



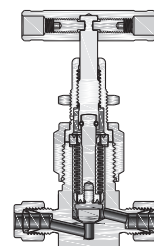
# Bellows-Sealed Valves

BS and BSM Series

# Contents

## General-Purpose Bellows-Sealed Valves (BS1 Series)

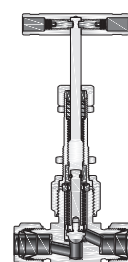
- ❖ Maximum working pressure up to 1000 psig (68.9 bar)
- ❖ Working temperature from -20°F to 900°F (-28°C to 482°C)
- ❖ Flow coefficients (Cv) from 0.12 to 1.2
- ❖ General-Purpose Bellows-Sealed Valves



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## Secondary Containment Bellows-Sealed Valves (BS2 Series)

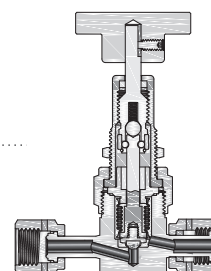
- ❖ Maximum working pressure up to 2500 psig (172 bar)
- ❖ Working temperature from -20°F to 1200°F (-28°C to 648°C)
- ❖ Flow coefficients (Cv) from 0.36 to 5.3
- ❖ General-Purpose Bellows-Sealed Valves



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## Low Pressure Bellows-Sealed Valves (BS3 Series)

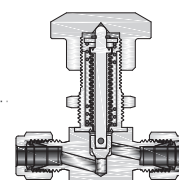
- ❖ Maximum working pressure up to 500 psig (34.4 bar)
- ❖ Working temperature from -40°F to 200°F (-40°C to 93°C)
- ❖ Flow coefficients (Cv) from 0.3 to 0.7
- ❖ General-Purpose Bellows-Sealed Valves



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## Nonrotating-Stem Needle Valves (BS4 Series)

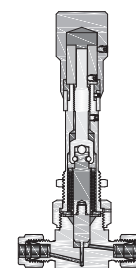
- ❖ Maximum working pressure up to 1000 psig (68.9 bar)
- ❖ Working temperature from -80°F to 600 °F (-62 °C to 315 °C)
- ❖ Flow coefficients (Cv) from 0.11 to 0.28
- ❖ General-Purpose Bellows-Sealed Valves



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## Bellows-Sealed Metering Valves (BSM Series)

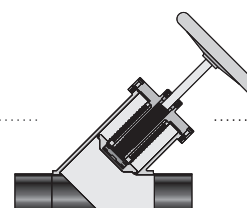
- ❖ Maximum working pressure up to 700 psig (48.2 bar)
- ❖ Working temperature from -20°F to 900°F (-28°C to 482°C)
- ❖ Flow coefficients: 0.019 and 0.30
- ❖ 316 stainless steel materials



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## High-Flow Bellows-Sealed Valves (BBS1 Series)

- ❖ Working Pressure: Vacuum ~ 375psi(25.8bar)
- ❖ Temperature: -22°F (-30°C) ~180°F (82°C)
- ❖ Highest Cv and Most Compact Design
- ❖ 316 stainless steel materials



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# General-Purpose Bellows-Sealed Valves

## BS1 Series

### Features

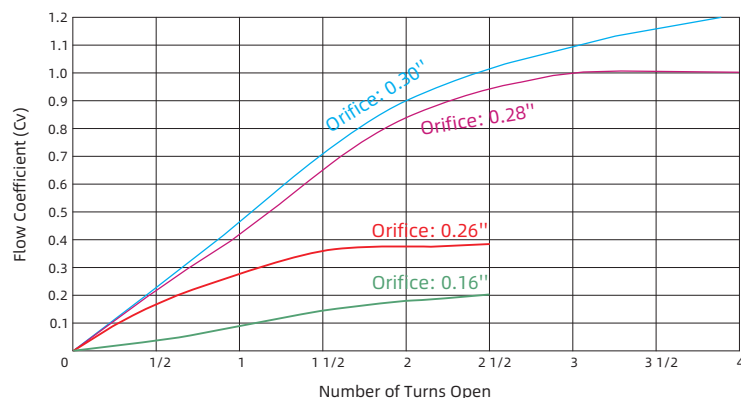
- ❖ Maximum working pressure up to 1000 psig (68.9 bar)
- ❖ Working temperature from -20°F to 900°F (-28°C to 482°C)
- ❖ Flow coefficients (Cv) from 0.12 to 1.2
- ❖ Variety of end connections
- ❖ 316 S.S., brass and monel 400 materials
- ❖ Panel and bottom mounting
- ❖ Bar, round handle are available
- ❖ Precision-formed metal bellows provides reliable seal
- ❖ Nonrotating stem tip: spherical, conical and regulating
- ❖ Gasket body to bellows seal is standard, weld seal also available
- ❖ Replaceable bellows and stem assembly
- ❖ Every valve is tested with helium for 10s to a maximum leak rate of  $4 \times 10^{-9}$  std cm<sup>3</sup>/s



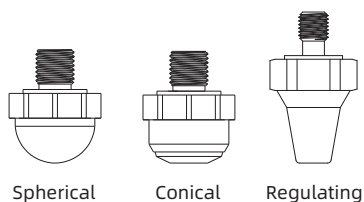
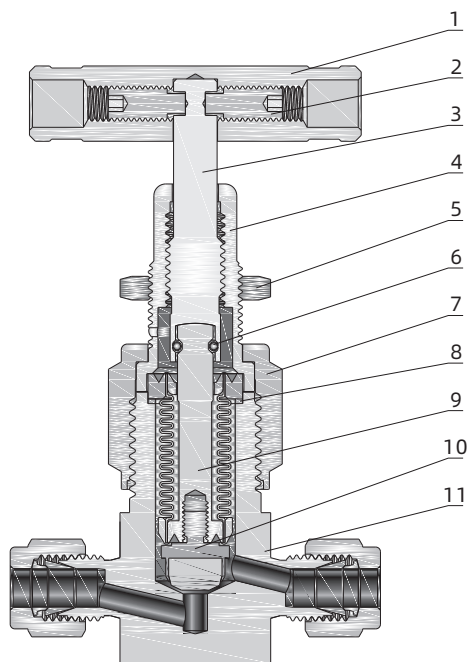
### Pressure-Temperature Ratings

Body Material	316 S.S.			Brass		Alloy 400	
Options	PCTFE(Tip) & Gasket body-to-bellows Seal	316 S.S.(Tip) & Gasket body-to-bellows Seal	316 S.S.(Tip) & Welded body-to-bellows Seal	PCTFE(Tip) & Gasket body-to-bellows Seal	316 S.S.(Tip) & Gasket body-to-bellows Seal	PCTFE(Tip) & Gasket body-to-bellows Seal	316 S.S.(Tip) & Gasket/Welded body-to-bellows Seal
Temperature, °F(°C)	Working Pressure, psig(bar)						
-20(-23) to 100(37)	1000(68.9)	1000(68.9)	1000(68.9)	1000(68.9)	1000(68.9)	700(48.2)	700(48.2)
200(93)	830(57.2)	830(57.2)	830(57.2)	710(48.9)	710(48.9)	610(42.0)	610(42.0)
300(148)	—	660(45.5)	660(45.5)	—	430(29.6)	—	530(36.5)
400(204)	—	500(34.4)	500(34.4)	—	150(10.3)	—	450(31.0)
500(260)	—	450(31.0)	450(31.0)	—	—	—	375(25.8)
600(315)	—	400(27.5)	400(27.5)	—	—	—	—
650(343)	—	—	360(24.8)	—	—	—	—
700(371)	—	—	330(22.7)	—	—	—	—
750(398)	—	—	300(20.6)	—	—	—	—
800(426)	—	—	260(17.9)	—	—	—	—
850(454)	—	—	230(15.8)	—	—	—	—
900(482)	—	—	200(13.7)	—	—	—	—

### Flow Coefficient vs. Turns Open

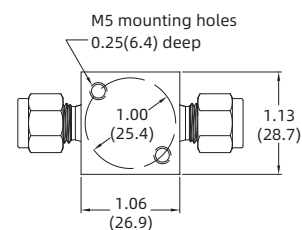
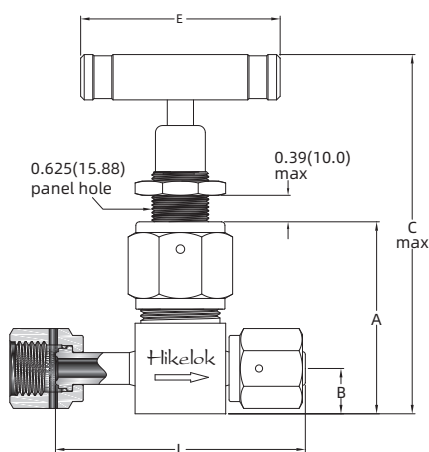
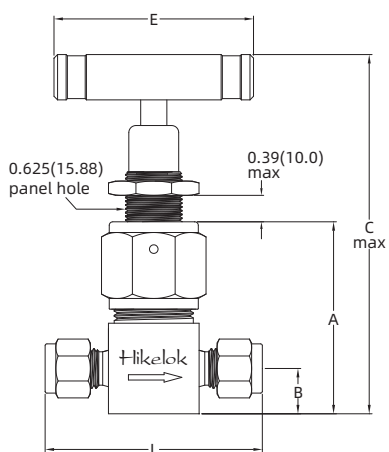


## Standard Materials of Construction



Component		Material Grade / ASTM Specification	
		316 S.S.	Alloy 400
1	Handle	Anodized aluminum 2024-T4/B211	
2	Screw	Alloy Steel / ANSI 18.3	
3	Actuator	416 S.S. / A582	416 S.S. / A582
4	Bonnet	316 S.S. / A479	316 S.S. / A479
5	Nut	316 S.S. / B783	
6	Pin	420 S.S.	
7	Bonnet Nut	Sliver-plated 316 S.S. / A479	Sliver-plated 316 S.S. / A479
8	Gasket	Silver-plated 316 S.S. / A580	Sliver-plated Alloy 400 / AMS4730
		PTFE-coated 316 S.S. / A580	PTFE-coated Alloy 400 / AMS4730
9	Stem	316 S.S. / A479	Alloy 400 / B164
	Weld Ring	316 S.S. / A479	Alloy 400 / B164
	Bellows	316L S.S.	Alloy 400 / B165
10	Stem Tip	316 S.S. / A479 (regulating)	Alloy k-500 / AMS4676 (regulating)
		PCTFE / D1430 (conical)	PCTFE/D1430 (conical)
		Weld Stellite (regulating or spherical)	—
11	Body	316 S.S. / A479	Alloy 400/B164

## Dimensions



Basic Ordering Number	Connection Type and Size	Orifice in. (mm)	Cv	Dimension in. (mm)								
				A	B	C	D	E	L	W	H	Ød
BS1-F4-04-	1/4" Hikelok	0.16 (4.1)	0.36	2.12 (53.8)	0.5 (12.7)	4.01 (101.8)	0.39 (10.0)	2.20 (56.0)	2.46 (62.5)	1.00 (25.4)	1.06 (27.0)	1.00 (25.4)
BS1-F8-08-	1/2" Hikelok	0.30 (7.6)	1.20	2.24 (56.8)	0.56 (14.2)	4.13 (104.8)	0.39 (10.0)	2.52 (64.0)	3.30 (83.8)	1.13 (28.7)	1.57 (39.9)	1.13 (28.7)
BS1-M6-04-	6 mm Hikelok	0.16 (4.1)	0.36	2.12 (53.8)	0.5 (12.7)	4.01 (101.8)	0.39 (10.0)	2.20 (56.0)	2.46 (62.5)	1.00 (25.4)	1.06 (27)	1.00 (25.4)
BS1-M10-08-	10 mm Hikelok	0.28 (7.1)	1.00	2.24 (56.8)	0.56 (14.2)	4.13 (104.8)	0.39 (10.0)	2.52 (64.0)	3.11 (79.0)	1.13 (28.7)	1.57 (39.9)	1.13 (28.7)
BS1-M12-08-	12 mm Hikelok	0.30 (7.6)	1.20	2.24 (56.8)	0.56 (14.2)	4.13 (104.8)	0.39 (10.0)	2.52 (64.0)	3.30 (83.8)	1.13 (28.7)	1.57 (39.9)	1.13 (28.7)
BS1-FSW4-04-	1/4" FSW	0.16 (4.1)	0.36	2.12 (53.8)	0.5 (12.7)	4.01 (101.8)	0.39 (10.0)	2.20 (56.0)	1.68 (42.7)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)
BS1-FSW6-08-	3/8" FSW	0.28 (7.1)	1.00	2.12 (53.8)	0.5 (12.7)	4.01 (101.8)	0.39 (10.0)	2.20 (56.0)	2.27 (57.7)	1.00 (25.4)	1.06 (27)	1.00 (25.4)
BS1-FSW8-08-	1/2" FSW	0.30 (7.6)	1.20	2.12 (53.8)	0.5 (12.7)	4.01 (101.8)	0.39 (10.0)	2.20 (56.0)	2.27 (57.7)	1.00 (25.4)	1.06 (27)	1.00 (25.4)
BS1-FBW4-04-	1/4" FBW	0.16 (4.1)	0.36	2.12 (53.8)	0.5 (12.7)	4.01 (101.8)	0.39 (10.0)	2.20 (56.0)	1.68 (42.7)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)
BS1-FBW6-08-	3/8" FBW	0.28 (7.1)	1.00	2.12 (53.8)	0.5 (12.7)	4.01 (101.8)	0.39 (10.0)	2.20 (56.0)	2.18 (55.4)	1.00 (25.4)	1.06 (27.0)	1.00 (25.4)
BS1-FBW8-08-	1/2" FBW	0.30 (7.6)	1.20	2.12 (53.8)	0.5 (12.7)	4.01 (101.8)	0.39 (10.0)	2.20 (56.0)	2.18 (55.4)	1.00 (25.4)	1.06 (27.0)	1.00 (25.4)
BS1-FGFS4-04-	1/4" Female GFS	0.16 (4.1)	0.36	2.12 (53.8)	0.5 (12.7)	4.01 (101.8)	0.39 (10.0)	2.52 (64.0)	2.76 (70.1)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)
BS1-FGFS8-08-	1/2" Female GFS	0.30 (7.6)	1.20	2.24 (56.8)	0.56 (14.2)	4.13 (104.8)	0.39 (10.0)	2.52 (64.0)	3.12 (79.2)	1.13 (28.7)	1.50 (38.1)	1.13 (28.7)
BS1-GFS4-04-	1/4" Male GFS	0.16 (4.1)	0.36	2.12 (53.8)	0.5 (12.7)	4.01 (101.8)	0.39 (10.0)	2.20 (56.0)	2.24 (56.9)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)
BS1-GFS8-08-	1/2" Male GFS	0.30 (7.6)	1.20	2.24 (56.8)	0.56 (14.2)	4.13 (104.8)	0.39 (10.0)	2.52 (64.0)	3.00 (76.2)	1.13 (28.7)	1.50 (38.1)	1.13 (28.7)

