

# SP Series

Springless Diaphragm Valves for high performance



## FEATURES

- Suitable for ultrahigh-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



# 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 D(Directional Handle) 2 L(Locking Handle) 3 R(Round Handle) 4 T(Toggle Handle) 5 6 7 8 9 10		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
<b>Low - Pressure Diaphragm Valve</b> • 4SP(Manual) • 4PSP(Pneumatic)								
<b>High - Pressure Diaphragm Valve</b> • 4HSP(Manual) • 4HPSP(Pneumatic)								
			BLABK : Straight Type					

GRADE	BA	EP
Inner Surface Roughness	Ry ≤ 3.0 $\mu\text{m}$ 10 $\mu\text{inch Ra(Avg.)}$ Cut Off Length : 0.8mm Measuring Length : 4mm	Ry ≤ 0.7 $\mu\text{m}$ 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 - SBL - OR - YW - GR - RD - BK - WH  
 Blue Sky Blue Orange Yellow Green Red Black White

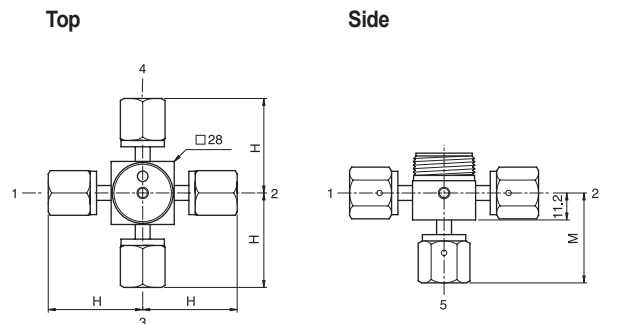
\* Eight handle colors are available  
 \* Low-Pressure valves have blue handles as standard  
 \* High-pressure valves have white handles as standard

## FLOW PATH

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

## END CONNECTIONS

Designator	Diagram	Designator	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)	-



# 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

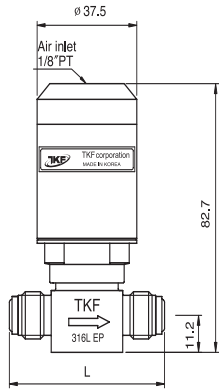
- Quick, quarter-turn actuation
- Handle with window provides visual indication of OPEN and CLOSED positions
- Available on high and low-pressure models

