

One-Piece Instrumentation Ball Valves



40G Series and 40 Series

- On-off, switching, and crossover flow paths
- Working pressures up to 3000 psig (206 bar)
- Temperatures from -65 to 300°F (-53 to 148°C)
- Environmental and heated-process applications
- 1/16 to 3/4 in. and 3 to 12 mm end connections

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Swagelok Instrumentation Ball Valves

Swagelok one-piece instrumentation ball valves have been well accepted and widely used in a variety of industries for many years.

Both the original Swagelok 40 series and the newer 40G series valves accommodate a wide range of actuator, flow path, and handle options, as well as offer ease of packing adjustment while inline.

40G Series and 40 Series Comparison

Feature	Valve Series		
	41G, 42G, 43G	41, 42, 43	44, 45
Valve Body Materials	Stainless steel	Brass, alloy 400	Stainless steel, brass, alloy 400
Packing Materials	Modified PTFE or UHMWPE	PTFE ^①	
Working Pressure psig (bar)	Up to 3000 (206), depending on valve size. See page 5.		
Temperature Rating °F (°C)	-65 to 300 (-53 to 148)	50 to 150 (10 to 65) ^①	
Flow Coefficients (C_v)	0.08 to 2.4	0.05 to 2.4	1.5 to 12
End Connection Sizes	1/16 to 3/8 in.; 3 to 8 mm		3/8 to 3/4 in.; 8 to 12 mm
Flow Patterns	On-off (2-way); switching (3-way)	On-off (2-way); switching (3-way, 5-way and 7-way); crossover (4-way and 6-way)	On-off (2-way); switching (3-way and 5-way); crossover (4-way)

^① Live-loaded PFA (all sizes) and UHMWPE (41, 42, and 43 series sizes) packing are available to extend the low-temperature rating to -65°F (-53°C). See the Swagelok *Live-Loaded 40 Series Ball Valves for Low-Temperature Service* catalog, MS-02-109.

Important Information About Swagelok Instrumentation 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.**
- ⚠ **Packing adjustment may be required during the service life of the valve to prevent leakage.**
- Service instructions are shipped with each 40G series and 40 series valve.
- 40G and 40 series valves are factory tested with nitrogen at 1000 psig (69 bar), or the rated pressure if lower than 1000 psig (69 bar). 40 series valve packing must be readjusted for service at higher than test pressure. See page 5 for standard production tests and page 22 for optional production tests.
- Instrumentation ball valves exposed to dynamic temperature conditions before installation may lose their initial packing load. Packing adjustment may be needed.
- 41G and 42G series valves require an 8 mm deep-well socket and 43G series valves require a 9 mm deep-well socket to adjust the packing bolt.
- 41 and 42 series valves require a 3/8 in. open-ended wrench; 44 series valves require a 1/2 in. open-ended wrench; and 45 series valves require a 5/8 in. open-ended wrench to adjust the packing bolt.
- 43 series valves require an adapter to adjust the packing bolt. Ordering number: **MS-WK-43**

Features

40G Series

Top-loaded, live-loaded design

- reduces need for packing adjustment
- allows adjustment with the valve in-line
- compensates for wear
- improves thermal cycle performance.

Balanced-trunnion, patent-pending design

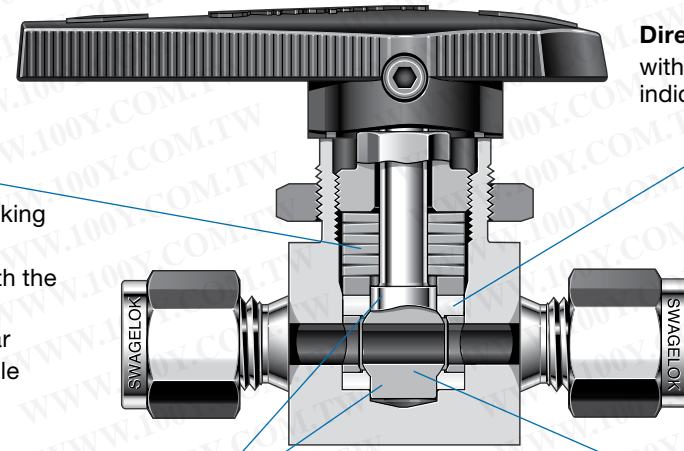
- supports packing, reducing the need for packing adjustment
- reduces packing volume, minimizing thermal effects
- minimizes packing extrusion
- improves thermal cycle performance.

Directional handle
with double-flat stem
indicates position of orifice.

Single-piece, patent-pending encapsulated packing

- is constructed of modified PTFE
- reduces potential leak points
- does not require system pressure to seal
- has virtually no dead space
- allows bidirectional flow
- is easily cleaned and purged.

One-piece ball stem
ensures alignment of
stem and orifice.



40 Series

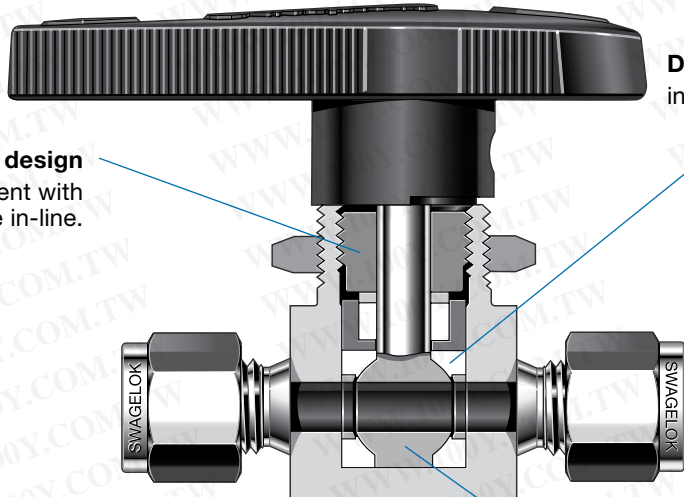
Top-loaded design
allows adjustment with
the valve in-line.

Directional handle
indicates position of orifice.

Capsule seat packing

- is constructed of PTFE
- does not require system pressure to make a seal
- has virtually no dead space
- allows bidirectional flow
- is easily cleaned and purged.

One-piece ball stem
ensures alignment of
stem and orifice.



Drop-in Replacement

Swagelok 41G, 42G, and 43G series valves easily replace original stainless steel 41, 42, and 43 series valves.

- Equivalent dimensions
- Comparable materials of construction

Couplings must be replaced on actuated valves. See pages 17 and 19.

Swagelok 44 and 45 series valves remain available in stainless steel; the full range of 40 series sizes is available in brass and alloy 400.

Materials of Construction

40G Series

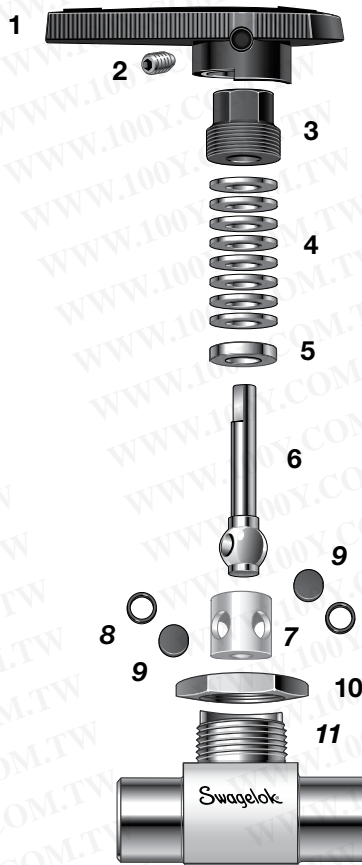
Component	Stainless Steel Valve Body Material
	Material Grade/ASTM Specification
1 Handle	Nylon with powdered metal 300 series SS insert
2 Set screw	S17400/A564
3 Packing bolt	Powdered metal 300 series SS
4 Springs ^①	S17700/A693
5 Gland	Powdered metal 300 series SS
6 Ball stem	316 SS/A276
7 Packing	Modified PTFE/D1710 type 1, Grade 1, Class B or UHMWPE/D4020
8 Side rings	Powdered metal 300 series SS/B783 ^②
9 Side discs	
10 Panel nut	Powdered metal 300 series SS/B783
11 Body ^③	316 SS/A276 and A479
Wetted lubricant	Silicone-based
Nonwetted lubricant	Molybdenum disulfide with hydrocarbon binder coating

Wetted components listed in *italics*.

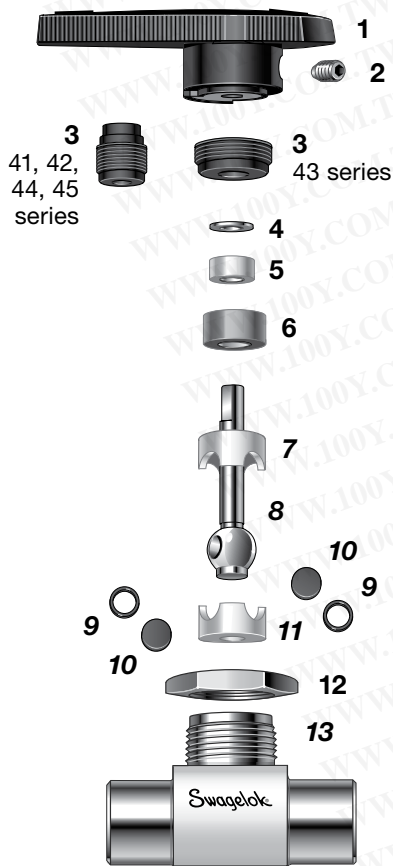
① 41G and 42G series: 8 springs; 43G series: 6 springs.

② B783 specification not available on 41G and 42G series; standard on 43G series.

③ Bodies with VCO[®] end connections and modified PTFE packing have fluorocarbon FKM O-rings; bodies with with VCO end connections and UHMWPE packing have ethylene propylene O-rings.



