

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

Selection Guide



MULTI-PORTS
ELBOW VALVES
MONOBLOCKS

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.

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* (MS-01-94), page 517
- *High-Pressure, Pneumatically Actuated Bellows-Sealed Valves—HB Series* (MS-01-76), page 528
- *Springless Diaphragm Valves for High Performance—DP Series*—(MS-01-165), page 544
- *High-Flow Springless Diaphragm Valves—DF Series* (MS-02-24), page 560
- *Diaphragm Valves for Atomic Layer Deposition—Atomic Layer Deposition (ALD) Diaphragm Valves* (MS-02-301), page 572
- *Diaphragm Valves—DL and DS Series* (MS-01-73), page 552.

Process Specifications

See Swagelok *Ultrahigh-Purity Process Specification (SC-01)* (MS-06-61), page 1180; Swagelok *Photovoltaic Process Specification (SC-06)* (MS-06-64), page 1177; and Swagelok *Special Cleaning and Packaging (SC-11)* (MS-06-63), page 1175, for details on processes, process controls, and process verification.

See **Ordering Information**, pages 584, 588, and 589 for process availability with each valve series and configuration.

Cleaning	Assembly and Packaging	Process Specification	Process Designator	Wetted Surface Roughness (R_a)			Testing	
				ALD, DF, DP Series	DL / DS Series	BN, HB Series	ALD, DF, DL / DS, DP Series	BN, HB Series
Special cleaning with non-ozone-depleting chemicals	Performed in specially cleaned areas; valves are individually bagged	<i>Special Cleaning and Packaging (SC-11)</i>	None	—	20 $\mu\text{in.}$ (0.51 μm) average, machine finished	20 $\mu\text{in.}$ (0.51 μm) average, machine finished	<i>ALD3 normally closed, DF, DP series:</i> Inboard helium leak tested to a rate of 1×10^{-9} std cm^3/s at the seat, envelope, and all seals	
			P1	Electro-polished and finished to an average of 5 $\mu\text{in.}$ (0.13 μm)	—	—		
High-purity cleaning with a continuously monitored, deionized water, ultrasonic cleaning system	Performed in specially cleaned areas; valves are individually bagged	<i>Photovoltaic Process Specification (SC-06)</i>	P6	Electro-polished and finished to an average of 5 $\mu\text{in.}$ (0.13 μm)	—	8 $\mu\text{in.}$ (0.20 μm) average, machine finished and electro-polished	<i>ALD3 and ALD6 normally open and ALD6 normally closed:</i> 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 <i>DL / DS series:</i> Inboard helium leak tested to a rate of 4×10^{-9} std cm^3/s at the seat, envelope, and all seals	Inboard helium leak tested to a rate of 4×10^{-9} std cm^3/s at the seat, envelope, and all seals <i>HB series:</i> Pneumatic actuator leak tested to a maximum leak rate of 1 std cm^3/min
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	<i>Ultrahigh-Purity Process Specification (SC-01)</i>	P	Electro-polished and finished to an average of 5 $\mu\text{in.}$ (0.13 μm)	8 $\mu\text{in.}$ (0.20 μm) average, machine finished and electro-polished	8 $\mu\text{in.}$ (0.20 μm) average, machine finished and electro-polished		
High-purity cleaning with a continuously monitored, deionized water, ultrasonic cleaning system	Performed in specially cleaned areas; valves are individually bagged	<i>Photovoltaic Process Specification (SC-06)</i>	SC06	—	—	20 $\mu\text{in.}$ (0.51 μm) average, machine finished		

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 584.

- 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 584.

