

Bellows-Sealed Valves

SM and SVH Series

Fittings

Valves

Pressure Gauges

Integrated Systems and Others

Process Specification



Bellows-Sealed Valves

Low Pressure Bellows-Sealed Valves

SM Series

Features

- ⦿ Metal-to-metal gasket seal without external leakage
- ⦿ Precision-formed metal bellows to ensure reliability
- ⦿ Non-rotating stem tip to increase shutoff cycle life
- ⦿ Manual and pneumatic actuator available
- ⦿ Pneumatic actuator to rotate 360° for ease of installation
- ⦿ Panel mounting and bottom mounting available
- ⦿ Position sensors available assembled on normally closed pneumatically actuated valves



Technical Data

| | | | |
|--|------------------|--|-----------------------------------|
| Ports Size | | 1/4" to 3/8" or 6 mm to 8 mm | 3/8" to 1/2" or 10 mm to 12 mm |
| Flow Coefficient (Cv) | | 0.30 | 0.80 |
| Orifice Size | | 0.16 in. (4.1mm) | 0.31 in. (8.0 mm) |
| Max. Working Pressure | Manual | 500 psig (34.4 bar) | |
| | Pneumatic | 145 psig (10 bar) | |
| Pneumatic Actuator Operating Pressure | | 60 to 90 psig (4.2 to 6.2 bar) | |
| Temperature | | PCTFE: -10 ~ 200 °F (-23 ~ 93 °C) PFA: -10 ~ 302 °F (-23 ~ 150 °C) Vespel: -10 ~ 400 °F (-23 ~ 204 °C) | |
| Leak Rate (Helium) | Internal | ≤ 4x10 ⁻⁹ std cm ³ /s | |
| | External | ≤ 4x10 ⁻⁹ std cm ³ /s | |

Flow Data

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

| Orifice in. (mm) | Pressure Drop to Atmosphere psig (bar) | Air (l/min) | Water (l/min) |
|---------------------|--|----------------|------------------|
| 0.16 (4.1) | 10 (0.68) | 96 | 3.6 |
| | 50 (3.4) | 250 | 7.9 |
| | 100 (6.8) | 450 | 11.0 |
| 0.31 (8.0) | 10 (0.68) | 270 | 9.6 |
| | 50 (3.4) | 730 | 21.6 |
| | 100 (6.8) | 1280 | 30.0 |

Fittings

Valves

Pressure Gauges

Integrated Systems and Others

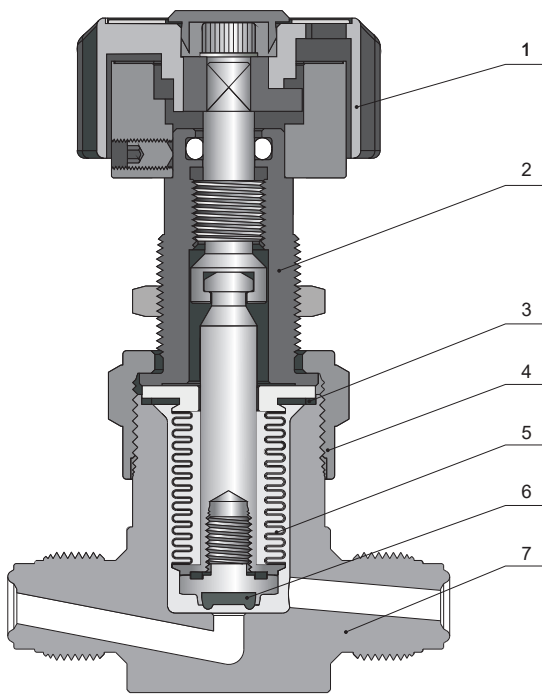
Process Specification

Process Specification

| Technology | Process Specification | Standard Cleaning and Packaging (FC-01) | Special Cleaning and Packaging (FC-02) | Ultra High Purity (FC-03) |
|--------------------------|-----------------------|---|--|---------------------------------------|
| Material/Specification | | 316 SS/ASTM A479 316L SS/SEMI F20 316L VAR/SEMI F20 | | 316L SS/SEMI F20 316L VAR/SEMI F20 |
| Wetted Surface Roughness | | Ra 20 µin. (0.51 µm) | | Ra 8 µin. (0.20 µm) |
| Polishing Process | | Machine finished | | Electropolished |

Note: Refer to page P-01 for a detailed description of Process Specification.

Major Materials of Construction



Manual Model

| Item | Component | Material/Specification |
|------|---------------|---|
| 1 | Handle | ABS |
| 2 | Bonnet | 316 SS/ASTM A479 |
| 3 | Bonnet Gasket | 316L SS/ASTM A269 |
| 4 | Bonnet Nut | 316 SS/ASTM A479 |
| 5 | Bellows | 316L SS/ASTM A269 |
| 6 | Seat | PCTFE/ASTM D1430 or PFA/ASTM D3307 or Vespel |
| 7 | Body | 316 SS/ASTM A479 or 316L SS/SEMI F20 or 316L VAR/SEMI F20 |

Fittings

Valves

Pressure Gauges

Integrated Systems and Others

Process Specification

Actuators

Manual - Round Handle

- ⦿ One-half turn to operate from fully open to closed
- ⦿ Handle with window to visually indicate open and closed states



Pneumatic

- ⦿ Normally open, "N.O." marked on the top of the actuator
- ⦿ Normally closed, "N.C." marked on the top of the actuator



Position Sensors

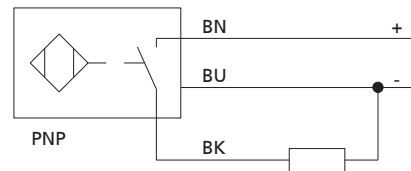
Transmit a signal to an electrical device indicating the open and closed position of pneumatically actuated valves

