General Service Ball Valves

GB Series

- Working pressures up to 6000 psig (413 bar) with temperatures from –40 to 250°F (–40 to 121°C)
- Swagelok® tube fitting end connections in fractional (3/8 in. to 1 in.) and metric (12 mm to 25 mm), female pipe end connections in fractional (3/8 in. to 1 in.)
- Corrosion-resistant body materials: 316/316L, Alloy 2507, 6-Moly, Alloy 625, Alloy 825, Alloy C-276
- Mechanically locked end screw design (patent pending) provides increased safety
- Optional API 607 for fire-safe applications and NACE MR0175/ISO 15156 for sour gas

Swagelok

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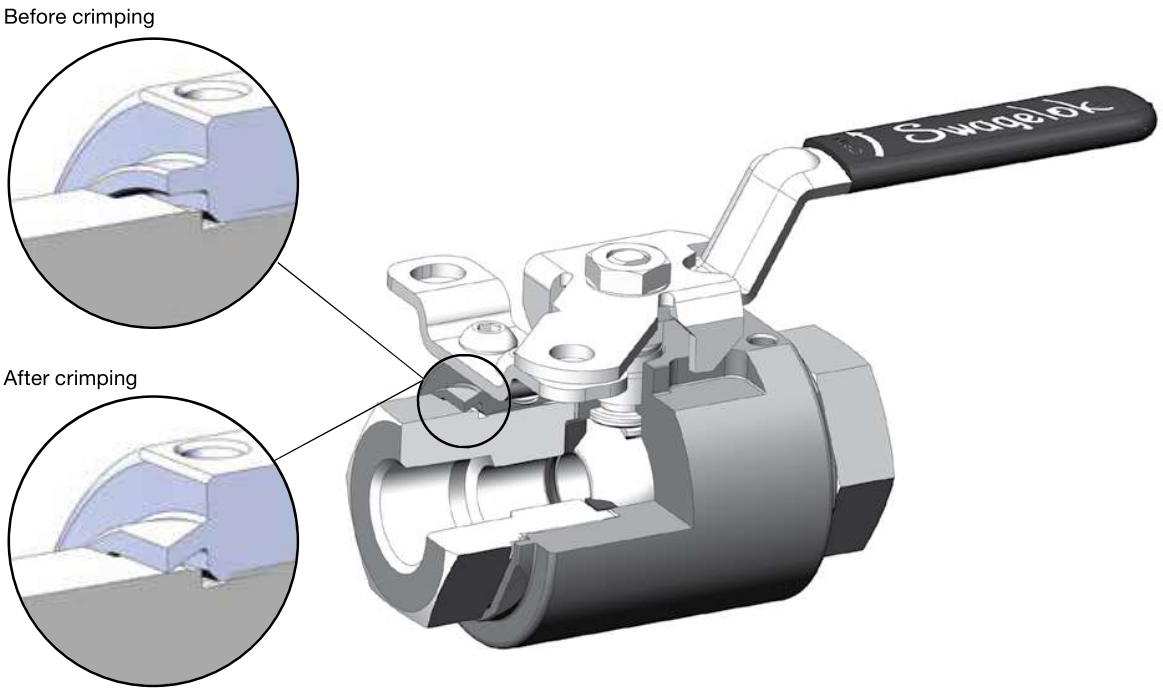
Features

- Body seals designed for hydrostatic system proof testing up to 1.5 × maximum rated pressure
- Valve bodies feature a bolt pattern that can be used for optional lockout, panel mount, and a bracket compatible with ISO 5211 pneumatic actuator to reduce inventory levels and provide installation flexibility
- Mechanically locked (crimped) end screw design (patent-pending) to avoid accidental disassembly and increase safety