# DIMENSIONS

## LOW - PRESSURE VALVES

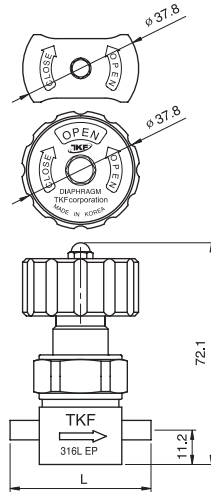
### PNEUMATIC ACUATOR

Male Integral MFS Fittings



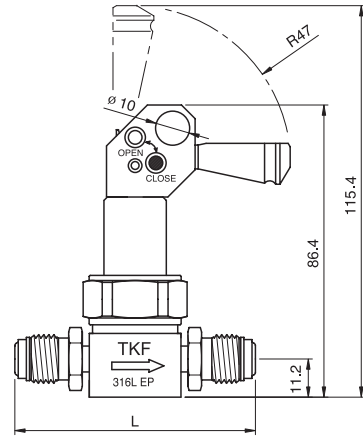
### DIRECTIONAL AND ROUND HANDLE

Tube Butt Weld Ends



### TOGGLE HANDLE

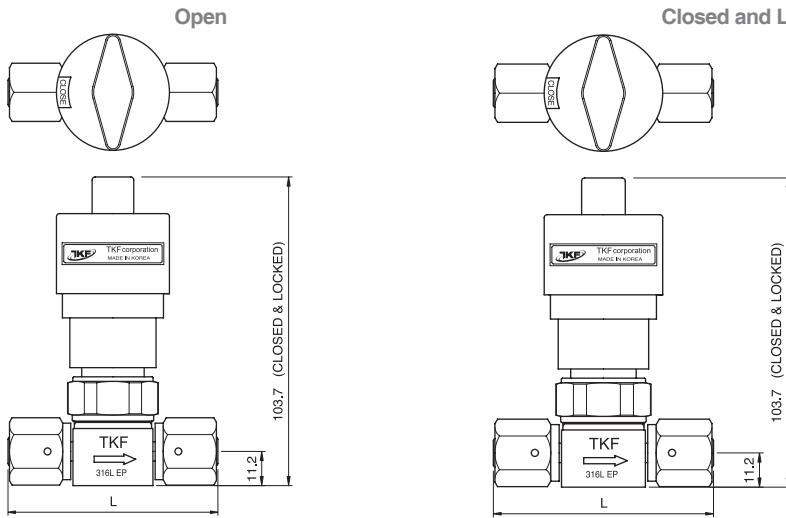
Male Rotatable MFS Fittings



\* 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

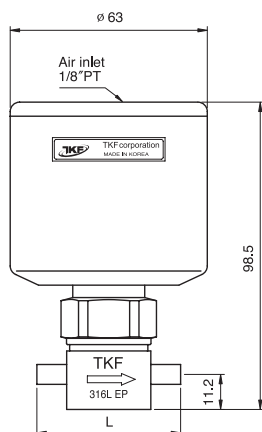
	Low - Pressure Models	
	Manual Actuators	Pneumatic Actuators
Cv Valve	0.27	0.27
Orifice Size	4.0mm	4.0mm
Max. Working Pressure (G.)	Vacuum to 250psig (17bar)	
Operating Pressure (G.)	-	60 ~ 120psig (4.1 ~ 8.2bar)
Burst Pressure (G.)	3,200 psig (220bar)	
Max. Working Temp.	-10 ~ 150°F (-23 ~ 65°C)	
Internal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

# DIMENSIONS

## LOW - PRESSURE VALVES

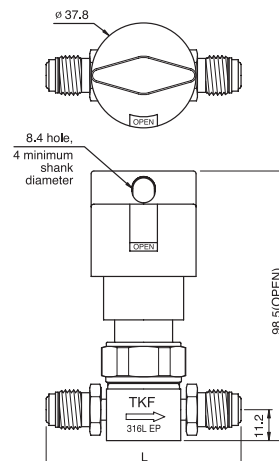
### PNEUMATIC ACTUATOR

Tube Butt Weld Ends



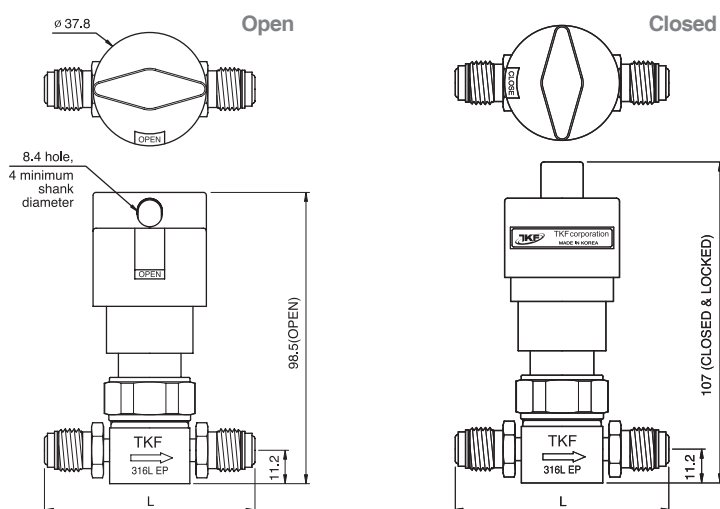
### DIRECTIONAL AND ROUND HANDLE

Female MFS Fittings



### LOCKING HANDLE

Male Rotatable MFS Fittings



\* Dimensions, in millimeters, are for reference only and are subject to change.

\* Dimensions L - page 5

## 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) 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 <sub>2</sub> Gas Sample Volume : 1CFM 0.1µm and Larger	No count	