

Diaphragm Valves

ALD Series Atomic Layer Deposition Diaphragm Valves

Features

- ⦿ Long cycle life under high-speed actuation
- ⦿ Quick response capable of valve opening or closing time of less than 5 ms
- ⦿ Consistent Cv less than $\pm 3\%$ from valve to valve
- ⦿ Thermal model extends actuator life for thermal application
- ⦿ Contained seat to provide excellent resistance to swelling and contamination
- ⦿ Elgiloy diaphragm to provide high strength and corrosion resistance to ensure long cycle life
- ⦿ High-purity grade PFA seat with broad range of chemical compatibility
- ⦿ Minimum particle generation and dead space facilitate purging
- ⦿ Suitable for ultra high purity applications



Technical Data

| 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 | 50 ~ 90 psig (3.4 ~ 6.2 bar) | | |
| Temperature | Standard model: 32 ~ 248 °F (0 ~ 120 °C) Thermal model: 32 ~ 392 °F (0 ~ 200 °C) | | |
| Leak Rate (Helium) | Internal | $\leq 1 \times 10^{-9}$ std cm ³ /s | $\leq 1 \times 10^{-8}$ std cm ³ /s |
| | External | $\leq 1 \times 10^{-9}$ std cm ³ /s | $\leq 1 \times 10^{-9}$ std cm ³ /s |

Flow Data

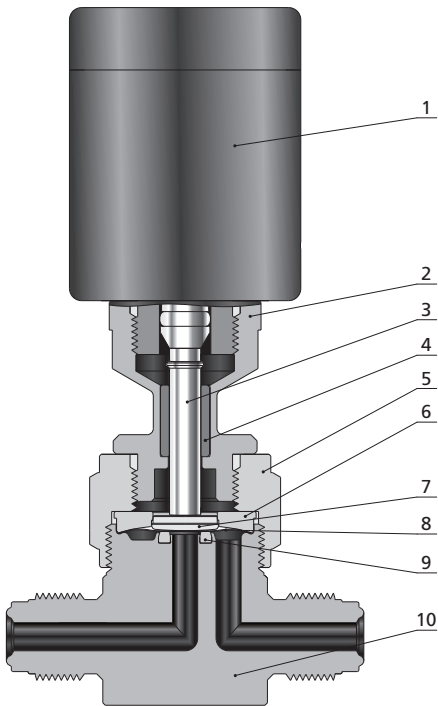
Air @ 70 °F (21 °C)
Water @ 60 °F (16 °C)

| 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 |

Product Technology Grade

| Technology | Product Grade | Ultra High Purity (F3) |
|--------------------------|---------------|--|
| Material/Specification | | 316L SS/SEMI F20 316L VAR/SEMI F20 316L VIM-VAR /SEMI F20 |
| Wetted Surface Roughness | | Ra 5 µin. (0.13 µm) |
| Polishing Process | | Electropolished |
| Process Specification | | FC-03 Ultra High Purity Process Specification |
| Cleaning | | Ultra high purity cleaning in continuously monitored ultrasonic cleaning system with deionized water |
| Assembly Environment | | In ISO Class 5/ Federal Class 100 cleanroom |
| Packaging | | Double bagged in cleanroom |