40 Series



Component	Valve Body Materials		
	Stainless Steel	Brass	Alloy 400
	Material Grade/ASTM Specification		
1 Handle	Nylon with brass insert		
2 Set screw	S17400 SS/A564		
3 Packing bolt	Powdered metal 300 series SS or 316 SS/A276, A479	Brass CDA 360/B16	Alloy 400/B164
4 Upper gland	316 SS/A240	41, 42, 45 series: brass 260/B36; 43, 44 series: 316 SS/A240	Alloy 400/B127
5 Bushing	PTFE/D1710		
6 Lower gland	Powdered metal 300 series SS	Brass CDA 360/B16	Alloy 400/B164
7 Upper packing	PTFE/D1710		
8 Ball stem	316 SS/A276	Brass CDA 360/B16 ^①	Alloy 400/B164
9 Side rings	<i>Fluorocarbon-coated powdered metal 300 series SS/B783</i>	<i>Fluorocarbon-coated brass powdered metal^①</i>	<i>Fluorocarbon-coated alloy 400 powdered metal</i>
10 Side discs			
11 Lower packing	PTFE/D1710		
12 Panel nut	Powdered metal 300 series SS/B783	Brass CDA 360/B16	Powdered metal 300 series SS/B783
13 Body ^②	316 SS/A276, A479	Brass CDA 356 or 360/B16	Alloy 400/B164
Wetted lubricant	41, 42, 43 series: <i>silicone-based</i> ; 44, 45 series: <i>silicone- and fluorinated-based</i>		
Nonwetted lubricant	Molybdenum disulfide with hydrocarbon binder coating		

Wetted components listed in *italics*.

① 4-way, 5-way, 6-way, and 7-way valves contain stainless steel stem, rings, and discs.

② Bodies with VCO end connections have fluorocarbon FKM O-rings.

Pressure-Temperature Ratings

The 40G series valve is designed for thermal cycling in both environmental and heated-process applications.

Ratings shown below apply to on-off (2-way) and switching (3-way) valves. Ratings for switching (5-way and 7-way) and crossover (4-way and 6-way) valves are shown on page 10 and 11, respectively.

Series	40G				40		
Packing Material	Modified PTFE		UHMWPE		PTFE		
Valve Size (Configuration)	41G, 42G (Straight, Angle, 3-Way); 43G (Angle, 3-Way)	43G (Straight)	41G, 42G (Straight, Angle, 3-Way); 43G (Angle, 3-Way)	43G (Straight)	41, 42 (Straight, Angle, 3-Way); 43 (Angle, 3-Way); 44, 45 (Straight)	43 (Straight)	44, 45 (Angle, 3-Way)
Temperature °F (°C)	Working Pressure, psig (bar)						
-65 (-53) to 50 (10)	2500 (172)	3000 (206)	2500 (172)	3000 (206)	—	—	—
50 (10) to 150 (65)	2500 (172)	3000 (206)	2500 (172)	3000 (206)	2500 (172) ^①	3000 (206) ^①	1500 (103) ^①
200 (93)	2500 (172)	2800 (193)	—	—	—	—	—
250 (121)	2500 (172)	2650 (182)	—	—	—	—	—
300 (148)	2500 (172)	2500 (172)	—	—	—	—	—

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

① Live-loaded PFA (all sizes) and UHMWPE (41, 42, and 43 series sizes) packing are available to extend the low-temperature rating to -65°F (-53°C). See the Swagelok *Live-Loaded 40 Series Ball Valves for Low-Temperature Service* catalog, MS-02-109.

Flow Data at 70°F (20°C)

Flow Coefficient (C _v)	Pressure Drop to Atmosphere (Δp), psi (bar)					
	10 (0.68)	50 (3.4)	100 (6.8)	10 (0.68)	50 (3.4)	100 (6.8)
	Air Flow std ft ³ /min (std L/min)			Water Flow U. S. gal/min (std L/min)		
0.05	0.6 (16)	1.5 (42)	2.6 (73)	0.1 (0.3)	0.3 (1.1)	0.5 (1.8)
0.06	0.7 (19)	1.8 (50)	3.2 (90)	0.2 (0.7)	0.4 (1.5)	0.6 (2.2)
0.07	0.8 (22)	2.1 (59)	3.7 (100)	0.2 (0.7)	0.5 (1.8)	0.7 (2.6)
0.08	0.9 (25)	2.4 (67)	4.3 (120)	0.3 (1.1)	0.6 (2.2)	0.8 (3.0)
0.10	1.1 (31)	3.0 (84)	5.3 (150)	0.3 (1.1)	0.7 (2.6)	1.0 (3.7)
0.15	1.7 (48)	4.5 (120)	8.0 (220)	0.4 (1.5)	1.0 (3.7)	1.5 (5.6)
0.20	2.3 (65)	6.0 (160)	11 (310)	0.6 (2.2)	1.4 (5.2)	2.0 (7.5)
0.30	3.4 (96)	9.0 (250)	16 (450)	0.9 (3.4)	2.1 (7.9)	3.0 (11)
0.35	4.0 (110)	10 (280)	19 (530)	1.1 (4.1)	2.4 (9.0)	3.5 (13)
0.50	5.6 (150)	15 (420)	27 (760)	1.6 (6.0)	3.5 (13)	5.0 (18)
0.60	6.8 (190)	18 (500)	32 (900)	1.9 (7.1)	4.2 (15)	6.0 (22)
0.70	7.9 (220)	21 (590)	37 (1000)	2.2 (8.3)	4.9 (18)	7.0 (26)
0.75	8.5 (240)	22 (620)	40 (1100)	2.3 (8.7)	5.3 (20)	7.5 (28)
0.80	9.0 (250)	24 (670)	42 (1100)	2.5 (9.4)	5.6 (21)	8.0 (30)
0.90	10 (280)	27 (760)	48 (1300)	2.8 (10)	6.4 (24)	9.0 (34)
1.2	14 (390)	36 (1000)	64 (1800)	3.8 (14)	8.5 (32)	12 (45)
1.4	16 (450)	42 (1100)	74 (2000)	4.4 (16)	9.9 (37)	14 (52)
1.5	17 (480)	45 (1200)	80 (2200)	4.7 (17)	11 (41)	15 (56)
1.6	18 (500)	48 (1300)	85 (2400)	5.0 (18)	11 (41)	16 (60)
1.7	19 (530)	51 (1400)	90 (2500)	5.3 (20)	12 (45)	17 (64)
2.0	22 (620)	60 (1600)	100 (2800)	6.3 (23)	14 (52)	20 (75)
2.4	27 (760)	72 (2000)	120 (3300)	7.6 (28)	17 (64)	24 (90)
2.6	29 (820)	78 (2200)	140 (3900)	8.2 (31)	18 (68)	26 (98)
3.0	34 (960)	90 (2500)	160 (4500)	9.5 (35)	21 (79)	30 (110)
3.5	39 (1100)	100 (2800)	180 (5000)	11 (41)	25 (94)	35 (130)
3.8	43 (1200)	110 (3100)	200 (5600)	12 (45)	27 (100)	38 (140)
4.6	52 (1400)	140 (3900)	240 (6700)	15 (56)	33 (120)	46 (170)
6.0	68 (1900)	180 (5000)	320 (9000)	19 (71)	42 (150)	60 (220)
6.3	71 (2000)	190 (5300)	330 (9300)	20 (75)	45 (170)	63 (230)
6.4	72 (2000)	190 (5300)	340 (9600)	20 (75)	45 (170)	64 (240)
12	130 (3600)	360 (10 000)	640 (18 000)	38 (140)	85 (320)	120 (450)

Testing

Every 40G series and 40 series ball valve is factory tested with nitrogen at 1000 psig (69 bar) or at its maximum rated pressure if less than 1000 psig (69 bar). Seat tests have a maximum allowable leak rate of 0.1 std cm³/min.

Cleaning and Packaging

All 40G series and 40 series valves are cleaned in accordance with Swagelok *Standard Cleaning and Packaging (SC-10)*, MS-06-62.

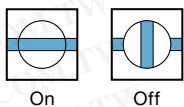
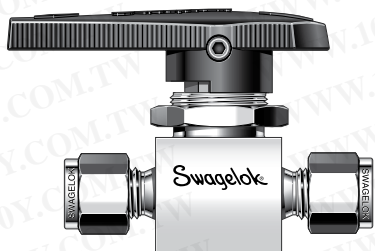
Special cleaning and packaging in accordance with Swagelok *Special Cleaning and Packaging (SC-11)*, MS-06-63, to ensure compliance with product cleanliness requirements stated in ASTM G93 Level C, is available as an option. See **Process Options**, page 22.

On-Off (2-Way) Valves

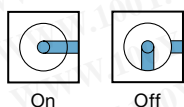
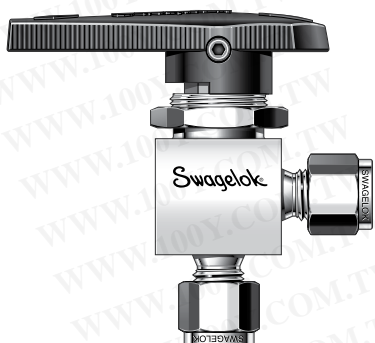
Flow Patterns

Straight and Angle Patterns for On-Off Service

Straight Pattern



Angle Pattern



Ordering Information

40G Series Valves

Select a 40G series ordering number from the **40G Series Complete Ordering Number** column, shaded blue.

Example: **SS-41GS1**

To order a valve with UHMWPE packing, insert **E** into the valve ordering number.

Example: **SS-41GES1**

40 Series Valves

Add a material designator to a 40 series basic ordering number from the **40 Series Basic Ordering Number** column, shaded gray.

Material	Valve Series	Designator
316 SS	44, 45	SS
Alloy 400	41, 42, 43, 44, 45	M
Brass	41, 42, 43, 44, 45	B

Examples: **M-42S4**
SS-44S6

Angle-Pattern Valves

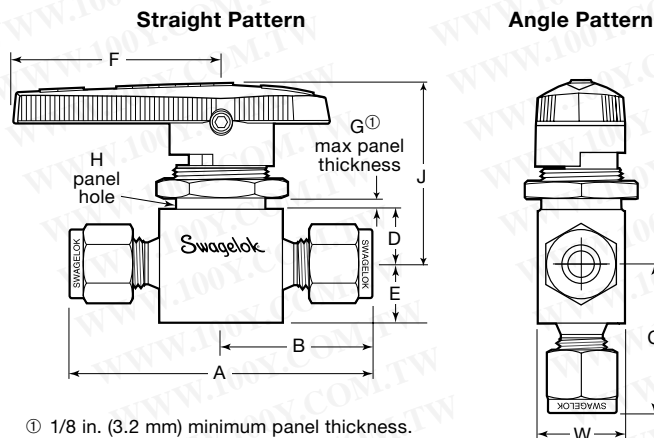
Angle-pattern valves have the same options and accessories as straight-pattern valves; the pressure-temperature ratings (page 5), flow coefficients, and dimensions are different.

