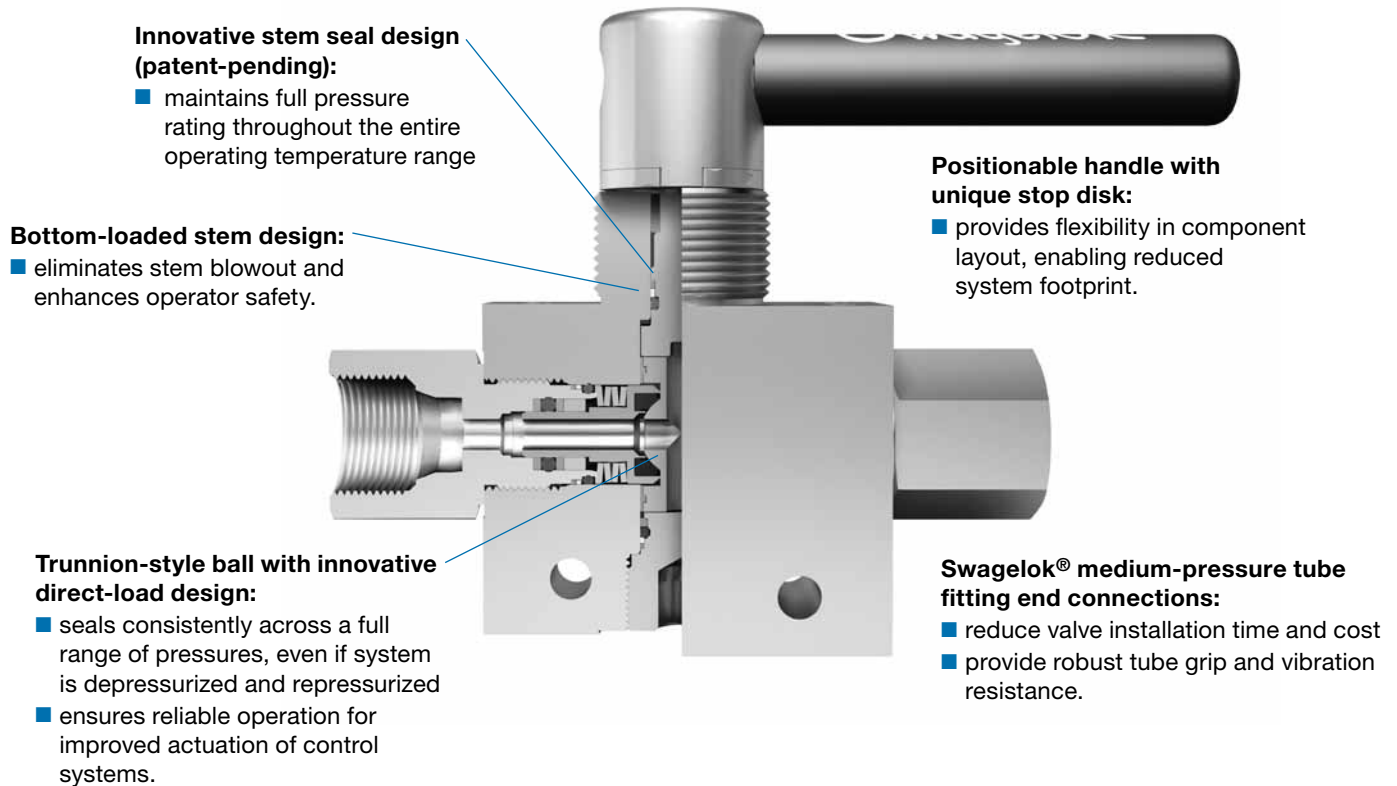


Medium-Pressure Ball Valves

FKB Series



Swagelok FKB series trunnion-style ball valves offer low-torque, quarter-turn operation in a compact design providing positive shutoff in applications up to 15 000 psig (1034 bar). Other features include:

- Flow coefficients (C_v) from 0.44 to 11.3
- Gaugeable Swagelok medium-pressure tube fitting and female NPT end connections
- 2-way (on-off) and 3-way (switching) flow patterns
- Nitrogen seat tested and shell tested to ensure product integrity
- Positionable bar handle and ISO 5211-compliant pneumatic actuators
- Manual valve panel and shoulder mounting are available as options.

