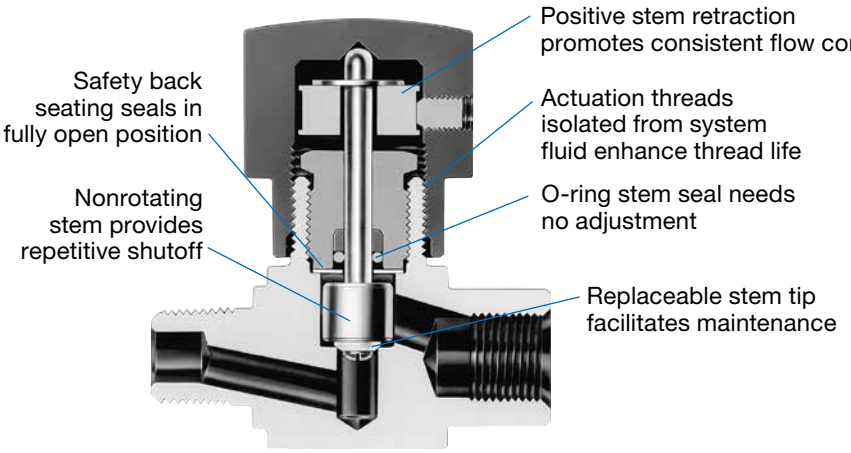
Nonrotating-Stem Needle Valves

D Series

- Pressures up to 3000 psig (206 bar)
- Temperatures up to 450°F (232°C) with PEEK stem tip
- Stainless steel, brass, and alloy 400 materials

Features

- Compact, rugged design is available in straight and angle flow patterns.
- Protective handle prevents contaminants from entering functional valve parts.
- Orifice sizes from 0.093 to 0.218 in. (2.4 to 5.6 mm) are available.
- Flow coefficients (C_v) from 0.12 to 0.53 are available.
- Female NPT, male NPT, Swagelok® tube fitting, and mixed end connections are available.



Materials of Construction

Component	Valve Body Materials		
	316 SS	Brass	Alloy 400
	Material Grade/ASTM Specification		
1 Handle	Anodized aluminum/B221		
Set screw	Nickel cadmium-plated steel		
2 Retaining ring	Zinc-plated steel		
3 Spool	Aluminum/B209, B211		
4 *Packing bolt*	*Molybdenum disulfide-coated 316 SS/A276*	*Molybdenum disulfide-coated brass 360/B16*	*Molybdenum disulfide-coated alloy 400/B164*
5 Backup ring	PTFE/D1710		
6 *O-ring*	*Fluorocarbon FKM*		
7 *Washer*	*Fluorocarbon-coated 316 SS/A167*	*Aluminum 5052/B209*	*Fluorocarbon-coated alloy 400/B127*
8 *Stem*	*316 SS/A276*		*Alloy 400/B164*
Stem tip	*PCTFE/D1430*		
Machine screw	*316 SS/A276*		*Alloy 400/B164*
9 *Body*	*316 SS/A182*	*Brass 377/B283*	*Alloy 400/B564*
Lubricants	*Molybdenum disulfide in hydrocarbon carrier; O-ring—silicone-based; machine screw—hydrocarbon thread lock*		

Wetted components listed in *italics*.

⚠ **To increase service life, ensure proper valve performance, and prevent leakage, apply only as much torque as is required to achieve positive shutoff.**

Pressure-Temperature Ratings

Ratings are limited to:

