimension diagrams, all viewed from the top perspective.

# Low Pressure/Ultra High Flow Diaphragm Valves

## DL Series

### Introduction

DL Series Low Pressure/Ultra High Flow Diaphragm Valves are suitable for high purity and ultra high purity applications. Featuring a springless design, these valves are available with a cast body or a stainless steel bar stock body, and offer optional purge ports.



### Features

- ⦿ Ideal for ultra high flow applications
- ⦿ No internally wetted threads or springs which minimizes particle generation and particle entrapment for high purity.
- ⦿ PCTFE stem tip insert for leak-tight shutoff

### 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)
Working Pressure		Vacuum to 300 psig (20.7 bar)
Pneumatic Actuator Operating Pressure		80 to 95 psig (5.5 to 6.5 bar)
Working Temperature		PCTFE: -10 ~ 150 °F (-23 ~ 65 °C) Polyimide: -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 psig (bar)	Air (l/min)	Water (l/min)
10(0.68)	3900	150
50(3.4)	11000	340
100(6.8)	19500	490

### Process Specification

Item	Process Specification	Standard Cleaning and Packaging Process (FC-01) Special Cleaning and Packaging Process (FC-02)	Ultra High Purity Process (FC-03)
	Material		316L SS, CF3M
Wetted Surface Roughness		Ra 20 μin. (0.5 μm)	Ra 5 μin. (0.13 μm) (Bar Stock) Ra 10 μin. (0.25 μm) (Casting)
Polishing Process		Machine finished	Electropolished

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

Fittings

Valves

Regulators

Filters

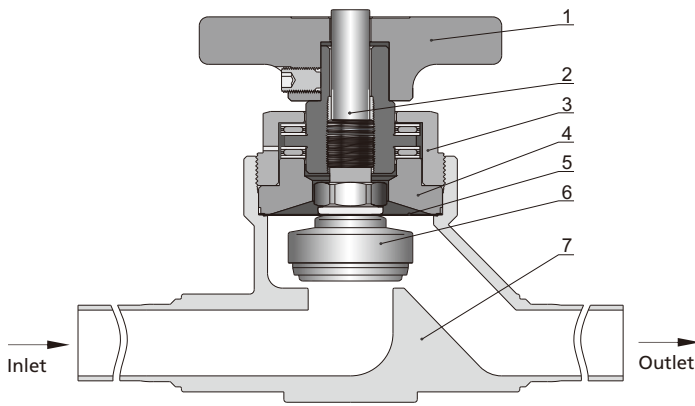
Tubing

Integrated Systems

Other Products

Technical Information

## Major Materials of Construction

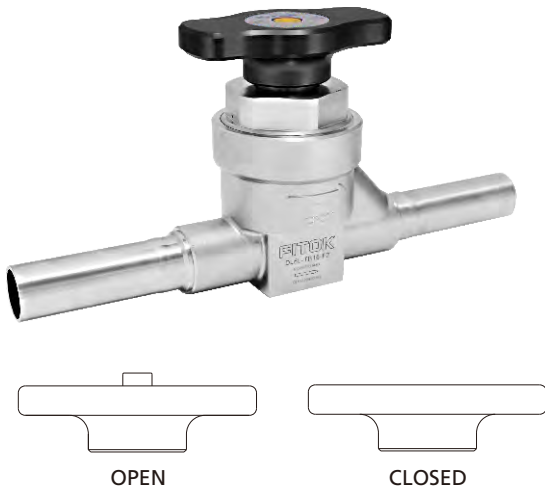


Item	Component	Material/Specification
1	Handle	Aluminum
2	Upper Stem	316 SS/ASTM A479
3	Bonnet Nut	316 SS/ASTM A479
4	Bonnet	316 SS/ASTM A479
5	Diaphragm (3)	Cobalt Alloy/AMS 5876
6	Stem Subassembly	316L SS and PCTFE/ASTM D1430 or Polyimide
7	Body	316L SS or CF3M

## Handles and Actuators

### Handle

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



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



### Position Sensors

Transmit a signal to an electrical device indicating the open and closed position of pneumatically actuated valves

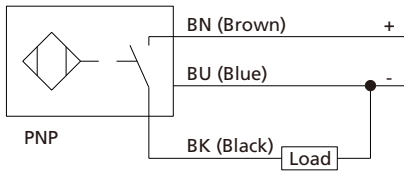
### Technical Information

Output	3-wire V (dc), PNP
Output Function	Normally open or normally closed
Voltage	10 ~ 30 V (dc)
Working Temperature	-13 ~ 158 °F (-25 ~ 70 °C)

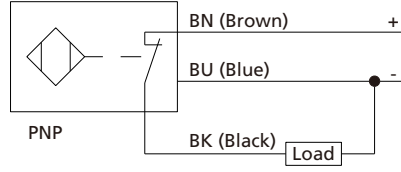
Fittings  
 Valves  
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**Wiring Diagram**

Normally open position sensors



Normally closed position sensors



Notes: For normally closed pneumatically actuated valves, when fitted with normally open sensors, the sensors transmit signals with indicators illuminated when the valves are open. Conversely, when fitted with normally closed sensors, the sensors transmit signals with indicators illuminated when the valves are closed.

**Explosion-proof Position Sensors**

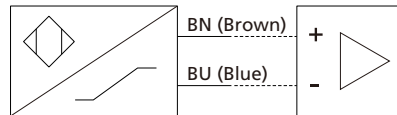
Transmit a signal to an electrical device, indicating the open and closed positions of pneumatically actuated valves.

Equipment Group II under ATEX Certification. The output complies with DIN EN 6094 7-5-6 (NAMUR) and the sensor should be used with an isolation amplifier.

**Technical Information**

<b>Output</b>	2 Wires DC
<b>Voltage</b>	8.2 V (dc)
<b>Working Temperatre</b>	-13 ~ 158 °F (-25 ~ 70 °C)

