

Diaphragm Valves

DQ, DM Series



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FITOK
Valves and Fittings

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Springless Diaphragm Valves for High Performance
DQ Series

01

All-metal Diaphragm Valves for High Performance
DM Series

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Springless Diaphragm Valves
for High Performance

DQ Series

Features

- 316L VIM-VAR stainless steel body
- Suitable for ultrahigh-purity applications
- Elgiloy material for strength and corrosion resistance for long cycle life
- Fully contained PCTFE seat design provides excellent resistance to swelling and contamination
- Wetted Surface Electropolished, Roughness Ra finished to an average of 0.2 µm.
- Helium leak tested, maximum leak rate of 1x10⁻⁹ std cm³/s
- Low-pressure and high-pressure models
- Manual or pneumatic actuation
- Aluminum piston accelerated open/close speed
- Different handle types and colors are available



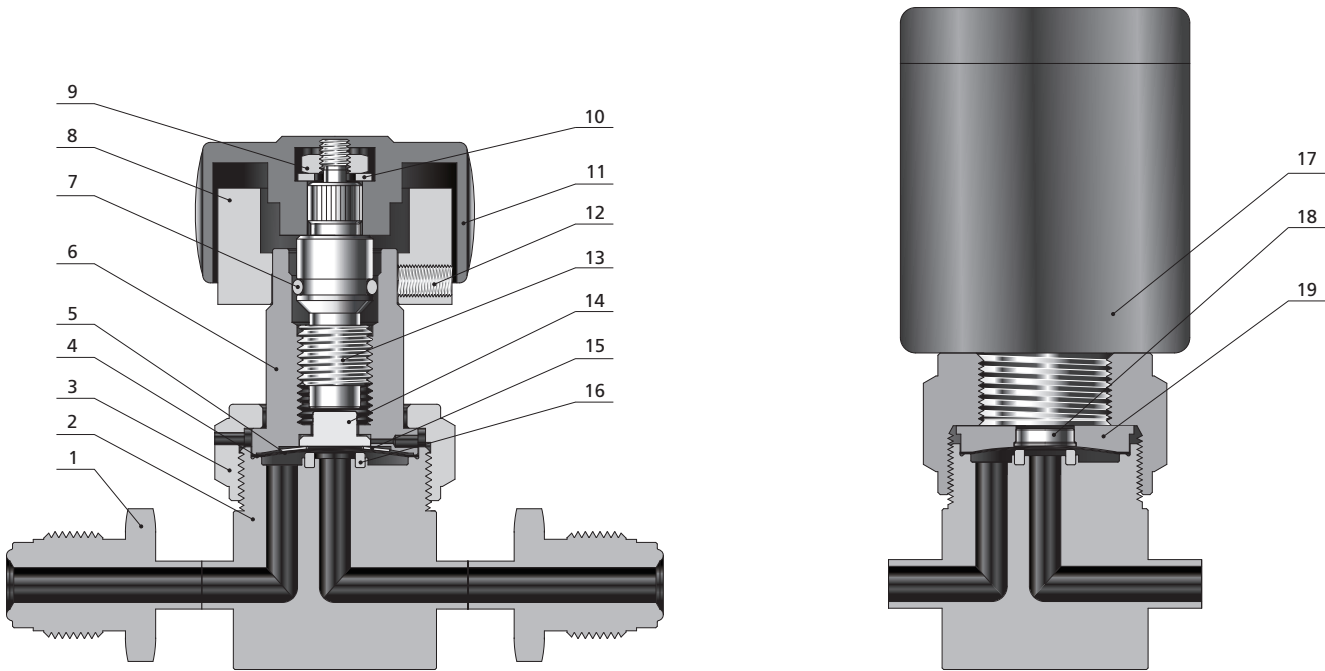
Technical Data

Sort	Working Pressure Psig (bar)		Temperature Rating °C(°F)	Flow Coefficient (Cv)	Orifice in.(mm)	Internal Volume in. ³ (cm ³)	Pneumatic Actuator	
	Operating	Burst					Actuation Pressure Psig (bar)	Air Displacement in. ³ (cm ³)
Low-pressure	Vacuum to 250(17.2)	3200 (220)	-23 to 65 (-10 to 150)	0.27	0.16 (4.1)	0.086 (1.4) (Body with TB4 ends)	60 to 120 (4.2 to 8.2)	0.09 (1.5)
High-pressure	Vacuum to 3045(210)	12 200 (840)		0.20			70 to 120 (4.9 to 8.2)	0.47 (7.7)

Flow Data

Pressure Drop to Atmosphere Δ P (bar)	Low-Pressure Models Cv=0.27		High-Pressure Models Cv=0.20	
	Air std L/min	Water L/min	Air std L/min	Water L/min
0.68	86	3.2	64	2.4
3.4	230	7.2	170	5.4
6.8	410	10.2	300	7.6

Materials of Construction



Item	Component	Material Grade/ASTM Specification	
		Low-Pressure	High-Pressure
1	Welded FR end connections	316 SS/A479 or 316L SS/A479 or 316L VIM/VAR/SEMI F20	
	Tube fittings	316 SS/A276	
2	Body	316 SS/A479 or 316L SS/A479 or 316L VIM/VAR/SEMI F20	
3	Bonnet nut	316 SS	
4	Diaphragm	Elgiloy/AMS 5876	
5	Support diaphragm	Silver-plated Elgiloy/AMS 5876	
6	Bonnet	S17400	
7	O-rings	FKM	
8	Actuator	316 SS	
9	Nut	304 SS	
10	Gasket	65 Mn	
11	Manual Actuator	Round handle	ABS with stainless steel insert
		Directional handle	Nylon with stainless steel insert
		Integral lockout handle	Glass-filled nylon with stainless steel base
		Toggle handle	316 SS with epoxy coating
12	Hexagon socket set	304 SS	
13	Stem	316 SS	
14	Button	—	316 SS

Item	Component	Material Grade/ASTM Specification	
		Low-Pressure	High-Pressure
15	Washer	—	S17700
16	Seat	PCTFE/D1430	
17	Pneumatic Actuator		
18	Button	—	316 SS
19	Bonnet	S17400	

Product grade

Grade	General purpose	High purity	Ultra-high purity
Material	316 SS or 316L SS	316L VIM/VAR/SEMI F20	316L VIM/VAR/SEMI F20
Wetted Surface Roughness	Ra 0.8 µm	Ra 0.4 µm	Ra 0.2 µm
Process	Machine finished	Machine Polish	Electropolished
Process Specification	FC-01 Standard Cleaning and Packaging	FC-02 Special Cleaning and Packaging	FC-03 Ultrahigh-Purity Process Specification
Cleaning	Thrice degreasinga ultrasonic cleaning	Special cleaning with non-ozone-depleting chemicals	Ultrahigh-purity cleaning with a continuously monitored, deionized water, ultrasonic cleaning system
Assembly	At atmosphere	Performed in specially cleaned areas	Performed in ISO Class 4 work areas
Testing	Inboard helium leak tested to maximum leak rate of 1x10 ⁻⁹ std cm ³ /s		
Packing	Individually bagged	Valves are Individually bagged	Valves are double bagged and vacuum sealed in cleanroom bags

