

Diaphragm Valves

Atomic Layer Deposition Diaphragm Valves

ALD Series

Features

- Quick response to offer a total response time of less than 15 ms and a valve opening and closing time of less than 5 ms
- Ultra long cycle life
- High Cv consistency from valve to valve
- Stable Cv values under high temperatures
- Standard and thermal types optional, the thermal type has a working temperature up to 200 °C
- A wide variety of port types and sizes available



Technical Data

		0.16 in. (4.1 mm)	0.23 in. (5.9 mm)
Orifice Size		0.16 in. (4.1 mm)	0.23 in. (5.9 mm)
Port Size		1/4" to 3/8", 6 mm to 8 mm or 1.125" to 1.5"	3/8" to 1/2", 10 mm to 12 mm or 1.5"
Flow Coefficient (Cv)		0.27	0.62
Working Pressure		Vacuum to 145 psig (10 bar)	
Actuator Operating Pressure		60 ~ 90 psig (4.2 ~ 6.2 bar)	
Temperature	body	Standard model: 32 ~ 248 °F (0 ~ 120 °C)	
		Thermal model: 32 ~ 392 °F (0 ~ 200 °C)	
	Actuator	32 ~ 248 °F (0 ~ 120 °C)	
	Solenoid Valve	-0.4 ~ 122 °F (-18 ~ 50 °C)	
	Sensor	-13 ~ 158 °F (-25 ~ 70 °C)	
Leak Rate (Helium)	Internal	≤1x10 ⁻⁹ std cm ³ /s	≤1x10 ⁻⁸ std cm ³ /s
	External	≤1x10 ⁻⁹ std cm ³ /s	≤1x10 ⁻⁹ std cm ³ /s

Flow Data

Air @ 70 °F (21 °C)
Water @ 60 °F (16 °C)

Orifice Size in. (mm)	Pressure Drop to Atmosphere psig (bar)	Air (l/min)	Water (l/min)
0.16 (4.1)	10 (0.68)	86	3.2
	50 (3.4)	230	7.2
	100 (6.8)	410	10.2
0.23 (5.9)	10 (0.68)	199	7.4
	50 (3.4)	530	16.6
	100 (6.8)	945	23.6

Fittings

Valves

Pressure Gauges

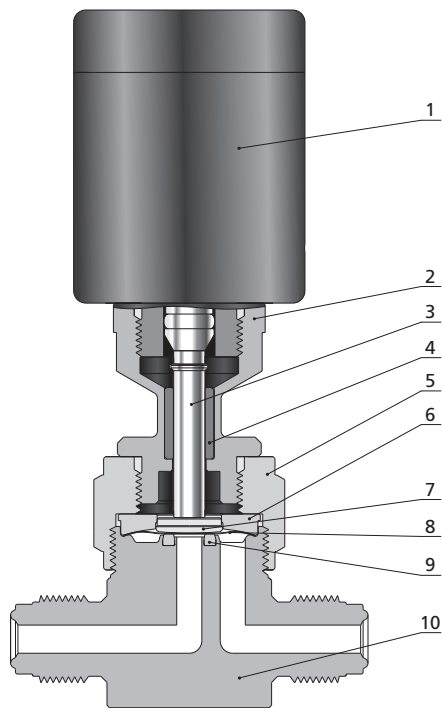
Integrated Systems and Others

Process Specification

Product Technology Grade

Process \ Material	316L SS	316L VAR
Process Specification	Ultra High Purity (FC-03)	Ultra High Purity (FC-03)
Wetted Surface Roughness	Ra 5 µin. (0.13 µm)	Ra 5 µin. (0.13 µm)
Polishing Process	Electropolished	Electropolished
Cleaning	Ultra high purity cleaning in continuously monitored ultrasonic cleaning system with deionized water	
Assembly Environment	In ISO 4/Federal 10 cleanroom	
Packaging	Double bagged in cleanroom	

Standard Materials of Construction



Normally Closed Thermal Actuator

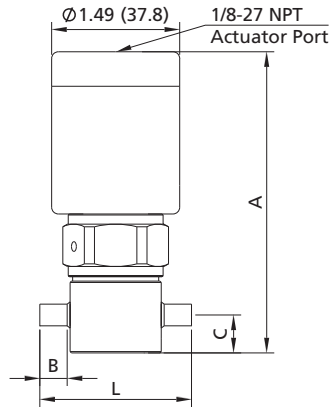
Item	Component	Material/Specification
1	Actuator	Aluminum
2	Thermal Isolation Coupling Housing (Thermal Model Only)	316 SS/ASTM A479
3	Thermal Isolation Coupling Stem (Thermal Model Only)	S17400/ASTM A564
4	Guide (Thermal Model Only)	PTFE/ASTM D1710
5	Bonnet Nut	316 SS/ASTM A479
6	Bonnet	S17400/ASTM A564
7	Button	316 SS/ASTM A479
8	Diaphragm	Cobalt Alloy/AMS 5876
9	Seat	PFA/ASTM D3307
10	Body	316L SS or 316L VAR