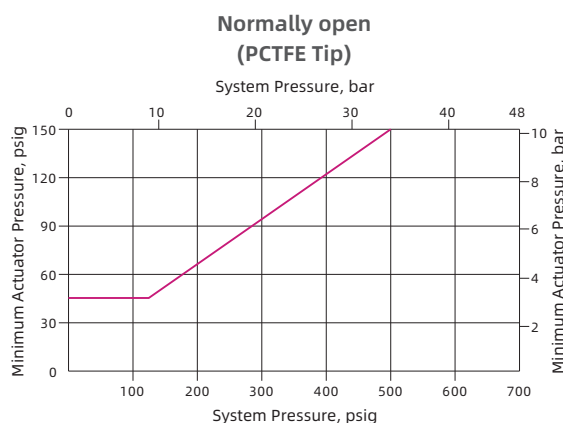
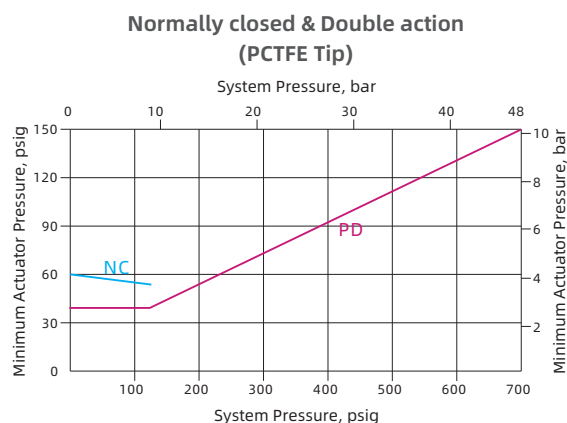
## Pneumatic Actuators

### Features

- ❖ Reliable piston design for enhanced cycle life
- ❖ Low actuation pressure
- ❖ Aluminum and stainless steel components

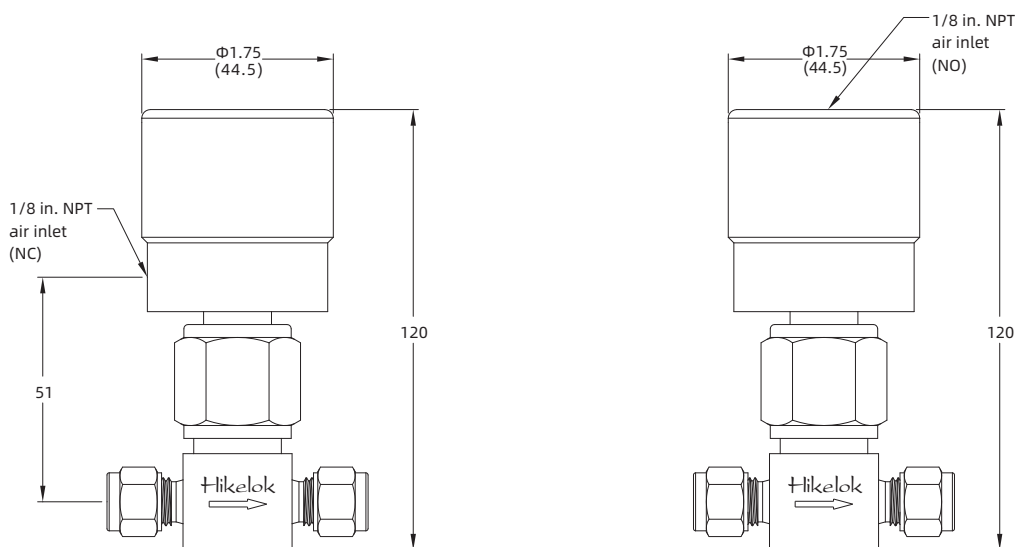
### Actuation Modes

- ❖ Normally closed(NC) – air opens, spring closes
- ❖ Normally open(NO) – air closes, spring opens
- ❖ Double acting(PD) – air opens and closes



Orifice Size 04(4.1mm)

## Dimensions



Orifice Size 04(4.1mm)

### Indicator Switches

- ❖ Transmits a signal to an electrical device indicating either the open or closed position of a pneumatically actuated valve.
- ❖ Features a single-pole, single-throw switch rated at:
  - 0.2 A for 24 V (DC) for normally open & closed switch;
  - 0.3 A for 220 V (AC) for a normally open & closed switch;
  - 5°F to 185°F (-15°C to 85°C) temperature.
- ❖ Wire length & temperature available
- ❖ Is available assembled on any BS1 series.

### How to Order

Series	Inlet Type	Inlet Size	Outlet Type	Outlet Size	Orifice Size	Seal Type	Tip Type	Handle	Body Material	Position Sensor							
BS1	FBW Fractional Tube Butt Weld	2 1/8 in.	Same as inlet type and inlet size  If outlet and inlet are the same, eliminate the outlet designator		04 0.16 in. (4.1 mm)	Gasket Seal	PCTFE	Black Aluminum	316 316 S.S.	IS Indicator Switches							
	MBW Metric Tube Butt Weld	4 1/4 in.									Welded Seal	V Conical	L1 Blue Aluminum	316L 316L S.S.			
	F Fractional Tube Fitting	6 3/8 in. or 6 mm													A Spherical	R1 Red Aluminum	304 304 S.S.
		8 1/2 in. or 8 mm															
	M Metric Tube Fitting	10 10 mm													S1 304 Stainless Steel		
	UGF Nut+Gasket+Fractional Bulge Nipple	12 3/4 in. or 12 mm														K1 Black Knob	
	UGM Nut+Gasket+Metric Bulge Nipple														NC		
	FGFS Female GFS Fitting															NO	
	GFS Male GFS Fitting														PD		

- ❖ Pneumatic actuators:
  - NC-low pressure Pneumatic, normally closed;
  - NO-low pressure Pneumatic, normally open;
  - PD-low pressure Double action.

# Secondary Containment Bellows-Sealed Valves

## BS2 Series

### Features

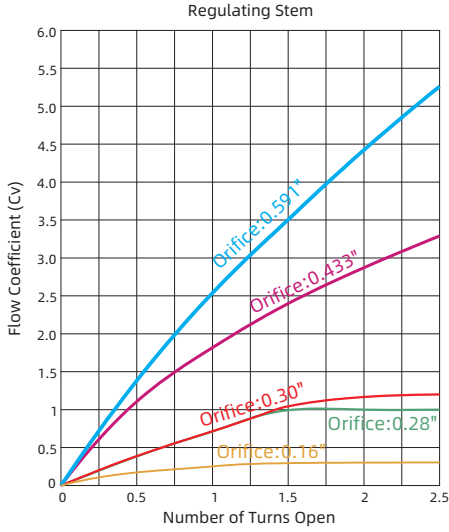
- ❖ Maximum working pressure up to 2500 psig (172 bar)
- ❖ Working temperature from -20°F to 1200°F (-28°C to 648°C)
- ❖ Flow coefficients (Cv) from 0.36 to 5.3
- ❖ Upper packing provides secondary containment system above the bellows
- ❖ Hydraulic-formed multilayer bellows enhanced cycle life
- ❖ Nonrotating stem tip eliminates galling within the seat area
- ❖ Strictly controlled bellows stroke to improve safety and cycle life
- ❖ Replaceable bellows and stem assembly
- ❖ Regulating, conical, and spherical stem tips available
- ❖ Panel, bottom, and side mounting available
- ❖ Double lock-pins enable steady and durable fastening of the handle
- ❖ Handle color options are available
- ❖ Every Hikelok bellows-sealed valve is factory tested with helium to a maximum leak rate of  $4 \times 10^{-9}$  std cm<sup>3</sup>/s at the seat, envelope and all seals



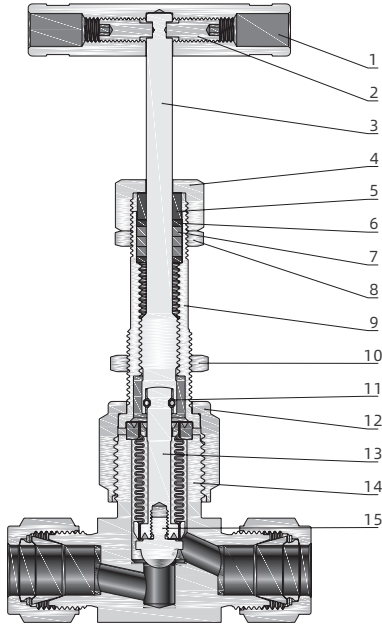
### Pressure-Temperature Ratings

Body Material	316 S.S.			
Options	Standard-Temperature Model			High-Temperature Model
	PCTFE (Tip) & Gasket body-to-bellows Seal	316 S.S. (Tip) & Gasket body-to-bellows Seal	316 S.S. (Tip) & Welded body-to-bellows Seal	316 S.S. (Tip) & Welded body-to-bellows Seal
Temperature, °F(°C)	Working Pressure, psig (bar)			
-20 (-23) to 100 (37)	2500 (172)	2500 (172)	2500 (172)	2500 (172)
200 (93)				
300 (148)	—	—	2120 (146)	2120 (146)
400 (204)			1740 (119)	1740 (119)
500 (260)			1360 (93.7)	1360 (93.7)
600 (315)			980 (67.5)	980 (67.5)
650 (343)			600 (41.3)	600 (41.3)
700 (371)			540 (37.2)	540 (37.2)
750 (398)			480 (33.0)	480 (33.0)
800 (426)			425 (29.2)	425 (29.2)
850 (454)			360 (24.8)	360 (24.8)
900 (482)			300 (20.6)	300 (20.6)
950 (510)	250 (17.2)	250 (17.2)		
1000 (537)	—	—	—	
1050 (565)	—	—	—	
1100 (593)	—	—	—	
1150 (621)	—	—	—	
1200 (648)	—	—	—	

# Flow Coefficient vs. Turns Open



# Standard Materials of Construction

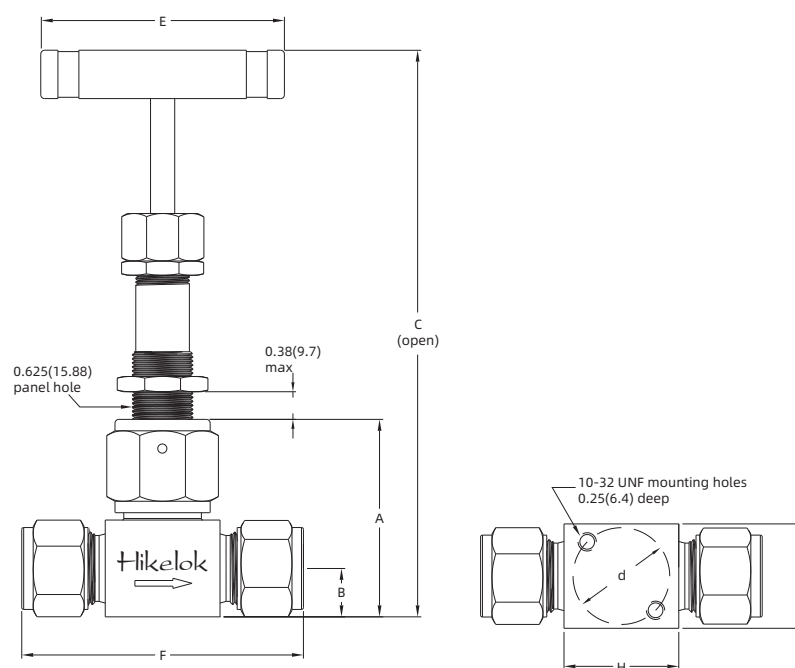


### Tip Types

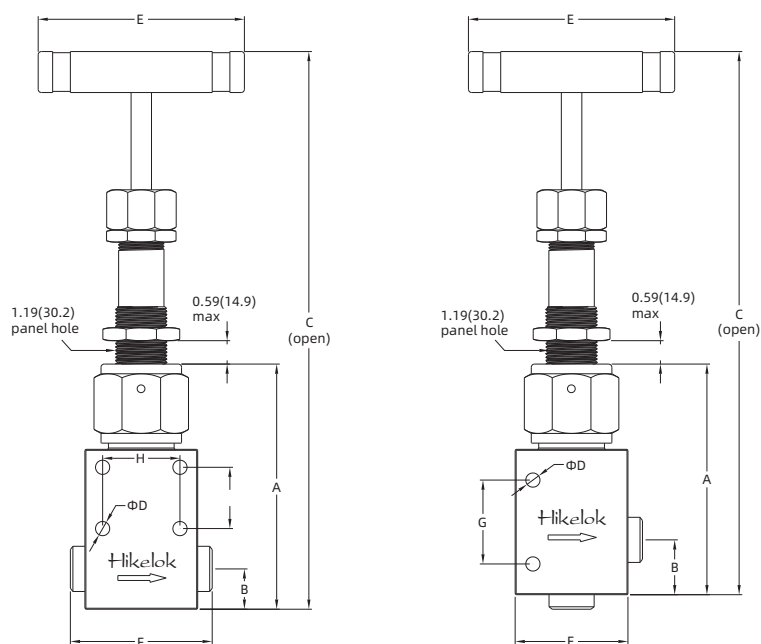


Component		Valve Body Material Grade / ASTM Specification
		316 S.S.
1	Handle	Green anodized aluminum 6061 / B211
2	Screw	Alloy Steel / ANSI 18.3
3	Actuator	416 S.S. / A582
4	Packing Nut	316 S.S. / A276
5	Gland	316 S.S. / A276
6	Spacer	316 S.S. / A276
7	Packing	PTFE or Graphite
8	Nut	316 S.S. / A276
9	Bonnet	316 S.S. / A479
10	Nut	316 S.S. / A479
11	Pin	Stainless steel
12	Bonnet Nut	316 S.S. / A479
	Stem	316 S.S. / A479
13	Weld Ring	316 S.S. / A479
	Bellows	316L S.S.
14	Body	316 S.S. / A182
15	Stem Tip	316 S.S. / A479 (regulating)
		PCTFE / D1430 (conical)
		Weld Stellite (regulating or spherical)