Manual Actuators

Round

- Quick, quarter-turn actuation
- Handle with window provides visual indication of open and closed positions
- Available on high-and low-pressure models

Directional

- Quick, quarter-turn actuation
- Handle shape provides visual indication of open and closed position
- Available on high-and low-pressure models

Integral Lockout

- Quick, quarter-turn actuation
- Lockable in the CLOSED position for safety
- Handle shape and window indicator provides visual indication of OPEN and CLOSED position
- Available on high-and low-pressure models

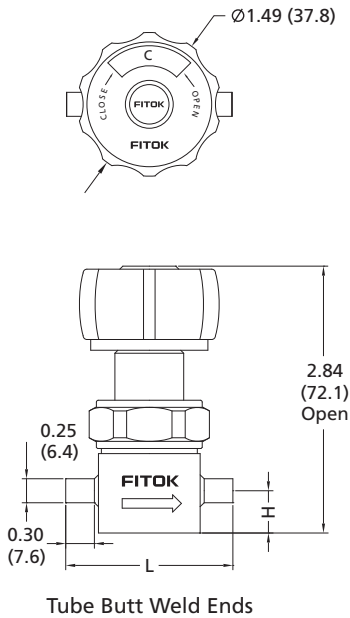
Toggle

- Spring-loaded toggle design quick actuation
- Lockable in the CLOSED position for safety
- Handle position provides visual indication of OPEN and CLOSED positions
- Narrow handle profile allows close parallel mounting of valves
- Available on low-pressure models with PCTFE seats

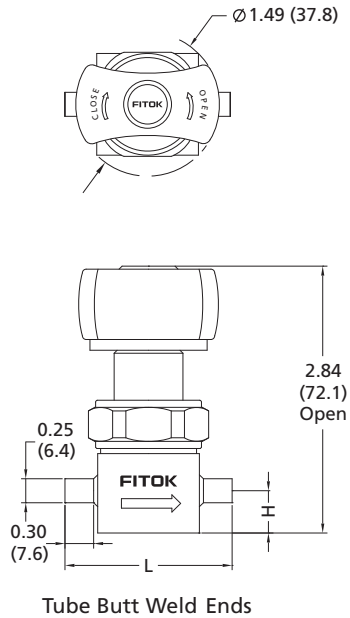
Dimensions

Low-Pressure Valves

Round Handle



Directional Handle



Pneumatic Actuators

High-Pressure Pneumatic Actuator

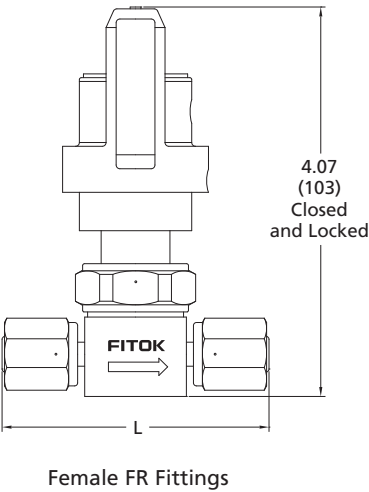
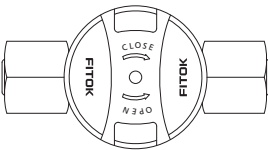
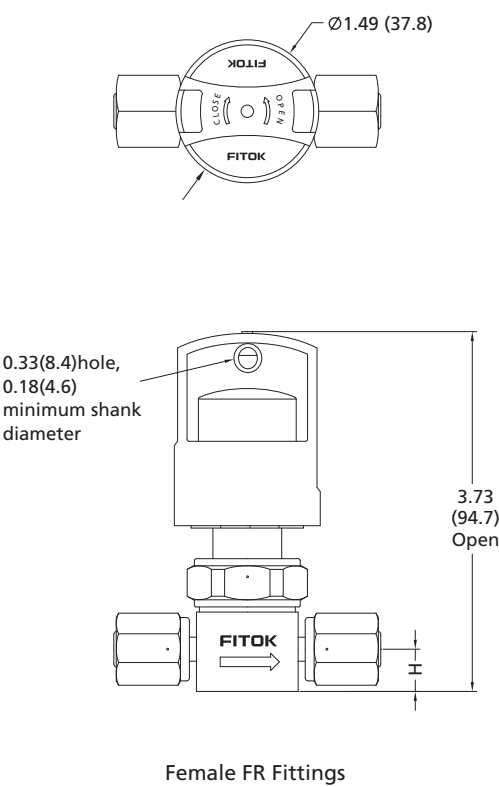
- Normally open
- Normally close

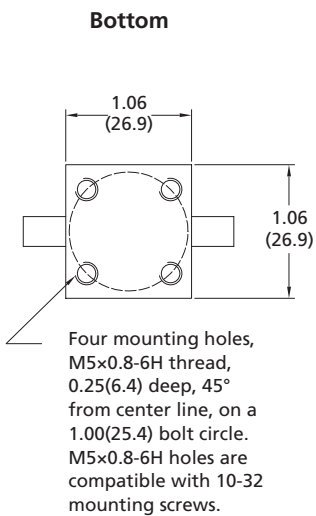
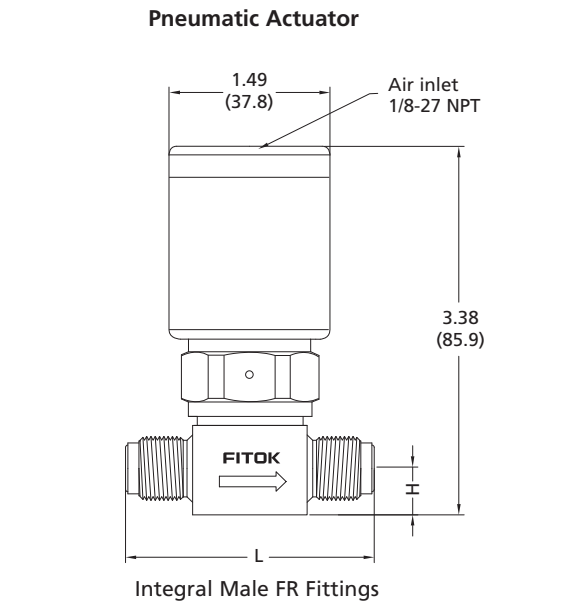
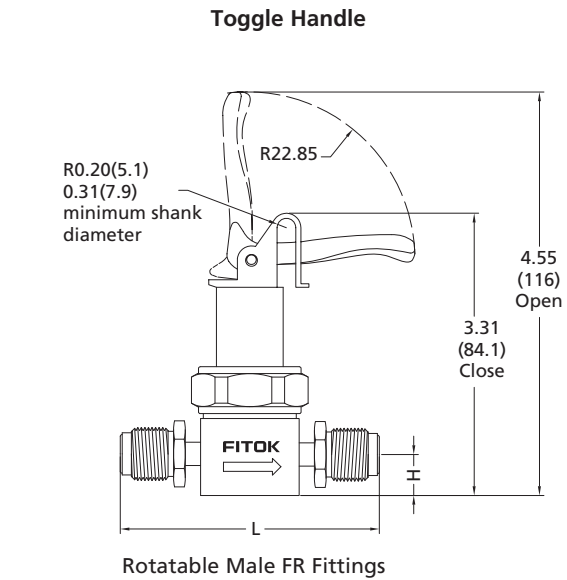
Low-Pressure Pneumatic Actuator

