Bellows- and Diaphragm-Sealed Multiport and Elbow Valves and Monoblock Manifolds

Selection Guide

ALD, BN, DF, DL/DS, DP, and HB Series

- Choose a valve type from individual product catalogs.
- Follow the instructions to build a valve ordering number for the multiport or elbow valve or monoblock manifold that meets your system requirements.
- See product catalogs for materials of construction, pressure-temperature ratings, options, and accessories.

Swagelok

Multiport and Elbow Valves and Monoblock Manifolds

Swagelok® multiport and elbow valves and monoblock manifolds are available in a wide variety of configurations to meet your system requirements.

See these Swagelok catalogs for materials of construction, technical data, and pressure-temperature ratings:

- *Bellows-Sealed Valves—BN Series* catalog, MS-01-94
- *High-Pressure, Pneumatically Actuated Bellows-Sealed Valves—HB Series* catalog, MS-01-76
- *Springless Diaphragm Valves for High Performance—DP Series* catalog, MS-01-165
- *High-Flow Springless Diaphragm Valves—DF Series* catalog, MS-02-24
- *Ultrahigh-Purity Valves for Atomic Layer Processing—Atomic Layer Deposition (ALD) Valves* catalog, MS-02-301
- *Diaphragm Valves—DL and DS Series* catalog, MS-01-73

Process Specifications

See Swagelok *Ultrahigh-Purity Process Specification (SC-01)* catalog, MS-06-61; Swagelok *Photovoltaic Process Specification (SC-06)* catalog, MS-06-64; and Swagelok *Special Cleaning and Packaging (SC-11)* catalog, MS-06-63, for details on processes, process controls, and process verification.

See **Ordering Information,** pages 6, 11, and 12 for process availability with each valve series and configuration.

Cleaning	Assembly and Packaging	Process Specification	Process Designator	Wetted Surface Roughness (R_a)			
				ALD3, ALD6, ALD7, DF, DP Series	DL / DS Series	BN, HB Series	ALD20
Special cleaning with non–ozone-depleting chemicals	Performed in specially cleaned areas; valves are individually bagged	*Special Cleaning and Packaging (SC-11)*	None	—	20 µin. (0.51 µm) average, machine finished	20 µin. (0.51 µm) average, machine finished	—
			P1	Electro-polished and finished to an average of 5 µin. (0.13 µm)	—	—	—
High-purity cleaning with a continuously monitored, deionized water, ultrasonic cleaning system	Performed in specially cleaned areas; valves are individually bagged	*Photovoltaic Process Specification (SC-06)*	P6	Electro-polished and finished to an average of 5 µin. (0.13 µm)	—	8 µin. (0.20 µm) average, machine finished and electro-polished	—
Ultrahigh-purity cleaning with a continuously monitored, deionized water, ultrasonic cleaning system	Performed in ISO Class 4 work areas; valves are double bagged and vacuum sealed in cleanroom bags	*Ultrahigh-Purity Process Specification (SC-01)*	P	Electro-polished and finished to an average of 5 µin. (0.13 µm)	8 µin. (0.20 µm) average, machine finished and electro-polished	8 µin. (0.20 µm) average, machine finished and electro-polished	6LVV electropolished and finished to an average of 5 µin. (0.13 µm) Alloy 22 finished to an average of 5 µin. (0.13 µm)
High-purity cleaning with a continuously monitored, deionized water, ultrasonic cleaning system	Performed in specially cleaned areas; valves are individually bagged	*Photovoltaic Process Specification (SC-06)*	SC06	—	—	20 µin. (0.51 µm) average, machine finished	—

Testing

ALD3, ALD6, ALD20, DF, DL / DS, DP Series	BN, HB Series
ALD3 normally closed, DF, DP series: Inboard helium leak tested to a rate of 1×10^{-9} std cm^3/s at the seat, envelope, and all seals *ALD3 or ALD6 normally open, and ALD6 or ALD7 normally closed:* Inboard helium leak tested to a rate of 1×10^{-8} std cm^3/s at the seat and to a rate of 1×10^{-9} std cm^3/s at the envelope and all other seals *DL / DS series:* Inboard helium leak tested to a rate of 4×10^{-9} std cm^3/s at the seat, envelope, and all seals *ALD20 series:* Inboard helium leak tested to a rate of 1×10^{-9} std cm^3/s at the envelope all external seals, and 1×10^{-7} std cm^3/s at the seat	Inboard helium leak tested to a rate of 4×10^{-9} std cm^3/s at the seat, envelope, and all seals *HB series:* Pneumatic actuator leak tested to a maximum leak rate of 1 std cm^3/min