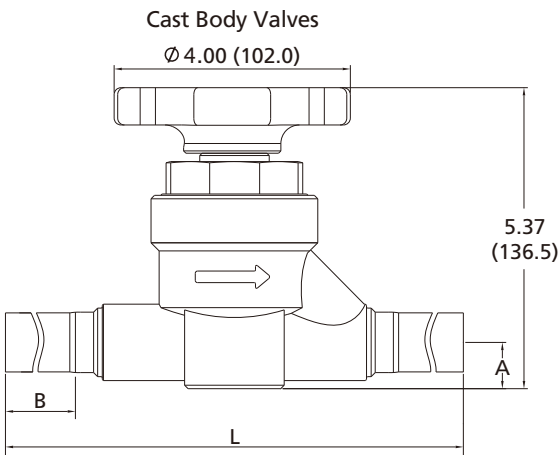
**Wiring Diagram**



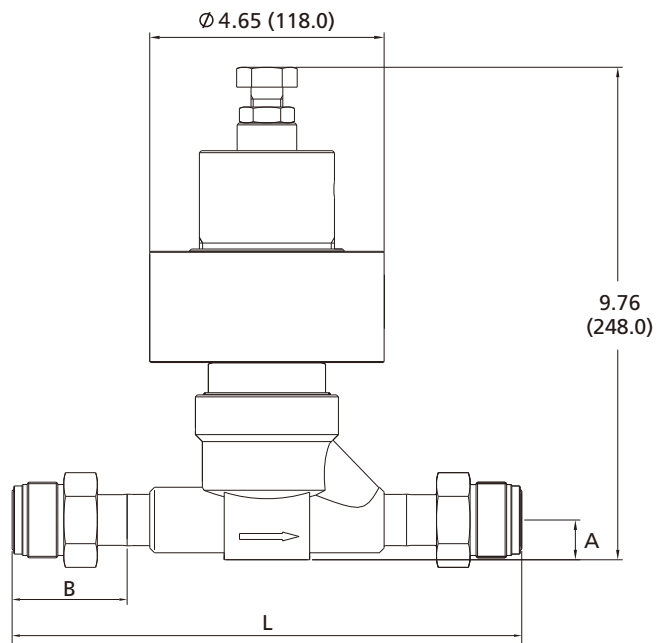
**Dimensions**

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

**Manual - Round Handle**



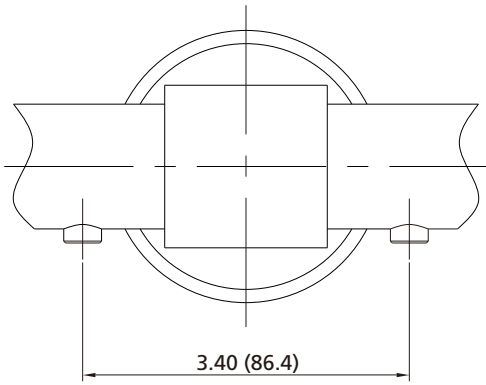
**Pneumatic**



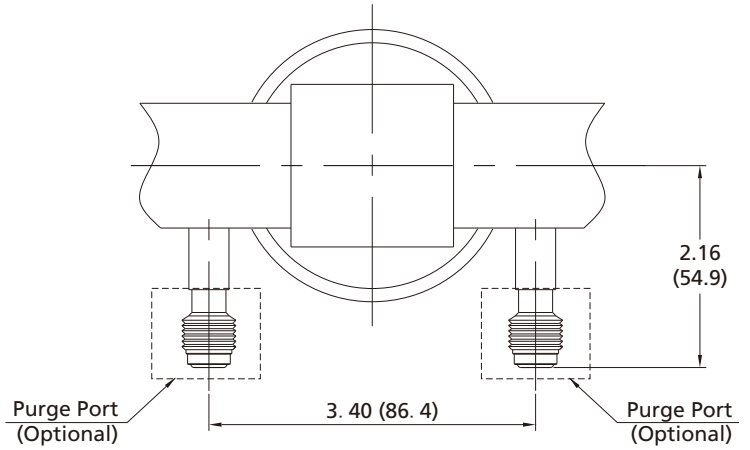
# V-95 Diaphragm Valves

- Fittings
- Valves
- Regulators
- Filters
- Tubing
- Integrated Systems
- Other Products
- Technical Information

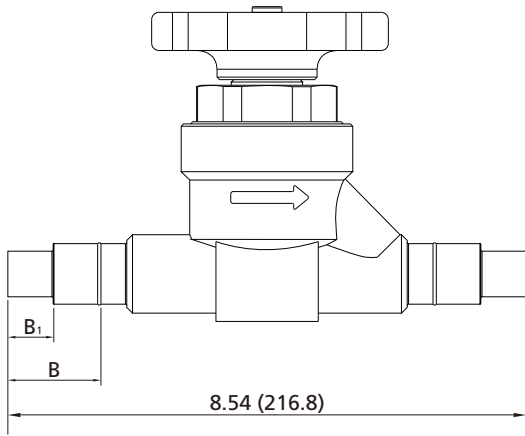
No Purge Ports



1/4" Integral Male FR Fitting

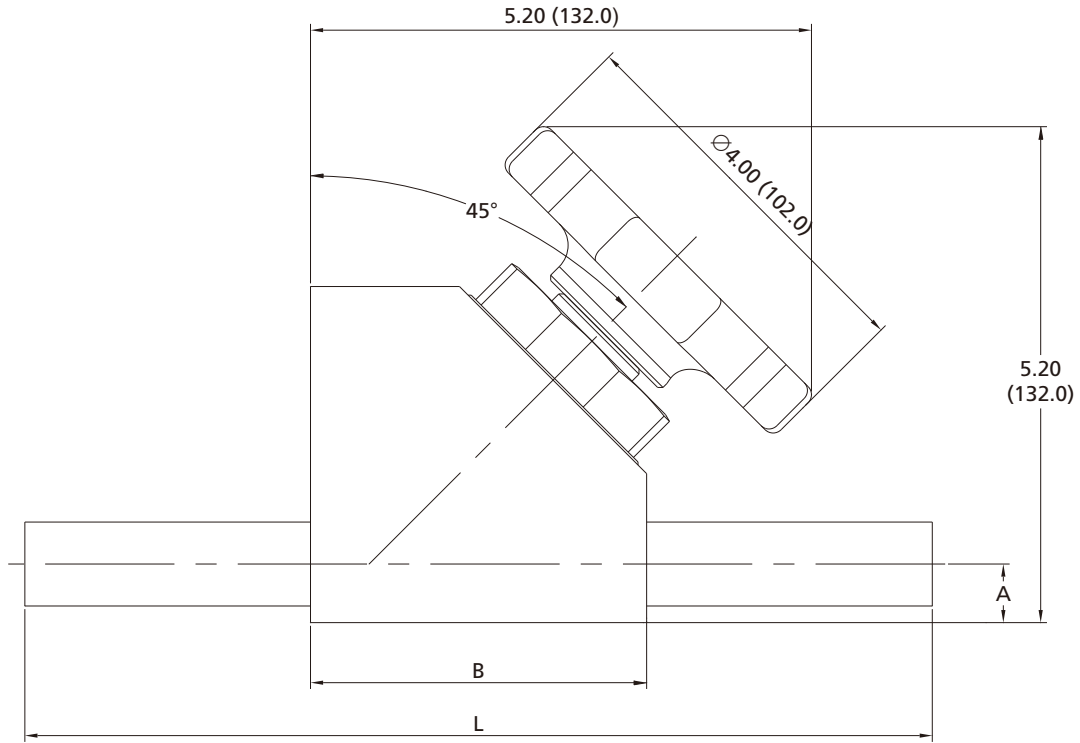


Outline Diagram of TB12 Reducing Port

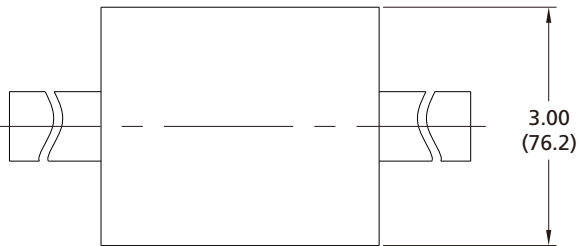


Basic Ordering Number	End Connections		Dimensions, in. (mm)			
	Type	Size	A	B	B <sub>1</sub>	L
DL6L-FL12-	FITOK Tube Fitting	3/4"	0.79 (20.0)	1.62 (41.2)	-	8.27 (210.0)
DL6L-FL16-		1"		1.98 (50.4)		9.45 (240)
DL6L-ML25-		25 mm		1.55 (39.3)		8.63 (219.0)
DL6L-TB12-	Fractional Tube Butt Weld	3/4" × 0.049" (Reducing Port)		1.53 (38.8)	0.75 (19.1)	8.54 (216.8)
DL6L-TB16-		1" × 0.065"		2.71 (68.9)	-	10.90 (277.0)
DL6L-MTB23-	Metric Tube Butt Weld	23 × 1.5 mm				
DL6L-MTB25-		25 × 1.5 mm				
DL6L-FR16-	Integral Male FR Fitting	1"	2.28 (57.9)	-	10.04 (255.0)	