Sensor Technical Information

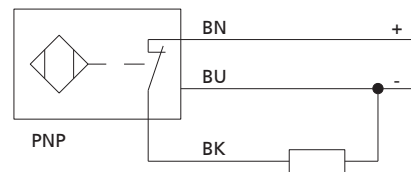
| | |
|----------------------------|----------------------------------|
| Output | 3-wire V (dc), PNP |
| Output Function | Normally open or normally closed |
| Voltage | 10 ~ 30 V (dc) |
| Working Temperature | -13 ~ 158 °F (-25 ~ 70 °C) |

Wiring Diagram

Normally Open Position Sensor



Normally Closed Position Sensor



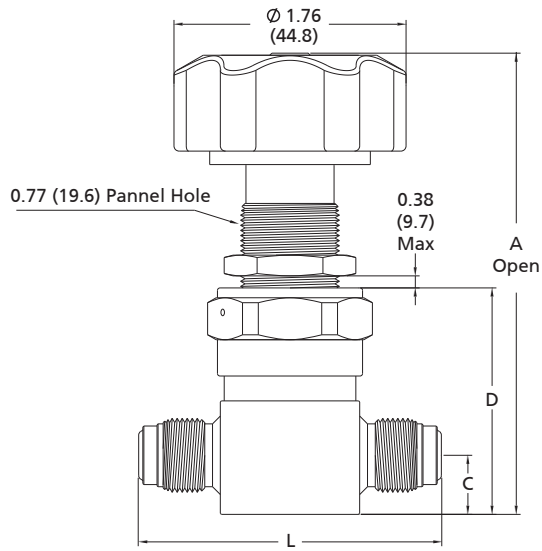
Dimensions and Ordering Information

Straight Type

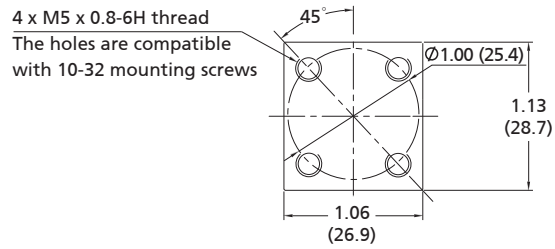
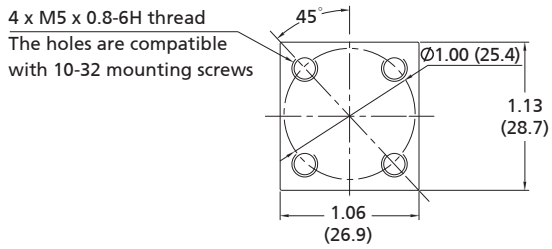
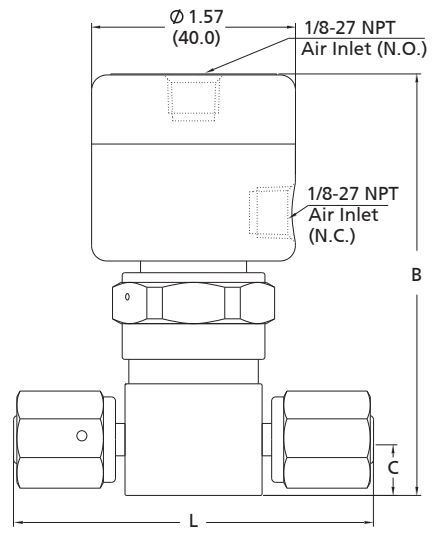
Dimensions

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

Manual - Handle



Pneumatic



Fittings

Valves

Pressure Gauges

Integrated Systems and Others

Process Specification

| Orifice in. (mm) | Basic Ordering Number | Connection Type and Size | Dimensions, in. (mm) | | | | |
|---------------------|--------------------------|---|----------------------|----------------|----------------|----------------|------------|
| | | | A | B | C | D | L |
| 0.16 (4.1) | SM□□-FL4-4- | 1/4" FITOK Tube Fitting | 3.51 (89.4) | 3.31 (84.0) | 0.45 (11.4) | 1.78 (45.2) | 2.44(62.1) |
| | SM□□-FL6-4- | 3/8" FITOK Tube Fitting | | | | | 2.58(65.5) |
| | SM□□-ML6-4- | 6 mm FITOK Tube Fitting | | | | | 2.47(62.8) |
| | SM□□-ML8-4- | 8 mm FITOK Tube Fitting | | | | | 2.53(64.3) |
| | SM□□-TB4-4- | 1/4"x0.035" Tube Butt Weld | | | | | 1.74(44.2) |
| | SM□□-TB6-4- | 3/8"x0.035" Tube Butt Weld | | | | | |
| | SM□□-MTB6-4- | 6x1 mm Tube Butt Weld | | | | | 1.75(44.4) |
| | SM□□-TS4-4- | 1/4" Tube Socket Weld | | | | | |
| | SM□□-FR4-4- | 1/4" Integral Male FR Metal Gasket Face Seal Fitting | | | | | 2.30(58.4) |
| | SM□□-FFR4-4- | 1/4" Rotatable Female FR Metal Gasket Face Seal Fitting | | | | | 2.76(70.1) |
| | SM□□-FO4-4- | 1/4" Male FO | | | | | 2.00(50.8) |
| 0.31 (8.0) | SM□□-FL6-8- | 3/8" FITOK Tube Fitting | 3.77 (95.7) | 3.76 (95.5) | 0.53 (13.5) | 2.02 (51.3) | 2.58(65.5) |
| | SM□□-FL8-8- | 1/2" FITOK Tube Fitting | | | | | 2.80(71.1) |
| | SM□□-ML10-8- | 10 mm FITOK Tube Fitting | | | | | 2.60(66.0) |
| | SM□□-ML12-8- | 12 mm FITOK Tube Fitting | | | | | 2.80(71.1) |
| | SM□□-TB6-8- | 3/8"x0.035" Tube Butt Weld | | | | | 1.74(44.2) |
| | SM□□-TB8-8- | 1/2"x0.049" Tube Butt Weld | | | | | |
| | SM□□-FR8-8- | 1/2" Integral Male FR Metal Gasket Face Seal Fitting | | | | | 2.58(65.5) |
| | SM□□-FFR8-8- | 1/2" Rotatable Female FR Metal Gasket Face Seal Fitting | | | | | 3.15(80.0) |