To order an angle-pattern valve, add **-A** to ordering number of a valve with the **C** dimension listed.

Examples: **SS-43GS4-A**
SS-44S6-A

Dimensions

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



On-Off (2-Way) Valves

End Connections		C _v		40G Series Complete Ordering Number	40 Series Basic Ordering Number	Orifice in. (mm)	Dimensions in. (mm)									
Inlet/Outlet	Size	Straight	Angle				A	B	C	D	E	F	G	H	J	W
Fractional Swagelok tube fittings	1/16 in.	0.10	—	SS-41GS1	-41S1	0.052 (1.32)	1.68 (42.7)	0.84 (21.3)	—	0.34 (8.6)	0.28 (7.1)	1.12 (28.4)	1/4 (6.4)	19/32 (15.1)	1.36 (34.5)	0.58 (14.7)
	1/8 in.	0.20	0.15	SS-41GS2	-41S2	0.093 (2.36)	2.01 (51.1)	1.01 (25.7)	0.97 (24.6)	0.34 (8.6)	0.28 (7.1)	1.12 (28.4)	1/4 (6.4)	19/32 (15.1)	1.36 (34.5)	0.58 (14.7)
	1/4 in.	0.60	0.35	SS-42GS4	-42S4	0.125 (3.18)	2.21 (56.1)	1.10 (27.9)	1.07 (27.2)	0.34 (8.6)	0.28 (7.1)	1.12 (28.4)	1/4 (6.4)	19/32 (15.1)	1.36 (34.5)	0.58 (14.7)
		1.4	0.90	SS-43GS4	-43S4	0.187 (4.75)	2.39 (60.7)	1.20 (30.5)	1.17 (29.7)	0.44 (11.2)	0.38 (9.7)	1.53 (38.9)	3/16 (4.8)	25/32 (19.8)	1.47 (37.3)	0.78 (19.8)
	3/8 in.	1.5	0.90	SS-43GS6	-43S6	0.187 (4.75)	2.58 (65.5)	1.29 (32.8)		0.44 (11.2)	0.38 (9.7)	1.53 (38.9)	3/16 (4.8)	25/32 (19.8)	1.47 (37.3)	0.78 (19.8)
		6.0	2.0	—	-44S6	0.281 (7.14)	3.05 (77.5)	1.52 (38.6)	1.43 (36.3)	0.56 (14.2)		2.00 (50.8)	3/8 (9.5)	1 1/8 (28.6)	2.07 (52.6)	1.12 (28.4)
	1/2 in.	12	4.6	—	-45S8	0.406 (10.3)	3.92 (99.6)	1.96 (49.8)	1.74 (44.2)	0.69 (17.5)		3.00 (76.2)	3/8 (9.5)	1 1/2 (38.1)	2.43 (61.7)	1.50 (38.1)
	3/4 in.	6.4	3.8	—	-45S12	0.406 (10.3)	3.92 (99.6)	1.96 (49.8)	1.74 (44.2)	0.69 (17.5)		3.00 (76.2)	3/8 (9.5)	1 1/2 (38.1)	2.43 (61.7)	1.50 (38.1)
Metric Swagelok tube fittings	3 mm	0.20	0.15	SS-41GS3MM	-41S3MM	0.093 (2.36)	2.01 (51.1)	1.01 (25.7)	0.97 (24.6)	0.34 (8.6)	0.28 (7.1)	1.12 (28.4)	1/4 (6.4)	19/32 (15.1)	1.36 (34.5)	0.58 (14.7)
	6 mm	0.60	0.35	SS-42GS6MM	-42S6MM	0.125 (3.18)	2.21 (56.1)	1.10 (27.9)	1.07 (27.2)	0.34 (8.6)	0.28 (7.1)	1.12 (28.4)	1/4 (6.4)	19/32 (15.1)	1.36 (34.5)	0.58 (14.7)
		1.4	0.90	SS-43GS6MM	-43S6MM	0.187 (4.75)	2.39 (60.7)	1.20 (30.5)	1.17 (29.7)	0.44 (11.2)	0.38 (9.7)	1.53 (38.9)	3/16 (4.8)	25/32 (19.8)	1.47 (37.3)	0.78 (19.8)
	8 mm	1.5	0.90	SS-43GS8MM	-43S8MM	0.187 (4.75)	2.46 (62.5)	1.23 (31.2)	1.20 (30.5)	0.44 (11.2)	0.38 (9.7)	1.53 (38.9)	3/16 (4.8)	25/32 (19.8)	1.47 (37.3)	0.78 (19.8)
	10 mm	6.0	2.0	—	-44S10MM	0.281 (7.14)	3.07 (78.0)	1.53 (38.9)	1.43 (36.3)	0.56 (14.2)		2.00 (50.8)	3/8 (9.5)	1 1/8 (28.6)	2.07 (52.6)	1.12 (28.4)
	12 mm	12	4.6	—	-45S12MM	0.406 (10.3)	3.92 (99.6)	1.96 (49.8)	1.74 (44.2)	0.69 (17.5)		3.00 (76.2)	3/8 (9.5)	1 1/2 (38.1)	2.43 (61.7)	1.50 (38.1)
Female NPT	1/8 in.	0.50	0.30	SS-42GF2	-42F2	0.125 (3.18)	1.63 (41.4)	0.81 (20.6)		0.34 (8.6)	0.28 (7.1)	1.12 (28.4)	1/4 (6.4)	19/32 (15.1)	1.36 (34.5)	0.58 (14.7)
		1.2	0.70	SS-43GF2	-43F2	0.187 (4.75)	2.00 (50.8)	1.00 (25.4)		0.44 (11.2)	0.38 (9.7)	1.53 (38.9)	3/16 (4.8)	25/32 (19.8)	1.47 (37.3)	0.78 (19.8)
	1/4 in.	0.90	0.75	SS-43GF4	-43F4	0.187 (4.75)	2.06 (52.3)	1.03 (26.2)		0.44 (11.2)	0.38 (9.7)	1.53 (38.9)	3/16 (4.8)	25/32 (19.8)	1.47 (37.3)	0.78 (19.8)
		3.0	1.7	—	-44F4	0.281 (7.14)	2.50 (63.5)	1.25 (31.8)		0.56 (14.2)		2.00 (50.8)	3/8 (9.5)	1 1/8 (28.6)	2.07 (52.6)	1.12 (28.4)
	3/8 in.	2.6	1.5	—	-44F6	0.281 (7.14)	2.50 (63.5)	1.25 (31.8)		0.56 (14.2)		2.00 (50.8)	3/8 (9.5)	1 1/8 (28.6)	2.07 (52.6)	1.12 (28.4)
	1/2 in.	6.3	3.5	—	-45F8	0.406 (10.3)	3.12 (79.2)	1.56 (39.6)		0.69 (17.5)		3.00 (76.2)	3/8 (9.5)	1 1/2 (38.1)	2.43 (61.7)	1.50 (38.1)
Female ISO/BSP tapered	1/4 in.	0.90	—	SS-43GF4RT	-43F4RT	0.187 (4.75)	2.06 (52.3)	1.03 (26.2)	—	0.44 (11.2)	0.38 (9.7)	1.53 (38.9)	3/16 (4.8)	25/32 (19.8)	1.47 (37.3)	0.78 (19.8)
	3/8 in.	2.6	—	—	-44F6RT	0.281 (7.14)	2.50 (63.5)	1.25 (31.8)	—	0.56 (14.2)		2.00 (50.8)	3/8 (9.5)	1 1/8 (28.6)	2.07 (52.6)	1.12 (28.4)
	1/2 in.	6.3	—	—	-45F8RT	0.406 (10.3)	3.12 (79.2)	1.56 (39.6)	—	0.69 (17.5)		3.00 (76.2)	3/8 (9.5)	1 1/2 (38.1)	2.43 (61.7)	1.50 (38.1)
Male NPT	1/4 in.	1.2	0.75	SS-43GM4	-43M4	0.187 (4.75)	2.00 (50.8)	1.00 (25.4)	1.03 (26.2)	0.44 (11.2)	0.38 (9.7)	1.53 (38.9)	3/16 (4.8)	25/32 (19.8)	1.47 (37.3)	0.78 (19.8)
Male NPT/ Swagelok tube fitting	1/4 in.	1.6	0.75	SS-43GM4-S4	-43M4-S4	0.187 (4.75)	2.20 (55.9)	1.20 (30.5)	1.03 (26.2)	0.44 (11.2)	0.38 (9.7)	1.53 (38.9)	3/16 (4.8)	25/32 (19.8)	1.47 (37.3)	0.78 (19.8)
VCO fittings	1/4 in.	0.60	0.35	SS-42GVCO4	-42VCO4	0.125 (3.18)	1.75 (44.4)	0.88 (22.4)	0.94 (23.9)	—	—	1.12 (28.4)	1/8 (3.2)	19/32 (15.1)	1.36 (34.5)	0.78 (19.8)
		2.4	0.90	SS-43GVCO4	-43VCO4	0.187 (4.75)	1.88 (47.8)	0.94 (23.9)		0.44 (11.2)		0.38 (9.7)	1.53 (38.9)	3/16 (4.8)	25/32 (19.8)	
Integral male VCR® fittings	1/4 in.	0.60	0.35	SS-42GVCR4	-42VCR4	0.125 (3.18)	2.13 (54.1)	1.06 (26.9)	1.09 (27.7)	0.44 (11.2)	0.38 (9.7)	1.12 (28.4)	1/8 (3.2)	19/32 (15.1)	1.36 (34.5)	0.78 (19.8)
		2.4	0.90	SS-43GVCR4	-43VCR4	0.187 (4.75)	2.39 (60.7)	1.20 (30.5)	1.17 (29.7)	0.44 (11.2)	0.38 (9.7)	1.53 (38.9)	3/16 (4.8)	25/32 (19.8)	1.47 (37.3)	
	1/2 in.	6.0	—	—	-44VCR8 ^①	0.281 (7.14)	2.88 (73.2)	1.44 (36.6)	—	0.56 (14.2)		2.00 (50.8)	3/8 (9.5)	1 1/8 (28.6)	2.07 (52.6)	1.50 (38.1)
		12	—	—	-45VCR8 ^①	0.406 (10.3)	3.12 (79.2)	1.56 (39.6)	—	0.69 (17.5)		3.00 (76.2)	3/8 (9.5)	1 1/2 (38.1)	2.43 (61.7)	

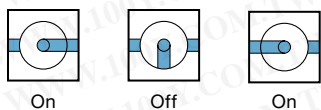
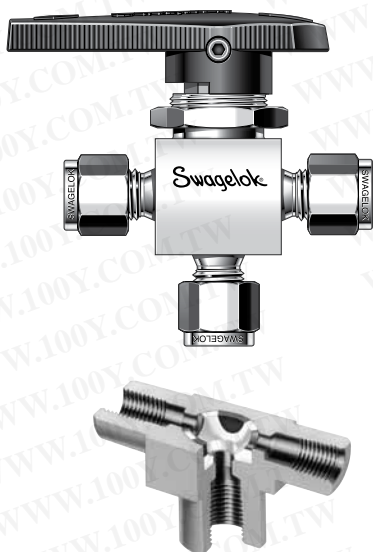
① Not recommended for panel mounting.

