

Diaphragm Valves



Fittings

Valves

Regulators

Filters

Tubing

Integrated
SystemsOther
ProductsTechnical
Information

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Atomic Layer Deposition Diaphragm Valves

ALD Series

Introduction

Atomic Layer Deposition (ALD) is a technique that deposits materials in the form of one atomic layer at a time on the substrate surface. FITOK ALD Series Atomic Layer Deposition Diaphragm Valves are ideal for the ALD process, delivering precise doses of gas during semiconductor chip manufacturing. These valves ensure the uniform gas deposition required for advanced technology.

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 and thermal types optional, the thermal type has a working temperature up to 392 °F (200 °C)
- ⦿ For the valve fitted with a solenoid valve, the solenoid valve is circularly rotatable along the actuator for easy position adjustment

Technical Data

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

① The shown Cv is at normal temperature and is adjustable before shipment.
Cv may fluctuate due to temperature variations. For more details, please contact FITOK.



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Flow Data

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

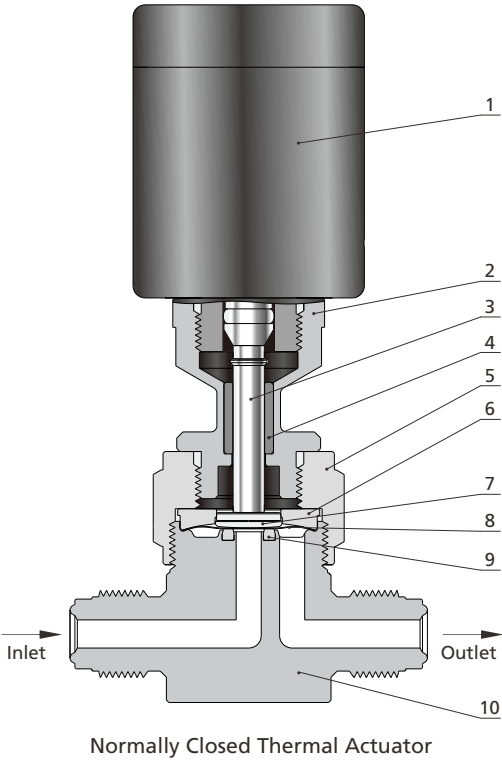
Orifice Size in. (mm)	Pressure Drop to Atmosphere psig (bar)	Air (l/min)	Water (l/min)
0.16 (4.1)	10 (0.68)	86	3.2
	50 (3.4)	230	7.2
	100 (6.8)	410	10.2
0.23 (5.9)	10 (0.68)	199	7.4
	50 (3.4)	530	16.6
	100 (6.8)	945	23.6

Process Specification

Process Specification	
Item	Ultra High Purity Process (FC-03)
Material	316L SS, 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 Class 4 (FS 209E Class 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

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Other Products

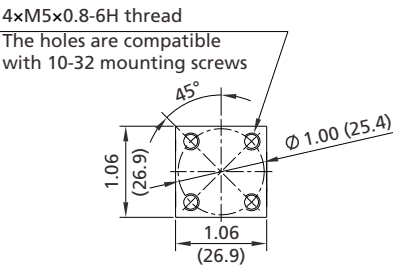
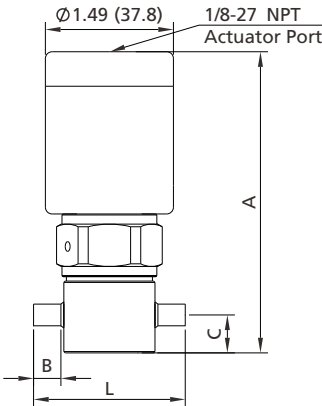
Technical Information

Dimensions and Ordering Information

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

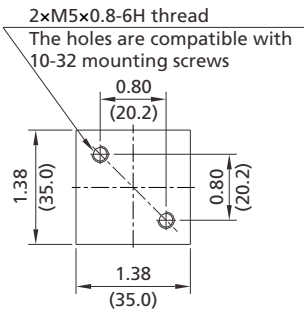
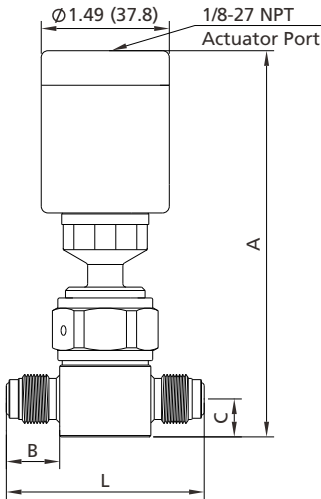
2-Port Valves

Standard Model



Orifice 0.16 in. (4.1 mm) Bottom

Thermal Model



Orifice 0.23 in. (5.9 mm) Bottom

Orifice Size in. (mm)	Cv	Valve Type	Basic Ordering Number	Connection Type and Size	Dimensions, in. (mm)				
					A	B	C	L	
0.16 (4.1)	0.27	Standard	ALD□□-TB4-4-	1/4"×0.035" Tube Butt Weld	3.50 (88.9)	0.30 (7.6)	0.44 (11.2)	1.74 (44.2)	
			ALD□□-TB6-4-	3/8"×0.035" Tube Butt Weld		0.26 (6.6)			
			ALD□□-FFR4-4-	1/4" Rotatable Female FR Metal Gasket Face Seal Fitting		0.86 (21.8)		2.78 (70.6)	
			ALD□□-RFR4-4-	1/4" Rotatable Male FR Metal Gasket Face Seal Fitting					
			ALD□□-FR4-4-	1/4" Integral Male FR Metal Gasket Face Seal Fitting				2.30 (58.4)	
		Thermal	ALD□□-TB4-4-HT-	1/4"×0.035" Tube Butt Weld	4.50 (114.0)	0.30 (7.6)	0.44 (11.2)	1.74 (44.2)	
			ALD□□-TB6-4-HT-	3/8"×0.035" Tube Butt Weld		0.26 (6.6)			
			ALD□□-FFR4-4-HT-	1/4" Rotatable Female FR Metal Gasket Face Seal Fitting		0.86 (21.8)		2.78 (70.6)	
			ALD□□-RFR4-4-HT-	1/4" Rotatable Male FR Metal Gasket Face Seal Fitting					
			ALD□□-FR4-4-HT-	1/4" Integral Male FR Metal Gasket Face Seal Fitting				2.30 (58.4)	
0.23 (5.9)	0.62	Standard	ALD□□-TB6-6-	3/8"×0.035" Tube Butt Weld	3.66 (93)	0.67 (17.0)	0.50 (12.7)	2.72 (69.0)	
			ALD□□-TB8-6-	1/2"×0.049" Tube Butt Weld		0.94 (24.0)		3.27 (83.0)	
			ALD□□-FFR8-6-	1/2" Rotatable Female FR Metal Gasket Face Seal Fitting					
			ALD□□-RFR8-6-	1/2" Rotatable Male FR Metal Gasket Face Seal Fitting					
			ALD□□-FR8-6-	1/2" Integral Male FR Metal Gasket Face Seal Fitting		0.81 (20.6)		3.00 (76.2)	
		Thermal	ALD□□-TB6-6-HT-	3/8"×0.035" Tube Butt Weld	4.65 (118.1)	0.67 (17.0)	0.50 (12.7)	2.72 (69.0)	
			ALD□□-TB8-6-HT-	1/2"×0.049" Tube Butt Weld		0.94 (24.0)		3.27 (83.0)	
			ALD□□-FFR8-6-HT-	1/2" Rotatable Female FR Metal Gasket Face Seal Fitting					
			ALD□□-RFR8-6-HT-	1/2" Rotatable Male FR Metal Gasket Face Seal Fitting				4.06 (103.0)	
			ALD□□-FR8-6-HT-	1/2" Integral Male FR Metal Gasket Face Seal Fitting		0.81 (20.6)		3.00 (76.2)	

Fittings

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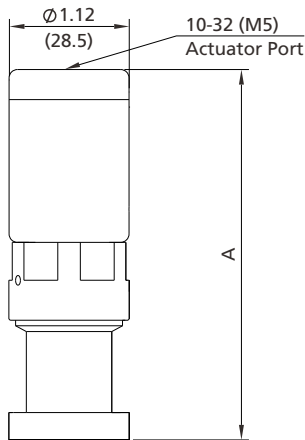
Integrated Systems

Other Products

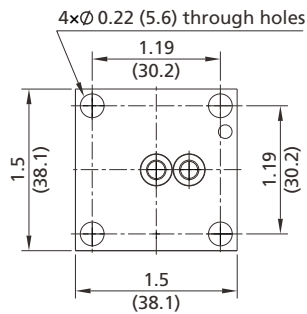
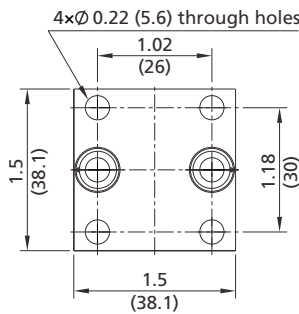
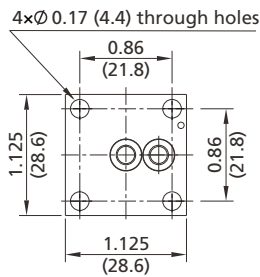
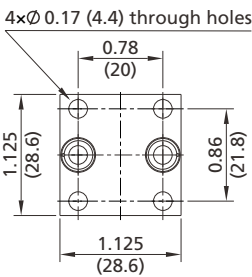
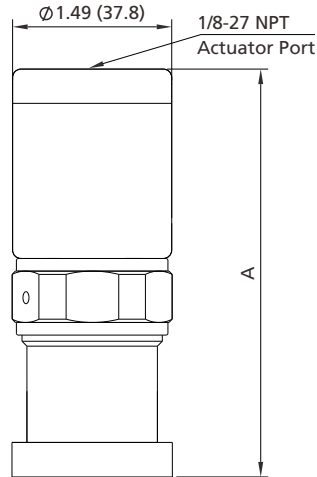
Technical Information

Modular Surface-Mount Valves

1.125" Surface-Mount



1.5" Surface-Mount



1.125" W-Seal Bottom

1.125" C-Seal Bottom

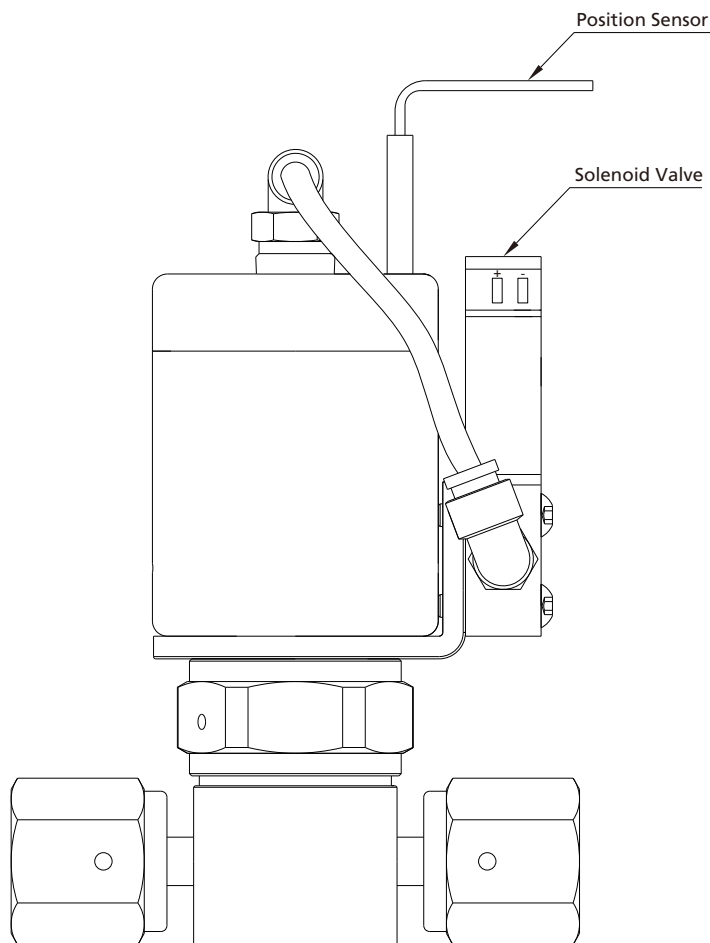
1.5" W-Seal Bottom

1.5" C-Seal Bottom

Orifice Size in. (mm)	Cv	Valve Type	Basic Ordering Number	Connection Type and Size	Dimension, in. (mm)
					A
0.16 (4.1)	0.27	Standard	ALD□□-WS11-4-	1.125" W-Seal	3.40 (86.4)
			ALD□□-CS11-4-	1.125" C-Seal	
			ALD□□-WS15-4-	1.5" W-Seal	3.70 (94.0)
			ALD□□-CS15-4-	1.5" C-Seal	
		Thermal	ALD□□-WS11-4-HT-	1.125" W-Seal	4.39 (111.5)
			ALD□□-CS11-4-HT-	1.125" C-Seal	
			ALD□□-WS15-4-HT-	1.5" W-Seal	4.69 (119.1)
			ALD□□-CS15-4-HT-	1.5" C-Seal	
0.23 (5.9)	0.62	Standard	ALD□□-CS15-HF-6-	1.5" C-Seal (High Flow)	3.81 (96.9)
		Thermal	ALD□□-CS15-HF-6-HT-	1.5" C-Seal (High Flow)	4.80 (122.0)

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

Output		3-wire V (dc), PNP
Output Function		Normally open or normally closed
Voltage		10 ~ 30 V (dc)
Operating Temperature		-13 ~ 158 °F (-25 ~ 70 °C)
Electrical Connection	Standard Sensor	Grey cable with a diameter of 3.3 mm and a length of 2 m
	Explosion-Proof Sensor	Blue cable with a diameter of 3.0 mm and a length of 2 m

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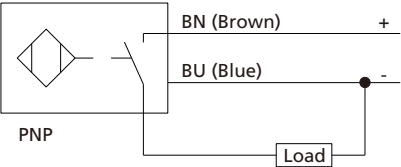
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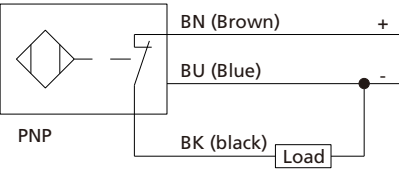
V-11 Diaphragm Valves

Wiring Diagram

Normally Open Position Sensor



Normally Closed Position Sensor



Note: 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.

Solenoid Valve Assemblies

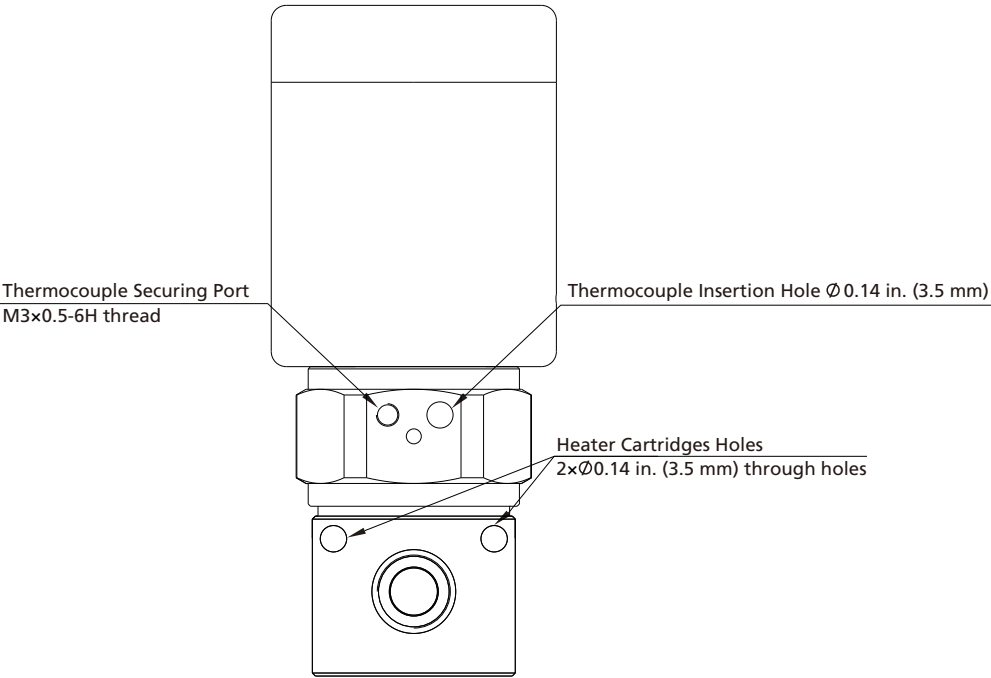
With fast-acting and high-flow features, the solenoid valve reduces overall response time. The solenoid valve assembly includes tubing, fittings, and a rotatable mounting bracket, offering flexibility for adjusting the solenoid valve position.

Technical Information

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

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.



Normally Closed Standard Actuator

Part Number Description

ALD6LV - FR4 - 4 - HT - 3P - CF3MOVBC

Body Material		Port Type		Port Size		Orifice Size		Actuator Type		Position Sensor	
6L	316L SS	TB	Fractional Tube Butt Weld	4	1/4" or 1/4"×0.035"	4	0.16" (4.1 mm)	C	Normally Closed		None
6LV	316L SS VAR		MTB	Metric Tube Butt Weld	6	6 mm or 3/8"×0.035"	6	0.23" (5.9 mm)	O	Normally Open	MO
		FR		Integral Male FR Metal Gasket Face Seal Fitting	8	8 mm or 1/2"×0.049"	Valve Type <td rowspan="3">MC</td> <td>Normally Closed Position Sensor</td>		MC	Normally Closed Position Sensor	
			FFR	Rotatable Female FR Metal Gasket Face Seal Fitting	10	10 mm		Standard			
				FFR	FR Metal Gasket Face Seal Fitting	12	12 mm	HT		Thermal	
		RFR	Rotatable Male FR Metal Gasket Face Seal Fitting	11	1.125"	Ports					
			WS	W-Seal	15	1.5"		2-Port			
		CS	C-Seal	15-HF	High Flow	3P	3-Port				
								Note: 3P applies only to valves with W/C sealed ports.			
Process Specification											
F3	FC-03										
Accessory											
		None									
V	Solenoid Valve Assembly										
Heater Cartridge Holes and Thermocouple Holes											
		None									
BC	Heater Cartridge Holes and Thermocouple Holes										

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)
Max. Working Pressure	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 ³ /s
	External $\leq 1 \times 10^{-9}$ std cm ³ /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

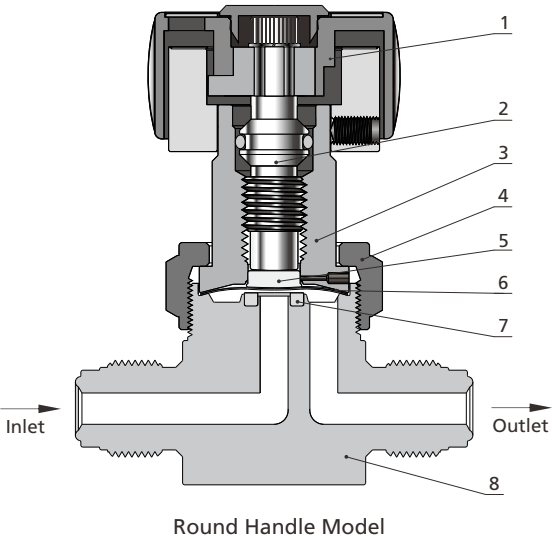
Process Specification

Item	Process Specification	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 10 μin. (0.25 μm)	Ra 5 μin. (0.13 μm) ^①	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.

Major Materials of Construction



Item	Component		Material/Specification
1	Handle	Round	ABS
		Integral Lockout	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 Handle

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



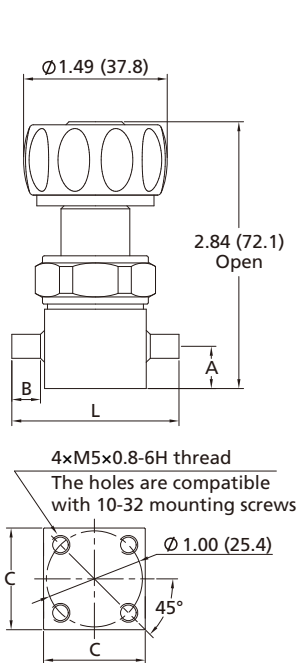
Dimensions and Ordering Information

Straight Type

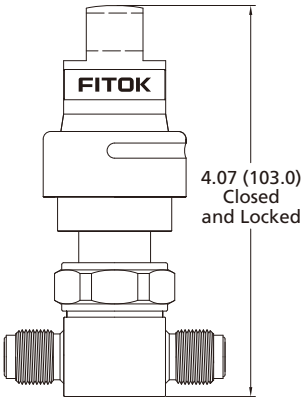
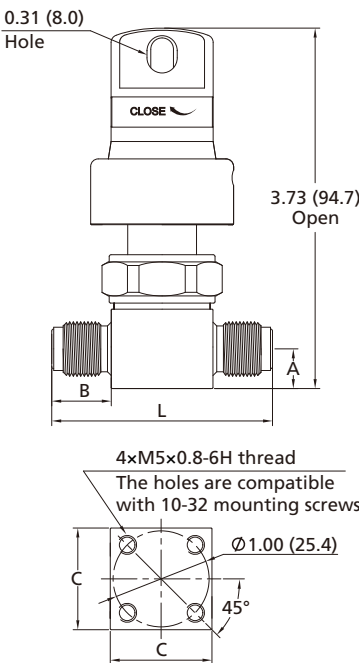
Dimensions

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

Round Handle



Integral Lockout 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	0.44 (11.2)	0.26 (6.6)	1.06 (26.9)	1.74 (44.2)
DQ□□-FFR4-	1/4" Rotatable Female FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	2.78 (70.6)
DQ□□-RFR4-	1/4" Rotatable Male FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	2.78 (70.6)
DQ□□-FR4-	1/4" Integral Male FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.62 (15.7)	1.06 (26.9)	2.30 (58.4)

Ordering Number Description

DQ6L - TB4 - FR4 - RAF2

Body Material		Inlet Type		Inlet Size		Outlet Type	Outlet Size	Handle Type		Process Specification		
6L	316L SS	TB	Fractional Tube Butt Weld	4	1/4" or 1/4" x0.035"	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	6	6 mm or 3/8" x0.035"			U	Manual-Integral Lockout Handle		F2	FC-02
		FR	Integral Male FR Metal Gasket Face Seal Fitting	8	8 mm						F3	FC-03
		FFR	Rotatable Female FR Metal Gasket Face Seal Fitting									
		RFR	Rotatable Male FR Metal Gasket Face Seal Fitting									
		FL	Fractional Tube Fitting									
		ML	Metric Tube Fitting									
								Seat				
									PCTFE			
								A	PFA			

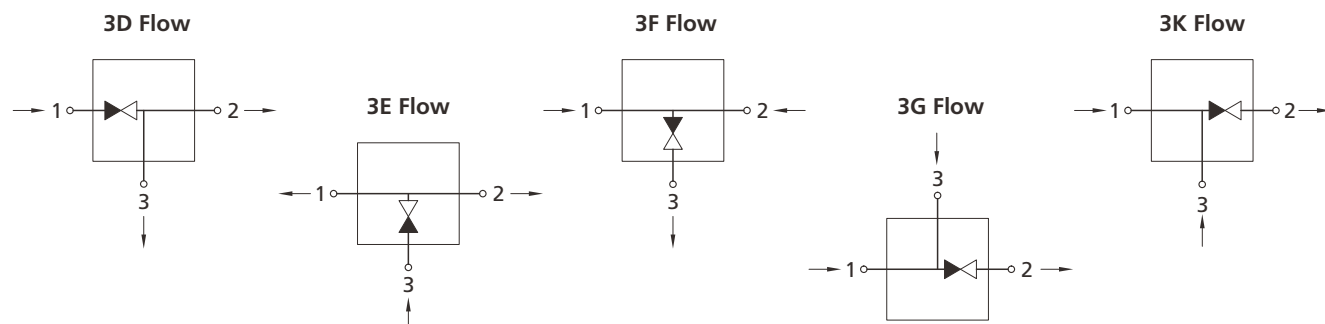
Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number.

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.

Branch Type

Flow Paths

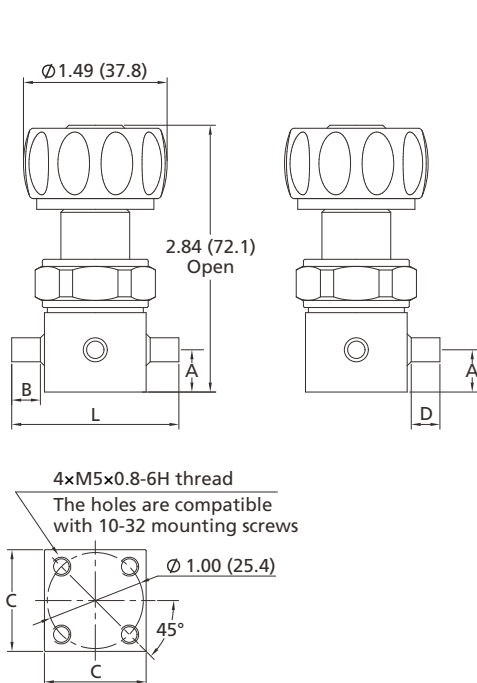
© Flow paths as viewed from the top



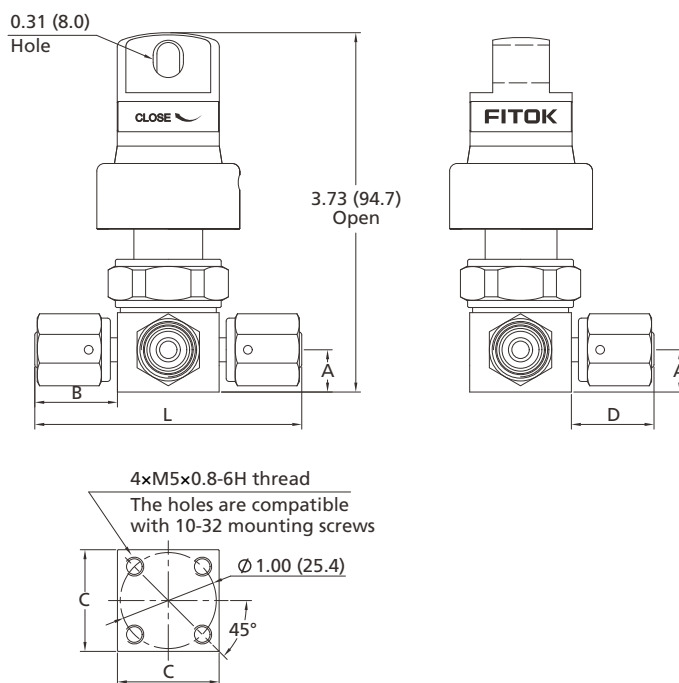
Dimensions

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

Round Handle



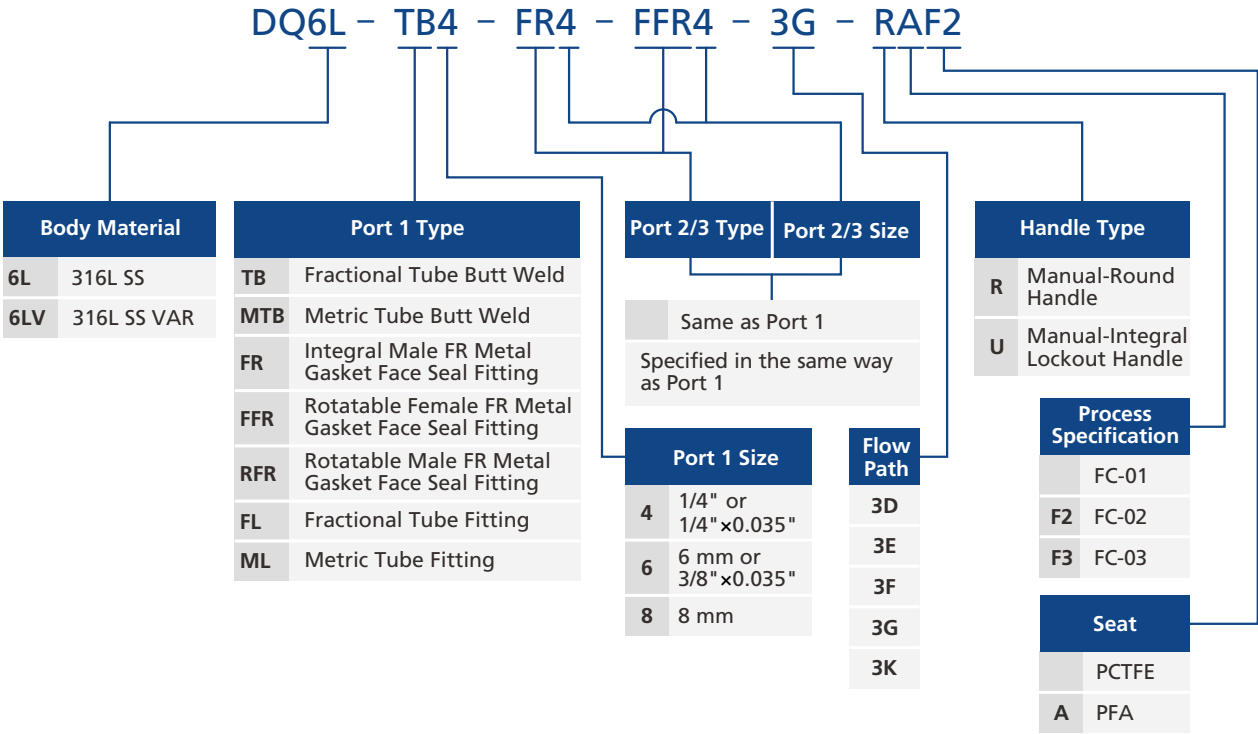
Integral Lockout Handle



Fittings
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Technical Information

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

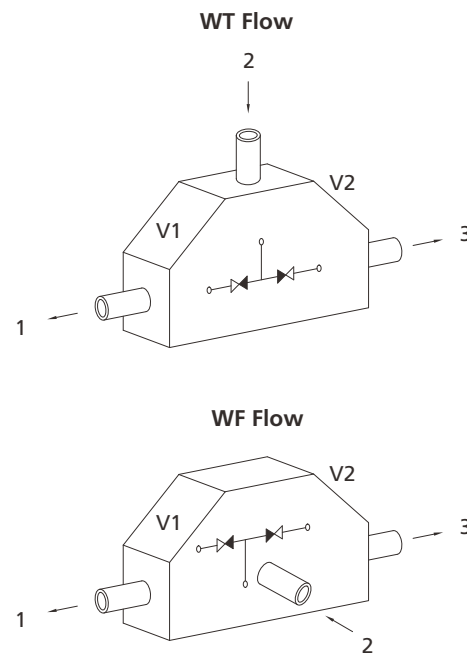
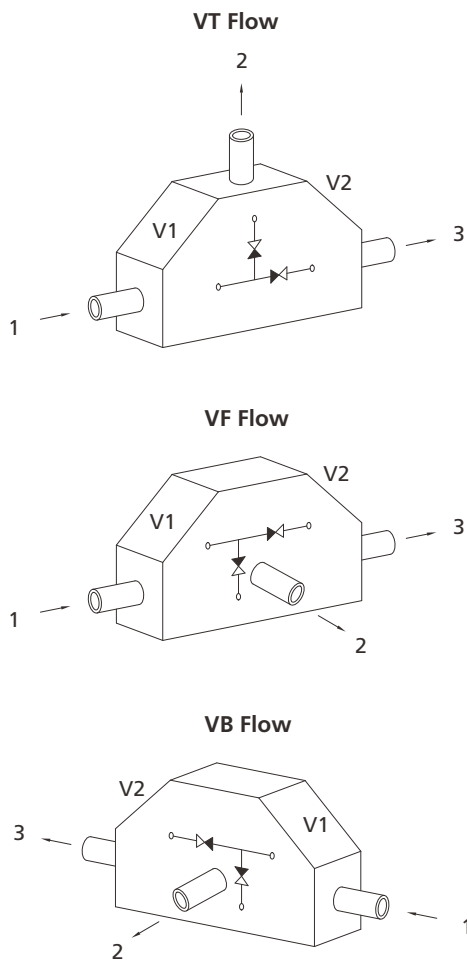
Ordering Number Description



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.