Dimensions and Ordering Information

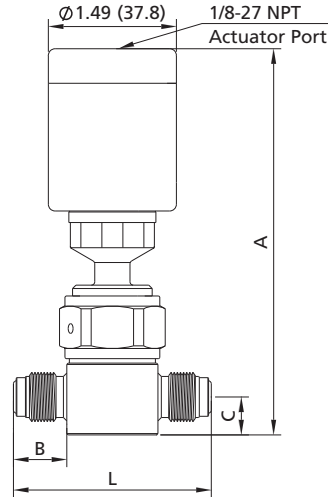
Dimensions, in inches (millimeters), are for reference only.

2-Port Valves

Standard Model

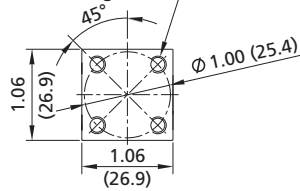


Thermal Model



4xM5x0.8-6H thread

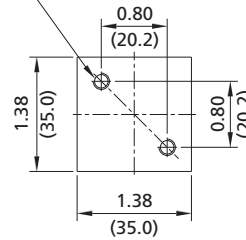
The holes are compatible with 10-32 mounting screws



Orifice 0.16 in. (4.1 mm) Bottom

2xM5x0.8-6H thread

The holes are compatible with 10-32 mounting screws



Orifice 0.23 in. (5.9 mm) Bottom

Fittings

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Integrated Systems and Others

Process Specification

V-06 Diaphragm Valves

Orifice Size in. (mm)	Cv	Valve Type	Basic Ordering Number	Connection Type and Size	Dimensions, in. (mm)				
					A	B	C	L	
0.16 (4.1)	0.27	Standard	ALD□□-TB4-4-	1/4"x0.035" Tube Butt Weld	3.50 (88.9)	0.30 (7.6)	0.44 (11.2)	1.74 (44.2)	
			ALD□□-TB6-4-	3/8"x0.035" Tube Butt Weld		0.26 (6.6)		2.78 (70.6)	
			ALD□□-FFR4-4-	1/4" Rotatable Female FR Metal Gasket Face Seal Fitting		0.86 (21.8)			
			ALD□□-RFR4-4-	1/4" Rotatable Male FR Metal Gasket Face Seal Fitting		0.62 (15.7)			2.30 (58.4)
			ALD□□-FR4-4-	1/4" Integral Male FR Metal Gasket Face Seal Fitting					
		Thermal	ALD□□-TB4-4-HT-	1/4"x0.035" Tube Butt Weld	4.50 (114.0)	0.30 (7.6)	0.44 (11.2)	1.74 (44.2)	
			ALD□□-TB6-4-HT-	3/8"x0.035" Tube Butt Weld		0.26 (6.6)		2.78 (70.6)	
			ALD□□-FFR4-4-HT-	1/4" Rotatable Female FR Metal Gasket Face Seal Fitting		0.86 (21.8)			
			ALD□□-RFR4-4-HT-	1/4" Rotatable Male FR Metal Gasket Face Seal Fitting		0.62 (15.7)			2.30 (58.4)
			ALD□□-FR4-4-HT-	1/4" Integral Male FR Metal Gasket Face Seal Fitting					
0.23 (5.9)	0.62	Standard	ALD□□-TB6-6-	3/8"x0.035" Tube Butt Weld	3.55 (90.1)	0.67 (17.0)	0.50 (12.7)	2.72 (69.0)	
			ALD□□-TB8-6-	1/2"x0.049" Tube Butt Weld		0.94 (24.0)		3.27 (83.0)	
			ALD□□-FFR8-6-	1/2" Rotatable Female FR Metal Gasket Face Seal Fitting				0.81 (20.6)	3.00 (76.2)
			ALD□□-RFR8-6-	1/2" Rotatable Male FR Metal Gasket Face Seal Fitting					
			ALD□□-FR8-6-	1/2" Integral Male FR Metal Gasket Face Seal Fitting					
		Thermal	ALD□□-TB6-6-HT-	3/8"x0.035" Tube Butt Weld	4.65 (118.1)	0.67 (17.0)	0.50 (12.7)	2.72 (69.0)	
			ALD□□-TB8-6-HT-	1/2"x0.049" Tube Butt Weld		0.94 (24.0)		3.27 (83.0)	
			ALD□□-FFR8-6-HT-	1/2" Rotatable Female FR Metal Gasket Face Seal Fitting				4.06 (103.0)	
			ALD□□-RFR8-6-HT-	1/2" Rotatable Male FR Metal Gasket Face Seal Fitting					
			ALD□□-FR8-6-HT-	1/2" Integral Male FR Metal Gasket Face Seal Fitting				0.81 (20.6)	3.00 (76.2)