Switching (3-Way) Valves

Flow Pattern

On-Off Switching Service

Center-Off Position



Ordering Information

40GX Series Valves

Select a 40GX series ordering number from the **40GX Series Complete Ordering Number** column, shaded *blue*.

Example: **SS-41GXS1**

To order a valve with UHMWPE packing, insert **E** into the valve ordering number.

Example: **SS-41GXES1**

40X Series Valves

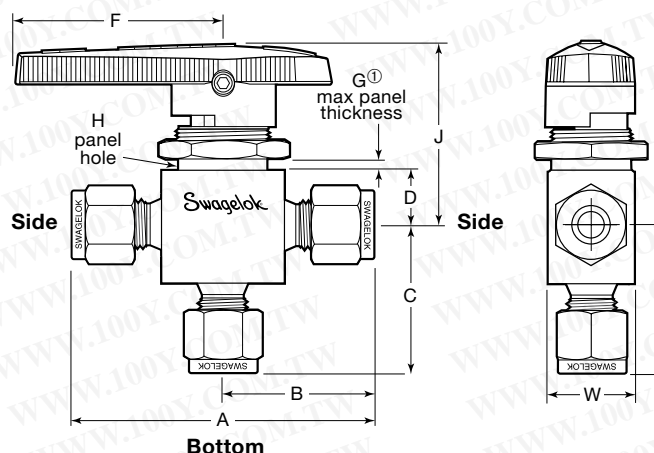
Add a material designator to a 40X series basic ordering number from the **40X Series Basic Ordering Number** column, shaded *gray*.

Material	Valve Series	Designator
316 SS	44X, 45X	SS
Alloy 400	41X, 42X, 43X, 44X, 45X	M
Brass	41X, 42X, 43X, 44X, 45X	B

Examples: **M-42XS4**
SS-44XS6

Dimensions

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



① 1/8 in. (3.2 mm) minimum panel thickness

Switching (3-Way) Valves

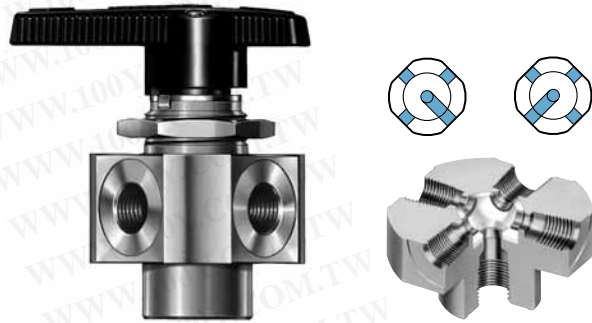
End Connections		C _v	40GX Series Complete Ordering Number	40X Series Basic Ordering Number	Orifice in. (mm)	Dimensions in. (mm)								
Side/Bottom	Size					A	B	C	D	F	G	H	J	W
Fractional Swagelok tube fittings	1/16 in.	0.08	SS-41GXS1	-41XS1	0.052 (1.32)	1.68 (42.7)	0.84 (21.3)	0.81 (20.6)	0.34 (8.6)	1.13 (28.7)	1/4 (6.4)	19/32 (15.1)	1.36 (34.5)	0.58 (14.7)
	1/8 in.	0.15	SS-41GXS2	-41XS2	0.093 (2.36)	2.01 (51.1)	1.01 (25.7)	0.97 (24.6)	0.34 (8.6)	1.13 (28.7)	1/4 (6.4)	19/32 (15.1)	1.36 (34.5)	0.58 (14.7)
	1/4 in.	0.35	SS-42GXS4	-42XS4	0.125 (3.18)	2.21 (56.1)	1.10 (27.9)	1.07 (27.2)	0.34 (8.6)	1.13 (28.7)	1/4 (6.4)	19/32 (15.1)	1.36 (34.5)	0.58 (14.7)
		0.90	SS-43GXS4	-43XS4	0.187 (4.75)	2.39 (60.7)	1.20 (30.5)	1.17 (29.7)	0.44 (11.2)	1.53 (38.9)	3/16 (4.8)	25/32 (19.8)	1.47 (37.3)	0.78 (19.8)
	3/8 in.	2.0	—	-44XS6	0.281 (7.14)	2.89 (73.4)	1.45 (36.8)	1.43 (36.3)	0.56 (14.2)	2.00 (50.8)	3/8 (9.7)	1 1/8 (28.7)	2.07 (52.6)	1.12 (28.4)
	1/2 in.	4.6	—	-45XS8	0.406 (10.3)	3.48 (88.4)	1.74 (44.2)		0.69 (17.5)	3.00 (76.2)	3/8 (9.7)	1 1/2 (38.1)	2.43 (61.7)	1.50 (38.1)
	3/4 in.	3.8	—	-45XS12	0.406 (10.3)	3.48 (88.4)	1.74 (44.2)		0.69 (17.5)	3.00 (76.2)	3/8 (9.7)	1 1/2 (38.1)	2.43 (61.7)	1.50 (38.1)
Metric Swagelok tube fittings	3 mm	0.15	SS-41GXS3MM	-41XS3MM	0.093 (2.36)	2.01 (51.1)	1.01 (25.7)	0.97 (24.6)	0.34 (8.6)	1.13 (28.7)	1/4 (6.4)	19/32 (15.1)	1.36 (34.5)	0.58 (14.7)
	6 mm	0.35	SS-42GXS6MM	-42XS6MM	0.125 (3.18)	2.21 (56.1)	1.10 (27.9)	1.07 (27.2)	0.34 (8.6)	1.13 (28.7)	1/4 (6.4)	19/32 (15.1)	1.36 (34.5)	0.58 (14.7)
		0.90	SS-43GXS6MM	-43XS6MM	0.187 (4.75)	2.39 (60.7)	1.20 (30.5)	1.17 (29.7)	0.44 (11.2)	1.53 (38.9)	3/16 (4.8)	25/32 (19.8)	1.47 (37.3)	0.78 (19.8)
	8 mm	0.80	SS-43GXS8MM	-43XS8MM	0.187 (4.75)	2.46 (62.5)	1.23 (31.2)	1.20 (30.5)	0.44 (11.2)	1.53 (38.9)	3/16 (4.8)	25/32 (19.8)	1.47 (37.3)	0.78 (19.8)
	10 mm	2.0	—	-44XS10MM	0.281 (7.14)	2.89 (73.4)	1.45 (36.8)	1.43 (36.3)	0.56 (14.2)	2.00 (50.8)	3/8 (9.7)	1 1/8 (28.7)	2.07 (52.6)	1.12 (28.4)
	12 mm	4.6	—	-45XS12MM	0.406 (10.3)	3.48 (88.4)	1.74 (44.2)		0.69 (17.5)	3.00 (76.2)	3/8 (9.7)	1 1/2 (38.1)	2.43 (61.7)	1.50 (38.1)
Female NPT	1/8 in.	0.30	SS-42GXF2	-42XF2	0.125 (3.18)	1.63 (41.4)	0.81 (20.6)		0.34 (8.6)	1.13 (28.7)	1/4 (6.4)	19/32 (15.1)	1.36 (34.5)	0.58 (14.7)
	1/4 in.	0.75	SS-43GXF4	-43XF4	0.187 (4.75)	2.06 (52.3)	1.03 (26.2)		0.44 (11.2)	1.53 (38.9)	3/16 (4.8)	25/32 (19.8)	1.47 (37.3)	0.78 (19.8)
		1.7	—	-44XF4	0.281 (7.14)	2.50 (63.5)	1.25 (31.8)		0.56 (14.2)	2.00 (50.8)	3/8 (9.7)	1 1/8 (28.7)	2.07 (52.6)	1.12 (28.4)
	3/8 in.	1.5	—	-44XF6	0.281 (7.14)	2.50 (63.5)	1.25 (31.8)		0.56 (14.2)	2.00 (50.8)	3/8 (9.7)	1 1/8 (28.7)	2.07 (52.6)	1.12 (28.4)
	1/2 in.	3.5	—	-45XF8	0.406 (10.3)	3.13 (79.5)	1.56 (39.6)		0.69 (17.5)	3.00 (76.2)	3/8 (9.7)	1 1/2 (38.1)	2.43 (61.7)	1.50 (38.1)
Female ISO/BSP tapered	1/4 in.	0.75	SS-43GXF4RT	-43XF4RT	0.187 (4.75)	2.06 (52.3)	1.03 (26.2)		0.44 (11.2)	1.53 (38.9)	3/16 (4.8)	25/32 (19.8)	1.47 (37.3)	0.78 (19.8)
	3/8 in.	1.5	—	-44XF6RT	0.281 (7.14)	2.50 (63.5)	1.25 (31.8)		0.56 (14.2)	2.00 (50.8)	3/8 (9.7)	1 1/8 (28.7)	2.07 (52.6)	1.12 (28.4)
	1/2 in.	3.5	—	-45XF8RT	0.406 (10.3)	3.13 (79.5)	1.56 (39.6)		0.69 (17.5)	3.00 (76.2)	3/8 (9.7)	1 1/2 (38.1)	2.43 (61.7)	1.50 (38.1)
Swagelok tube fittings/ Male NPT	1/4 in.	0.80	SS-43GXS4-S4-M4	-43XS4-S4-M4	0.187 (4.75)	2.39 (60.7)	1.20 (30.5)	1.03 (26.2)	0.44 (11.2)	1.53 (38.9)	3/16 (4.8)	25/32 (19.8)	1.47 (37.3)	0.78 (19.8)
Integral male VCR fittings	1/4 in.	0.35	SS-42GXVCR4	-42XVCR4	0.125 (3.18)	2.13 (54.1)	1.06 (26.9)	1.09 (27.7)	0.44 (11.2)	1.13 (28.7)	1/8 (3.2)	19/32 (15.1)	1.36 (34.5)	0.78 (19.8)
		0.90	SS-43GXVCR4	-43XVCR4	0.187 (4.75)		1.53 (38.9)	3/16 (4.8)		25/32 (19.8)	1.47 (37.3)			