Fittings

Valves

Pressure Gauges

Integrated Systems and Others

Process Specification

Ordering Number Description

SMSS - FL4 - ML6 - 4 - RAF2MO - CE

| Body Material | | Inlet Type | | Inlet Size | | Outlet Type | Outlet Size | Actuator Type | | Seat | | Process Specification | | | | |
|---------------|----------|------------|--|------------|---------------------------------------|----------------|------------------------------------|---------------|---------------------------|---|---------------------------------|------------------------------|---|-------|--|--|
| 6L | 316L SS | TB | Fractional Tube Butt Weld | 4 | 1/4" or 1/4"x0.035" | Same as Inlet | Specified in the same way as Inlet | R | Manual-Round Handle | PCTFE | FC-01 | F2 | FC-02 | | | |
| 6LV | 316L VAR | MTB | Metric Tube Butt Weld | 6 | 6 mm or 6x1 mm or 3/8" or 3/8"x0.035" | | | C | Normally Closed Pneumatic | A | | | | PFA | | |
| SS | 316 SS | TS | Fractional Tube Socket Weld | 8 | 8 mm or 1/2" or 1/2"x0.049" | O | Normally Open Pneumatic | V | VespeI | F3 | | | | FC-03 | | |
| | | FR | Integral Male FR Metal Gasket Face Seal Fitting | 10 | 10 mm | Orifice | | | | Position Sensor | | | | | | |
| | | FFR | Rotatable Female FR Metal Gasket Face Seal Fitting | 12 | 12 mm | 4 | 0.16" (4.1 mm) | | | None | | | | | | |
| | | FL | Fractional Tube Fitting | | | 8 | 0.31" (8.0 mm) | | | MO | Normally Open Position Sensor | | | | | |
| | | ML | Metric Tube Fitting | | | | | | | MC | Normally Closed Position Sensor | | | | | |
| | | FO | Male FO Fitting | | | | | | | Note: For normally closed pneumatic valves only | | | | | | |
| | | | | | | | | | | | | Product Certification | | | | |
| | | | | | | | | | | | | None | | | | |
| | | | | | | | | | | | | CE | CE Certification (For Pneumatic only) | | | |
| | | | | | | | | | | | | AX | ATEX Certification (For Pneumatic only) | | | |

Note:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
- For -CE selections, products have "CE" lettering and, additionally, if the products are fitted with position sensors, the sensors conform to CE.
- For -AX selections, products conform to Equipment Group II under ATEX certification with "EX" lettering on them and, additionally, if the products are fitted with position sensors, the sensors are explosion-proof, with details described above.

Fittings

Valves

Pressure Gauges

Integrated Systems and Others

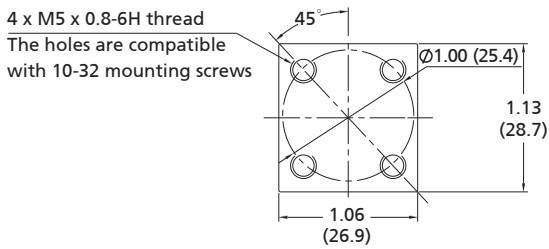
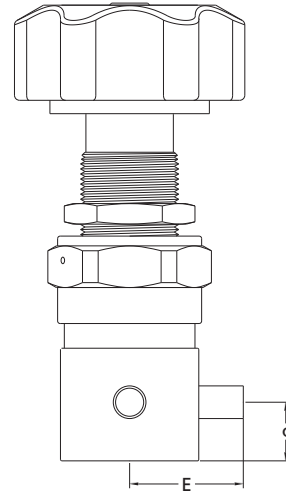
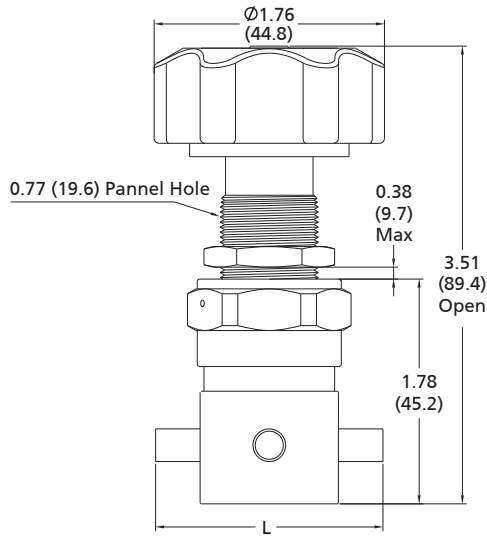
Process Specification

Branch Type

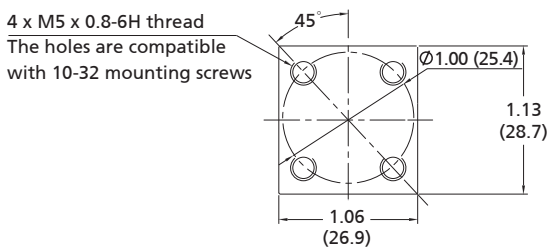
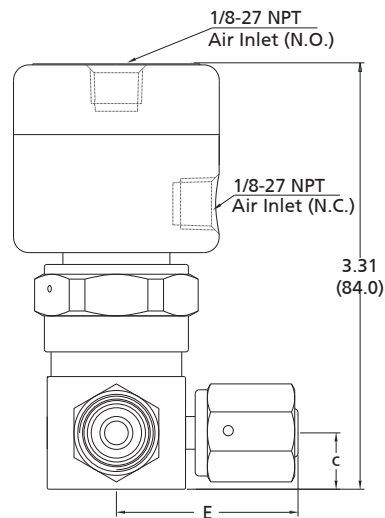
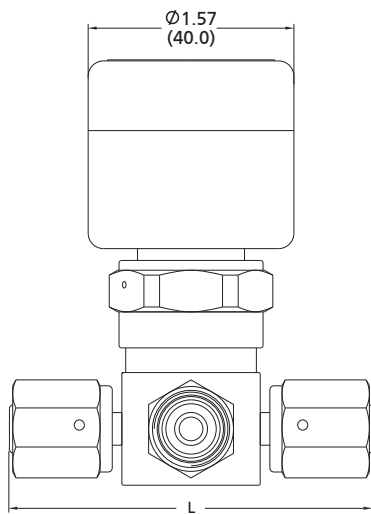
Dimensions

