



Springless Diaphragm Valves

for high performance



SP Series

- Suitable for Ultra High-Purity Applications
- 316L Stainless Steel, 316L Stainless Steel VAR Body
- Low-Pressure and High-Pressure Models
- Metal Seal, Tube Butt Weld, Lok End Connections
- Manual or Pneumatic Actuation



Actuator Options

Pneumatic Actuators



Low-Pressure Models

- Pressure rating : 250 psig (17bar)
- Temperature rating :
-10 to 150°F (-23 to 65°C)
- Flow coefficient : 0.27



High-Pressure Models

- Pressure rating : 3045 psig (210bar)
- Temperature rating :
-10 to 150°F (-23 to 65°C)
- Flow coefficient : 0.20

Manual Actuators

Low-pressure valves have blue handle as standard.
High-pressure valves have white handle as standard.



Directional

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



Toggle

- Spring-loaded toggle design for quick actuation
- Lockable in the CLOSED position for safety
- Handle position provides visual indication of OPEN and CLOSED positions
- Available on low-pressure models



Locking

- 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



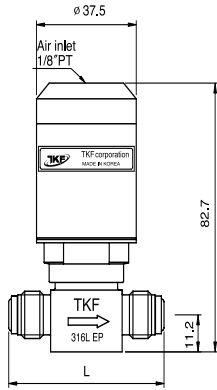
Round

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

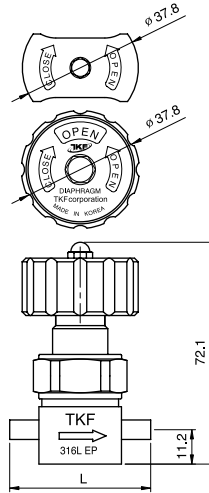
Dimensions

Low - Pressure Valves

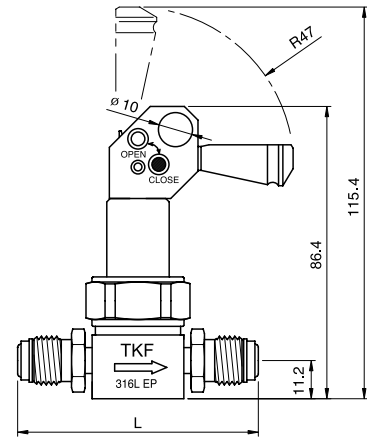
Pneumatic Actuator
Male Integral MFS Fittings



Directional and Round Handle
Tube Butt Weld Ends

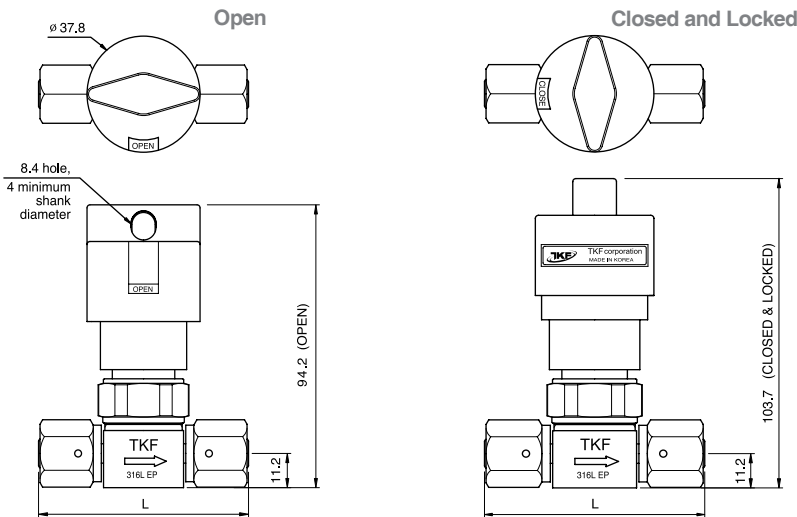


Toggle Handle
Male Rotatable MFS Fittings



* Dimensions, in millimeters, are for reference only and are subject to change.
* Dimensions L - page 5

Locking Handle
Female MFS Fittings



Material

Body :	316L Stainless Steel 316L Stainless Steel VAR
Seat :	PCTFE
Diaphragm :	Ni-Co Alloy
O-Ring :	Viton