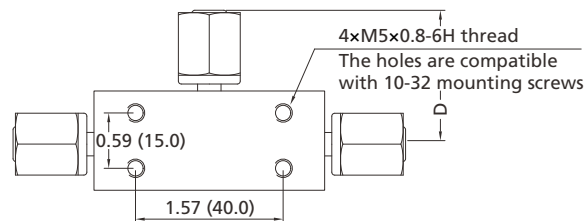
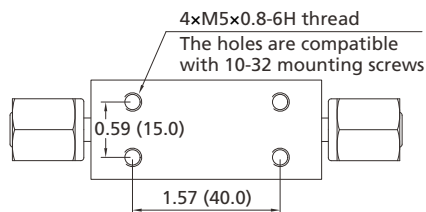
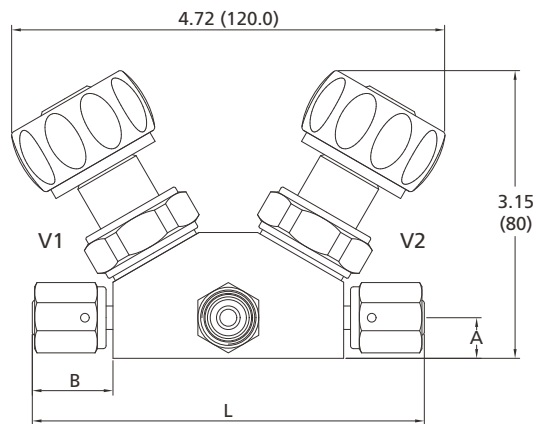
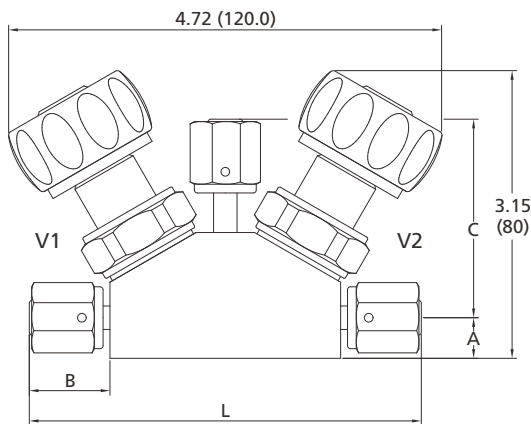
2-Valve 3-Way Block Type

Flow Paths



Dimensions

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

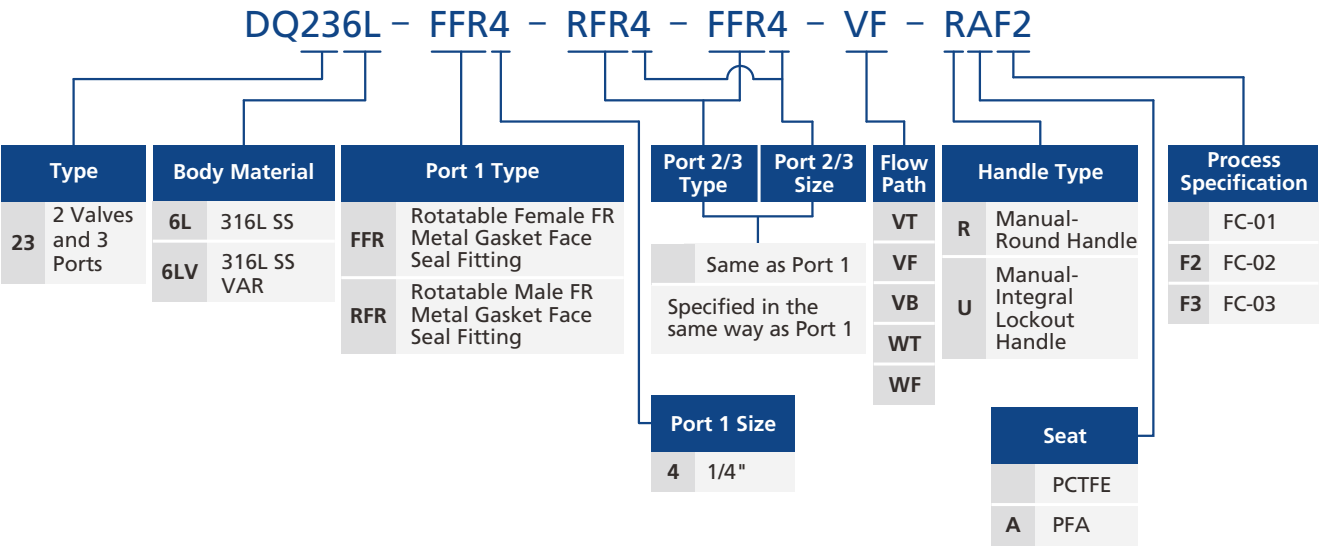


Fittings
Valves
Regulators
Filters
Tubing
Integrated Systems
Other Products
Technical Information

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
DQ23□□-FFR4-	1/4" Rotatable Female FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	2.12 (53.8)	—	4.24 (107.6)
DQ23□□-FFR4-	1/4" Rotatable Female FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	—	1.37 (34.8)	4.24 (107.6)
DQ23□□-RFR4-	1/4" Rotatable Male FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	2.12 (53.8)	—	4.24 (107.6)
DQ23□□-RFR4-	1/4" Rotatable Male FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	—	1.37 (34.8)	4.24 (107.6)

Ordering Number Description

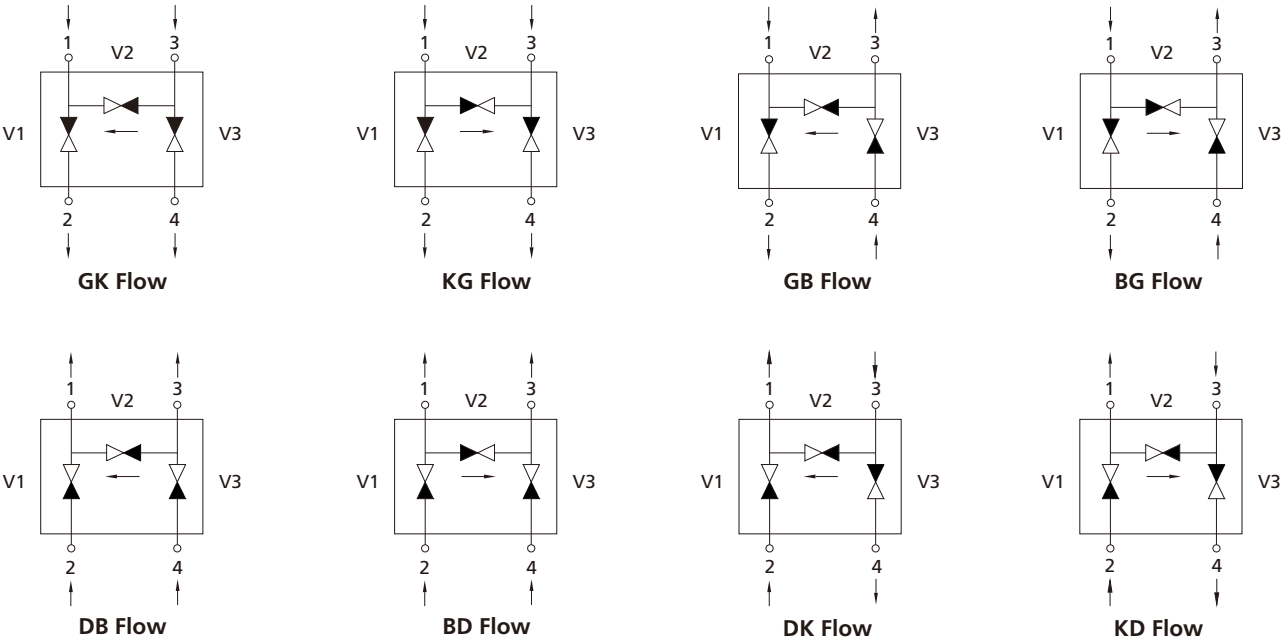


Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number.
Not all combinations are available, Should you have any questions, please contact FITOK Group or our authorized distributors.

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
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Technical Information

V-21 Diaphragm Valves

Fittings

Valves

Regulators

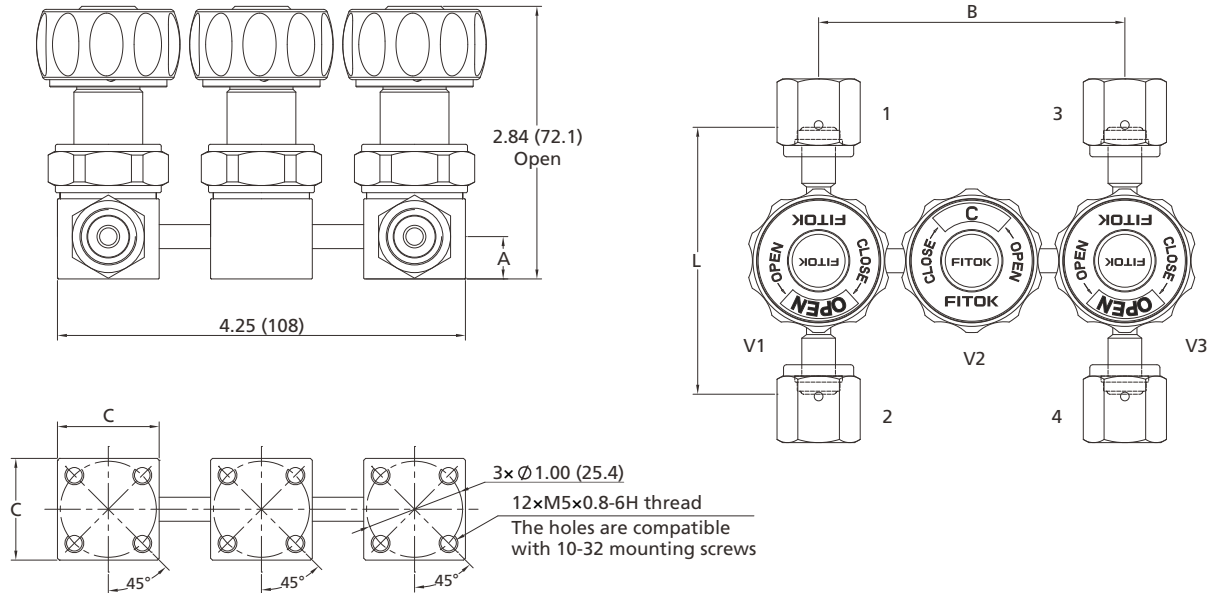
Filters

Tubing

Integrated Systems

Other Products

Technical Information



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

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 Metal Gasket Face Seal Fitting	Same as Port 1	Specified in the same way as Port 1	GK	R	Manual-Round Handle	F2	FC-01
	6LV	316L SS VAR	RFR	Rotatable Male FR Metal Gasket Face Seal Fitting	KG			FC-02				
								GB	U	Manual-Integral Lockout Handle	F3	FC-03
								BG				
								DB				
								BD				
								DK				
								KD				
				Port 1 Size								Seat
				4 1/4"								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

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)
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 ³ /s
	External	$\leq 1 \times 10^{-9}$ std cm ³ /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	316L SS, 316L SS VAR
Wetted Surface Roughness		Ra 5 μin. (0.13 μm)	
Polishing Process		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

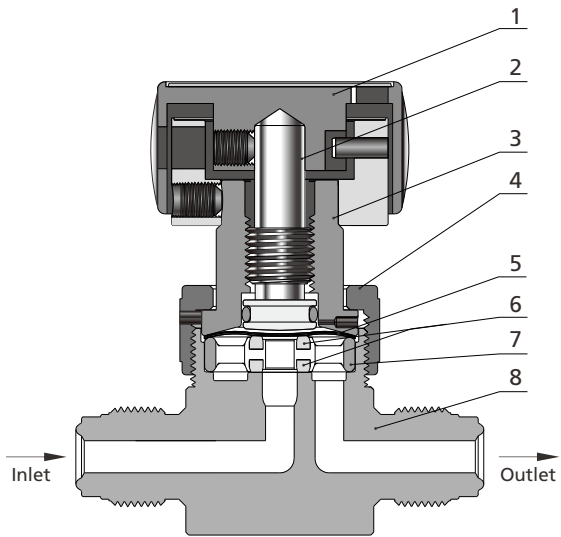
Regulators

Filters

Tubing

Integrated
SystemsOther
ProductsTechnical
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Major Materials of Construction

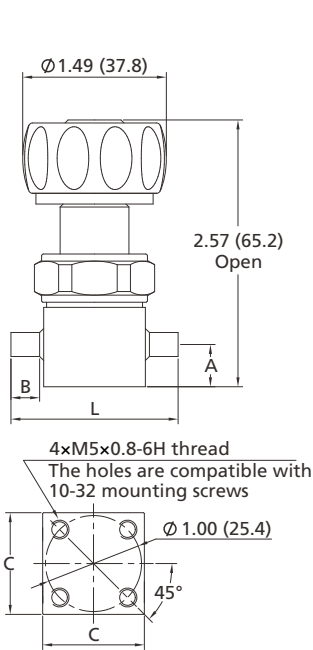


Item			Material/Specification
1	Handle	Round Handle	Aluminum
		Integral Lockout Handle	Aluminum
2	Stem		316 SS/ASTM A479
3	Bonnet		S17400/ASTM A564
4	Bonnet Nut		316 SS/ASTM A479
5	Diaphragm (2)		Cobalt Alloy/AMS 5876
6	Seat		PCTFE/ASTM D1430 or PFA/ASTM D3307
7	Seat Retainer		316L SS or 316L SS VAR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

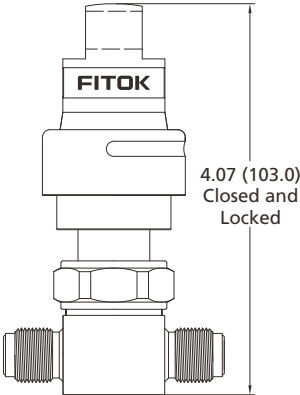
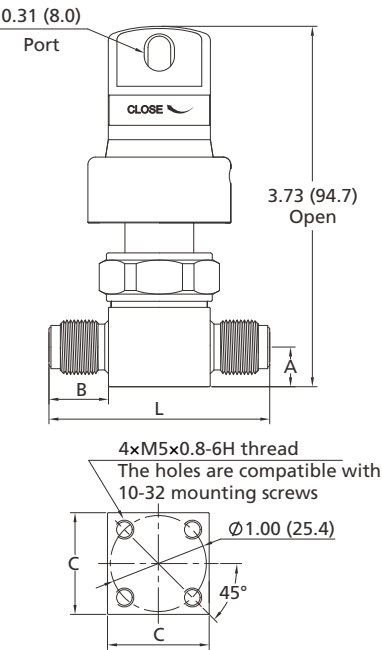
Dimensions and Ordering Information

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

Round Handle



Integral Lockout Handle



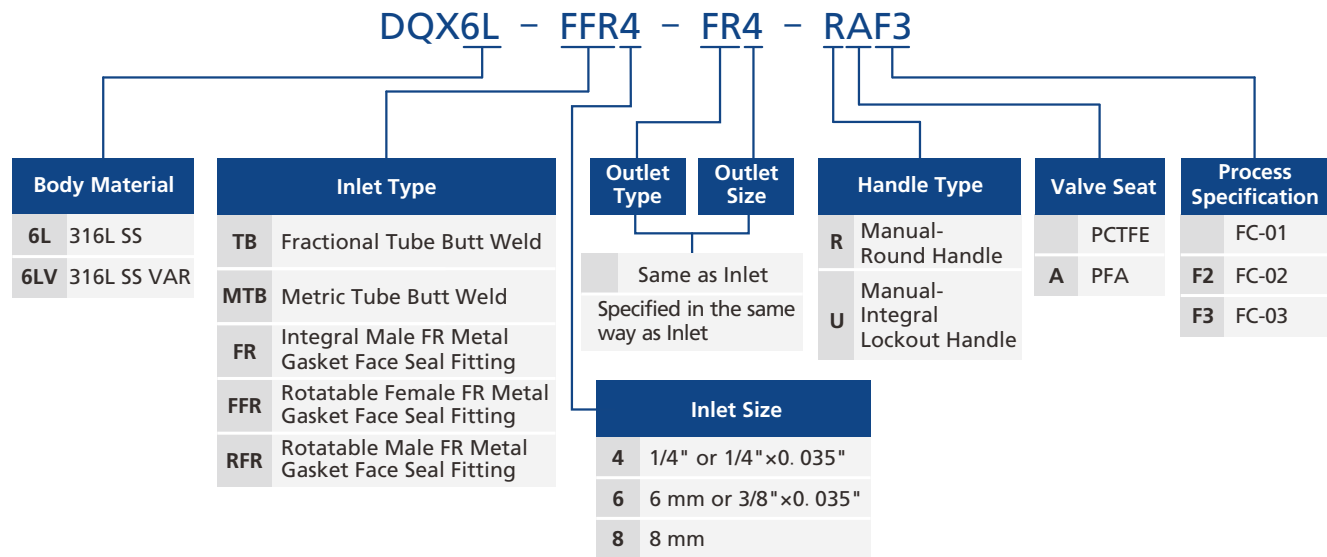
Basic Ordering Number	Connection Type and Size	Dimension, in. (mm)			
		A	B	C	L
DQX□□-TB4-	1/4" x0.035" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.06 (26.9)	1.74 (44.2)
DQX□□-TB6-	3/8" x0.035" Tube Butt Weld	0.44 (11.2)	0.26 (6.6)	1.06 (26.9)	1.74 (44.2)
DQX□□-FFR4-	1/4" Rotatable Female FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	2.78 (70.6)
DQX□□-RFR4-	1/4" Rotatable Male FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	2.78 (70.6)
DQX□□-FR4-	1/4" Integral Male FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.62 (15.7)	1.06 (26.9)	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.

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

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

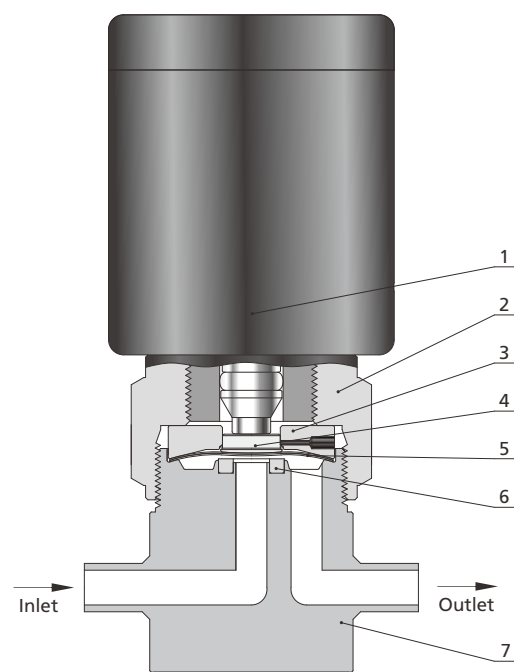
Process Specification

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) ^①	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.

Major Materials of Construction

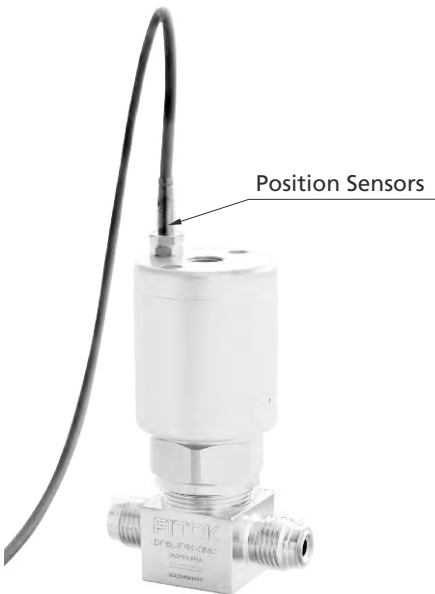


Normally Closed Pneumatic Model

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

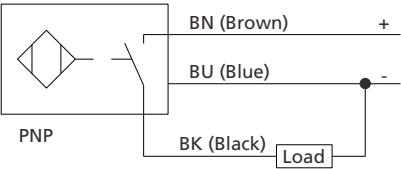
Output	3-wire V (dc), PNP
Output Function	Normally open or normally closed
Voltage	10 ~ 30 V (dc)
Working Temperature	-13 ~ 158 °F (-25 ~ 70 °C)

Fittings
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Other Products
Technical Information

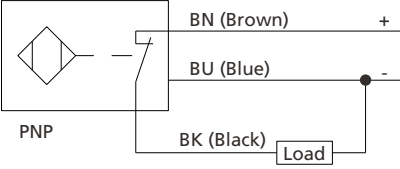
V-27 Diaphragm Valves

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

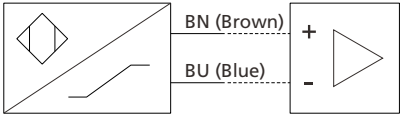
Transmit a signal to an electrical device, indicating the open and closed positions of pneumatically actuated valves.

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

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

Wiring Diagram

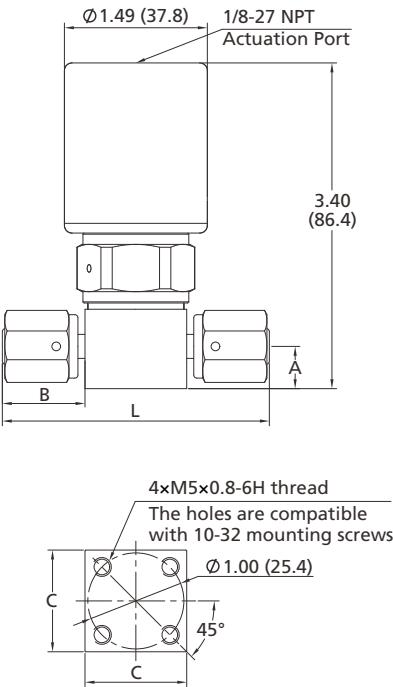


Dimensions and Ordering Information

Straight Type

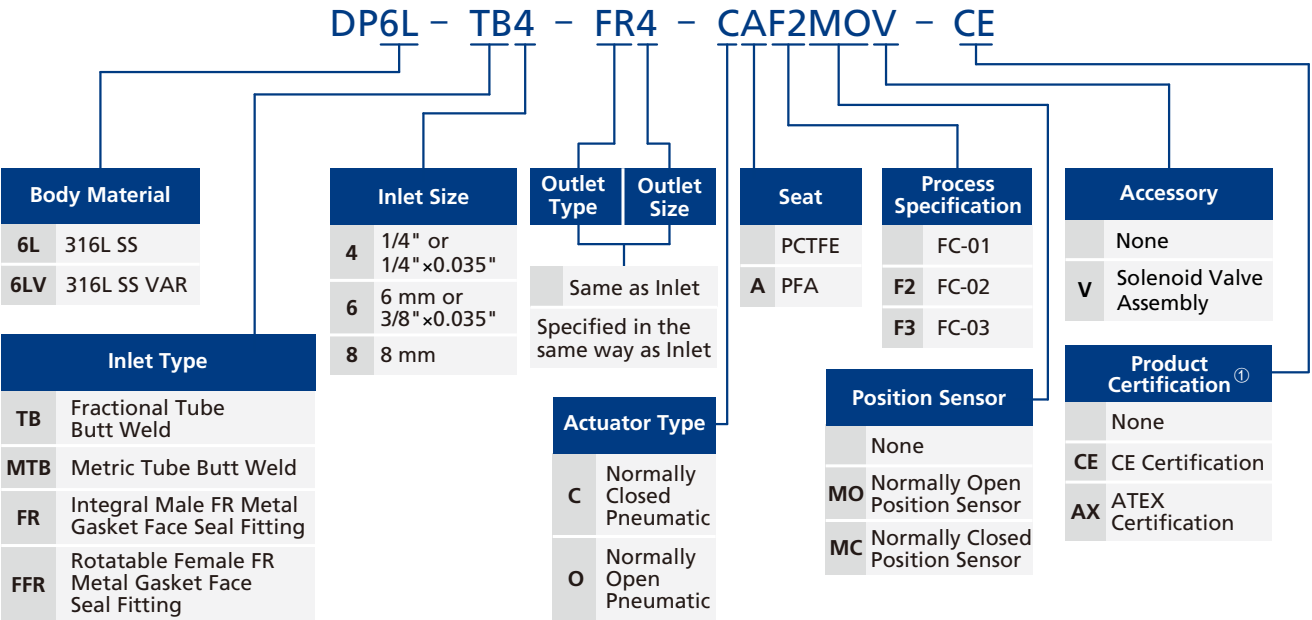
Dimensions

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"x0.035" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.06 (26.9)	1.74 (44.2)
DP□□-TB6-	3/8"x0.035" Tube Butt Weld	0.44 (11.2)	0.26 (6.6)	1.06 (26.9)	1.74 (44.2)
DP□□-FFR4-	1/4" Rotatable Female FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	2.78 (70.6)
DP□□-RFR4-	1/4" Rotatable Male FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	2.78 (70.6)
DP□□-FR4-	1/4" Integral Male FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.62 (15.7)	1.06 (26.9)	2.30 (58.4)

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".

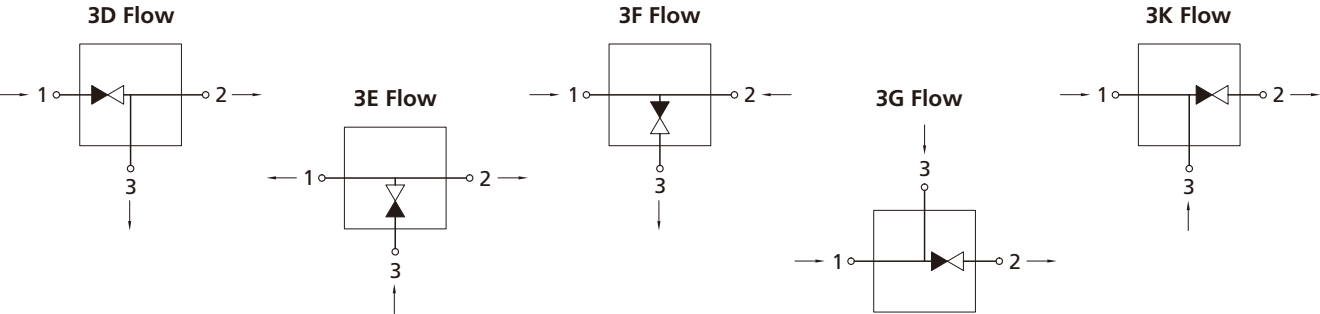
Notes:

- 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.