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

Manual - Round Handle



Pneumatic



Fittings

Valves

Pressure Gauges

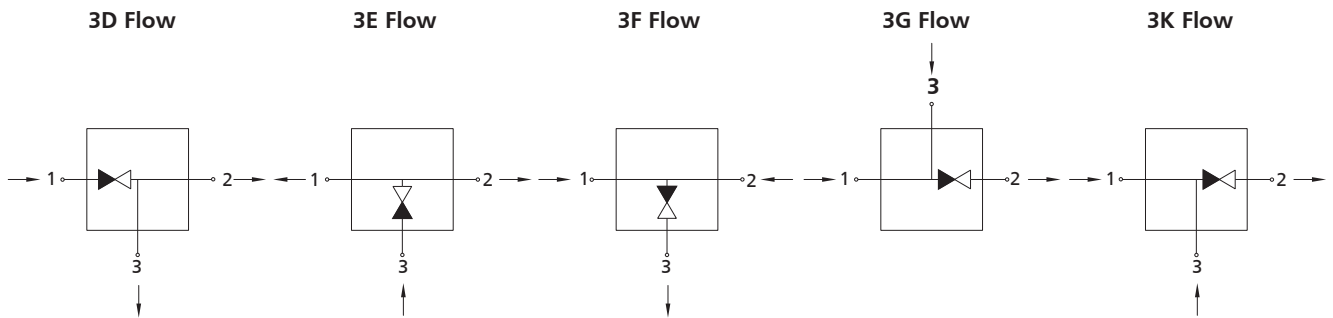
Integrated Systems and Others

Process Specification

| Basic Ordering Number | Connection Type and Size | Dimensions, in. (mm) | | |
|-----------------------|---|----------------------|-------------|-------------|
| | | C | E | L |
| SM□□-TB4-4- | 1/4"x0.035" Tube Butt Weld | 0.45 (11.4) | 0.87 (22.1) | 1.74 (44.2) |
| SM□□-MTB6-4- | 6x1 mm Tube Butt Weld | | | |
| SM□□-FFR4-4- | 1/4" Rotatable Female FR Metal Gasket Face Seal Fitting | | 1.38 (35.1) | 2.76 (70.1) |
| SM□□-RFR4-4- | 1/4" Rotatable Male FR Metal Gasket Face Seal Fitting | | 1.74 (44.2) | 3.48 (88.4) |

Flow Paths

⦿ Flow paths as viewed from the top



Ordering Number Description

SMSS - TB4 - FR4 - FFR4 - 4 - 3G - RAF2MO - CE

| Body Material | Port 1 Type | Port 2/3 Type | Port 2/3 Size | Flow Path | Actuator Type | Seat | Process Specification | | |
|---------------|--|----------------|-------------------------------------|------------------|-----------------------------|----------|---------------------------|--|--|
| 6L 316L SS | TB Fractional Tube Butt Weld | Same as Port 1 | Specified in the same way as Port 1 | 3D | R Manual-Round Handle | PCTFE | FC-01 | | |
| 6LV 316L VAR | MTB Metric Tube Butt Weld | | | A PFA | | F2 FC-02 | | | |
| SS 316 SS | TS Fractional Tube Socket Weld | Port 1 Size | 4 1/4" or 1/4"x0.035" | 3F | C Normally Closed Pneumatic | V Vespel | F3 FC-03 | | |
| | FR Integral Male FR Metal Gasket Face Seal Fitting | | | 6 6x1 mm or 3/8" | | 3G | O Normally Open Pneumatic | | |
| | FFR Rotatable Female FR Metal Gasket Face Seal Fitting | | | 8 8 mm | | 3K | | | |

| Orifice | Position Sensor |
|------------------|------------------------------------|
| 4 0.16" (4.1 mm) | None |
| | MO Normally Open Position Sensor |
| | MC Normally Closed Position Sensor |

Note: For normally closed pneumatic valves only

Note:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
- For -CE selections, products have "CE" lettering and, additionally, if the products are fitted with position sensors, the sensors conform to CE.
- For -AX selections, products conform to Equipment Group II under ATEX certification with "EX" lettering on them and, additionally, if the products are fitted with position sensors, the sensors are explosion-proof, with details described above.

| Product Certification | |
|-----------------------|---|
| | None |
| CE | CE Certification (For Pneumatic only) |
| AX | ATEX Certification (For Pneumatic only) |

Bellows-Sealed Valves

High Pressure Pneumatic Bellows-Sealed Valves

SVH Series

Features

- ⦿ Packless valves with all-metal seal to atmosphere
- ⦿ Compact designed body with minimal dead space
- ⦿ 316L SS precision-formed bellows for long cycle life
- ⦿ PCTFE stem tip material with remarkable chemical and thermal resistance
- ⦿ Normally closed and normally open pneumatic actuator optional
- ⦿ Bottom mounting
- ⦿ Normally open and normally closed position sensors optional



Technical Data

| | | |
|---------------------------------------|--|--|
| Ports Size | 1/4" to 3/8" or 6 mm to 8 mm | |
| Flow Coefficient (Cv) | 0.30 | |
| Orifice Size | 0.15 in. (3.8 mm) | |
| Max. Working Pressure | 3500 psig (241 bar) | |
| Pneumatic Actuator Operating Pressure | 60 to 90 psig (4.2 to 6.2 bar) | |
| Temperature | PCTFE: -40 ~ 150 °F (-40 ~ 65 °C) Vespel: -40 ~ 400 °F (-40 ~ 204 °C) | |
| Leak Rate (Helium) | Internal | $\leq 4 \times 10^{-9}$ std cm ³ /s |
| | External | $\leq 4 \times 10^{-9}$ std cm ³ /s |

Flow Data

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

| Pressure Drop to Atmosphere psig (bar) | Air (l/min) | Water (l/min) |
|--|-------------|---------------|
| 10 (0.68) | 96 | 3.6 |
| 50 (3.4) | 250 | 7.9 |
| 100 (6.8) | 450 | 11.0 |

Process Specification

| Technology | Standard Cleaning and Packaging (FC-01) | Special Cleaning and Packaging (FC-02) | Ultra High Purity (FC-03) |
|--------------------------|---|--|---------------------------|
| Material/Specification | 316 SS/ASTM A479 316L SS/SEMI F20 | | 316L SS/SEMI F20 |
| Wetted Surface Roughness | Ra 20 μin. (0.51 μm) | | Ra 10 μin. (0.25 μm) |
| Polishing Process | Machine finished | | Electropolished |

Note: Refer to page P-01 for a detailed description of Process Specification.