Standard Materials of Construction



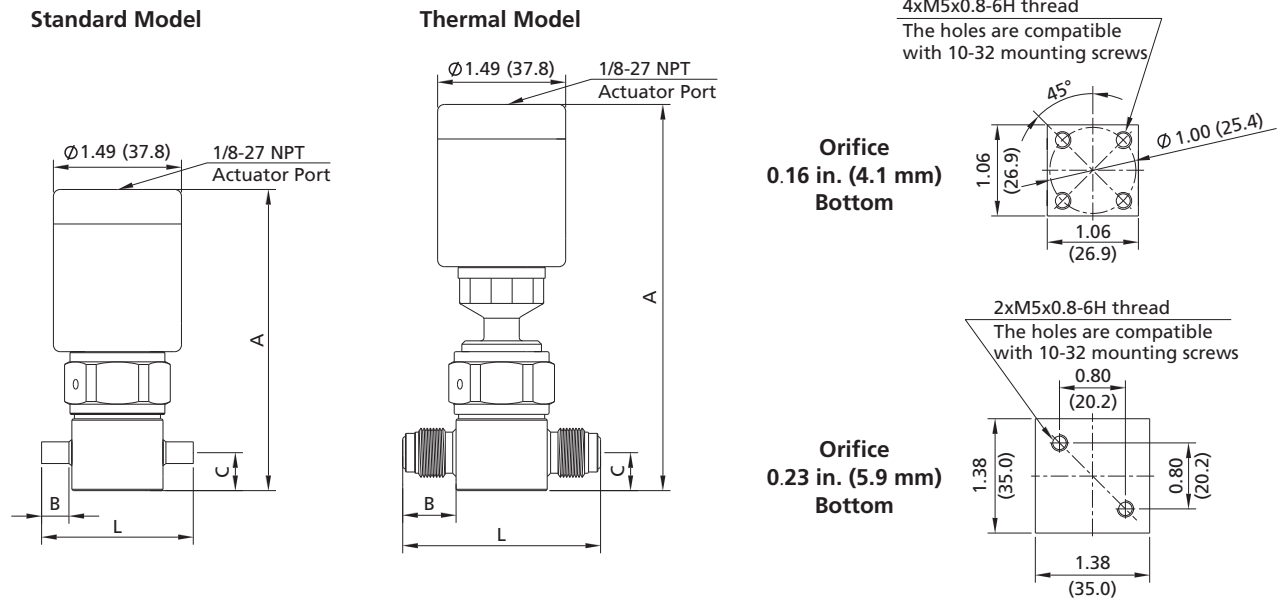
Normally Closed Thermal Actuator

| 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 | Elgiloy/AMS 5876 |
| 9 | Seat | PFA/ASTM D3307 |
| 10 | Body | 316L SS/SEMI F20 or 316L VAR/SEMI F20 or 316L VIM-VAR/SEMI F20 |