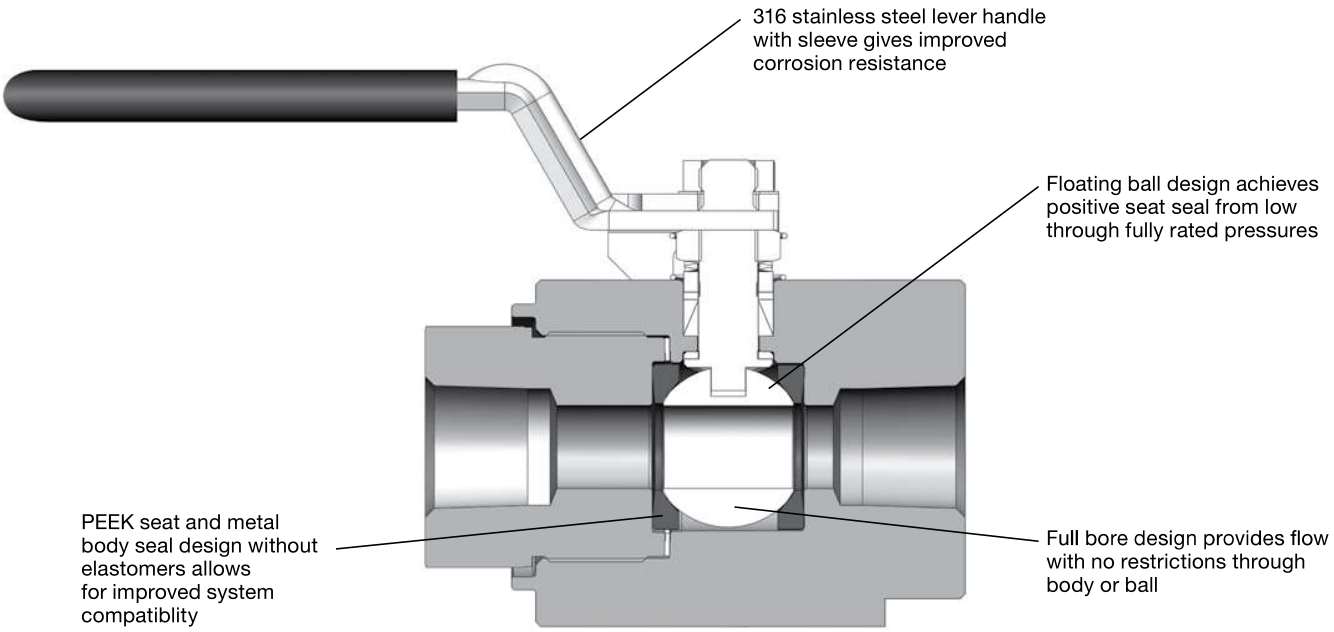
Important Information About Swagelok General Service Ball Valves

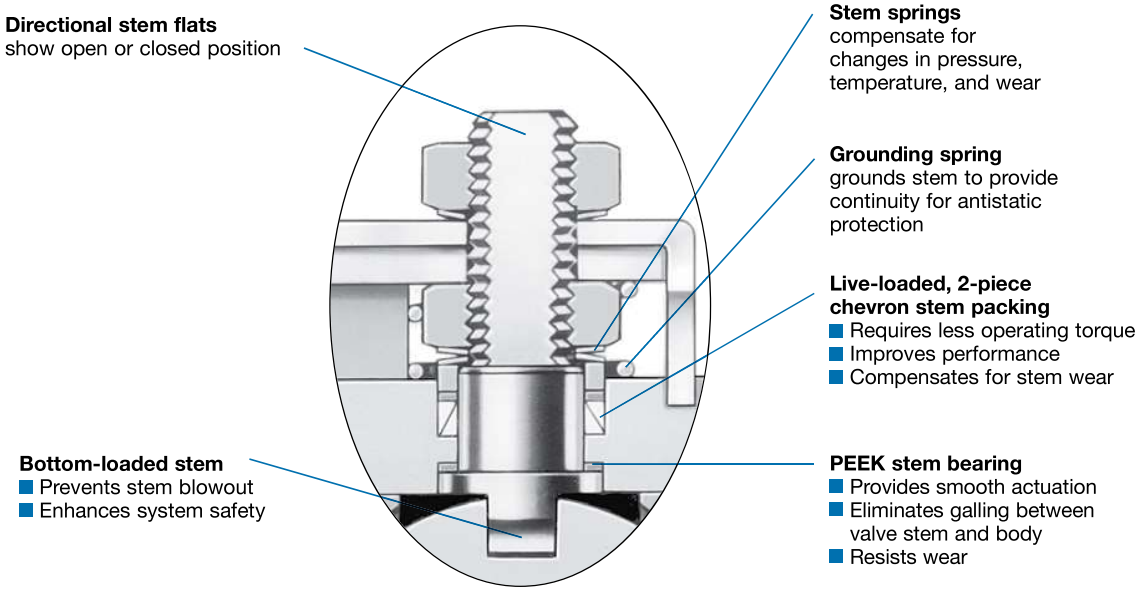
⚠ **Swagelok general service ball valves are designed to be operated in a fully open or fully closed position.**

⚠ **A packing adjustment may be required periodically to increase service life and to prevent leakage.**

⚠ **Valves that have not been cycled for a period of time may have a higher initial actuation torque.**

Swagelok General Service Ball Valves





Pressure-Temperature Ratings

	316/316L	Alloy 2507	Alloy 625	Alloy 825	6-Moly	Alloy C-276
Temperature, °F (°C)	**Working Pressure,** psig (bar)					
–40 (–40)① to100 (37)	6000 (413)	6000 (413)	6000 (413)	6000 (413)	6000 (413)	6000 (413)
200 (93)	5190 (357)	5981 (412)	6000 (413)	5510 (379)	5800 (399)	5472 (377)
250 (121)	4935 (340)	5818 (400)	6000 (413)	5369 (369)	5535 (381)	5263 (362)

① Seal and survive to –58°F (–50°C), actuation not permitted below –40°F (–40°C). See PTR-5024, *Low Temperature Thermal Cycle Test of Swagelok® 8GB and 16GB Series General Service Ball Valves*.