Fittings

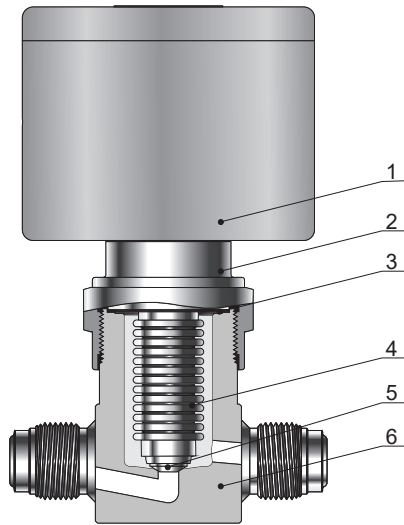
Valves

Pressure Gauges

Integrated Systems and Others

Process Specification

Major Materials of Construction



Normally Closed Model

| Item | Component | Material/Specification |
|------|--------------------|--------------------------------------|
| 1 | Pneumatic Actuator | Aluminum |
| 2 | Bonnet Nut | 304 SS/ASTM A479 |
| 3 | Gasket | PTFE-Coated 316L SS/A240 |
| 4 | Bellows | 316L SS/ASTM A269 |
| 5 | Seat | PCTFE/ASTM D1430 or Vsepel |
| 6 | Body | 316 SS/ASTM A479 or 316L SS/SEMI F20 |

Pneumatic Actuators

- ☉ Normally open, "N.O." marked on the top of the actuator
- ☉ Normally closed, "N.C." marked on the top of the actuator



Position Sensors

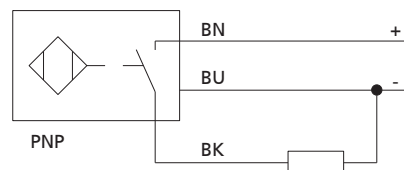
Transmit a signal to an electrical device indicating the open and closed position of pneumatically actuated valves

Sensor Technical Information

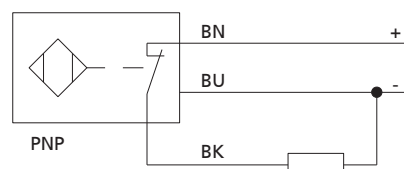
| | |
|---------------------|----------------------------------|
| Output | 3-wire V (dc), PNP |
| Output Function | Normally open or normally closed |
| Voltage | 10 ~ 30 V (dc) |
| Working Temperature | -13 ~ 158 °F (-25 ~ 70 °C) |

Wiring Diagram

Normally Open Position Sensor



Normally Closed Position Sensor



Explosion-proof Position Sensors

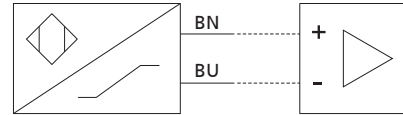
Transmit a signal to an electrical device, indicating the open and closed positions of pneumatically actuated valves.

Equipment Group II under ATEX Certification. The output complies with DIN EN 6094 7-5-6 (NAMUR) and the sensor should be used with an isolation amplifier.

Technical Information

| | |
|----------------------------|----------------------------|
| Output | 2 Wires DC |
| Voltage | 8.2 V (dc) |
| Working Temperature | -13 ~ 158 °F (-25 ~ 70 °C) |