Important Information About Swagelok Ball Valves

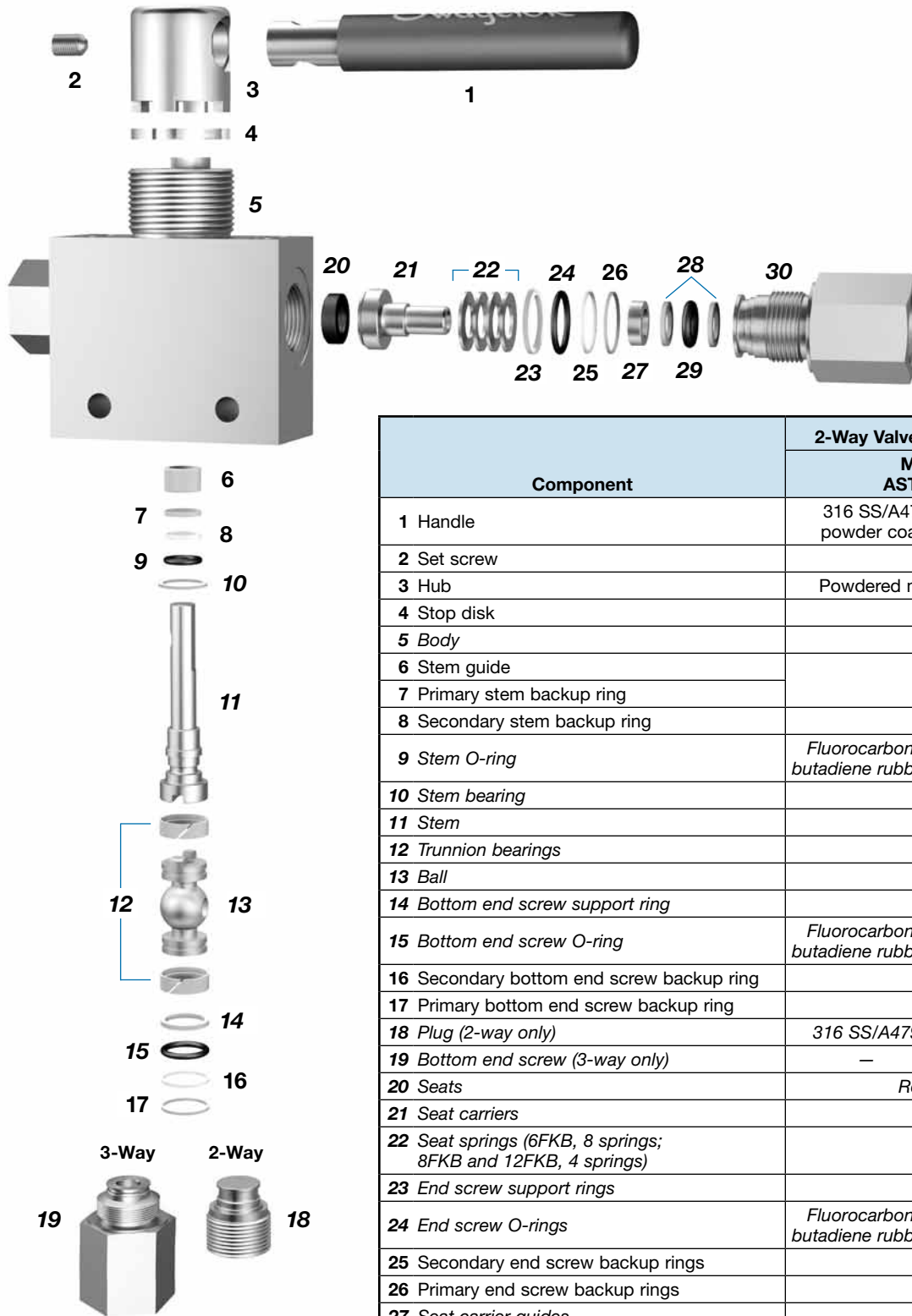
- ⚠ Swagelok ball valves are designed to be used in a fully open or fully closed position.
- ⚠ Valves that have not been cycled for a period of time may have a higher initial actuation torque.

Pressure-Temperature Ratings

Temperature °F (°C)	O-Ring Material		
	Fluorocarbon FKM	HNBR	Per- fluorocarbon FFKM
	Working Pressure, psig (bar)		
0 (-17) to 250 (121)	15 000 (1034)	15 000 (1034)	—
20 (-6) to 185 (85)	—	—	15 000 (1034)

For more information about pressure ratings of valves with medium-pressure tube fitting end connections, see the Swagelok *Medium-Pressure Gaugeable Tube Fittings and Adapter Fittings* catalog, MS-02-335.