Pressure ratings for valves with Swagelok tube fitting ends may be lower due to the tubing pressure rating. Refer to Swagelok *Tubing Data,* MS-01-107 for additional information.

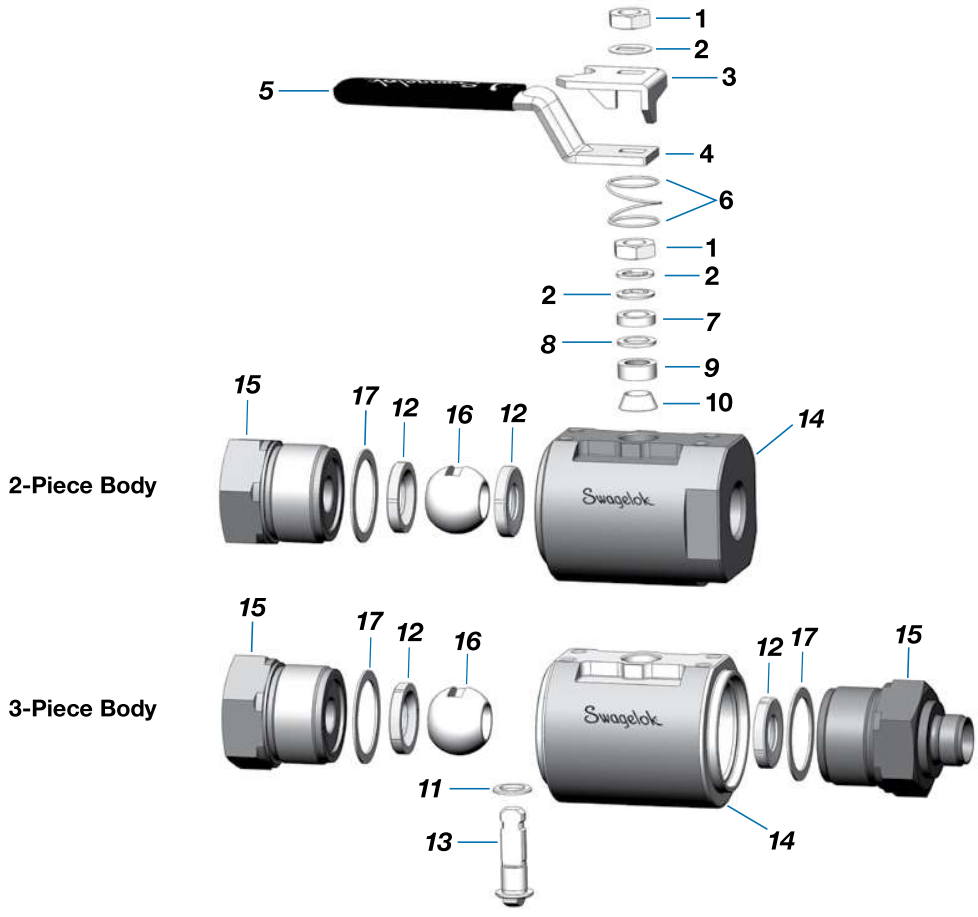
Ratings are based on ASME Code for Pressure Piping B31.3, Process Piping and ASME B31.1, Power Piping.

The rating for AGB Fire Safe valves with Grafoil® packing has a minimum temperature of –20°F (–28°C).

Materials of Construction

Component	Valve Body Materials					
	316/316L	Alloy 2507	Alloy 625	Alloy 825	6-Moly	Alloy C-276
	Material Grade/ASTM Specification					
1 Stem nut (2)	316 SS					
2 Stem springs (3)	316 SS/A249					
3 Stop plate	316 SS/A240					
4 Handle						
5 Handle sleeve	Vinyl					
6 Grounding spring	316 SS/A313					
7 Gland	PTFE-coated 316 SS/B783					
8 Packing support	Polyetheretherketone (PEEK)					
9 *Top packing*	*Polyetheretherketone (PEEK)*①					
10 *Bottom packing*						
11 *Stem bearing*						
12 *Seats (2)*						
13 *Stem*	*316/316L SS A276*	*625/B446/B574*	*625/B446/B574*	*625/B446/B574*	*625/B446*	*C276/B574*
14 *Body*	*316/316L SS A276 and A479*	*2507/A479*	*625/B446*	*825/B425*	*6MO A479 and B691*	
15 *End screw(s)*						
16 *Ball*	*316/316L SS A276*				*625/B446*	
17 *End screw gasket (2)*	*Silver-plated 316 SS/A240*	*Silver-plated C276*	*Silver-plated C276*	*Silver-plated C276*	*Silver-plated C276*	*Silver-plated C276*
Wetted lubricant	*PTFE-based*					

Wetted components listed in *italics.*
① Coated with molybdenum disulfide with a hydrocarbon carrier (excluding the 8GB seats).