- Normally open
- Normally close



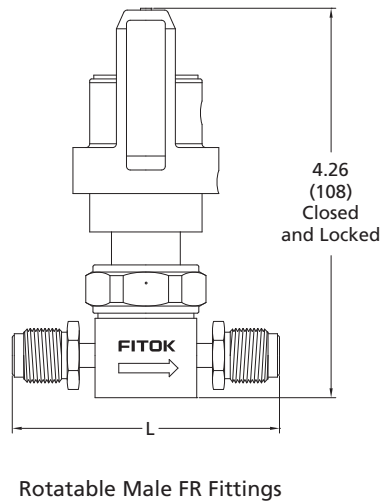
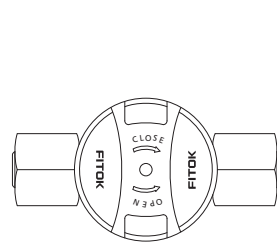
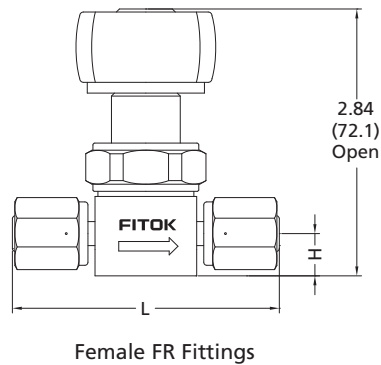
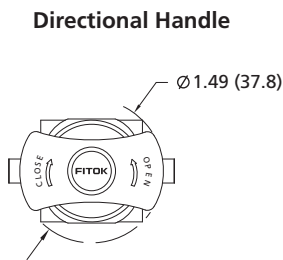
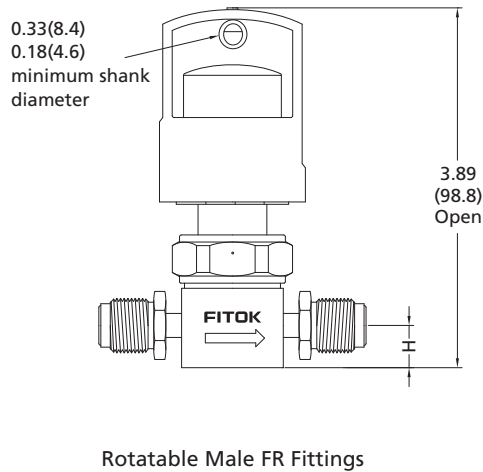
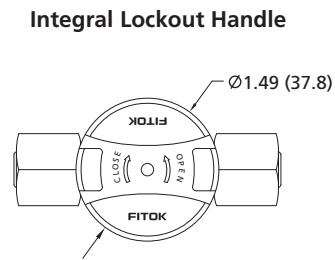
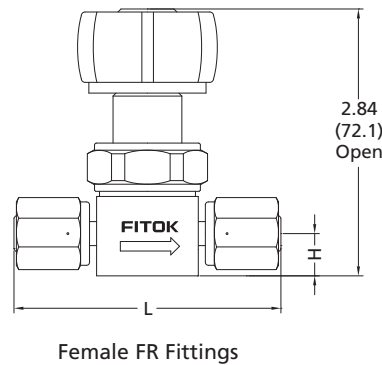
Integral Lockout Handle

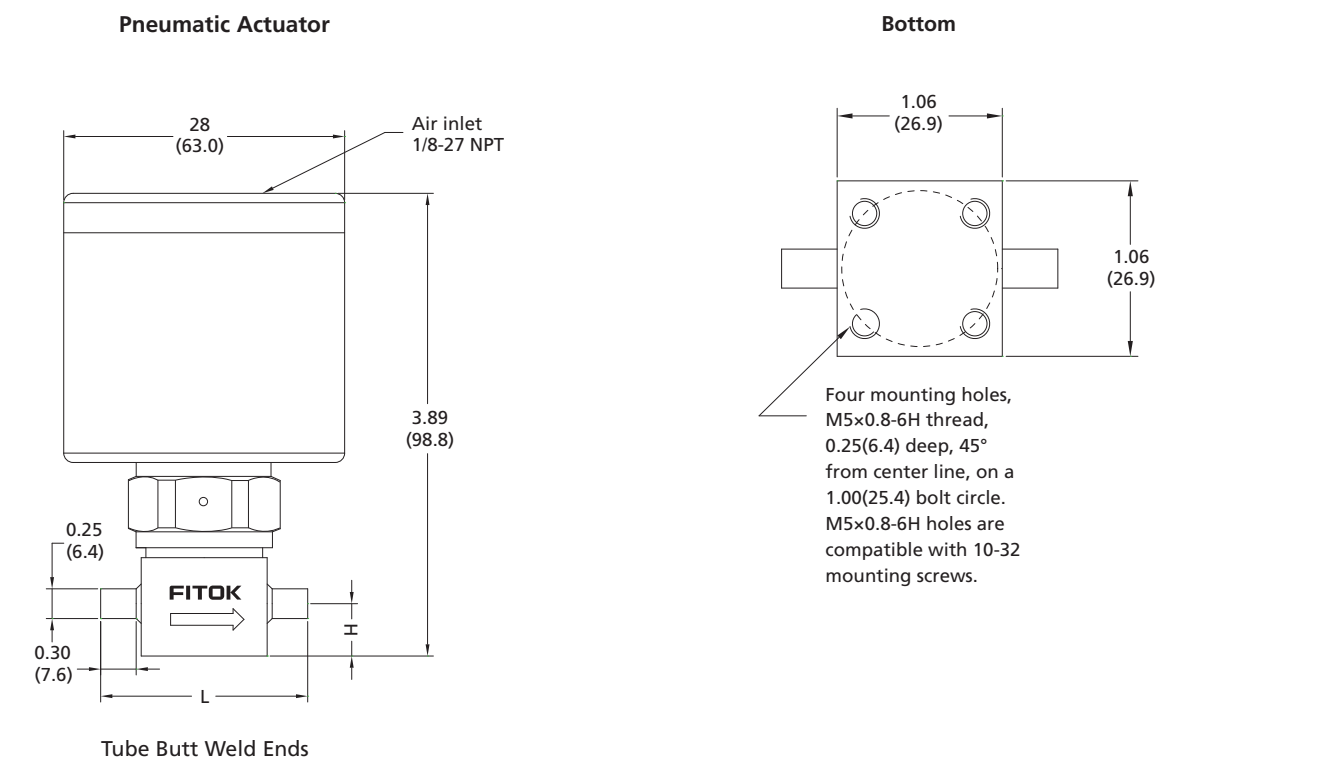




Basic Ordering Number	Connection Type and Size		Dimension, in.(mm)	
	Inlet	Outlet	L	H
DQ6LW-TB4-L-	1/4" tube butt weld 0.30"(7.6 mm) tube stub, 0.035"wall	1/4" tube butt weld 0.30"(7.6 mm) tube stub, 0.035"wall	1.74(44.2)	0.44(11.2)
DQ6LW-TB4S-L-	1/4" tube butt weld 0.26"(6.6 mm) tube stub, 0.035"wall	1/4" tube butt weld 0.26"(6.6 mm) tube stub, 0.035"wall	1.61(40.9)	0.44(11.2)
DQ6LW-MTB6-L-	6 mm tube butt weld, 1 mm wall	6 mm tube butt weld 1 mm, wall	1.74(44.2)	0.44(11.2)
DQ6LW-FFR4-L-	1/4" female FR fitting	1/4" female FR fitting	2.78(70.6)	0.44(11.2)
DQ6LW-RFR4-L-	1/4" rotatable male FR fitting	1/4" rotatable male FR fitting		
DQ6LW-FR4-L-	1/4" integral male FR fitting	1/4" integral male FR fitting	2.30(58.4)	0.44(11.2)
DQ6LW-FL4-L-	1/4" FITOK	1/4" FITOK	2.46(62.5)	0.44(11.2)
DQ6LW-ML6-L-	6 mm FITOK	6 mm FITOK	2.45(62.2)	0.44(11.2)