Materials of Construction



Component	2-Way Valve	3-Way Valve
	Material Grade/ ASTM Specification	
1 Handle	316 SS/A479 with blue electrostatic powder coating and white epoxy ink	
2 Set screw	316 SS/A276	
3 Hub	Powdered metal 300 series SS/B783	
4 Stop disk	316 SS/A276	
5 Body	316 SS/A479	
6 Stem guide	PEEK	
7 Primary stem backup ring	PTFE	
8 Secondary stem backup ring	PTFE	
9 Stem O-ring	<i>Fluorocarbon FKM, hydrogenated nitrile butadiene rubber, or perfluorocarbon FFKM</i>	
10 Stem bearing	PEEK	
11 Stem	316 SS/A479	
12 Trunnion bearings	PEEK	
13 Ball	316 SS/A276	
14 Bottom end screw support ring	PEEK	
15 Bottom end screw O-ring	<i>Fluorocarbon FKM, hydrogenated nitrile butadiene rubber, or perfluorocarbon FFKM</i>	
16 Secondary bottom end screw backup ring	PTFE	
17 Primary bottom end screw backup ring	PEEK	
18 Plug (2-way only)	316 SS/A479	—
19 Bottom end screw (3-way only)	—	316 SS/A479
20 Seats	Reinforced PEEK	
21 Seat carriers	316 SS/A276	
22 Seat springs (6FKB, 8 springs; 8FKB and 12FKB, 4 springs)	17-7PH/A673	
23 End screw support rings	PEEK	
24 End screw O-rings	<i>Fluorocarbon FKM, hydrogenated nitrile butadiene rubber, or perfluorocarbon FFKM</i>	
25 Secondary end screw backup rings	PTFE	
26 Primary end screw backup rings	PEEK	
27 Seat carrier guides	316 SS	
28 Seat carrier backup rings	PEEK	
29 Seat carrier O-rings	<i>Fluorocarbon FKM, hydrogenated nitrile butadiene rubber, or perfluorocarbon FFKM</i>	
30 End screws	316 SS/A479	
Wetted lubricants	<i>Silicone-based, tungsten disulfide and fluorinated-based</i>	
Nonwetted lubricants	Hydrocarbon-based	

Wetted components listed in *italics*.

Testing

Every Swagelok medium-pressure ball valve is factory tested with nitrogen at 1000 psig (68.9 bar). Seats have a maximum allowable leak rate of 0.1 std cm³/min. Shell testing is performed to a requirement of no detectable leakage with a liquid leak detector.

Cleaning and Packaging

All Swagelok medium-pressure ball valves are cleaned and packaged in accordance with Swagelok *Standard Cleaning and Packaging (SC-10)*, MS-06-62.

Ordering Information and Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change. Dimensions shown with Swagelok medium-pressure tube fitting nuts finger-tight.