Branch Type

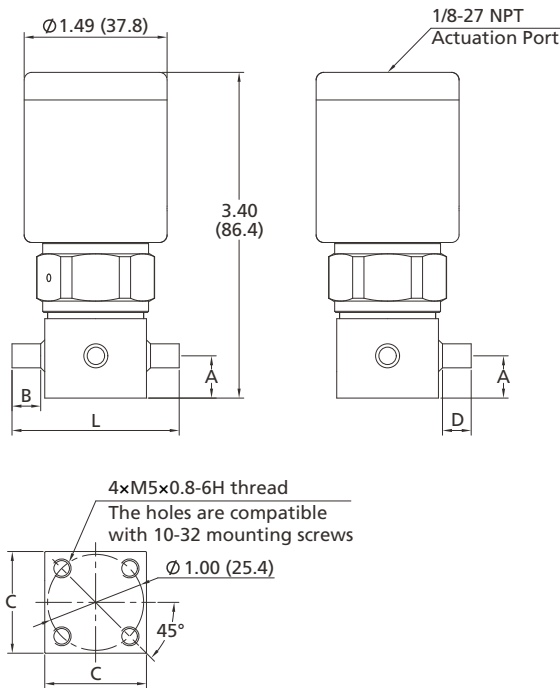
Flow Paths

☉ 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	0.44 (11.2)	0.26 (6.6)	1.06 (26.9)	0.26 (6.6)	1.74 (44.2)
DP□□-FFR4-	1/4" Rotatable Female FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	0.86 (21.8)	2.78 (70.6)
DP□□-RFR4-	1/4" Rotatable Male FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	0.86 (21.8)	2.78 (70.6)
DP□□-FR4-	1/4" Integral Male FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.62 (15.7)	1.06 (26.9)	0.62 (15.7)	2.30 (58.4)

Ordering Number Description

DP6L – TB4 – FR4 – FFR4 – 3G – CAF2MO – CE

Body Material		Port 1 Type		Port 2/3 Type	Port 2/3 Size	Actuator Type		Process Specification	
6L	316L SS	TB	Fractional Tube Butt Weld	Same as Port 1	Specified in the same way as Port 1	C	Normally Closed Pneumatic	FC-01	
6LV	316L SS VAR	MTB	Metric Tube Butt Weld			O	Normally Open Pneumatic	F2	FC-02
		FR	Integral Male FR Metal Gasket Face Seal Fitting					F3	FC-03
		FFR	Rotatable Female FR Metal Gasket Face Seal Fitting						
		RFR	Rotatable Male FR Metal Gasket Face Seal Fitting						
		FL	Fractional Tube Fitting						
		ML	Metric Tube Fitting						

Port 1 Size	Flow Path	Seat	
4	1/4" or 1/4"×0.035"	3D	PCTFE
6	6 mm or 3/8"×0.035"	3E	
8	8 mm	3F	PFA
		3G	
		3K	

Position Sensor	
	None
MO	Normally Open Position Sensor
MC	Normally Closed Position Sensor

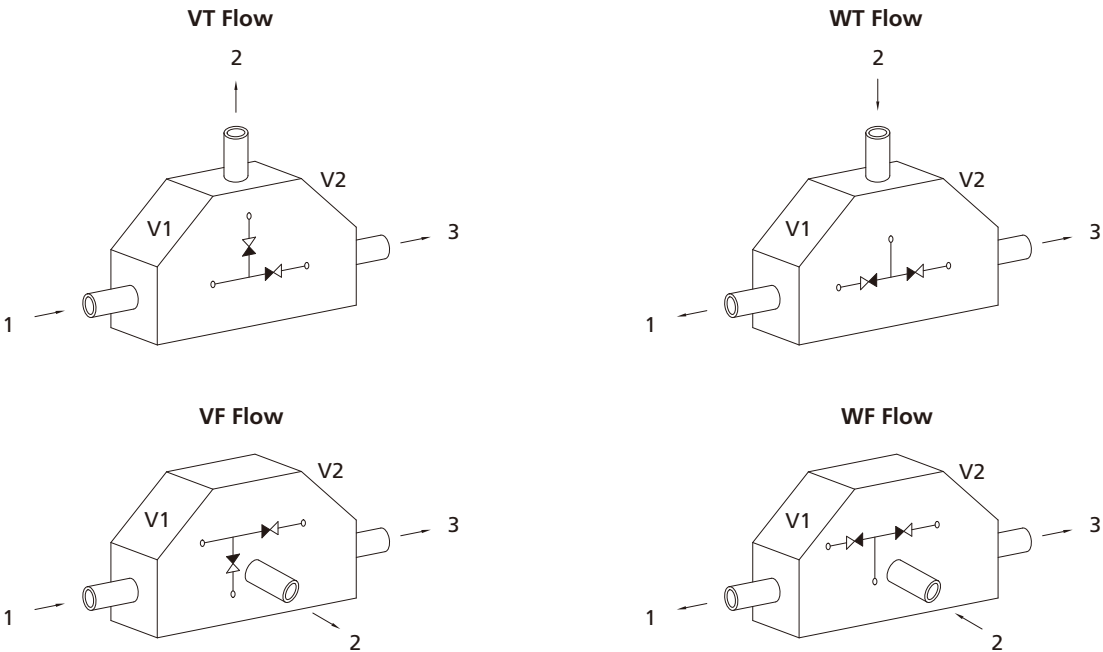
Product Certification	
	None
CE	CE Certification
AX	ATEX Certification

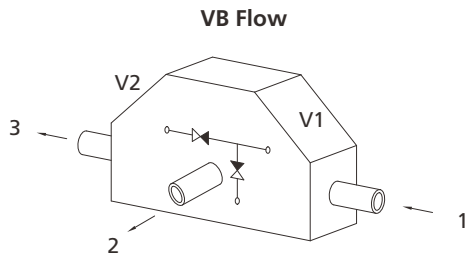
Notes:

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.

2-Valve 3-Way Block Type

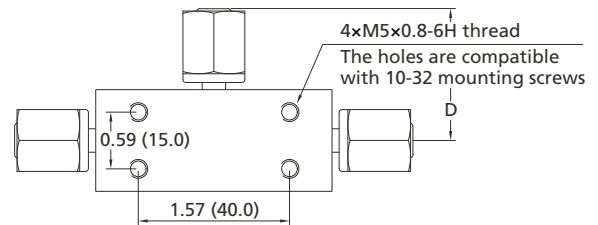
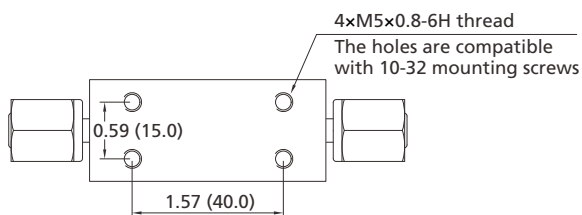
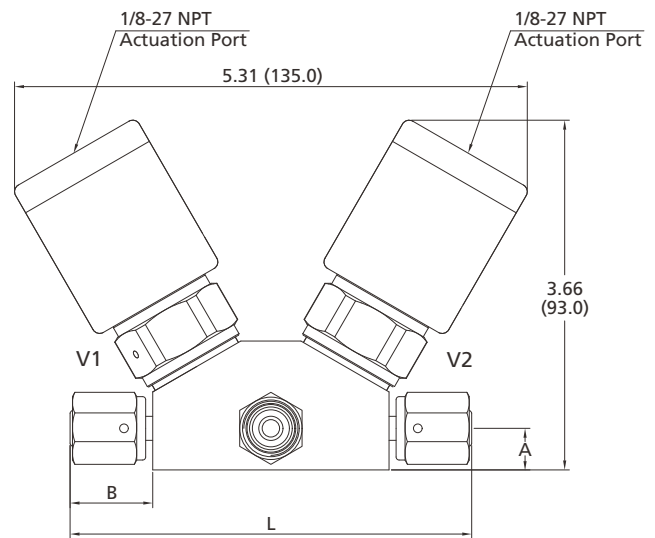
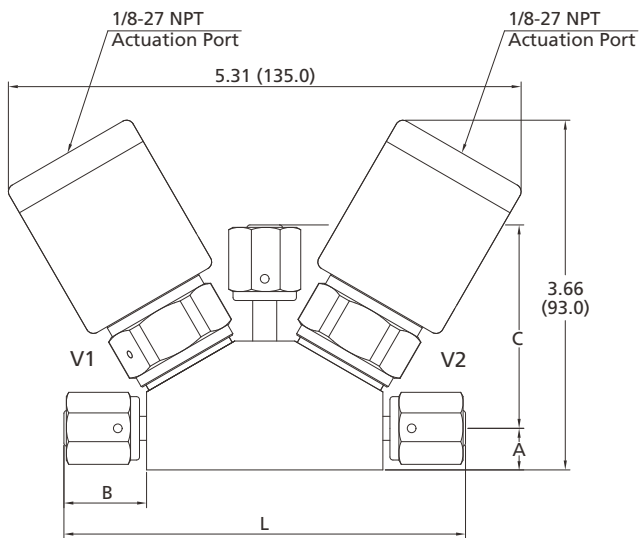
Flow Paths





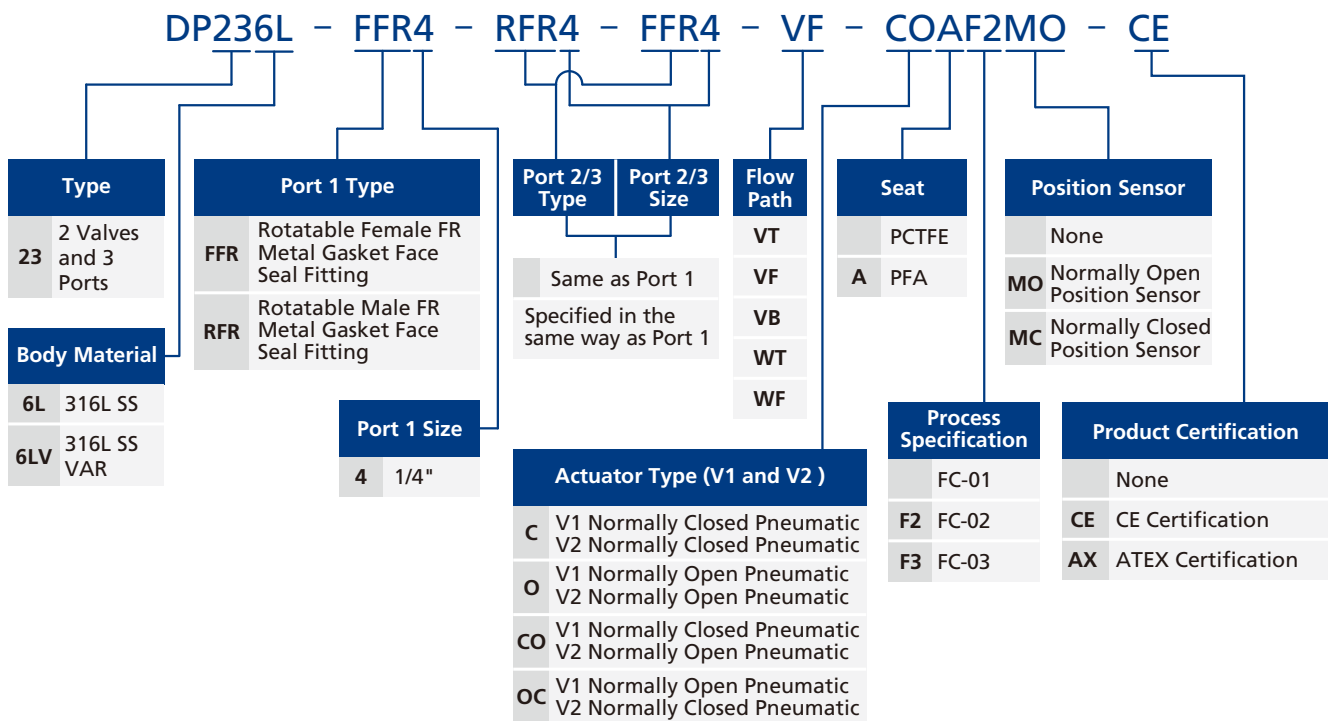
Dimensions

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



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

Ordering Number Description



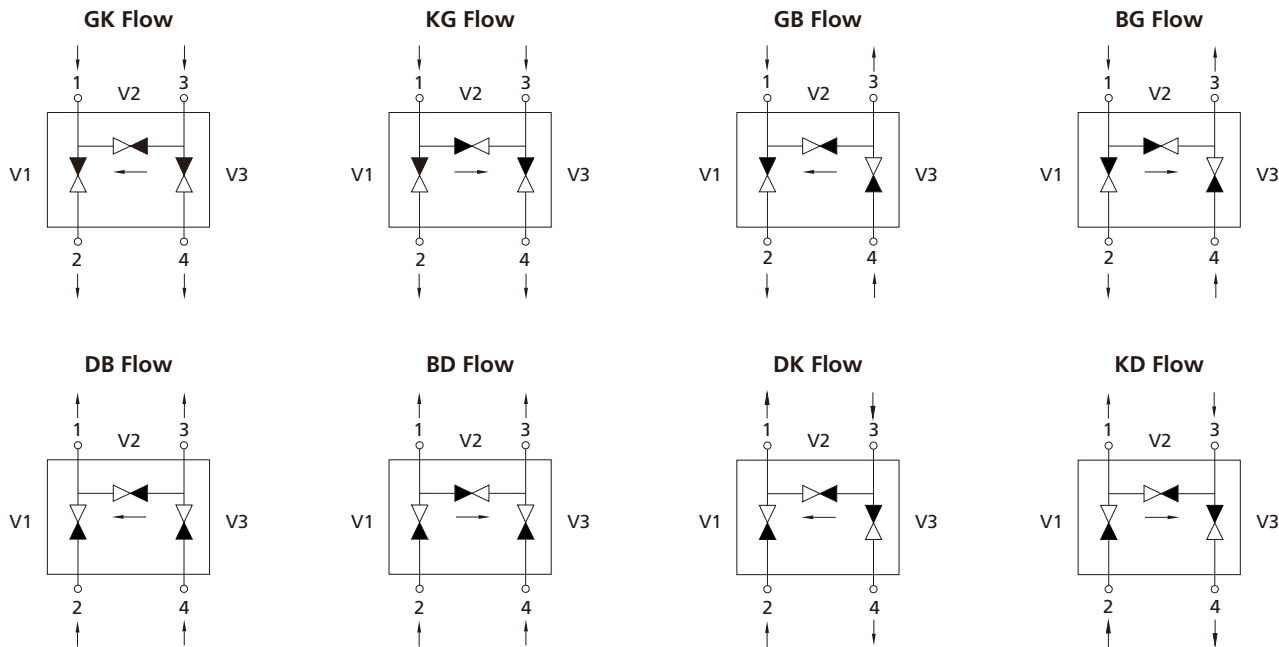
Notes:

- "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.

3-Valve 4-Way Block Type

Flow Paths

☉ Flow paths as viewed from the top



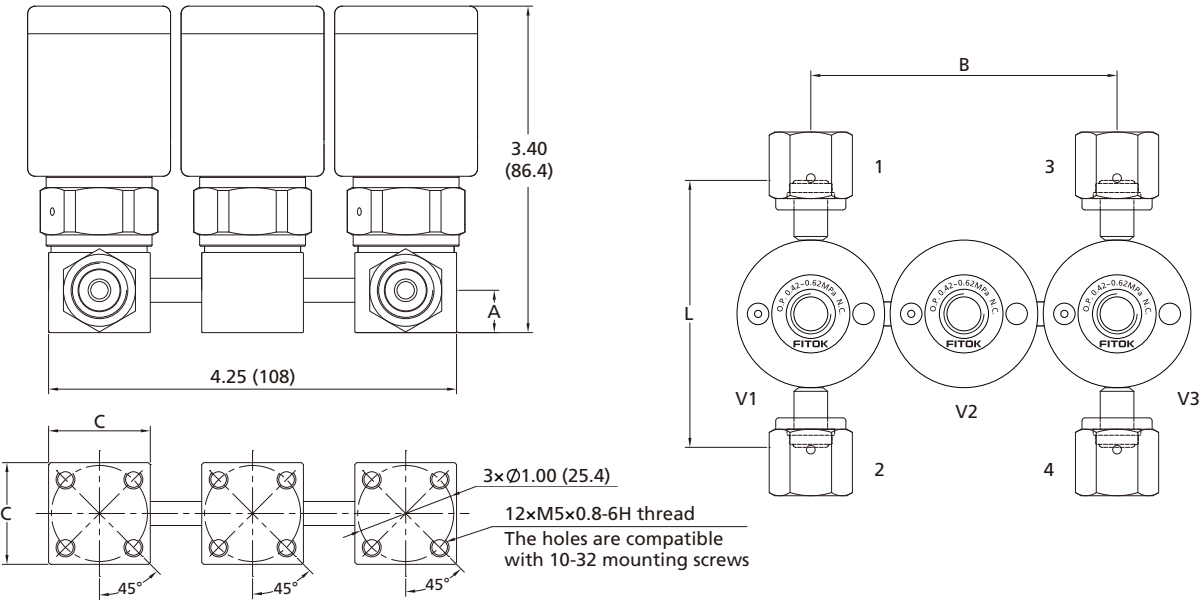
Dimensions

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



Fittings
Valves
Regulators
Filters
Tubing
Integrated Systems
Other Products
Technical Information

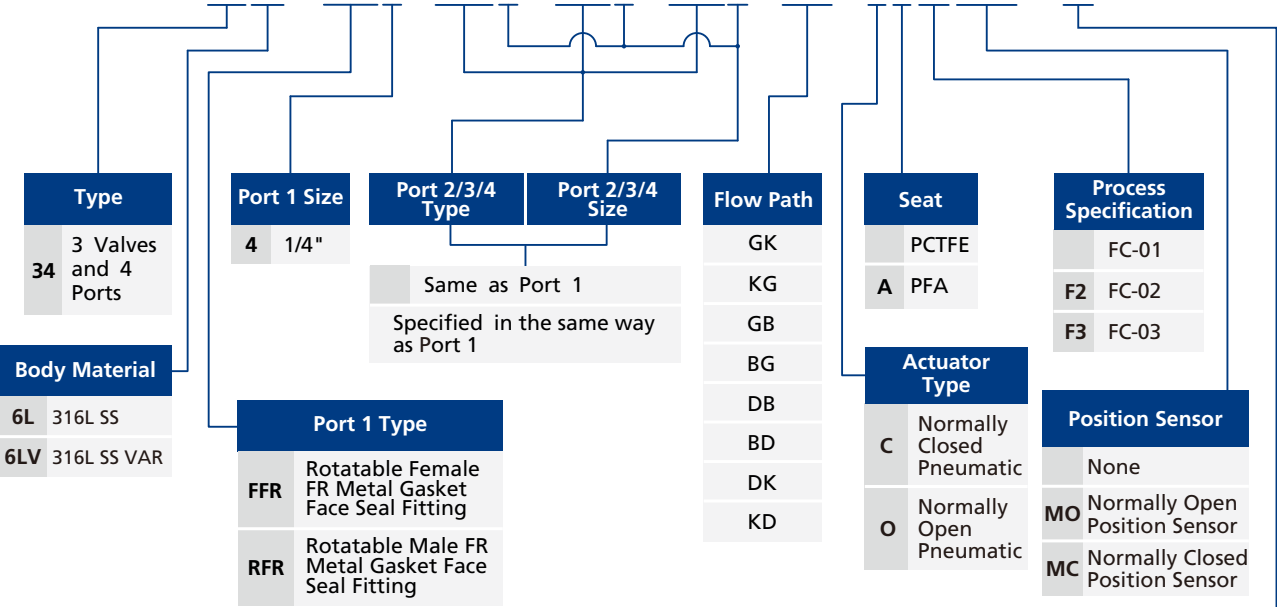
V-35 Diaphragm Valves



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

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

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

Flow Data

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

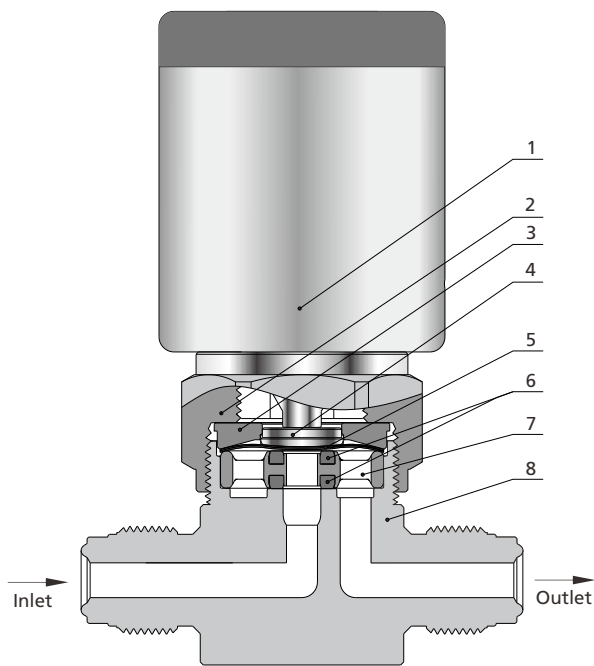
Pressure Drop to Atmosphere psig (bar)	Air (l/min)	Water (l/min)
10 (0.68)	96	3.6
50 (3.4)	250	7.9
100 (6.8)	450	11.0

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	316L SS, 316L SS VAR
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

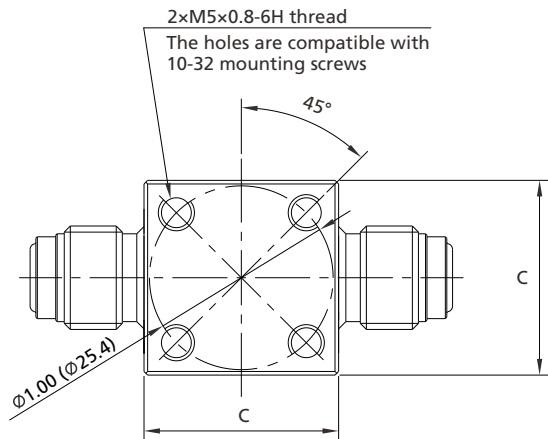
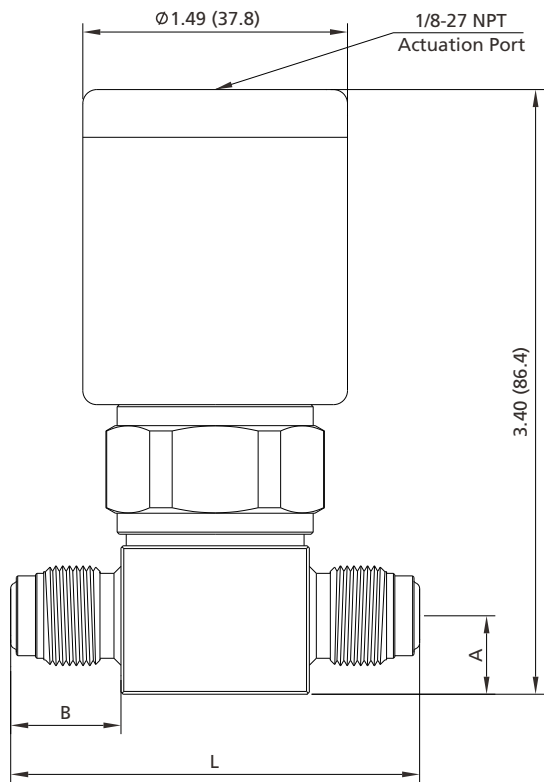


Normally Closed Pneumatic Model
(Replaceable-Seat Type)

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	0.44 (11.2)	0.26 (6.6)	1.06 (26.9)	1.74 (44.2)
DPX□□-FFR4-	1/4" Rotatable Female FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	2.78 (70.6)
DPX□□-RFR4-	1/4" Rotatable Male FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	2.78 (70.6)
DPX□□-FR4-	1/4" Integral Male FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.62 (15.7)	1.06 (26.9)	2.30 (58.4)

Service Kit Ordering Information

Basic Ordering Information	Description	Remarks
□□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
□□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 Normally Closed Pneumatic	PCTFE	FC-01
6LV	316L SS VAR	MTB	Metric Tube Butt Weld	6 6 mm or 3/8"×0.035"				A PFA	F2 FC-02
		FR	Integral Male FR Metal Gasket Face Seal Fitting	8 8 mm			O Normally Open Pneumatic		F3 FC-03
		FFR	Rotatable Female FR Metal Gasket Face Seal Fitting						
		RFR	Rotatable Male FR Metal Gasket Face Seal 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 ^①
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	$\leq 1 \times 10^{-9}$ std cm ³ /s	
	External	$\leq 1 \times 10^{-9}$ std cm ³ /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-41.

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

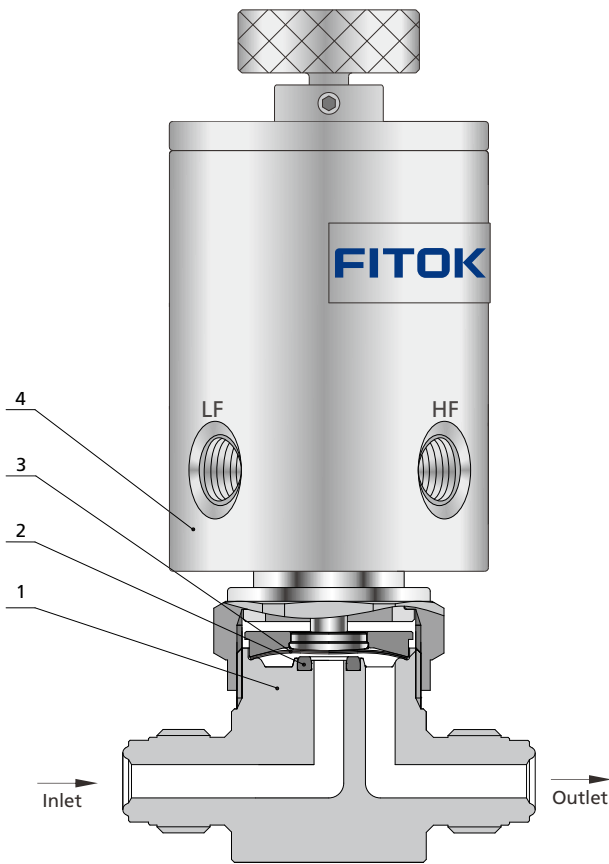


Process Specification

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 Class 4 (FS 209E Class 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



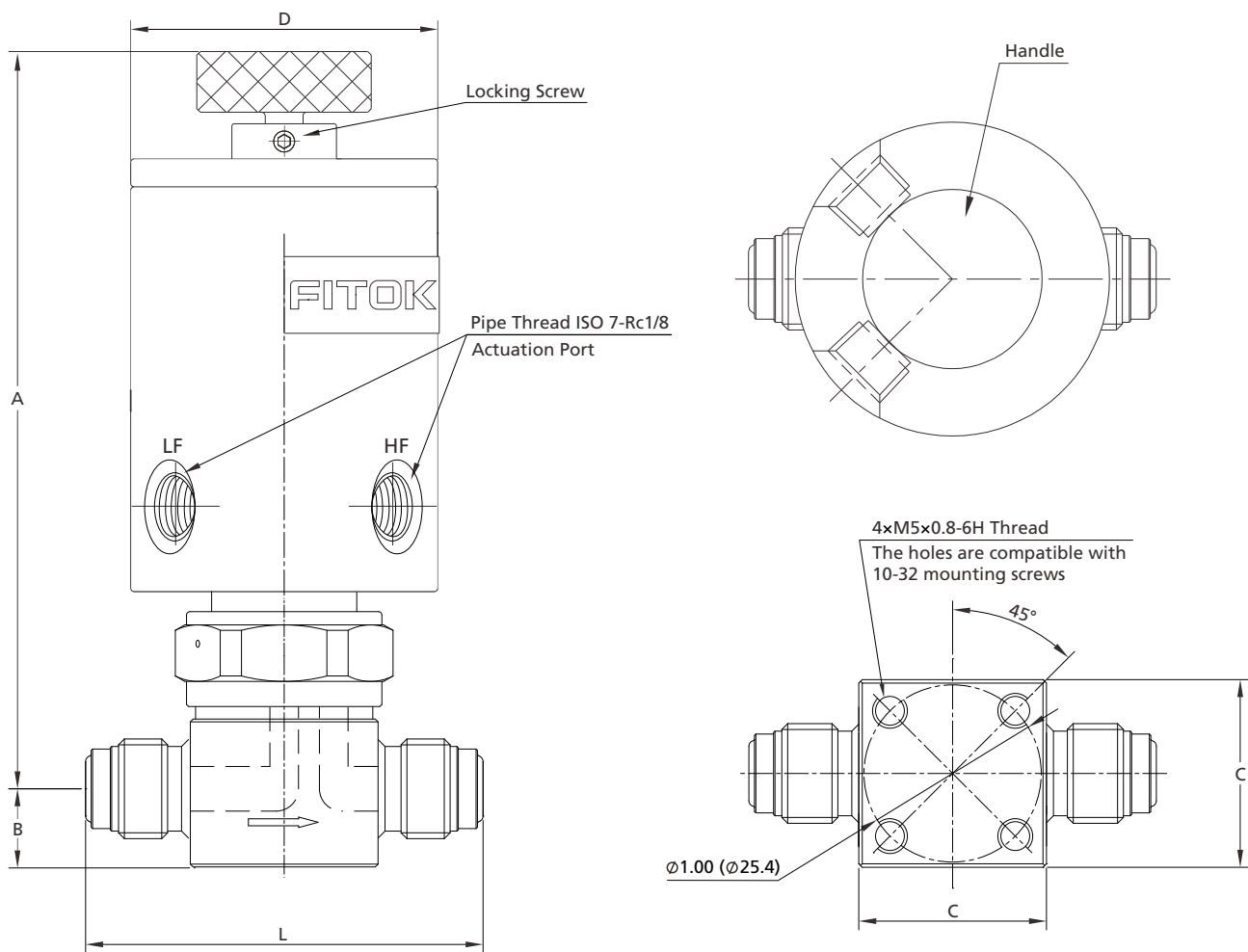
Nomally Closed Pneumatic Actuator

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

Fittings
Valves
Regulators
Filters
Tubing
Integrated Systems
Other Products
Technical Information

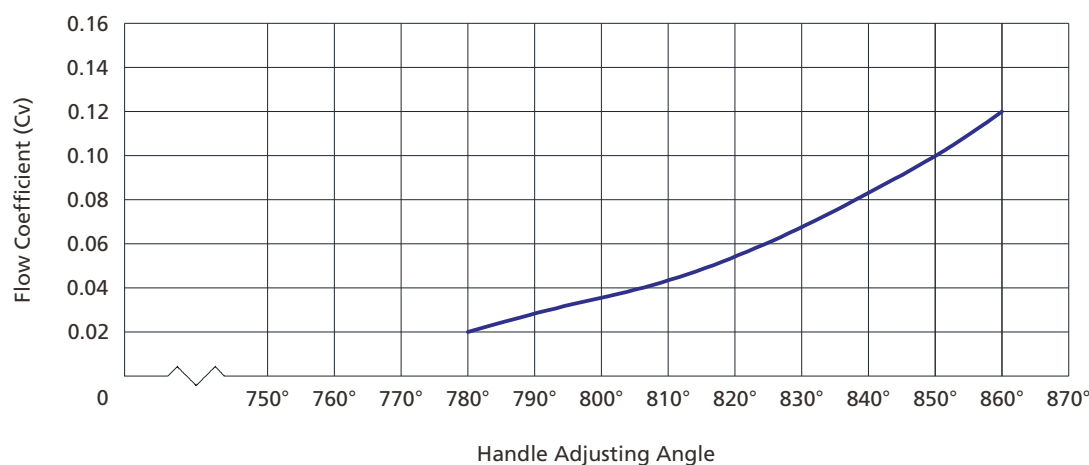
Dimensions and Ordering Information

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



Flow Adjustment Instructions for Low-Flow Mode:

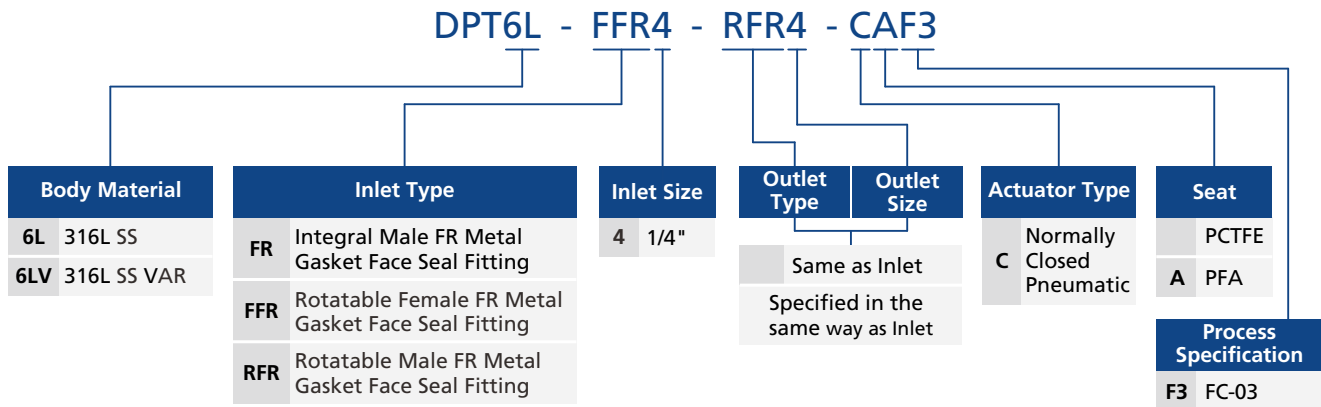
Loosen the locking screws and turn the handle clockwise to the end. Then, rotate the handle counterclockwise until the desired Cv value is reached (see below relationship between Cv and handle adjusting angle). Once the desired Cv is achieved, tighten the locking screws.