Multiport and Elbow Valves

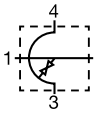
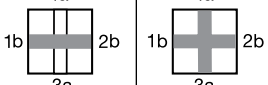
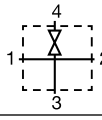
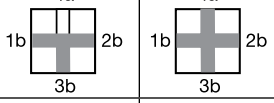
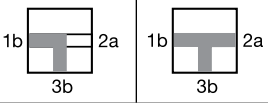
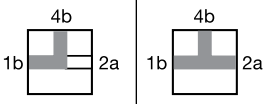
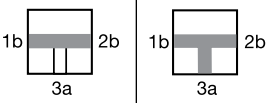
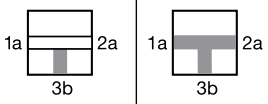
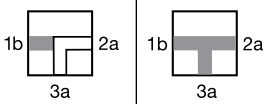
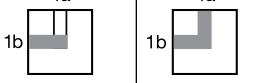
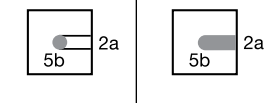
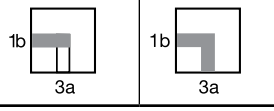
To order a multiport or elbow valve, select designators for:

- Valve type
- Flow path
- End connections for each port
- Process.

Flow Path

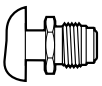
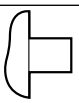
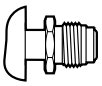
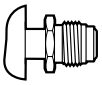
Select a flow path as viewed from the top of the valve. Insert the flow path designator in the valve ordering number, as shown on page 6.

- An **a** next to the port number in the Flow Path column indicates a port **above** the valve seat.
- A **b** next to the port number in the Flow Path column indicates a port **below** the valve seat.

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

End Connections

Select an end connection for each port on the body in numerical order. Insert the end connection designator in the valve ordering number in the same sequence it is selected, as shown on page 6.

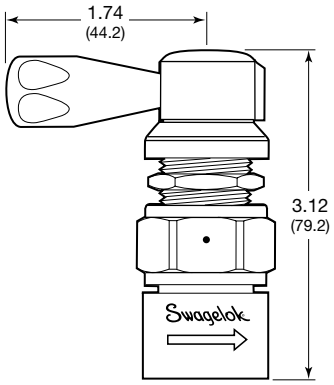
End Connections		Designator
ALD3, BN, DL / DS, DP, HB Series		
1/4 in. female VCR® fitting		3
1/4 in. rotatable male VCR fitting		2
1/4 in. tube butt weld, 0.30 in. (7.6 mm) tube stub, 0.035 in. wall		1
1/4 in. tube butt weld, 0.26 in. (6.6 mm) short tube stub, 0.035 in. wall		F
6 mm tube butt weld, 7.6 mm (0.30 in.) tube stub, 1 mm wall		4
ALD6, ALD7, DF Series		
1/4 in. female “H” type VCR fitting		D
1/4 in. rotatable male “H” type VCR fitting		E
3/8 in. tube butt weld, 0.50 in. (12.7 mm) tube stub, 0.035 in. wall		9
ALD6, ALD7, DF Series, ALD20		
1/2 in. female VCR fitting		8
1/2 in. rotatable male VCR fitting		7
ALD20		
1/2 in. tube butt weld, 0.50 in. (12.7 mm) tube stub, 0.049 in. wall		B

Multiport and Elbow Valves

Dimensions

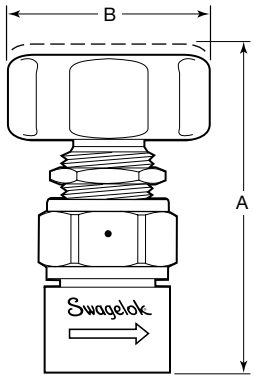
Dimensions, in inches (millimeters), are for reference only and are subject to change.

Body and Actuators



Lever

DL Series

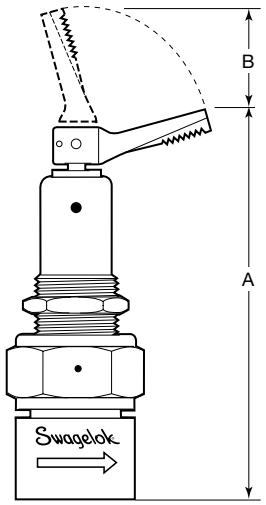


Rotary / Round / Directional / Lockout

BN, DF, DP, DS Series

(DS series shown—DF and DP series do not contain panel nuts.)