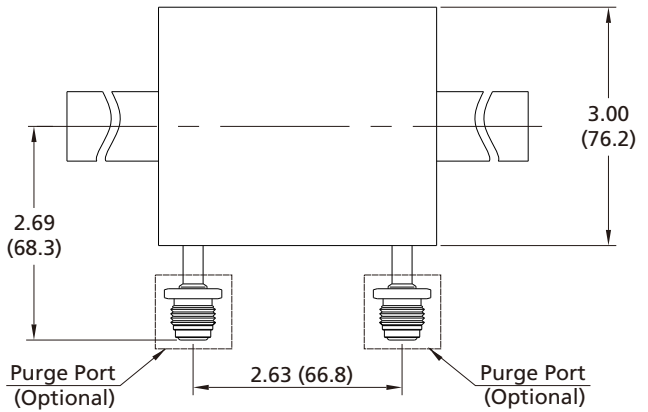
Bar Stock Valves



No purge ports

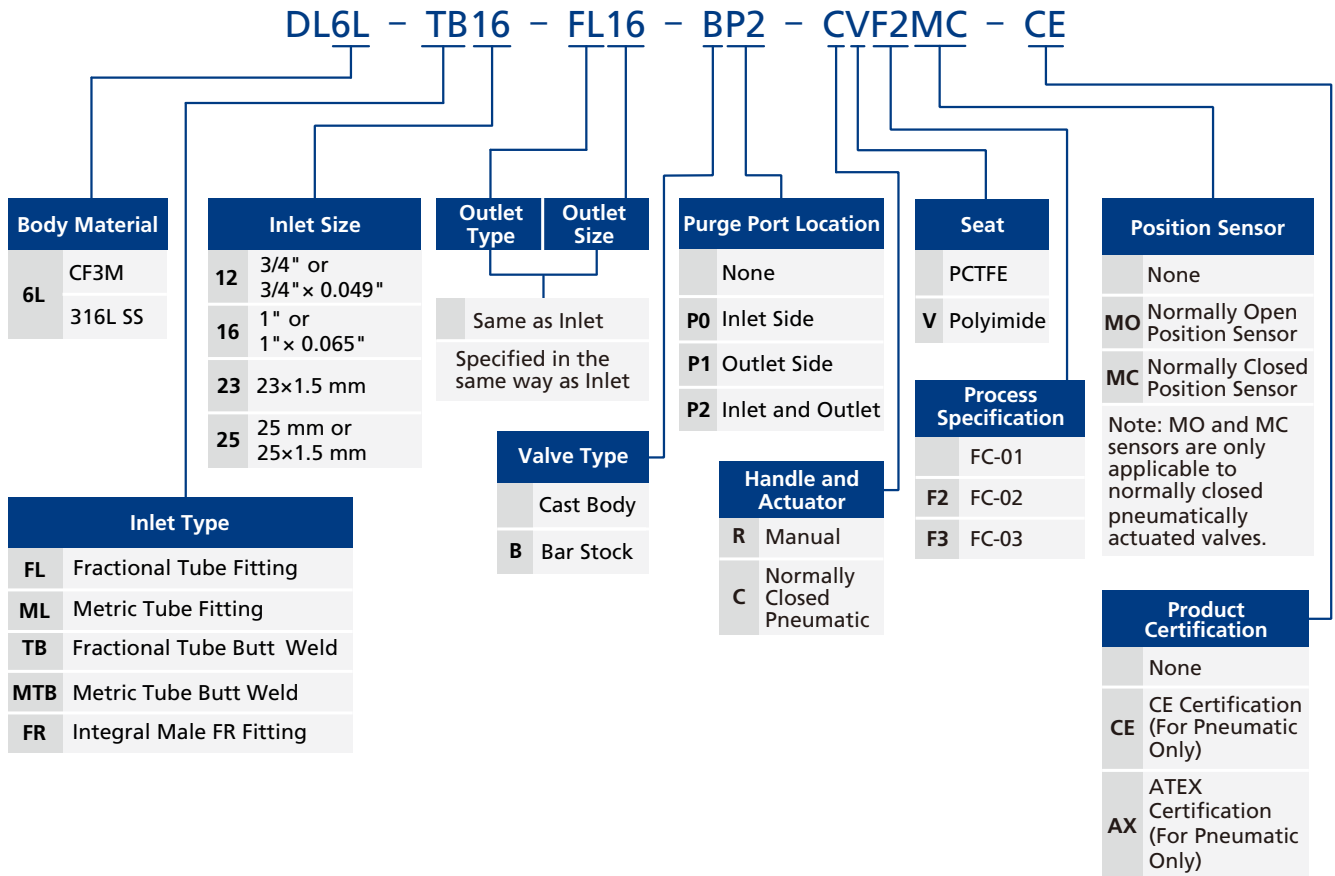


1/4" Rotatable Male FR Fitting



Basic Ordering Number	End Connections		Dimensions, in. (mm)		
	Type	Size	A	B	L
DL6L-TB12-B-	Fractional Tube Butt Weld	3/4" x 0.049"	0.61 (15.5)	3.50 (88.9)	9.46 (240.0)
DL6L-TB16-B-		1" x 0.065"			

## Ordering Number Description



**Notes:**

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available; Should you have any questions, please contact FITOK Group or our authorized distributors.
- For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

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# High Pressure/High Flow Diaphragm Valves

## DF Series

### Features

DF Series High Pressure/High Flow Diaphragm Valves are suitable for high purity and ultra high purity applications. Featuring an easily replaceable seat, these valves are ideal for high pressure and high flow applications.

### Features

- ⊙ Ideal for high flow applications
- ⊙ Metal-to-metal seal
- ⊙ Spring type design
- ⊙ Cobalt alloy diaphragm with high strength and corrosion resistance to ensure long cycle life
- ⊙ Normally closed or normally open position sensors optional for pneumatically actuated valves

### 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)
Working Pressure	Handle	Vacuum to 3500 psig (241 bar)
	Pneumatic	Vacuum to 3000 psig (207 bar)
Max. Differential Back Pressure <sup>①</sup>		150 psig (10.3 bar)
Pneumatic Actuator Operating Pressure		75 to 105 psig (5.2 to 7.2 bar)
Working Temperature		PCTFE: -10 ~ 150 °F (-23 ~ 65 °C) Polyimide: -10 ~ 250 °F (-23 ~ 121 °C)
Leak Rate (Helium)	Internal	$\leq 4 \times 10^{-9}$ std.-cm <sup>3</sup> /s
	External	$\leq 4 \times 10^{-9}$ 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. 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.