Dimensions and Ordering Information

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

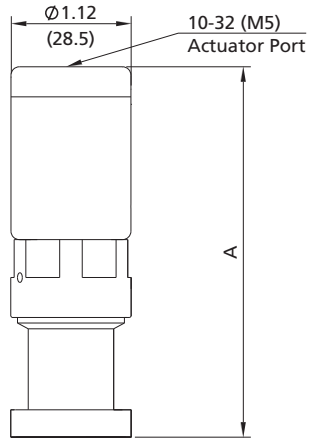
2-Port Valves



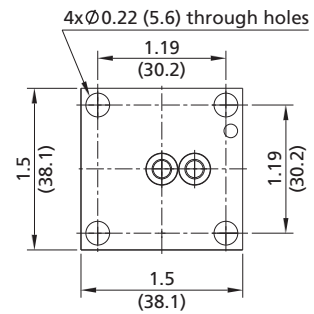
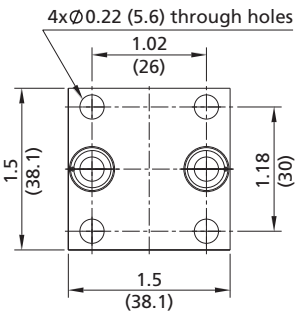
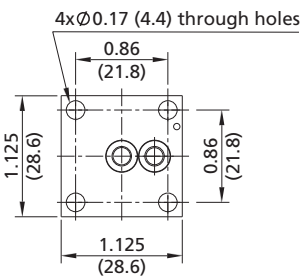
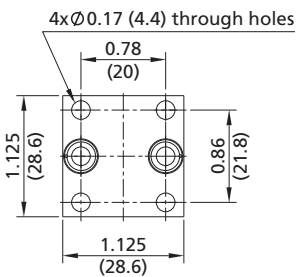
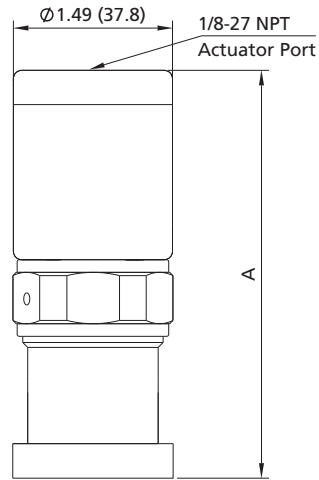
| Orifice Size in. (mm) | Valve Type | Basic Ordering Number | Connection Type and Size | Dimensions, in. (mm) | | | |
|--------------------------|---------------|--------------------------|--------------------------|----------------------|-------------|-------------|-------------|
| | | | | A | B | C | L |
| 0.16 (4.1) | Standard | ALD□□-TB4-4- | 1/4" Tube Butt Weld | 3.50 (88.9) | 0.30 (7.6) | 0.44 (11.2) | 1.74 (44.2) |
| | | ALD□□-TB6-4- | 3/8" Tube Butt Weld | | 0.26 (6.6) | | |
| | | ALD□□-FFR4-4- | 1/4" Female FR | | 0.86 (21.8) | | 2.78 (70.6) |
| | | ALD□□-RFR4-4- | 1/4" Rotatable Male FR | | 0.62 (15.7) | | |
| | | ALD□□-FR4-4- | 1/4" Integral Male FR | | 0.62 (15.7) | | |
| | Thermal | ALD□□-TB4-4-HT- | 1/4" 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" Tube Butt Weld | | 0.26 (6.6) | | |
| | | ALD□□-FFR4-4-HT- | 1/4" Female FR | | 0.86 (21.8) | | 2.78 (70.6) |
| | | ALD□□-RFR4-4-HT- | 1/4" Rotatable Male FR | | 0.62 (15.7) | | |
| | | ALD□□-FR4-4-HT- | 1/4" Integral Male FR | | 0.62 (15.7) | | |
| 0.23 (5.9) | Standard | ALD□□-TB6-6- | 3/8" Tube Butt Weld | 3.55 (90.1) | 0.67 (17.0) | 0.50 (12.7) | 2.72 (69.0) |
| | | ALD□□-TB8-6- | 1/2" Tube Butt Weld | | 0.94 (24.0) | | |
| | | ALD□□-FFR8-6- | 1/2" Female FR | | 0.81 (20.6) | | 3.00 (76.2) |
| | | ALD□□-RFR8-6- | 1/2" Rotatable Male FR | | 0.81 (20.6) | | |
| | | ALD□□-FR8-6- | 1/2" Integral Male FR | | 0.81 (20.6) | | |
| | Thermal | ALD□□-TB6-6-HT- | 3/8" Tube Butt Weld | 4.54 (115.2) | 0.67 (17.0) | 0.50 (12.7) | 2.72 (69.0) |
| | | ALD□□-TB8-6-HT- | 1/2" Tube Butt Weld | | 0.94 (24.0) | | |
| | | ALD□□-FFR8-6-HT- | 1/2" Female FR | | 0.94 (24.0) | | 3.27 (83.0) |
| | | ALD□□-RFR8-6-HT- | 1/2" Rotatable Male FR | | 0.81 (20.6) | | |
| | | ALD□□-FR8-6-HT- | 1/2" Integral Male FR | | 0.81 (20.6) | | |