Valve Series	Dimensions, in. (mm)	
	A	B
BN	4.33 (110)	1.88 (47.8)
DF, round	3.18 (80.8)	1.50 (38.1)
DF, lockout	4.31 (109) max	1.49 (37.8)
DP, round and directional, high- and low-pressure	2.84 (72.1)	1.49 (37.8)
DP, lockout, high-pressure	Open 3.89 (98.9); closed, locked 4.26 (108)	1.49 (37.8)
DP, lockout, low-pressure	Open 3.73 (94.7); closed, locked 4.07 (103)	1.49 (37.8)
DS	3.19 (81.0)	1.87 (47.5)

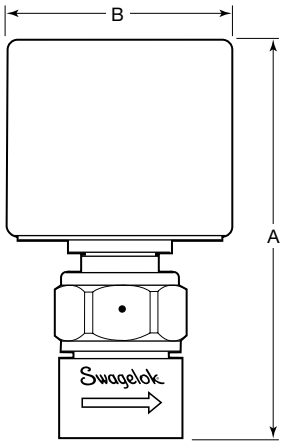


Toggle

BN, DP Series

(BN series shown—DP series does not contain panel nuts.)

Valve Series	Dimensions, in. (mm)	
	A	B
BN	3.85 (97.8)	0.94 (23.9)
DP, low pressure	4.55 (116)	1.24 (31.5)



Pneumatic Actuator

ALD, BN, DF, DP, HB Series

(HB series shown)

Valve Series	Dimensions, in. (mm)	
	A	B
ALD3, normally closed	3.50 (88.9) (standard actuator) 4.50 (114) (thermal actuator)	1.49 (37.8)
ALD3, normally open	3.22 (81.8) (standard actuator) 4.22 (107) (thermal actuator)	1.125 (28.6)
ALD6, normally closed	3.76 (95.5) (standard actuator) 4.76 (121) (thermal actuator)	1.49 (37.8)
ALD6, normally open	3.48 (88.4) (standard actuator) 4.48 (114) (thermal actuator)	1.125 (28.6)
ALD7, normally closed	3.63 (92.2)	1.50 (38.1)
ALD20	5.23 (132.9)	1.54 (39.1)
BN	3.67 (93.2)	1.24 (31.5)
DF	3.71 (94.2)	1.50 (38.1)
DP, high-pressure	3.89 (98.8)	2.48 (63.0)
DP, low-pressure	3.38 (85.9)	1.49 (37.8)
HB	3.90 (99.1)	2.12 (53.8)

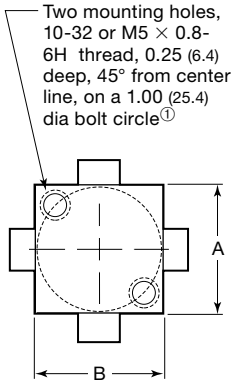
Multiport and Elbow Valves

Dimensions

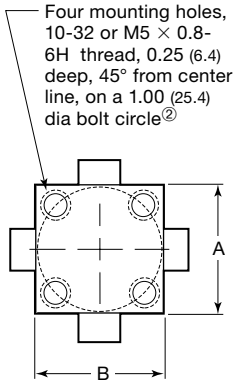
Dimensions, in inches (millimeters), are for reference only and are subject to change.

Body and End Connections

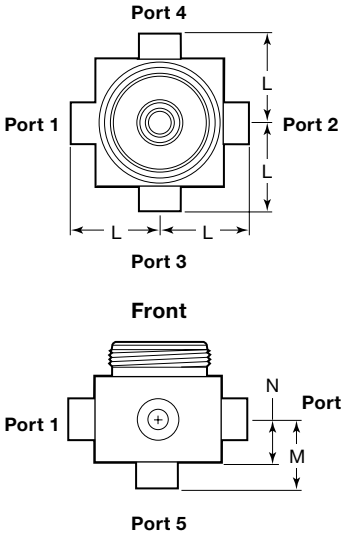
Bottom
BN, DL /DS, HB Series



Bottom
ALD, DF, DP Series



Top



Front

① Bodies with **L** or **R** flow path designators have mounting holes reversed from the pattern shown. Bodies with **N** flow path designator have no mounting holes.

② Bodies with **N** flow path designator have no mounting holes.

Valve Series	Dimensions in. (mm)	
	A	B
ALD3, DP	1.06 (26.9)	1.06 (26.9)
BN, DL / DS, HB	1.13 (28.7)	1.06 (26.9)
ALD6, ALD7, DF	1.25 (31.8)	1.25 (31.8)
ALD20	1.75 (44.5)	1.75 (44.5)