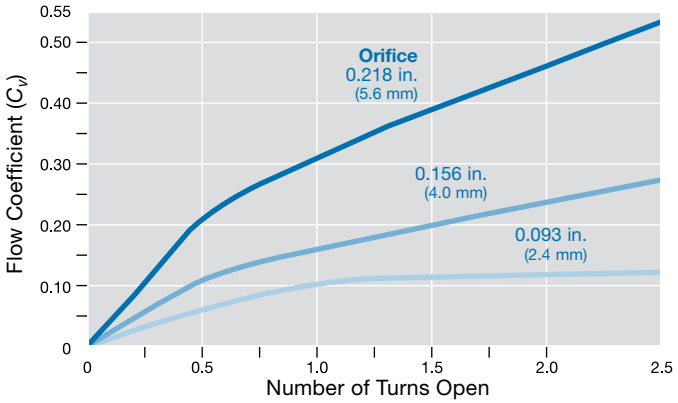
- 250°F (121°C) max with Buna N, silicone, and ethylene propylene O-rings.
- –65 to 250°F (–53 to 121°C) with Buna C O-rings.
- 30 to 100°F (–1 to 37°C) with Kalrez® O-rings to 3000 psi, 30 to 150°F (–1 to 65°C) with Kalrez® O-rings to 1000 psi.

ASME Class	1250		N/A		1500	
Material Group	2.2		N/A		3.4	
Material Name	316 SS		Brass		Alloy 400	
Stem Tip Material	PCTFE	PEEK	PCTFE	PEEK	PCTFE	PEEK
Temperature, °F (°C)	Working Pressure, psig (bar)					
–20 (–28) to 100 (37)	3000 (206)	3000 (206)	3000 (206)	3000 (206)	3000 (206)	3000 (206)
150 (65)	2790 (192)	2790 (192)	2675 (184)	2675 (184)	2820 (194)	2820 (194)
200 (93)	2580 (177)	2580 (177)	2350 (161)	2350 (161)	2640 (181)	2640 (181)
250 (121)	—	2455 (169)	—	2200 (151)	—	2555 (176)
300 (148)	—	2330 (160)	—	2050 (141)	—	2470 (170)
350 (176)	—	2235 (153)	—	1220 (84.0)	—	2430 (167)
400 (204)	—	2140 (147)	—	390 (26.8)	—	2390 (164)
450 (232)	—	2065 (142)	—	—	—	2380 (163)

For more information about pressure ratings of valves with tube fitting end connections, refer to *Tubing Data* catalog, MS-01-107.

Flow Data at 100°F (37°C)

Flow Coefficient at Turns Open



Testing

Every Swagelok nonrotating-stem needle valve is factory tested with nitrogen at 1000 psig (69 bar). Seats have a maximum allowable leak rate of 0.1 std cm^3/min. Shell testing is performed to a requirement of no detectable leakage with a liquid leak detector.

Cleaning and Packaging

Every Swagelok nonrotating-stem needle valve is cleaned and packaged in accordance with Swagelok *Standard Cleaning and Packaging (SC-10)* catalog, MS-06-62.

Ordering Information and Dimensions

Stainless Steel Valve

Select an ordering number.

Alloy 400 or Brass Valves

Replace **SS** with **M** for alloy 400 or **B** for brass.

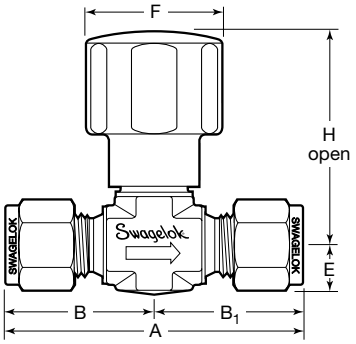
Example: **M**-ODKS2

PEEK Stem Tip

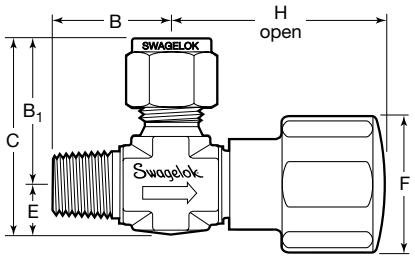
Replace **K** with **P.**

Example: SS-OD**P**S2

Straight Pattern



Angle Pattern



Angle-Pattern Valves

Select a valve with a C dimension listed and add **-A** to the ordering number.