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.

Basic Ordering Number	Connection Type and Size	Dimensions, in. (mm)				
		A	B	C	D	L
DPT6L-FR4-CAF3	1/4" Integral Male FR Metal Gasket Face Seal 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 Metal Gasket Face Seal Fitting					2.78 (70.6)

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.

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

- Metal-to-metal diaphragm seal
- Cobalt alloy diaphragm with high strength and corrosion resistance to ensure long cycle life
- Long cycle life in high pressure applications
- Manual and pneumatic actuators available
- Normally closed or normally open position sensors are optional for pneumatically actuated valves

Technical Data

Port Size	1/4" to 3/8" or 6 mm to 8 mm	
Flow Coefficient (Cv)	0.20	
Orifice Size	0.16 in. (4.1 mm)	
Max. Working Pressure	3000 psig (207 bar)	
Pneumatic Actuator Operating Pressure	75 to 105 psig (5.2 to 7.2 bar)	
Temperature	PCTFE: -10 ~ 150 °F (-23 ~ 65 °C) Polyimide: 50 ~ 302 °F (10 ~ 150 °C)	
Leak Rate (Helium)	Internal	$\leq 1 \times 10^{-9}$ std cm ³ /s
	External	$\leq 1 \times 10^{-9}$ std cm ³ /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

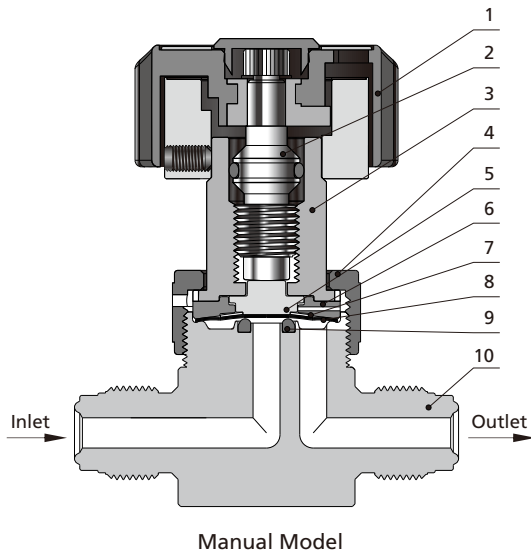
Process Specification

Item	Process Specification	
	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 10 µin. (0.25 µm)	Ra 5 µin. (0.13 µm) ^①
Polishing Process	Machine finished	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



Position Sensors

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

Pneumatic

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



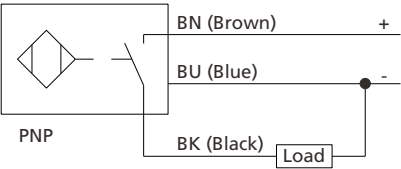
Technical Information

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)

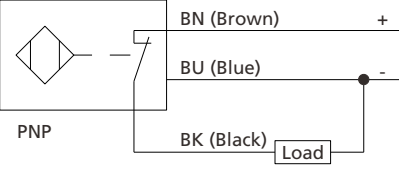
V-45 Diaphragm Valves

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 closed. Conversely, when fitted with normally closed sensors, the sensors transmit signals with indicators illuminated when the valves are open.

Explosion-proof Position Sensors

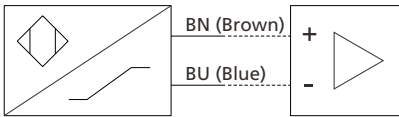
Transmit a signal to an electrical device, indicating the open and closed positions of pneumatically actuated valves.

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

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

Wiring Diagram



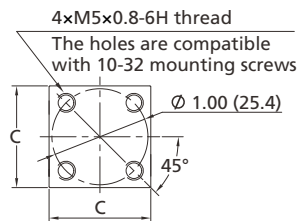
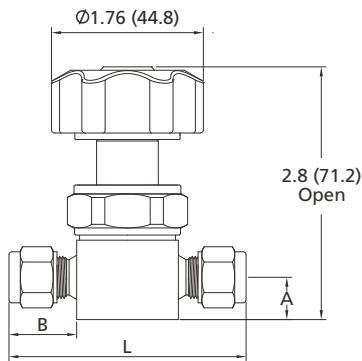
Dimensions and Ordering Information

Straight Type

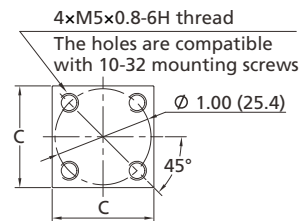
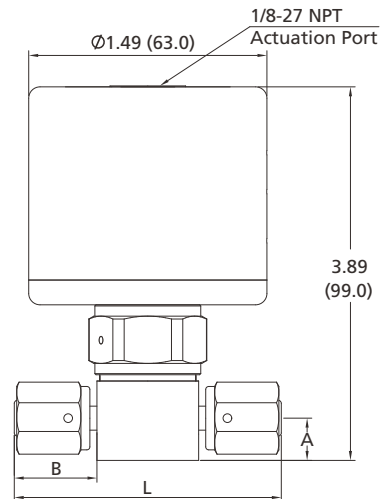
Dimensions

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

Manual - Round Handle

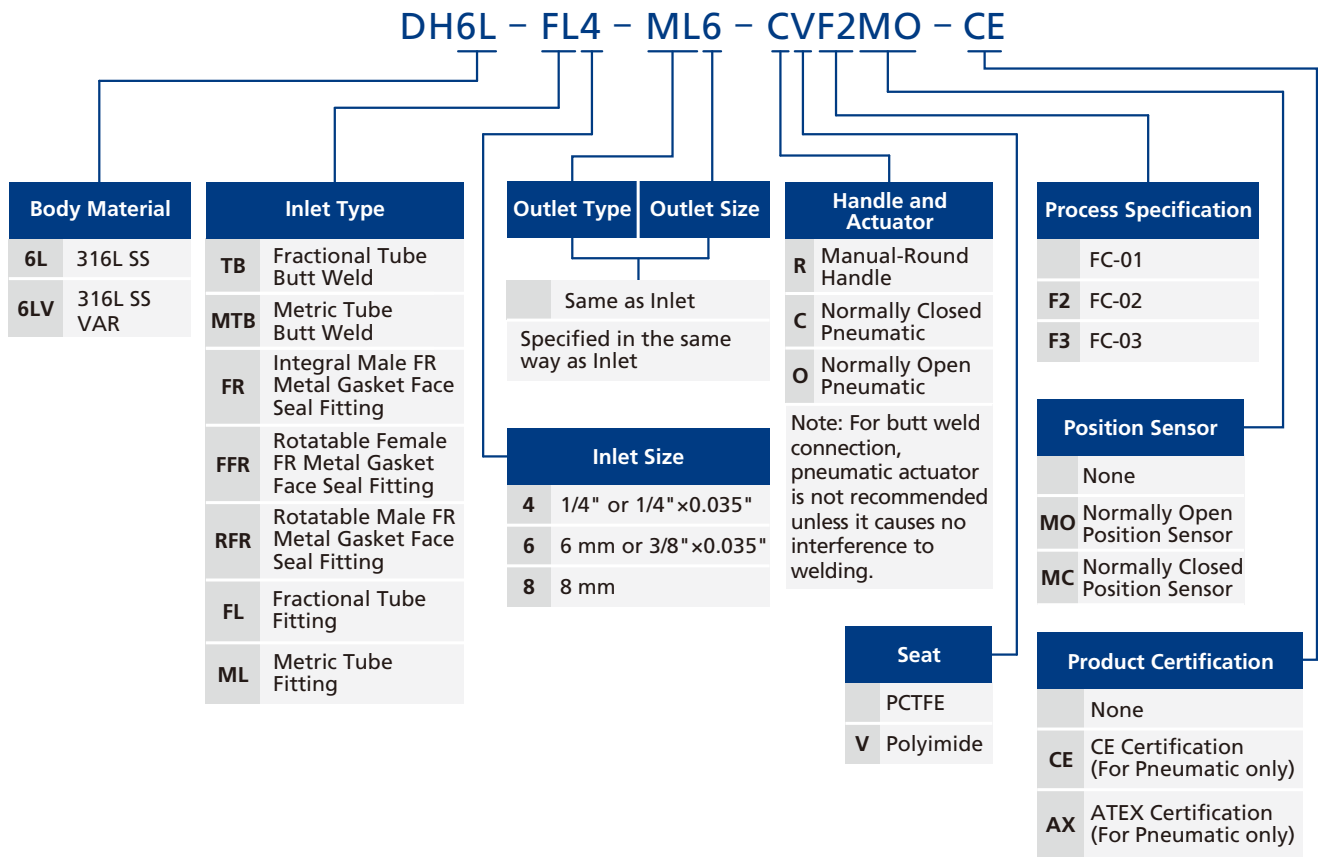


Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)			
		A	B	C	L
DH□□-TB4-	1/4"×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"×0.035" Tube Butt Weld		0.26 (6.6)		1.74 (44.2)
DH□□-FFR4-	1/4" Rotatable Female FR Metal Gasket Face Seal Fitting		0.86 (21.8)		2.78 (70.6)
DH□□-RFR4-	1/4" Rotatable Male FR Metal Gasket Face Seal Fitting		0.86 (21.8)		2.78 (70.6)
DH□□-FR4-	1/4" Integral Male FR Metal Gasket Face Seal Fitting		0.62 (15.7)		2.30 (58.4)
DH□□-ML6-	6 mm FITOK Tube Fitting		0.70 (17.9)		2.47 (62.7)

Ordering Number Description

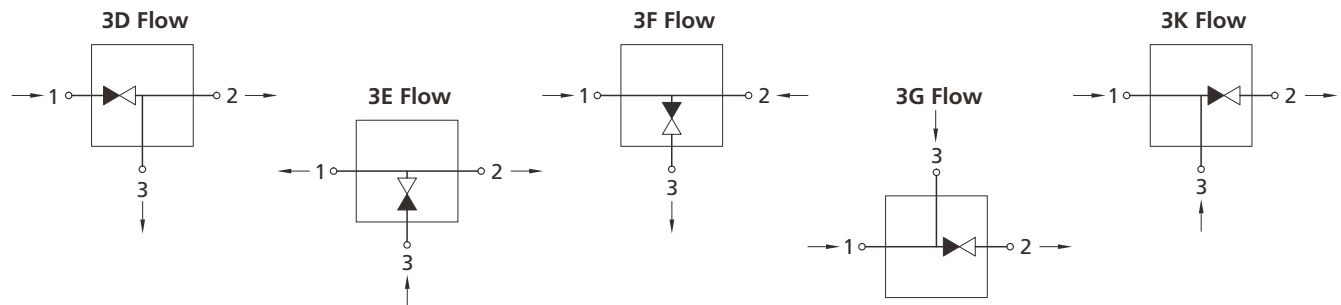


- Notes:
- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available; Should you have any questions, please contact FITOK Group or our authorized distributors.
 - For the –CE or AX options, the valve conforms to ATEX 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.

Branch Type

Flow Paths

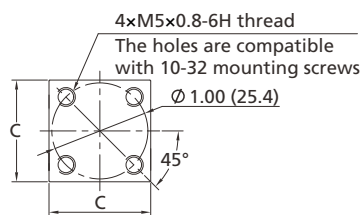
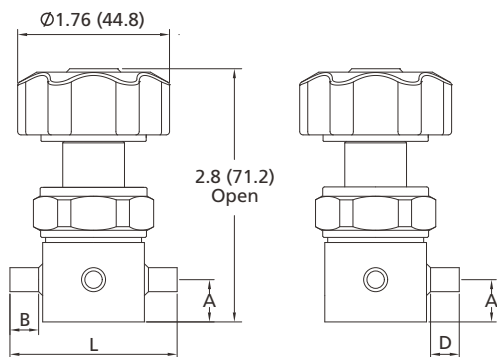
☉ Flow paths as viewed from the top



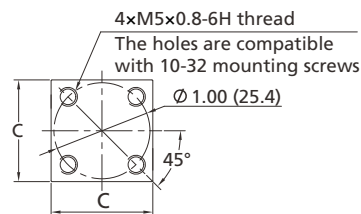
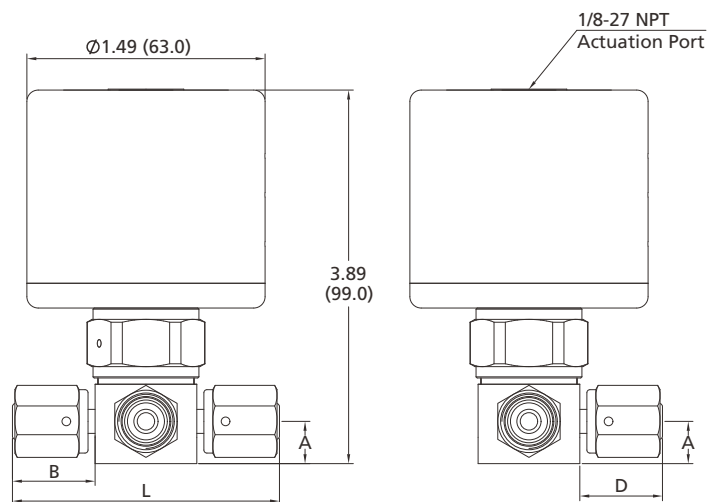
Dimensions

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

Manual - Round Handle

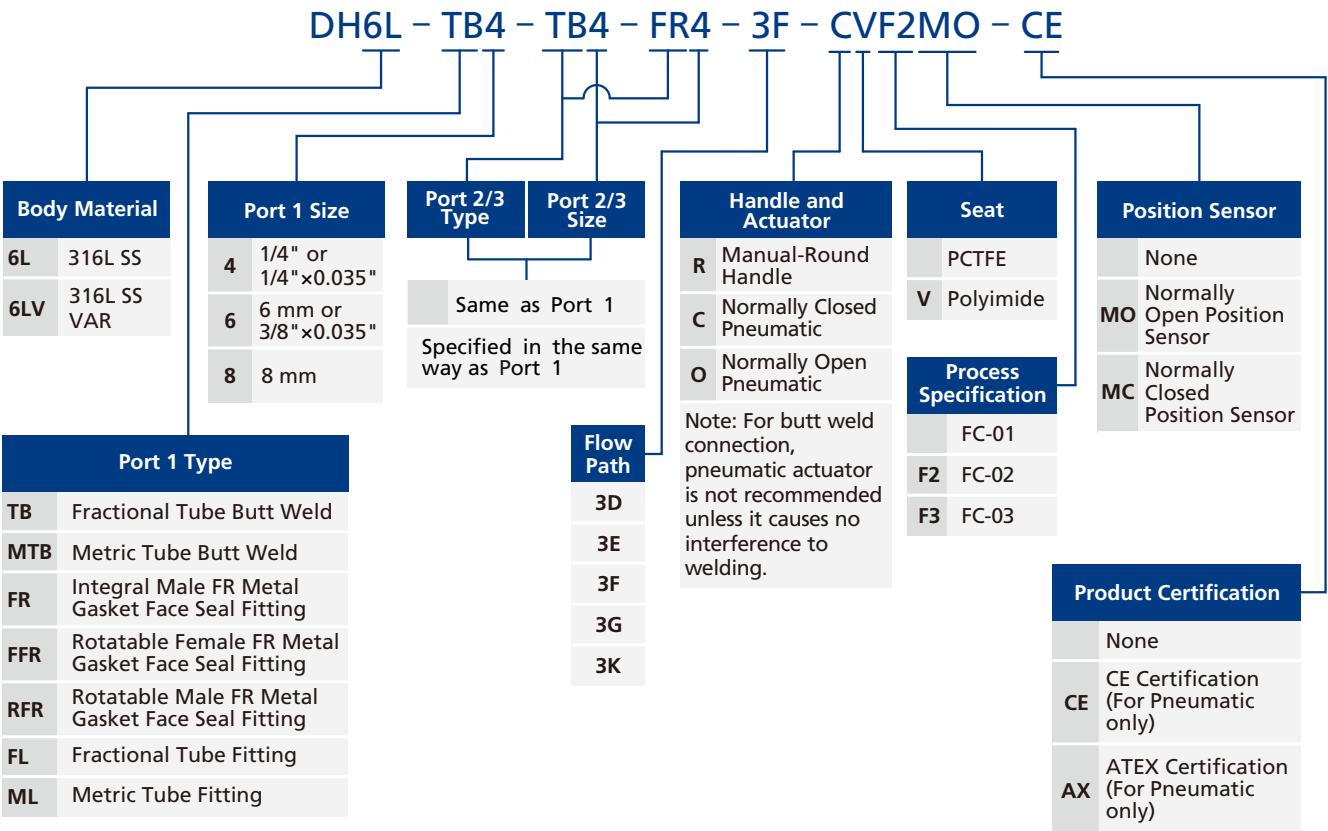


Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	C	D	L
DH□□-TB4-	1/4" x0.035" 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" x0.035" Tube Butt Weld	0.44 (11.2)	0.26 (6.6)	1.06 (26.9)	0.26 (6.6)	1.74 (44.2)
DH□□-FFR4-	1/4" Rotatable Female FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	0.86 (21.8)	2.78 (70.6)
DH□□-RFR4-	1/4" Rotatable Male FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	0.86 (21.8)	2.78 (70.6)
DH□□-FR4-	1/4" Integral Male FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.62 (15.7)	1.06 (26.9)	0.62 (15.7)	2.30 (58.4)
DH□□-FL4-	1/4" FITOK Tube Fitting	0.44 (11.2)	0.70 (17.9)	1.06 (26.9)	0.70 (17.9)	2.47 (62.7)

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 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

Port Size			1/4" to 3/8" or 6 mm to 8 mm
Flow Coefficient (Cv)	Lever Handle	0.14	
	Round Handle	0.30	
	Pneumatic Actuator	0.20	
Orifice Size			0.16 in. (4.1 mm)
Max. Working Pressure			3500 psig (241 bar)
Max. Differential Back Pressure ^①			1500 psig (103 bar)
Pneumatic Actuator Operating Pressure			60 to 90 psig (4.2 to 6.2 bar)
Temperature			PCTFE: -100 ~ 250 °F (-73 ~ 121 °C) Polyimide: -100 ~ 320 °F (-73 ~ 160 °C)
Leak Rate (Helium)	Internal	$\leq 4 \times 10^{-9}$ std cm ³ /s	
	External	$\leq 4 \times 10^{-9}$ std cm ³ /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.



Fittings

Valves

Regulators

Filters

Tubing

Integrated Systems

Other Products

Technical Information

Flow Data

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

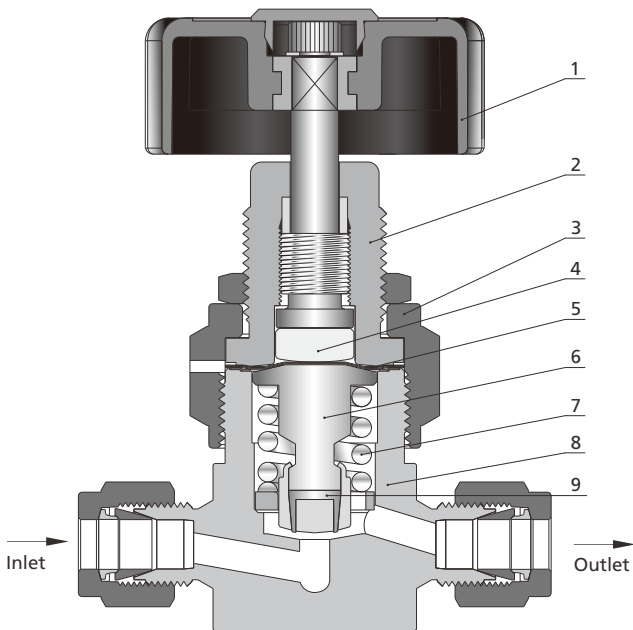
Pressure Drop to Atmosphere psig (bar)	Lever Handle		Round Handle		Pneumatic Actuator	
	Air (l/min)	Water (l/min)	Air (l/min)	Water (l/min)	Air (l/min)	Water (l/min)
10 (0.68)	49	1.6	100	3.5	64	2.4
50 (3.4)	130	3.9	270	8.0	170	5.4
100 (6.8)	240	5.4	490	11.4	300	7.6

Process Specification

Item	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	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

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)

Fittings

Valves

Regulators

Filters

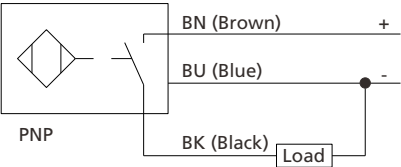
Tubing

Integrated
SystemsOther
ProductsTechnical
Information

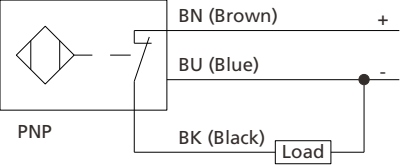
V-53 Diaphragm Valves

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 closed. Conversely, when fitted with normally closed sensors, the sensors transmit signals with indicators illuminated when the valves are open.

Explosion-proof Position Sensors

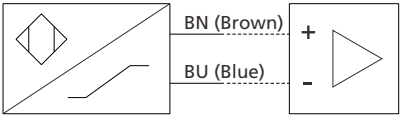
Transmit a signal to an electrical device, indicating the open and closed positions of pneumatically actuated valves.