Swagelok

Ordering Information

Build a GB series ball valve ordering number by combining the designators in the sequence shown below.

Standard

1		2	3	4
SS	-	8GB	S	8

Two different end connections with options

1		2	3	4		5	6		7
6MO	-	16GB	S	25MM	-	F	16	-	JLW20YW

Note: Dashes are removed from right to left until 25 characters are achieved in the part number.

Two different end connections with options and pneumatic actuator

1		2	3	4	5	6		8
SS	-	A8GB	F	8	-	S	8	- A60C6

1 Material

(Refer to Materials of Construction on page 4.)

SS = 316/316L SS
6MO = 6-Moly
2507 = Alloy 2507
625 = Alloy 625
825 = Alloy 825
HC = C-276

2 Configuration

8GB = GB valve with 1/2 in. bore
16GB = GB valve with 7/8 in. bore
A8GB = 8GB (API 607)
A16GB = 16GB (API 607)

3 End Connection 1 Type

S = Swagelok tube fitting
F = Female NPT
FK = Swagelok medium pressure
F_RP = ISO/BSP parallel thread (replace underscore with size)
F_RT = Female ISO/BSP (replace underscore with size)
MS = SAE straight

4 End Connection 1 Size

6 = 3/8 in. (8GB only)
8 = 1/2 in. (8GB only)
12 = 3/4 in.
16 = 1 in. (16GB only)
12MM = 12 mm (8GB only)
16MM = 16 mm (8GB only)
18MM = 18 mm
20MM = 20 mm
22MM = 22 mm (16GB only)
25MM = 25 mm (16GB only)

5 End Connection 2 Type

(Required *only* if different from End Connection 1 Type.)

S = Swagelok tube fitting
F = Female NPT
FK = Swagelok medium pressure
F_RT = Female ISO/BSP (replace underscore with size)
MS = SAE straight

6 End Connection 2 Size

(Required *only* if different from End Connection 1 Size.)

6 = 3/8 in. (8GB only)
8 = 1/2 in. (8GB only)
12 = 3/4 in.
16 = 1 in. (16GB only)
12MM = 12 mm (8GB only)
16MM = 16 mm (8GB only)
18MM = 18 mm
20MM = 20 mm
22MM = 22 mm (16GB only)
25MM = 25 mm (16GB only)

7 Valve Options

(Note: If selecting more than one option, designators must be in alphabetical order.)

None = Standard (black handle sleeve)
BL = Blue handle sleeve
GR = Green handle sleeve
JK = Oval handle (orange is standard)
JL = Lever handle with locking bracket (panel mount for 8GB only)
JLK = Oval handle with locking bracket
PT, W3, W20 = Production tests (see page 9)
RD = Red handle sleeve (standard for A8GB and A16GB)
SG = Alloy 400 ball and stem (625 stem for API 607 valves) selected in accordance with MR0175/ ISO 15156 (SS only)
YW = Yellow handle sleeve

8 Pneumatic Actuator Options

(Refer to ISO 5211-Compliant Pneumatic Actuators on page 10.)

Sour Gas Valves

GB series valves are available for sour gas service. Alloy 2507, 6-Moly, alloy 625, alloy 825, and alloy C-276 utilize materials in accordance with NACE MR0175/ISO15156 as standard. No special designator is required.

The standard 316/316L SS valve uses a 316/316L body and end screws in accordance with NACE MR0175/ ISO15156. For a SS valve with all wetted materials in accordance with NACE MR0175, an alloy 400 ball and stem (alloy 625 stem for API 607 valves) are used and can be ordered by adding -SG to the SS valve ordering number.