High-Pressure Valves



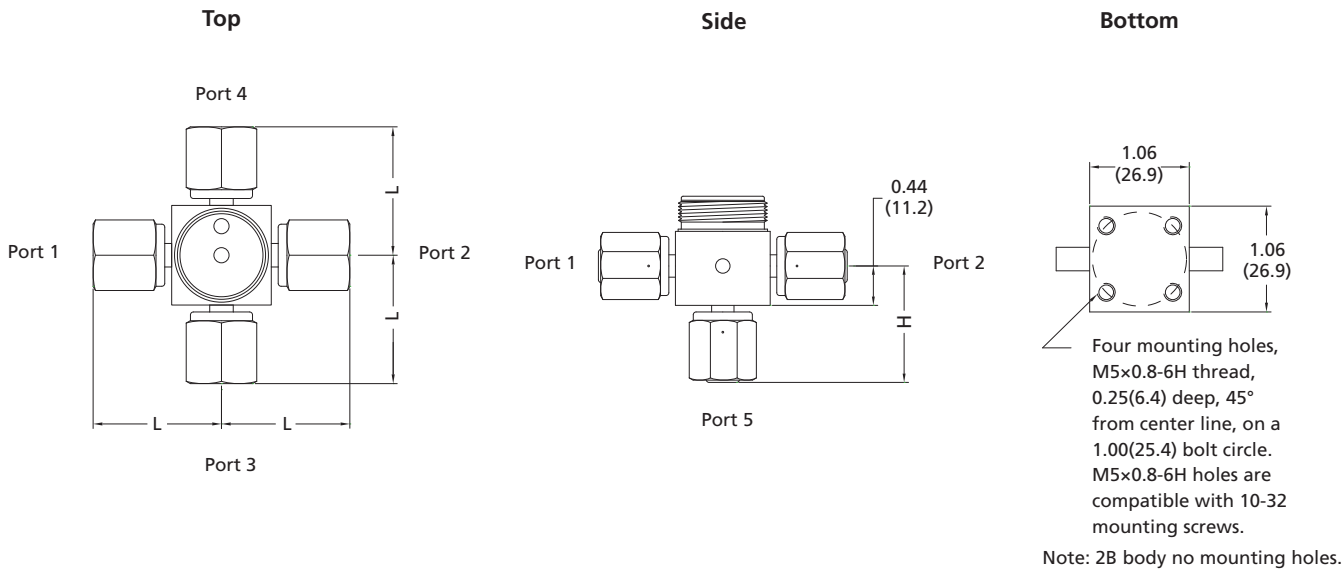


Basic Ordering Number	Connection Type and Size		Dimension, in.(mm)	
	Inlet	Outlet	L	H
DQ6LW- TB4- H-	1/4" tube butt weld 0.30"(7.6 mm) tube stub, 0.035" wall	1/4" tube butt weld 0.30"(7.6 mm) tube stub, 0.035" wall	1.74(44.2)	0.44(11.2)
DQ6LW- TB4S- H-	1/4" tube butt weld 0.26"(6.6 mm) tube stub, 0.035" wall	1/4" tube butt weld 0.26"(6.6 mm) tube stub, 0.035" wall	1.61(40.9)	0.44(11.2)
DQ6LW- MTB6- H-	6 mm tube butt weld, 1 mm wall	6 mm tube butt weld 1 mm, wall	1.74(44.2)	0.44(11.2)
DQ6LW- FFR4- H-	1/4" female FR fitting	1/4" female FR fitting	2.78(70.6)	0.44(11.2)
DQ6LW- RFR4- H-	1/4" rotatable male FR fitting	1/4" rotatable male FR fitting		
DQ6LW- FR4- H-	1/4" integral male FR fitting	1/4" integral male FR fitting	2.30(58.4)	0.44(11.2)
DQ6LW- FL4- H-	1/4" FITOK	1/4" FITOK	2.46(62.5)	0.44(11.2)
DQ6LVV- ML6- H-	6 mm FITOK	6 mm FITOK	2.45(62.2)	0.44(11.2)

Multiport and Elbow Valves

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

End Connections and Dimentions

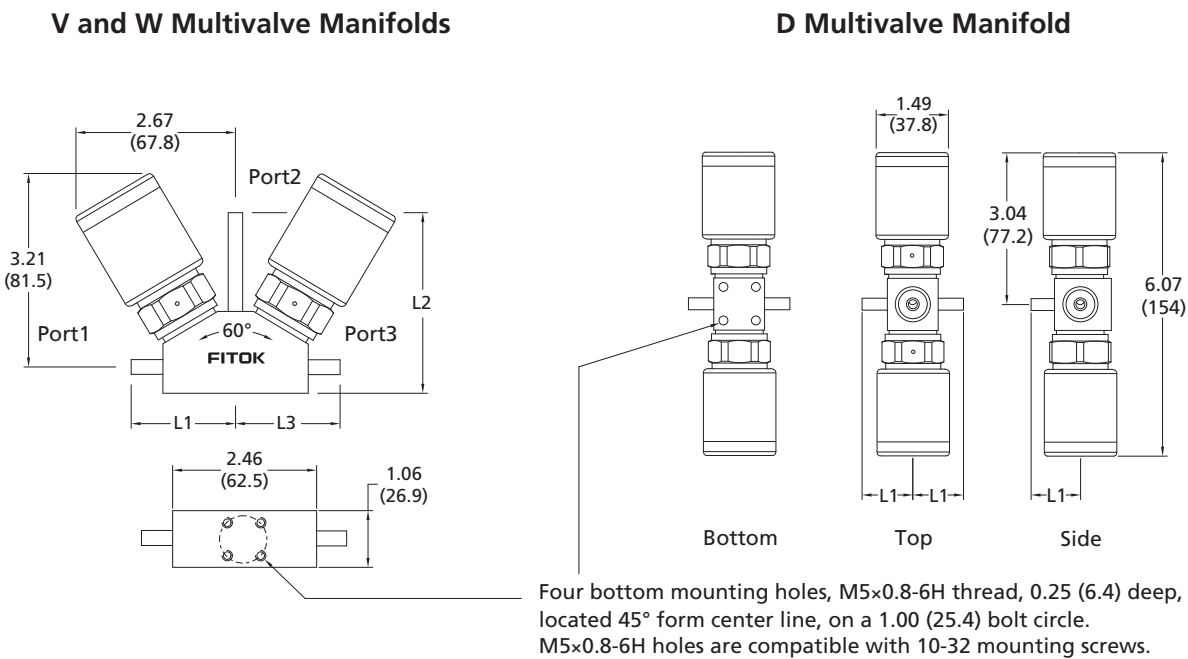


Designator	End Connection		Dimentions, in.(mm)	
			L	H
TB4	1/4" tube butt weld 0.30" (7.6 mm) tube stub, 0.035" wall		0.87(22.1)	0.76(19.3)
TB4S	1/4" tube butt weld 0.26" (6.6 mm) tube stub, 0.035" wall		0.81(20.6)	0.70(17.8)
TB6	6mm tube butt weld, 1 mm wall		0.87(22.1)	0.76(19.3)
FFR4	1/4" female FR fitting		1.39(35.3)	1.28(32.5)
RFR4	1/4" rotatable male FR fitting		1.39(35.3)	1.63(41.4)