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

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

Wiring Diagram



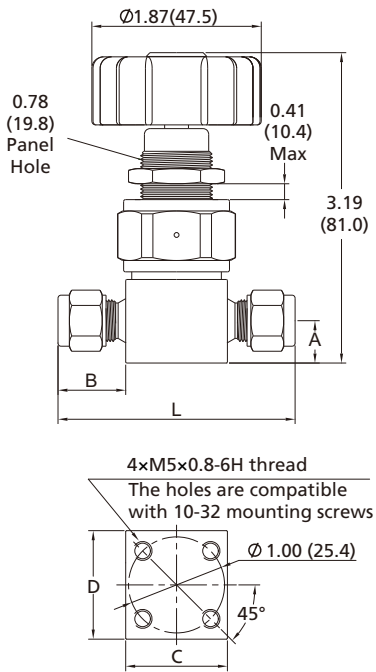
Dimensions and Ordering Information

Straight Type

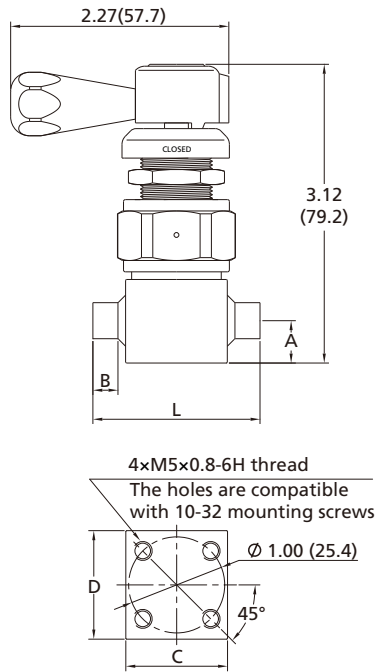
Dimensions

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

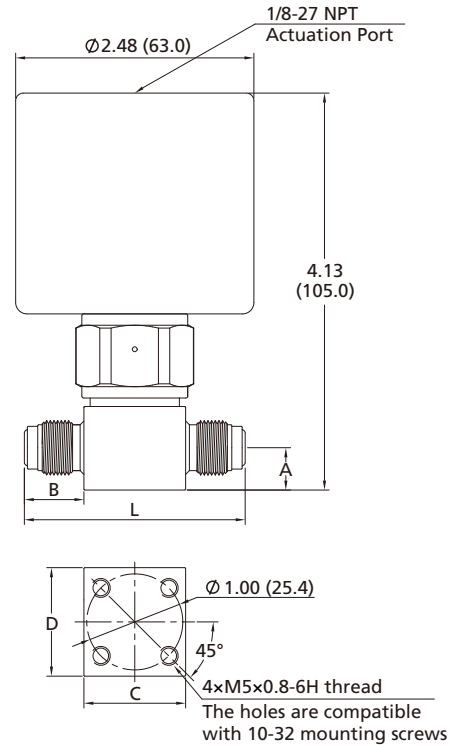
Manual - Round Handle



Manual - Lever Handle



Pneumatic



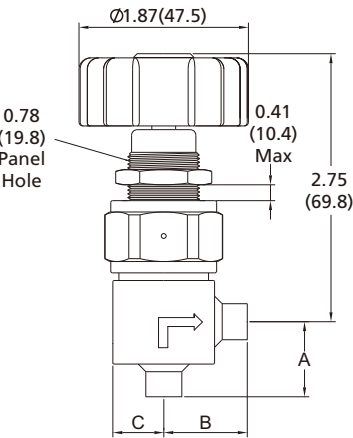
Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	C	D	L
DM□□-FL4-	1/4" FITOK Tube Fitting	0.44 (11.2)	0.69 (17.6)	1.06 (26.9)	1.13 (28.7)	2.47 (62.1)
DM□□-FL6-	3/8" FITOK Tube Fitting		0.76 (19.3)			2.58 (65.5)
DM□□-ML6-	6 mm FITOK Tube Fitting		0.70 (17.9)			2.47 (62.8)
DM□□-ML8-	8 mm FITOK Tube Fitting		0.74 (18.7)			2.53 (64.3)
DM□□-TB4-	1/4" x0.035" Tube Butt Weld		0.30 (7.6)			1.74 (44.2)
DM□□-TB6-	3/8" x0.049" 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 Metal Gasket Face Seal Fitting		0.62 (15.7)			2.30 (58.4)
DM□□-FFR4-	1/4" Rotatable Female FR Metal Gasket Face Seal 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

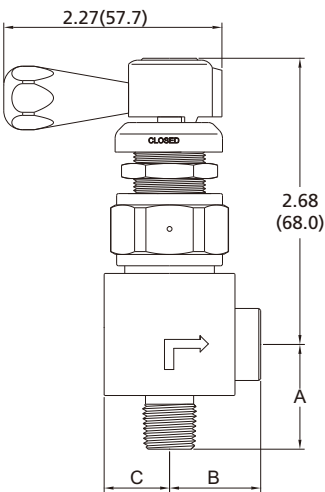
Dimensions

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

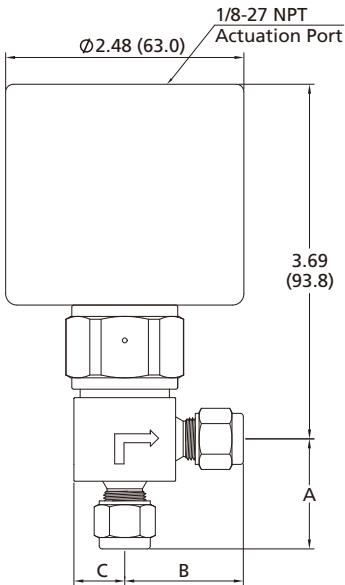
Manual - Round Handlee



Manual - Lever Handle

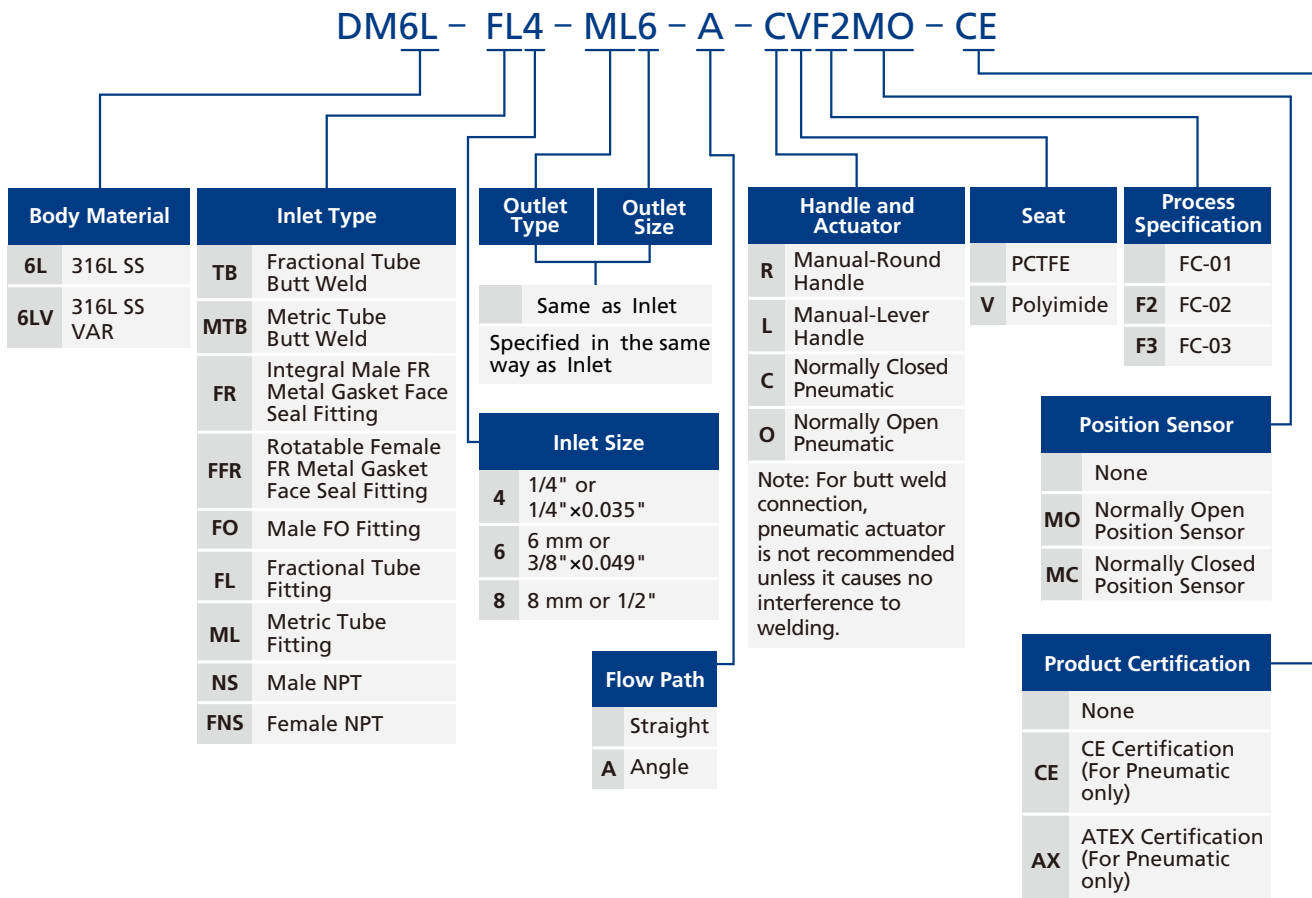


Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)		
		A	B	C
DM□□-FL4-	1/4" FITOK Tube Fitting	1.14 (29.1)	1.23 (31.3)	0.53 (13.4)
DM□□-ML6-	6 mm FITOK Tube Fitting	1.14 (29.1)	1.23 (31.3)	0.53 (13.4)
DM□□-TB6-	3/8"x0.049" Tube Butt Weld	0.78 (19.8)	0.87 (22.0)	0.53 (13.4)
DM□□-NS4-FNS4	Inlet 1/4" Male NPT	1.09 (27.7)	0.95 (24.1)	0.68 (17.3)
	Outlet 1/4" Female NPT			

Ordering Number Description



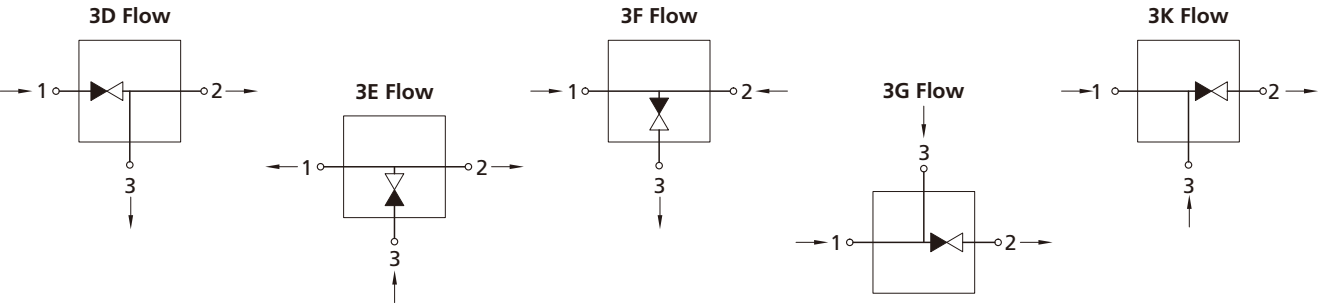
Notes:

- "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

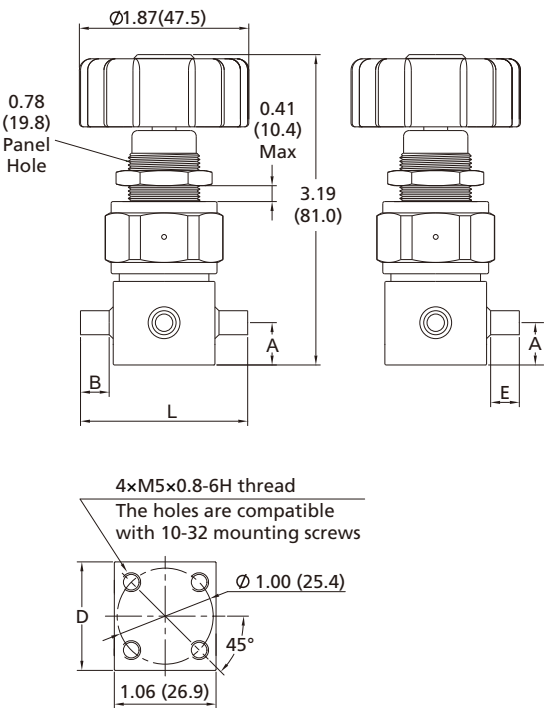
☉ Flow paths as viewed from the top



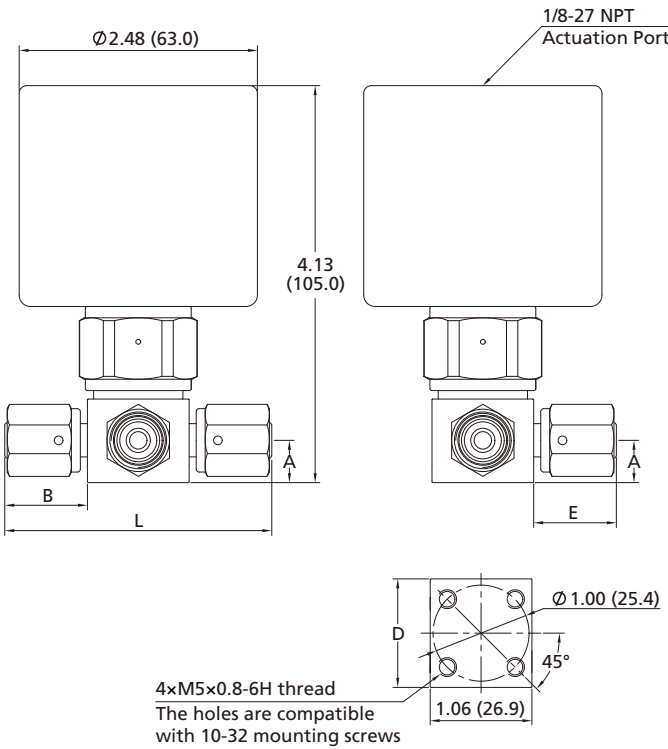
Dimensions

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

Manual - Round Handle

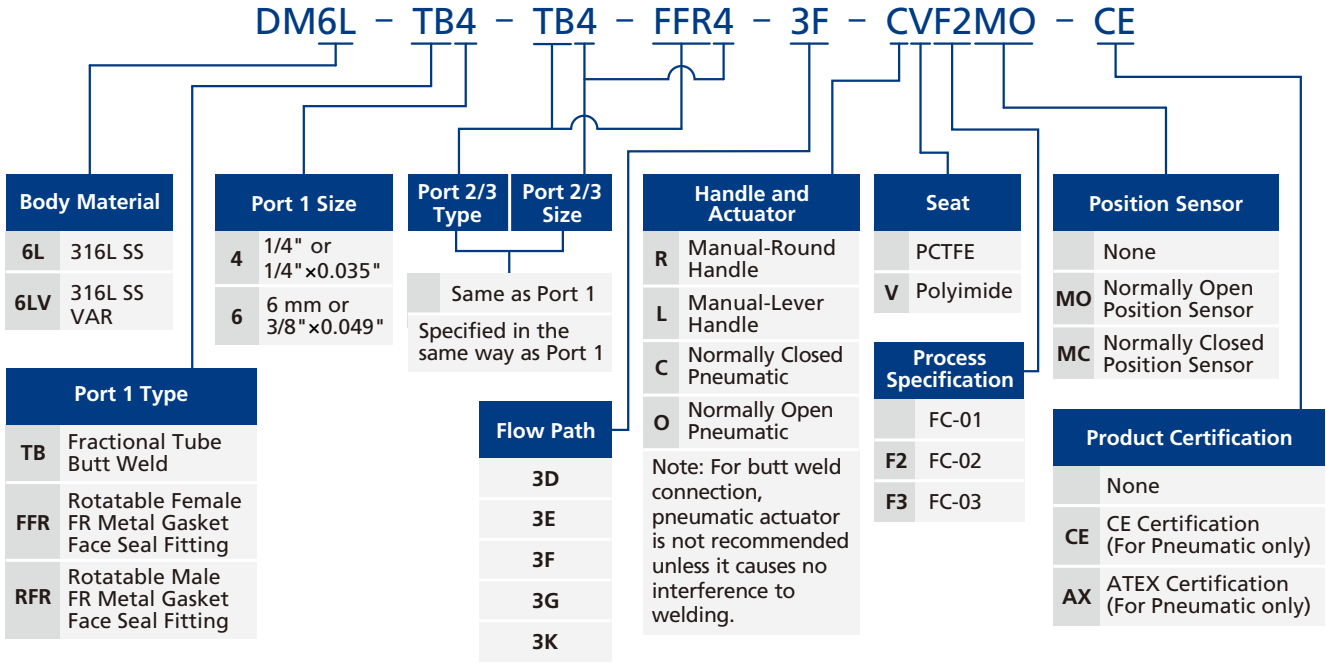


Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	D	E	L
DM□□-TB4-	1/4" x 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□□-MTB6-	3/8" x 0.049" Tube Butt Weld	0.44 (11.2)	0.30 (7.6)	1.13 (28.7)	0.30 (7.6)	1.74 (44.2)
DM□□-FFR4-	1/4" Rotatable Female FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.85 (21.6)	1.13 (28.7)	0.85 (21.6)	2.76 (70.1)
DM□□-RFR4-	1/4" Rotatable Male FR Metal Gasket Face Seal Fitting	0.44 (11.2)	1.21 (30.7)	1.13 (28.7)	1.21 (30.7)	3.48 (88.4)

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 Compact Diaphragm Valves

DS Series

Features

DS Series High Pressure Compact Diaphragm Valves are suitable for high purity and ultra high purity applications. Featuring an internally springless flow path, these valves offer high cleanliness. The pneumatically actuated valves are small in size, making them ideal for use on compact equipment. Additionally, the manual valves boast a pressure rating of up to 4500 psig.

Features

- ⦿ Reduced inner volume
- ⦿ Minimized number of components
- ⦿ Manual and pneumatic actuators available
- ⦿ Aluminum piston to increase operation speed



Technical Data

Port Size		1/4" to 3/8" or 6 mm to 8 mm
Flow Coefficient (Cv)		0.17
Orifice Size		0.12 in. (3.0 mm)
Max. Working Pressure	Manual	4500 psig (310 bar)
	Pneumatic	3000 psig (207 bar)
Pneumatic Actuator Operating Pressure		60 to 90 psig (4.2 to 6.2 bar)
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 ³ /s
	External	$\leq 1 \times 10^{-9}$ std cm ³ /s

Flow Data

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

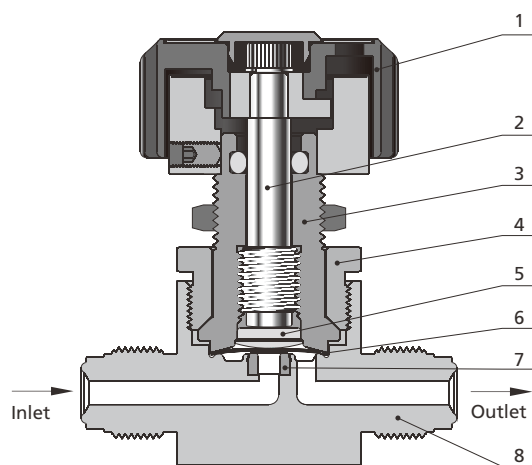
Pressure Drop to Atmosphere psig (bar)	Air (l/min)	Water (l/min)
10 (0.68)	55	1.9
50 (3.4)	150	4.5
100 (6.8)	260	6.4

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	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



Manual Model

Item	Component	Material/Specification
1	Handle	ABS
2	Stem	316 SS/ASTM A479
3	Bonnet	S17400/ASTM A564
4	Bonnet Nut	316 SS/ASTM A479
5	Button	316 SS/ASTM A479
6	Diaphragm (5)	Cobalt Alloy (3) /AMS 5876 + C17200 (2) /ASTM B194
7	Seat	PCTFE/ASTM D1430 or Polyimide
8	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

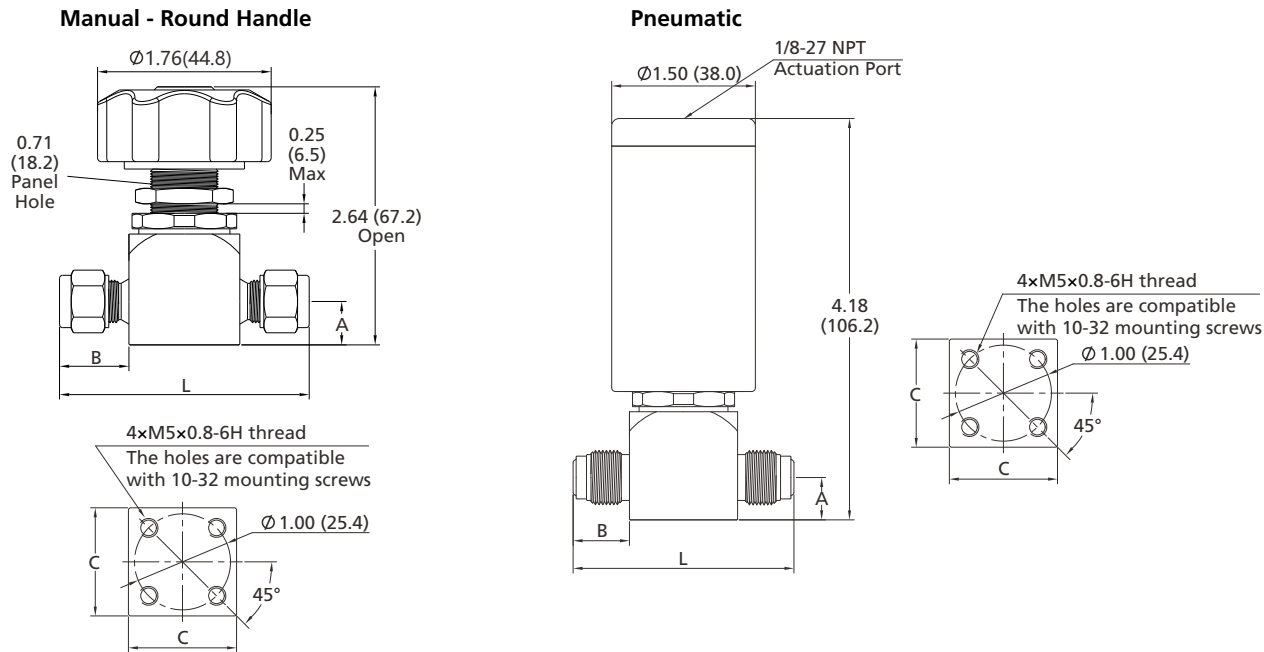


Dimensions and Ordering Information

Straight Type

Dimensions

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



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)			
		A	B	C	L
DS□□-TB4-	1/4" 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 Metal Gasket Face Seal Fitting		0.86 (21.8)		2.85 (72.3)
DS□□-FR4-	1/4" Integral Male FR Metal Gasket Face Seal 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 - RVF2 - CE

Body Material	
6L	316L SS
6LV	316L SS VAR

Inlet Type	
TB	Fractional Tube Butt Weld
MTB	Metric Tube Butt Weld
FR	Integral Male FR Metal Gasket Face Seal Fitting
FFR	Rotatable Female FR Metal Gasket Face Seal Fitting
FL	Fractional Tube Fitting
ML	Metric Tube Fitting
NS	Male NPT
FNS	Female NPT

Outlet Type	Outlet Size
	Same as Inlet
	Specified in the same way as Inlet

Inlet Size	
4	1/4" or 1/4" x 0.035"
6	6 mm
8	8 mm

Actuator Type	
R	Manual-Round Handle
C	Normally Closed Pneumatic
O	Normally Open Pneumatic

Seat	
	PCTFE
V	Polyimide

Process Specification	
	FC-01
F2	FC-02
F3	FC-03

Product Certification	
	None
CE	CE Certification (For Pneumatic only)

Note:

1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

2. For -CE selections, products have "CE" lettering.

2-Valve 3-Way Block Type

Flow Paths

The diagrams illustrate the flow paths for a 2-Valve 3-Way Block Type valve in five different configurations:

- VT Flow:** Port 1 is the inlet, port 2 is the outlet, and port 3 is the vent. Valve V1 is open, and valve V2 is closed.
- WT Flow:** Port 1 is the inlet, port 2 is the outlet, and port 3 is the vent. Valve V1 is closed, and valve V2 is open.
- VF Flow:** Port 1 is the inlet, port 2 is the outlet, and port 3 is the vent. Valve V1 is open, and valve V2 is closed.
- WF Flow:** Port 1 is the inlet, port 2 is the outlet, and port 3 is the vent. Valve V1 is closed, and valve V2 is open.
- VB Flow:** Port 1 is the inlet, port 2 is the outlet, and port 3 is the vent. Valve V1 is open, and valve V2 is closed.

FITOK

V-63 Diaphragm Valves

Dimensions

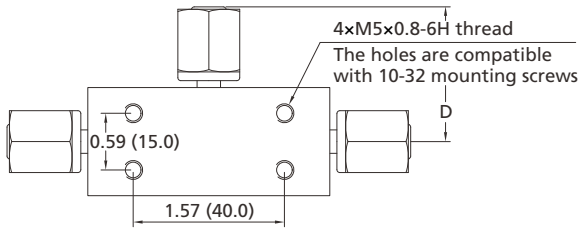
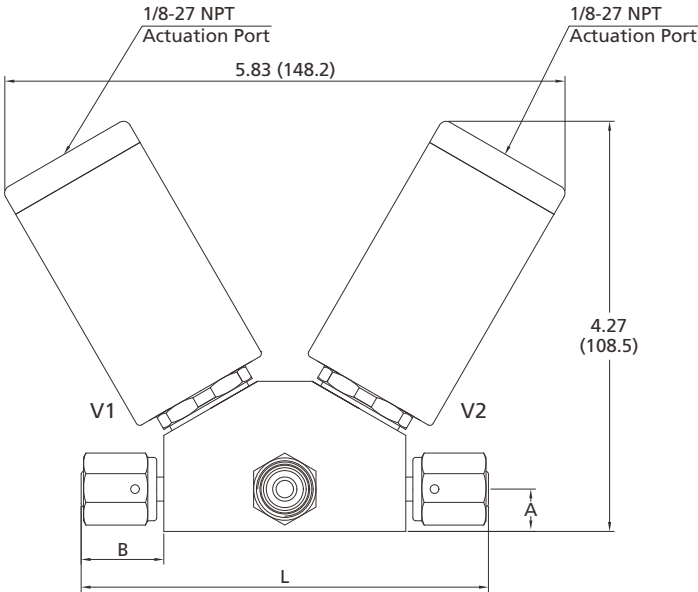
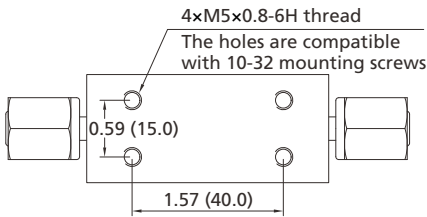
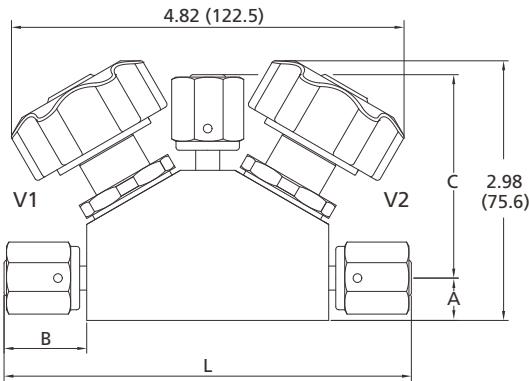
Dimensions, in inches (millimeters), are for reference only.

Fittings
Valves
Regulators
Filters
Tubing
Integrated Systems
Other Products
Technical Information



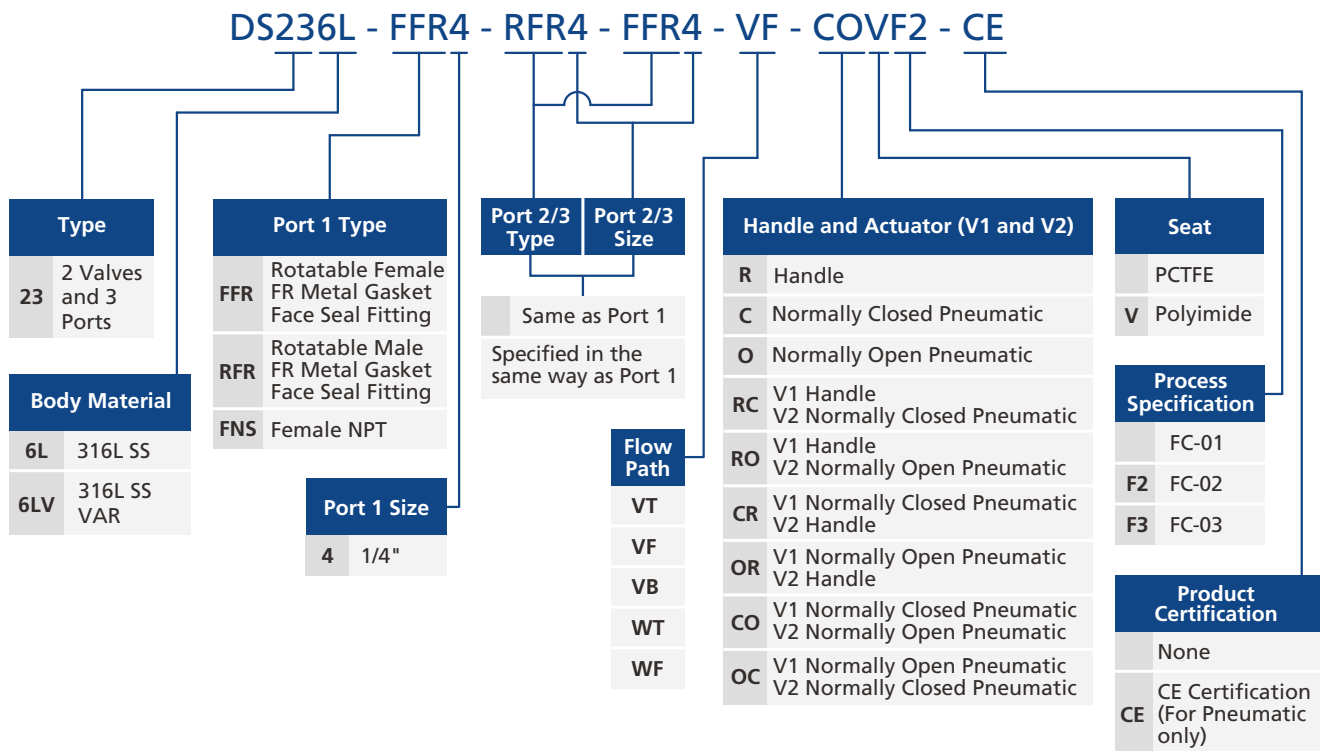
Manual - Round Handle

Pneumatic



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

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.
- For -CE selections, products have "CE" lettering.

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



Technical Data

Port Size	3/8" to 1/2" or 10 mm to 12 mm	
Flow Coefficient (Cv)	0.70	
Orifice Size	0.31 in. (7.9 mm)	
Max. Working Pressure	145 psig (10 bar)	
Pneumatic Actuator Operating Pressure	60 to 90 psig (4.2 to 6.2 bar)	
Temperature	PCTFE: -10 ~ 176 °F (-23 ~ 80 °C) PFA: -10 ~ 302 °F (-23 ~ 150 °C)	
Leak Rate (Helium)	Internal	≤1×10 ⁻⁹ std cm ³ /s
	External	≤1×10 ⁻⁹ std cm ³ /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

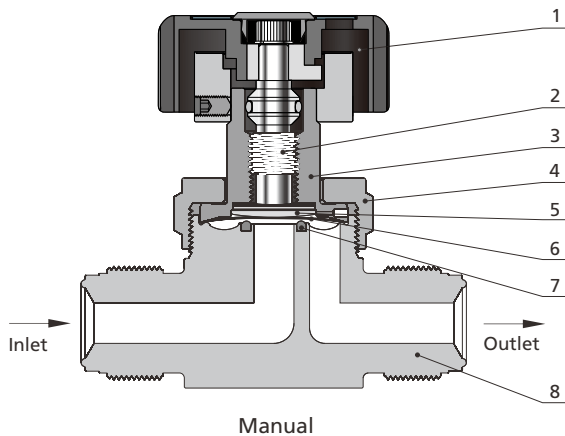
Process Specification

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) ^①	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.

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



Position Sensors

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

Pneumatic

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

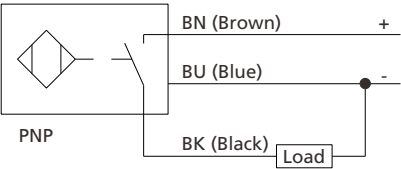


Technical Information

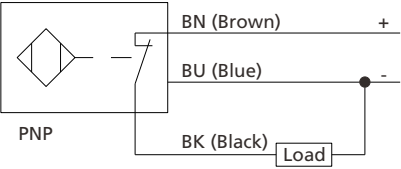
Output	3-wire V (dc), PNP
Output Function	Normally open or normally closed
Voltage	10 ~ 30 V (dc)
Working Temperature	-13 ~ 158 °F (-25 ~ 70 °C)

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

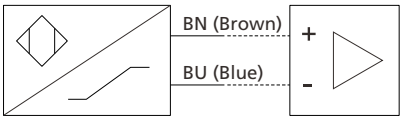
Transmit a signal to an electrical device, indicating the open and closed positions of pneumatically actuated valves.