Switching (5-Way and 7-Way) Valves (40 Series)

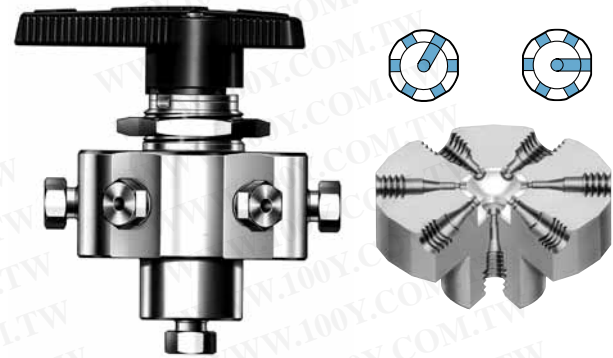
Features

- Capsule seat packing allows reliable switching.
- Flow can be switched from a single inlet to multiple outlets or from multiple inlets to a common outlet.
- 43Z and 43Z6 series valves have a spring-loaded detent for exact port positioning.
 - Detent handle components:
 - Handle: nylon with brass insert
 - Set screw: S17400 stainless steel
 - Pins, detent plate: nickel-plated steel
 - Springs: steel/ASTM A228

5-Way Valve



7-Way Valve



Pressure-Temperature Ratings

Valve Series	Temperature °F (°C)	Working Pressure psig (bar)
43Z (5-way)	50 to 150 (10 to 65) ^①	2500 (172)
45Z (5-way)		1500 (103)
43Z6 (7-way)		500 (34.4)

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

^① Live-loaded PFA (all sizes) and UHMWPE (41, 42, and 43 series sizes) packing are available to extend the low-temperature rating to -65°F (-53°C). See the Swagelok *Live-Loaded 40 Series Ball Valves for Low-Temperature Service* catalog, MS-02-109.

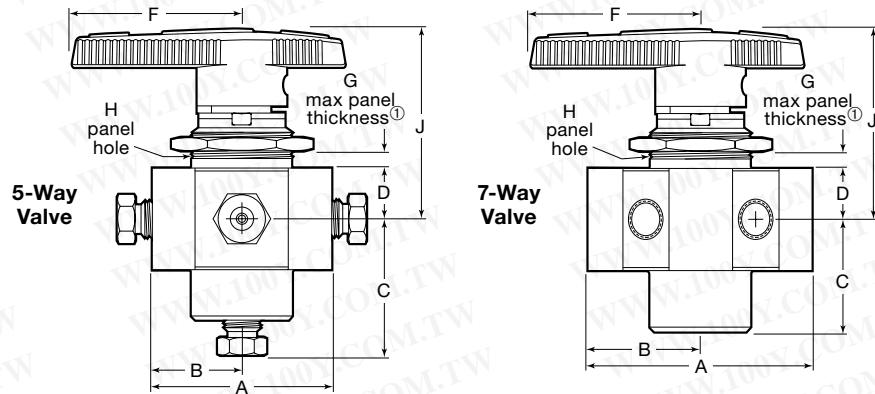
Ordering Information and Dimensions

Add a material designator to a 40 series basic ordering number.

Material	Designator
316 SS	SS
Alloy 400	M
Brass	B

Example: **SS-43ZFS2**

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



^① 1/8 in. (3.2 mm) minimum panel thickness.

End Connections	40 Series Basic Ordering Number	C _v	Orifice in. (mm)	Dimensions in. (mm)								
				Inlets/Outlets	Size	A	B	C	D	F	G	H
5-Way Valves												
Female Swagelok tube fittings	1/8 in. -43ZFS2 ^①	0.07	0.062 (1.57)	1.94 (49.3)	0.97 (24.6)	0.44 (11.2)	1.53 (38.9)	5/32 (4.1)	29/32 (23.1)	1.69 (42.9)		
Female NPT	1/8 in. -43ZF2 ^①	0.07	0.062 (1.57)	1.55 (39.4)	0.78 (19.8)	0.88 (22.4)	0.44 (11.2)	1.53 (38.9)	5/32 (4.1)	29/32 (23.1)	1.69 (42.9)	
	1/2 in. -45ZF8-ND ^②	3.5	0.406 (10.3)	3.13 (79.5)	1.56 (39.6)	0.69 (17.5)	3.00 (76.2)	3/8 (9.7)	1 1/2 (38.1)	2.43 (61.7)		
7-Way Valves												
Female Swagelok tube fittings	1/16 in. -43Z6FS1	0.05	0.052 (1.32)	1.94 (49.3)	0.97 (24.6)	0.44 (11.2)	1.53 (38.9)	5/32 (4.1)	29/32 (23.1)	1.69 (42.9)		
	1/8 in. -43Z6FS2	0.07	0.062 (1.57)	1.94 (49.3)	0.97 (24.6)	0.44 (11.2)	1.53 (38.9)	5/32 (4.1)	29/32 (23.1)	1.69 (42.9)		

^① Cross-port flow may occur during switching. If cross-port flow is unacceptable, specify a 0.049 in. ball orifice. Example: SS-43ZF2-049

^② Cross-port flow may occur during switching. If cross-port flow is unacceptable, specify a 0.093 in. ball orifice. Example: SS-45ZF8-ND-093

Crossover (4-Way and 6-Way) Valves (40 Series)

Features

- Capsule packing allows crossover of two or three streams.
- Machined stops provide positive port positioning.
 - Stop plate material: aluminum/ASTM B209 or B211.

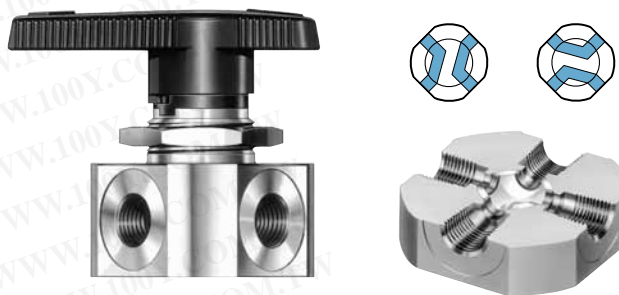
Pressure-Temperature Ratings

Valve Series	Temperature °F (°C)	Working Pressure psig (bar)
43Y (4-way)	50 to 150 (10 to 65) ^①	2500 (172)
45Y (4-way)		1500 (103)
43Y6 (6-way)		500 (34.4)

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

① Live-loaded PFA (all sizes) and UHMWPE (41, 42, and 43 series sizes) packing are available to extend the low-temperature rating to -65°F (-53°C). See the Swagelok *Live-Loaded 40 Series Ball Valves for Low-Temperature Service* catalog, MS-02-109.

4-Way Valve



6-Way Valve



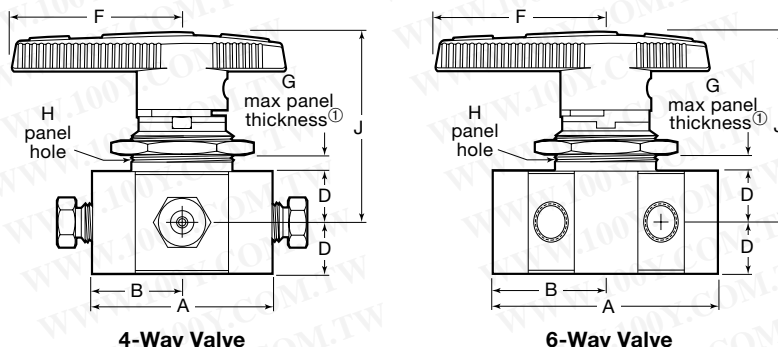
Ordering Information and Dimensions

Add a material designator to a 40 series basic ordering number.

Material	Designator
316 SS	SS
Alloy 400	M
Brass	B

Example: **SS-43YFS1**

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



① 1/8 in. (3.2 mm) minimum panel thickness.

End Connections		40 Series Basic Ordering Number	C _v	Orifice in. (mm)	Dimensions in. (mm)						
Inlets/Outlets	Size				A	B	D	F	G	H	J
4-Way Valves											
Female Swagelok tube fittings	1/16 in.	-43YFS1 ^①	0.06	0.052 (1.32)	1.55 (39.4)	0.78 (19.8)	0.44 (11.2)	1.53 (38.9)	3/16 (4.8)	29/32 (23.1)	1.68 (42.7)
	1/8 in.	-43YFS2 ^①	0.08	0.062 (1.57)	1.94 (49.3)	0.97 (24.6)	0.44 (11.2)	1.53 (38.9)	3/16 (4.8)	29/32 (23.1)	1.68 (42.7)
Female NPT	1/8 in.	-43YF2 ^①	0.08	0.062 (1.57)	1.55 (39.4)	0.78 (19.8)	0.44 (11.2)	1.53 (38.9)	3/16 (4.8)	29/32 (23.1)	1.69 (42.9)
	1/2 in.	-45YF8 ^②	1.6	0.281 (7.14)	3.13 (79.5)	1.56 (39.6)	0.69 (17.5)	3.00 (76.2)	3/8 (9.7)	1 1/2 (38.1)	2.43 (61.7)
6-Way Valves											
Female Swagelok tube fittings	1/16 in.	-43Y6FS1	0.06	0.052 (1.32)	1.94 (49.3)	0.97 (24.6)	0.44 (11.2)	1.53 (38.9)	3/16 (4.8)	29/32 (23.1)	1.68 (42.7)
	1/8 in.	-43Y6FS2	0.08	0.062 (1.57)	1.94 (49.3)	0.97 (24.6)	0.44 (11.2)	1.53 (38.9)	3/16 (4.8)	29/32 (23.1)	1.68 (42.7)

① Cross-port flow may occur during switching. If cross-port flow is unacceptable, specify a 0.049 in. ball orifice. Example: SS-43YFS2-049

② Cross-port flow may occur during switching. If cross-port flow is unacceptable, specify a 0.093 in. ball orifice. Example: SS-45YF8-093

Handle Options

Factory-Assembled Handles

Nylon Directional

Black is standard. For other colors, add a handle color designator to the valve ordering number.