End Connections	Dimensions in. (mm)		
	L	M	N
ALD3, BN, DL / DS, DP, HB Series			
1/4 in. female VCR fitting	1.39 (35.3)	1.28 (32.5)	0.45 (11.4)
1/4 in. rotatable male VCR fitting	1.74 (44.2)①	1.63 (41.4)	0.45 (11.4)
1/4 in. tube butt weld, 0.30 in. (7.6 mm) tube stub	0.87 (22.1)②	0.76 (19.3)	0.45 (11.4)
1/4 in. tube butt weld, 0.26 in. (6.6 mm) tube stub	0.81 (20.6)	0.70 (17.8)	0.45 (11.4)
6 mm tube butt weld, 0.30 in. (7.6 mm) tube stub	0.87 (22.1)②	0.76 (19.3)	0.45 (11.4)
ALD6, ALD7, DF Series			
1/4 in. female "H" type VCR fitting	1.39 (35.3)	1.21 (30.7)	0.45 (11.4)
1/4 in. rotatable male "H" type VCR fitting	1.48 (37.6)	1.30 (33.0)	0.45 (11.4)
1/2 in. female VCR fitting	2.08 (52.8)	1.90 (48.3)	0.45 (11.4)
1/2 in. rotatable male VCR fitting	2.08 (52.8)	1.90 (48.3)	0.45 (11.4)
3/8 in. tube butt weld, 0.50 in. (12.7 mm) tube stub	1.12 (28.4)	0.95 (24.1)	0.45 (11.4)
ALD20			
1/2 in. female VCR fitting	2.33 (59.1)	2.15 (54.7)	0.70 (17.8)
1/2 in. rotatable male VCR fitting	2.33 (59.1)	2.15 (54.7)	0.70 (17.8)
1/2 in. tube butt weld, 0.50 in. (12.7 mm) tube stub	1.37 (34.8)	1.20 (30.4)	0.70 (17.8)

① ALD3 and DP series: 1.39 in. (35.3 mm).

② BN, DL / DS, HB series: L = 0.95 in. (24.1 mm) for ports 1 and 2 if the opposite port has a female or male VCR fitting end connection.

Multiport and Elbow Valves

Ordering Information

Build a valve ordering number by combining the designators in the sequence shown below.

A		B	C	D	E	F	G
6	L	V	V –	D	P	C	1 1 1 P – C

A Material

BN, DF, DL / DS, HB Series
6LV = 316L VAR stainless steel
ALD3, ALD6, ALD7, DP Series
6LVV = 316L VIM/VAR stainless steel
ALD20 Series
6LVV = 316L VIM/VAR stainless steel
HC22 = Alloy22/B574

B Valve Series

ALD3 = ALD3, standard
ALD3T = ALD3, thermal
ALD6 = ALD6, standard
ALD7 = ALD7
ALD6T = ALD6, thermal
ALD20 = ALD20, thermal
BN = BN (rotary handle or pneumatic actuator)
BNT = BN (toggle handle)
DF = DF (rotary handle or pneumatic actuator)
DFL = DF (integral lockout handle)
DL = DL (lever handle)
DP = Low-pressure DP (directional handle or pneumatic actuator)
DPL = Low-pressure DP (integral lockout handle)
DPR = Low-pressure DP (round handle)
DPT = Low-pressure DP (toggle handle)
DPH = High-pressure DP (directional handle or pneumatic actuator)
DPHL = High-pressure DP (integral lockout handle)
DPHR = High-pressure DP (round handle)
DS = DS (rotary handle)
HB = HB (pneumatic actuator)

C Seat Material (DF and DP Series Only)

V= Polyimide

Omit designator for standard DF and DP series with PCTFE seat and for all other series.

D Flow Path

Select a 2-, 3-, or 4-port flow path; see the schematics on page 3.

E End Connections

Select an end connection for each port on the body in numerical order; see page 3 for port numbering and page 3 for styles and sizes available.

F Process

See page 2 for process descriptions including cleaning and packaging, wetted surface finish, and testing.

All Series
P = Swagelok *Ultrahigh-Purity Process Specification (SC-01)* **(required** for ALD valves)
BN, DL / DS, and HB Series
None = Swagelok *Special Cleaning and Packaging (SC-11)*
BN and HB Series
-SC06 = Swagelok *Photovoltaic Process Specification (SC-06)*
DF Series
P1 = Swagelok *Special Cleaning and Packaging (SC-11)*
BN, DF, DP, and HB Series
P6 = Swagelok *Photovoltaic Process Specification (SC-06)*

G Actuation

Pneumatic (ALD3, ALD6 Series)
C = Normally closed
NO = Normally open
Pneumatic (ALD7, ALD20 Series)
C = Normally closed
Pneumatic (BN, DF, DP, HB Series)
C = Normally closed
O = Normally open
CM = Normally closed with indicator switch
Manual (DF, DP Series Handle Color)
BK = Black
BL = Blue①
GR = Green
OR = Orange
RD = Red
WH = White①
YW = Yellow

① DP series—no designator or final dash (–) is required for a blue handle on a low-pressure valve or a white handle on a high-pressure valve.

Monoblock Manifolds

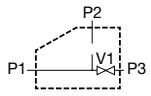
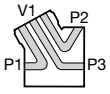
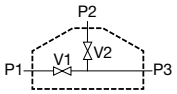
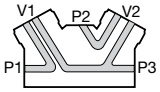
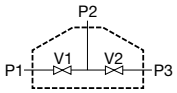
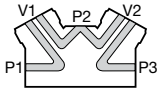
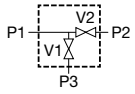
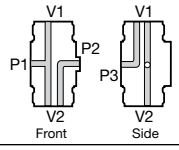
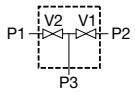
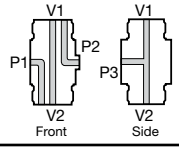
To customize a multivalve manifold to meet your system requirements, select designators for:

- Flow path
- End connections for each port
- Process
- Actuator (manual or pneumatic).