Wiring Diagram



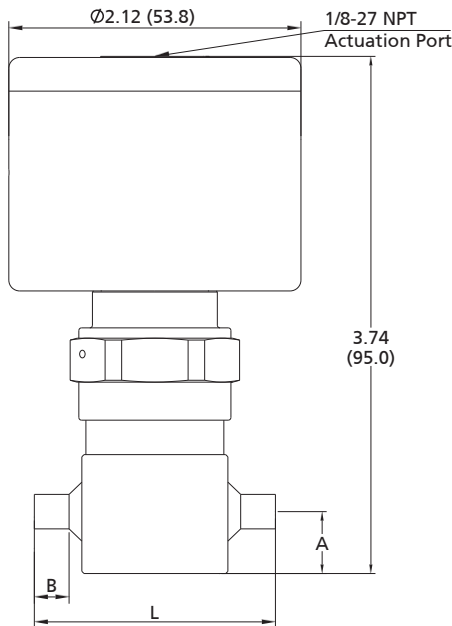
Dimensions and Ordering Information

Straight Type

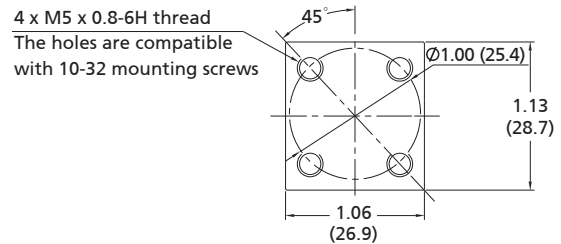
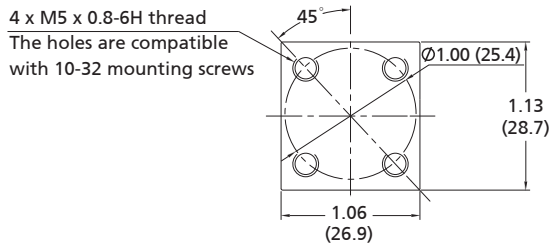
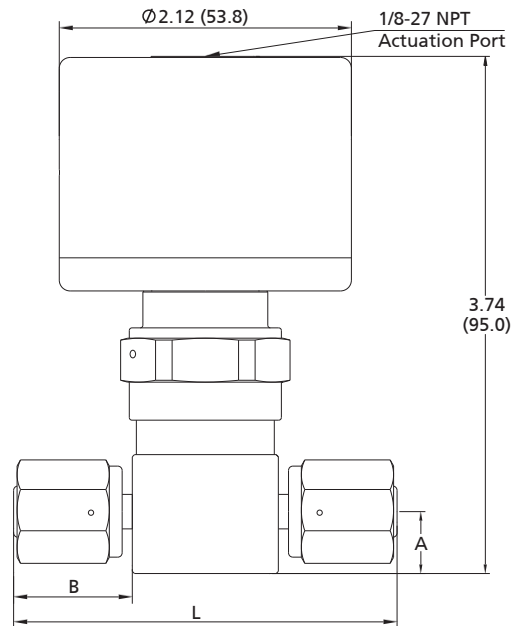
Dimensions

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

Normally Closed



Normally Open



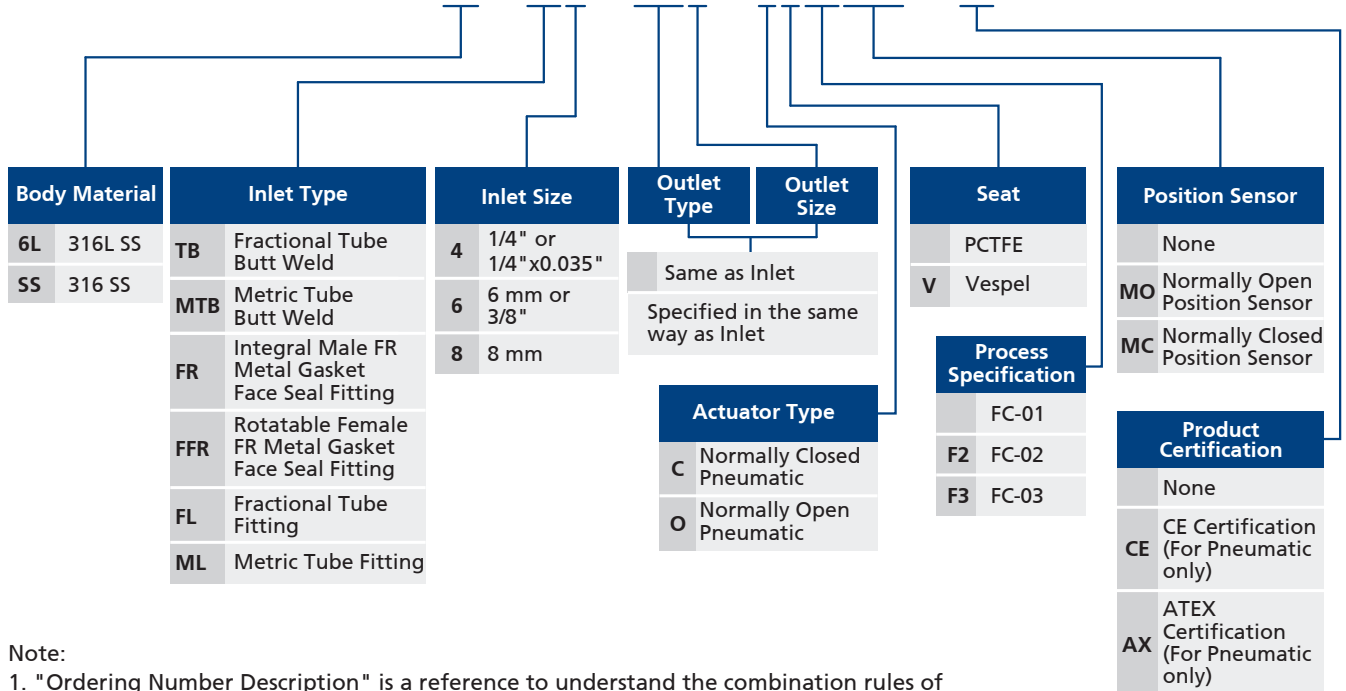
Fittings

| Basic Ordering Number | Connection Type and Size | Dimensions in. (mm) | | |
|-----------------------|---|---------------------|-------------|-------------|
| | | A | B | L |
| SVH□□-TB4- | 1/4"x0.035" Tube Butt Weld | 0.44 (11.2) | 0.25 (6.4) | 1.75 (44.4) |
| SVH□□-FFR4- | 1/4" Rotatable Female FR Metal Gasket Face Seal Fitting | 0.44 (11.2) | 0.85 (21.6) | 2.76 (70.1) |
| SVH□□-FR4- | 1/4" Integral Male FR Metal Gasket Face Seal Fitting | 0.44 (11.2) | 0.62 (15.7) | 2.30 (58.4) |
| SVH□□-FL4- | 1/4" FITOK Tube Fitting | 0.44 (11.2) | 0.70 (17.8) | 2.46 (62.5) |
| SVH□□-FL6- | 3/8" FITOK Tube Fitting | 0.44 (11.2) | 0.76 (19.3) | 2.58 (65.5) |
| SVH□□-ML6- | 6 mm FITOK Tube Fitting | 0.44 (11.2) | 0.70 (17.9) | 2.47 (62.8) |

Valves

Ordering Number Description

SVHSS - FL4 - ML6 - CVF2MO - CE



Pressure Gauges

Integrated Systems and Others

Process Specification

Note:

