

# Springless Diaphragm Valves (1.125 in.) For Modular Gas Systems



## DE Series

- 1.125 in. C-seal and W-seal designs
- Available in two- and three-port configurations
- Compact pneumatic and manual actuators
- Fixed orientation of actuator to body for consistency of installation
- Corner chamfers on outlet side of body for visual indication of flow direction

## Features

Swagelok® DE series springless diaphragm valves are available with a variety of actuation options for ease of integration into your 1.125 in. C-seal or W-seal modular gas system.



### Pneumatic Actuator

- Normally closed and normally open models.
- Formed aluminum housing (threadless design) for maximized efficiency.
- Permanently attached to body assembly providing maintenance-free operation.
- Fixed orientation of actuator to body for ease of installation—Swagelok logo is always on outlet port side of valve.
- Visual indication of valve state and pneumatic actuation with manual integral lockout override hybrid options are also available.

### Manual Lockout Actuator

- One-quarter turn window handle for quick actuation.
- Standard integral lockout provides positive visual and mechanical lockout in the closed position.
- Handle shape and window provide open/closed indication.
- Handle orientation to body is fixed for ease of installation.
- Manual actuator with integral lockout positioned perpendicular to the handle is also available.

### Seat

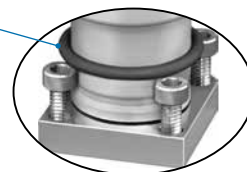
Fully contained PFA seat design provides:

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

### Diaphragm

- Cobalt-based superalloy (UNS R30003) material for strength and corrosion resistance
- Optimal design for cycle life and flow
- High integrity seal
- Weld isolation ring for enhanced diaphragm cycle life (patent pending).

Blue bolt retention ring for W-seal valves rolls down the cylinder to keep bolts in place during assembly / reassembly.



### Body

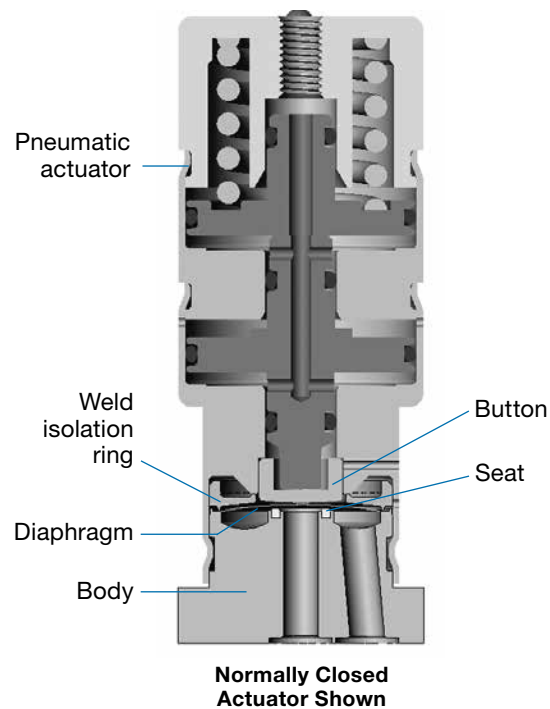
- 316L VIM-VAR stainless steel body material for ultrahigh-purity applications
- Fully swept flow path:
  - minimizes entrapment area
  - facilitates purging
  - maximizes flow capacity.
- Corner chamfers on outlet port side of body
  - provide visual indication of flow direction (top view)
  - match actuator orientation for ease of installation—Swagelok logo is always on outlet port side of valve.

## Materials of Construction

Component	Grade / Specification
Button	Aluminum
Weld isolation ring	S17400 SS
<i>Diaphragm</i>	<i>Cobalt-based superalloy (UNS R30003) / AMS 5876</i>
<i>Seat</i>	<i>Type II, high-purity grade PFA / ASTM D3307</i>
<i>Body</i>	<i>316L VIM-VAR SS / SEMI F20 Ultrahigh-Purity<sup>①</sup></i>
Bolt retention ring (W-seal valves only)	EPDM, blue
Lubricant	PTFE-based
Manual Lockout Actuator	
Handle	Nylon
Cylinder	Aluminum
Handle stem	Aluminum
Handle pin	300 series SS
Cap screw	300 series SS
Lock lever	300 series SS
O-rings	Buna N
Pneumatic Actuator	
Cylinder, cap	Aluminum
Pistons	Aluminum
O-rings	Buna N
Springs	S17700 SS
Indicator ball	Buna N

Wetted components listed in *italics*. Actuator component materials shown for standard manual and pneumatic actuators; contact your authorized Swagelok sales and service representative for optional actuator additional materials.