Flow Path

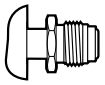
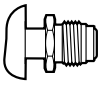
Select a flow path. Insert the flow path designator in the manifold ordering number, as shown on pages 11 and 12.

- P1, P2, and P3 designate port numbers.
- V1 and V2 designate valve numbers.

Manifold	Schematic	Flow Path	Valve Series	Designator
1-valve, 3-port			ALD6, ALD7, DF	5V
2-valve, 3-port			ALD3, ALD6, ALD7, DF, DP	1V
			BN, DL / DS, HB	M4V
			ALD3, DP	2V
			BN, DL / DS, HB	M3V
2-valve, 3-port double pattern			ALD3, DP	1D
			BN, DL / DS, HB	M1D
			BN, DL / DS, HB	M2D

End Connections

Select an end connection for each port on the body in numerical order. Place the end connection designator in the valve ordering number in the same sequence it is selected.

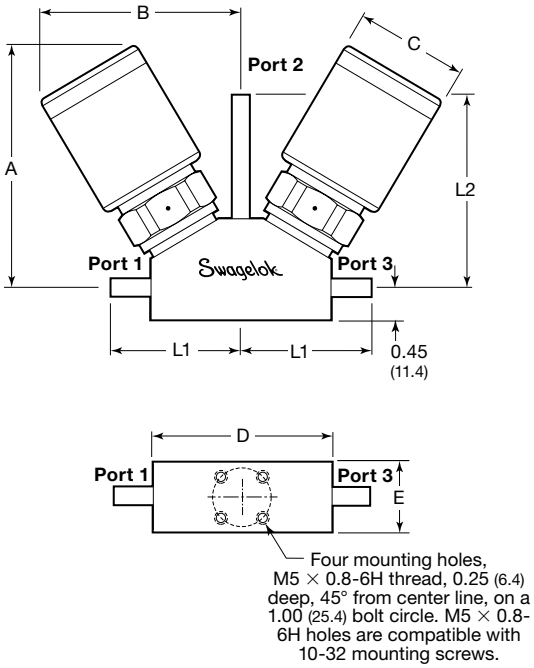
End Connections		Designator
ALD3, BN, DL / DS, HB, DP Series—All Ports ALD6, ALD7, DF Series—Port 2		
1/4 in. female VCR fitting		2
1/4 in. rotatable male VCR fitting		1
1/4 in. tube butt weld, 0.30 in. (7.6 mm) tube stub, 0.035 in. wall		3
6 mm tube butt weld, 1 mm wall		4
ALD6, ALD7, DF Series—Ports 1 and 3		
1/4 in. female “H” type VCR fitting		D
1/4 in. rotatable male “H” type VCR fitting		E
3/8 in. tube butt weld, 0.50 in. (12.7 mm) tube stub, 0.035 in. wall		9

Monoblock Manifolds

Dimensions

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

2 Valve, 3 Port



Body and End Connections

End Connection	Dimensions, in. (mm) L1	L2
ALD3, BN, DL / DS, DP, HB Series		
1/4 in. female VCR fitting	2.03 (51.6)	2.66 (67.6)
		3.91 (99.3)①
1/4 in. rotatable male VCR fitting	2.39 (60.7)	3.35 (85.1)
		4.60 (117)①
1/4 in. tube butt weld, 0.30 in. (7.6 mm) tube stub, 0.035 in. wall	1.81 (46.0)	2.79 (70.9)
		4.04 (103)①
ALD6, ALD7, DF Series		
1/4 in. female VCR fitting	—	2.66 (67.6)
1/4 in. rotatable male VCR fitting		3.35 (85.1)
1/4 in. tube butt weld, 0.30 in. (7.6 mm) tube stub, 0.035 in. wall		2.79 (70.9)
1/4 in. female “H” type VCR fitting	2.03 (51.6)	—
1/4 in. rotatable male “H” type VCR fitting	2.39 (60.7)	
3/8 in. tube butt weld, 0.50 in. (12.7 mm) tube stub, 0.035 in. wall	1.81 (46.0)	

① DP series high-pressure manifold.