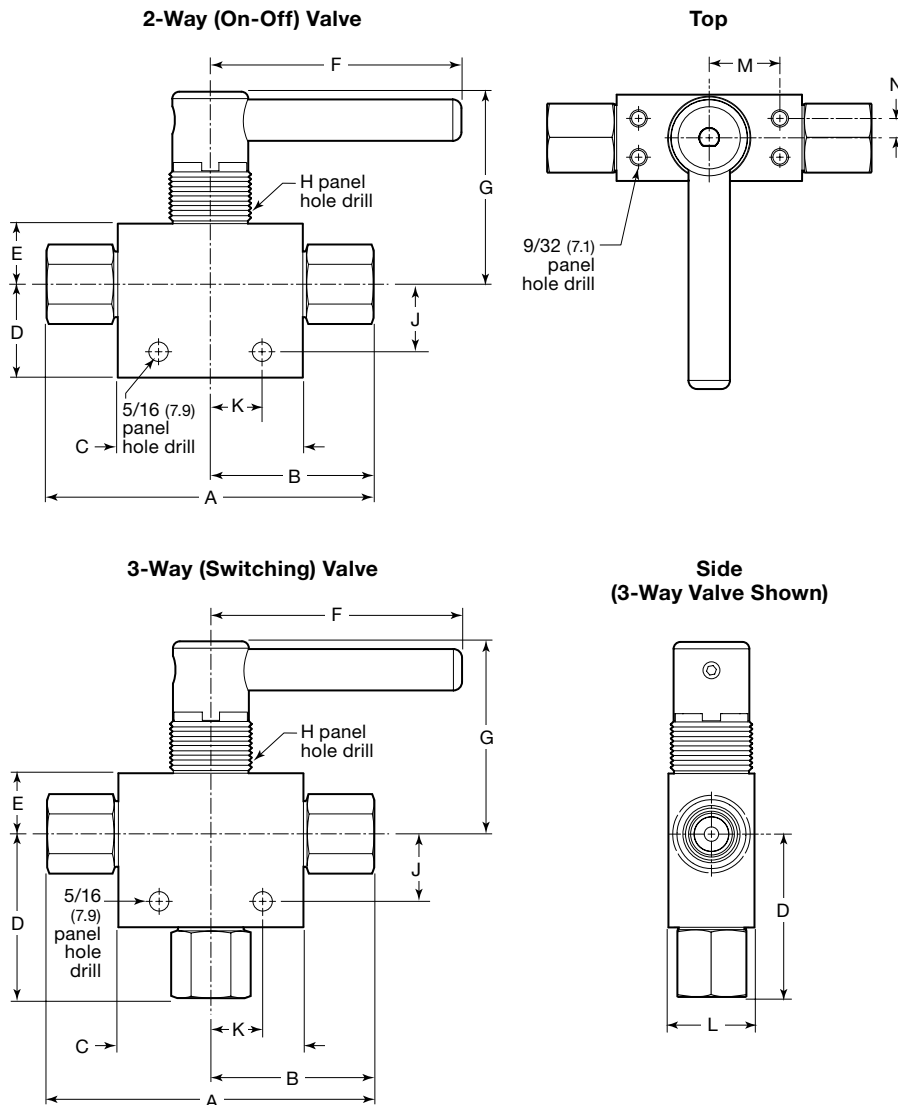
Select an ordering number from the table, next page.

Valve ordering numbers specify fluorocarbon FKM O-rings. To order valves with optional O-ring materials, add **-H** for HNBR (hydrogenated nitrile butadiene rubber) or **-C** for perfluorocarbon FFKM to the valve ordering number.

Example: SS-6FKBFK4-**H**

Valve ordering numbers specify the standard positionable handle. To order valves with locking handles, add **-LH** to the valve ordering number.