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, DF Series		
1/4 in. female "H" type VCR fitting		D
1/4 in. rotatable male "H" type VCR fitting		E
1/2 in. female VCR fitting		8
1/2 in. rotatable male VCR fitting		7
3/8 in. tube butt weld, 0.50 in. (12.7 mm) tube stub, 0.035 in. wall		9

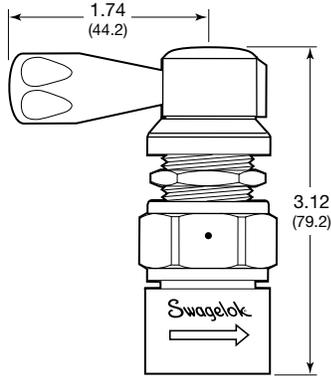
MULTI-PORTS
ELBOW VALVES
MONOBLOCKS

Multiport and Elbow Valves

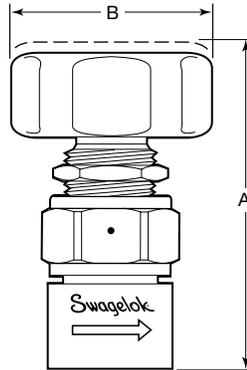
Dimensions

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

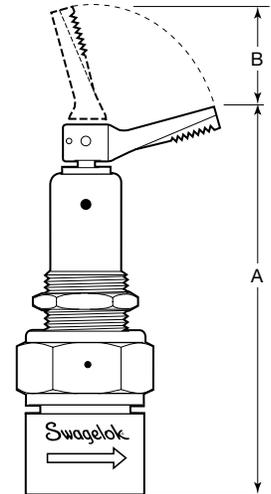
Body and Actuators



Lever
DL Series



Rotary / Round / Directional / Lockout
BN, DF, DP, DS Series
(DS series shown—DF and DP series do not contain panel nuts.)

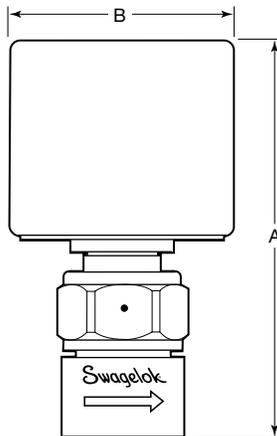


Toggle
BN, DP Series
(BN series shown—DP series does not contain panel nuts.)

MULTI-PORTS
ELBOW VALVES
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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)

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)

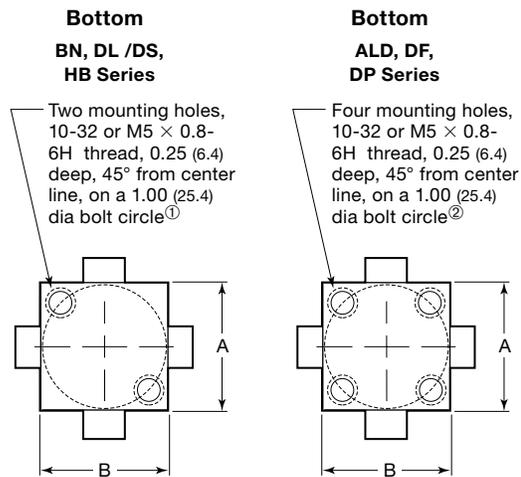
Valve Series	Dimensions, in. (mm)	
	A	B
ALD3, normally closed	3.50 (88.9) (standard actuator) 4.50 (114) (thermal actuator)	1.49 (37.8)
ALD3, normally open	3.22 (81.8) (standard actuator) 4.22 (107) (thermal actuator)	1.125 (28.6)
ALD6, normally closed	3.76 (95.5) (standard actuator) 4.76 (121) (thermal actuator)	1.49 (37.8)
ALD6, normally open	3.48 (88.4) (standard actuator) 4.48 (114) (thermal actuator)	1.125 (28.6)
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

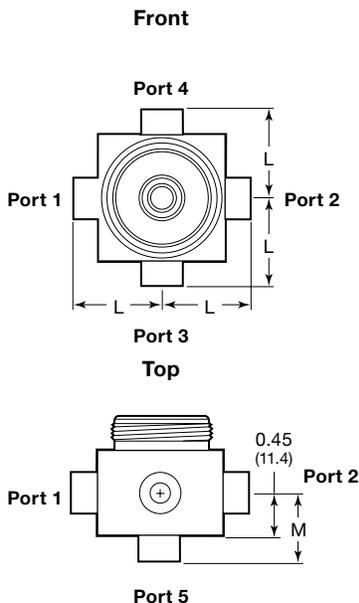
Dimensions

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

Body and End Connections



- 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, DF	1.25 (31.8)	1.25 (31.8)

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

- 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.