Fittings

Valves

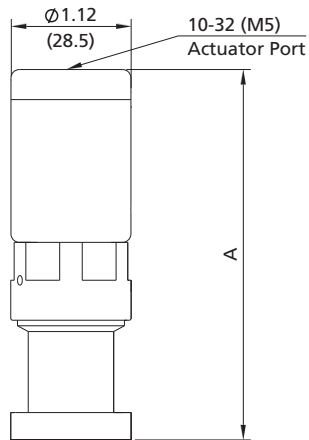
Pressure Gauges

Integrated Systems and Others

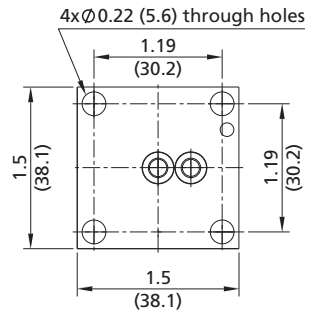
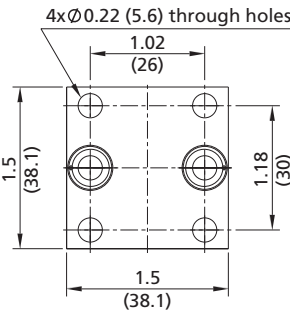
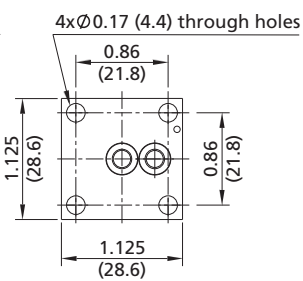
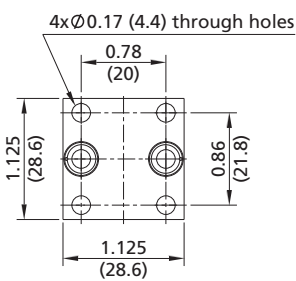
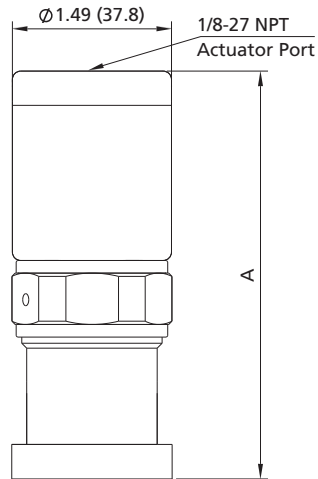
Process Specification

Modular Surface-Mount Valves

1.125" Surface-Mount



1.5" Surface-Mount



1.125" W-Seal Bottom

1.125" C-Seal Bottom

1.5" W-Seal Bottom

1.5" C-Seal Bottom

Orifice Size in. (mm)	Cv	Valve Type	Basic Ordering Number	Connection Type and Size	Dimension, in. (mm)
					A
0.16 (4.1)	0.27	Standard	ALD□□-WS11-4-	1.125" W-Seal	3.40 (86.4)
			ALD□□-CS11-4-	1.125" C-Seal	
			ALD□□-WS15-4-	1.5" W-Seal	3.70 (94.0)
			ALD□□-CS15-4-	1.5" C-Seal	
		Thermal	ALD□□-WS11-4-HT-	1.125" W-Seal	4.39 (111.5)
			ALD□□-CS11-4-HT-	1.125" C-Seal	
			ALD□□-WS15-4-HT-	1.5" W-Seal	4.69 (119.1)
			ALD□□-CS15-4-HT-	1.5" C-Seal	
0.23 (5.9)	0.62	Standard	ALD□□-CS15-6-	1.5" C-Seal	3.81 (96.9)
		Thermal	ALD□□-CS15-6-HT-	1.5" C-Seal	4.80 (122.0)

Fittings

Valves

Pressure Gauges

Integrated Systems and Others

Process Specification

Options and Accessories

Valves with position sensors, solenoid valve assemblies, heater cartridge and thermocouple holes are available.