Body and Actuators

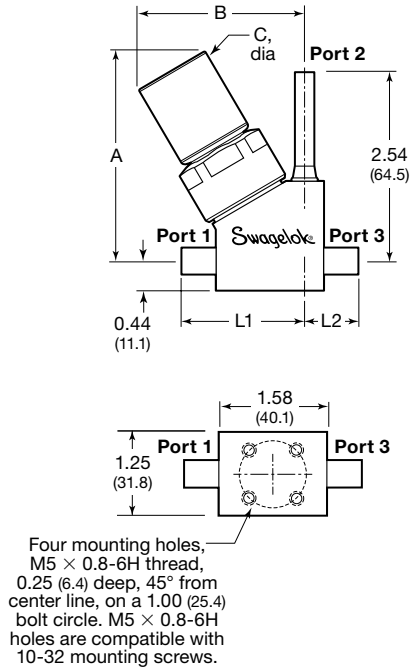
Valve Series, Actuation	Dimensions, in. (mm) A	B	C	D	E
ALD3, normally closed	3.32 (84.3) (standard): 4.18 (106) (thermal)	2.73 (69.3) (standard): 3.22 (81.5) (thermal)	1.49 (37.8)	2.46 (62.5)	1.06 (26.9)
ALD3, normally open	3.00 (76.2) (standard): 3.87 (98.3) (thermal)	2.44 (62.0) (standard): 2.94 (74.7) (thermal)	1.125 (28.6)		
ALD6, normally closed	3.67 (93.2) (standard): 4.53 (115) (thermal)	2.86 (72.6) (standard): 3.36 (85.3) (thermal)	1.49 (37.8)	2.59 (65.8)	1.25 (31.8)
ALD6, normally open	3.37 (85.6) (standard): 4.23 (107) (thermal)	2.58 (65.6) (standard): 3.08 (78.2) (thermal)	1.125 (28.6)		
ALD7, normally closed	3.57 (90.7)	2.80 (71.1)	1.50 (38.1)		
BN, rotary	4.08 (104)	3.33 (84.6)	1.88 (47.8)	2.41 (61.2)	1.13 (28.7)
BN, pneumatic	3.31 (84.1)	2.68 (68.1)	1.24 (31.5)		
BN, toggle	4.15 (105)	3.38 (85.9)	—		
DF, round	3.14 (79.8)	2.52 (64.0)	1.50 (38.1)	2.59 (65.8)	1.25 (31.8)
DF, pneumatic	3.62 (91.9)	2.84 (72.0)			
DF, lockout	3.72 (94.5) open; 3.90 (99.1) closed and locked	2.87 (72.9) open; 2.72 (69.1) closed and locked	1.49 (37.8)		
DL	2.75 (69.5)	3.31 (84.1)	—	2.41 (61.2)	1.13 (28.7)
DP, directional, high- and low-pressure	2.62 (66.6)	2.32 (58.9)	1.49 (37.8)	2.46 (62.5)	1.06 (26.9)
DP lockout, high-pressure	3.48 (88.4) open; 3.72 (94.5) closed and locked	2.81 (71.4) open; 2.69 (68.3) closed and locked	1.49 (37.8)		
DP lockout, low-pressure	3.32 (84.3) open; 3.55 (90.2) closed and locked	2.73 (69.3) open; 2.59 (65.8) closed and locked	1.49 (37.8)		
DP, pneumatic, high-pressure	3.89 (98.8)	3.33 (84.6)	2.48 (63.0)		
DP, pneumatic, low-pressure	3.21 (81.5)	2.67 (67.8)	1.49 (37.8)		
DP, round, high- and low-pressure	2.68 (68.1)	2.33 (59.2)	1.49 (37.8)		
DS	3.03 (77.0)	2.71 (68.8)	1.87 (47.5)	2.41 (61.2)	1.13 (28.7)
HB	3.73 (94.7)	3.31 (84.1)	2.12 (53.8)	2.41 (61.2)	1.13 (28.7)

Monoblock Manifolds

Dimensions

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

1 Valve, 3 Port



Body and Actuators

Valve Series, Actuation	Dimensions, in. (mm)		
	A	B	C
ALD6, normally closed	3.67 (93.2) (standard); 4.53 (115) (thermal)	2.86 (72.6) (standard); 3.36 (85.3) (thermal)	1.49 (37.8)
ALD6, normally open	3.37 (85.6) (standard); 4.23 (107) (thermal)	2.58 (65.6) (standard); 3.08 (78.2) (thermal)	1.125 (28.6)
ALD7, normally closed	3.57 (90.7)	2.80 (71.1)	1.50 (38.1)
DF, round	3.59 (91.2)	2.52 (64.0)	1.50 (38.1)
DF, pneumatic	4.07 (103)	2.84 (72.0)	
DF, lockout	3.72 (94.5) open; 3.90 (99.1) closed and locked	2.87 (72.9) open; 2.72 (69.1) closed and locked	1.49 (37.8)