### Process Specification

Item	Process Specification	
	Standard Cleaning and Packaging Process (FC-01) Special Cleaning and Packaging Process (FC-02)	Ultra High Purity Process (FC-03)
Material	316L SS	
Wetted Surface Roughness	Ra 20 μin. (0.5 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.

### Flow Data

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

Pressure Drop to Atmosphere psig (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



Fittings

Valves

Regulators

Filters

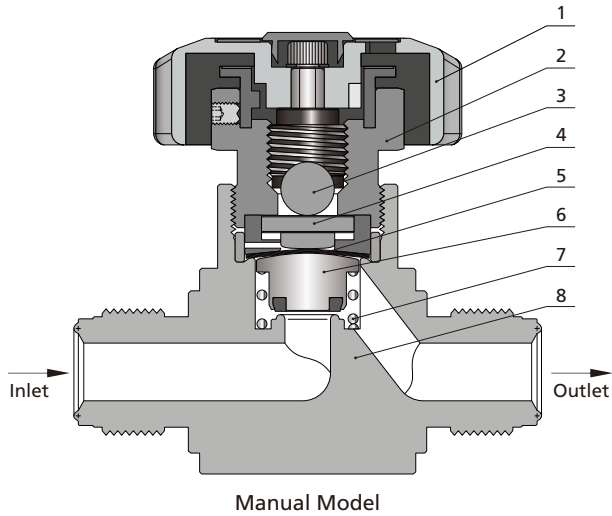
Tubing

Integrated Systems

Other Products

Technical Information

## Major Materials of Construction



Item	Component	Material/Specification
1	Handle	Aluminum
2	Bonnet Nut	S17400/ASTM A564
3	Ball	400C/A276
4	Button	316 SS/ASTM A479
5	Diaphragm (5)	Cobalt Alloy/AMS 5876
6	Seat Subassembly	316L SS and PCTFE/ASTM D1430 or Polyimide
7	Spring	316 SS/ASTM A313
8	Body	316L SS

## Handles and 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



### Position Sensors

Transmit a signal to an electrical device indicating the open and closed position of pneumatically actuated valves

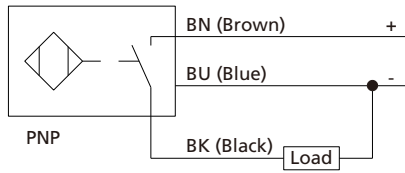
#### Technical Information

Output	3-wire V (dc), PNP
Output Function	Normally open or normally closed
Voltage	10 ~ 30 V (dc)
Working Temperature	-13 ~ 158 °F (-25 ~ 70 °C)

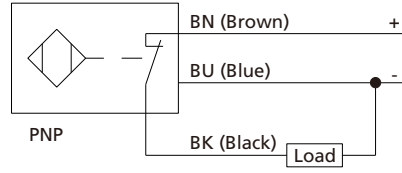
Fittings  
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**Wiring Diagram**

**Normally open position sensors**



**Normally closed position sensors**



**Notes:**

1. For normally closed pneumatically actuated valves, when fitted with normally open sensors, the sensors transmit signals with indicators illuminated when the valves are open. Conversely, when fitted with normally closed sensors, the sensors transmit signals with indicators illuminated when the valves are closed.
2. For normally open pneumatically actuated valves, when fitted with normally open sensors, the sensors transmit signals with indicators illuminated when the valves are closed. Conversely, when fitted with normally closed sensors, the sensors transmit signals with indicators illuminated when the valves are open.

**Explosion-proof Position Sensors**

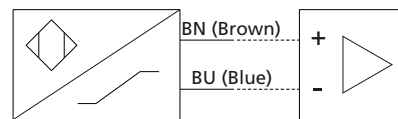
Transmit a signal to an electrical device, indicating the open and closed positions of pneumatically actuated valves.

Equipment Group II under ATEX Certification. The output complies with DIN EN 6094 7-5-6 (NAMUR) and the sensor should be used with an isolation amplifier.

**Technical Information**

<b>Output</b>	2 Wires DC
<b>Voltage</b>	8.2 V (dc)
<b>Working Temperatre</b>	-13 ~ 158 °F (-25 ~ 70 °C)

**Wiring Diagram**



Fittings

Valves

Regulators

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Integrated Systems

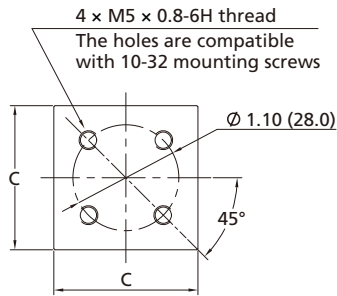
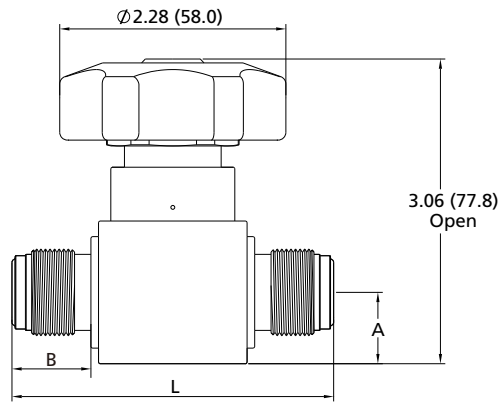
Other Products

Technical Information

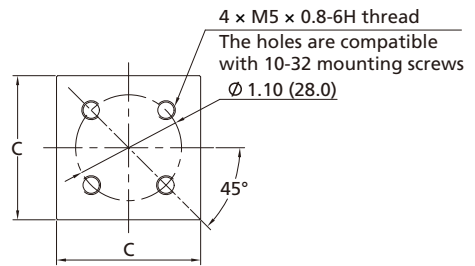
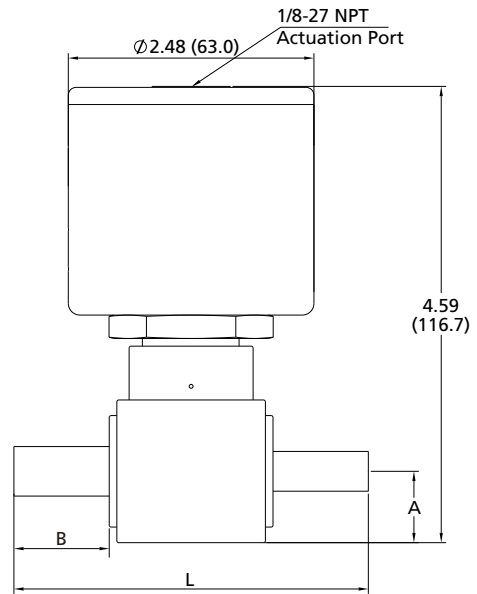
## Dimensions