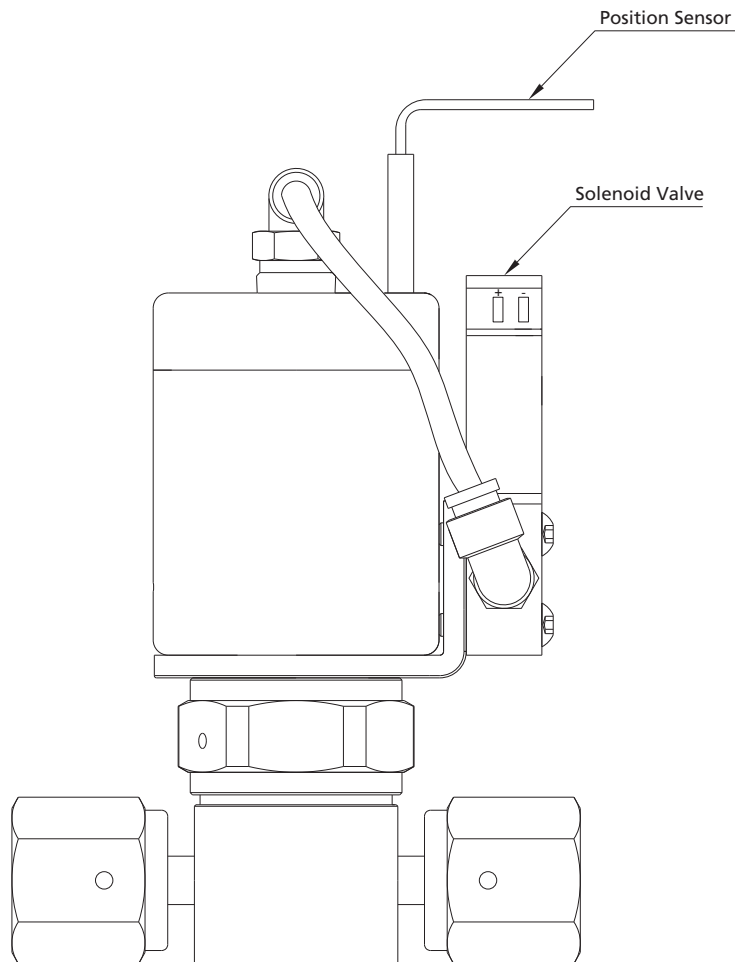
Fittings

Valves

Pressure Gauges

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Process Specification



Normally Closed Standard Actuator

Position Sensors

Transmit a signal to an electrical device indicating the on-off position of pneumatically actuated valves.

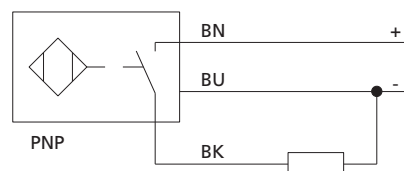
Sensor Technical Information

Output	3-wire V (dc), PNP
Output Function	Normally open or normally closed
Voltage	10 ~ 30 V (dc)
Operating Temperature	-13 ~ 158 °F (-25 ~ 70 °C)

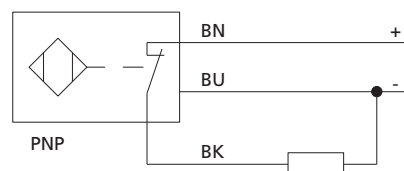
Note: Not applicable to modular surface-mount valves in 1.125".