## Dimensions



Basic Ordering Number	End Connections	Orifice in. (mm)	Cv	Dimensions, in. (mm)							
				A	B	C	E	F	G	H	Ød
BS2-F4-04-	1/4" Hikelok	0.16 (4.1)	0.36	2.69 (59.9)	0.56 (14.2)	6.48 (165)	2.50 (63.5)	2.46 (62.5)	1.00 (25.4)	1.06 (26.9)	1.00 (25.4)
BS2-F8-08-	1/2" Hikelok	0.30 (7.6)	1.20	1.61 (40.9)	0.50 (12.7)	6.59 (167)	2.50 (63.5)	3.30 (83.8)	1.13 (28.7)	1.57 (39.9)	1.13 (28.7)
BS2-M6-04-	6 mm Hikelok	0.16 (4.1)	0.36	1.49 (37.8)	0.56 (14.2)	6.48 (165)	2.50 (63.5)	2.46 (62.5)	1.00 (25.4)	1.06 (26.9)	1.00 (25.4)
BS2-FSW4-04-	1/4" FSW	0.16 (4.1)	0.36	1.49 (37.8)	0.56 (14.2)	6.48 (165)	2.50 (63.5)	1.68 (42.7)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)
BS2-FSW8-08-	1/2" FSW	0.30 (7.6)	1.20	1.61 (40.9)	0.50 (12.7)	6.59 (167)	2.50 (63.5)	2.27 (57.7)	1.13 (28.7)	1.52 (38.6)	1.13 (28.7)
BS2-FBW4-04-	1/4" FBW	0.16 (4.1)	0.36	1.49 (37.8)	0.56 (14.2)	6.48 (165)	2.50 (63.5)	1.68 (42.7)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)
BS2-FBW8-08-	1/2" FBW	0.30 (7.6)	1.20	1.61 (40.9)	0.50 (12.7)	6.59 (167)	2.50 (63.5)	2.27 (57.7)	1.13 (28.7)	1.52 (38.6)	1.13 (28.7)
BS2-FGFS4-04-	1/4" Female GFS	0.16 (4.1)	0.36	1.49 (37.8)	0.56 (14.2)	6.48 (165)	2.50 (63.5)	2.76 (70.1)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)
BS2-FGFS8-08-	1/2" Female GFS	0.30 (7.6)	1.20	1.61 (40.9)	0.50 (12.7)	6.59 (167)	2.50 (63.5)	2.98 (75.7)	1.13 (28.7)	1.52 (38.6)	1.13 (28.7)
BS2-GFS4-04-	1/4" Male GFS	0.16 (4.1)	0.36	1.49 (37.8)	0.56 (14.2)	6.48 (165)	2.50 (63.5)	2.24 (56.9)	1.00 (25.4)	1.00 (25.4)	1.00 (25.4)
BS2-GFS8-08-	1/2" Male GFS	0.30 (7.6)	1.20	1.61 (40.9)	0.50 (12.7)	6.59 (167)	2.50 (63.5)	3.00 (76.2)	1.13 (28.7)	1.52 (38.6)	1.13 (28.7)



Basic Ordering Number	End Connections	Orifice in. (mm)	CV	Dimensions, in. (mm)							
				A	B	C	E	F	G	H	ΦD
BS2-FSW12-11-	3/4" FSW	0.433 (11.0)	3.10	4.88 (124)	1.00 (25.4)	11.60 (295)	4.00 (102)	2.44 (62.0)	1.25 (31.8)	1.46 (37.0)	0.27 (6.9)
BS2-FBW12-11-	3/4" FBW	0.433 (11.0)	3.10	4.88 (124)	1.00 (25.4)	11.60 (295)	4.00 (102)	2.44 (62.0)	1.25 (31.8)	1.46 (37.0)	0.27 (6.9)
BS2-FSW12-15-A1-	3/4" FSW	0.591 (15.0)	5.30	4.88 (124)	1.44 (36.6)	11.60 (295)	4.00 (102)	2.49 (63.2)	1.60 (40.6)	—	0.26 (6.6)
BS2-FBW12-15-A1-	3/4" FBW	0.591 (15.0)	5.30	4.88 (124)	1.44 (36.6)	11.60 (295)	4.00 (102)	2.49 (63.2)	1.60 (40.6)	—	0.26 (6.6)
BS2-FBW16-15-A1-	1" FBW	0.591 (15.0)	5.30	4.88 (124)	1.44 (36.6)	11.60 (295)	4.00 (102)	2.49 (63.2)	1.60 (40.6)	—	0.26 (6.6)

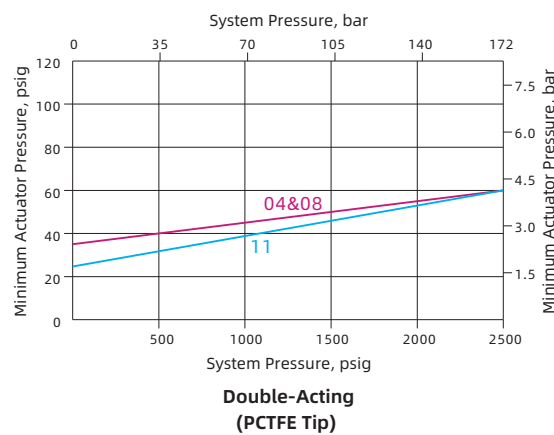
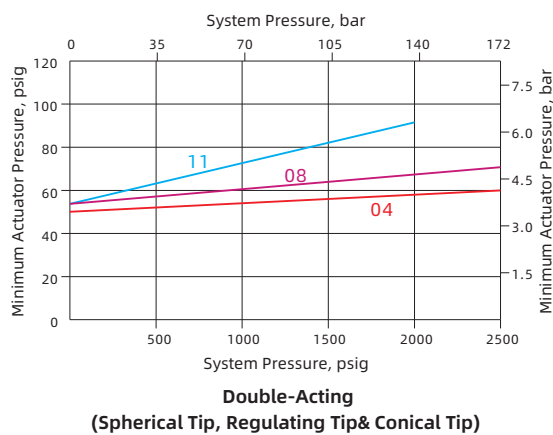
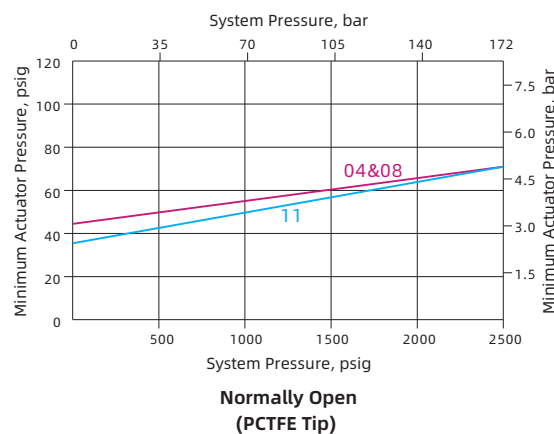
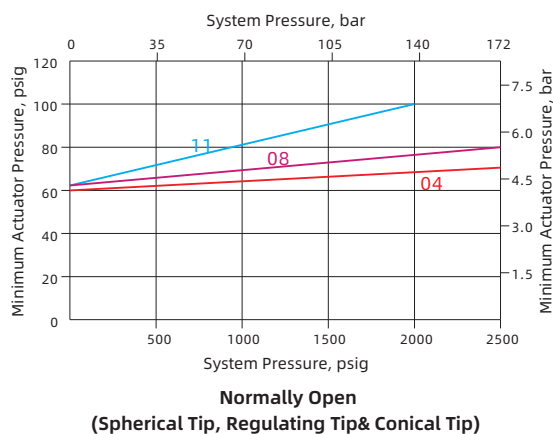
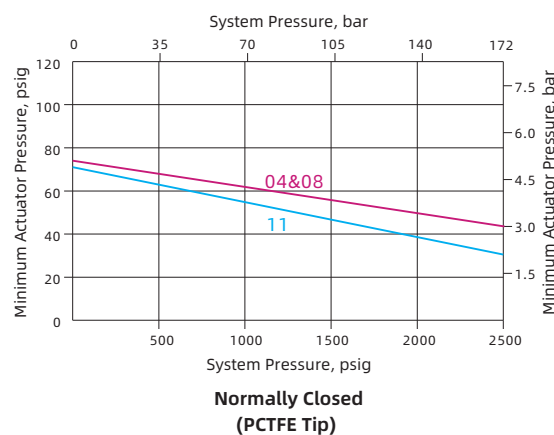
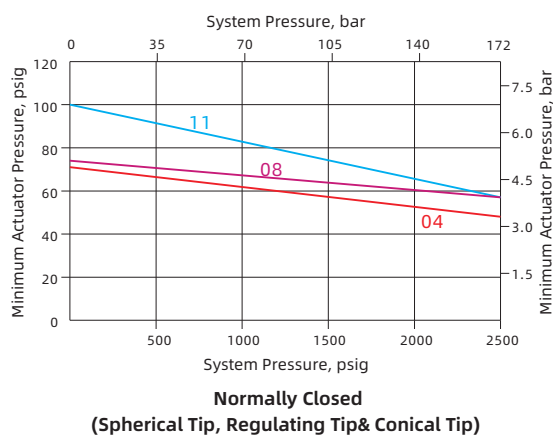
# Pneumatic Actuators

## Features

- ❖ Reliable piston design for enhanced cycle life
- ❖ Low actuation pressure
- ❖ Aluminum and stainless steel components

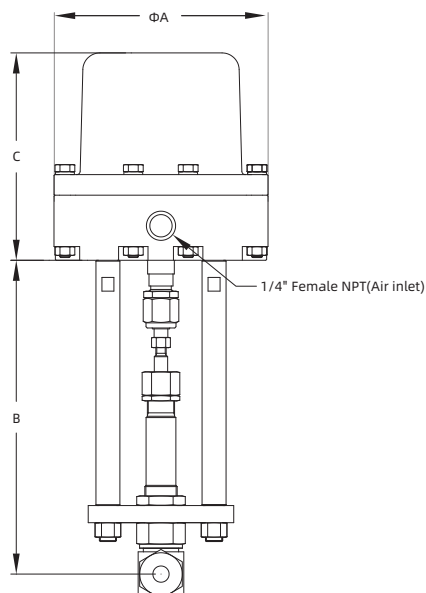
## Actuation Modes

- ❖ Normally closed(NC) – air opens, spring closes
- ❖ Normally open(NO) – air closes, spring opens
- ❖ Double acting(PD) – air opens and closes

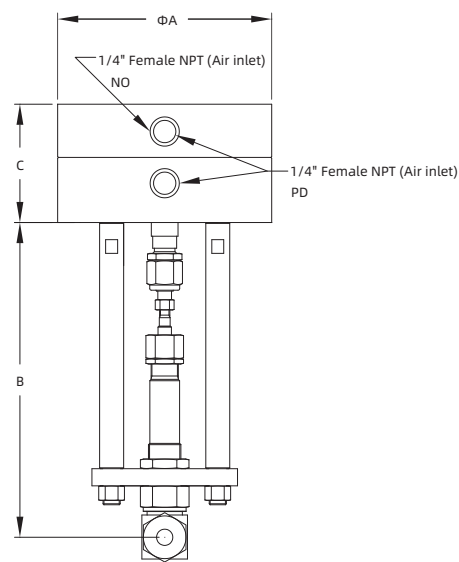


## Dimensions

❖ in inches (millimeters), are for reference only and are subject to change.