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

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

Wiring Diagram



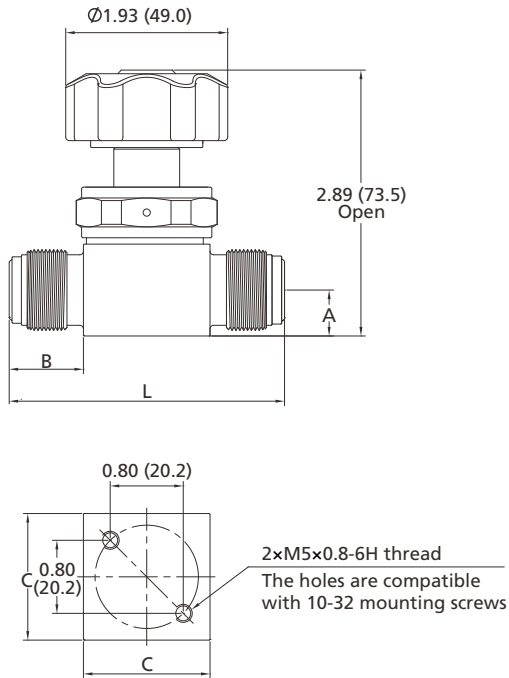
Dimensions and Ordering Information

Straight Type

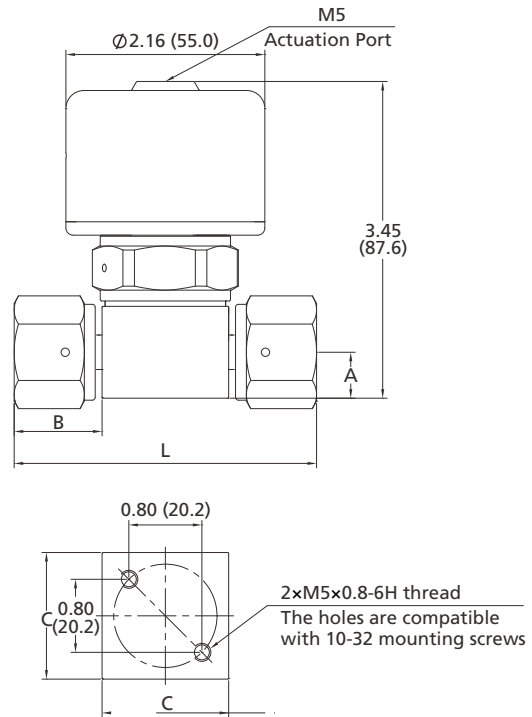
Dimensions

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

Manual - Round Handle

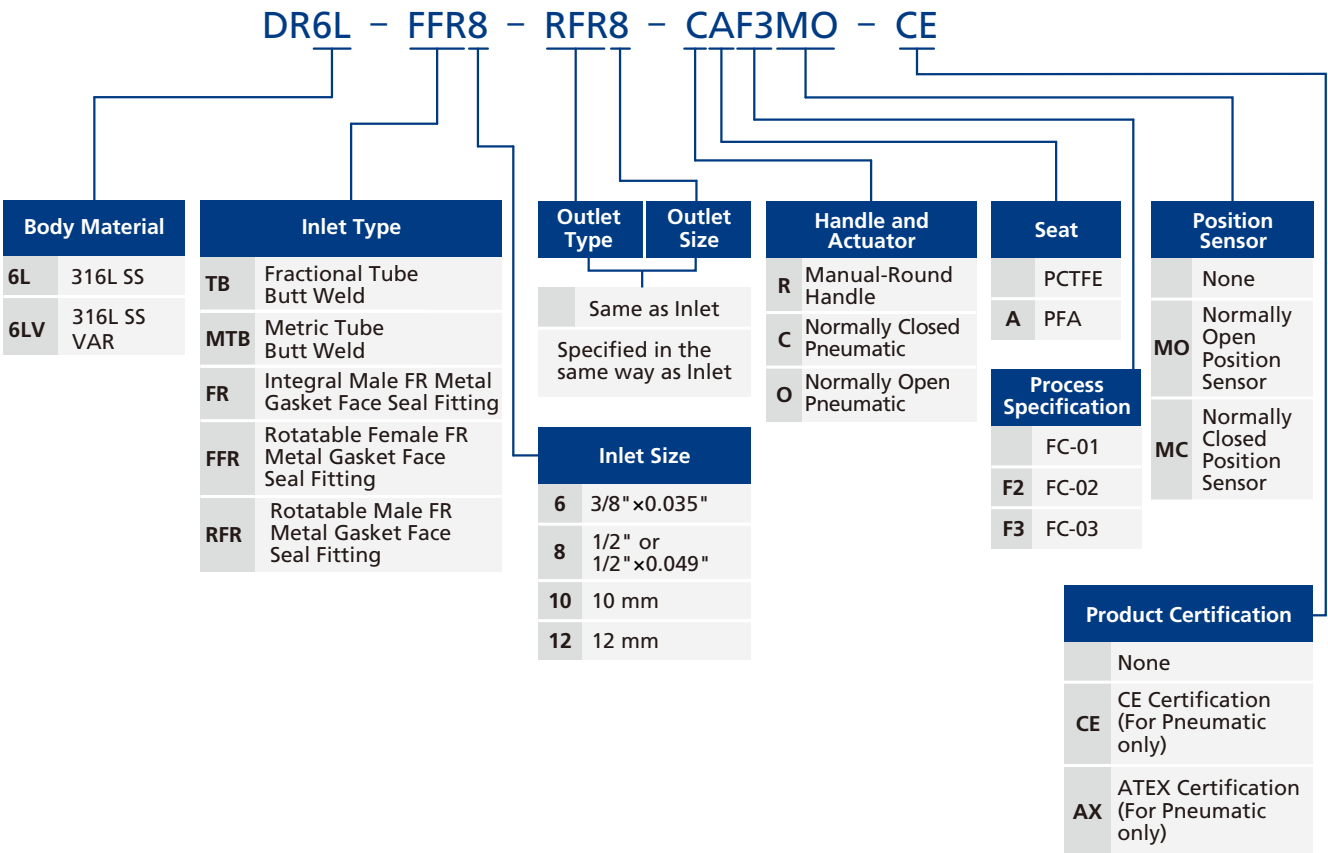


Pneumatic



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

Ordering Number Description



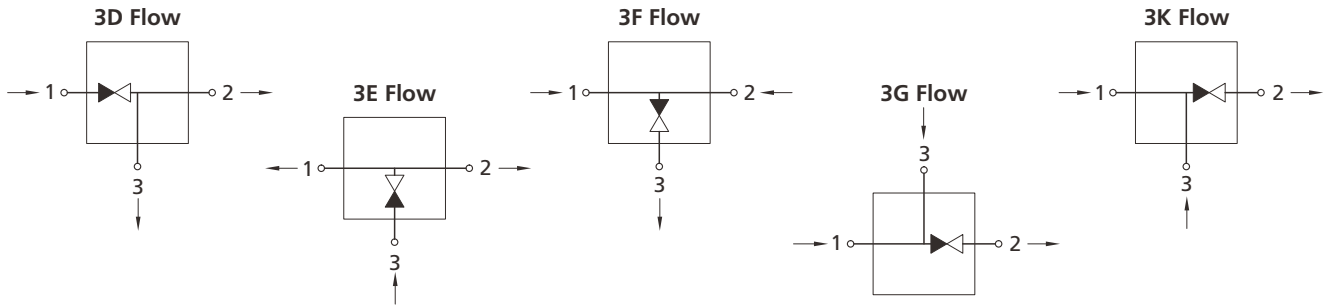
Notes:

- "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

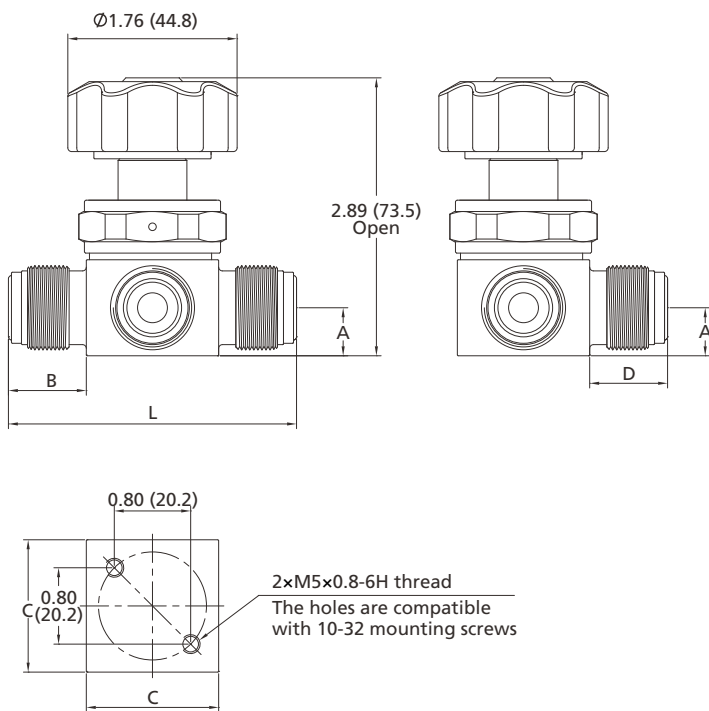
☉ Flow paths as viewed from the top



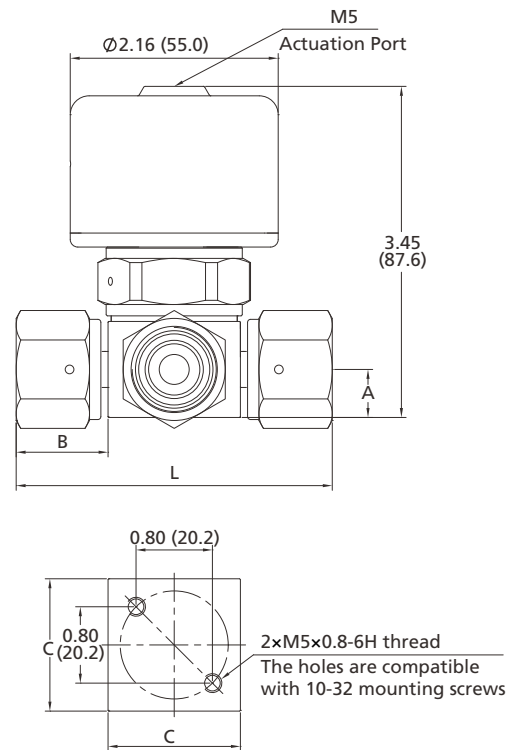
Dimensions

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

Manual - Round Handle

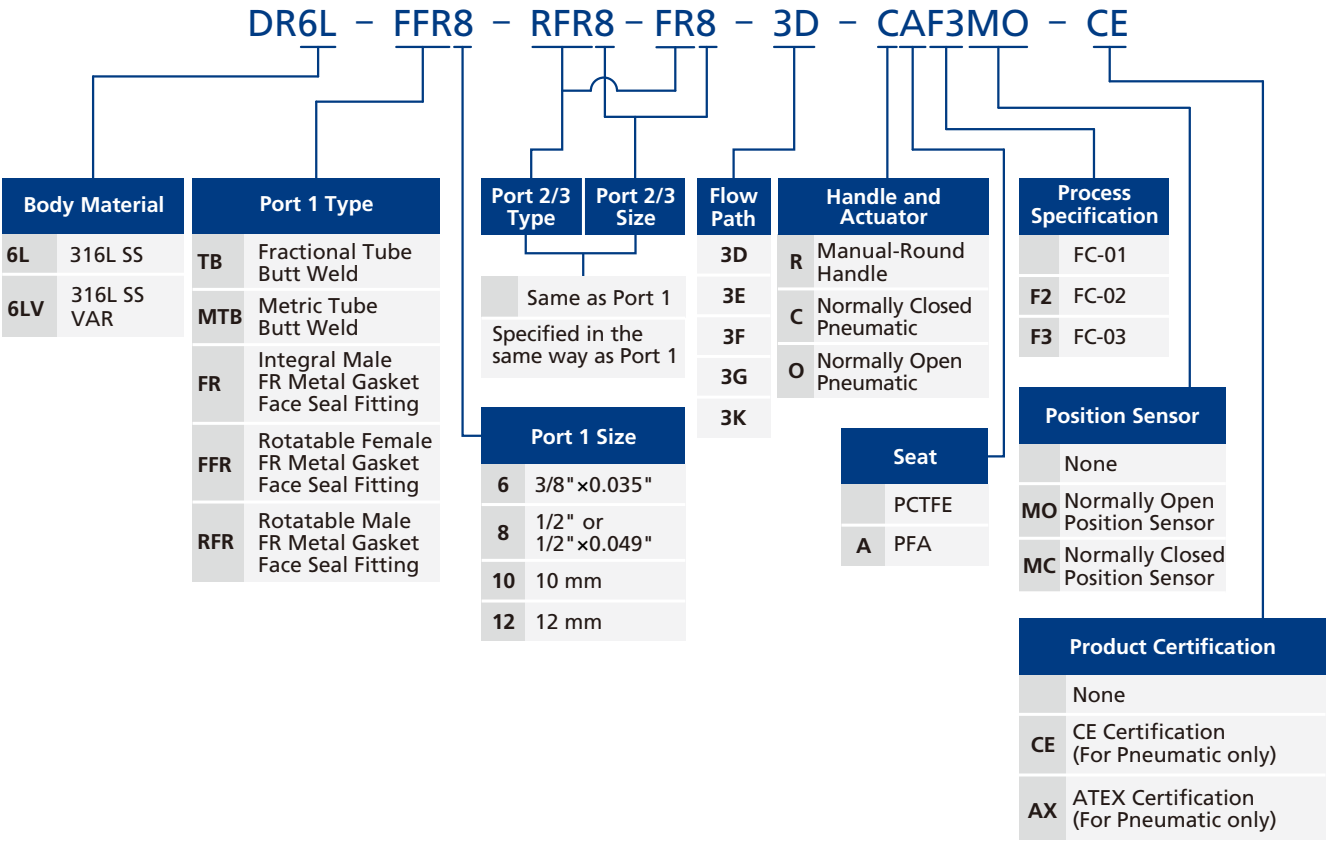


Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)				
		A	B	C	D	L
DR□□-TB6-	3/8"×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"×0.049" Tube Butt Weld	0.50 (12.7)	0.67 (17.0)	1.38 (35.0)	0.67 (17.0)	2.72 (69.0)
DR□□-FFR8-	1/2" Rotatable Female FR Metal Gasket Face Seal Fitting	0.50 (12.7)	0.94 (24.0)	1.38 (35.0)	0.94 (24.0)	3.27 (83.0)
DR□□-RFR8-	1/2" Rotatable Male FR Metal Gasket Face Seal Fitting	0.50 (12.7)	1.34 (34.0)	1.38 (35.0)	1.34 (34.0)	4.05 (103.0)
DR□□-FR8-	1/2" Integral Male FR Metal Gasket Face Seal Fitting	0.50 (12.7)	0.81 (20.6)	1.38 (35.0)	0.81 (20.6)	3.00 (76.2)

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/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

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)
Max. Working Pressure	Manual	300 psig (20.7 bar)	
	Pneumatic	145 psig (10 bar)	
Pneumatic Actuator Operating Pressure			60 to 90 psig (4.2 to 6.2 bar)
Temperature			PCTFE: -10 ~ 150 °F (-23 ~ 65 °C) Polyimide: -10 ~ 250 °F (-23 ~ 121 °C)
Leak Rate (Helium)	Internal	$\leq 1 \times 10^{-9}$ std cm ³ /s	
	External	$\leq 1 \times 10^{-9}$ std cm ³ /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	316L SS, F316L SS, 316L SS VAR
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.



Fittings

Valves

Regulators

Filters

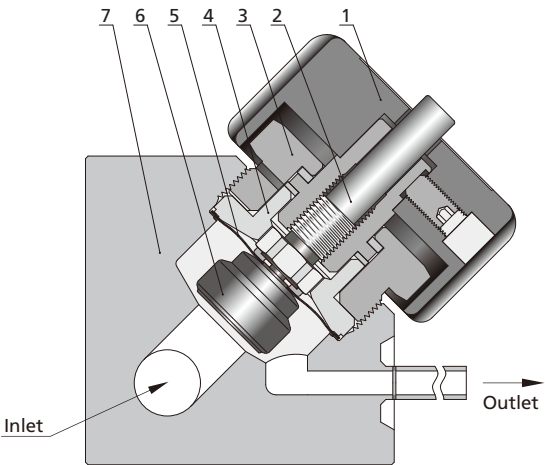
Tubing

Integrated Systems

Other Products

Technical Information

Major Materials of Construction



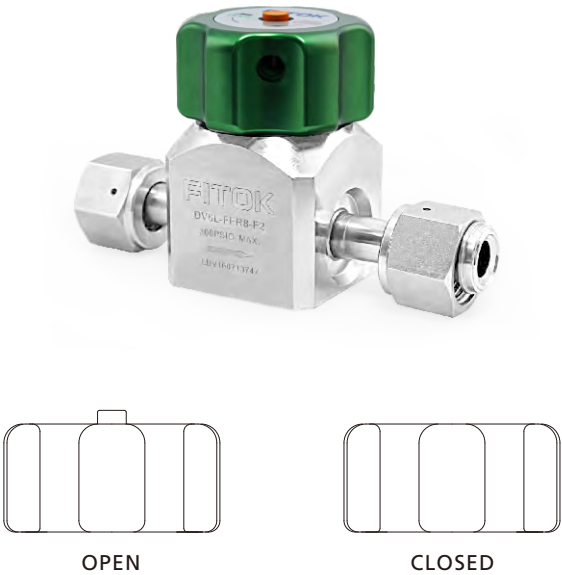
Manual Actuation - Branch Type

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



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 - Lockout Handle

- Lockable in the closed position



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

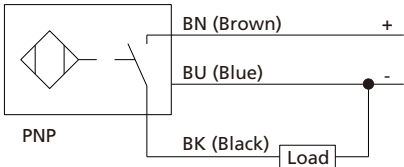
Note: Position sensors are applicable only to normally closed pneumatically actuated valves.

Technical Information

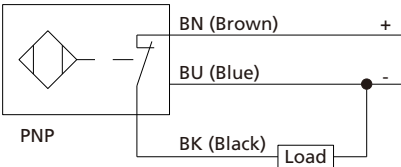
Output	3-wire V (dc), PNP
Output Function	Normally open or normally closed
Voltage	10 ~ 30 V (dc)
Working Temperature	-13 ~ 158 °F (-25 ~ 70 °C)

Wiring Diagram

Normally open position sensors



Normally closed position sensors



Notes: 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

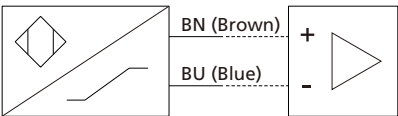
Transmit a signal to an electrical device, indicating the open and closed positions of pneumatically actuated valves.

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

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

Wiring Diagram



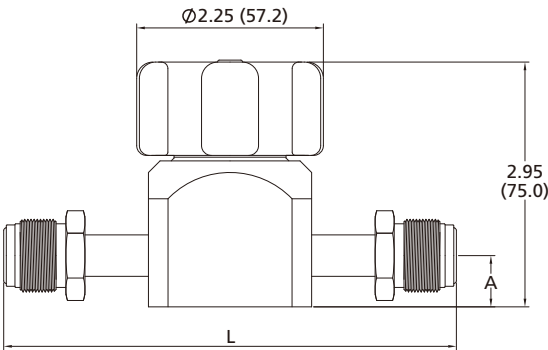
Dimensions and Ordering Information

Straight Type

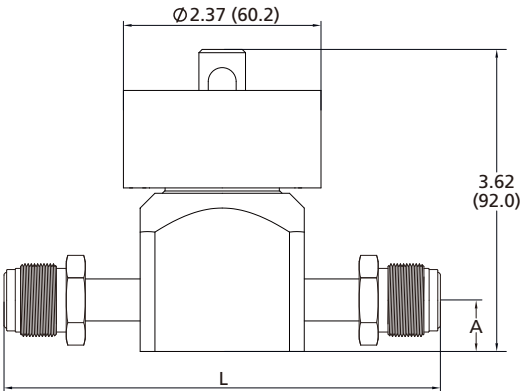
Dimensions

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

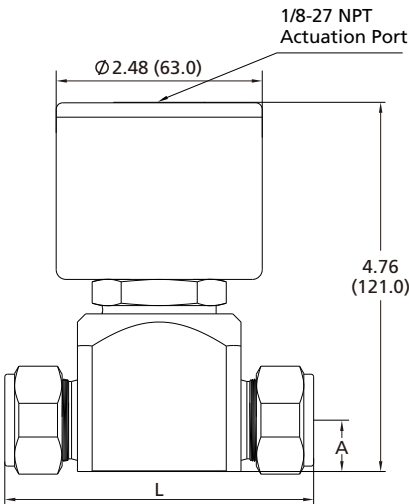
Manual - Round Handle



Manual - Lockout Handle



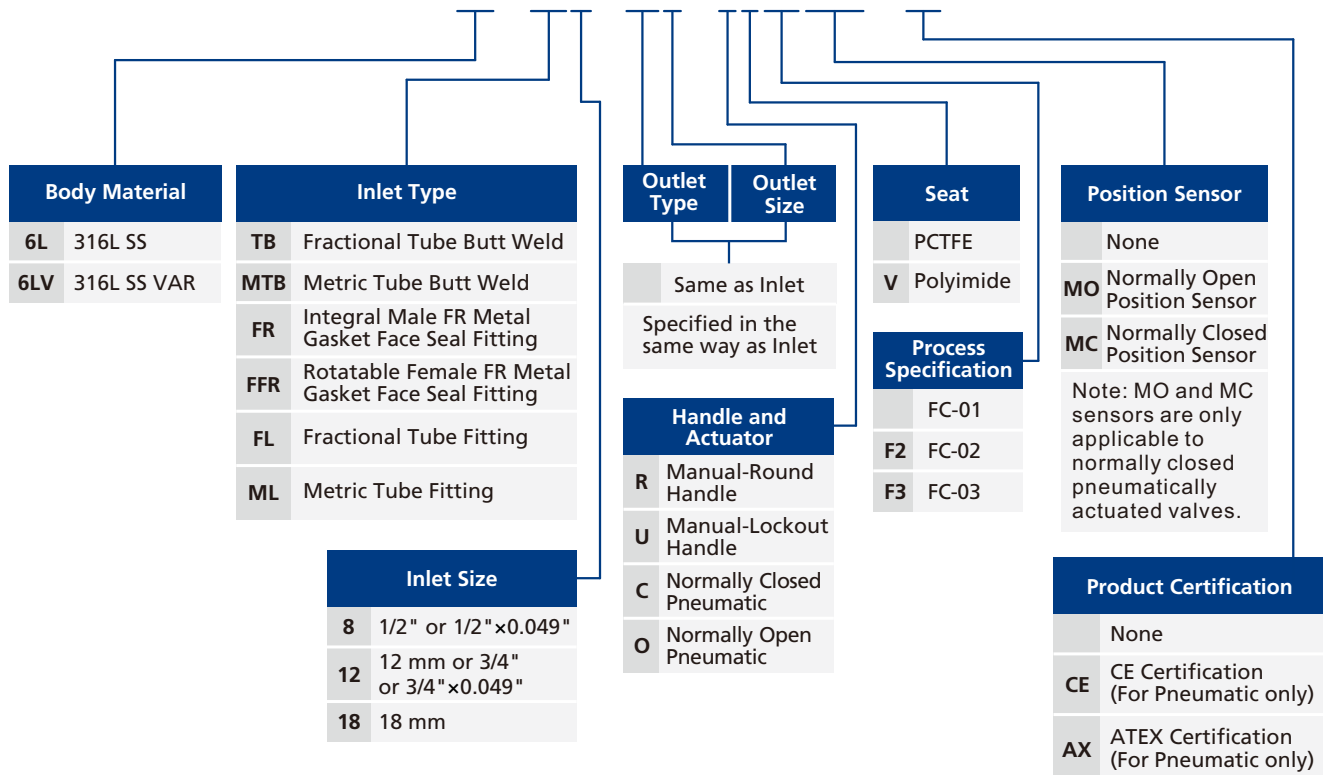
Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)	
		A	L
DV□□-TB8-	1/2" x 0.049" Tube Butt Weld	0.62 (15.7)	5.91 (150.0)
DV□□-TB12-	3/4" x 0.049" Tube Butt Weld		
DV□□-FR8-	1/2" Integral Male FR Metal Gasket Face Seal Fitting		5.47 (138.9)
DV□□-FFR8-	1/2" Rotatable Female FR Metal Gasket Face Seal Fitting		
DV□□-FL8-	1/2" FITOK Tube Fitting		3.71 (94.2)
DV□□-FL12-	3/4" FITOK Tube Fitting		3.72 (94.4)

Ordering Number Description

DV6L - FR8 - FL8 - CVF2MO - CE



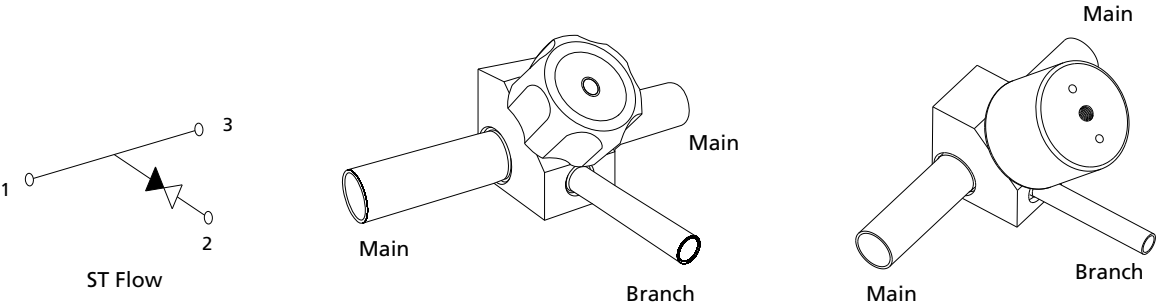
Notes:

- "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.

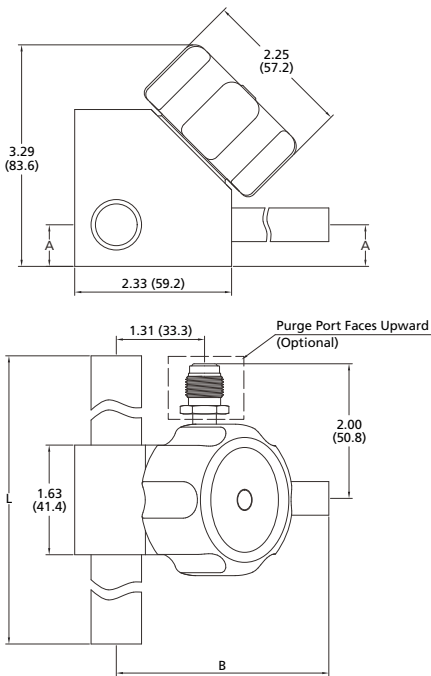
Branch Type

Dimensions

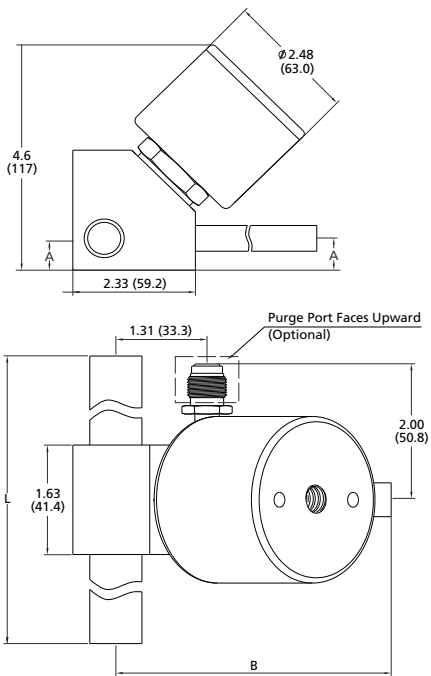
Dimensions, in inches (millimeters), are for reference only.