① 20 % minimum elongation allowed.



## Technical Data

Working Pressure psig (bar)		Temperature Rating °F (°C)	Flow Coefficient ( $C_v$ ) <sup>①</sup>	Orifice in. (mm)	Internal Volume in. <sup>3</sup> (cm <sup>3</sup> )	Pneumatic Actuator	
Operating	Burst					Actuation Pressure psig (bar)	Air Displacement in. <sup>3</sup> (cm <sup>3</sup> )
Vacuum to 125 (8.6)	>3200 (220)	14 to 150 (-10 to 65)	0.3	0.16 (4.1)	0.052 (0.85) (2-port) 0.062 (1.02) (3-port)	Normally closed 60 to 120 (4.1 to 8.2) Normally open and normally closed with manual integral lockout override 60 to 90 (4.1 to 6.2)	0.20 (3.28)

①  $C_v$  value excludes substrate.

## Process Specifications

See Swagelok *Ultrahigh-Purity Process Specification (SC-01)* catalog, MS-06-61, and Swagelok *Special Cleaning and Packaging (SC-11)* catalog, MS-06-63, for details on processes, process controls, and process verification.

Cleaning	Assembly and Packaging	Process Designator	Process Specification	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.	P	<i>Ultrahigh-Purity Process Specification (SC-01)</i>	Electropolished and finished to an average of 5 $\mu\text{in.}$ (0.13 $\mu\text{m}$ )	Inboard helium leak tested to a rate of $1 \times 10^{-9}$ std $\text{cm}^3/\text{s}$ at the seat, envelope, and all seals.
Special cleaning with non-ozone-depleting chemicals	Performed in specially cleaned areas; valves are individually bagged.	P1	<i>Special Cleaning and Packaging (SC-11)</i>		

### Performance Specifications

Refer to *DE Series Springless Diaphragm Valves (1.125 in.) Technical Report, MS-06-113*, for additional information on surface finish, helium leak testing, particle counting, moisture analysis, hydrocarbon analysis, ionic cleanliness, lab cycle testing, and hydrostatic burst pressure testing data.

### Ordering Information and Dimensions

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

To order a valve with a manual actuator and a **P** process designator, select an ordering number.

Seal Design	Ordering Number
<b>2-Port Manual</b>	
C-seal	6LVV-MSM-DE3-2-P
W-seal	6LVV-MSM-DE3-W2-P
<b>3-Port Manual</b>	
C-seal	6LVV-MSM-DE3-3-P
W-seal	6LVV-MSM-DE3-W3-P

To order a valve with a **P1** process designator, replace **P** with **P1**.

Example: 6LVV-MSM-DE3-2-**P1**

To order a manual valve with integral lockout perpendicular to the handle, add **-M4** to the valve ordering number.