**Normally Closed (NC)**  
All Stem Tips



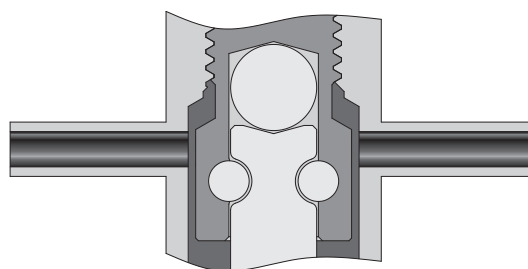
**Normally Open (NO) & Double-Acting (PD)**  
All Stem Tips

Valve Series (Orifice Size)	Dimensions, in. (mm)		
	ΦA	B	C
04 & 08	4.92(125.0)	7.20(183.0)	4.76(121.0)
11	6.49(165.0)	10.00(254.0)	8.19(208.0)

Valve Series (Orifice Size)	Dimensions, in. (mm)		
	ΦA	B	C
04 & 08	4.92(125.0)	7.20(183.0)	2.72(69.0)
11	6.49(165.0)	10.00(254.0)	3.00(76.2)

## Bonnet Sniffer Tubes

- ❖ Bonnet sniffer tubes are 1 in. (25.4 mm) long, 1/4 in. (6.4 mm) tube extensions that enable monitoring of bellows integrity.
- ❖ 04 and 08 series tubes are welded to the bonnet.
- ❖ 11 series tubes are attached to the bonnet with 1/8 in. female NPT threads. Sniffer tube not included.
- ❖ To order, add -BST1 for one bonnet sniffer tube or -BST2 for two bonnet sniffer tubes to the valve ordering number.
- ❖ Examples: **B52-F4-04-NC-316-BST1**



## Indicator Switches

- ❖ Transmits a signal to an electrical device indicating either the open or closed position of a pneumatically actuated valve.
- ❖ Features a single-pole, single-throw switch rated at:
  - 0.2 A for 24 V (DC) for normally open & closed switch;
  - 0.3 A for 220 V (AC) for a normally open & closed switch;
  - 5 to 185°F (-15 to 85°C) temperature.
- ❖ Wire length & temperature available
- ❖ Is available assembled on any BS2 series

## How to Order

**B52** — **MBW10** — **M10** — **07** — **WR** — **A1** — **316** — **IS** — **BST1**

Series	Inlet Type	Inlet Size	Outlet Type	Outlet Size	Orifice Size	Seal Type	Tip Type	Handle	Flow Pattern	Body Material	Position Sensor	Bonnet Sniffer Tubes	
<b>B52</b>	<b>FSW</b> Fractional Tube Socket Weld	<b>2</b> 1/8 in.	Same as inlet type and inlet size	<b>04</b> 0.16 in. (4.1 mm)	Gasket Seal	Conical	Green Handle	Straight	316 316 S.S.	No	No		
	<b>MSW</b> Metric Tube Socket Weld	<b>4</b> 1/4 in.	If outlet and inlet are the same, eliminate the outlet designator	<b>08</b> 0.3 in. (7.6 mm)	<b>W</b> Welded Seal	<b>K</b> PCTFE	<b>L1</b> Blue Aluminum	<b>A1</b> Angle	<b>316L</b> 316L S.S.	Indicator Switches	<b>BST1</b>		
	<b>FBW</b> Fractional Tube Butt Weld	<b>6</b> 3/8 in. or 6 mm		<b>11</b> 0.433 in. (11 mm)		<b>R</b> Regulating	<b>R1</b> Red Aluminum		<b>304</b> 304 S.S.		<b>BST2</b>		
	<b>MBW</b> Metric Tube Butt Weld	<b>8</b> 1/2 in. or 8 mm		<b>15</b> 0.591 in. (15 mm)		<b>A</b> Spherical	<b>G1</b> Green Aluminum		<b>304L</b> 304L S.S.				
	<b>F</b> Fractional Tube Fitting	<b>10</b> 10 mm		<b>20</b> 0.787 in. (20 mm)			<b>S1</b> 304 Stainless Steel		<b>A400</b> Alloy 400				
	<b>M</b> Metric Tube Fitting	<b>12</b> 3/4 in. or 12 mm					<b>NC</b> Spring return, normally closed						
	<b>UGF</b> Nut+Gasket+ Fractional Bulge Nipple	<b>14</b> 14 mm or M14					<b>NO</b> Spring return, normally open						
	<b>UGM</b> Nut+Gasket+ Metric Bulge Nipple	<b>16</b> 1 in. or 16 mm					<b>PD</b> Double action						
	<b>FGFS</b> Female FR Fitting	<b>18</b> 18 mm											
	<b>GFS</b> Male FR Fitting	<b>20</b> 1 1/4 or 20 mm or M20 x 1.5											
		<b>22</b> 22 mm or M22 x 1.5											
		<b>25</b> 25 mm											
		<b>27</b> M27 x 2											
	<b>28</b> 28 mm												

# Low Pressure Bellows-Sealed Valves

## BS3 Series

### Features

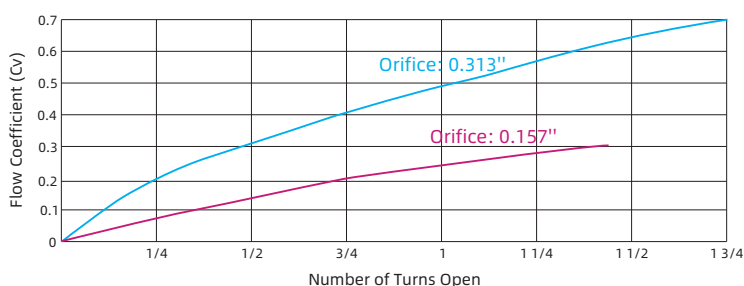
- ❖ Maximum working pressure up to 500 psig (34.4 bar)
- ❖ Working temperature from -40°F to 200°F (-40°C to 93°C)
- ❖ Flow coefficients (Cv) from 0.3 to 0.7
- ❖ Variety of end connections
- ❖ 316 S.S. and 316L VAR S.S. materials
- ❖ Panel and bottom mounting
- ❖ Bar, round handle are available
- ❖ Precision-formed metal bellows provides reliable seal
- ❖ Nonrotating stem tip
- ❖ Bonnet seals to body without gasket
- ❖ Actuator-stem coupling design for smooth actuation
- ❖ Every valve is tested with helium for 10s to a maximum leak rate of  $4 \times 10^{-9}$  std cm<sup>3</sup>/s



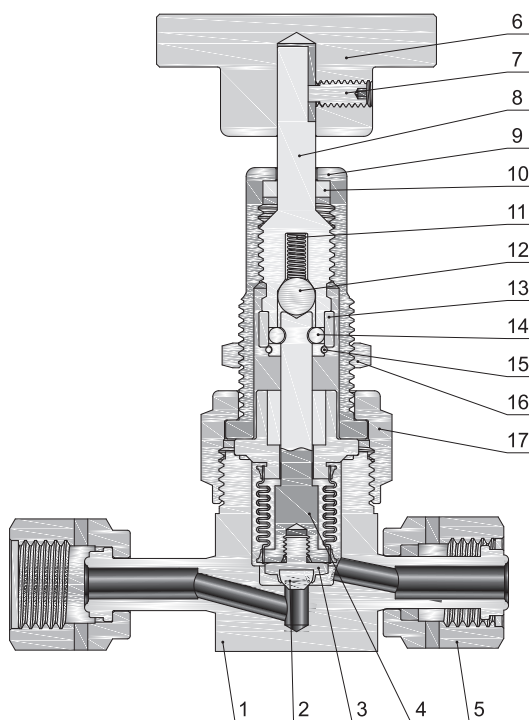
### Pressure-Temperature Ratings

Temperature °F(°C)	Working Pressure, psig(bar)		
	Rotary handle	Pneumatic Actuators	
		Normally closed(NC)	Normally open(NO)
-40(-40) to 200(93)	500 (34.4)	125 (8.6)	400 (27.5)

### Flow Coefficient vs. Turns Open

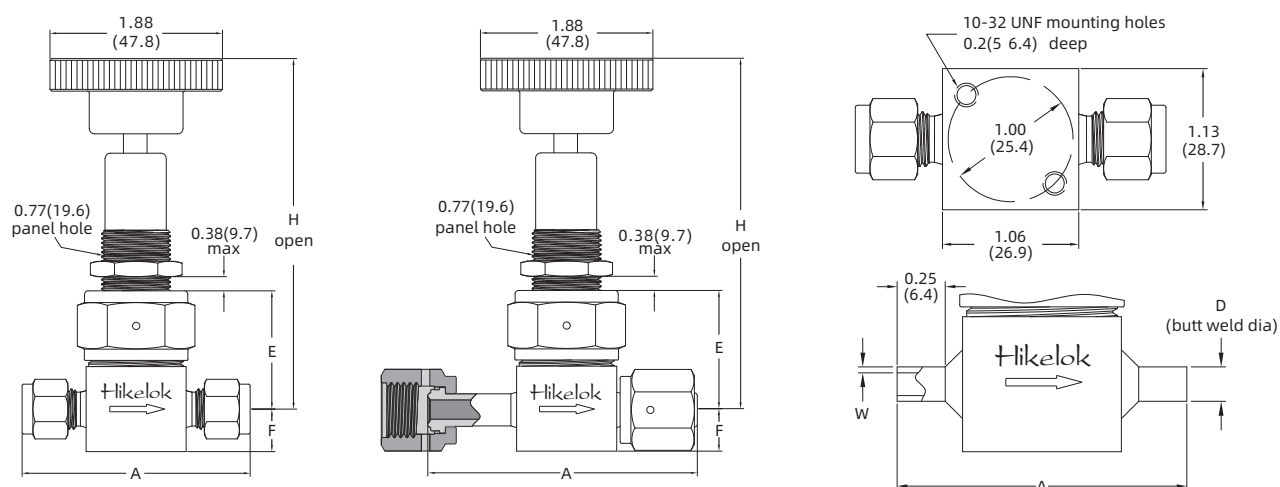


### Standard Materials of Construction



Component	Material Grade / ASTM Specification	
	1	Body
2	Stem insert	PCTFE/AMS 3650
3	Adapter	316L S.S. / A479
4	Stem	316L S.S. / A479
	Bushing	Phosphor bronze C54400 / B139
	Weld ring	316L S.S. / A479
	Bellows	300 series S.S. / A269 or A240
5	Nut	316L S.S. / A479
6	Handle	Anodized Aluminum
7	Screw	Alloy steel / ANSI 18.3
8	Actuator	630 S.S. / A564
9	Bonnet	316 S.S. / A479
10	Stem wiper	PTFE / AMS 3656
11	Spring	302 S.S. / A313
12	Bearing	440C S.S.
13	Bearing retainer	316 S.S. / A479
14	Bearing	Chrome steel
15	Retainer ring	302 S.S.
16	Nut	316 S.S. / A479
17	Bonnet nut	316 S.S. / A479

## Dimensions



Basic Ordering Number	Connection Type and Size	Orifice in. (mm)	Cv	Dimension, in. (mm)									
				A	D	E	F	H	W				
BS3-F4-04-	1/4" Hikelok	0.157 (4.0)	0.30	2.46 (62.5)	—	1.27 (32.3)	0.45 (11.4)	3.88 (98.6)	—				
BS3-F6-04-	3/8" Hikelok			2.58 (65.5)									
BS3-M6-04-	6mm Hikelok			2.46 (62.5)									
BS3-M8-04-	8mm Hikelok			2.53 (64.3)									
BS3-FBW4-04-	1/4" FBW			0.25 (6.4)						0.035 (0.89)			
BS3-FBW6-04-	3/8" FBW			1.74 (44.2)							0.38 (9.6)		
BS3-MBW6-04-	6mm MBW			(6.0)							1.0		
BS3-FSW4-04-	1/4" FSW			1.75 (44.4)						0.38 (9.6)	0.060 (1.5)		
BS3-GFS4-04-	1/4" Male GFS			2.30 (58.4)						—			
BS3-OFS4-04-	1/4" Male OFS			2.00 (50.8)									
BS3-FGFS4-04-	1/4" Female GFS			2.76 (70.1)							—		
BS3-F6-08-	3/8" Hikelok			2.58 (65.5)						0.313 (8.0)		0.70	1.28 (32.5)
BS3-F8-08-	1/2" Hikelok	2.80 (71.1)											
BS3-M10-08-	10mm Hikelok	2.60 (66.0)											
BS3-M12-08-	12mm Hikelok	2.80 (71.1)											
BS3-FBW6-08-	3/8" FBW	0.38 (9.6)	0.035 (0.89)										
BS3-FBW8-08-	1/2" FBW	1.74 (44.2)		0.50 (12.7)									
BS3-FT8-08-	1/2" FT	3.40 (86.4)		1.0									
BS3-GFS8-08-	1/2" Male GFS	2.58 (65.5)	—	1.33 (33.7)	0.66 (16.8)	3.94 (100.2)	—						
BS3-FGFS8-08-	1/2" Female GFS	3.15 (80.0)	1.27 (32.2)	3.87 (98.2)									

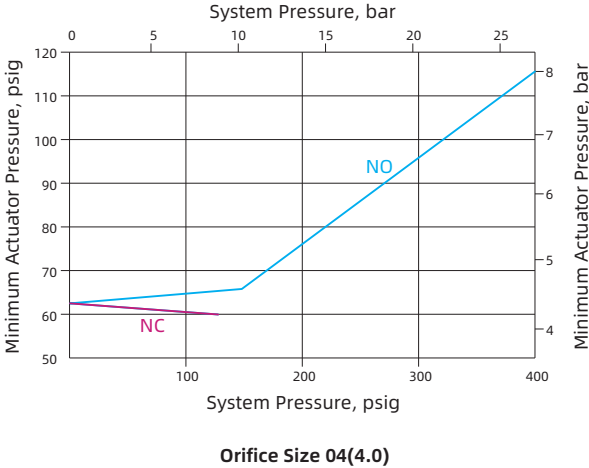
# Pneumatic Actuators

## Features

- ❖ Reliable piston design for enhanced cycle life
- ❖ Low actuation pressure
- ❖ Aluminum and stainless steel components