Example: SS-ODKS2**-A**

End Connections		C_v	Orifice in. (mm)	Ordering Number	Dimensions, in. (mm)						
Inlet/Outlet	Size				A	B	B_1	C	E	F	H
Swagelok tube fittings	1/8 in.	0.12	0.093 (2.4)	SS-ODKS2	2.20 (55.9)	1.10 (27.9)		1.41 (35.8)	0.31 (7.9)	1.12 (28.4)	1.86 (47.2)
	1/4 in.	0.27	0.156 (4.0)	SS-14DKS4	2.27 (57.6)	1.13 (28.7)		1.51 (38.4)	0.38 (9.7)		
	3/8 in.	0.53	0.218 (5.6)	SS-16DKS6	2.58 (65.5)	1.29 (32.8)		1.79 (45.5)	0.50 (12.7)	1.25 (31.8)	2.02 (51.3)
	6 mm	0.27	0.156 (4.0)	SS-14DKS6MM	2.27 (57.6)	1.13 (28.7)		1.51 (38.4)	0.38 (9.7)	1.12 (28.4)	1.86 (47.2)
Female NPT	1/4 in.	0.53	0.218 (5.6)	SS-16DKF4	2.12 (53.8)	1.06 (26.9)		—	0.50 (12.7)	1.25 (31.8)	2.02 (51.3)
Male NPT	1/4 in.	0.27	0.156 (4.0)	SS-14DKM4	1.97 (50.0)	0.98 (24.9)		1.36 (34.5)	0.38 (9.7)	1.12 (28.4)	1.86 (47.2)
	1/4 in.	0.53	0.218 (5.6)	SS-16DKM4	2.25 (57.2)	1.12 (28.4)		—	0.50 (12.7)	1.25 (31.8)	2.02 (51.3)
	3/8 in.			SS-16DKM6					0.56 (14.2)		
Male NPT/ Swagelok tube fitting	1/8 to 1/4 in.	0.12	0.093 (2.4)	SS-ODKM2-S4	1.85 (47.0)	0.75 (19.0)	1.10 (27.9)	1.42 (36.1)	0.31 (7.9)	1.12 (28.4)	1.86 (47.2)
	1/4 in.	0.27	0.156 (4.0)	SS-14DKM4-S4	2.12 (53.8)	0.98 (24.9)	1.13 (28.7)	1.51 (38.4)	0.38 (9.7)	1.12 (28.4)	1.86 (47.2)
	1/4 to 3/8 in.	0.53	0.218 (5.6)	SS-16DKM4-S6	2.38 (60.5)	1.12 (28.4)	1.26 (32.0)	1.79 (45.5)	0.50 (12.7)	1.25 (31.8)	2.02 (51.3)
	1/4 in. to 6 mm	0.27	0.156 (4.0)	SS-14DKM4-S6MM	2.12 (53.8)	0.98 (24.9)	1.13 (28.7)	1.51 (38.4)	0.38 (9.7)	1.12 (28.4)	1.86 (47.2)
Male/female NPT	1/8 in.	0.12	0.093 (2.4)	SS-ODKM2-F2	1.69 (42.9)	0.75 (19.0)	0.94 (23.9)	1.25 (31.8)	0.31 (7.9)	1.12 (28.4)	1.86 (47.2)
	1/4 in.	0.53	0.218 (5.6)	SS-16DKM4-F4	2.19 (55.6)	1.12 (28.4)	1.06 (26.9)	1.56 (39.6)	0.50 (12.7)	1.25 (31.8)	2.02 (51.3)
	1/2 to 1/4 in.			SS-16DKM8-F4	2.50 (63.5)	1.25 (31.8)		1.81 (46.0)	0.56 (14.2)		

Dimensions are for reference only and are subject to change. Dimensions shown with Swagelok nuts finger-tight.

Options and Accessories

Optional O-Ring Materials

Fluorocarbon FKM O-rings are standard. For an optional O-ring material, add an O-ring designator to the valve ordering number.