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

**Manual - Round Handle**

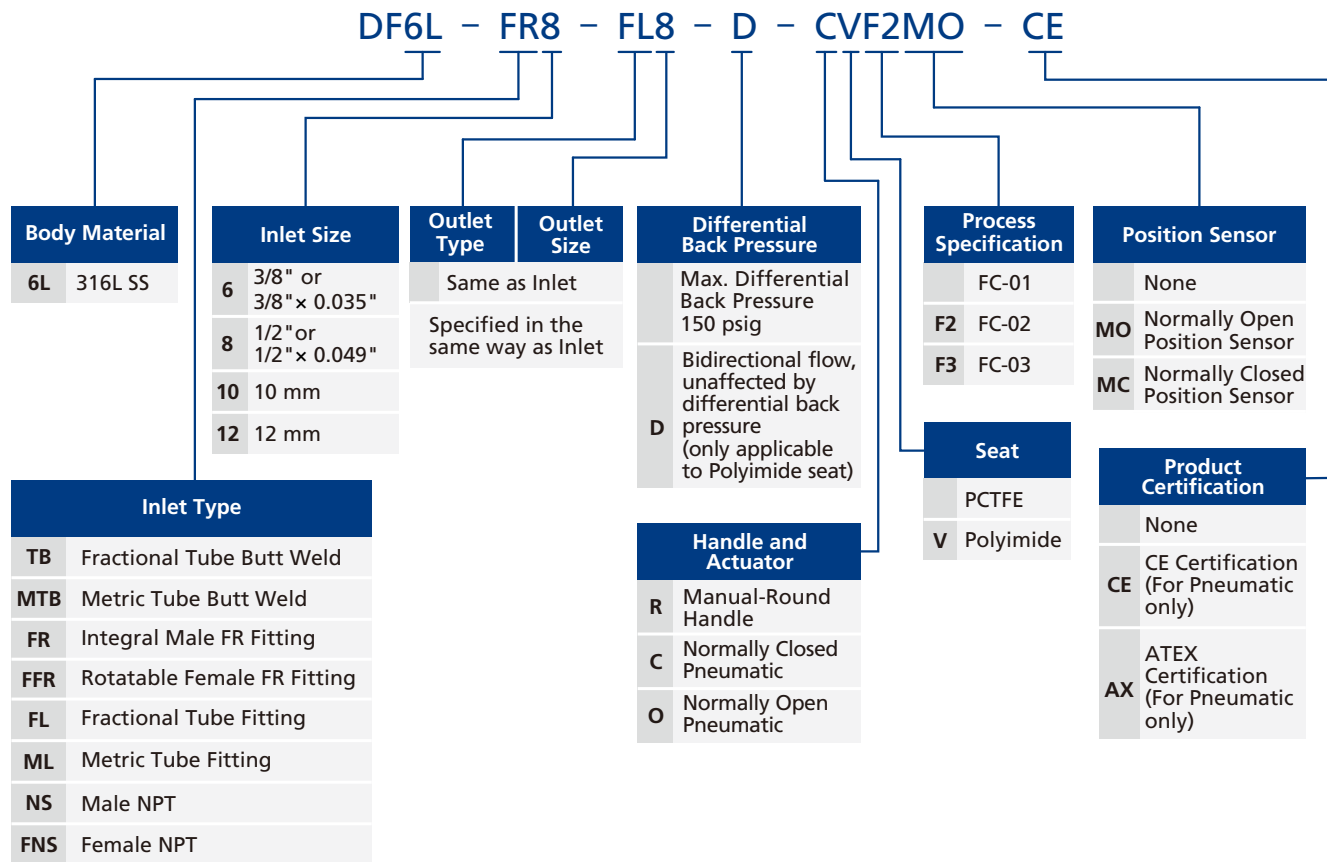


**Pneumatic**



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)			
		A	B	C	L
DF6L-TB6-	3/8" x 0.035" Tube Butt Weld	0.71 (18.0)	0.96 (24.5)	1.50 (38.1)	3.58 (90.9)
DF6L-TB8-	1/2" x 0.049" Tube Butt Weld		0.80 (20.3)		3.25 (82.5)
DF6L-FR8-	1/2" Integral Male FR Fitting		1.12 (28.4)		3.89 (98.8)
DF6L-FFR8-	1/2" Rotatable Female FR Fitting		0.76 (19.3)		3.27 (83.0)
DF6L-FL6-	3/8" FITOK Tube Fitting		0.86 (21.9)		3.47 (88.2)
DF6L-FL8-	1/2" FITOK Tube Fitting		0.91 (23.0)		3.30 (84.0)
DF6L-FNS8-	1/2" Female NPT				

## Ordering Number Description



**Notes:**

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available; Should you have any questions, please contact FITOK Group or our authorized distributors.
- For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.
- To order unaffected by differential back pressure options, add "-D" to the part number. Pneumatic actuated valve with "-D" in the part number has an air source pressure 75~105 psig (5.2~7.5 bar) and an actuator outside diameter of 66.2 mm.

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# Economic Diaphragm Valves

## DE Series

### Introduction

DE series economic diaphragm valves are typical products for ultra high purity gas fluid systems. While maintaining the same basic performance by using the same materials, cleaning and packaging processes as the other series of FITOK diaphragm valves. FITOK's advanced manufacturing processes and stringent quality control ensure the products meet the application needs of ultra high purity gas fluid systems for the semiconductor industry.



### Features

- ⦿ Minimal particle generation and minimal dead space
- ⦿ Cobalt alloy diaphragm with high strength and corrosion resistance to ensure long cycle life
- ⦿ No springs or threads in wetted areas improves cleanliness

### Technical Data

Port Size	1/4"	
Flow Coefficient (Cv)	0.27	
Orifice Size	0.16 in. (4.1 mm)	
Working Pressure	Vacuum to 150 psig (10.3 bar)	
Pneumatic Actuator Operating Pressure	60 ~ 90 psig (4.2 ~ 6.2 bar)	
Working Temperature	-10 ~ 176 °F (-23 ~ 80 °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)

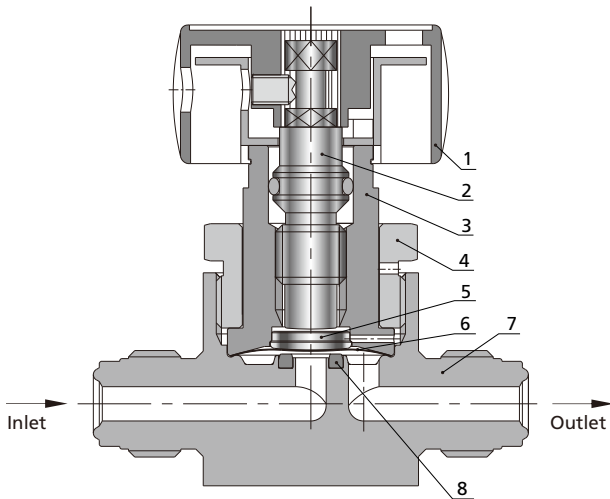
Water @ 60 °F (16 °C)