Manual-Round Handle



Pneumatic

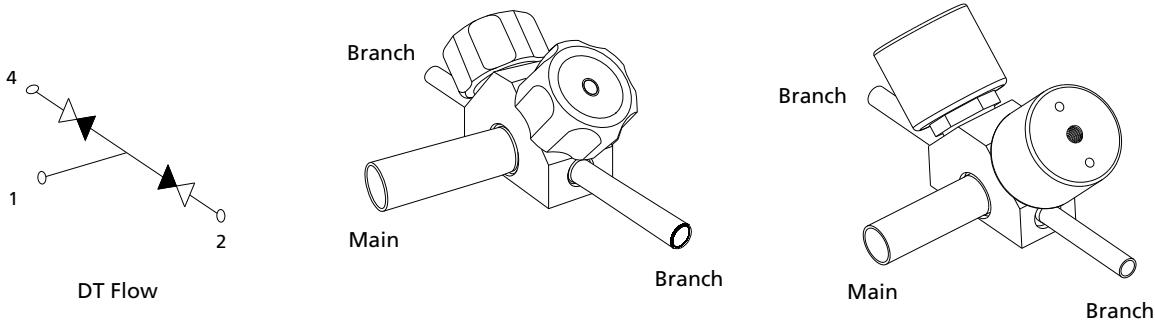


Basic Ordering Number	Connection Type and Size		Dimensions in. (mm)		
	Main	Branch	A	B	L
DV□□-TB8-TB4-	1/2"×0.049" Tube Butt Weld	1/4"×0.035" Tube Butt Weld	0.62 (15.7)	4.69 (119.0)	7.58 (193.0)
DV□□-TB8-TB8-	1/2"×0.049" Tube Butt Weld	1/2"×0.049" Tube Butt Weld			
DV□□-TB8-RFR4-	1/2"×0.049" Tube Butt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

Branch Type

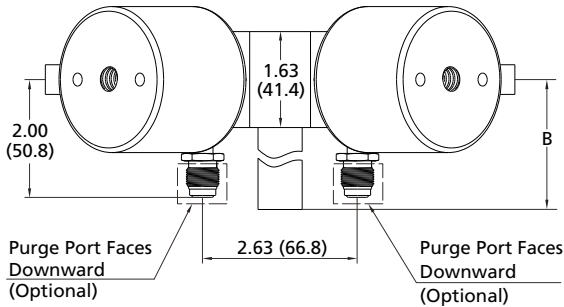
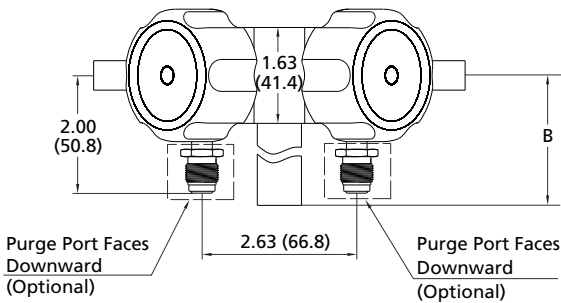
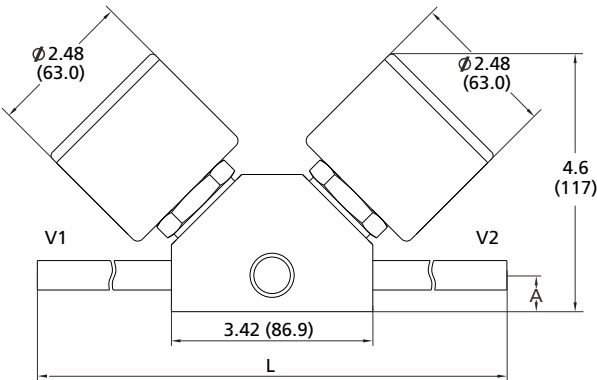
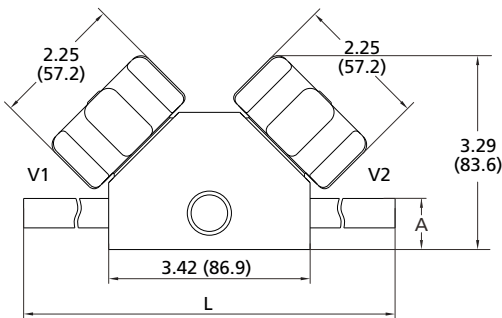
Dimensions

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



Manual-Round Handle

Pneumatic

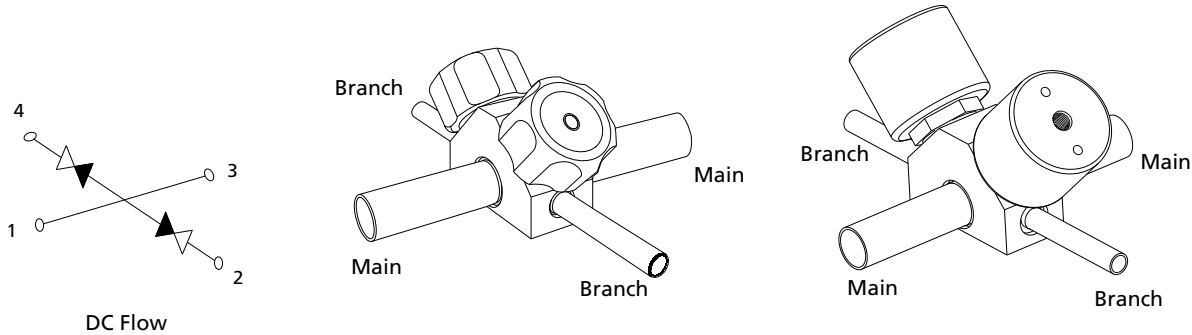


Basic Ordering Number	Connection Type and Size		Dimensions in. (mm)		
	Main	Branch	A	B	L
DV□□-TB12-TB8-	3/4" x 0.049" Tube Butt Weld	1/2" x 0.049" Tube Butt Weld	0.62 (15.7)	3.79 (96.3)	9.38 (238.0)
DV□□-TB12-RFR8-	3/4" x 0.049" Tube Butt Weld	1/2" Rotatable Male FR Metal Gasket Face Seal Fitting			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

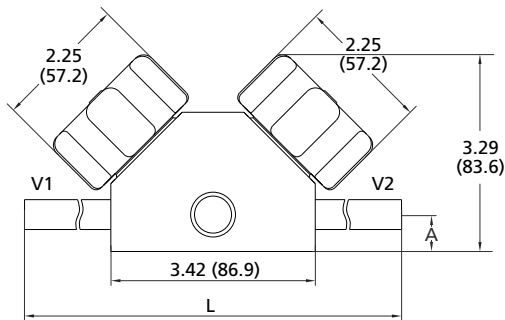
Branch Type

Dimensions

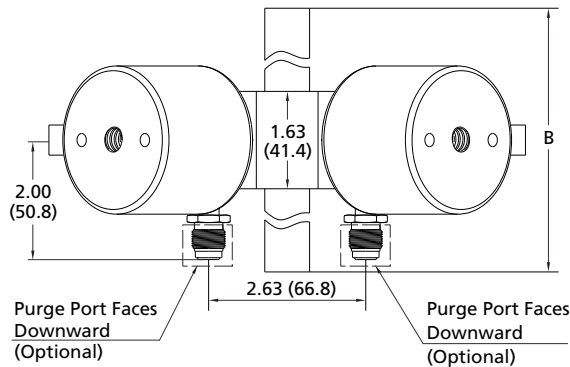
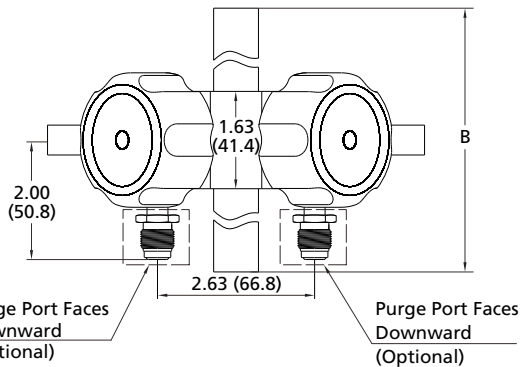
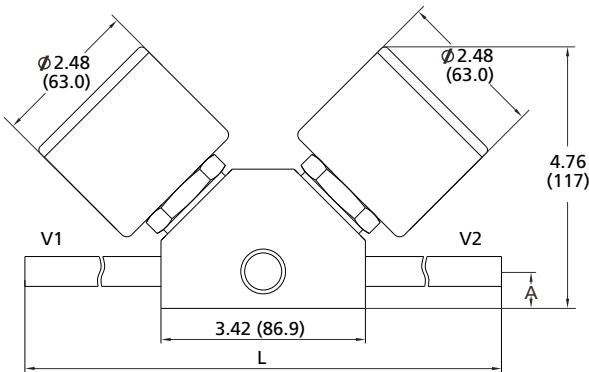
Dimensions, in inches (millimeters), are for reference only.



Manual-Round Handle

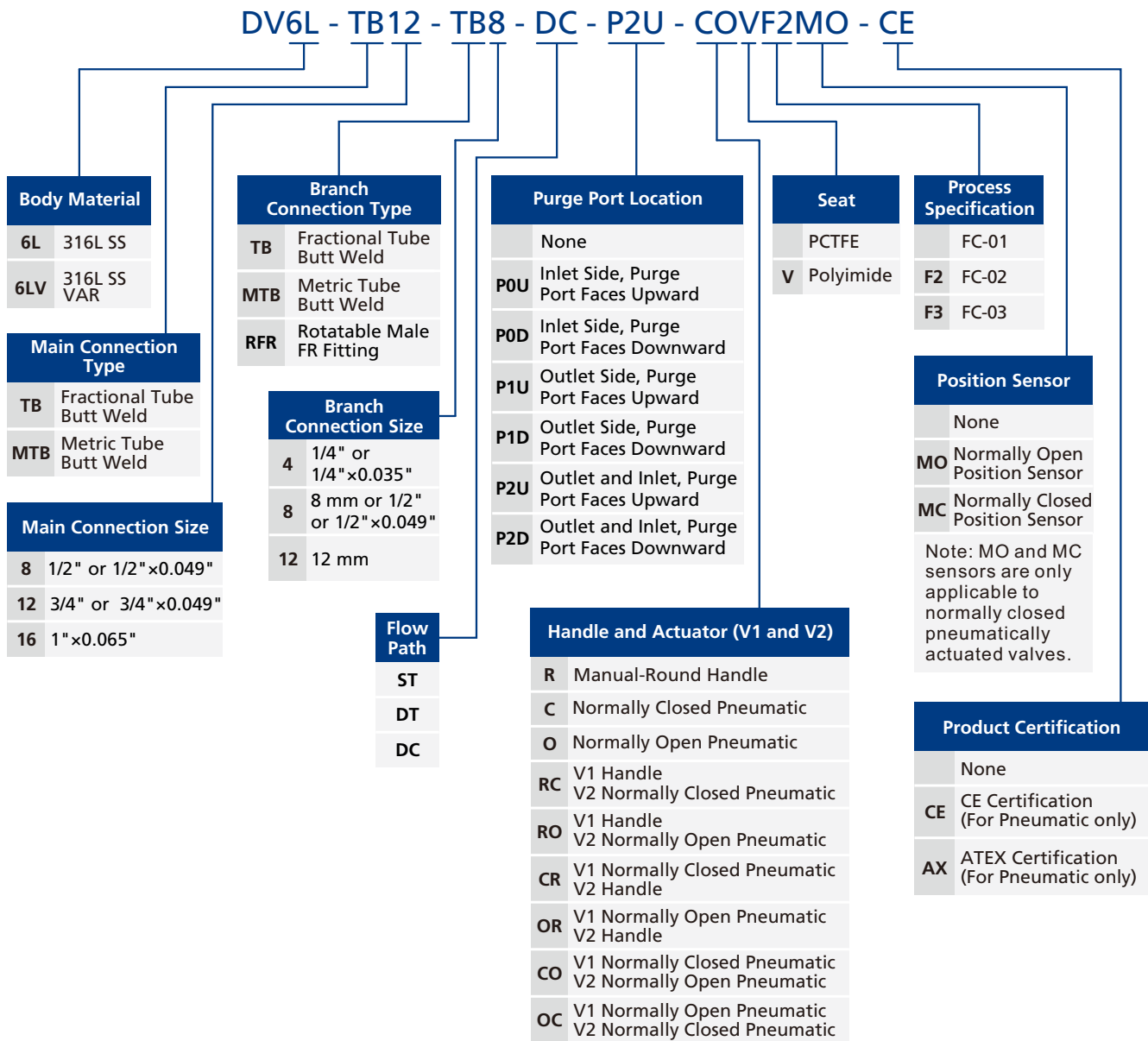


Pneumatic



Basic Ordering Number	Connection Type and Size		Dimensions in. (mm)		
	Main	Branch	A	B	L
DV□□-TB8-TB8-	1/2"×0.049" Tube Butt Weld	1/2"×0.049" Tube Butt Weld	0.62 (15.7)	7.58 (193.0)	9.38 (238.0)
DV□□-TB8-RFR8-	1/2"×0.049" Tube Butt Weld	1/2" Rotatable Male FR Metal Gasket Face Seal Fitting			
DV□□-TB12-TB8-	3/4"×0.049" Tube Butt Weld	1/2"×0.049" Tube Butt Weld			
DV□□-TB12-RFR8-	3/4"×0.049" Tube Butt Weld	1/2" Rotatable Male FR Metal Gasket Face Seal Fitting			
DV□□-TB16-TB8-	1"×0.065" Tube Butt Weld	1/2"×0.049" Tube Butt Weld			
DV□□-TB16-RFR8-	1"×0.065" Tube Butt Weld	1/2" Rotatable Male FR Metal Gasket Face Seal 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.
- 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)
Max. Working Pressure		300 psig (20.7 bar)
Pneumatic Actuator Operating Pressure		80 to 95 psig (5.5 to 6.5 bar)
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 ³ /s
	External	$\leq 1 \times 10^{-9}$ std cm ³ /s

Flow Data

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

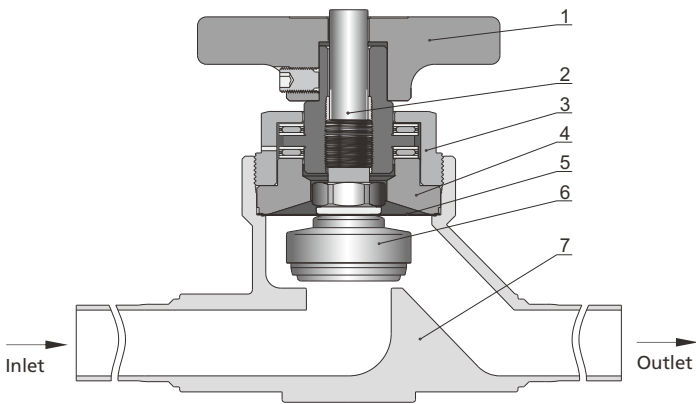
Pressure Drop to Atmosphere psig (bar)	Air (l/min)	Water (l/min)
10(0.68)	3900	150
50(3.4)	11000	340
100(6.8)	19500	490

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.

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

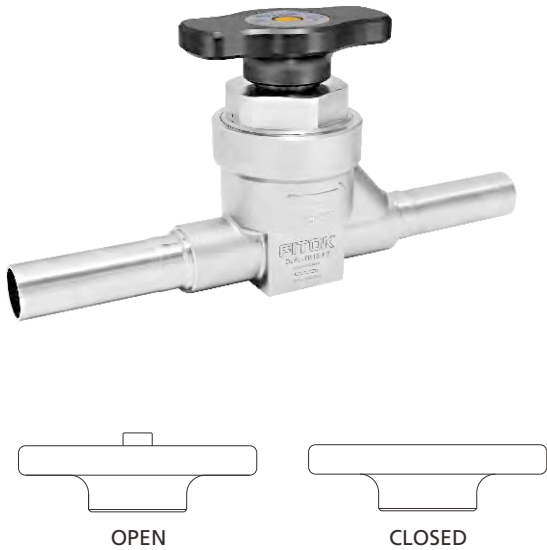
Handles and Actuators

Handle

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

Pneumatic

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



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



Fittings
Valves
Regulators
Filters
Tubing
Integrated Systems
Other Products
Technical Information

Position Sensors

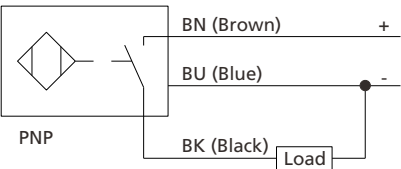
Transmit a signal to an electrical device indicating the open and closed position of pneumatically actuated valves

Technical Information

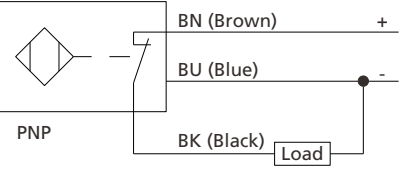
Output	3-wire V (dc), PNP
Output Function	Normally open or normally closed
Voltage	10 ~ 30 V (dc)
Working Temperature	-13 ~ 158 °F (-25 ~ 70 °C)

Wiring Diagram

Normally open position sensors



Normally closed position sensors



Notes: 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

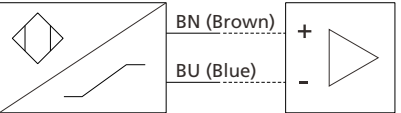
Transmit a signal to an electrical device, indicating the open and closed positions of pneumatically actuated valves.

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

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

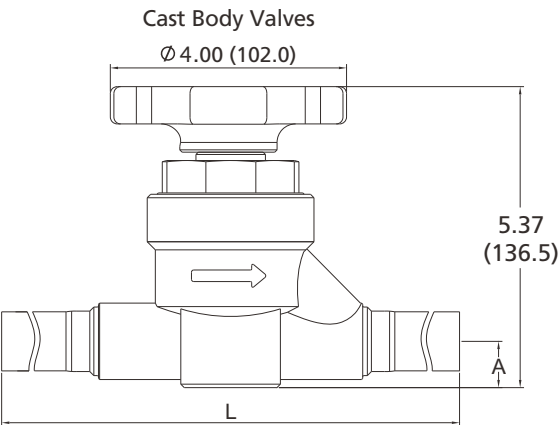
Wiring Diagram



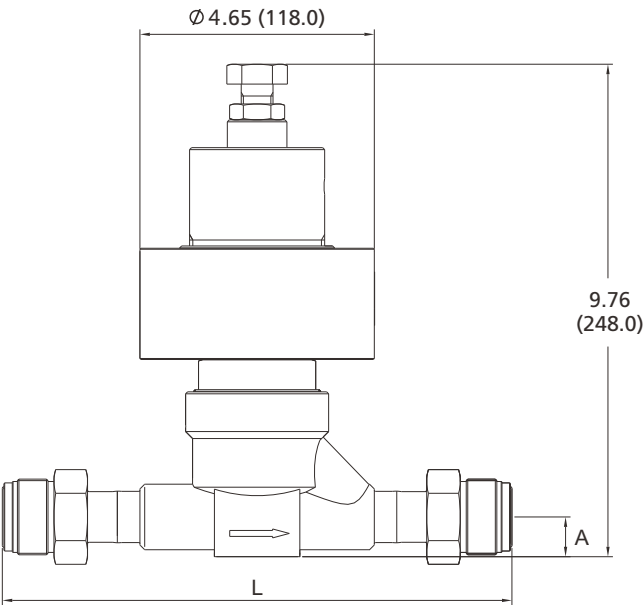
Dimensions

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

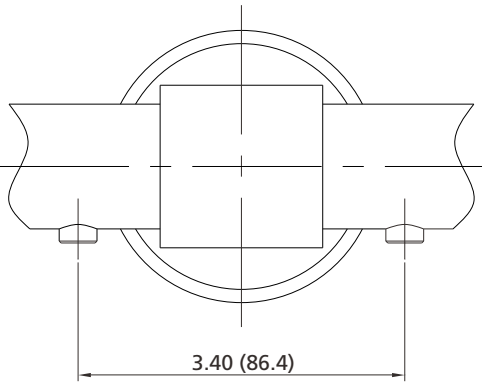
Manual - Round Handle



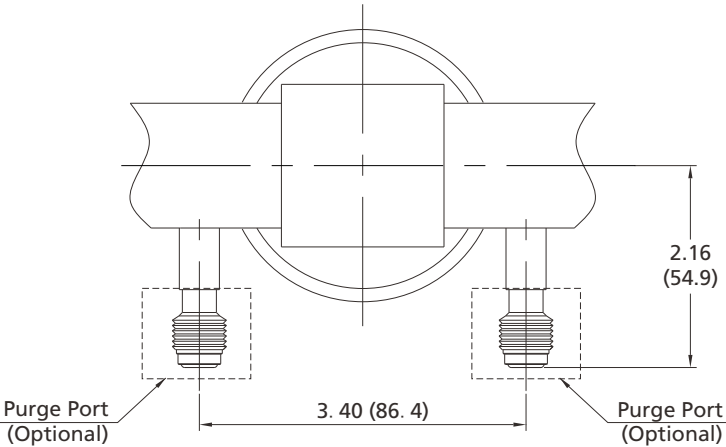
Pneumatic



No Purge Ports



1/4" Integral Male FR Metal Gasket Face Seal Fitting

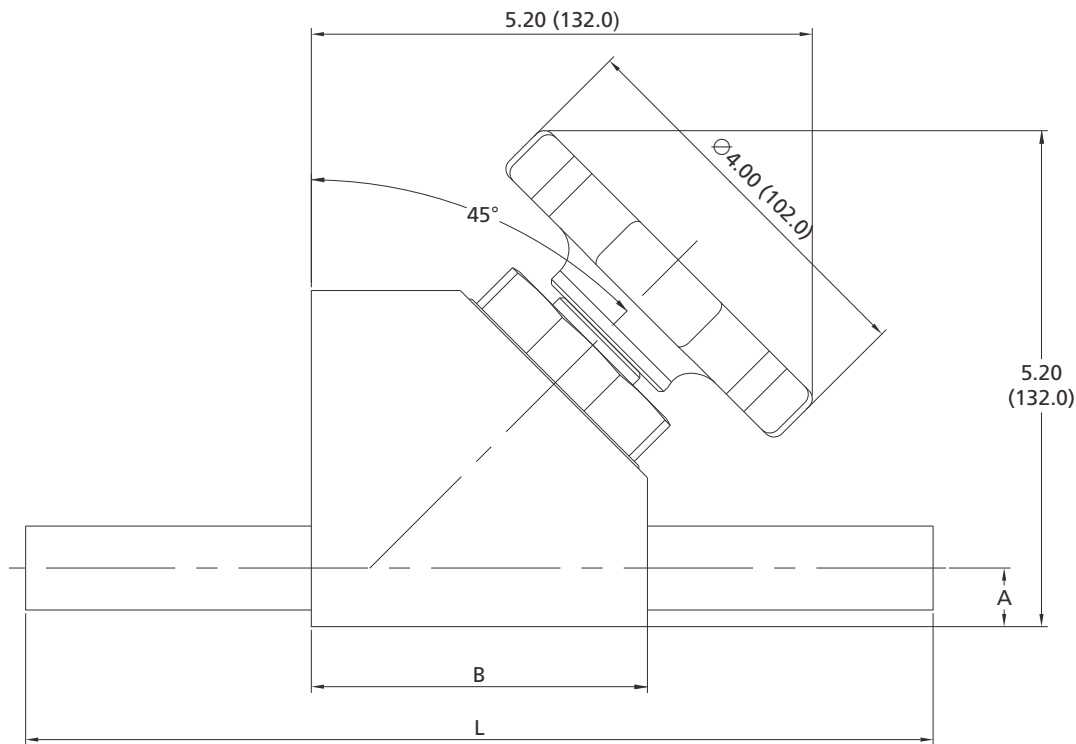


Basic Ordering Number	End Connections		Dimensions, in. (mm)	
	Type	Size	A	L
DL6L-FL12-	FITOK Tube Fitting	3/4"	0.79 (20.0)	8.27 (210.0)
DL6L-FL16-		1"		8.46 (215.0)
DL6L-ML25-		25 mm		8.63 (219.0)
DL6L-TB16-	Fractional Tube Butt Weld	1"×0.065"		10.90 (277.0)
DL6L-MTB23-	Metric Tube Butt Weld	23×1.5 mm		
DL6L-MTB25-		25×1.5 mm		
DL6L-FR16-	Integral Male FR Metal Gasket Face Seal Fitting	1"		10.04 (255.0)

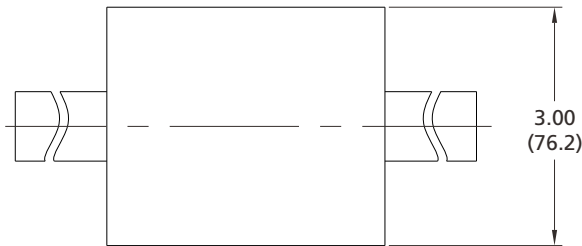
Fittings
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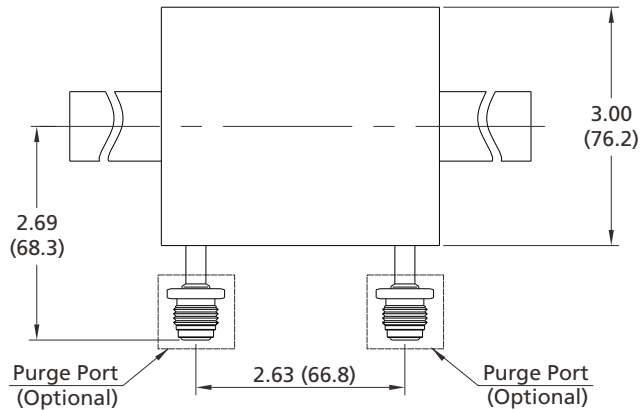
Bar Stock Valves



No purge ports

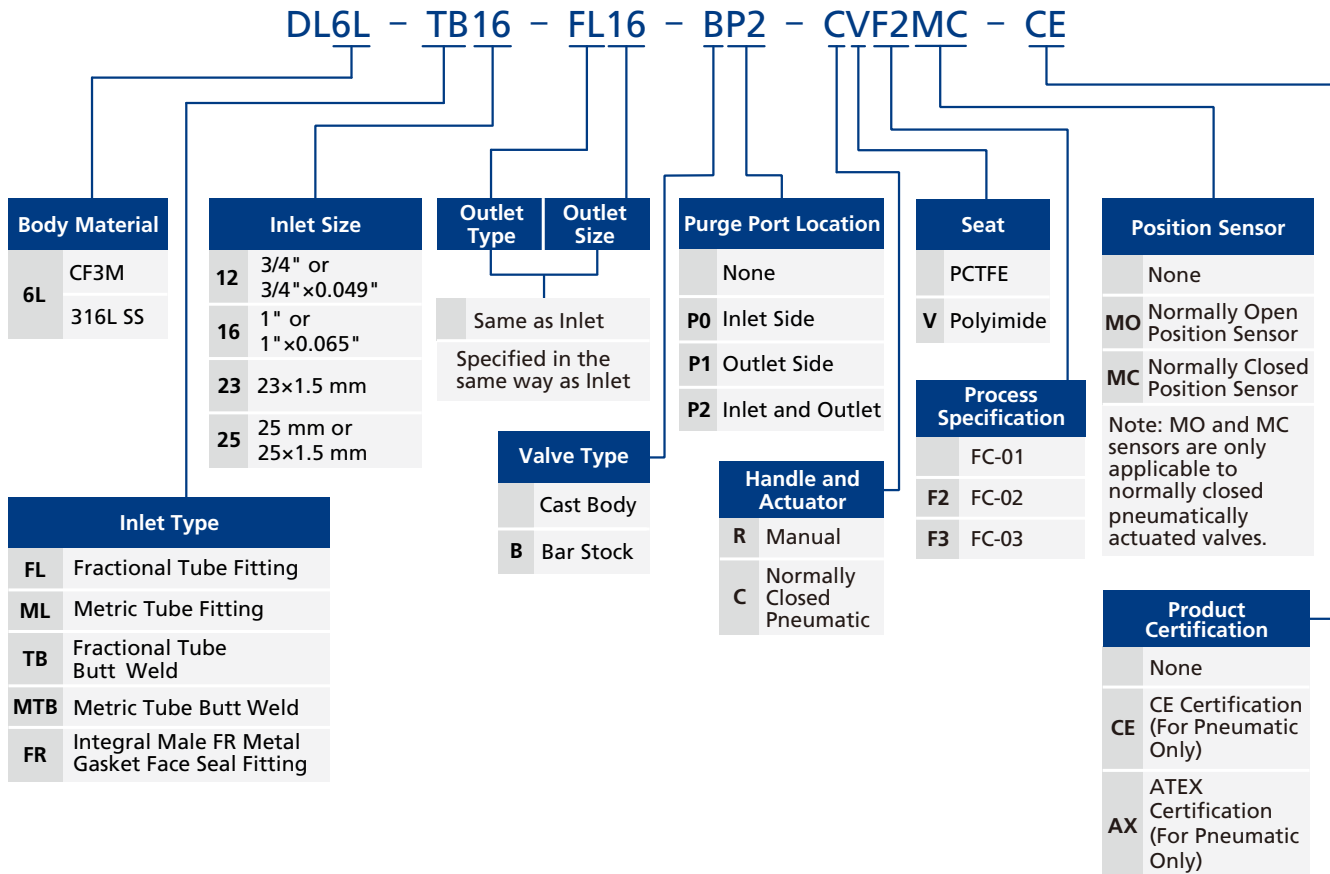


1/4" Rotatable Male FR Metal Gasket Face Seal Fitting



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

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)
Max. Working Pressure	Handle	3500 psig (241 bar)	
	Pneumatic	3000 psig (207 bar)	
Max. Differential Back Pressure ^①			150 psig (10.3 bar)
Pneumatic Actuator Operating Pressure			60 to 90 psig (4.2 to 6.2 bar)
Temperature			PCTFE: -10 ~ 150 °F (-23 ~ 65 °C) Polyimide: -10 ~ 250 °F (-23 ~ 121 °C)
Leak Rate (Helium)	Internal	≤4×10 ⁻⁹ std cm ³ /s	
	External	≤4×10 ⁻⁹ std cm ³ /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.

Flow Data

Air @ 70 °F (21 °C)

Water @ 60 °F (16 °C)

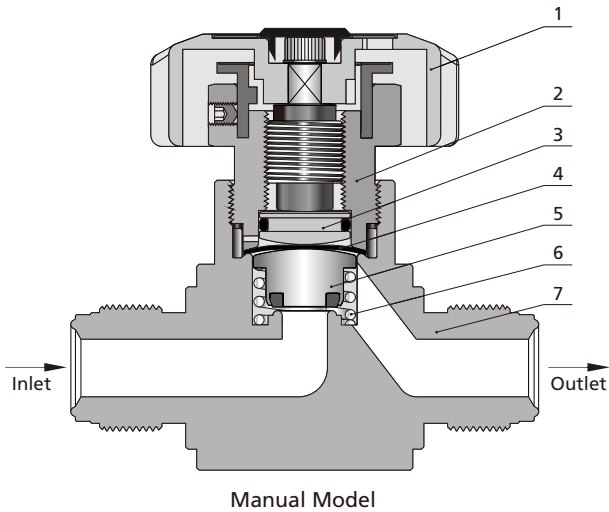
Pressure Drop to Atmosphere psig (bar)	Air (l/min)	Water (l/min)
10 (0.68)	274	9.5
50 (3.4)	733	21.5
100 (6.8)	1300	30.3

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.