Examples:
SS-43GS4-BL
B-43S4-BL

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

Nylon Oval

Add **-K** to the valve ordering number.

Examples:
SS-43GS4-K
B-43S4-K



Metal

Ideal for continuous elevated ambient temperatures

Stainless Steel Directional (40G Series)

Add **-SHD** to the valve ordering number.

Example:
SS-43GS4-SHD



316 Stainless Steel Bar

Add **-SH** to the valve ordering number.

Examples:
SS-44S6-SH
B-43S4-SH



Aluminum Bar

Add **-BKB** to the valve ordering number.

Examples:
SS-44S6-BKB
B-43S4-BKB



No Handle

Add **-NH** to the valve ordering number.

Example: SS-43GS4-NH
B-43S4-NH

See page 20 for 40G series valves with no handle and no handle stop, typically specified for valves to be field assembled to pneumatic actuators.

Handle Kits for Field Assembly

Kits include handle and set screw.

Valve Series ^①	Nylon Directional ^②	Nylon Oval ^③	Stainless Steel Directional	Stainless Steel Bar	Aluminum Bar
41G, 41GX ^④ , 42G, 42GX ^④	NY-5K-42G-BK	NY-5K-42GK-BK	SS-5K-42GPM	—	—
43G, 43GX ^④	NY-5K-43G-BK	NY-5K-43GK-BK	SS-5K-43GPM	—	—
41, 41X ^⑤ , 42, 42X ^⑤	BZ-5K-42-BK	—	—	SS-5K-42B	A-5K-42B-BK
43, 43X ^⑤ , 43Y	BZ-5K-43-BK	—	—	SS-5K-43B	A-5K-43B-BK
43Z	BZ-5K-43Z-BK	—	—	—	—
44, 44X ^⑤	BZ-5K-44-BK	—	—	SS-5K-44B	A-5K-44B-BK
45, 45X ^⑤ , 45Y	BZ-5K-45-BK	—	—	SS-5K-45B	A-5K-45B-BK

① X designates switching (3-way) valve; Y designates crossover (4-way) valve; Z designates switching (5-way) valve.

② Ordering number specifies a black handle. For another color, replace **-BK** with a handle color designator from the table above. Example: BZ-5K-42-BL

③ Nylon oval handles are only available factory assembled on 40 series valves.

④ Handle kits for 40GX series 3-way valves with **L** or **H** flow paths also require a powdered metal 300 series SS stop insert, which can be ordered separately. Use ordering numbers: **SS-5SI-42G** for 41GX and 42GX series valves; and **SS-5SI-43G** for 43GX series valves.

⑤ To order handle kits for 40X series 3-way valves with **L** or **H** flow paths, contact your authorized Swagelok sales and service representative.

Locking Brackets (41G/41, 42G/42, and 43G/43 Series)

- Allows lockout of 2-way, straight-pattern valves with directional handles in the open or closed position with a standard lock.
- Additional small-diameter hole can be used to tether locking mechanism to bracket or attach ID tag.
- Brackets cannot be used on valves with integral VCO and VCR fitting end connections or with panel mounting.

- To order the locking bracket factory-assembled on a valve, add **-LH** to the valve ordering number. Example: SS-42GS4-LH
- To order the locking bracket for field assembly, use kit ordering numbers: **SS-51K-41G-LH** for 41G/41 and 42G/42 series valves; **SS-51K-43G-LH** for 43G/43 series valves



Handle Options

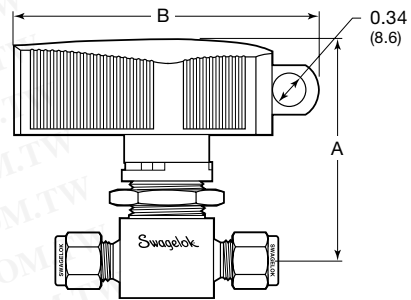
Latch-Lock Handles (43G Series; 43, 44, 45 Series)

- Lock on-off valves open and closed or closed only
- Lock switching valves at each port, (including center-off position on 3-way model)
- Lock crossover valves in both positions
- Confirm handle position with positive detent
- Assist compliance with lockout/tagout programs
- Fit padlocks with 3/16 to 5/16 in. (4.8 to 7.9 mm) shackle diameters.



Dimensions

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



Materials of Construction

Component	Material
Handle	Reinforced nylon
Locking mechanism	304 SS
Detent base, handle base, handle pin stop	Powdered metal 300 series SS
Spring	S17700 SS
Set screw	S17400 SS
Lubricant	Hydrocarbon-based

Valve Series	Type	Dimensions in. (mm)	
		A	B
43G 43GX	On-off (2-way) Switching (3-way)	2.27 (57.7)	3.02 (76.7)
43 43X 43Z	On-off (2-way) Switching (3-way) Switching (5-way)		
43Y 43Y6 43Z6	Crossover (4-way) Crossover (6-way) Switching (7-way)	2.30 (58.4)	3.02 (76.7)
44 44X	On-off (2-way) Switching (3-way)	2.63 (66.9)	3.96 (101)
45 45X 45Y	On-off (2-way) Switching (3-way) Crossover (4-way)	2.85 (72.4)	3.96 (101)

Caution: These handles are designed to prevent unintentional valve operation. They are not tamper resistant and can be removed, even when locked.

Ordering Information

Factory Assembled

- Select a 43G, 43, 44, or 45 series valve ordering number.
Example: **SS-43GS4**
- To order a valve with a black latch-lock handle, add a handle designator.
Example: **SS-43GS4-LL**
- To order a handle color other than black, add a handle color designator to the valve ordering number, keeping the handle and color designators in *alphabetical* order.
Examples: **SS-43GS4-BL-LL**
SS-43GS4-LL-RD

Kits for Field Assembly

- To order a black handle kit, select a handle kit basic ordering number.
Example: **NY-5K-43GLL-BK**
- For another handle color, replace **BK** with a handle color designator from the table at right.
Example: **NY-5K-43GLL-BL**

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

Valve Series	Type	Factory Assembly Handle Designators		Field Assembly Handle Kit Basic Ordering Numbers	
		Open/Closed	Closed Only	Open/Closed	Closed Only
43G	On-off (2-way)	-LL	-LLC	NY-5K-43GLL-BK	NY-5K-43GLLC-BK
43GX	Switching (3-way)		—	NY-5K-43GXLL-BK	—
43	On-off (2-way)	-LL	-LLC	NY-5K-43LL-BK	NY-5K-43LLC-BK
43X	Switching (3-way)		—	NY-5K-43XLL-BK	—
43Y	Crossover (4-way)		—	NY-5K-43YLL-BK	—
43Y6	Crossover (6-way)		—	NY-5K-43Y6LL-BK	—
43Z	Switching (5-way)		—	NY-5K-43ZLL-BK	—
43Z6	Switching (7-way)		—	NY-5K-43Z6LL-BK	—
44	On-off (2-way)		-LLC	NY-5K-44LL-BK	NY-5K-44LLC-BK
44X	Switching (3-way)		—	NY-5K-44XLL-BK	—
45	On-off (2-way)		-LLC	NY-5K-45LL-BK	NY-5K-45LLC-BK
45X	Switching (3-way)		—	NY-5K-45XLL-BK	—
45Y	Crossover (4-way)	—	NY-5K-45YLL-BK	—	

Vent Port and Stem Extension Options

Vented Valves

Pressure rating for vented valves is 500 psig (34.4 bar).

2-Way, Straight-Pattern Valves

When the valve is closed, the downstream port vents to atmosphere through a vent hole in the side of the valve body.

2-Way, Angle-Pattern and 3-Way Valves

When the valve is closed, the bottom port vents to atmosphere through a vent hole in the side of the valve body.

Ordering Information

To order a vented valve, insert **V** into the valve ordering number.

Example: SS-43GVS4
B-43VS4

Warning: Cross-vent flow may occur in vented valves.

To eliminate cross-vent flow, specify a smaller ball orifice. Add a designator from the table below to the valve ordering number.

Valve Series	Orifice in. (mm)	Designator
41G, 41GX, 41, 41X, 42G, 42GX, 42, 42X	0.040 (1.02)	-040
43G, 43GX, 43, 43X, 44, 44X, 45, 45X	0.049 (1.24)	-049
45, 45X	0.093 (2.36)	-093

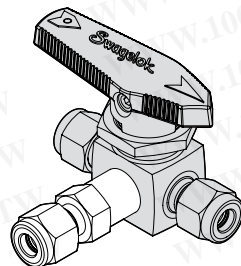
Examples: SS-41GVS1-040
B-42VS4-040

Welded Vent Port Connections

Stainless steel vented valves are available with a Swagelok tube fitting or a tube stub welded to the vent port. See the table below.

40G Series Ordering Information

To order a 40G series vented valve with a welded vent port connection, add the connection designator to the vented valve ordering number.



Swagelok Tube Fitting Connection Welded to Vent Port

Vent Port Connection	Size	Designator
Fractional Swagelok tube fitting	1/8 in.	-WVS2
	1/4 in.	-WVS4
	3/8 in.	-WVS6 ^①
Metric Swagelok tube fitting	3 mm	-WVS3M
	6 mm	-WVS6M
	8 mm	-WVS8M ^①
Fractional tube stub	1/4 × 0.049, 2 in. long	-WV4T49-2
Metric tube stub	6 × 1.0, 50 mm long	-WV6MT10-50M

^① Available for 43G series valves only.

Example: SS-43GVS4-WVS4

40 Series Ordering Information

To order a 40 series vented valve with welded vent port connection, contact your authorized Swagelok representative.

Stem Extensions (Manual Valves)

Standard lengths are 2, 4, and 6 in.