Body and End Connections

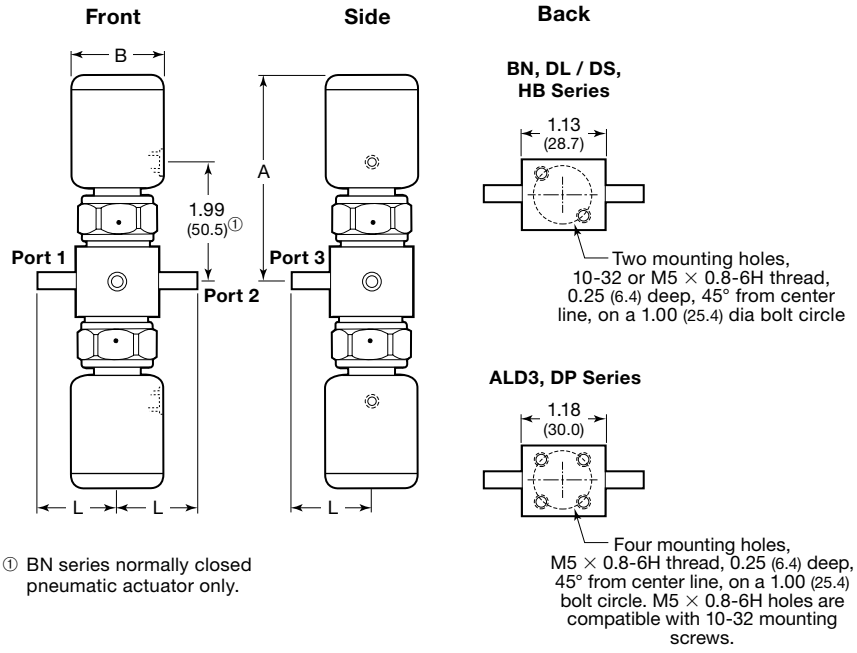
End Connection	Dimensions in. (mm)	
	L1	L2
1/4 in. female “H” type VCR fitting	2.18 (55.4)	1.18 (30.0)
1/4 in. rotatable male “H” type VCR fitting	2.18 (55.4)	1.18 (30.0)
3/8 in. tube butt weld, 0.50 in. (12.7 mm) tube stub, 0.035 in. wall	1.81 (46.0)	0.90 (22.9)

Monoblock Manifolds

Dimensions

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

Double Pattern



① BN series normally closed pneumatic actuator only.

Body and Actuators

Valve Series, Actuation	Dimensions, in. (mm)	
	A	B
ALD3, normally closed	3.16 (80.3) (standard); 4.16 (106) (thermal)	1.49 (37.8)
ALD3, normally open		1.125 (28.6)
BN, pneumatic	3.35 (85.1)	1.24 (31.5)
BN, rotary	4.01 (102)	1.88 (47.8)
BN, toggle	4.46 (103)	—
DL	2.80 (71.2)	—
DP, directional, high- and low-pressure	2.49 (63.2) open	1.49 (37.8)
DP, lockout, high-pressure	3.55 (90.1) open; 3.91 (99.3) closed and locked	1.49 (37.8)
DP, lockout, low-pressure	3.38 (85.9) open; 3.72 (94.5) closed and locked	1.49 (37.8)
DP, pneumatic, high-pressure	3.55 (90.1)	2.48 (63.0)
DP, pneumatic, low-pressure	3.04 (77.2)	1.49 (37.8)
DP, round high- and low-pressure	2.49 (63.3) open	1.49 (37.8)
DS	2.87 (72.9)	1.87 (47.5)
HB	3.90 (99.1)	2.12 (53.8)

Body and End Connections

End Connection	L in. (mm)
ALD3, DP Series	
1/4 in. female VCR fitting	1.39 (35.3)
1/4 in. rotatable male VCR fitting	1.39 (35.3)
1/4 in. tube butt weld, 0.30 in. (7.6 mm) tube stub, 0.035 in. wall	0.87 (22.1)
6 mm tube butt weld, 0.30 in. (7.6 mm) tube stub, 0.035 in. wall	0.87 (22.1)
BN, DL / DS, HB Series	
1/4 in. female VCR fitting	1.41 (35.8)
1/4 in. rotatable male VCR fitting	1.77 (45.0)
1/4 in. tube butt weld, 0.30 in. (7.6 mm) tube stub, 0.035 in. wall	0.87 (22.1)①
6 mm tube butt weld, 0.30 in. (7.6 mm) tube stub, 0.035 in. wall	0.87 (22.1)①

① L = 0.95 in. (24.1 mm) for ports 1 and 2 if the opposite port has a female or male VCR fitting end connection.

Monoblock Manifolds

Ordering Information—ALD, DF, and DP Series

Build a valve ordering number by combining the designators in the sequence shown below.