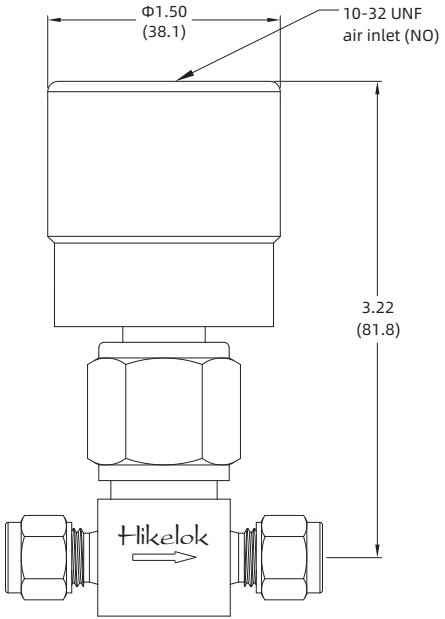
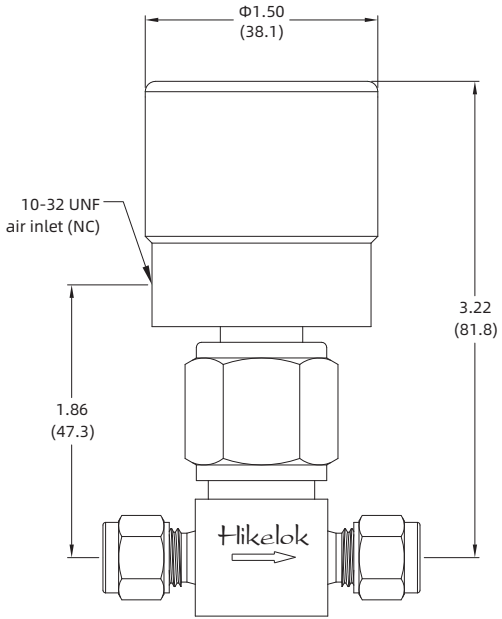
## Actuation Modes

- ❖ Normally closed(NC) – air opens, spring closes
- ❖ Normally open(NO) – air closes, spring opens



## Dimensions

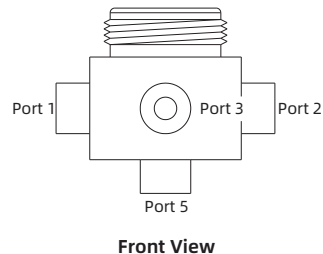
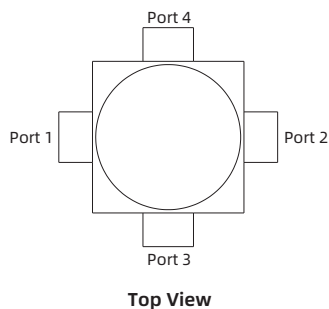
❖ in inches (millimeters), are for reference only and are subject to change.



**Orifice Size 04(4.0)**

## Port Schematic

❖ Viewed from the top and front of the valve



## Flow Path

Ports	Schematic	Flow Path		Flow Pattern Designator
		Closed	Open	
2				2L
				2N
				2R
3				3A
				3B
				3C
				3F
4				3G
				3D
4				3E

❖ An a next to the port number in the Flow Path column indicates a port above the valve seat.

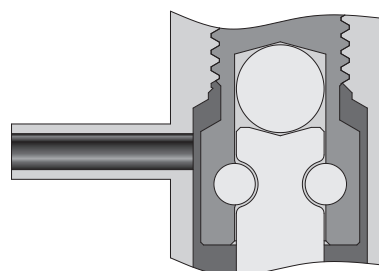
❖ An b next to the port number in the Flow Path column indicates a port below the valve seat.

## Multivalve Manifolds

Designator	Schematic	Flow Path
V		
W		
D		
2D		

## Bonnet Sniffer Tubes

- ❖ Bonnet sniffer tubes allow monitoring of bellows integrity
- ❖ 3/16 in. (4.7 mm) outside diameter, 1.38 in. (34.9 mm) long
- ❖ 316 stainless steel material with fluorocarbon FKM O -ring
- ❖ Threads to test port of bonnet
- ❖ Pneumatically actuated valves only



## Indicator Switches

- ❖ Transmits a signal to an electrical device indicating either the open or closed position of a pneumatically actuated valve
- ❖ Features a single-pole, single-throw switch rated at:
  - 0.2 A for 24 V (DC) for normally open & closed switch;
  - 0.3 A for 220 V (AC) for a normally open & closed switch;
  - 5 to 185°F (-15 to 85°C) temperature
- ❖ Wire length & temperature available
- ❖ Is available assembled on any BS3 series

### How to Order

**BS3 — MBW10 — M10 — 04 — A1 — 316 — BST1**

Series	Inlet Type	Inlet Size	Outlet Type	Outlet Size	Orifice Size	Handle	Flow Pattern	Body Material	Bonnet Sniffer Tubes
BS3	<b>FBW</b> Fractional Tube Butt Weld	2 1/8 in.	Same as inlet type and inlet size		<b>04</b> 0.157 in. (4.0 mm)	Black Aluminum	Straight	<b>316</b> 316 S.S.	No
	<b>MBW</b> Metric Tube Butt Weld	4 1/4 in.				Blue Aluminum	<b>A1</b> Angle	<b>316L</b> 316L S.S.	<b>BST1</b>
	<b>F</b> Fractional Tube Fitting	6 3/8 in. or 6 mm	If outlet and inlet are the same, eliminate the outlet designator	<b>08</b> 0.313 in. (8.0 mm)	<b>L1</b> Blue Aluminum	See porting configurations for the following code	<b>316LV</b> 316L VAR		
	<b>M</b> Metric Tube Fitting	8 1/2 in. or 8 mm			<b>R1</b> Red Aluminum	<b>2L</b>			
	<b>FGFS</b> Female GFS Fitting	10 10 mm			Green Aluminum	<b>2N</b>			
	<b>GFS</b> Male GFS Fitting	12 3/4 in. or 12 mm				<b>2R</b>			
						<b>3A</b>			
						<b>3B</b>			
						<b>3C</b>			
						<b>3F</b>			
						<b>3G</b>			
						<b>4D</b>			
						<b>4E</b>			

# Nonrotating-Stem Needle Valves

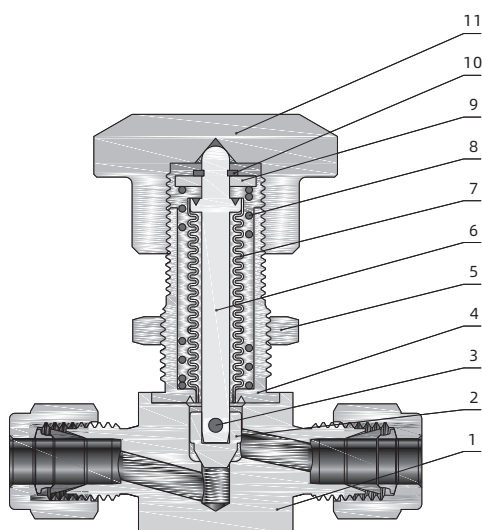
## BS4 Series

### Features

- ❖ Maximum working pressure up to 1000 psig (68.9 bar)
- ❖ Working temperature from -80°F to 600 °F (-62 °C to 315 °C)
- ❖ Flow coefficients (Cv) from 0.11 to 0.28
- ❖ Variety of end connections
- ❖ 316 stainless steel body material
- ❖ Panel and bottom mounting
- ❖ Precision-formed metal bellows provides reliable seal
- ❖ Nonrotating stem tip
- ❖ Welded body to bonnet seal
- ❖ Every valve is tested with helium for 10s to a maximum leak rate of  $4 \times 10^{-9}$  std cm<sup>3</sup>/s



### Standard Materials of Construction

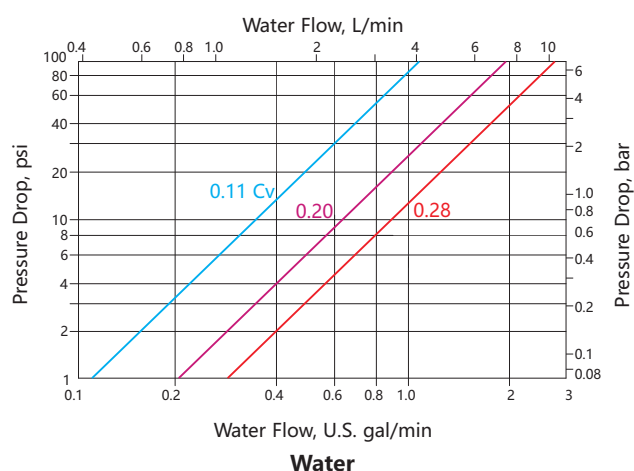
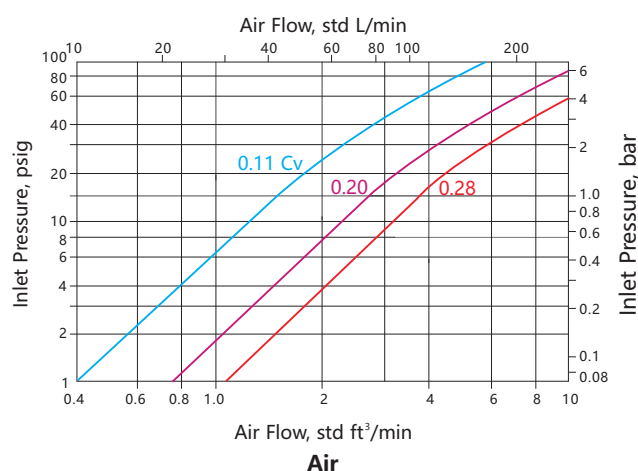


Component	Material Grade / ASTM Specification
1 Body	316 S.S. / A479
2 Stem Tip	S17400 / A564
3 Stem Pin	420 S.S.
4 Bonnet	316 S.S. / A479
5 Nut	316 S.S. / A479
6 Stem	420 S.S.
7 Bellows	321 S.S. & 316 S.S. / A269
8 Spring	631 S.S. / AMS 5678
9 Washer	316 S.S. / A240
10 Retaining Ring	304 S.S.
11 Handle	Green-Anodized Aluminum

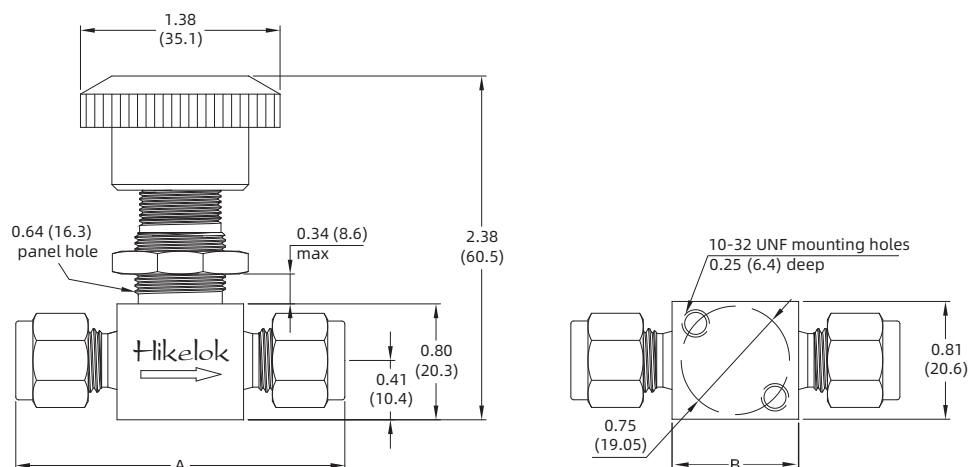
### Pressure-Temperature Ratings

Temperature, °F (°C)	Working Pressure, psig (bar)	
	316 S.S. Tip	Stellite Tip
-62 (-80) to 600 (315)	1000 (68.9)	1000 (68.9)

### Flow Data at 70°F (20°C)



## Dimensions



Basic Ordering Number	Connection Type and Size	Orifice in. (mm)		Cv	Dimension in. (mm)		
		Body	Port		A	B	
BS4-F2-04-	1/8" Hikelok	0.148 (3.8)	0.082	0.11	2.09 (53.1)	0.88 (22.3)	
BS4-F4-04-	1/4" Hikelok		0.156 (4.0)		0.28		2.27 (57.7)
BS4-M6-04-	6mm Hikelok			1.94 (49.3)			1.04 (26.4)
BS4-FNPT4-04-	1/4" Female NPT						
BS4-NPT2-04-	1/8" Male NPT		0.156 (4.0)	0.28	1.94 (49.3)		0.82 (20.8)
BS4-NPT4-04-	1/4" Male NPT				2.12 (53.8)		0.88 (22.3)
BS4-GFS4-04-	1/4" Male GFS						
BS4-FGFS4-04-	1/4" Female GFS		1.5 (38.1)				
BS4-FBW6-FSW4-04-	3/8" Tube butt weld to 1/4" Tube socket weld						

## How to Order

**BS4** — **F4** — **M6** — **04** — **NC** — **316**

Series	Inlet Type	Inlet Size	Outlet Type	Outlet Size	Orifice Size	Tip Material	Handle	Body Material
BS4	<b>FBW</b> Fractional Tube Butt Weld	<b>2</b> 1/8 in.	Same as inlet type and inlet size		<b>04</b> 0.148 in. (3.8 mm)	S17400	Green Round	<b>316</b> 316 S.S.
	<b>FSW</b> Fractional Tube Socket Weld	<b>4</b> 1/4 in.						
	<b>MBW</b> Metric Tube Butt Weld	<b>6</b> 3/8 in. or 6 mm	If outlet and inlet are the same, eliminate the outlet designator					
	<b>MSW</b> Metric Tube Socket Weld							
	<b>FGFS</b> Female GFS Fitting	<b>8</b> 8 mm						
	<b>GFS</b> Male GFS Fitting							
	<b>FNPT</b> Female NPT							
	<b>NPT</b> Male NPT							
	<b>FBT</b> Female BSPT							
	<b>MBT</b> Male BSPT							
	<b>F</b> Fractional Tube Fitting							
	<b>M</b> Metric Tube Fitting							