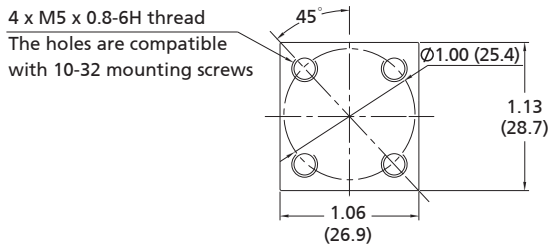
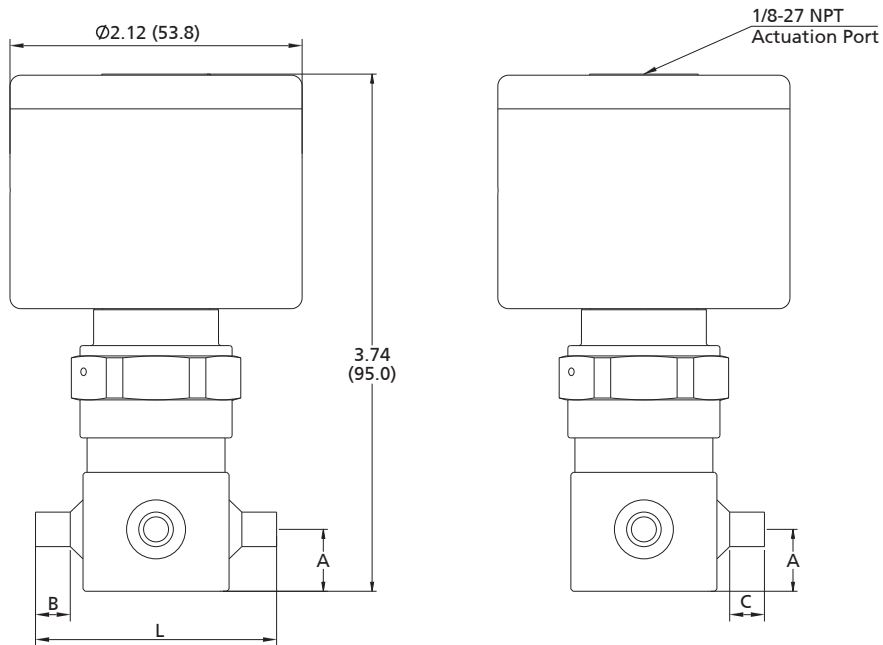
1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. For -CE selections, products have "CE" lettering and, additionally, if the products are fitted with position sensors, the sensors conform to CE.
3. For -AX selections, products conform to Equipment Group II under ATEX certification with "EX" lettering on them and, additionally, if the products are fitted with position sensors, the sensors are explosion-proof, with details described above.

Branch Type

Dimensions

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

Normally Closed



4 x M5 x 0.8-6H thread
The holes are compatible with 10-32 mounting screws

Fittings

Valves

Pressure Gauges

Integrated Systems and Others

Process Specification

V-114 Bellows-Sealed Valves

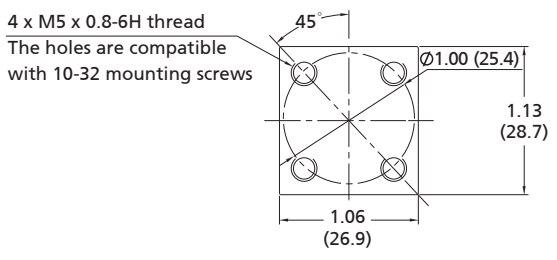
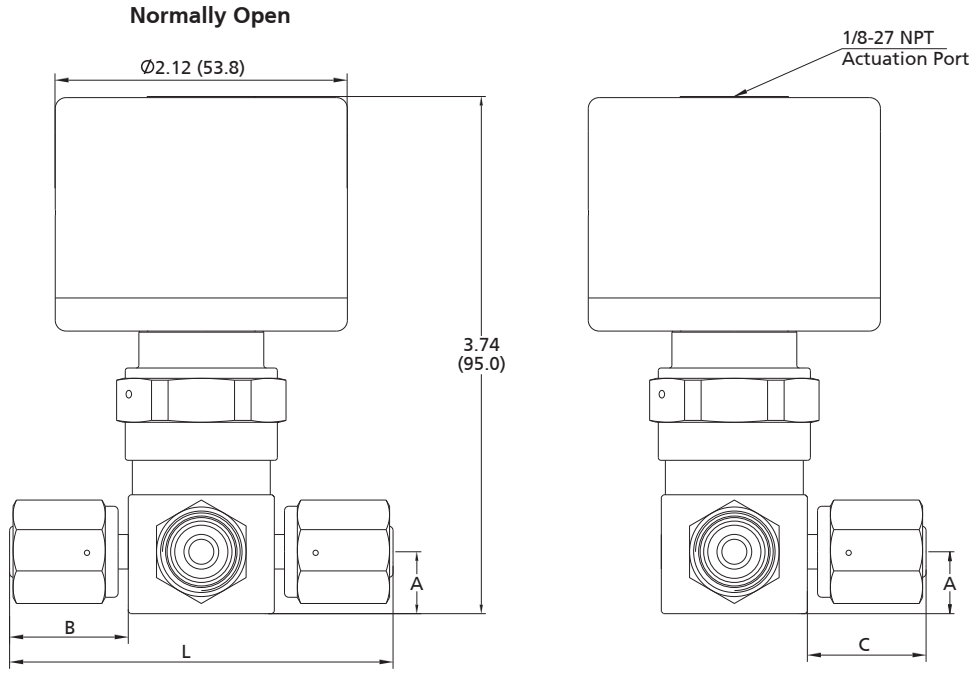
Fittings