MULTI-PORTS
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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

ALD, DP Series

6LVV = 316L VIM/VAR stainless steel

B Valve Series

ALD3 = ALD3, standard

ALD3T = ALD3, thermal

ALD6 = ALD6, standard

ALD6T = ALD6, 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 581.

E End Connections

Select an end connection for each port on the body in numerical order; see page 581 for port numbering and page 581 for styles and sizes available.

F Process

See page 580 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 (ALD Series)

C = Normally closed

NO = Normally open

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 = Blue^①

GR = Green

OR = Orange

RD = Red

WH = White^①

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 588 and 589.

- 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, DF	5V
2-valve, 3-port			ALD3, ALD6, 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, 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, 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

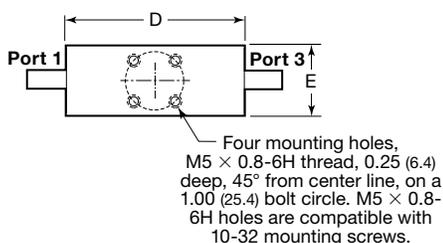
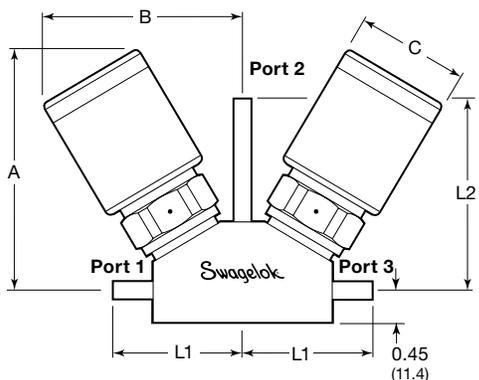
MULTI-PORTS
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Monoblock Manifolds

Dimensions

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

2 Valve, 3 Port



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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, 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

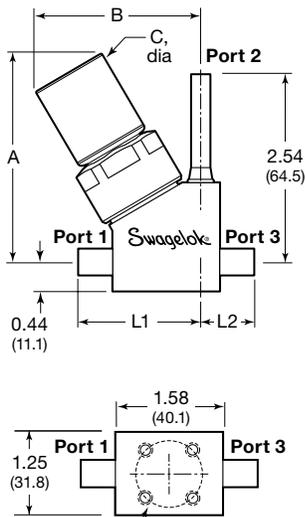
Valve Series, Actuation	Dimensions, in. (mm)				
	A	B	C	D	E
ALD3, normally closed	3.32 (84.3) (standard); 4.18 (106) (thermal)	2.73 (69.3) (standard); 3.22 (81.5) (thermal)	1.49 (37.8)	2.46 (62.5)	1.06 (26.9)
ALD3, normally open	3.00 (76.2) (standard); 3.87 (98.3) (thermal)	2.44 (62.0) (standard); 2.94 (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)		
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)		
HB	3.73 (94.7)	3.31 (84.1)	2.12 (53.8)	2.41 (61.2)	1.13 (28.7)

Monoblock Manifolds

Dimensions

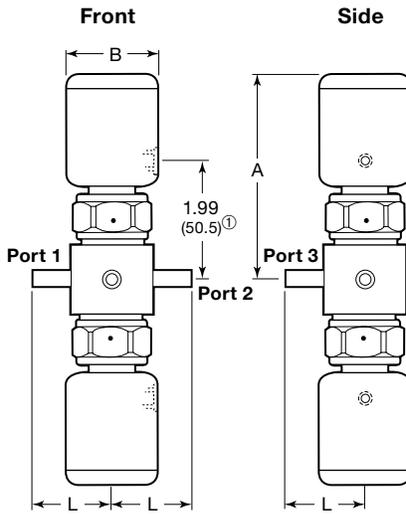
Dimensions, in inches (millimeters), are for reference only and are subject to change.