# Bellows-Sealed Metering Valves

## BSM Series

### Features

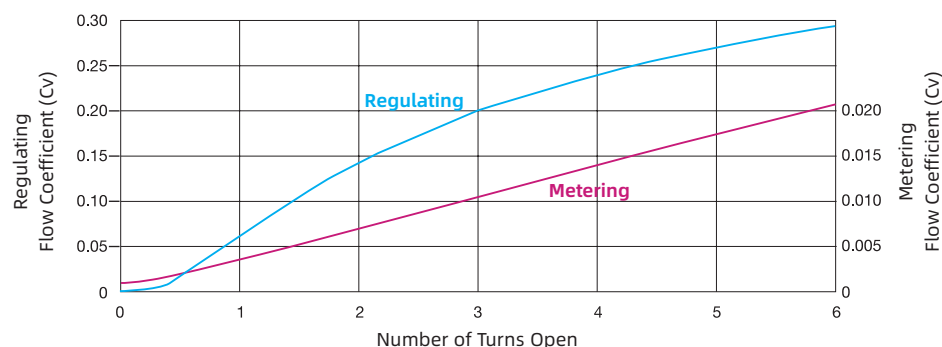
- ❖ Maximum working pressure up to 700 psig (48.2 bar)
- ❖ Working temperature from -20°F to 900°F (-28°C to 482°C)
- ❖ Flow coefficients: 0.019 and 0.30
- ❖ Vernier handle measure stem position in 0.001 in. (0.025 mm) increments.
- ❖ Panel and bottom mounting
- ❖ 316 stainless steel materials



### Technical Data

Body-to-Bellows Seal	Stem Tip	Stem Taper	Cv
Gasket	Metering	3°	0.019
	Regulating	20°	0.30
Welded	Metering	3°	0.019
	Regulating	20°	0.30

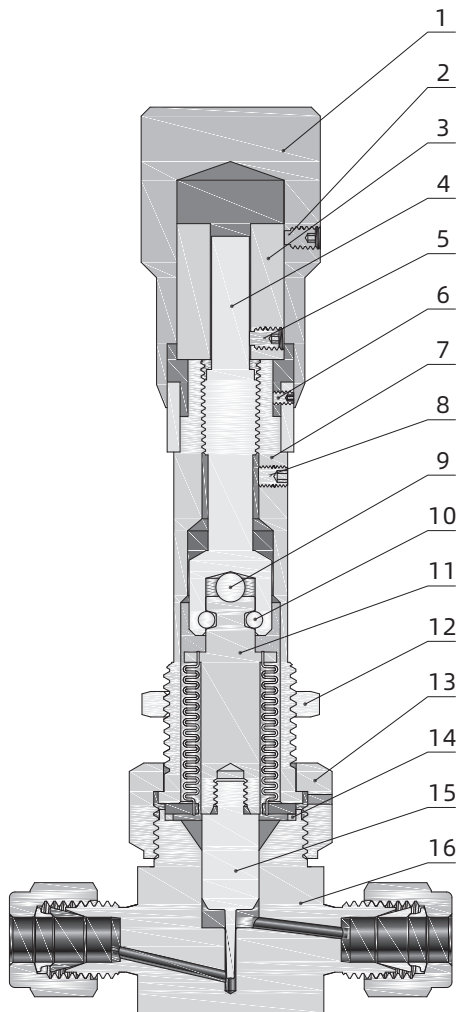
### Flow Coefficient vs. Turns Open



### Pressure-Temperature Ratings

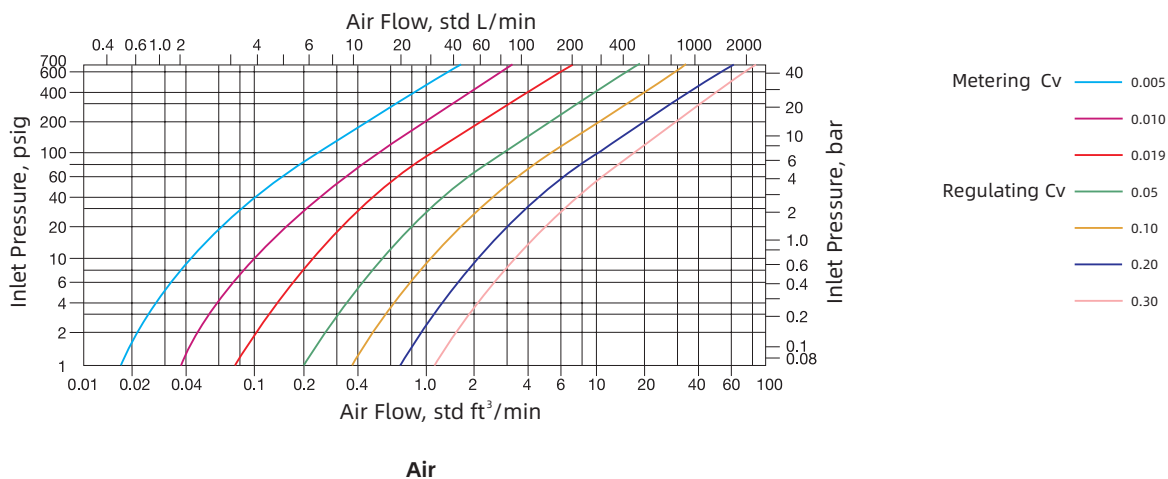
Material	316 S.S.	
Options	316 S.S.(Tip)&Welded body-to-bellows Seal	316 S.S.(Tip)&Gasket body-to-bellows Seal
Temperature, °F (°C)	Working Pressure, psig (bar)	
-20 (-28) to 100 (37)	700 (48.2)	700 (48.2)
200 (93)	610 (42.0)	610 (42.0)
300 (148)	530 (36.5)	530 (36.5)
400 (204)	450 (31.0)	450 (31.0)
500 (260)	375 (25.8)	375 (25.8)
600 (315)	300 (20.6)	300 (20.6)
650 (343)	260 (17.9)	—
700 (371)	230 (15.8)	—
750 (398)	200 (13.7)	—
800 (426)	160 (11.0)	—
850 (454)	130 (8.9)	—
900 (482)	100 (6.8)	—

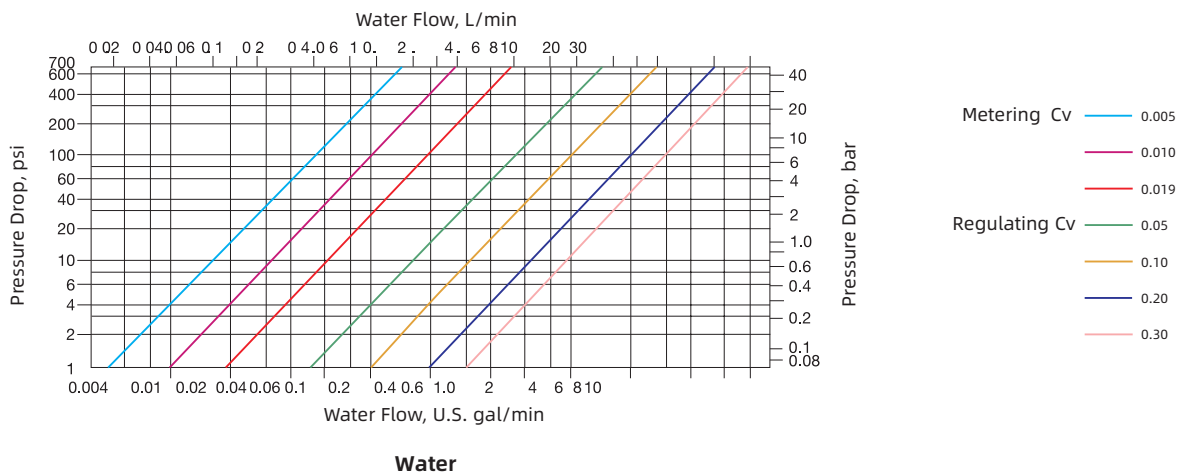
## Standard Materials of Construction



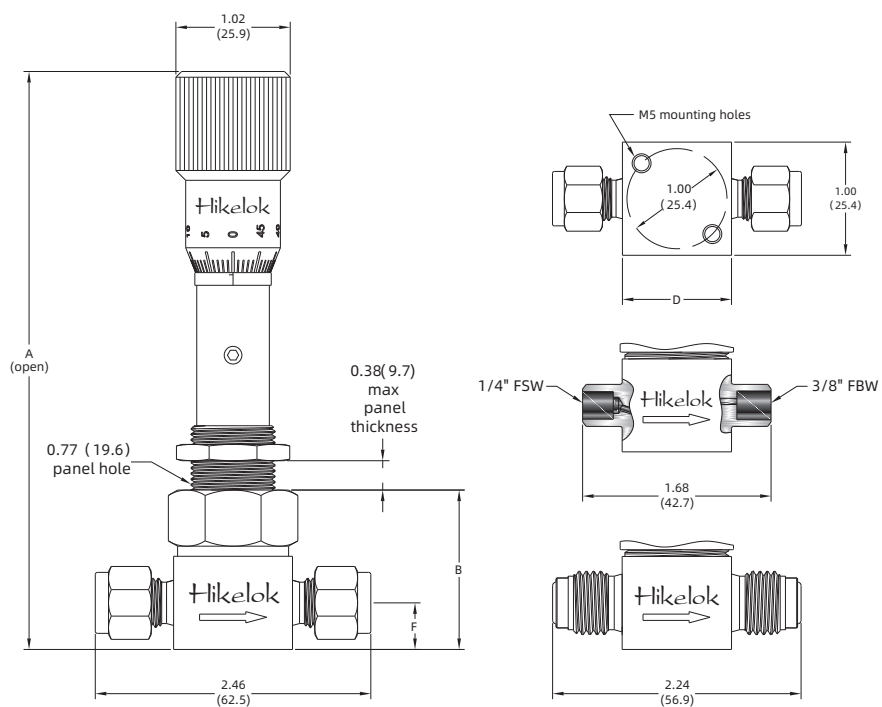
Component		Material Grade / ASTM Specification
1	Handle	Silver-mist chrome-plated 313 S.S. / A582
2	Screw	Alloy steel / ANSI 18.3
3	Bushing	303 S.S. / A582
4	Actuator	416 S.S. / A582
5	Screw	Alloy steel / ANSI 18.3
6	Screw	Alloy steel / ANSI 18.3
7	Bonnet	316 S.S. / A479
8	Screw	Alloy steel / ANSI 18.3
9	Bearing	420C S.S.
10	Pin	420 S.S. / A276
11	Stem	316 S.S. / A479
	Bellows	321 S.S. / A269
	Weld ring	316 S.S. / A479
12	Panel nut	316 S.S. / B783
13	Bonnet nut	Silver-plated 316 S.S. / A479
14	Gasket	Silver-plated 316 S.S. / A580
15	Stem tip	Hard chrome-plated 316 S.S. / A479
16	Body	316 S.S. / A479

## Flow Data at 70°F (20°C)





## Dimensions



Basic Ordering Number	Connection Type and Size	Orifice in.(mm)	CV	Dimension in. (mm)			
				A	B	D	F
BSM-F4-GM-	1/4" Hikelok	0.057 (1.4)	0.019	5.24 (133.1)	1.45 (36.8)	1.06 (26.9)	0.56 (14.2)
BSM-F4-GR-	1/4" Hikelok	0.166 (4.2)	0.30	5.22 (132.6)			
BSM-F4-WM-	1/4" Hikelok	0.057 (1.4)	0.019	5.17 (131.3)	1.42 (36.1)		
BSM-F4-WR-	1/4" Hikelok	0.166 (4.2)	0.30	5.15 (130.8)			
BSM-M6-GM-	6 mm Hikelok	0.057 (1.4)	0.019	5.24 (133.1)	1.45 (36.8)	1.06 (26.9)	0.56 (14.2)
BSM-M6-GR-	6 mm Hikelok	0.166 (4.2)	0.30	5.22 (132.6)			
BSM-M6-WM-	6 mm Hikelok	0.057 (1.4)	0.019	5.17 (131.3)	1.42 (36.1)		
BSM-M6-WR-	6 mm Hikelok	0.166 (4.2)	0.30	5.15 (130.8)			
BSM-FBW6FSW4-GM-	1/4" FSW to 3/8" FBW	0.057 (1.4)	0.019	5.24 (133.1)	1.45 (36.8)	1.00 (25.4)	0.56 (14.2)
BSM-FBW6FSW4-GR-	1/4" FSW to 3/8" FBW	0.166 (4.2)	0.30	5.22 (132.6)			
BSM-FBW6FSW4-WM-	1/4" FSW to 3/8" FBW	0.057 (1.4)	0.019	5.17 (131.3)	1.42 (36.1)		
BSM-FBW6FSW4-WR-	1/4" FSW to 3/8" FBW	0.166 (4.2)	0.30	5.15 (130.8)			
BSM-GFS4-GM-	1/4" Male GFS	0.057 (1.4)	0.019	5.24 (133.1)	1.45 (36.8)	1.00 (25.4)	0.44 (11.2)
BSM-GFS4-GR-	1/4" Male GFS	0.166 (4.2)	0.30	5.22 (132.6)			
BSM-GFS4-WM-	1/4" Male GFS	0.057 (1.4)	0.019	5.17 (131.3)	1.42 (36.1)		
BSM-GFS4-WR-	1/4" Male GFS	0.166 (4.2)	0.30	5.15 (130.8)			

## How to Order

BSM — MBW10 — M10 — GM 316

Series	Inlet Type	Inlet Size	Outlet Type	Outlet Size	Body-to-Bellows Seal	Stem Tip	Body Material
BSM	<b>FBW</b> Fractional Tube Butt Weld	2 1/8 in.	Same as inlet type and inlet size		<b>G</b> Gasket	<b>M</b> Metering	316 316 S.S.
	<b>MBW</b> Metric Tube Butt Weld	4 1/4 in.					
	<b>F</b> Fractional Tube Fitting	6 3/8 in. or 6 mm					
	<b>M</b> Metric Tube Fitting	8 1/2 in. or 8 mm					
	<b>FGFS</b> Female GFS Fitting	10 10 mm					
	<b>GFS</b> Male GFS Fitting	12 3/4 in. or 12 mm					