Example: SS-6FKBFK4-H-**LH**



Ordering Information and Dimensions

End Connections		Flow Coefficient (C _v)	Valve Ordering Number	Dimensions, in. (mm)													
Type	Size			A	B	C	D	E	F	G	H	J	K	L	M	N	
6FKB Series On-Off (2-Way) Valves, 0.209 in. (5.31 mm) Orifice																	
Swagelok medium-pressure tube fitting	1/4 in.	0.5	SS-6FKBFK4	5.03 (128)	2.52 (64.0)	2.68 (68.1)	1.35 (34.3)	0.88 (22.4)	3.65 (92.7)	2.79 (70.9)	1.25 (31.8)	0.98 (24.9)	0.75 (19.0)	1.25 (31.8)	1.02 (26.0)	0.28 (7.1)	
	3/8 in.	1.5	SS-6FKBFK6	5.87 (149)	2.94 (74.7)												
	1/2 in.	1.4	SS-6FKBFK8	5.87 (149)	2.94 (74.7)												
Female NPT	1/4 in.	1.3	SS-6FKBF4	4.22 (107)	2.11 (53.6)	2.68 (68.1)	1.35 (34.3)	0.88 (22.4)	3.65 (92.7)	2.79 (70.9)	1.25 (31.8)	0.98 (24.9)	0.75 (19.0)	1.25 (31.8)	1.02 (26.0)	0.28 (7.1)	
	3/8 in.	1.1	SS-6FKBF6	4.34 (110)	2.17 (55.1)												
	1/2 in.	1.0	SS-6FKBF8	4.78 (121)	2.39 (60.7)												
6FKB Series Switching (3-Way) Valves, 0.209 in. (5.31 mm) Orifice																	
Swagelok medium-pressure tube fitting	1/4 in.	0.44	SS-6FKBFXK4	5.03 (128)	2.52 (64.0)	2.68 (68.1)	1.35 (34.3)	0.88 (22.4)	3.65 (92.7)	2.79 (70.9)	1.25 (31.8)	0.98 (24.9)	0.75 (19.0)	1.25 (31.8)	1.02 (26.0)	0.28 (7.1)	
	3/8 in.	0.98	SS-6FKBFXK6	5.87 (149)	2.94 (74.7)												2.05 (52.1)
	1/2 in.	0.83	SS-6FKBFXK8	5.87 (149)	2.94 (74.7)												2.37 (60.2)
Female NPT	1/4 in.	0.81	SS-6FKBFXF4	4.22 (107)	2.11 (53.6)	2.68 (68.1)	1.35 (34.3)	0.88 (22.4)	3.65 (92.7)	2.79 (70.9)	1.25 (31.8)	0.98 (24.9)	0.75 (19.0)	1.25 (31.8)	1.02 (26.0)	0.28 (7.1)	
	3/8 in.	0.76	SS-6FKBFXF6	4.34 (110)	2.17 (55.1)												2.12 (53.8)
	1/2 in.	0.73	SS-6FKBFXF8	4.78 (121)	2.39 (60.7)												2.18 (55.4)
8FKB Series On-Off (2-Way) Valves, 0.375 in. (9.52 mm) Orifice																	
Swagelok medium-pressure tube fitting	1/2 in.	3.2	SS-8FKBFK8	7.20 (183)	3.60 (91.4)	3.75 (95.2)	1.95 (49.5)	1.18 (30.0)	4.49 (114)	3.10 (78.7)	1.56 (39.6)	1.57 (39.9)	1.00 (25.4)	1.63 (41.4)	1.55 (39.4)	0.38 (9.7)	
Female NPT	1/2 in.	4.5	SS-8FKBF8	5.81 (148)	2.90 (73.7)												
12FKB Series On-Off (2-Way) Valves, 0.560 in. (14.2 mm) Orifice																	
Swagelok medium-pressure tube fitting	3/4 in.	7.3	SS-12FKBFK12	9.25 (235)	4.93 (118)	4.58 (116)	2.30 (58.4)	1.33 (33.8)	4.46 (113)	3.48 (88.4)	1.56 (39.6)	1.85 (47.0)	1.44 (36.6)	2.00 (50.8)	1.55 (39.4)	0.38 (9.7)	
Female NPT	3/4 in.	11.3	SS-12FKBF12	7.38 (187)	3.69 (93.7)												

ISO 5211-Compliant Pneumatic Actuators

Swagelok ISO 5211-compliant rack and pinion pneumatic actuators are available in spring-return and double-acting modes. On-off (2-way) valves require 90° actuation; switching (3-way) valves require 180° actuation.

Swagelok can provide complete actuated ball valve assemblies—including valves, actuators, sensors, bracket kits, and solenoids—with interfaces that meet ISO 5211, NAMUR, and VDI/VDE 3845.

For technical data, including actuator materials of construction and weight, see the *ISO 5211-Compliant Actuators for Swagelok Ball Valves*, MS-02-337.

⚠ Caution: Actuated assemblies must be properly aligned and supported. Improper alignment or inadequate support of the actuated assembly may result in leakage or premature valve failure.

Pressure-Temperature Ratings

Maximum actuator pressure is 116 psig (8.0 bar). See **Minimum Actuator Pressure** table below for minimum actuator pressures.

Actuator Service	Actuator Service Designator	Temperature Range °F (°C)
Standard	—	-40 to 176 (-40 to 80)
High temperature	HT	5 to 302 (-15 to 150)