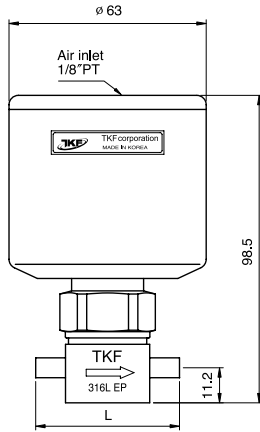
Major Specifications

	Low - Pressure Models	
	Manual Actuators	Pneumatic Actuators
Cv Valve	0.27	0.27
Orifice Size	4.0mm	4.0mm
Max. Working Pressure (G.)	Vacuum to 250psig (17bar)	
Operating Pressure (G.)	-	60 ~ 120psig (4.1 ~ 8.2bar)
Burst Pressure (G.)	3,200 psig (220bar)	
Max. Working Temp.	-10 ~ 150°F (-23 ~ 65°C)	
Internal Leakage Allowance (He) Test Pressure $\leq 1 \times 10^{-2}$ Torr	$\leq 1 \times 10^{-9}$ atm · cc/sec	
External Leakage Allowance (He) Test Pressure $\leq 1 \times 10^{-2}$ Torr	$\leq 1 \times 10^{-9}$ atm · cc/sec	
Particle Inspection (BA, EP) Pressure : 60 ~ 80psi N ₂ Gas Sample Volume : 1CFM 0.1µm and Larger	No count	

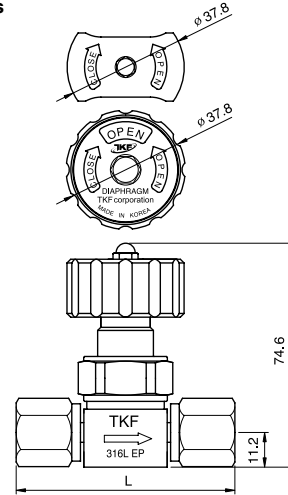
Dimensions

High - Pressure Valves

Pneumatic Actuator
Tube Butt Weld Ends

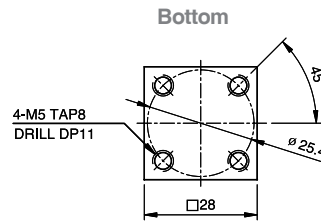
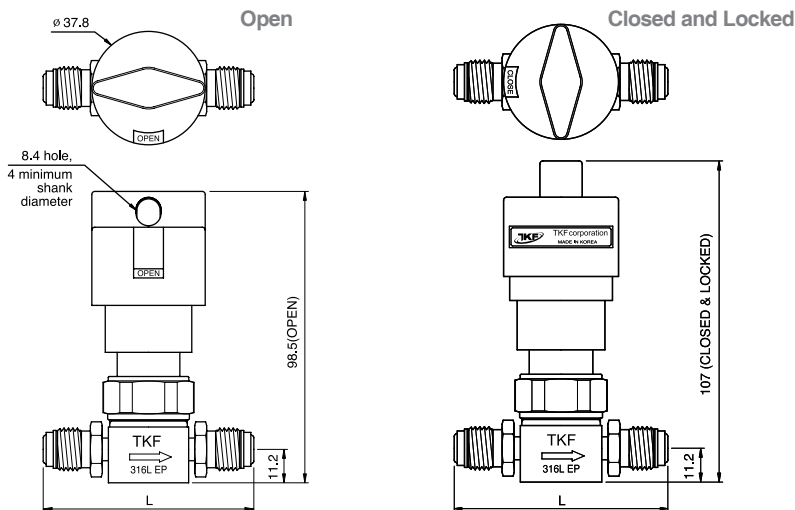


Directional and Round Handle
Female MFS Fittings



* Dimensions, in millimeters, are for reference only and are subject to change.
* Dimensions L - page 5

Locking Handle
Male Rotatable MFS Fittings



Material

Body :	316L Stainless Steel 316L Stainless Steel VAR
Seat :	PCTFE
Diaphragm :	Ni-Co Alloy
O-Ring :	FKM