# High-Flow Bellows-Sealed Valves

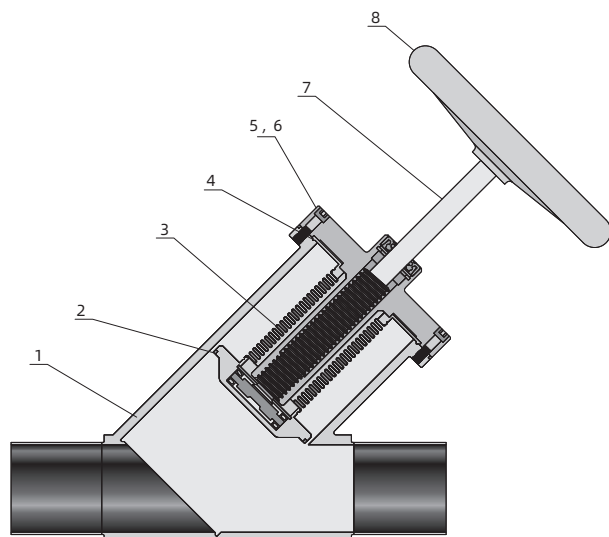
## BBS1 Series

### Features

- ❖ Working Pressure: Vacuum ~ 375psig (25.8bar)
- ❖ Working temperature from -22°F to 180°F (-30°C to 82°C)
- ❖ Highest Cv and Most Compact Design
- ❖ Inconel 625 or 316 Bellows for High Cycle Life and Superior Corrosion Resistance
- ❖ Bearings ensures easy operation
- ❖ Electropolished-Ra 0.25µm Max Wetted Area Surface Finish Standard
- ❖ Ultra-high purity gas distribution system control
- ❖ Ultra Smooth Seat Holder for Cleanliness
- ❖ Inboard and Across the Seat Leak Tested with 100% Helium



### Standard Materials of Construction



Component		Material Grade / ASTM Specification
1	Body	316L S.S./ASTM A182
2	Tip	PCTFE / ASTM D1430
3	Bellows	Inconel 625 Alloy or 316 S.S./ASTM A240
4	Gasket	Nickel
5	Bolt	304 S.S.
6	Bonnet	316 S.S./ASTM A276
7	Stem	630 S.S./ASTM A564
8	Hand Wheel	ABS or Cast Aluminium or Black Reinforced Phenolic Plastic (Color can be customized)

### Pressure-Temperature Ratings

Material	316L S.S./ASTM A479	
Options	PCTFE(Tip) & Gasket body-to- bellows Seal	PI(Tip) & Gasket body-to- bellows Seal
Temperature, °F (°C)	Working Pressure, psig (bar)	
-22 (-30) to 100(37)	375 (25.8)	375 (25.8)
180 (82)	375 (25.8)	375 (25.8)
302 (150)	—	375 (25.8)

### Testing

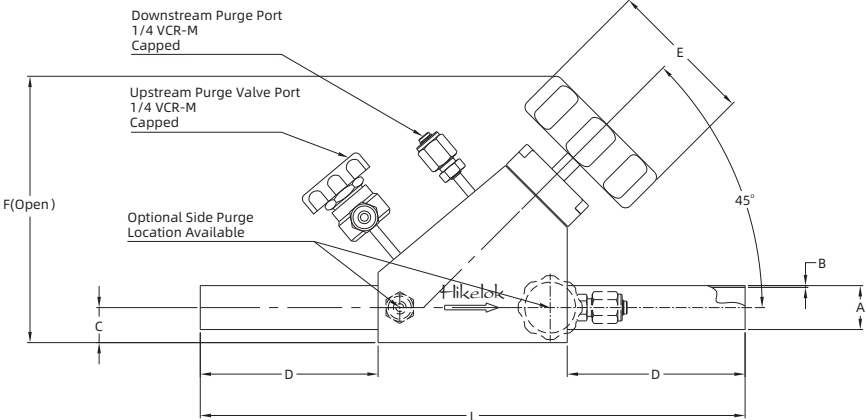
- ❖ Every BBS1 series valve is factory vacuum tested with helium at room temperature for 5s to a maximum leak rate of  $1 \times 10^{-10}$  pa.m<sup>3</sup>/s at the seat, envelope, and all seals

### Cleanliness and Packaging

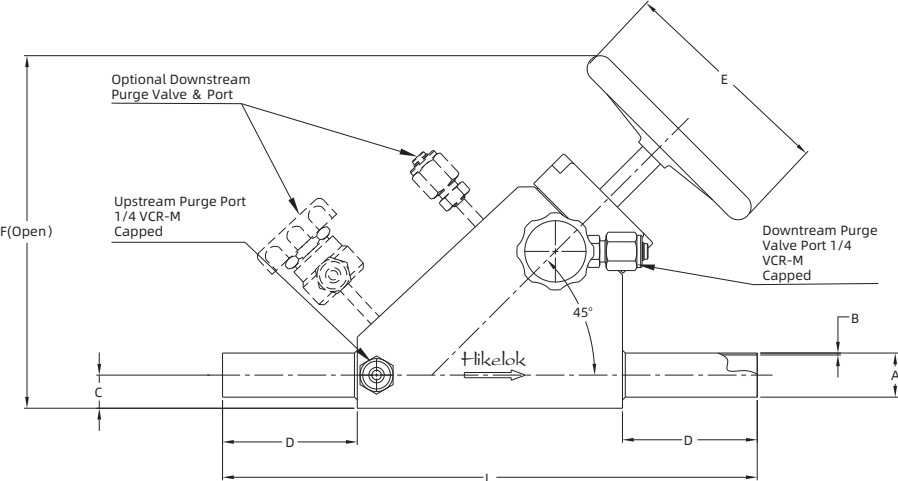
- ❖ Every BBS1 series assembled, tested, purged and final packaged in CLASS 100 cleanroom. Double-bag packaging (2 mil nylon inner bag, 6 mil polyethylene outer bag)

# Dimensions

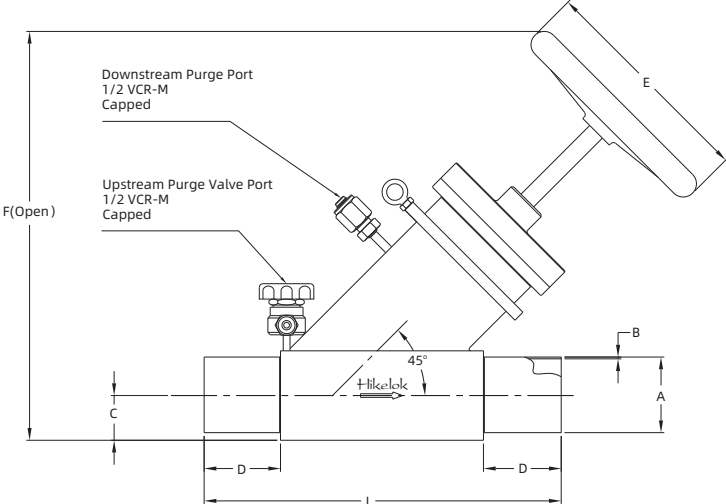
## BBS1-FFBW8/12-



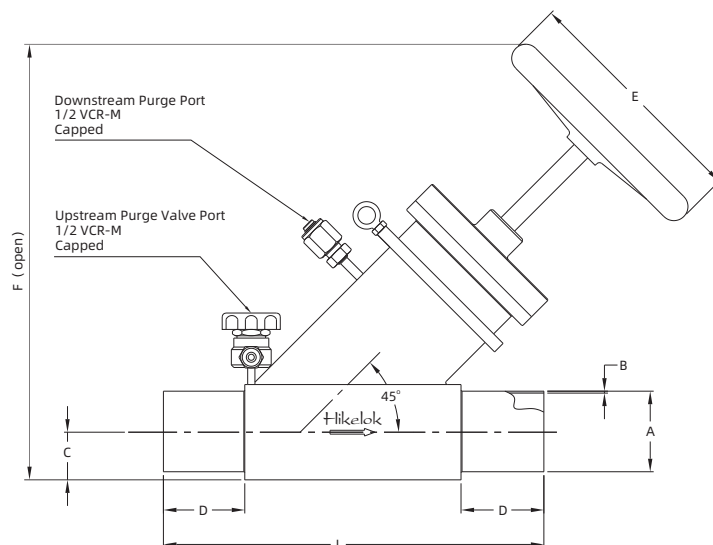
## BBS1-FFBW16-



## BBS1-FFBW32-



BBS1-FFBW48/64/96-



Basic Ordering Information	Seat-Orifice	Cv	Size / in (mm)						
			A	B	C	D	E	F	L
BBS1-FFBW8-	0.5(12.7)	5.1	0.50(12.7)	0.049(1.24)	0.50(12.7)	3.04(77.2)	2.50(63.5)	4.75(120.6)	9.54(242.3)
BBS1-FFBW12-	0.75(19.1)	10	0.75(19.1)	0.065(1.65)	0.50(15.2)	3.04(77.2)	2.50(63.5)	4.75(120.6)	9.31(236.5)
BBS1-FFBW16-	1.06(27.1)	29	1.00(25.4)	0.065(1.65)	0.75(19.1)	3.06(77.7)	3.94(100.1)	8.05(204.5)	12.04(305.8)
BBS1-FFBW24-	2.65(67.3)	85	1.50(38.1)	0.065(1.65)	1.31(33.3)	5.12(130)	7.87(200)	13.15(334)	17.22(437.4)
BBS1-FFBW32-	2.65(67.3)	178	2.00(50.8)	0.065(1.65)	1.31(33.3)	4.18(106.2)	7.87(200)	13.15(334)	15.34(389.6)
BBS1-FFBW48-	5.42(137.7)	452	3.00(76.2)	0.065(1.65)	2.37(60.2)	8.01(203.5)	11.8(299.7)	21.7(551.2)	26.72(678.7)
BBS1-FFBW64-	5.42(137.7)	758	4.00(101.6)	0.083(2.11)	2.37(60.2)	4.17(105.9)	11.8(299.7)	21.7(551.2)	19.04(483.6)
BBS1-FFBW96-	5.42(137.7)	526	6.00(152.4)	0.109(2.77)	2.37(60.2)	11.75(298.5)	11.8(299.7)	21.7(551.2)	19.04(483.6)

❖ **NOTE 1:** All tolerances are  $\pm 0.06$  in. ( $\pm 1.52$ mm) unless otherwise stated.

❖ **NOTE 2:** Dimensional drawings shown are for reference only. Please contact Hikelok for customer drawings

(1) No grease is used at the receiving part;

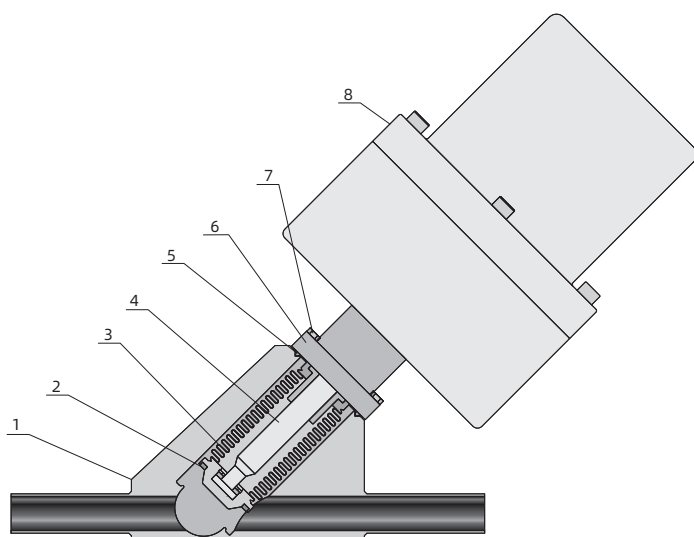
(2) These materials are basic configurations and can be configured according to user requirements.