1 Valve, 3 Port



Four mounting holes, M5 × 0.8-6H thread, 0.25 (6.4) deep, 45° from center line, on a 1.00 (25.4) bolt circle. M5 × 0.8-6H holes are compatible with 10-32 mounting screws.

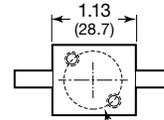
Double Pattern



① BN series normally closed pneumatic actuator only.

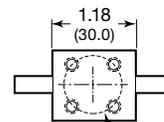
Back

BN, DL / DS, HB Series



Two mounting holes, 10-32 or M5 × 0.8-6H thread, 0.25 (6.4) deep, 45° from center line, on a 1.00 (25.4) dia bolt circle

ALD3, DP Series



Four mounting holes, M5 × 0.8-6H thread, 0.25 (6.4) deep, 45° from center line, on a 1.00 (25.4) bolt circle. M5 × 0.8-6H holes are compatible with 10-32 mounting screws.

Body and Actuators

Valve Series, Actuation	Dimensions, in. (mm)		
	A	B	C
ALD6, normally closed	3.67 (93.2) (standard)	2.86 (72.6) (standard)	1.49 (37.8)
	4.53 (115) (thermal)	3.36 (85.3) (thermal)	
ALD6, normally open	3.37 (85.6) (standard)	2.58 (65.6) (standard)	1.125 (28.6)
	4.23 (107) (thermal)	3.08 (78.2) (thermal)	
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)

Body and Actuators

Valve Series, Actuation	Dimensions, in. (mm)	
	A	B
ALD3, normally closed	3.16 (80.3) (standard)	1.49 (37.8)
	4.16 (106) (thermal)	
ALD3, normally open	4.16 (106) (thermal)	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;	1.49 (37.8)
	3.91 (99.3) closed and locked	
DP, lockout, low-pressure	3.38 (85.9) open;	1.49 (37.8)
	3.72 (94.5) closed and locked	
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

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 585 for flow path schematics.

ALD3, ALD6, 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, 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 585 for port numbering and styles and sizes available.

F Process

See page 580 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 (ALD Series)

A = Normally closed

NO = Normally open

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**
 6 L – M 3 V 2 2 2 P – G G

A Material

6L = 316L stainless steel

B Flow Path

See page 585 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 585 for port numbering and styles and sizes available.

D Process

See page 580 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, see the Swagelok *Oxygen System Safety* technical report (MS-06-13), page 1184.

⚠ 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.

Caution: Do not mix or interchange parts with those of other manufacturers.

About this document

Thank you for downloading this electronic catalog, which is part of General Product catalog Swagelok published in print. This type of electronic catalog is updated as new information arises or revisions, which may be more current than the printed version.

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Visit www.swagelok.com to locate your Swagelok representative and obtain any information on features, technical information and product references, or to learn about the variety of services available only through authorized sales centers and service Swagelok.

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.

Warranty Information

Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit your Swagelok Web site or contact your authorized Swagelok representative.

Swagelok, Ferrule-Pak, Goop, Hinging-Colleting, IGC, Kenmac, Micro-Fit, Nupro, Snoop, Sno-Trik, SWAK, VCO, VCR, Ultra-Torr, Whitey—TM Swagelok Company
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Rapid Tap—TM Relton Corporation
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SolidWorks—TM SolidWorks Corporation