Valves

Pressure Gauges

Integrated Systems and Others

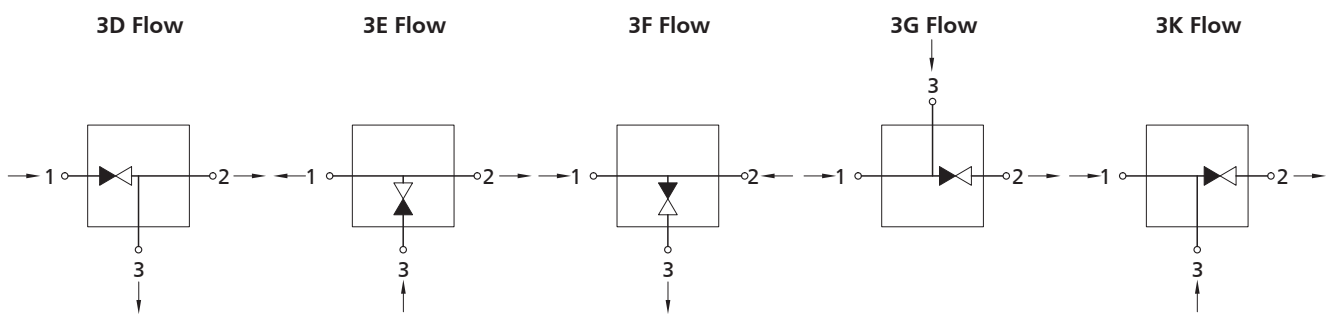
Process Specification



| Basic Ordering Number | Connection Type and Size | Dimensions in. (mm) | | | |
|-----------------------|---|---------------------|-------------|-------------|-------------|
| | | A | B | C | L |
| SVH□□-TB4- | 1/4" x 0.035" Tube Butt Weld | 0.44 (11.2) | 0.25 (6.4) | 0.25 (6.4) | 1.75 (44.4) |
| SVH□□-FFR4- | 1/4" Rotatable Female FR Metal Gasket Face Seal Fitting | 0.44 (11.2) | 0.85 (21.6) | 0.85 (21.6) | 2.76 (70.1) |
| SVH□□-FR4- | 1/4" Integral Male FR Metal Gasket Face Seal Fitting | 0.44 (11.2) | 0.62 (15.7) | 0.62 (15.7) | 2.30 (58.4) |
| SVH□□-FL4- | 1/4" FITOK Tube Fitting | 0.44 (11.2) | 0.70 (17.8) | 0.70 (17.8) | 2.46 (62.5) |
| SVH□□-FL6- | 3/8" FITOK Tube Fitting | 0.44 (11.2) | 0.76 (19.3) | 0.76 (19.3) | 2.58 (65.5) |
| SVH□□-ML6- | 6 mm FITOK Tube Fitting | 0.44 (11.2) | 0.70 (17.8) | 0.70 (17.9) | 2.47 (62.8) |

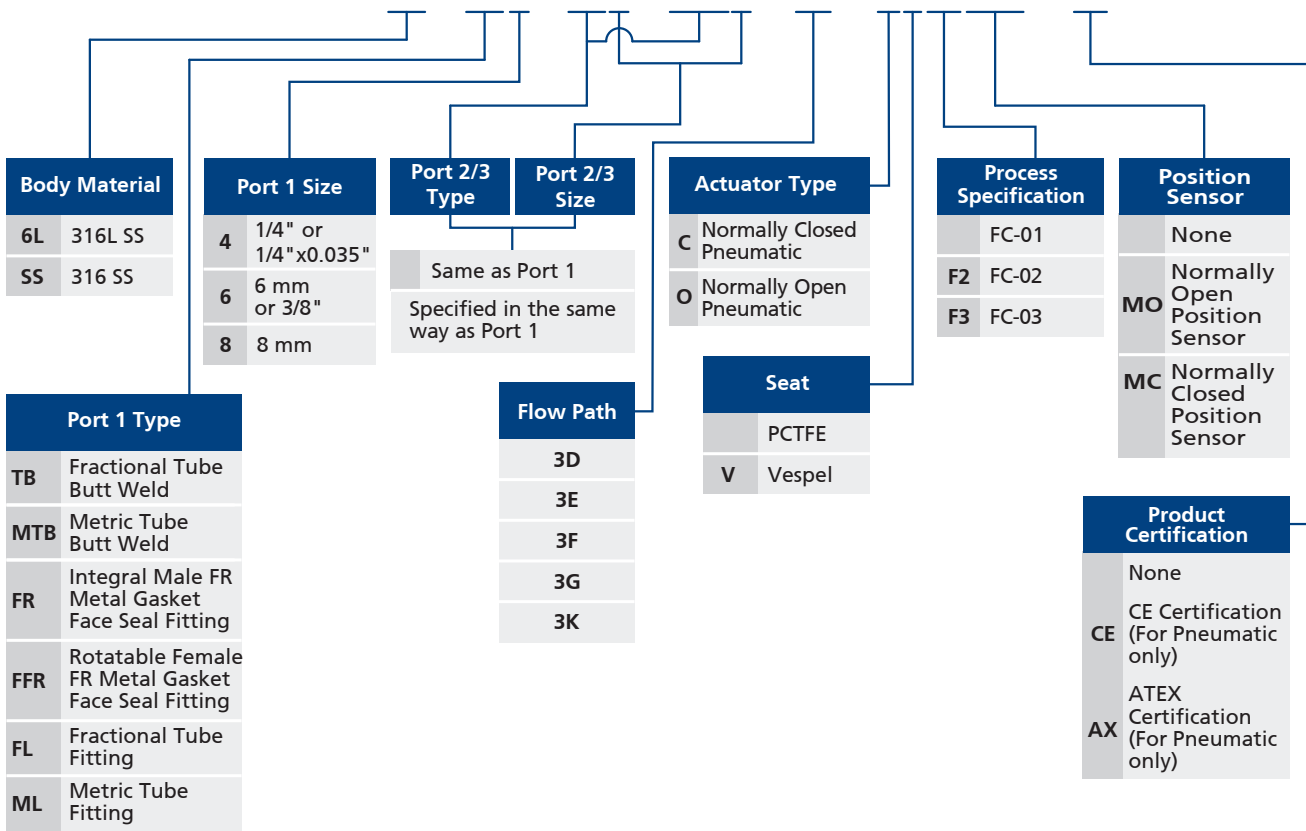
Flow Paths

☉ Flow paths as viewed from the top



Ordering Number Description

SVHSS – TB4 – FR4 – FFR4 – 3G – CVF2MO – CE



Fittings

Valves

Pressure Gauges

Integrated Systems and Others

Process Specification

Note:

- "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
- For -CE selections, products have "CE" lettering and, additionally, if the products are fitted with position sensors, the sensors conform to CE.
- For -AX selections, products conform to Equipment Group II under ATEX certification with "EX" lettering on them and, additionally, if the products are fitted with position sensors, the sensors are explosion-proof, with details described above.