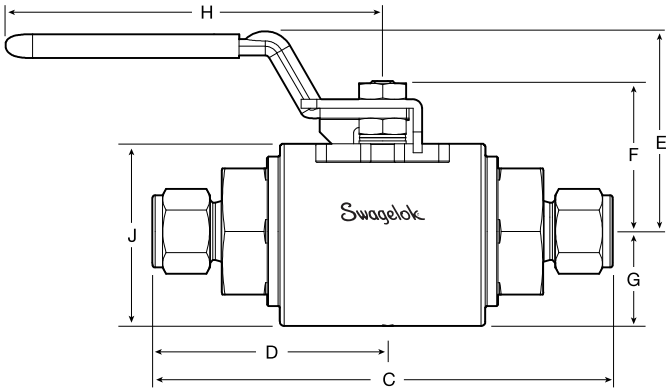
Example: SS-8GBF8-**SG**

Dimensions

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

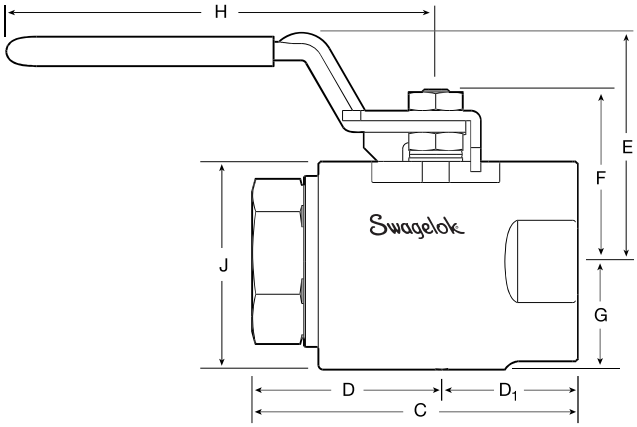
Swagelok Tube Fitting End Connections

Dimensions are shown with Swagelok nuts finger-tight. See **Ordering Information** on page 5.

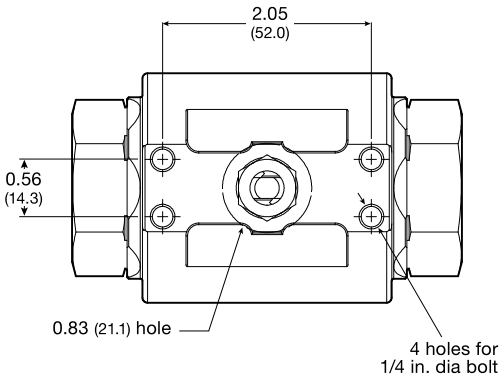


1/2 in. Female Pipe Thread End Connections (two-piece body)

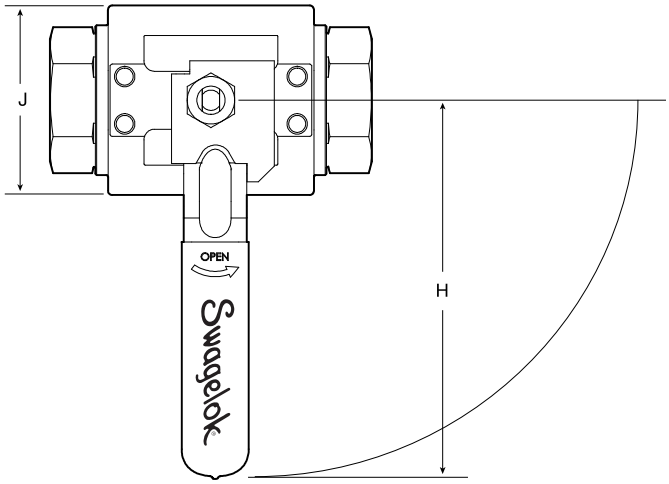
Female NPT pipe thread dimensions are based on ASME B1.20.1. See **Ordering Information** on page 5.



Bolt Pattern and Panel Mount Template (For Use with Locking/Panel Mount Handle [-JL])