# Pneumatic actuator

## Features

- ❖ Working Pressure: Vacuum ~ 250psig (17.2bar)
- ❖ Highest Cv and Most Compact Design
- ❖ Inconel 625 or 316 Bellows for High Cycle Life and Superior Corrosion Resistance
- ❖ Bearings ensures easy operation
- ❖ Electropolished-Ra 0.25µm Max Wetted Area Surface Finish Standard
- ❖ Ultra-high purity gas distribution system control
- ❖ Ultra Smooth Seat Holder for Cleanliness
- ❖ Inboard and Across the Seat Leak Tested with 100% Helium
- ❖ Drive modes Normally Open Normally Closed Double Acting
- ❖ The cylinder is made of aluminium alloy material

## Standard Materials of Construction



Component		Material Grade / ASTM Specification
1	Body	316L S.S. / ASTM A182
2	Tip	PCTFE / ASTM D1430
3	Bellows	Inconel 625 Alloy or 316 S.S. / ASTM A269
4	Stem	631 S.S. / ASTM A564
5	Gasket	Nickel
6	Bonnet	316 S.S. / ASTM A276
7	Bolt	B8M / ASTM A193
8	Cylinder	6061 / ASTM B211

## Pressure-Temperature Ratings

Material	316L S.S./ASTM A182	
Options	PCTFE(Tip) & Gasket body-to- bellows Seal	PI(Tip) & Gasket body-to- bellows Seal
Temperature, °F (°C)	Working Pressure, psig (bar)	
-22 (-30) to 100(37)	250 (17.2)	250 (17.2)
180 (82)	250 (17.2)	250 (17.2)
302 (150)	—	250 (17.2)

## Testing

- ❖ Every BBS1 series valve is factory vacuum tested with helium at room temperature for 5s to a maximum leak rate of  $1 \times 10^{-10}$  pa.m<sup>3</sup>/s at the seat, envelope, and all seals

## Cleanliness and Packaging

- ❖ Every BBS1 series assembled, tested, purged and final packaged in CLASS 100 cleanroom. Double-bag packaging (2 mil nylon inner bag, 6 mil polyethylene outer bag)

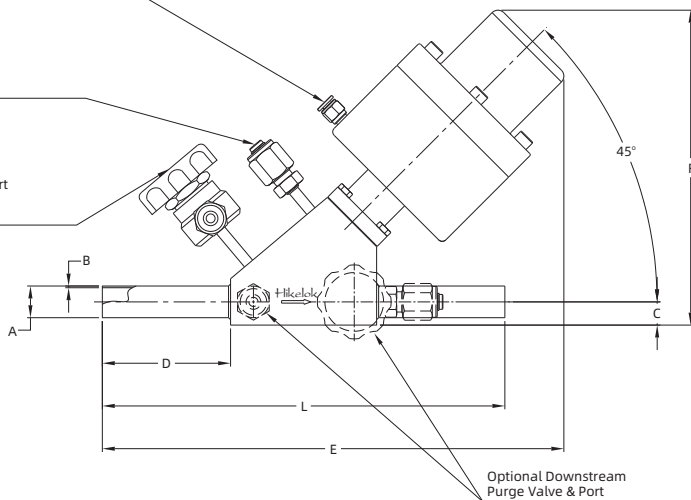
## Dimensions

### BBS1-FFBW8- (NC)

Air Inlet  
Air Open 5.5-7bar  
Straight Connector Fitting To Suit  
1/4" OD Pipe

Downstream Purge Port  
1/4 VCR-M  
Capped

Upstream Purge Valve Port  
1/4 VCR-M  
Capped

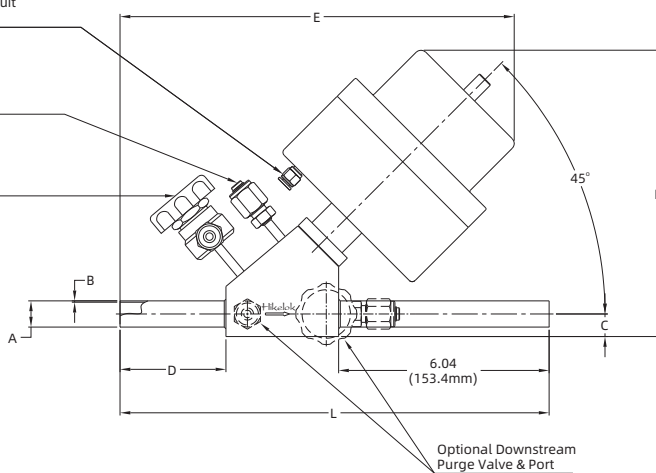


### BBS1-FFBW12- (NC/NO)

Air Inlet  
Air Open 4-7bar  
Straight Connector Fitting To Suit  
1/4" OD Pipe

Downstream Purge Port  
1/4 VCR-M  
Capped

Upstream Purge Valve Port  
1/4 VCR-M  
Capped

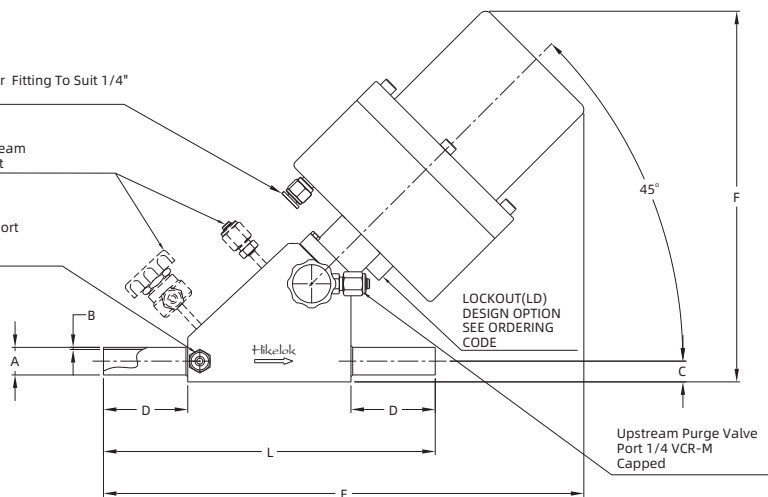


### BBS1-FFBW16/24- (NC/NO)

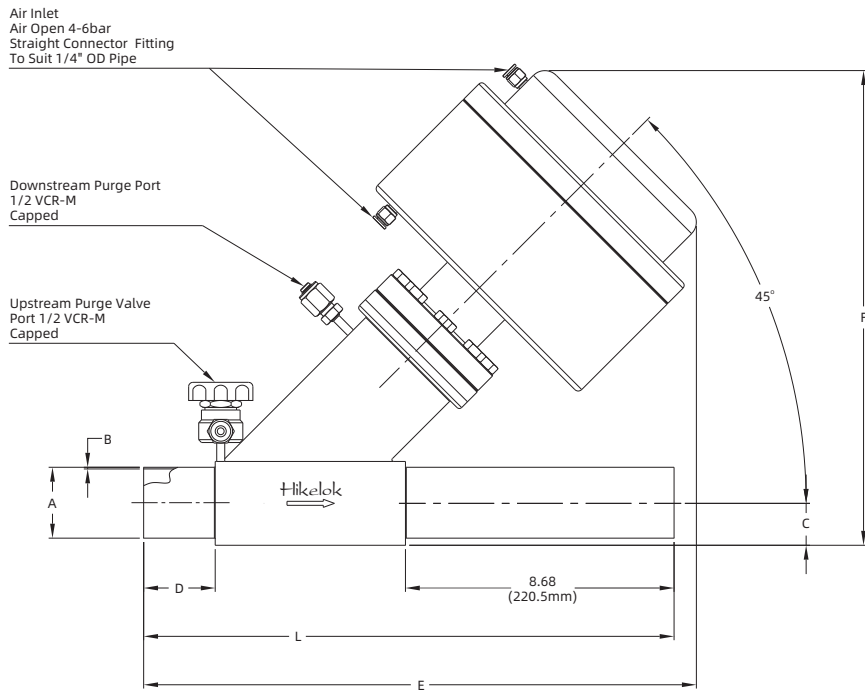
Air Inlet  
Air Open 4-6bar  
Straight Connector Fitting To Suit 1/4"  
OD Pipe

Optional Downstream  
Purge Valve & Port

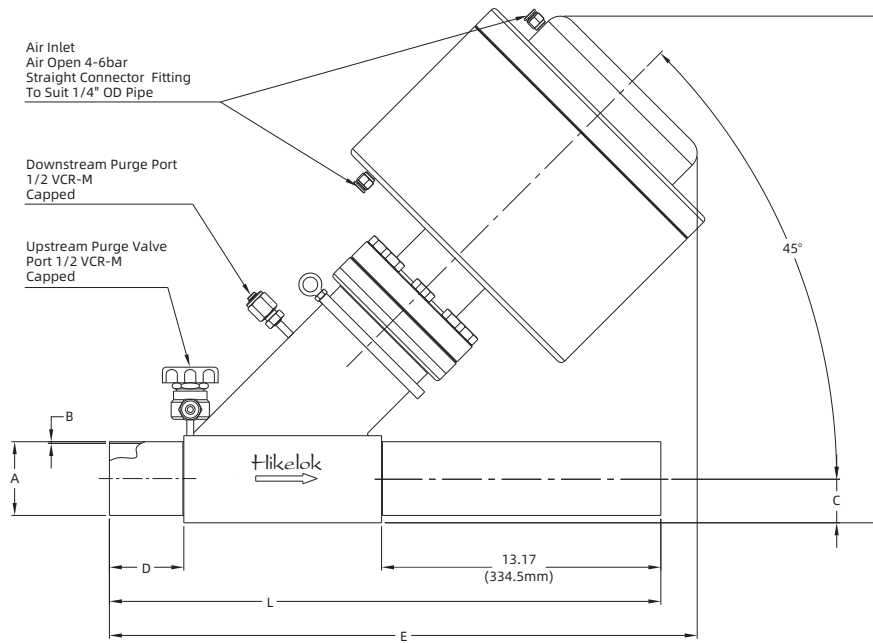
Upstream Purge Port  
1/4 VCR-M  
Capped



**BBS1-FFBW24/32- (PD)**



**BBS1-FFBW48/64/96- (PD)**



Basic Ordering Information	Seat-Orifice	Cv	Size / in (mm)						
			A	B	C	D	E	F	L
BBS1-FFBW8-NC	0.5(12.7)	5.0	0.50(12.7)	0.049(1.24)	0.50(12.7)	3.04(77.2)	10.83(275.1)	7.34(186.4)	9.54(242.3)
BBS1-FFBW12-NC	0.75(19.1)	11.5	0.75(19.1)	0.065(1.65)	0.50(15.2)	3.04(77.2)	11.33(287.8)	8.08(205.2)	12.31(312.7)
BBS1-FFBW12-NO	0.75(19.1)	11.5	0.75(19.1)	0.065(1.65)	0.50(15.2)	3.04(77.2)	10.51(267.0)	7.14(181.4)	12.31(312.7)
BBS1-FFBW16-NC	1.06(27.1)	29	1.00(25.4)	0.065(1.65)	0.75(19.1)	3.06(77.7)	17.13 (435.1)	13.48(342.4)	12.04(305.8)
BBS1-FFBW16-NO	1.06(27.1)	29	1.00(25.4)	0.065(1.65)	0.75(19.1)	3.06(77.7)	14.74(374.4)	11.1(281.9)	12.04(305.8)
BBS1-FFBW24-NC	1.06(27.1)	29	1.50(38.1)	0.065(1.65)	0.75(19.1)	5.01(127.3)	19.08(484.6)	13.48(342.4)	15.94(404.9)
BBS1-FFBW24-NO	1.06(27.1)	29	1.50(38.1)	0.065(1.65)	0.75(19.1)	5.01(127.3)	16.69(423.9)	11.1(281.9)	15.94(404.9)
BBS1-FFBW24-PD	2.65(67.3)	85	1.50(38.1)	0.065(1.65)	1.31 (33.3)	5.12(130.0)	21.41(543.8)	14.7(373.4)	20.47(520.0)
BBS1-FFBW32-PD	2.65(67.3)	178	2.00(50.8)	0.065(1.65)	1.31 (33.3)	4.18(106.2)	20.47(519.9)	14.7(373.4)	19.87(503.4)
BBS1-FFBW48-PD	5.42(137.7)	452	3.00(76.2)	0.065(1.65)	2.37(60.2)	8.01(203.5)	33.39(848.1)	21.7(551.2)	24.88(632)
BBS1-FFBW64-PD	5.42(137.7)	758	4.00(101.6)	0.083 (2.11)	2.37(60.2)	4.17(105.9)	29.56(750.8)	24.88(632.0)	28.04(712.2)
BBS1-FFBW96-PD	5.42(137.7)	526	6.00(152.4)	0.109(2.77)	2.37(60.2)	11.75(298.5)	37.13(943.1)	24.88(632.0)	36.2(919.5)

❖ **NOTE 1:** All tolerances are ±0.06 in. (±1.52mm) unless otherwise stated.

❖ **NOTE 2:** Dimensional drawings shown are for reference only. Please contact Hikelok for customer drawings

(1) No grease is used at the receiving part;

(2) These materials are basic configurations and can be configured according to user requirements;

(3) Air Inlet - Actuator can be rotated only when valve is in open position with air being supplied to the actuator.

## Indicator Switches

❖ Transmits a signal to an electrical device indicating either the open or closed position of a pneumatically actuated valve.

❖ Features a single-pole, single-throw switch rated at:

(1) 0.2 A for 24 V (DC) for normally open & closed switch;

(2) 0.3 A for 220 V (AC) for a normally open & closed switch;

(3) 5°F to 185°F (-15°C to 85°C) temperature. Wire length & temperature available is available assembled on any BBS1 series.

## How to Order

BBS1 — **FFBW24** — **PI** — **UVM4** — **DPF4** — **10** — **NC** — **316L** — **LD**

Series	Inlet Type	Inlet Size	Outlet Type	Outlet Size	Tip Type	Upstream Purge Valve & Purge Port	Valve & Port Size	Downstream Purge Valve & Purge Port	Valve & Port Size	Surface Finish	Handle	Body Material	Lock	
BBS1	FFBW Fractional Tube Butt Weld	8 1/2 in. or 8 mm or NPS 1/2	Same as inlet type and inlet size	M4 1/4 Male GFS Fitting	PCTFE	None	M4 1/4 Male GFS Fitting	None	M4 1/4 Male GFS Fitting	10 0.25Ra max-EP	Black Wheel	316L 316L S.S.	Handle Lockout Clear Clam Shell LD	
	MMBW Metric Tube Butt Weld	12 3/4 in. or 12 mm or NPS 3/4	If outlet and inlet are the same, eliminate the outlet designator	M8 1/2 Male GFS Fitting	PI PI	Upstream & Downstream purge port	M8 1/2 Male GFS Fitting	DP Downstream purge port	M8 1/2 Male GFS Fitting	5 0.12Ra max-EP	R1 Red Wheel		Pneumatic actuator Lock-out Body Size BBS1-FFBW16 only	
		16 1 in. or 16 mm or NPS 1		F4 1/4 Female GFS Fitting		Upstream purge port	F4 1/4 Female GFS Fitting	DV Downstream purge valve	F4 1/4 Female GFS Fitting	20 0.4Ra max-EP	G1 Green Wheel			
		24 1.5 in. or 24 mm or NPS 1.5		F8 1/2 Female GFS Fitting		Upstream & Downstream purge valve	F8 1/2 Female GFS Fitting		F8 1/2 Female GFS Fitting		L1 Blue wheel			
		32 2 in. or 32 mm or NPS 2				Upstream purge valve					NC Spring return, normally closed			
		48 3 in. or 48 mm or NPS 3									NO Spring return, normally open			
		64 4 in. or 64 mm or NPS 4									PD Double acting			
	96 6 in. or 96 mm or NPS 6													