Factory Assembled

To order a factory-assembled stem extension, add the stem extension designator to the valve ordering number

Stem Extension Length, in. (mm)	Stem Extension Designator
2 (50.8)	-SE2
4 (102)	-SE4
6 (152)	-SE6

Examples: SS-43GS4-SE2
SS-44S6-SE4

Kits for Field Assembly

To order a stem extension kit for field assembly, add a dash and the stem extension length (2, 4, 6) in inches to the kit basic ordering number.

Valve Series	Stem Extension Kit Basic Ordering Number
41G, 42G	MS-SE-42G
43G	MS-SE-43G
41, 42	MS-SE-42
43	MS-SE-43
44	MS-SE-44
45	MS-SE-45

Examples: MS-SE-42G-2"
MS-SE-44-4"

Accessories

Directional Name Plates

- Indicate the direction of flow.
- Available for all 40G series and 40 series valves.
- Matte surface accepts ink or labels.

To order, add **-WN1** (blank nameplate) or **-WN2** (marked nameplate) to the valve ordering number.

Examples: SS-43GS4-WN1
B-42VS4-WN2

Directional name plate kits are also available. Contact your authorized Swagelok representative.



Pneumatic Actuators



Swagelok rack and pinion pneumatic actuators are compact, lightweight, and easily mountable. The actuators are available in spring-return and double-acting modes. Straight, angle-pattern, and 4-way valves require 90° actuation; 3-way valves require 180° actuation.

For technical data, including actuator materials of construction, air displacement, and weight, see the *Rack and Pinion Pneumatic Actuators for Swagelok Ball Valves* catalog, MS-06-87.

⚠ 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

Actuator Service	Actuator Service Designator	Temperature Range °F (°C)	Maximum Actuator Pressure, psig (bar)	
			At 100°F (37°C)	At Maximum Temperature
Standard	—	-20 to 200 (-28 to 93)	200 (13.7)	165 (11.3)
High temperature	HT	0 to 400 (-17 to 204)		100 (6.8)
Low temperature	LT	-40 to 200 (-40 to 93)		165 (11.3)
Nonfluorocarbon	NF	-20 to 200 (-28 to 93)		165 (11.3)

Actuator Pressure at Maximum System Pressure

Based on valve performance using pressurized air or nitrogen.

Valve Series ^①	Actuator Model	Actuator Model Designator	Actuation Modes			
			Spring Return		Double Acting	
			Single	Dual	Single	Dual
Minimum Actuator Pressure, psig (bar)						
41G, 42G, 41, 42	31 (90°)	-31	60 (4.2)	70 (4.9)	25 (1.8)	35 (2.5)
41GX, 42GX, 41X, 42X	51 (180°)	-51	60 (4.2)	70 (4.9)	25 (1.8)	35 (2.5)
43G, 43, 43Y	31 (90°)	-31	80 (5.6)	—	50 (3.5)	80 (5.6)
	33 (90°)	-33	65 (4.5)	75 (5.2)	20 (1.4)	35 (2.5)
43GX, 43X	51 (180°)	-51	70 (4.9)	—	50 (3.5)	80 (5.6)
	53 (180°)	-53	65 (4.5)	70 (4.9)	20 (1.4)	35 (2.5)
44	33 (90°)	-33	70 (4.9)	90 (6.3)	25 (1.8)	50 (3.5)
44X	53 (180°)	-53	70 (4.9)	80 (5.6)	25 (1.8)	50 (3.5)
45, 45Y	33 (90°)	-33	90 (6.3)	—	60 (4.2)	100 (6.9)
45X	53 (180°)	-53	85 (5.9)	—	60 (4.2)	100 (6.9)

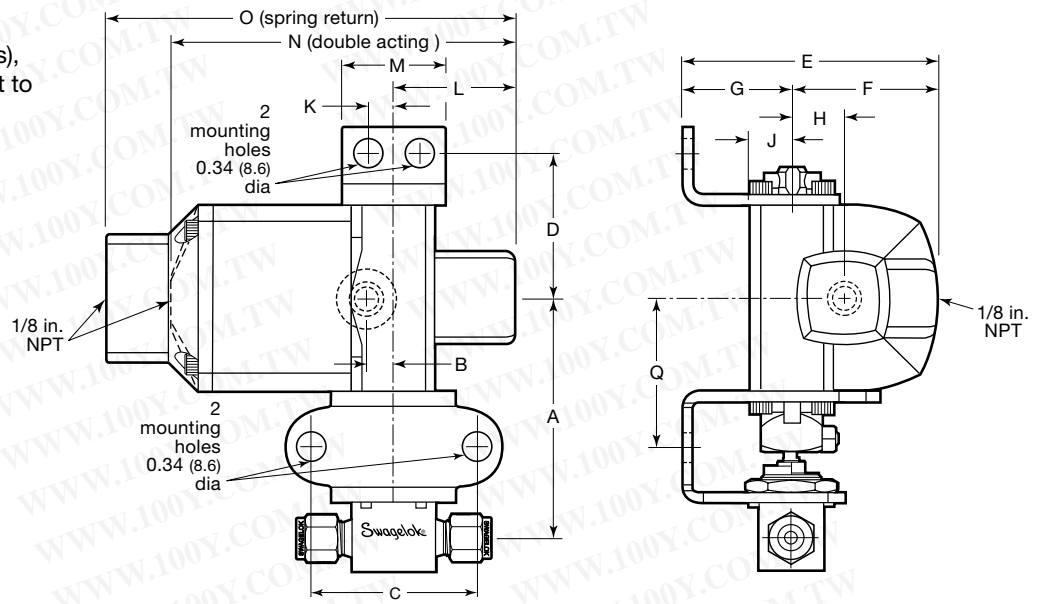
^① X designates switching (3-way) valve; Y designates crossover (4-way) valve.

See next page for **Dimensions and Ordering Information**.

Pneumatic Actuators

Dimensions

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



Valve Series ^①	Actuator Model	Dimensions, in. (mm)														
		A	B	C	D	E	F	G	H	J	K	L	M	N	O	Q
41G, 42G, 41, 42, 41GX, 42GX, 41X, 42X	31 (90°)	2.81	0.34	2.00	1.75	3.04	1.73	1.31	0.60	0.52	0.31	1.46	1.25	4.09	4.91	1.80
	51 (180°)	(71.4)	(8.6)	(50.8)	(44.5)	(77.2)	(43.9)	(33.3)	(15.2)	(13.2)	(7.9)	(37.1)	(31.8)	(104)	(125)	(45.7)
43G, 43, 43GX, 43X, 43Y	31 (90°)	2.91	0.34	2.00	1.75	3.04	1.73	1.31	0.60	0.52	0.31	1.46	1.25	4.09	4.91	1.80
	51 (180°)	(73.9)	(8.6)		(50.8)	(44.5)	(77.2)	(43.9)	(33.3)	(15.2)	(7.9)	(37.1)	(31.8)	(104)	(125)	(45.7)
	33 (90°)	3.47	0.48	2.31	2.07	2.32	1.75	0.75	0.81	0.44	2.16	1.56	5.89	7.86	2.30	
	53 (180°)	(88.1)	(12.1)	(58.7)	(103)	(58.9)	(44.5)	(19.1)	(20.6)	(11.2)	(54.9)	(39.6)	(150)	(200)	(58.4)	
44, 44X	33 (90°)	4.13	0.48	2.00	2.31	4.07	2.32	1.75	0.75	0.81	0.44	2.16	1.56	5.89	7.86	2.56
	53 (180°)	(104)	(12.1)	(50.8)	(58.7)	(103)	(58.9)	(44.5)	(19.1)	(20.6)	(11.2)	(54.9)	(39.6)	(150)	(200)	(65.0)
45, 45X, 45Y	33 (90°)	4.25	0.48	2.19	2.31	4.07	2.32	1.75	0.75	0.81	0.44	2.16	1.56	5.89	7.86	2.56
	53 (180°)	(108)	(12.1)	(55.6)	(58.7)	(103)	(58.9)	(44.5)	(19.1)	(20.6)	(11.2)	(54.9)	(39.6)	(150)	(200)	(65.0)

① X designates switching (3-way) valve; Y designates crossover (4-way) valve.

Ordering Information

Factory-Assembled Valves with Actuators

Typical Ordering Number

A **B** **C** **D**
SS - 43GS4 -31 D HT

A Valve Ordering Number

B Actuator Model

Based on valve series, select actuator designator. See **Actuator Pressure at Maximum System Pressure** table, page 15.

- 31 = 90° actuation
- 33 = 90° actuation
- 51 = 180° actuation
- 53 = 180° actuation

C Actuation Mode

- C** = Spring return, normally closed
- D** = Double acting
- O** = Spring return, normally open
- S** = Spring return, 3-way and 4-way valves

D Actuator Service

- HT** = High temperature
- LT** = Low temperature
- NF** = Nonfluorocarbon
- None** = Standard

For dual-mounted assemblies (two valves mounted to one actuator), add **DM** to the ordering number.

Example: **SS-43GS4-31DDM**

Pneumatic Actuators

Ordering Information

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-1 31 - DA -HT

A Actuator Model

Based on valve series, select actuator model. See **Dimensions** table, page 16.

- 31 = 90° actuation
- 33 = 90° actuation
- 51 = 180° actuation
- 53 = 180° actuation

B Actuation Mode

DA = Double acting
SR = Spring return

C Actuator Service

-HT = High temperature
-LT = Low temperature
-NF = Nonfluorocarbon
None = Standard

Mounting Bracket Kits

Mounting bracket kits contain:

- 316 stainless steel mounting bracket
- 420 stainless steel actuator roll pin
- Coupling
 - 40G series—304 stainless steel
 - 40 series—carbon steel
- Coupling pin
 - 40G series—S17400 stainless steel
 - 40 series—carbon steel
- Lock nut
 - 40G series—18-8 stainless steel
 - 40 series—carbon steel
- Four 18-8 stainless steel socket head cap screws (kit SS-MS-41G for 41G, 42G, 41GX, and 42GX series *only*)
- instructions.