Handle Closed



Dimensions

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

End Connection		Ordering Number	Orifice in. (mm)	C_v	Dimensions, in. (mm)							
Type	Size				C	D	D_1	E	F	G	H	J
Fractional Swagelok Tube Fitting	3/8 in.	SS-8GBS6	0.281 (7.1)	2.5	5.55 (141)	2.77 (70.4)	–	2.35 (59.7)	1.79 (45.5)	1.13 (28.6)	4.50 (114)	2.17 (55.0)
	1/2 in.	SS-8GBS8②	0.41 (10.4)	7	5.78 (147)	2.89 (73.4)	–	2.35 (59.7)	1.79 (45.5)	1.13 (28.6)	4.50 (114)	2.17 (55.0)
	3/4 in.	SS-8GBS12②	0.516 (13.1)	10	5.77 (147)	2.89 (73.3)	–	2.35 (59.7)	1.79 (45.5)	1.13 (28.6)	4.50 (114)	2.17 (55.0)
	3/4 in.	SS-16GBS12	0.620 (15.7)	15	6.92 (176)	3.46 (87.9)	–	2.94 (74.7)	2.52 (64.0)	1.50 (38.1)	6.00 (152)	2.93 (74.3)
	1 in.	SS-16GBS16	0.875 (22.2)	40	7.26 (184)	3.63 (92.2)	–	2.94 (74.7)	2.52 (64.0)	1.50 (38.1)	6.00 (152)	2.93 (74.3)
Swagelok Medium-Pressure Tube Fitting	3/4 in.	SS-16GBFK12	0.56 (14.2)	5	5.44 (138)	2.72 (69.1)	–	2.94 (74.7)	2.52 (64.0)	1.50 (38.1)	6.00 (152)	2.93 (74.3)
	1 in.	SS-16GBFK16	0.73 (18.5)	10	5.44 (138)	2.72 (69.1)	–	2.94 (74.7)	2.52 (64.0)	1.50 (38.1)	6.00 (152)	2.93 (74.3)
Metric Swagelok Tube Fitting	12 mm	SS-8GBS12MM	0.375 (9.5)	5	5.77 (147)	2.89 (73.3)	–	2.35 (59.7)	1.79 (45.5)	1.13 (28.6)	4.50 (114)	2.17 (55.0)
	16 mm	SS-8GBS16MM	0.50 (12.7)	10	5.77 (147)	2.89 (73.3)	–	2.35 (59.7)	1.79 (45.5)	1.13 (28.6)	4.50 (114)	2.17 (55.0)
	20 mm	SS-8GBS20MM	0.516 (13.1)	10	5.77 (147)	2.88 (73.3)	–	2.35 (59.7)	1.79 (45.5)	1.13 (28.6)	4.50 (114)	2.17 (55.0)
	20 mm	SS-16GBS20MM	0.625 (15.9)	15	6.92 (176)	3.46 (87.9)	–	2.94 (74.7)	2.52 (64.0)	1.50 (38.1)	6.00 (152)	2.93 (74.3)
	25 mm	SS-16GBS25MM	0.875 (22.2)	40	7.27 (185)	3.63 (92.3)	–	2.94 (74.7)	2.52 (64.0)	1.50 (38.1)	6.00 (152)	2.93 (74.3)
Female NPT Pipe Thread	3/8 in.	SS-8GBF6	0.516 (13.1)	10	3.78 (96.0)	1.89 (48.0)	–	2.35 (59.7)	1.79 (45.5)	1.13 (28.6)	4.50 (114)	2.17 (55.0)
	1/2 in.	SS-8GBF8① (2-piece body)	0.516 (13.1)	10	3.37 (85.0)	1.89 (48.0)	1.48 (37.6)	2.35 (59.7)	1.79 (45.5)	1.13 (28.6)	4.50 (114)	2.17 (55.0)
	3/4 in.	SS-8GBF12②	0.516 (13.1)	10	4.58 (116)	2.29 (58.1)	–	2.35 (59.7)	1.79 (45.5)	1.13 (28.6)	4.50 (114)	2.17 (55.0)
	3/4 in.	SS-16GBF12	0.875 (22.2)	40	4.98 (127)	2.49 (63.3)	–	2.94 (74.7)	2.52 (64.0)	1.50 (38.1)	6.00 (152)	2.93 (74.3)
	1 in.	SS-16GBF16③	0.875 (22.2)	40	5.44 (138)	2.72 (69.1)	–	2.94 (74.7)	2.52 (64.0)	1.50 (38.1)	6.00 (152)	2.93 (74.3)
Female ISO/ BSP Tapered Pipe Thread	1/2 in.	SS-8GBF8RT	0.516 (13.1)	10	3.78 (96)	1.89 (48)	–	2.35 (59.7)	1.79 (45.5)	1.13 (28.6)	4.50 (114)	2.17 (55.0)
Female SAE Straight Pipe Thread	1/2 in.	SS-8GBMS8	0.516 (13.1)	7	3.78 (96.0)	1.89 (48.0)	–	2.35 (59.7)	1.79 (45.5)	1.13 (28.6)	4.50 (114)	2.17 (55.0)
	3/4 in.	SS-8GBMS12	0.516 (13.1)	10	4.58 (116)	2.29 (58.1)	–	2.35 (59.7)	1.79 (45.5)	1.13 (28.6)	4.50 (114)	2.17 (55.0)
	3/4 in.	SS-16GBMS12	0.875 (22.2)	15	4.98 (127)	2.49 (63.3)	–	2.94 (74.7)	2.52 (64.0)	1.50 (38.1)	6.00 (152)	2.93 (74.3)
	1 in.	SS-16GBMS16③	0.875 (22.2)	40	5.44 (138)	2.72 (69.1)	–	2.94 (74.7)	2.52 (64.0)	1.50 (38.1)	6.00 (152)	2.93 (74.3)

① The 1/2 in. female NPT pipe thread configuration has a 2-piece body (stainless steel only). All other configurations have 3-piece bodies.
② The 8GB valves with 3/4 in. end connections or 1/2 in. diameter and 0.035 in. tube wall will have a slight flow restriction through the valve.
③ The 16GB valves with 1 in. diameter and schedule 40 or 80 pipe will have a slight flow restriction through the valve

Options and Accessories

Handles

8GB/A8GB Lever Handle with Locking/ Panel Mount Bracket

16GB Lever Handle with Locking Bracket

Oval Handle

Oval Handle with Locking Bracket

A variety of handle options are available for use with GB series ball valves. To order a lever handle with locking- bracket, add **-JL** to the ordering number. The 8GB valve can also be panel mounted for a lever handle with locking bracket. Maximum panel thickness is 0.105 in. (2.67 mm) (12 Gauge sheet metal.)

To order an oval handle, add **-JK** to the ordering number. Refer to page 5 for other options.