Example: SS-ODKS2-**BC**

O-Ring Kits

O-ring kits contain O-ring, backup ring, washer, retaining ring, lubricant, and instructions. To order, add a kit designator to a kit basic ordering number.

Example: **BC70-9K-OD**

O-ring Material	O-ring Designator	Kit Designator	Kit Basic Ordering Number
Buna C	-BC	BC70	-9K-OD (OD, 14D series) -9K-16D (16D series)
Buna N	-B	BN70	
Ethylene propylene	-E	EP70	
Fluorocarbon FKM	—	VA70	
Kalrez®	-KZ	KZ70	
Silicone	-SI	SI70	

Stem Tip Kits

Kits contain stem tip, machine screw, and instructions.

To order, select a kit basic ordering number and add **SS** for a 316 SS or brass valve, or **M** for an alloy 400 valve.

Examples: **SS**-3BK-14DK
M-3BK-14DP

Valve Series	Kit Basic Ordering Number	
	PCTFE Tip	PEEK Tip
OD, 14D	-3BK-14DK	-3BK-14DP
16D	-3BK-16DK	-3BK-16DP

Seal Maintenance Kits

Kits contain stem tip, machine screw, retaining ring, washer, fluorocarbon FKM O-ring, backup ring, lubricants, and instructions.

To order, select a kit basic ordering number and add **SS** for a 316 SS or brass valve, or **M** for an alloy 400 valve.

Examples: **SS**-91K-14DK
M-91K-14DP

Valve Series	Kit Basic Ordering Number	
	PCTFE Tip	PEEK Tip
OD, 14D	-91K-14DK	-91K-14DP
16D	-91K-16DK	-91K-16DP

⚠ WARNING
Do not mix/interchange Swagelok products or components not governed by industrial design standards, including Swagelok tube fitting end connections, with those of other manufacturers.

Handles

Black aluminum knob handles are standard. For handles of other colors, add a handle color designator to the valve ordering number.

Example: SS-ODKS2-**BL**

Handle Color	Designator
Blue	-BL
Green	-GR
Orange	-OG
Red	-RD
Yellow	-YW

Handle Kits

Select a handle kit ordering number. For kits with handles of colors other than black, replace **-BK** with a handle color designator.

Example: A-5K-14D-**BL**

Valve Series	Kit Ordering Number
OD, 14D	A-5K-14D-BK
16D	A-5K-16D-BK

Sour Gas Service

Nonrotating-stem 316 SS needle valves with NPT end connections are available for sour gas service. Packing bolt, washer, stem, and stem tip screw are alloy 400. Materials are selected in accordance with NACE MR0175/ISO 15156. See the NACE specification for information on stainless steel tube fitting requirements.

To order, add **-SG** to the ordering number.

Example: SS-16DKF4-**SG**

Valves with Rupture Discs or Outage Tubes

⚠ Be sure to use the correct pressure relief device for the gas being used.

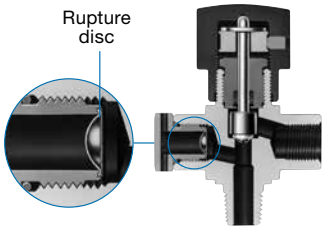
16D Series

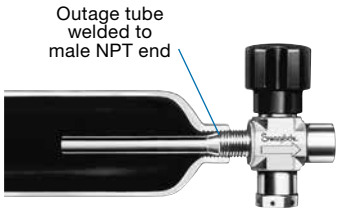
Certain 16D series valves can be configured as valves with rupture discs.

14D and 16D Series

Certain 14D and 16D series valves can be configured as valves with outage tubes.

For more information about valves with rupture discs or outage tubes, refer to *Sample Cylinders, Accessories, and Outage Tubes* catalog, MS-01-177.





Swagelok

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 of the individual catalog. 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.

Warranty Information

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

⚠ WARNING
Do not mix/interchange Swagelok products or components not governed by industrial design standards, including Swagelok tube fitting end connections, with those of other manufacturers.