Multivalve Manifolds

Designator	Schematic	Flow Path
V		
W		
D		

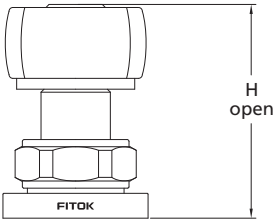
End Connections and Dimentions



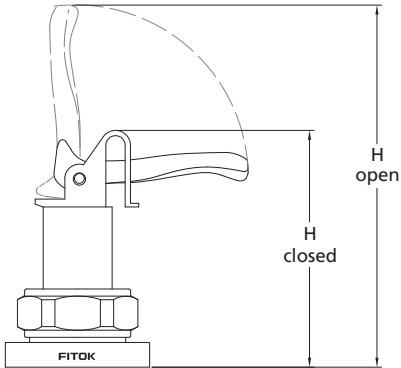
Designator	End Connection		Dimentions, in.(mm)			
			V and W Multivalve Manifolds			D Multivalve Manifold
			L1	L2	L3	L1
TB4	1/4" tube butt weld 0.30" (7.6 mm) tube stub, 0.035" wall		1.81(46.0)	2.79(70.9) 4.04(103)	1.81(46.0)	0.87(22.1)
FFR4	1/4" female FR fitting		2.03(51.6)	2.66(67.6) 3.91(99.3)	2.03(51.6)	1.39(35.3)
RFR4	1/4" rotatable male FR fitting		2.39(60.7)	3.35(85.1) 4.60(117)	2.39(60.7)	

IGS Modular Surface-Mount Valves

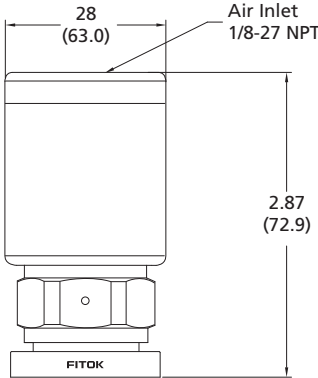
Directional and Roud Handles



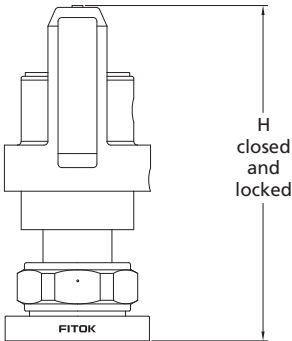
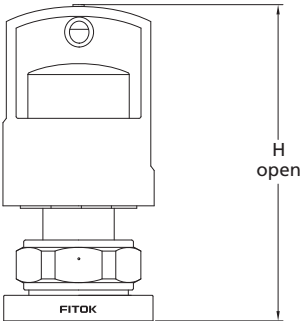
Toggle Handle