Locking Handle Bracket Kits

Locking Handle Bracket Kits			
Valve Series	**Kit Description**	**Kit Contents**	**Kit Ordering Number**
8GB/A8GB lever handle	Locking/panel mount	(1) Stop bracket (4) Cap screws (1) Stop plate	SS-5DK-8GB-JL
8GB/A8GB oval handle	Locking	(1) Lockable stop plate (1) Locking bracket (2) Cap screws	SS-5DK-8GB-JLK
16GB/A16GB lever and oval handles①			SS-5DK-16GB-LH

① The temperature range for the 16GB with oval handle is limited to a range of 0°F (–17°C) to 250°F (121°C).

Fire Series (A8GB and A16GB) Option

GB Series valves are offered with a fire safe option that meets the testing specifications of API 607, 7th edition. This option can be ordered for the 8GB or 16GB by adding an A prior to the valve series and size. With the fire safe option, a red lever handle, Grafoil packing, and vented ball are standard. The vented ball allows pressure to equalize between the valve body and the upstream port, preventing overpressurization and potential seal blowout under fire conditions. With the vented ball, the valve is not bi-directional. This option is rated from –20°F to 250°F (– 28°C to 121°C).

Vented Ball

A8GB and A16GB Alternative Materials of Construction

Component	Material Grade/ ASTM Specification
Packing supports (2)	Polymide
Packing	Grafoil with 316 SS wire
Stem bearing(s)①	Alloy X-750/AMS 5542
Lubricants	Fluorinated tungsten disulfide; molybdenum disulfide with hydrocarbon binder; nickel antiseize in hydrocarbon carrier

① Coated with molybdenum disulfide with hydrocarbon binder.

Process Options

Production Tests

To specify an optional production test in addition to the standard testing, add a designator from the table at right to the valve ordering number.

Example: SS-8GBF8**-PT**

Test Designator	Production Test Description
-PT	Valves are tested with nitrogen at a customer-specified pressure. Test pressure must not exceed the rated pressure of the valve. Maximum allowable leak rate depends on test pressure.
-W20	Valves are hydrostatically tested with deionized water at 1.5 times the rated pressure of the valve. No visible leakage is permitted.
-W3	Valves are tested for shell and seat leakage to satisfy the testing requirements of API 598

Low Fugitive Emissions

The American Petroleum Institute's API 641 tests for fugitive emissions to atmosphere for quarter turn ball valves. The tests are conducted at a third party lab and certify that at no point in the test did the valve leak in excess of 100 ppm of methane. Certificates stating that the valve is certified for Low Emissions service are available for the following GB series valves: 8GB and 16GB. For more information, contact your authorized Swagelok sales and service representative.

Testing

Every Swagelok general service ball valve① is factory tested in both directions 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.

① Valves with vented balls are only seat tested from inlet to outlet.

Cleaning and Packaging

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

ISO 5211-Compliant Pneumatic Actuators

Swagelok GB series valve with actuator, solenoid, and proximity sensor.

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 250 (–15 to 121)

These Swagelok rack and pinion pneumatic actuators are ISO 5211-compliant and are suitable for general applications. They are available in spring-return and double-acting modes. On-off (2-way) valves require 90° actuation.

Valve-actuator assemblies on this page are based on a 70 to 250°F (20 to 121°C) system temperature and the valve cycling at least once per day but not more than once per hour. For additional information on selecting and sizing ISO 5211-compliant actuators, refer to *Actuated Ball Valve Selection Guide—ISO 5211-Compliant Actuator Mounting Bracket Kits* catalog, MS-02-136.

For other valve body materials or if your application falls outside of this scope, contact your authorized Swagelok sales and service representative.

For technical data, including actuator materials of construction and weight, refer to *Ball Valve Actuation Options* catalog, MS-02-343.

For additional information on selecting and sizing ISO 5211-compliant actuators, refer to *Actuated Ball Valve Selection Guide—ISO 5211-Compliant Actuator Mounting Bracket Kits* catalog, MS-02-136.

Minimum Actuator Pressure

Valve Series	Actuator Model	Spring Return Model Designators		Actuator Model	Double Acting Model Designator	Actuation Mode	
						Spring Return	Double Acting
		Normally Closed	Normally Open			Minimum Actuator Pressure, psig (bar)	
8GB	A30	-A30C4	-A30O4	A30	-A30D	58 (4.0)	36 (2.5)
A8GB	A30	-A30C5	-A30O5	A30	-A30D	72 (5.0)	43 (3.0)
	A60	-A60C3	-A60O3	A60	-A60D	43 (3.0)	36 (2.5)
16GB	A60	-A60C4	-A60O4	A30	-A30D	—	58 (4.0)
				A60	-A60D	58 (4.0)	36 (2.5)
A16GB	A100	-A100C4	-A100O4	A60	-A60D	—	58 (4.0)
				A100	-A100D	58 (4.0)	36 (2.5)

⚠ **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.**

ISO 5211-Compliant Pneumatic Actuators

Ordering Information

Factory-Assembled Valves with Actuators

Typical Ordering Number

A **B** **C**

SS-8GBS8 -A30D HT

A Valve Ordering Number

B Actuator Model
Based on valve series, actuation mode, and flow pattern, select actuator designator. See **Minimum Actuator Pressure** table, page 10.