Major Materials of Construction



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

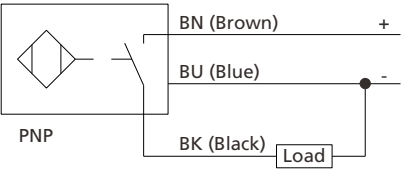
Technical Information

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)

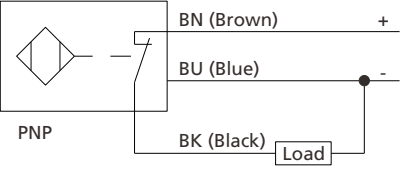
V-89 Diaphragm Valves

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 closed. Conversely, when fitted with normally closed sensors, the sensors transmit signals with indicators illuminated when the valves are open.

Explosion-proof Position Sensors

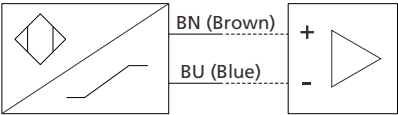
Transmit a signal to an electrical device, indicating the open and closed positions of pneumatically actuated valves.

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

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

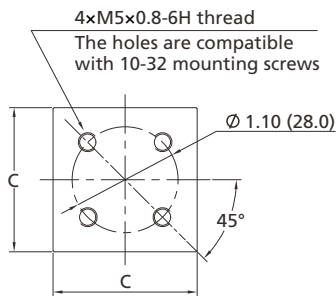
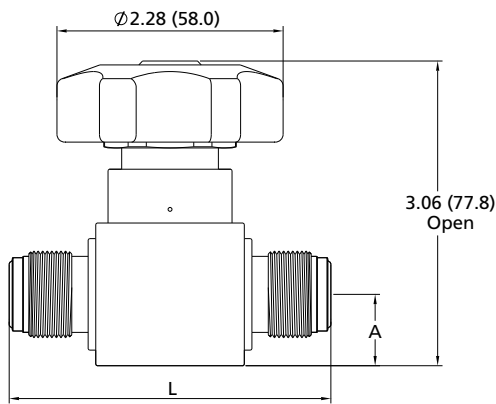
Wiring Diagram



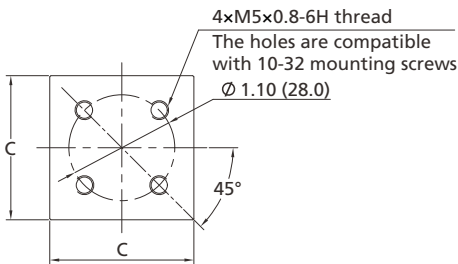
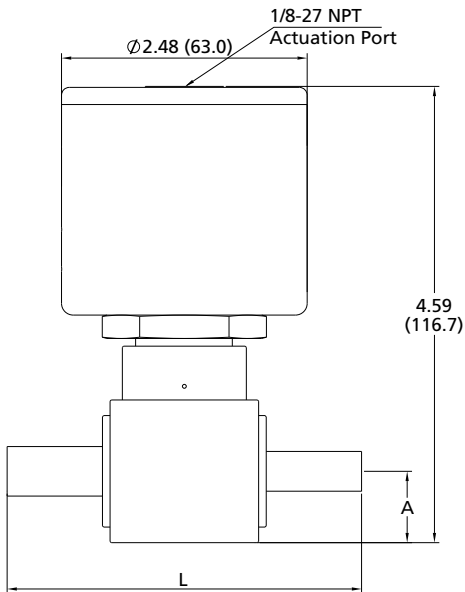
Dimensions

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

Manual - Round Handle



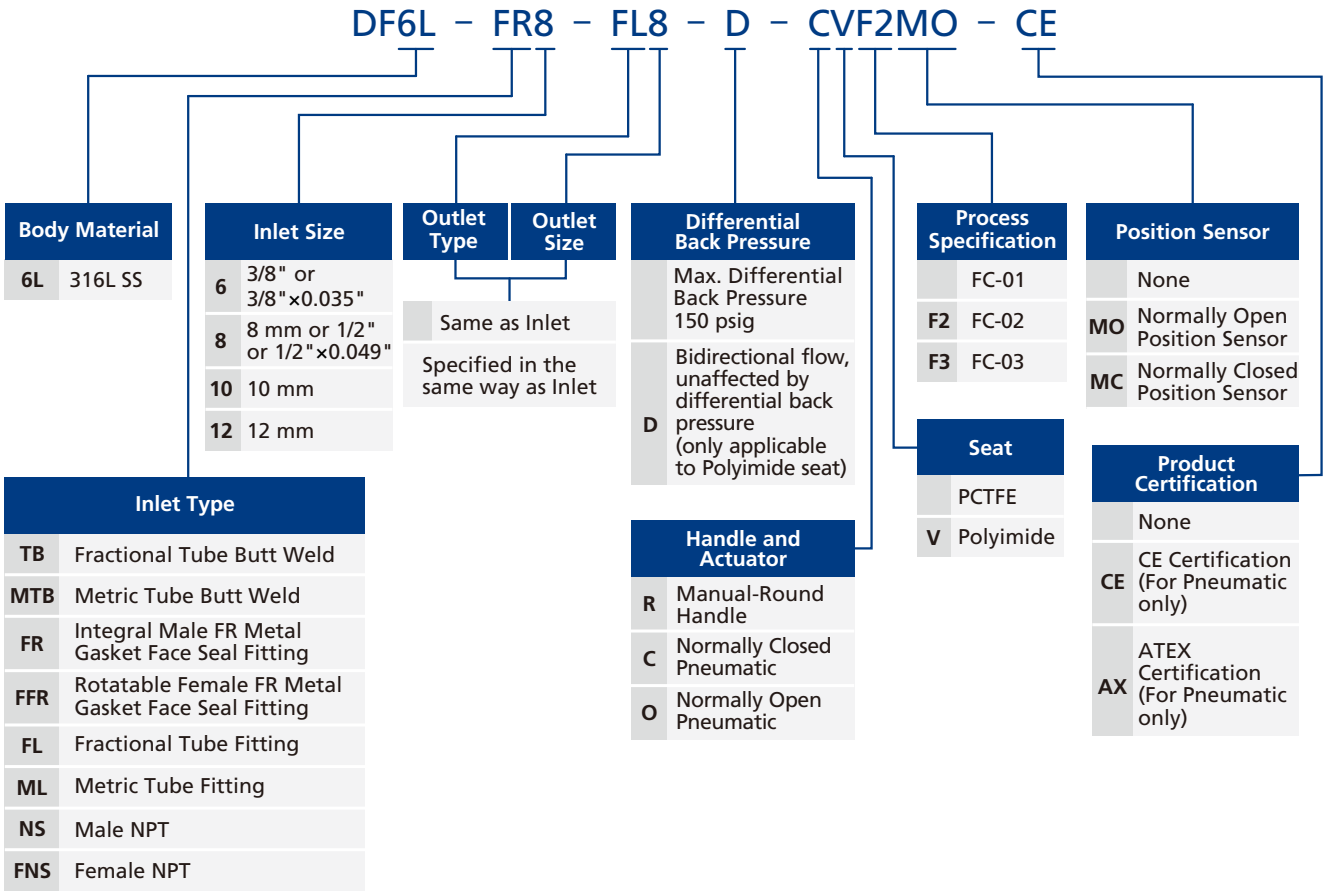
Pneumatic



Basic Ordering Number	Connection Type and Size	Dimensions in. (mm)		
		A	C	L
DF6L-TB6-	3/8"×0.035" Tube Butt Weld	0.71 (18.0)	1.50 (38.1)	3.58 (90.9)
DF6L-TB8-	1/2"×0.049" Tube Butt Weld			3.58 (90.9)
DF6L-FR8-	1/2" Integral Male FR Metal Gasket Face Seal Fitting			3.25 (82.5)
DF6L-FFR8-	1/2" Rotatable Female FR Metal Gasket Face Seal Fitting			3.89 (98.8)
DF6L-FL6-	3/8" FITOK Tube Fitting			3.27 (83.0)
DF6L-FL8-	1/2" FITOK Tube Fitting			3.47 (88.2)
DF6L-FNS8-	1/2" Female NPT			3.30 (84.0)

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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.
 - 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.

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 advance 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)
Temperature			-10 ~ 176 °F (-23 ~ 80 °C)
Leak Rate (Helium)	Internal	$\leq 1 \times 10^{-9}$ std cm ³ /s	
	External	$\leq 1 \times 10^{-9}$ std cm ³ /s	

Flow Data

Air @ 70 °F (21 °C)

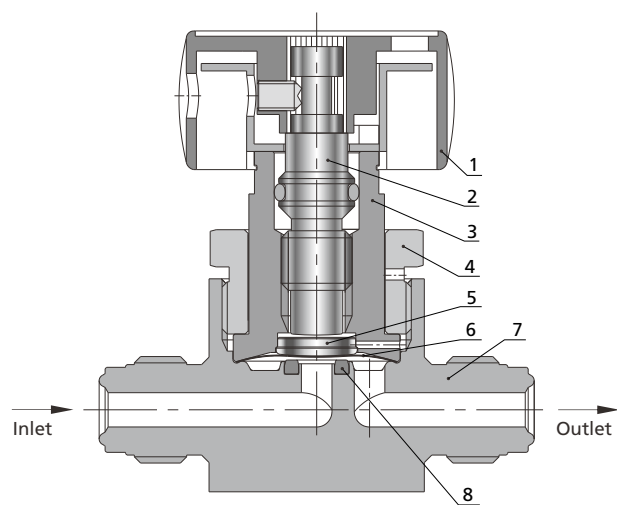
Water @ 60 °F (16 °C)

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



Dimensions and Ordering Information

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

Fittings

Valves

Regulators

Filters

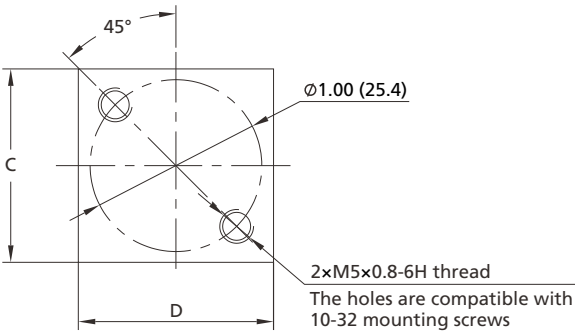
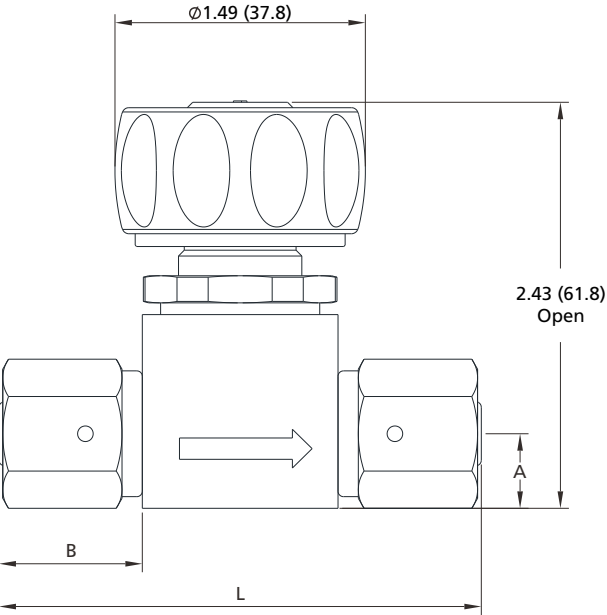
Tubing

Integrated Systems

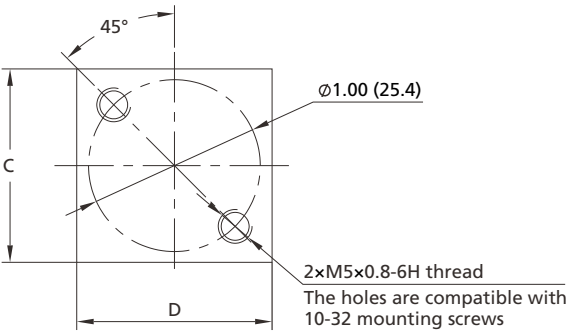
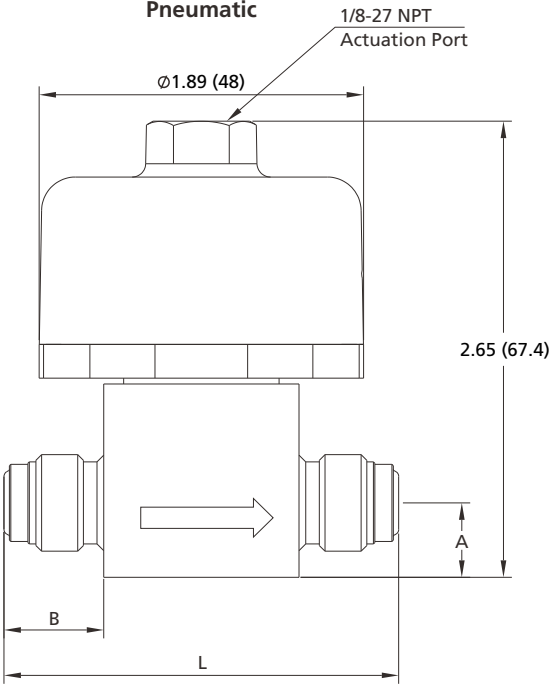
Other Products

Technical Information

Manual - Round Handle

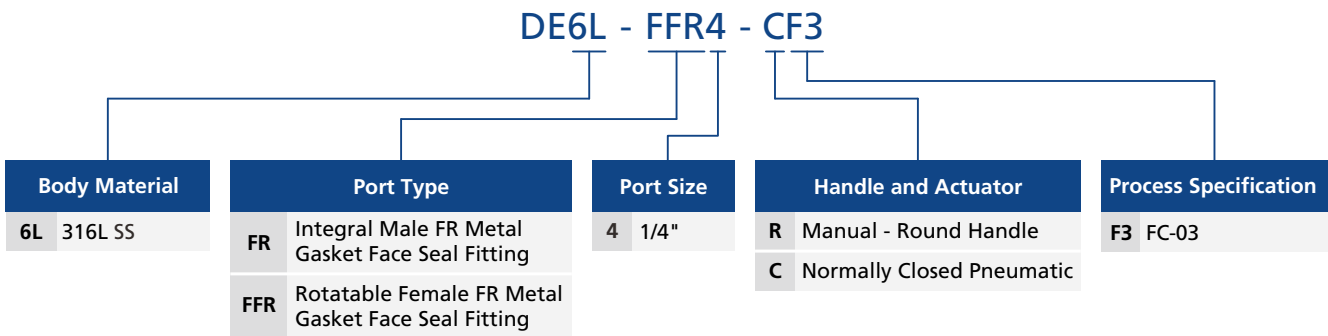


Pneumatic



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

Part 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.

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)	
Max. Working Pressure	145 psig (10 bar)	
Pneumatic Actuator Operating Pressure	72 ~ 101 psig (5 ~ 7 bar)	
Temperature	Body	14 ~ 482 °F (-10 ~ 250 °C)
	Actuator	14 ~ 482 °F (-10 ~ 250 °C)
Leak Rate (helium)	Internal	≤3×10 ⁻⁹ std cm ³ /s
	External	≤3×10 ⁻⁹ std cm ³ /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

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



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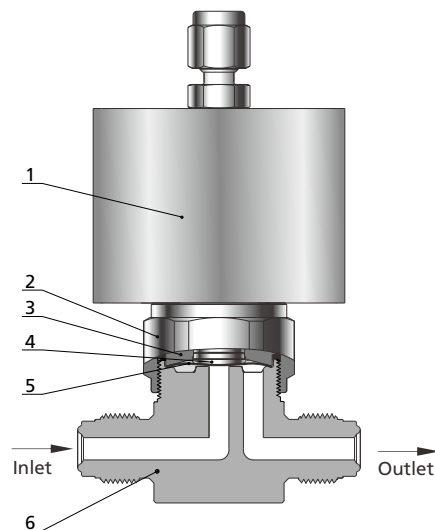
Tubing

Integrated Systems

Other Products

Technical Information

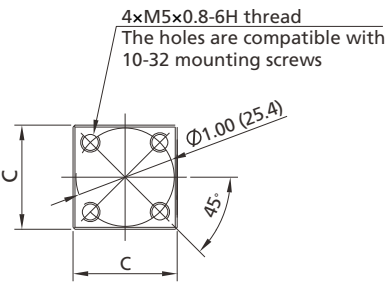
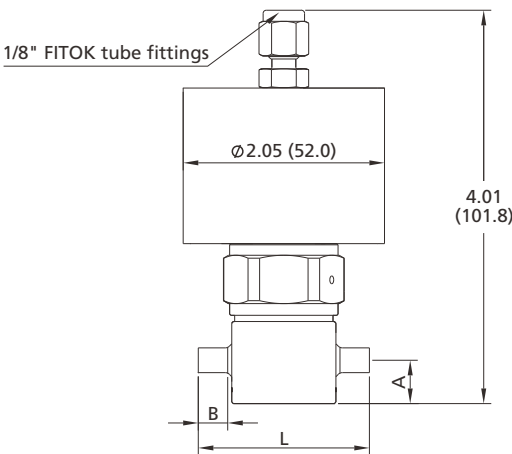
Major Materials of Construction



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

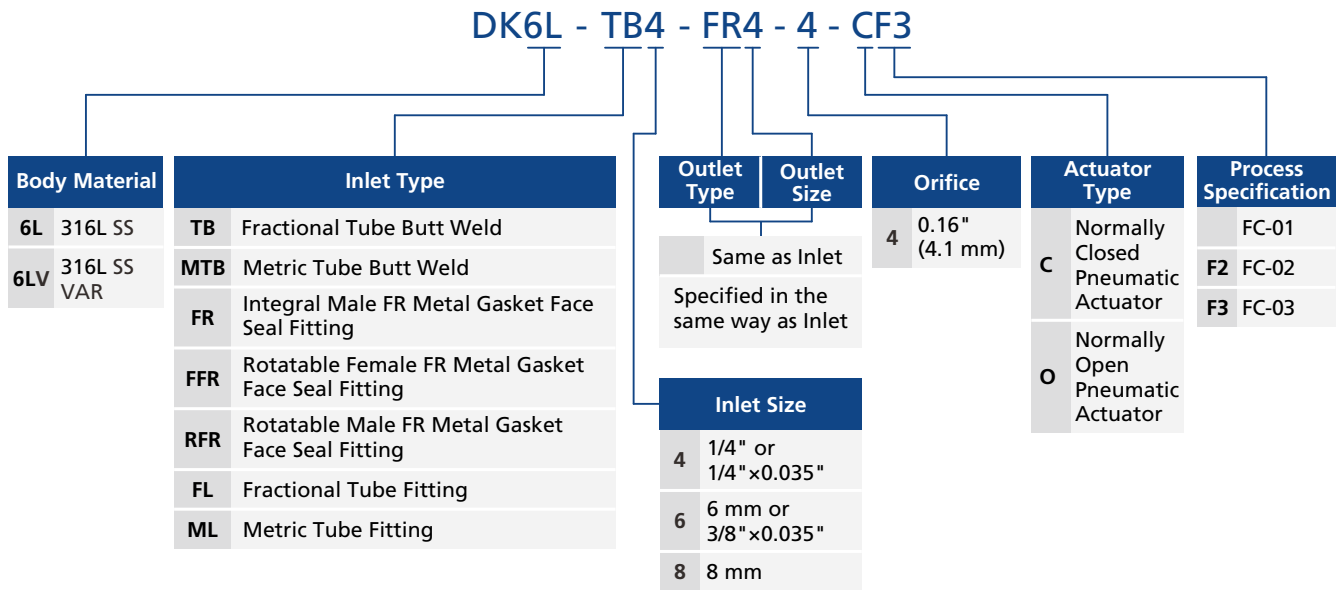
Dimensions and Ordering Information

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"×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"×0.035" Tube Butt Weld	0.44 (11.2)	0.26 (6.6)	1.06 (26.9)	1.74 (44.2)
DK□□-FFR4-4-	1/4" Rotatable Female FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	2.78 (70.6)
DK□□-RFR4-4-	1/4" Rotatable Male FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.86 (21.8)	1.06 (26.9)	2.78 (70.6)
DK□□-FR4-4-	1/4" Integral Male FR Metal Gasket Face Seal Fitting	0.44 (11.2)	0.62 (15.7)	1.06 (26.9)	2.30 (58.4)

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.

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Diaphragm Valves

DI/DIH Series

Introduction

DI and DIH series diaphragm valves for integrated gas systems (IGS) are available with surface-mount port options, using SEMI-compliant surface-mounting. Featuring either W-seal or C-seal metal hard seals between the valve and the substrate, these diaphragm valves can be installed in integrated gas systems.



Features

- ⦿ Cobalt alloy diaphragm improves strength and corrosion resistance
- ⦿ W-seal and C-seal optional
- ⦿ No packing diaphragm seal ensures high purity
- ⦿ No dead zone for easy purging
- ⦿ Pneumatic actuator optional
- ⦿ Wetted components electropolished to a surface finish of 5 µin. (0.13 µm) Ra max.

Technical Data

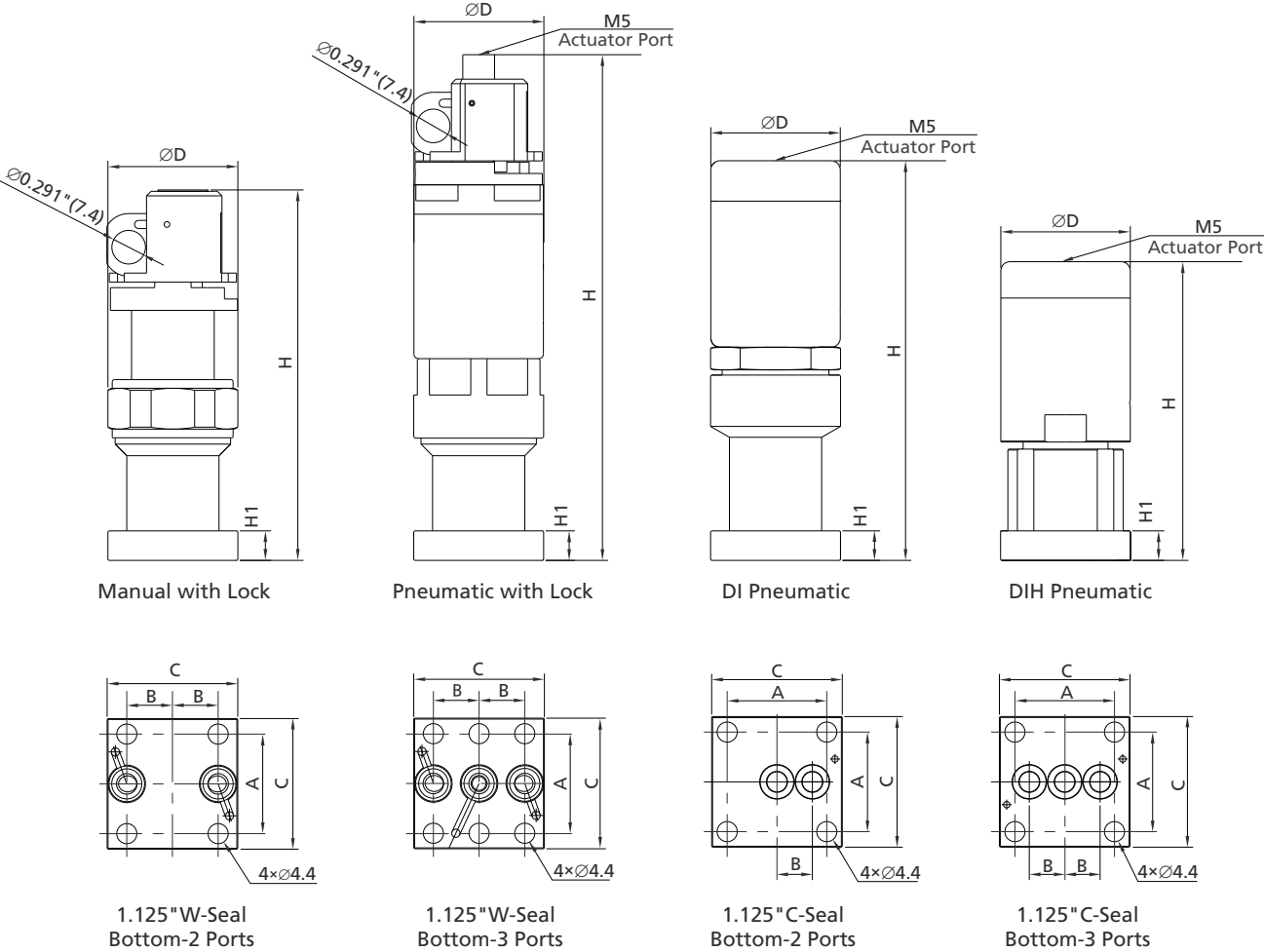
Max. Working Pressure	Manual	145 psig (10 bar)
	Pneumatic	
Working Temperature		PCTFE: 14~176°F (-10~80°C) PFA: 14~302°F (-10~150°C)
Flow Coefficient (Cv)		0.2(DI), 0.3(DIH)
Pneumatic Actuator Working Pressure		60~90 psig (4.2~6.2 bar)
Leakage Rate (Helium)	Internal	≤1×10 ⁻⁹ std cm ³ /s
	External	≤1×10 ⁻⁹ std cm ³ /s

Process Specification

Item	Process Specification
	Ultra High Purity Process (FC-03)
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.

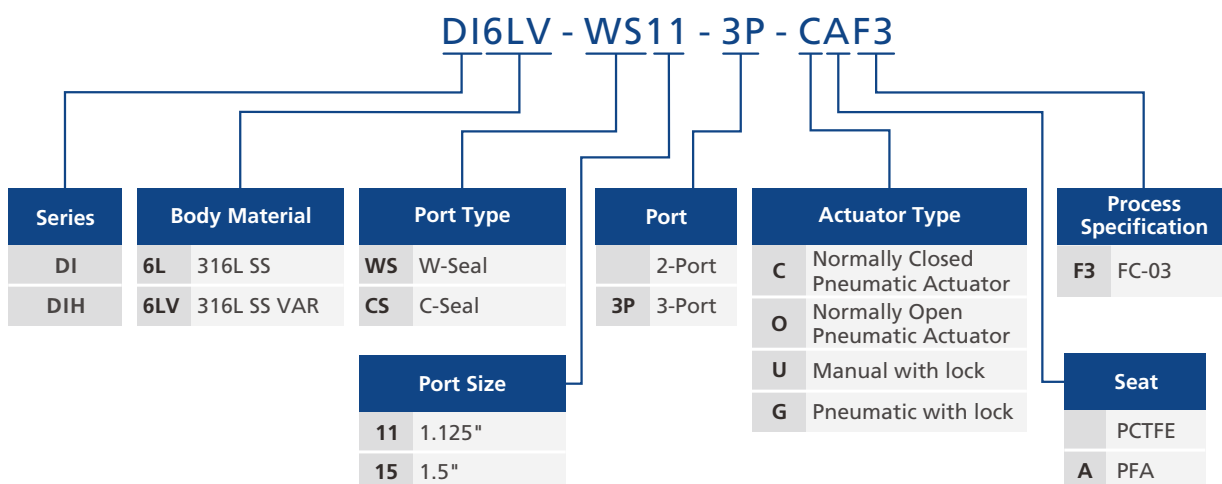


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V-101 Diaphragm Valves

Fittings	Basic Ordering Number	Port Type and Size	Dimensions, in. (mm)					
			A	B	C	D	H	H1
Valves	DI□□-WS11-CF3	1.125" W-Seal	0.86 (21.8)	0.39 (10.0)	1.13 (28.6)	1.12 (28.5)	3.41 (86.6)	0.26 (6.5)
	DI□□-WS11-OF3					1 (25.4)	3.24 (82.4)	
	DI□□-WS11-3P-CF3							
	DI□□-WS11-3P-OF3							
Regulators	DI□□-CS11-CF3	1.125" C-Seal		0.31 (7.75)		1.12 (28.5)	3.41 (86.6)	
	DI□□-CS11-OF3							
	DI□□-CS11-3P-CF3							
	DI□□-CS11-3P-OF3							
Filters	DIH□□-WS11-UF3	1.125" W-Seal	0.39 (10.0)	1 (25.4)	2.89 (73.4)		3.21 (81.6)	
	DIH□□-WS11-GF3						4.38 (111.3)	
	DIH□□-WS11-CF3						2.91 (73.8)	
	DIH□□-WS11-OF3							
Tubing	DIH□□-WS11-3P-CF3	1.125" C-Seal	0.31 (7.75)	1.12 (28.5)	3.21 (81.6)			
	DIH□□-WS11-3P-OF3					4.38 (111.3)		
	DIH□□-CS11-UF3						2.59 (65.8)	
	DIH□□-CS11-GF3					3.21 (81.6)		
	DIH□□-CS11-CF3						4.38 (111.3)	
	DIH□□-CS11-OF3					2.59 (65.8)		
	DIH□□-CS11-3P-UF3							
	DIH□□-CS11-3P-GF3							
Other Products	DIH□□-CS11-3P-CF3							
	DIH□□-CS11-3P-OF3							
Technical Information								

Ordering Number Description



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. Mounting screws and gasket are not included, please contact FITOK Group or our authorized distributors if you have any requests.