Modular Surface-Mount Valves

1.125" Surface-Mount



1.5" Surface-Mount



1.125" W-Seal Bottom

1.125" C-Seal Bottom

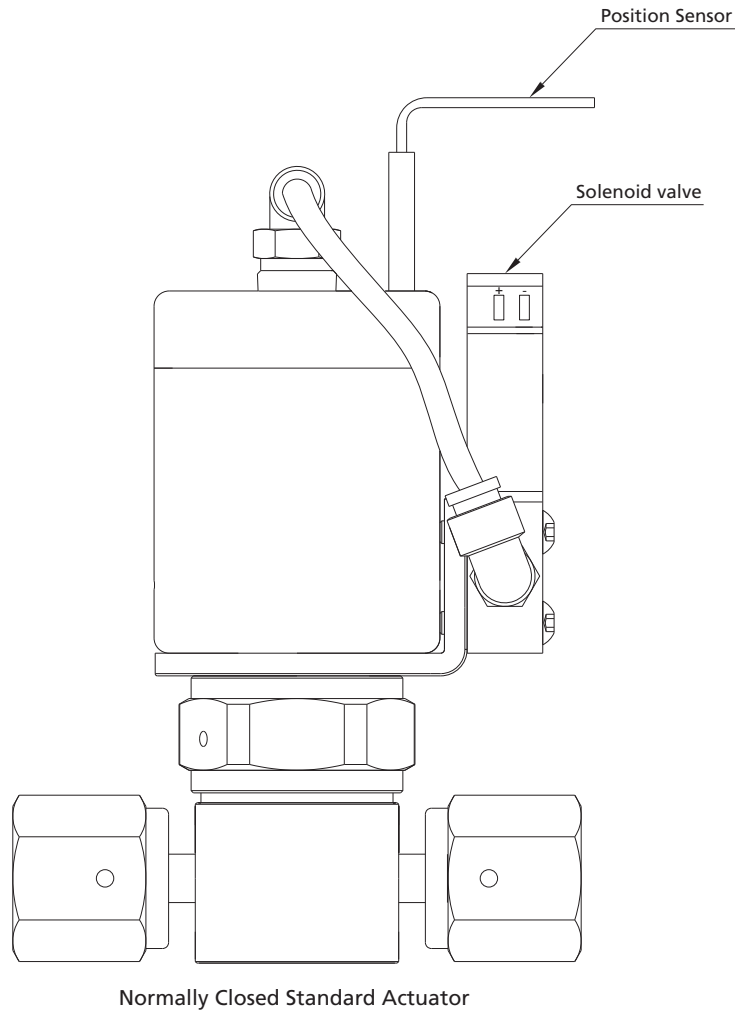
1.5" W-Seal Bottom

1.5" C-Seal Bottom

| Orifice Size in. (mm) | Valve Type | Basic Ordering Number | Connection Type and Size | Dimensions, in. (mm) |
|--------------------------|---------------|-----------------------|-----------------------------|----------------------|
| | | | | A |
| 0.16 (4.1) | 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) | 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) |

Options and Accessories

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



Position Sensors

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

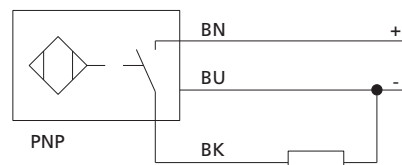
Sensor Technical Information

| | |
|------------------------------|----------------------------------|
| 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) |

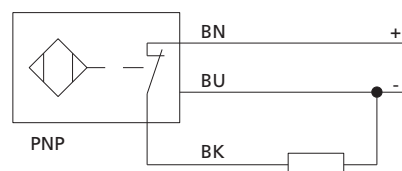
Note: Not applicable to modular surface-mount valves in 1.125".

Wiring Diagram

Normally Open Position Sensor



Normally Closed Position Sensor



Solenoid Valve Assemblies

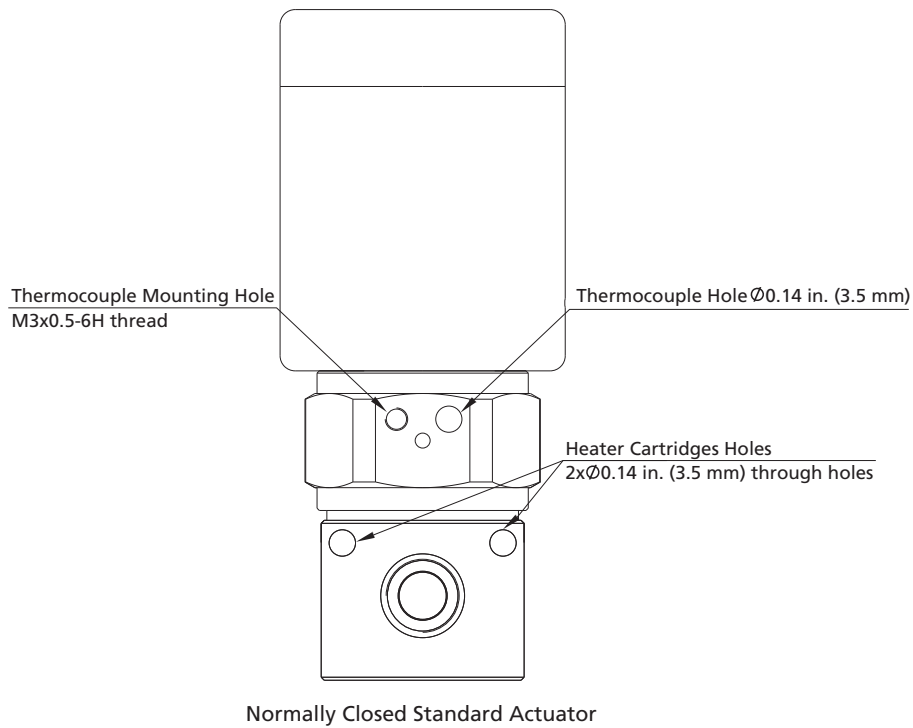
Fast-acting, high-flow solenoid valve enhances ALD series valve response time. Includes tubing, fittings and rotatable mounting bracket for installation versatility.

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 | | 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