Pressure Drop to Atmosphere psig (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

Item	Process Specification	Ultra High Purity Process (FC-03)
Material		316L SS
Wetted Surface Roughness		Ra 5 μin. (0.13 μm)
Polishing Process		Electropolished
Cleaning		Ultra high purity cleaning in continuously monitored ultrasonic cleaning system with deionized water
Assembly Environment		ISO Class 4 (FS 209E Class 10 equivalent) cleanroom
Packaging		Double bagged in cleanroom

## Major Materials of Construction



Item	Component	Material / Specification
1	Handle	Aluminum
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	Cobalt Alloy/AMS 5876
7	Body	316L SS
8	Seat	PCTFE/ASTM D1430

## Handles and Actuators

### Manual - Round Handle

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



### Normally Closed Pneumatic

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



Fittings

Valves

Regulators

Filters

Tubing

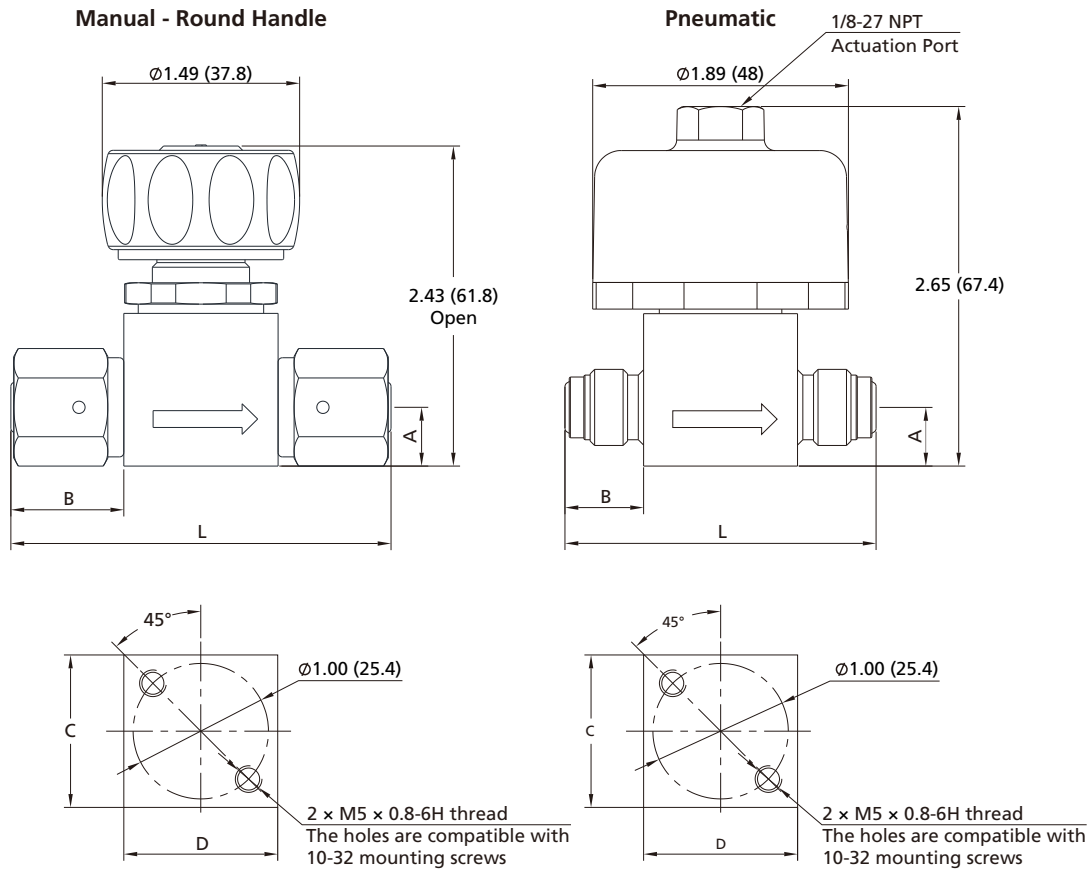
Integrated Systems

Other Products

Technical Information

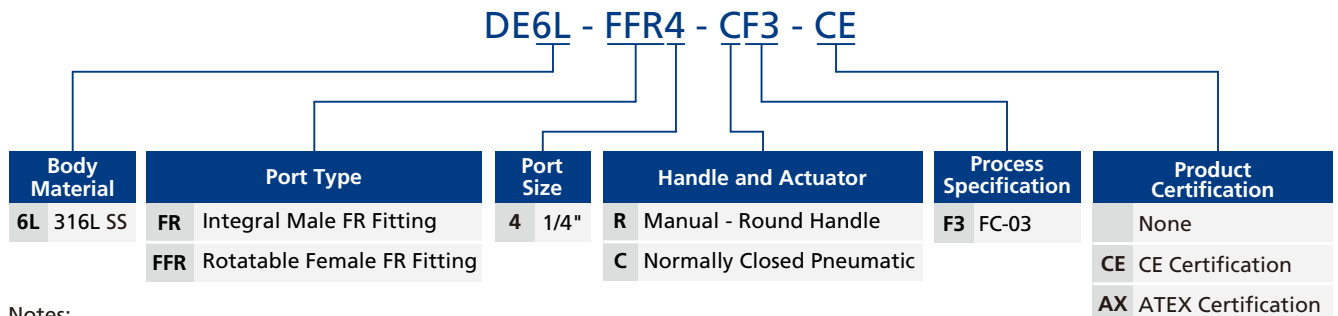
## Dimensions and Ordering Information

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



Ordering Number	Connection Type and Size	Dimensions, in. (mm)				
		A	B	C	D	L
DE6L-FFR4-RF3	1/4" Rotatable Female FR Fitting	0.43 (11)	0.82 (20.9)	1.13 (28.6)	1.14 (28.9)	2.78 (70.6)
DE6L-FFR4-CF3			0.58 (14.7)			
DE6L-FR4-RF3	1/4" Integral Male FR Fitting	0.43 (11)	0.82 (20.9)	1.13 (28.6)	1.14 (28.9)	2.30 (58.4)
DE6L-FR4-CF3			0.58 (14.7)			

## Part Number Description



**Notes:**

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available; Should you have any questions, please contact FITOK or our authorized distributors.
- For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

# High Temperature Diaphragm Valves

## DK Series

### Introduction

DK series diaphragm valves are designed and manufactured to Ultra-High Purity (UHP) standards, ensuring the complete absence of non-metallic materials, such as resins, in gas wetted areas. These valves represent the pinnacle of metal diaphragm valve technology and can operate at temperatures up to 250°C. This makes them ideal for applications such as Metal-Organic Chemical Vapor Deposition (MOCVD) systems and corrosive media delivery systems.