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 - **A30-4** - DIN **-HT**

A Actuator Model
Based on valve series, actuation mode, and flow pattern, select actuator designator. See **Minimum Actuator Pressure** table, page 10, and **Actuator Model Designators** table below.

B Coupling Drive Type
DIN

C Actuator Service
-HT = High temperature
None = Standard

Actuator Model Designators

Valve Series	Spring Return Actuator Model	Spring Return Model Designator	Double Acting Model	Double Acting Model Designator
8GB	A30	A30-4	A30	A30-DA
A8GB	A30	A30-5	A30	A30-DA
	A60	A60-3	A60	A60-DA
16GB	A60	A60-4	A30	A30-DA
			A60	A60-DA
A16GB	A100	A100-4	A60	A60-DA
			A100	A100-DA

Options for Pneumatic Actuators

Swagelok can provide factory assemblies with pneumatic actuators, solenoid valves, limit switches, and position sensors, as well as kits for field assembly.

Actuator Mounting Kits		
Valve Series	**Actuator Model**	**Kit Ordering Number**
8GB	A30	SS-MB-8GB-F05-14DIN-M
A8GB	A30 or A60	
16GB	A30 or A60	SS-MB-16GB-F05-14DIN-M
A16GB	A60	
	A100	SS-MB-16GB-F05-17DIN-M

Mounting Bracket Kits

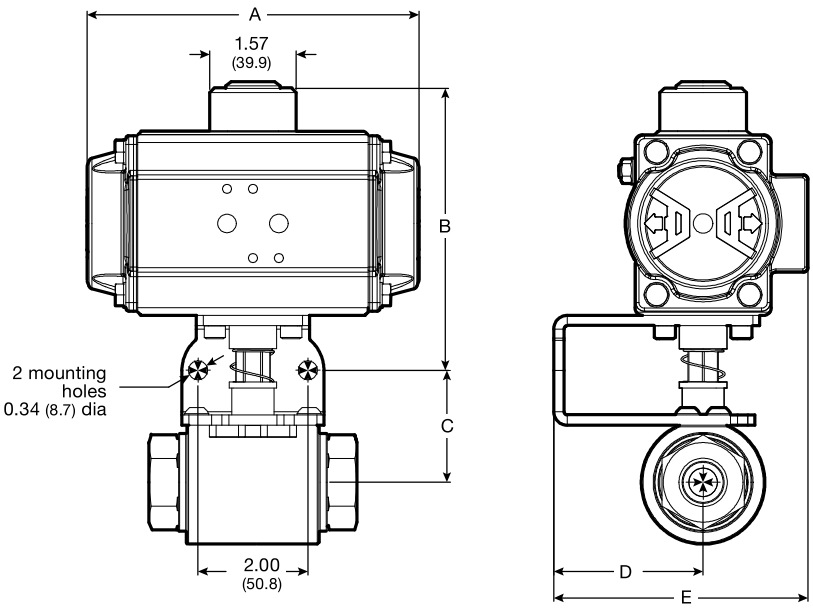
Swagelok ISO 5211 mounting bracket kits contain:

- 316 stainless steel mounting bracket
- four A4 stainless steel socket head cap screws (A4 is approximately equivalent to AISI 316.)
- 316 stainless steel coupling
- Aluminum coupling sleeve
- 302 stainless steel coupling spring
- four 316 stainless 1/4–20 button head cap screws
- instructions.

ISO 5211-Compliant Pneumatic Actuators

Dimensions

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



Valve Series	Actuator Model	Dimensions, in. (mm)				
		A	B	C	D	E
On-Off (2-Way) Valves						
8GB	A30	6.04 (153)	5.13 (130)	2.04 (51.8)	2.72 (69.1)	4.63 (118)
	A60	8.01 (203)	5.80 (147)	2.04 (51.8)	2.72 (69.1)	4.71 (118)
16GB	A60	8.01 (203)	5.80 (147)	2.43 (61.6)	2.72 (69.1)	4.71 (118)
	A100	9.46 (240)	6.31 (160)	2.43 (61.6)	2.72 (69.1)	4.94 (126)

Options for ISO 5211-Compliant and Swagelok Pneumatic Actuators

Swagelok offers a range of accessories to enhance instrumentation and process ball valve performance and control, including solenoid valves, limit switches, and position sensors. Factory assemblies and kits for field assembly are available.

Refer to *Ball Valve Actuation Options* catalog, MS-02-343, for additional information.

Oxygen Service Hazards

For more information about hazards and risks of oxygen-enriched systems, refer to *Oxygen System Safety* technical report, MS-06-13.

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.

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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