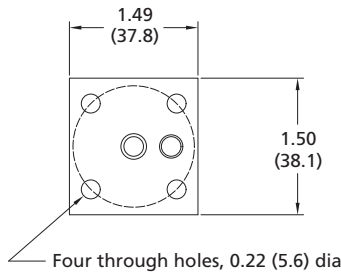
Pneumatic Actuator



Integral Lockout Handle



Bottom

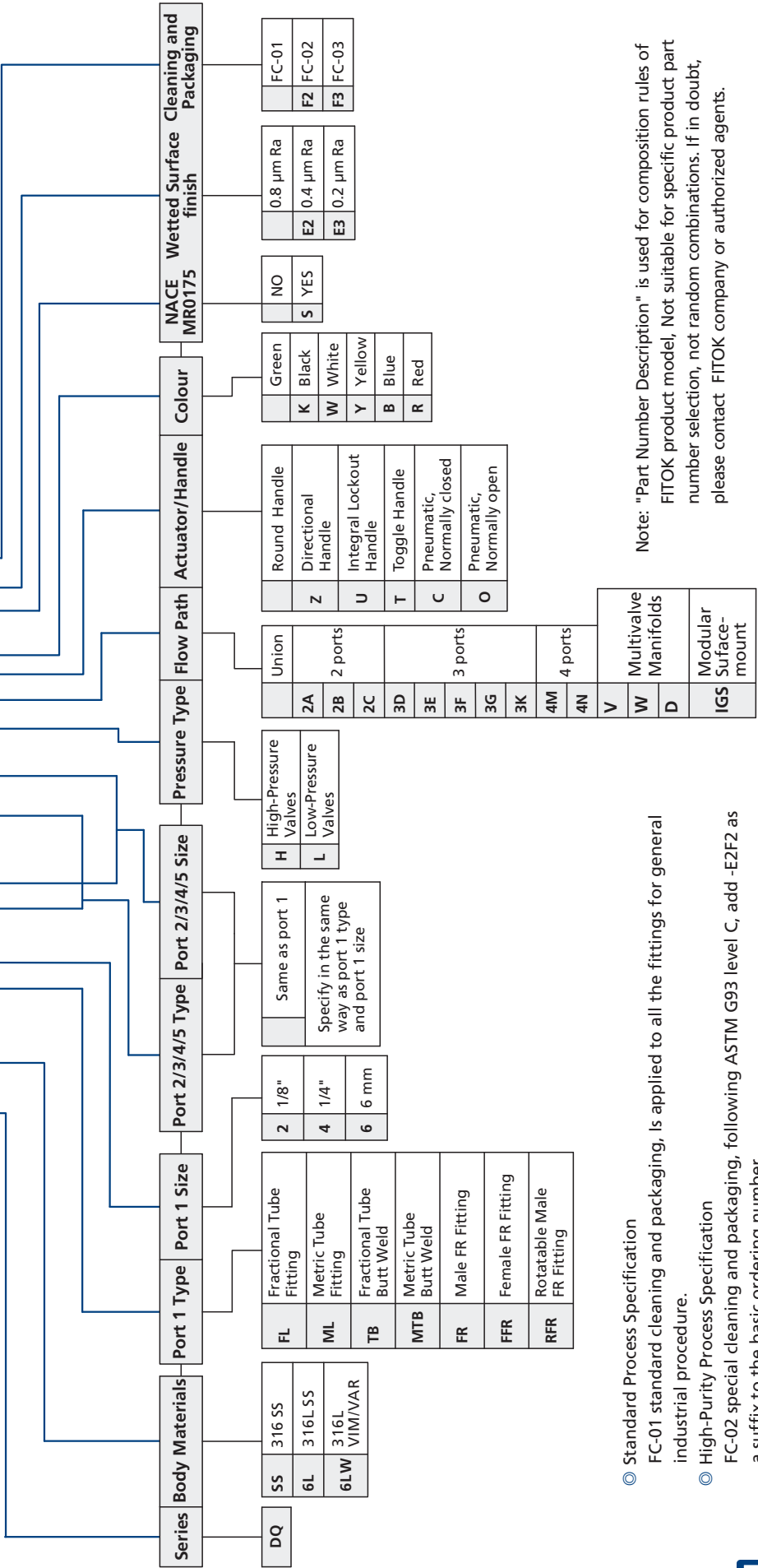


Handle Type	Dimensions, in.(mm)			
	Low-Pressure		High-Pressure	
	H Open	H Closed	H Open	H Closed
Directional and Roud	2.36(59.9)	2.34(59.4)	2.36(59.9)	2.34(59.4)
Integral Lockout	3.25(82.6)	3.59(91.2)	3.41(86.6)	3.78(96.0)
Toggle	2.83(71.9)	4.04(103)		

ⓘ Notice: Toggle Handle and Pneumatic Actuator is not used for high pressure system.

Part Number Description

DQ6LW – TB4 – TB4 – MTB6 – H3KZY – SE3F3



Note: "Part Number Description" is used for composition rules of FITOK product model, Not suitable for specific product part number selection, not random combinations. If in doubt, please contact FITOK company or authorized agents.

- ⓘ Standard Process Specification
FC-01 standard cleaning and packaging, Is applied to all the fittings for general industrial procedure.
- ⓘ High-Purity Process Specification
FC-02 special cleaning and packaging, following ASTM G93 level C, add -E2F2 as a suffix to the basic ordering number.
- ⓘ Ultrahigh-purity Process Specification
FC-03 ultrahigh-purity cleaning and packaging, add - E3F3 as a suffix to the basic ordering number.

All-metal Diaphragm Valves for High Performance

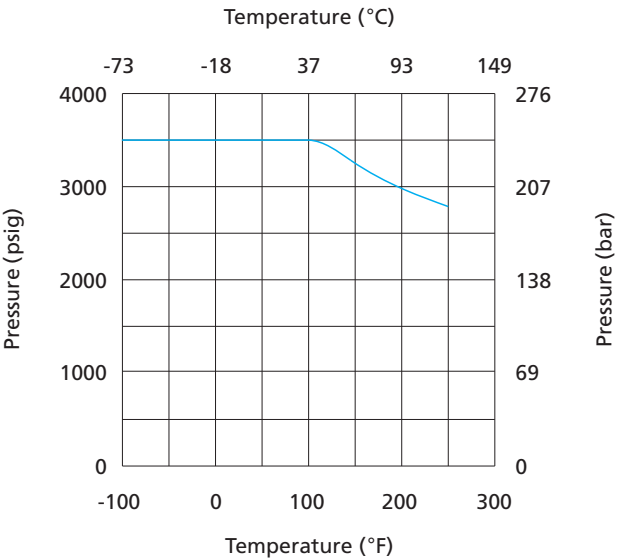
DM Series

Features

- All-metal containment, packless
- Repetitive shutoff with fully contained softseat stem tip
- Working pressures from vacuum to 3500 psig (241 bar)
- Temperatures from -100 to 250°F (-73 to 121°C)
- Helium leak tested, maximum leak rate of 4x10⁻⁹ std cm³/s
- Round handle, approximately one and one-half turns to operate from fully open to closed.
- Lever handle, just one-quarter turn of the handle to actuate the valve from fully open to closed.



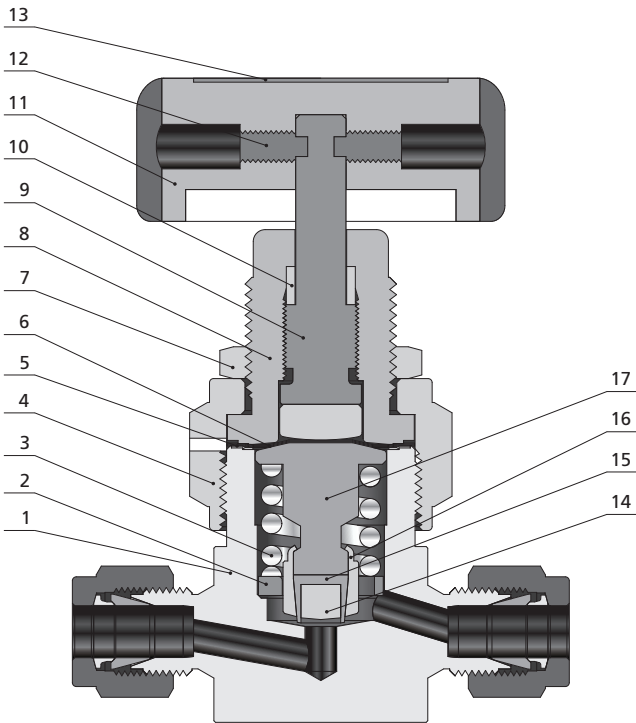
Pressure-Temperature Ratings



Technical Data

Series	Orifice in.(mm)	Flow Coefficient (Cv)	PressureRating at 70° F(20° C)	Differential Back Pressure Max at 70° F(20° C)	Temperature Rating	Containment
Lever handle	0.156 (4.0)	0.14	3500 psig (241 bar)	1500 psig (103 bar)	-100 to 250° F -73 to 121° C	0.18in. ³ Max(2.9 cm ³)
Round handle		0.30				