### Features

- ⦿ Thermal immersion design for use in high temperature up to 482 °F (250 °C)
- ⦿ Metal seat to provide excellent resistance to swelling and contamination
- ⦿ Cobalt alloy diaphragm with high strength and corrosion resistance to ensure long cycle life
- ⦿ All-Metal wetted parts with broad chemical compatibility
- ⦿ Minimal particle generation and minimal dead space, easy to purge

### 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)	
Working Pressure	Vacuum to 145 psig (10 bar)	
Pneumatic Actuator Operating Pressure	72 ~ 101 psig (5 ~ 7 bar)	
Working Temperature	Body	14 ~ 482 °F (-10 ~ 250 °C)
	Actuator	14 ~ 482 °F (-10 ~ 250 °C)
Leak Rate (helium)	Internal	$\leq 3 \times 10^{-9}$ std·cm <sup>3</sup> /s
	External	$\leq 3 \times 10^{-9}$ std·cm <sup>3</sup> /s

### Flow Data

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

Pressure Drop to Atmosphere psig (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

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

Notes: Refer to page P-01 for a detailed description of Process Specification.

① Wetted surface roughness of valves with FR Series metal gasket face seal connections and tube butt weld connections.



Fittings

Valves

Regulators

Filters

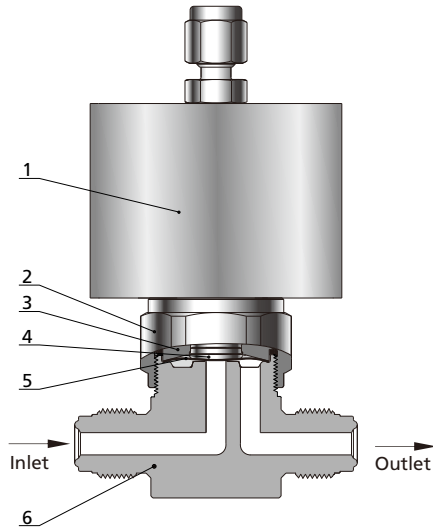
Tubing

Integrated Systems

Other Products

Technical Information

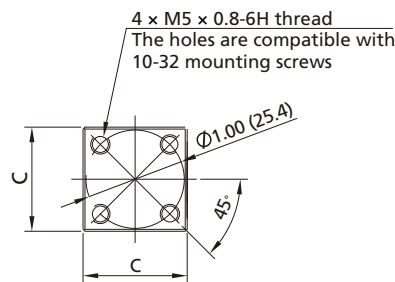
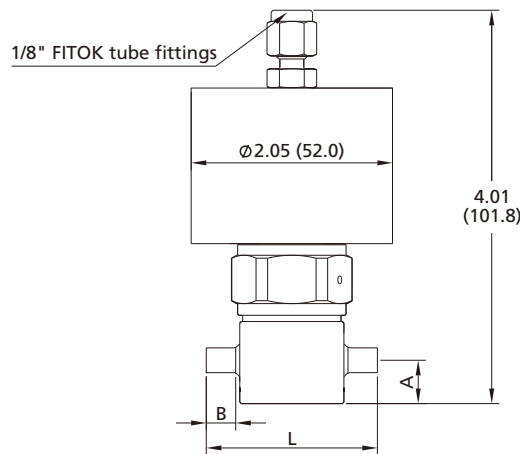
## Major Materials of Construction



Item	Component	Material/Specification
1	Actuator	316 SS/ASTM A479
2	Bonnet Nut	316 SS/ASTM A479
3	Bonnet	S17400/ASTM A564
4	Button	316 SS/ASTM A479
5	Diaphragm (2)	Cobalt Alloy/AMS 5876
6	Body	316L SS or 316L SS VAR

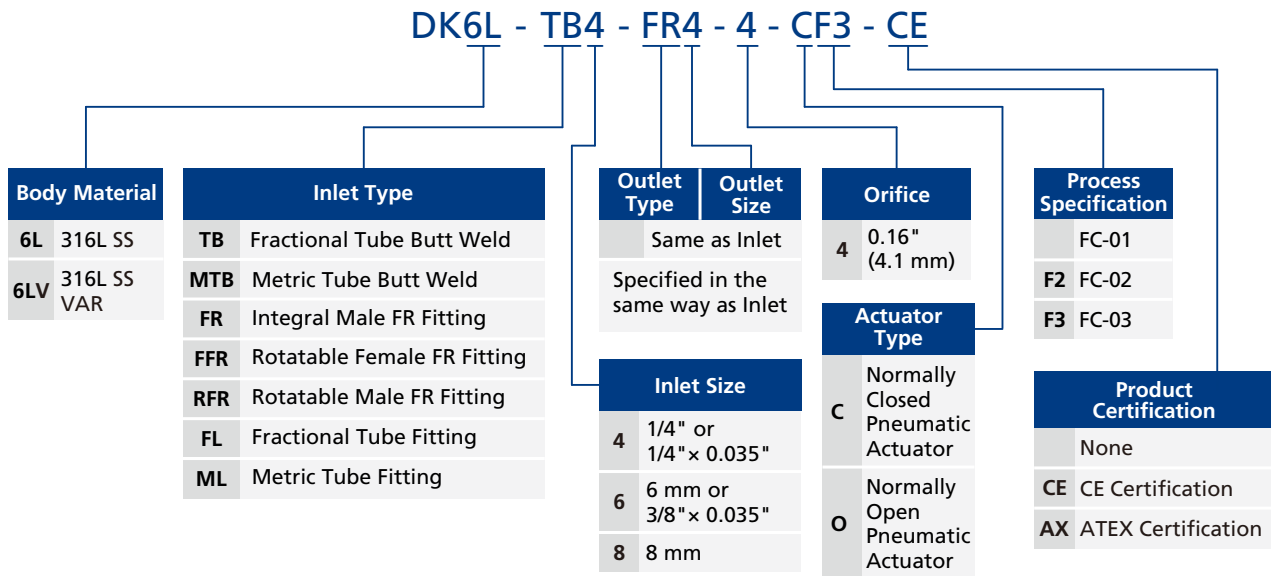
## Dimensions and Ordering Information

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



Basic Ordering Number	Connection Type and Size	Dimensions, in. (mm)			
		A	B	C	L
DK□□-TB4-4-	1/4" x 0.035" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.06 (26.9)	1.74 (44.2)
DK□□-TB6-4-	3/8" x 0.035" Tube Butt Weld		0.26 (6.6)		2.78 (70.6)
DK□□-FFR4-4-	1/4" Rotatable Female FR Fitting		0.86 (21.8)		2.30 (58.4)
DK□□-RFR4-4-	1/4" Rotatable Male FR Fitting		0.62 (15.7)		2.30 (58.4)
DK□□-FR4-4-	1/4" Integral Male FR Fitting				

## Ordering Number Description



**Notes:**

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available; Should you have any questions, please contact FITOK or our authorized distributors.
- For the -CE or AX options, the valve conforms to ATEX certification, with "CE" marking and explosion protection "EX" marking. For position sensor selections, the -CE option includes a 3-wire position sensor compliant with CE certification, while the -AX option includes a 2-wire explosion-proof position sensor compliant with ATEX certification. The 2-wire explosion-proof position sensor requires use with an isolating switch amplifier.

- Fittings
- Valves
- Regulators
- Filters
- Tubing
- Integrated Systems
- Other Products
- Technical Information

# Surface Mount Diaphragm Valves

## DIM Series

### Introduction

DIM Series Diaphragm Valves feature SEMI-compliant surface-mounting. Utilizing either W-seal or C-seal metal seals between the valve and the substrate, these valves are suitable for installation in integrated gas systems (IGS).