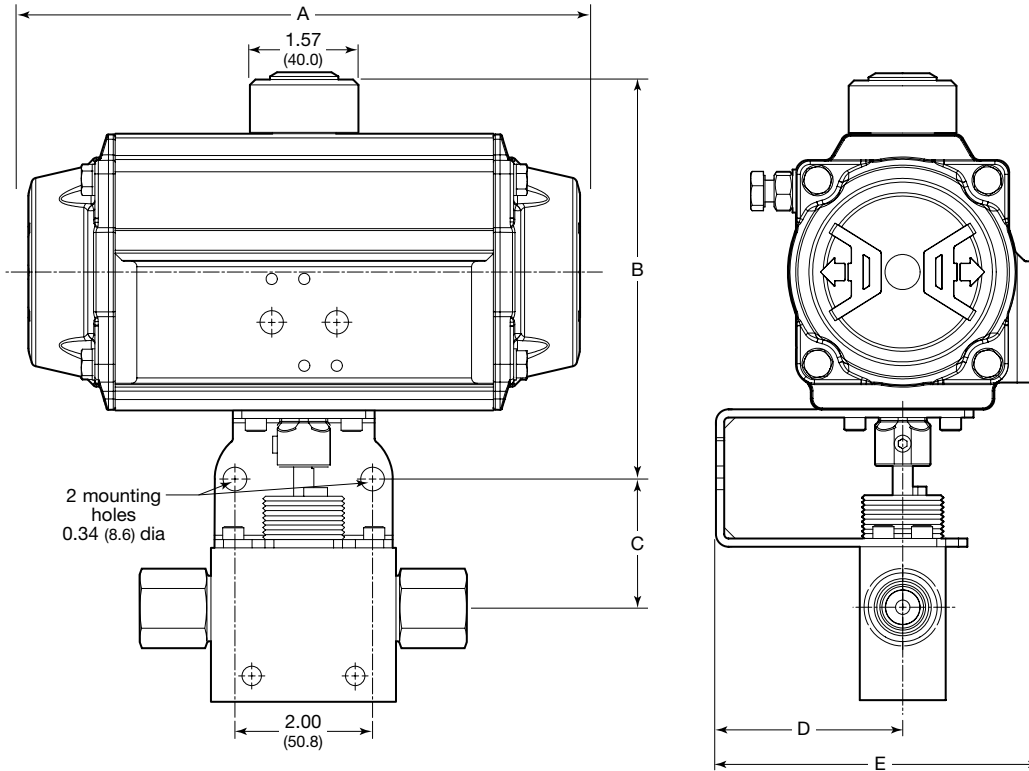
Minimum Actuator Pressure

Actuator Model	Spring Return Model Designators		Double Acting Model Designator	Actuation Mode	
	Normally Closed	Normally Open		Spring Return	Double Acting
				Minimum Actuator Pressure, psig (bar)	
6FKB Series On-Off (2-Way) Valves					
A30 (90°)	—	—	-A30D	—	43 (3.0)
A60 (90°)	-A60C5	-A60O5	-A60D	72 (5.0)	36 (2.5)
6FKB Series Switching (3-Way) Valves					
A30 (180°)	—	—	-A30XD	—	43 (3.0)
A60 (180°)	—	—	-A60XD	—	36 (2.5)
8FKB Series On-Off (2-Way) Valves					
AF60 (90°)	—	—	-AF60D	—	84 (5.7)
A100 (90°)	-A100C6	-A100O6	-A100D	88 (6.0)	55 (3.8)
12FKB Series On-Off (2-Way) Valves					
A150 (90°)	—	—	-A150D	—	84 (5.7)
A220 (90°)	-A220C5	-A220O5	-A220D	80 (5.5)	51 (3.5)

ISO 5211-Compliant Pneumatic Actuators

Dimensions

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



Actuator Model	Dimensions, in. (mm)				
	A	B	C	D	E
6FKB Series On-Off (2-Way) Valves					
A30 (90°)	6.04 (153)	5.24 (133)	1.88 (47.8)	2.72 (69.1)	4.63 (118)
A60 (90°)	8.01 (203)	5.91 (150)	1.88 (47.8)	2.72 (69.1)	4.71 (120)
6FKB Series Switching (3-Way) Valves					
A30 (180°)	8.50 (216)	5.24 (133)	1.88 (47.8)	2.72 (69.1)	4.63 (118)
A60 (180°)	11.4 (290)	5.91 (150)	1.88 (47.8)	2.72 (69.1)	4.71 (120)
8FKB Series On-Off (2-Way) Valves					
AF60 (90°)	8.01 (203)	6.06 (154)	2.16 (54.9)	2.87 (72.9)	4.86 (123)
A100 (90°)	9.41 (239)	6.57 (167)	2.16 (54.9)	2.87 (72.9)	5.09 (129)
12FKB Series On-Off (2-Way) Valves					
A150 (90°)	10.2 (259)	7.04 (179)	2.31 (58.7)	2.87 (72.9)	5.35 (136)
A220 (90°)	12.0 (305)	8.15 (207)	2.31 (58.7)	2.87 (72.9)	5.71 (145)

ISO 5211-Compliant Pneumatic Actuators

Ordering Information

Factory-Assembled Valves with Actuators

Typical Ordering Number

A
B
C
SS-6FKBFK8 -A60C5 HT

A Valve Ordering Number

B Actuator Model

Based on actuation mode and flow pattern, select actuator designator. See **Minimum Actuator Pressure** table, page 5.