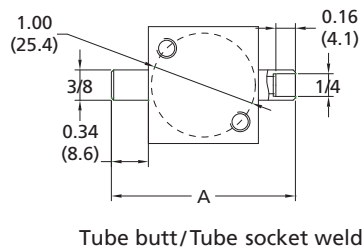
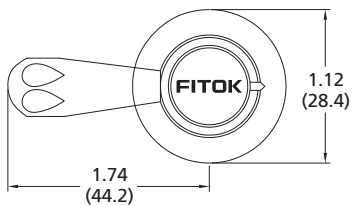
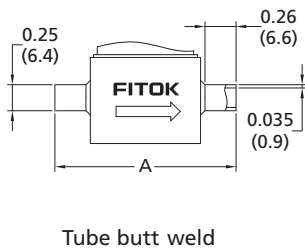
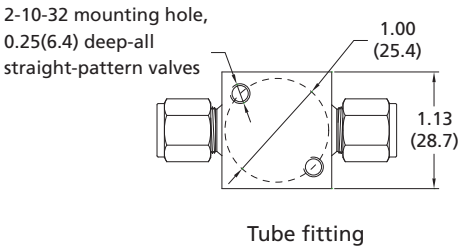
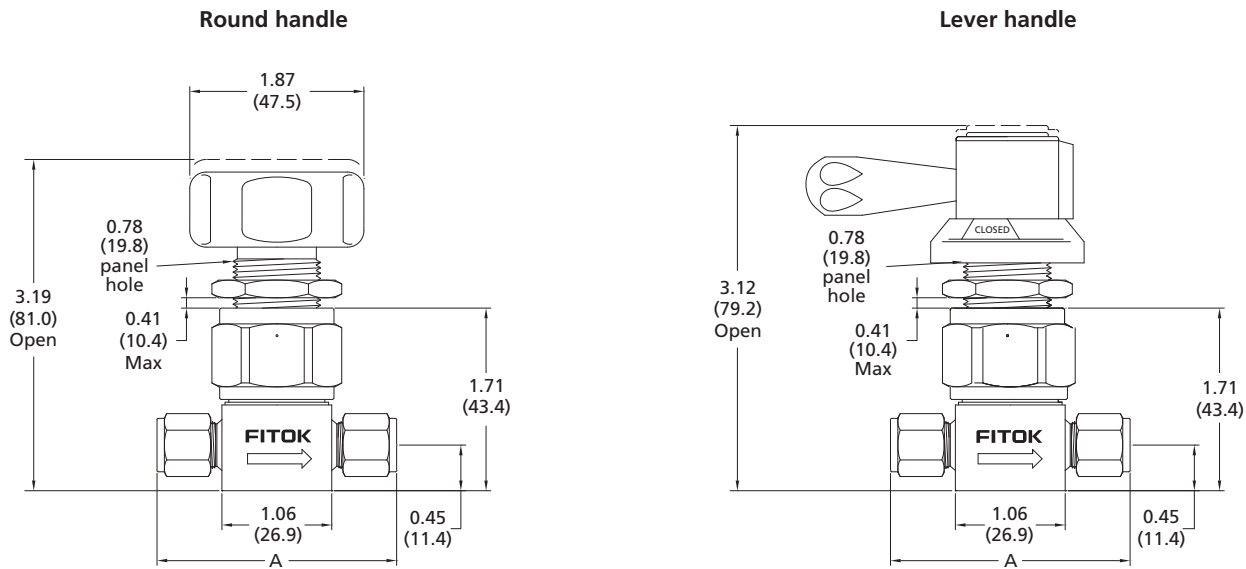
Materials of Construction



Item	Component	Material Grade/ASTM Specification	
		316 SS/A479	316L SS/A479
1	Body	316 SS/A479	316L SS/A479
2	Guide	Electropolished 316 SS/A479	
3	Spring	316 SS/A313	
4	Bonnet nut	316 SS/A479	
5	Gasket	PTFE-coated 316L SS/A240	
6	Diaphragms(3)	316 SS/A240	
7	Panel mount nut	316 SS/A479	
8	Bonnet	316 SS/A479	
9	Actuator	416 SS/A582	
10	Wipe ring	Glass-filled PTFE	
11	Round Handle	Aluminum 6061-T6/B211	
12	Set screw	304 SS	
13	Lable	PVC	
14	Stem plug	316L SS/A479	
15	Stem insert	PCTFE/D1430	
16	Stem container	316L SS/A479	
17	Stem	316L SS/A479	

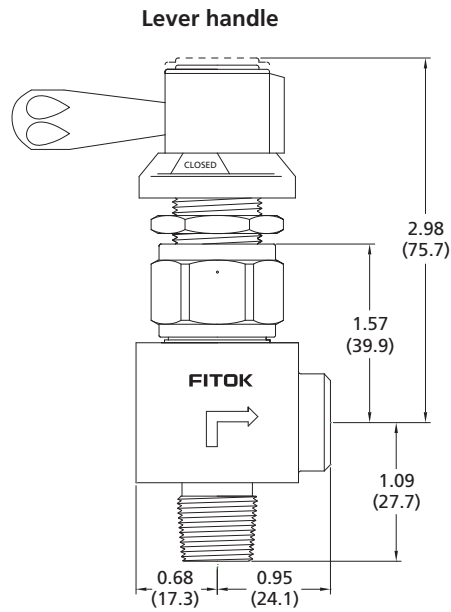
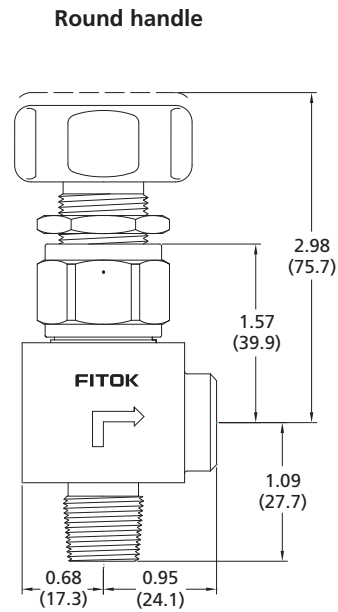
Dimentions

Straight Patterns



Basic Ordering Number	Connection Type and Size		Dimension, in. (mm)
	Inlet	Outlet	A
DM□□-FL4-	1/4" FITOK	1/4" FITOK	2.46(62.5)
DM□□-FL6-	3/8" FITOK	3/8" FITOK	2.58(65.5)
DM□□-ML6-	6 mm FITOK	6 mm FITOK	2.46(62.5)
DM□□-ML8-	8 mm FITOK	8 mm FITOK	2.53(64.3)
DM□□-TB4-	1/4" Tube butt weld	1/4" Tube butt weld	1.74(44.2)
DM□□-TB6-	3/8" Tube butt weld	3/8" Tube butt weld	1.74(44.2)
DM□□-TB6-TS4-	3/8" Tube butt weld	1/4" Tube socket weld	1.75(44.4)
DM□□-TB8-TS6-	1/2" Tube butt weld	3/8" Tube socket weld	1.81(46.0)
DM□□-NS4-	1/4 NPT Male NPT	1/4 NPT Male NPT	2.46(62.5)
DM□□-FNS4-	1/4 NPT Female NPT	1/4 NPT Female NPT	2.46(62.5)
DM□□-FR4-	1/4 FR Male NPT	1/4 FR Male NPT	2.30(58.4)
DM□□-FFR4-	1/4 FR Female NPT	1/4 FR Female NPT	2.76(70.1)
DM□□-FFR4-FR4-	1/4 FR Female NPT	1/4 FR Male NPT	2.54(64.5)
DM□□-FR4-FFR4-	1/4 FR Male NPT	1/4 FR Female NPT	2.54(64.5)
DM□□-FO4-	1/4 FO Male NPT	1/4 FO Male NPT	2.00(50.8)