Example: 6LVV-MSM-DE3-2-**P-M4**

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

Example: 6LVV-MSM-DE3-2-**P-C**

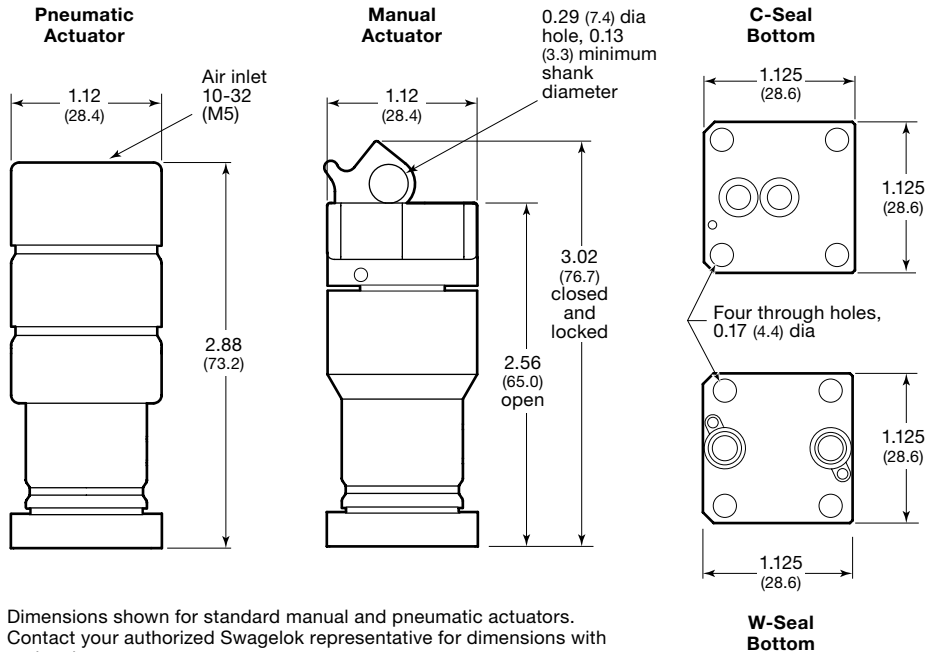
To order a pneumatically actuated valve with visual indication add **-PI** to the ordering number.

Example: 6LVV-MSM-DE3-2-**P-C-PI**

To order a normally closed pneumatic valve with manual integral lockout override, *remove -C* and *add -HYB-PI* to the ordering number.

Example:

6LVV-MSM-DE3-2-**P-HYB-PI**



Dimensions shown for standard manual and pneumatic actuators. Contact your authorized Swagelok representative for dimensions with optional actuators.

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

## Introduction

Since 1947, Swagelok has designed, developed, and manufactured high-quality, general-purpose and specialty fluid system products to meet the evolving needs of global industries. Our focus is on understanding our customers' needs, finding timely solutions, and adding value with our products and services.

We are pleased to provide this global edition of the book-bound *Swagelok Product Catalog*, which compiles more than 100 separate product catalogs, technical bulletins, and reference documents into one convenient, easy-to-use volume. Each product catalog is up to date at the time of printing, with its revision number shown on the last page the individual catalog; for example, the Swagelok *Gaugeable Tube Fittings and Tube Adapters* catalog is MS-01-140, RevW. Subsequent revisions will supersede the printed version and will be posted on the Swagelok website and in the Swagelok electronic Desktop Technical Reference (eDTR) tool.

For more information, visit your Swagelok website or contact your authorized Swagelok sales and service representative.

### 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](http://swagelok.com) or contact your authorized Swagelok representative.

Swagelok, Ferrule-Pak, Goop, Hinging-Collecting, IGC, Kenmac, Micro-Fit, Nupro, Snoop, Sno-Trik, SWAK, VCO, VCR, Ultra-Torr, Whitey—TM Swagelok Company  
15-7 PH—TM AK Steel Corp.  
AccuTrak, Beacon, Westlock—TM Tyco International Services  
Aflas—TM Asahi Glass Co., Ltd.  
ASCO, El-O-Matic—TM Emerson  
AutoCAD—TM Autodesk, Inc.  
CSA—TM Canadian Standards Association  
Crastin, DuPont, Kalrez, Krytox, Teflon, Viton—TM E.I. duPont  
Nemours and Company  
DeviceNet—TM ODVA  
Dyneon, Elgiloy, TFM—TM Dyneon  
Elgiloy—TM Elgiloy Specialty Metals  
FM—TM FM Global  
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Honeywell, MICRO SWITCH—TM Honeywell  
MAC—TM MAC Valves  
Microsoft, Windows—TM Microsoft Corp.  
NACE—TM NACE International  
PH 15-7 Mo, 17-7 PH—TM AK Steel Corp  
picofast—Hans Turck KG  
Pillar—TM Nippon Pillar Packing Company, Ltd.  
Raychem—TM Tyco Electronics Corp.  
Sandvik, SAF 2507—TM Sandvik AB  
Simriz—TM Freudenberg-NOK  
SolidWorks—TM SolidWorks Corporation  
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