Springless Diaphragm Valves (1.125 in.)

For High Performance

DP Series

- 1.125 in. C-seal and W-seal designs
- Available in two- and three-port configurations
- Compact pneumatic and manual actuators

Swagelok

Features

Seat

Fully contained PFA seat design provides:

- enhanced purity and improved thermal stability
- excellent helium leak test performance
- minimal particle generation
- long cycle life.

Diaphragm

- Elgiloy® material for strength and corrosion resistance
- Optimal design for long cycle life

Body

- 316L VIM-VAR stainless steel body material for ultrahigh-purity applications
- Fully swept flow path:
  - minimizes entrapment area
  - facilitates purging
  - maximizes flow capacity.

Actuators

- Normally closed and normally open pneumatic models
- Three-quarter-turn manual actuator lockable in the CLOSED position

Technical Data

Working Pressure psig (bar)		Temperature Rating °F (°C)		Flow Coefficient (C_v)	Orifice in. (mm)	Internal Volume in.³ (cm³)	Pneumatic Actuator	
Operating	Burst	Operating	Short-Term Bakeout				Actuation Pressure psig (bar)	Air Displacement in.³ (cm³)
Vacuum to 125 (8.6)	4500 (310)	–10 to 302 (–23 to 150)①	392 (200) (valve open)	0.27	0.16 (4.1)	0.078 (1.28) (2-port) 0.105 (1.72) (3-port)	Normally closed 65 to 120 (4.5 to 8.2) Normally open 65 to 80 (4.5 to 5.5)	0.03 (0.49)

① Maximum operating temperature with pneumatic actuator and electronic actuator-position sensor, page 4, is 158°F (70°C).

Process Specifications

See Swagelok® *Ultrahigh-Purity Process Specification (SC-01)*, MS-06-61, for details on process, process controls, and process verification.

Cleaning	Assembly and Packaging	Wetted Surface Roughness (R_a)	Testing
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	Electropolished and finished to an average of 5 µin. (0.13 µm)	Inboard helium leak tested to a rate of 1×10^{-9} std cm³/s at the seat, envelope, and all seals

Performance Specifications

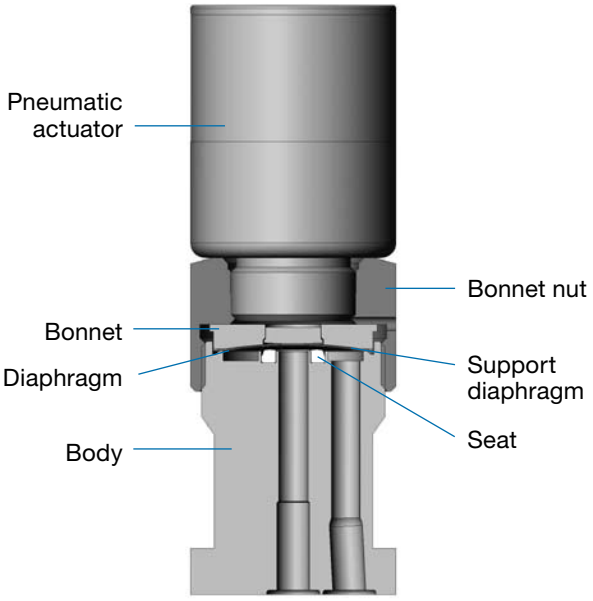
See the *DP Series Springless Diaphragm Valves (1.125 in.) Technical Report,* MS-06-21, for more information on helium leak testing, particle counting, moisture analysis, hydrocarbon analysis, ionic cleanliness, and lab cycle testing data.

Materials of Construction

Component	Grade / Specification
Bonnet nut	316 SS / ASTM A479
Bonnet	S17400
Support diaphragm	Silver-plated Elgiloy / AMS 5876
Diaphragm	*Elgiloy / AMS 5876*
Seat	*Type II, high-purity grade PFA / ASTM D3307*
Body	*316L VIM-VAR SS / SEMI F20-0305 Ultrahigh-Purity*①
Lubricant	PTFE-based
Lockout Handle	
Handle	Powder-coated powdered metal 300 series SS
Handle pin	400 series SS
Button	316 SS
Button spring	S17700 SS
Pneumatic Actuator	
Cylinder, cap	Aluminum
Pistons	Powdered metal 300 series SS—normally open; aluminum—normally open and normally closed
Base	Powdered metal 300 series SS—normally open; none—normally closed
O-rings	Fluorocarbon FKM
Guide rings	PTFE
Springs	S17700 SS

Wetted components listed in *italics*.