### Features

- ⦿ Cobalt alloy diaphragm improves strength and corrosion resistance
- ⦿ W-seal and C-seal optional
- ⦿ No packing diaphragm seal ensures high purity
- ⦿ No dead space for easy purging
- ⦿ Pneumatic actuator optional

### Technical Data

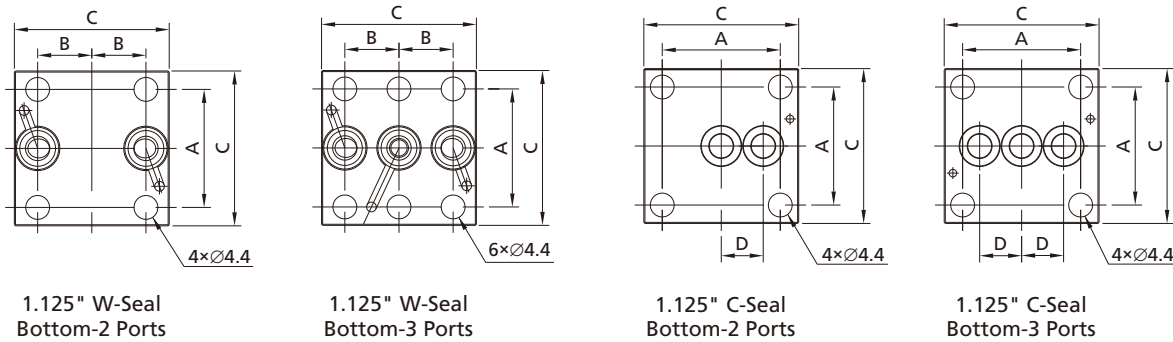
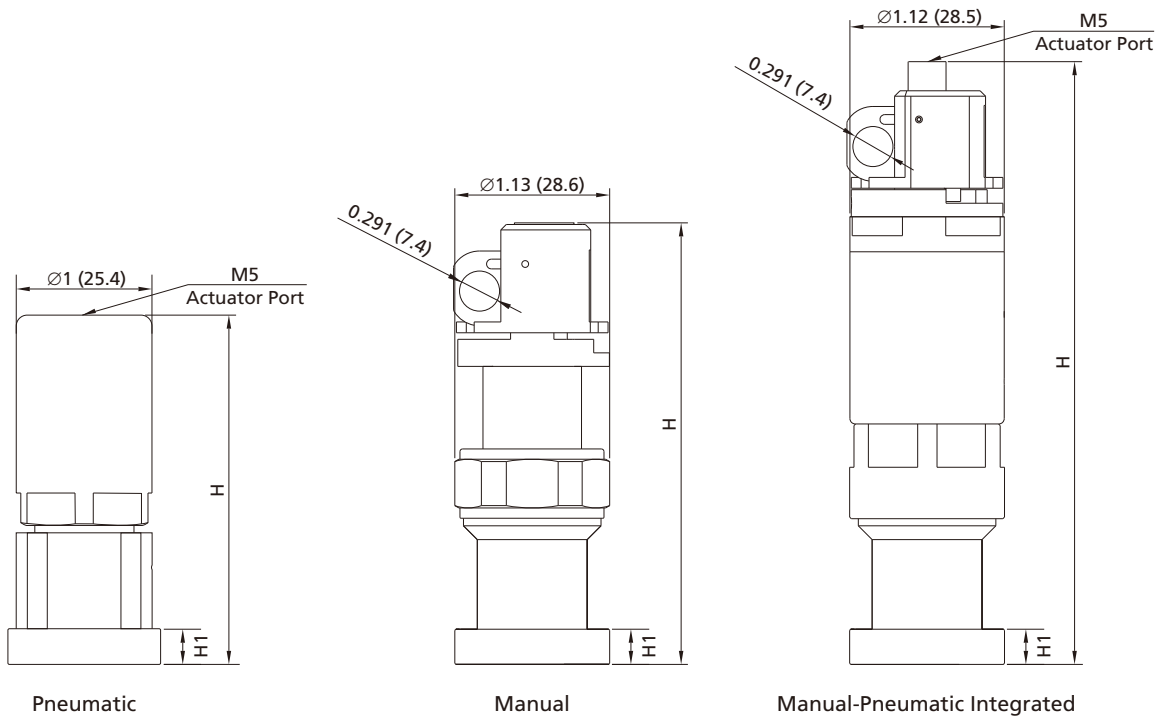
Working Pressure	Manual	Vacuum to 145 psig (10 bar)
	Pneumatic	
Working Temperature		PCTFE: 14~176°F (-10~80°C) PFA: 14~302°F (-10~150°C)
Flow Coefficient (Cv)		0.3
Pneumatic Actuator Working Pressure		60~90 psig (4.2~6.2 bar)
Leakage Rate (Helium)	Internal	$\leq 1 \times 10^{-9}$ std·cm <sup>3</sup> /s
	External	$\leq 1 \times 10^{-9}$ std·cm <sup>3</sup> /s

### Process Specification

Item	Process Specification
<b>Ultra High Purity Process (FC-03)</b>	
Material	316L SS, 316L SS VAR
Wetted Surface Roughness	Ra 5 μin. (0.13 μm)
Polishing Process	Electropolished

## Dimensions and Ordering Information

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



Fittings

Valves

Regulators

Filters

Tubing

Integrated Systems

Other Products

Technical Information

V-111 Diaphragm Valves

	Basic Ordering Number	Port Type and Size	Dimensions, in. (mm)					
			A	B	C	D	H	H1
Fittings	DIM□□-WS11-CF3	1.125" W-Seal	0.86 (21.8)	0.39 (10.0)	1.13 (28.6)	—	2.89 (73.4)	0.26 (6.5)
	DIM□□-WS11-OF3						2.89 (73.4)	
DIM□□-WS11-UF3	3.21 (81.6)							
Valves	DIM□□-WS11-GF3						4.38 (111.3)	
	DIM□□-WS11-3P-CF3						2.89 (73.4)	
	DIM□□-WS11-3P-OF3						2.89 (73.4)	
	DIM□□-WS11-3P-UF3						3.21 (81.6)	
	DIM□□-WS11-3P-GF3						4.38 (111.3)	
	Regulators	DIM□□-CS11-CF3	1.125" C-Seal	0.86 (21.8)	—	1.13 (28.6)	0.31 (7.75)	2.57 (65.4)
DIM□□-CS11-OF3		2.57 (65.4)						
DIM□□-CS11-UF3		3.21 (81.6)						
DIM□□-CS11-GF3		4.38 (111.3)						
DIM□□-CS11-3P-CF3		2.57 (65.4)						
DIM□□-CS11-3P-OF3		2.57 (65.4)						
DIM□□-CS11-3P-UF3		3.21 (81.6)						
DIM□□-CS11-3P-GF3		4.38 (111.3)						
Filters								
Tubing								
Integrated Systems								
Other Products								
Technical Information								