Angle Patterns



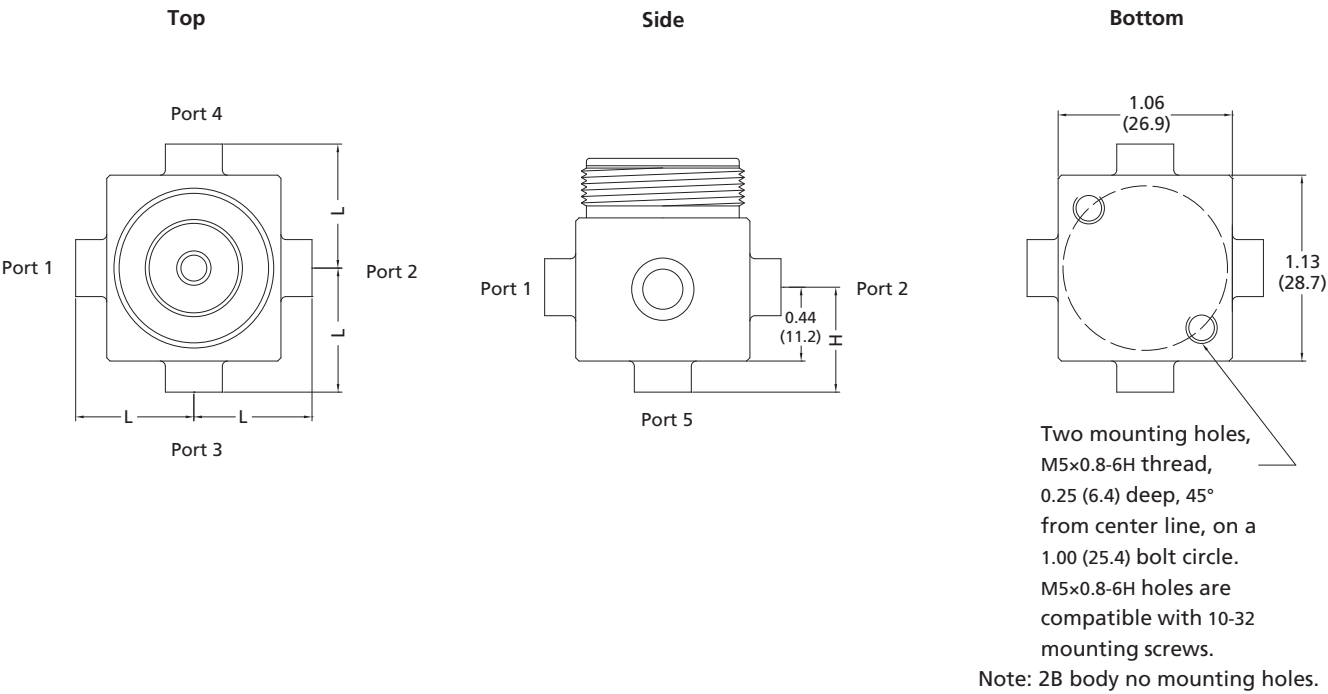
Basic Ordering Number	Connection Type and Size	
	Inlet	Outlet
DM□□-NS4-FNS4-A-	1/4 NPT Male NPT	1/4 NPT Female NPT

Multiport and Elbow Valves

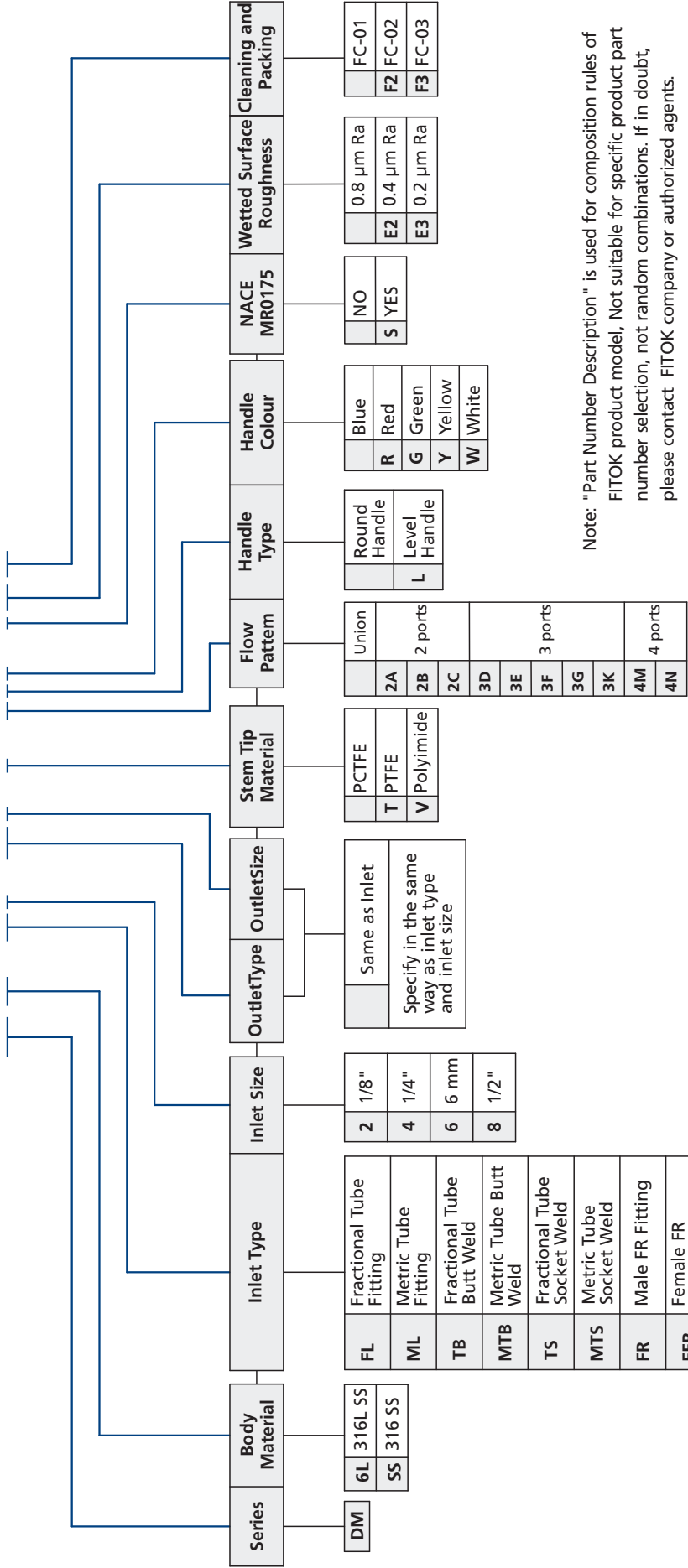
Designator	Schematic	Flow Path		Designator	Schematic	Flow Path	
		Closed	Open			Closed	Open
2A				3D			
2B				3E			
2C				3F			
4M				3G			
4N				3K			

Designator	End Connection		Dimentions, in. (mm)	
			L	H
TB4	1/4" tube butt weld 0.30" (7.6 mm) tube stub, 0.035" wall		0.87(22.1)	0.76(19.3)
TB6	6mm tube butt weld, 1 mm wall		0.87(22.1)	0.76(19.3)
FFR4	1/4" female FR fitting		1.38(35.1)	1.27(32.3)
RFR4	1/4" rotatable male FR fitting		1.74(44.2)	1.63(41.4)

End Connections and Dimentions



DM6L – FL4 – NS4 – T – ALR – SE2F2



Note: "Part Number Description" is used for composition rules of FITOK product model, Not suitable for specific product part number selection, not random combinations. If in doubt, please contact FITOK company or authorized agents.

- Standard Process Specification
FC-01 standard cleaning and packaging, Is applied to all the fittings for general industrial procedure.
- High-Purity Process Specification
FC-02 special cleaning and packaging, following ASTM G93 level C, add -E2F2 as a suffix to the basic ordering number.
- Ultrahigh-purity Process Specification
FC-03 ultrahigh-purity cleaning and packaging, add - E3F3 as a suffix to the basic ordering number.