C Actuator Service

HT = High temperature
None = Standard

Kits for Field Assembly

Order one actuator kit and one mounting bracket kit for each valve.

Actuator Kit Typical Ordering Number

A
B
C
MS - A60-DA - DIN -HT

A Actuator Model

Based on actuation mode and flow pattern, select actuator designator. See **Minimum Actuator Pressure** table, page 5, and **Actuator Model Designators** table below.

B Coupling Drive Type

DIN

C Actuator Service

-HT = High temperature
None = Standard

Actuator Model Designators

Actuator Model	Spring Return Model Designator	Double Acting Model Designator
6FKB Series On-Off (2-Way) Valves		
A30 (90°)	—	A30-DA
A60 (90°)	A60S5	A60-DA
6FKB Series Switching (3-Way) Valves		
A30 (180°)	—	A30-XDA
A60 (180°)	—	A60-XDA
8FKB Series On-Off (2-Way) Valves		
AF60 (90°)	—	AF60-DA
A100 (90°)	A100S6	A100-DA
12FKB Series On-Off (2-Way) Valves		
A150 (90°)	—	A150-DA
A220 (90°)	A220S5	A220-DA

Mounting Bracket Kits

Swagelok ISO 5211 mounting bracket kits contain:

- 316 stainless steel mounting bracket
- Eight 316 stainless steel socket head cap screws
- Powdered metal 300 series stainless steel coupling
- 316 stainless steel set screw
- Instructions.

Valve Series	Kit Ordering Number
6FKB	SS-MB-6FKB-F05-14DIN-M
8FKB	SS-MB-8FKB-F07-17DIN-M
12FKB	SS-MB-12FKB-F07-17DIN-M

Options

Handle Colors

Stainless steel bar handles with blue electrostatic powder coating are standard. Other colors are available.

To order, add a handle color designator to the valve ordering number.

Example:

SS-6FKBFBK4-BK

Handle Color	Designator
Black	-BK
Green	-GR
Orange	-OR
Red	-RD
Yellow	-YW

Options for Pneumatic Actuators

For Field Assembly or Factory Assembly

■ Solenoid Valves

attach to the actuator to create an electropneumatically actuated ball valve assembly.

■ Position Indicators

provide visual status of a valve.

■ Limit Switches

indicate actuator position by means of an electrical signal. They meet a variety of NEMA ratings such as NEMA 4 (weatherproof) and NEMA 7 (explosion proof).

All electrical components listed above meet North American NEMA and European CE/CENELEC requirements. Contact your authorized Swagelok representative for ordering information.

Accessories

Locking Handle Kits

Locking handle kits are available. Each kit contains a 316 stainless steel locking bracket, bracket screws, locking stop disk, and instructions.

Panel Nut Kits

Panel nut kits are available for manual valves. Panel thickness minimum is 0.12 in. (3.0 mm); maximum is 0.50 in. (12.7 mm). Each kit contains a 316 stainless steel panel nut and instructions.

Cap Screw Kits

Cap screw kits are available for panel mounting manual valve body shoulders to a panel 0.125 in. (3.2 mm) thick. Each kit contains four 1/4-20, 3/8 in. (9.7 mm) long 316 stainless steel cap screws and instructions.

Valve Series	Valve Flow Path	Ordering Numbers			
		Locking Handle Kits	Panel Nut Kits	Cap Screw Kits	Stop Disk Kits
6FKB	2-way	SS-5DK-6FKB-LH	SS-7K-6FKB	SS-6SCK-0882	SS-5DK-6FKB
	3-way	SS-5DK-6FKBX-LH			SS-5DK-6FKBX
8FKB	2-way	SS-5DK-8FKB-LH	SS-7K-8FKB	SS-6SCK-0882	SS-5DK-8FKB
12FKB	2-way	SS-5DK-12FKB-LH	SS-7K-8FKB	SS-6SCK-0882	SS-5DK-12FKB

Stop Disk Kits

Replacement stop disk kits are available. Each kit contains a replacement stop disk and instructions.

Related Products

Fittings

See the Swagelok *Medium-Pressure Gaugeable Tube Fittings and Adapter Fittings* catalog, MS-02-335, for more information.



Tubing

See the Swagelok *Medium-Pressure Tubing—Heavy-Wall Annealed and Cold-Drawn 1/8-Hard* catalog, MS-02-334, for more information



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.