Wiring Diagram

Normally Open Position Sensor



Normally Closed Position Sensor



Solenoid Valve Assemblies

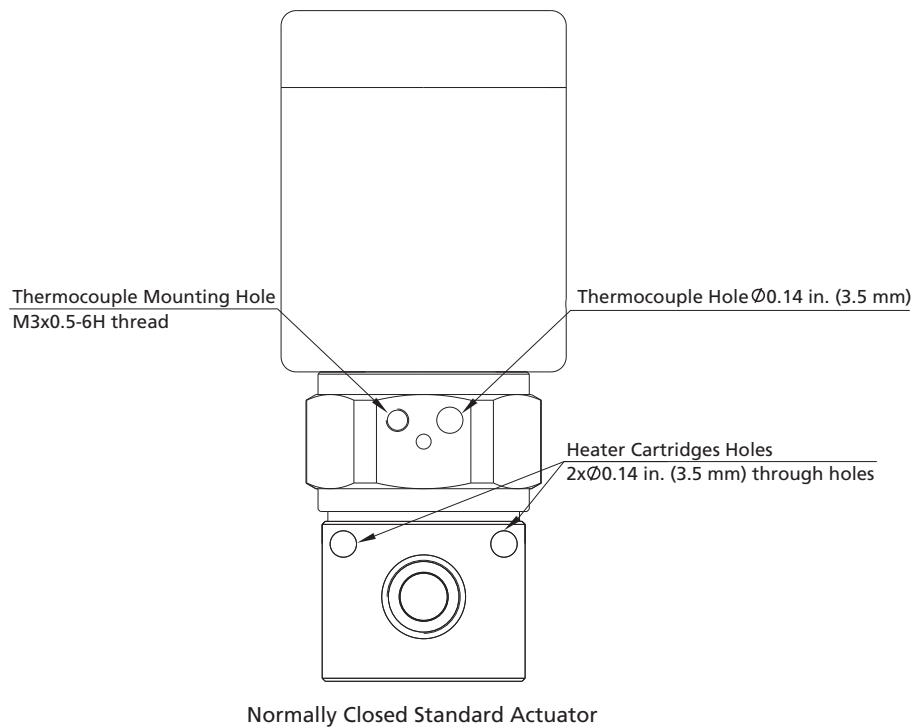
Fast-acting, high-flow solenoid valve enhances ALD series valve response time. Includes tubing, fittings and rotatable mounting bracket for installation versatility.

Solenoid Valve Technical Information

Solenoid Valve	Voltage/Power	24 V (dc)/4.0 W
	Temperature Range	-0.4 ~ 122 °F (-18 ~ 50 °C)
	Port	M5×0.8-6H thread, compatible with 10-32 screws
Fitting	Material	316 SS
Tubing		Polyurethane
Bracket		304 SS
O-Ring		Fluorocarbon FKM

Heater Cartridge and Thermocouple Holes

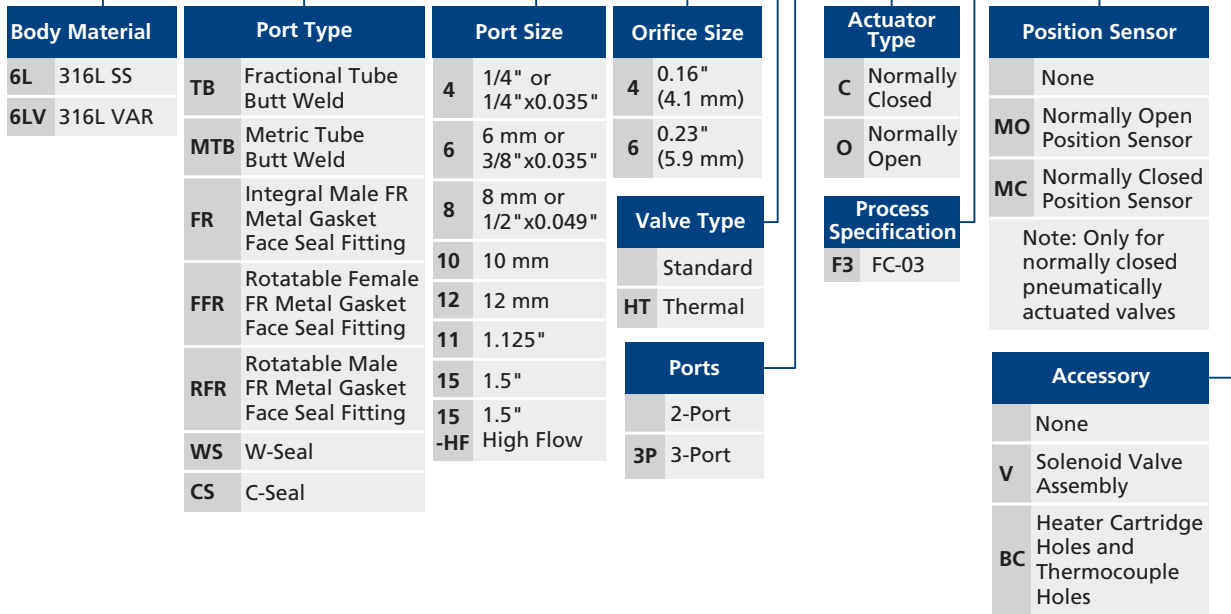
Valves are available with holes in the body to accommodate heater cartridges and thermocouple.



Note: Not applicable to modular surface-mount valves.

Part Number Description

ALD6LW - FR4 - 4 - HT - 3P - CF3MOVBC



Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.