Major Specifications

	High - Pressure Models	
	Manual Actuators	Pneumatic Actuators
Cv Valve	0.2	0.2
Orifice Size	4.0mm	4.0mm
Max. Working Pressure (G.)	Vacuum to 3,045psig (210bar)	
Operating Pressure (G.)	-	70~120psig (4.8~8.2bar)
Burst Pressure (G.)	12,200 psig (840bar)	
Max. Working Temp.	-10 ~ 150°F (-23 ~ 65°C)	
Internal Leakage Allowance (He)	≤ 1 x 10 ⁻⁹ atm · cc/sec	
Test Pressure ≤ 1 x 10 ⁻² Torr		
External Leakage Allowance (He)	≤ 1 x 10 ⁻⁹ atm · cc/sec	
Test Pressure ≤ 1 x 10 ⁻² Torr		
Particle Inspection (BA, EP)		
Pressure : 60 ~ 80psi N ₂ Gas	No count	
Sample Volume : 1CFM		
0.1µm and Larger		

Ordering Information

Number	Series	End Connection	Flow	Manual Handle	Handle	Pneumatic	Option	Grade
S : 316L Stainless Steel D : 316L Stainless Steel VAR		TL TS TJ VF RM VM SW	1 2 3 4 5 6 7 8 9 10	D(Directional Handle) L(Locking Handle) R(Round Handle) T(Toggle Handle)	BK - Black RD - Red BL - Blue SBL - Sky Blue WH - White GR - Green YW - Yellow OR - Orange	C - Normally Closed O - Normally Open	X **	BLANK - BA Grade P - EP Grade
Low - Pressure Diaphragm Valve • SP(Manual) • 4PSP(Pneumatic)								
High - Pressure Diaphragm Valve • 4HSP(Manual) • 4HPSP(Pneumatic)								

BLABK : Straight Type

GRADE	BA	EP
Inner Surface Roughness	Ry ≤ 3.0 μm 10 $\mu\text{inch Ra(Avg.)}$ Cut Off Length : 0.8mm Measuring Length : 4mm	Ry ≤ 0.7 μm 5 $\mu\text{inch Ra(Avg.)}$ Cut Off Length : 0.25mm Measuring Length : 1.25mm
Polishing	Machining Finish	Electro Polishing Finish

Example Part Numbers

Ordering	S4SP-VM-L-GR-P	D4HPSP-VFVFVF-7-C
Material	316L Stainless Steel	316L Stainless Steel VAR
Series	Low - Pressure Manual Diaphragm Valve	High - Pressure Pneumatic Diaphragm Valve
End Connection	1/4" Male Integral MFS Fitting	1/4" Female Integral MFS Fitting
Flow	Straight Type	3 Port
Manual Handle	Locking Handle	-
Handle Color	Green	-
Pneumatic	-	Normally Closed
Grade	EP Grade	BA Grade

Color Coded Handles



- BL - Blue
- SBL - Sky Blue
- OR - Orange
- YW - Yellow
- GR - Green
- RD - Red
- BK - Black
- WH - White

- * Eight handle colors are available
- * Low-Pressure valves have blue handles as standard
- * High-pressure valves have white handles as standard

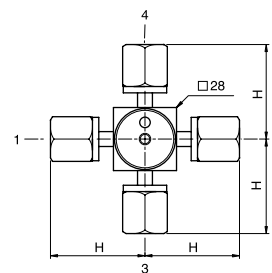
Flow Path

Ports	Schematic	Flow Path		Designator
		Closed	Open	
4 Port				4
				5
3 Port				1
				2
				3
				6
				7
				7
2 Port				8
				9
				10

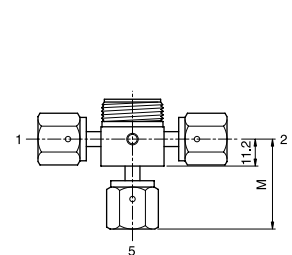
End Connections

Designator	Dimensions, mm(inch)	Dimensions, mm(inch)			
		L	H	M	
1/4 in. Tube Butt Weld		TW	44.2 (1.74)	22.1 (0.87)	19.3 (0.76)
1/4 in. Female MFS Fitting		VF	70.6 (2.78)	35.3 (1.39)	41.4 (1.63)
1/4 in. Male Integral MFS Fitting		VM	58.4 (2.30)	29.2 (1.15)	-
1/4 in. Lok Tube Fittings		SW	69.5 (2.74)	34.7 (1.37)	-

Top



Side



Springless Diaphragm Valves for high performance



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