① 20 % minimum elongation allowed.



Normally Closed Actuator Shown

Ordering Information and Dimensions

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

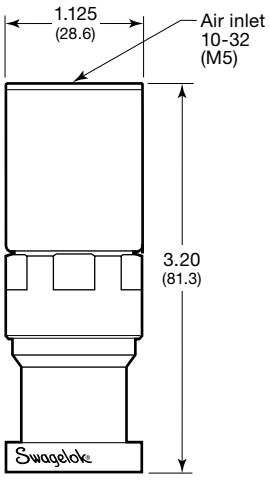
To order a valve with a manual (lockout) handle, select an ordering number.

Seal Design	Ordering Number
2-Port Manual (Lockout)	
C-seal	6LVV-MSM-DPEL-2-P
W-seal	6LVV-MSM-DPEL-W2-P
3-Port Manual (Lockout)	
C-seal	6LVV-MSM-DPEL-3-P
W-seal	6LVV-MSM-DPEL-W3-P

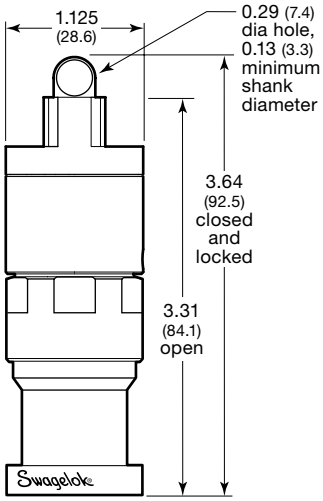
To order a valve with pneumatic actuation, remove the second **L** and add **-C** for a normally closed actuator or **-O** for a normally open actuator.

Example: 6LVV-MSM-DPE-2-P**-C**

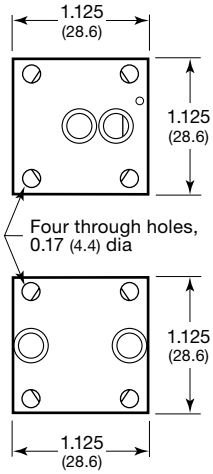
Pneumatic Actuator



Lockout Handle



C-Seal Bottom



W-Seal Bottom

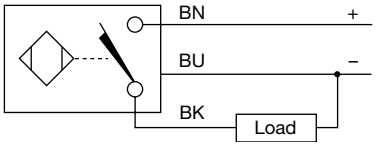
Electronic Actuator-Position Sensors

Electronic actuator-position sensors transmit a signal to an electrical device indicating the open position of pneumatically actuated valves. Sensors and electrical connectors described below are third-party products.

Sensor Technical Information

Output	3-wire V (dc)—transistor (current-sourcing)
Voltage	10 to 30 V (dc) polarity protected—pulsed SCP
Output Function	Normally open (NO)
Operating Temperature	–23 to 70°C (–10 to 158°F)

Wiring Diagram



Factory-Assembled Electronic Actuator-Position Sensors

To order an electronic actuator-position sensor factory assembled to a valve, add **S** to the valve ordering number.

Example: 6LVV-MSM-DPE-2-P-C**S**

Electrical connector is a short pigtail; a mating direct-current M8 3-wire push-on straight female connector is available.

Ordering number: **MS-CSK-BALF-1**

Electronic Actuator-Position Sensor Kits for Field Assembly

Kits for normally closed and normally open actuators are available. Kits for normally open actuators include a nut and star washer.

Actuation Mode	Sensor Electrical Connector	Kit Ordering Number
Normally closed	Short pigtail	MS-PSK-ALD3E-B
	Long cable with flying leads	MS-PSLK-ALD3E-B
Normally open	Short pigtail	MS-PSK-ALD-B
	Long cable with flying leads	MS-PSLK-ALD-B

Kits with short pigtail connector require a mating direct-current 3-wire push-on straight female connector.

Ordering number: **MS-CSK-BALF-1**

Diaphragm Replacement Kits

Kits include two diaphragms and replacement instructions.

Kit ordering number: **E-3DK-DPE**

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.

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

Warranty Information

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

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