A	B	C	D	E	F	G
6 L V	– F	1 V		D 2 D	P	– A A

A Material

DF Series

6LV = 316L VAR stainless steel

ALD, DP Series

6LVV = 316L VIM/VAR stainless steel

B Valve Series

A3 = ALD3, standard
A3T = ALD3, thermal
A6 = ALD6, standard
A6T = ALD6, thermal
A7 = ALD7
F = DF (rotary handle or pneumatic actuator)
FL = DF (integral lockout handle)
P = Low-pressure DP (directional handle or pneumatic actuator)
PL = Low-pressure DP (integral lockout handle)
PR = Low-pressure DP (round handle)
PT = Low-pressure DP (toggle handle)
PH = High-pressure DP (directional handle or pneumatic actuator)
PHL = High-pressure DP (integral lockout handle)
PHR = High-pressure DP (round handle)

C Flow Path

See page 7 for flow path schematics.

ALD3, ALD6, ALD7, DF, DP Series

1V = 2-valve, 3-port monoblock

ALD3, DP Series

1D = 2-valve, 3-port double pattern
2V = 2-valve, 3-port monoblock

ALD6, ALD7, DF Series

5V = 1-valve, 3-port monoblock

D Seat Material (DF and DP Series Only)

V= Polyimide

Omit designator for standard DF and DP series with PCTFE seat and for all other series.

E End Connections

Select an end connection for each port on the body in numerical order; see page 7 for port numbering and styles and sizes available.

F Process

See page 2 for process descriptions including cleaning and packaging, wetted surface finish, and testing.

All Series

P = Swagelok *Ultrahigh-Purity Process Specification (SC-01)* **(required** for ALD valves)

DF, DP Series

P1 = Swagelok *Special Cleaning and Packaging (SC-11)*
P6 = Swagelok *Photovoltaic Process Specification (SC-06)*

G Actuation

Add a designator for each valve.

Pneumatic (ALD3, ALD6 Series)

A = Normally closed
NO = Normally open

Pneumatic (ALD7 Series)

A = Normally closed

Pneumatic (DF, DP Series)

A = Normally closed
B = Normally open
C = Normally closed with indicator switch

Manual (DF, DP Series Handle Color)

T = Black
U = Blue
S = Green
V = Orange
W= Red
X = White
Y = Yellow

Monoblock Manifolds

Ordering Information—BN, DL / DS, and HB Series

Build a valve ordering number by combining the designators in the sequence shown below.

A	B	C	D	E
6L –	M3V	222	P –	GG

A Material

6L = 316L stainless steel

B Flow Path

See page 7 for flow path schematics.

M3V = 2-valve, 3-port monoblock
M4V = 2-valve, 3-port monoblock
M1D = 2-valve, 3-port double pattern
M2D = 2-valve, 3-port double pattern

C End Connections

Select an end connection for each port on the body in numerical order; see page 7 for port numbering and styles and sizes available.

D Process

See page 2 for process descriptions including cleaning and packaging, wetted surface finish, and testing.

All Series

None = Swagelok *Special Cleaning and Packaging (SC-11)*
P = Swagelok *Ultrahigh-Purity Process Specification (SC-01)*

BN and HB Series

P6 = Swagelok *Photovoltaic Process Specification (SC-06)*
-SC06 = Swagelok *Photovoltaic Process Specification (SC-06)*

E Actuation

Add a designator for each valve.

BN Series

G = Toggle handle
H = Rotary handle
I = Normally closed pneumatic
J = Normally open pneumatic

DL / DS Series

P = DS series, rotary handle
V = DL series, lever handle

HB Series

A = Normally closed
B = Normally open

Oxygen Service Hazards

For more information about hazards and risks of oxygen-enriched systems, refer to Swagelok *Oxygen System Safety* technical report, MS-06-13.

⚠ **To increase service life, ensure proper valve performance, and prevent leakage, apply only as much torque as is required to achieve positive shutoff in manually actuated BN series and DS series valves.**

⚠ **Warning: Do not mix/interchange Swagelok products or components not governed by industrial design standards, including Swagelok tube fitting end connections, with those of other manufacturers.**

Swagelok

Introduction

Since 1947, Swagelok has designed, developed, and manufactured high-quality, general-purpose and specialty fluid system products to meet the evolving needs of global industries. Our focus is on understanding our customers' needs, finding timely solutions, and adding value with our products and services.

We are pleased to provide this global edition of the book-bound *Swagelok Product Catalog,* which compiles more than 100 separate product catalogs, technical bulletins, and reference documents into one convenient, easy-to-use volume. Each product catalog is up to date at the time of printing, with its revision number shown on the last page of the individual catalog. Subsequent revisions will supersede the printed version and will be posted on the Swagelok website and in the Swagelok electronic Desktop Technical Reference (eDTR) tool.

For more information, visit your Swagelok website or contact your authorized Swagelok sales and service representative.

Warranty Information

Swagelok products are backed by The Swagelok Limited Life-time Warranty. For a copy, visit swagelok.com or contact your authorized Swagelok representative.

Safe Product Selection
When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.

⚠ WARNING
Do not mix/interchange Swagelok products or components not governed by industrial design standards, including Swagelok tube fitting end connections, with those of other manufacturers.