Valve Series ^①	Actuator Model	Mounting Bracket Kit Ordering Number
41G, 42G	31 (90°)	SS-MB-41G ^②
41GX, 42GX	51 (180°)	SS-MB-41G ^②
43G	31 (90°)	SS-MB-43G
	33 (90°)	SS-MB-43G-133
43GX	51 (180°)	SS-MB-43G
	53 (180°)	SS-MB-43G-133
41, 42	31 (90°)	MS-MB-41 ^②
41X, 42X	51 (180°)	MS-MB-41 ^②
43	31 (90°)	MS-MB-43
	33 (90°)	MS-MB-43-133
43X	51 (180°)	MS-MB-43
	53 (180°)	MS-MB-43-133
43Y	31 (90°)	MS-MB-43Y
	33 (90°)	MS-MB-43Y-133
44	33 (90°)	MS-MB-44 ^③
44X	53 (180°)	MS-MB-44 ^③
45	33 (90°)	MS-MB-45
45X	53 (180°)	MS-MB-45
45Y	33 (90°)	MS-MB-45Y

^① **X** designates switching (3-way) valve; **Y** designates crossover (4-way) valve.

^② 42G series and 42 series valves with VCO or VCR end connections mounted to a Swagelok pneumatic actuator are only available factory assembled.

^③ 44 series valves with VCR end connections require kit **MS-MB-44-VCR**.

Coupling Kits

Coupling kits enable replacement of 41, 42, or 43 series valves mounted to Swagelok pneumatic actuators with equivalent 41G, 42G, or 43G series valves. Coupling kits contain:

- 304 stainless steel coupling
- S17400 stainless steel coupling pin
- 18-8 stainless steel lock nut
- instructions.

Valve Series ^①	Actuator Model	Coupling Kit Ordering Number
41G, 42G	31 (90°)	304-5K-41G-131
41GX, 42GX	51 (180°)	304-5K-41G-131
43G	31 (90°)	304-5K-43G-131
	33 (90°)	304-5K-43G-133
43GX	51 (180°)	304-5K-43G-131
	53 (180°)	304-5K-43G-133

^① **X** designates switching (3-way) valve; **Y** designates crossover (4-way) valve.

ISO 5211-Compliant Pneumatic Actuators



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)

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. Straight and angle-pattern valves require 90° actuation; 3-way valves require 180° actuation.

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

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

Minimum Actuator Pressure

Valve Series ^①	Actuator Model	Actuator Model Designator	Actuation Modes	
			Spring Return	Double Acting
			Minimum Actuator Pressure psig (bar)	
41G, 42G, 41, 42	A10 (90°)	-A10	50 (3.5)	36 (2.5)
	A15 (90°)	-A15	36 (2.5)	36 (2.5)
41GX, 42GX, 41X, 42X	A15 (180°)	-A15	—	36 (2.5)
43G, 43	A10 (90°)	-A10	—	43 (3.0)
	A15 (90°)	-A15	43 (3.0)	36 (2.5)
43GX, 43X	A15 (180°)	-A15	—	36 (2.5)
44	A10 (90°)	-A10	—	50 (3.5)
	A15 (90°)	-A15	50 (3.5)	36 (2.5)
44X	A15 (180°)	-A15	—	36 (2.5)
45	A30 (90°)	-A30	65 (4.5)	36 (2.5)
45X	A30 (180°)	-A30	—	36 (2.5)

① X designates switching (3-way) valve.

Certifications

Factory-assembled valve assemblies with ISO 5211-compliant actuators are available with ATEX conformity on request at the time of order quotation. ATEX certification is not available for field assemblies.

*For field assembly to ISO 5211-compliant actuators, 40 series valves must contain a two-flat, K-style stem. To order a 40 series valve with a K-style stem and no handle, add **-K-NH** to the valve ordering number.*

Example: B-43S4-K-NH

Standard 40G series valves are assembled with a two-flat stem.

⚠ 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 D
SS - 43GS4 -A15 D HT

A Valve Ordering Number

B Actuator Model

Based on valve series, select actuator designator. See **Minimum Actuator Pressure** table, page 18.

- A10 = A10
- A15 = A15
- A30 = A30

C Actuation Mode

- C3** = Normally closed, spring return (41G, 42G, 43G, 41, 42, 43 series 2-way valves with A15 and A30 actuators)
- O3** = Normally open, spring return (41G, 42G, 43G, 41, 42, 43 series 2-way valves with A15 and A30 actuators)
- C4** = Normally closed, spring return (41G, 41 series 2-way valves with A10 actuator; 44, 45 series 2-way valves)
- O4** = Normally open, spring return (41G, 41 series 2-way valves with A10 actuator; 44, 45 series 2-way valves)
- D** = Double acting (2-way valves)
- XD** = Double acting (3-way valves)
- S3** = Spring return (all 3-way valves with H and L flow paths)

D 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 D
MS - A15 - DA - DIN -HT

A Actuator Model

Based on valve series, select actuator designator. See **Minimum Actuator Pressure** table, page 18.

- A10** = A10
- A15** = A15
- A30** = A30

B Actuation Mode

- DA** = Double acting (2-way valves)
- XDA** = Double acting (3-way valves)
- 3** = Spring return

D Actuator Service

- HT** = High temperature
- None** = Standard

C Coupling Drive Type

DIN

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 316 SS)
- Coupling
 - 40G series—powdered metal
 - 300 series stainless steel
 - 40 series—316 stainless steel
- A4 stainless steel set screw
- Instructions

Valve Series ^①	Mounting Bracket Kit Ordering Number
41G, 41GX, 42G, 42GX	SS-MB-41G-F04-11DIN-M ^②
43G, 43GX	SS-MB-43G-F04-11DIN-M
41, 41X, 42, 42X	SS-MB-41-F04-11DIN-M ^②
43, 43X	SS-MB-43-F04-11DIN-M
44, 44X	SS-MB-44-F04-11DIN-M
45, 45X	SS-MB-45-F05-14DIN-M

^① X designates switching (3-way) valve.

^② 42G series and 42 series valves with VCO or VCR end connections mounted to a Swagelok ISO 5211-compliant pneumatic actuator are only available factory assembled.

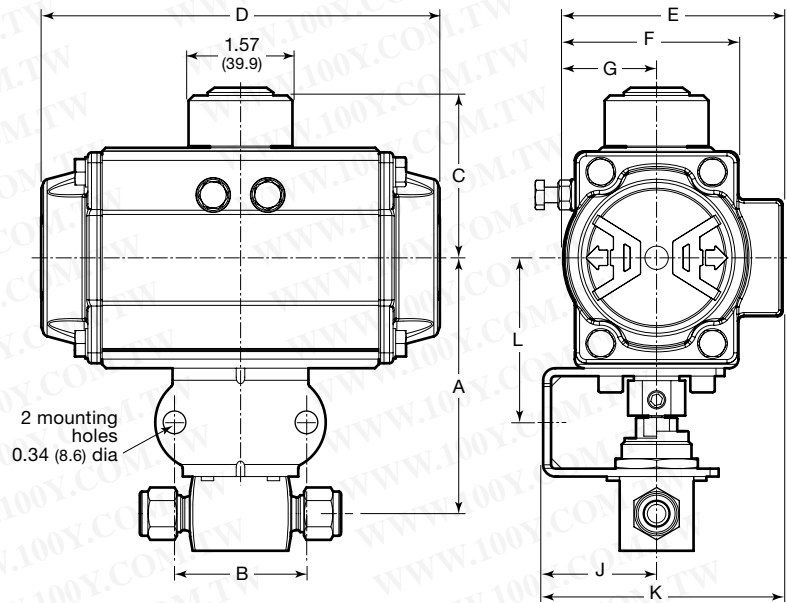
Couplings and Set Screws

Replacement of 41, 42, or 43 series valves mounted to ISO 5211-compliant pneumatic actuators with equivalent 41G, 42G, or 43G series valves requires new couplings and set screws. To order, contact your authorized Swagelok representative.

ISO 5211-Compliant Pneumatic Actuators

Dimensions

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



Valve Series ^①	Actuator Model	Dimensions, in. (mm)									
		A	B	C	D	E	F	G	J	K	L
41G, 42G, 41, 42	A10 (90°)	2.99 (75.9)	2.00 (50.8)	2.09 (53.1)	4.65 (118)	2.44 (62.0)	2.09 (53.1)	1.04 (26.4)	1.44 (36.6)	2.84 (72.1)	1.97 (50.0)
	A15 (90°)	3.05 (77.5)	2.00 (50.8)	2.15 (54.6)	5.33 (135)	2.80 (71.1)	2.24 (56.9)	1.14 (29.0)	1.44 (36.6)	3.09 (78.5)	2.03 (51.6)
41GX, 42GX, 41X, 42X	A15 (180°)	3.05 (77.5)	2.00 (50.8)	2.15 (54.6)	7.55 (192)	2.80 (71.1)	2.24 (56.9)	1.14 (29.0)	1.44 (36.6)	3.09 (78.5)	2.03 (51.6)
43G, 43	A10 (90°)	3.06 (77.7)	2.00 (50.8)	2.09 (53.1)	4.65 (118)	2.44 (62.0)	2.09 (53.1)	1.04 (26.4)	1.44 (36.6)	2.84 (72.1)	1.96 (49.8)
	A15 (90°)	3.12 (79.2)	2.00 (50.8)	2.15 (54.6)	5.33 (135)	2.80 (71.1)	2.24 (56.9)	1.14 (29.0)	1.44 (36.6)	3.09 (78.5)	2.02 (51.3)
43GX, 43X	A15 (180°)	3.12 (79.2)	2.00 (50.8)	2.15 (54.6)	7.55 (192)	2.80 (71.1)	2.24 (56.9)	1.14 (29.0)	1.44 (36.6)	3.09 (78.5)	2.02 (51.3)
44	A10 (90°)	3.50 (88.9)	2.00 (50.8)	2.09 (53.1)	4.65 (118)	2.44 (62.0)	2.09 (53.1)	1.04 (26.4)	1.44 (36.6)	2.84 (72.1)	2.12 (53.8)
	A15 (90°)	3.56 (90.4)	2.00 (50.8)	2.15 (54.6)	5.33 (135)	2.80 (71.1)	2.24 (56.9)	1.14 (29.0)	1.44 (36.6)	3.09 (78.5)	2.18 (55.4)
44X	A15 (180°)	3.56 (90.4)	2.00 (50.8)	2.15 (54.6)	7.55 (192)	2.80 (71.1)	2.24 (56.9)	1.14 (29.0)	1.44 (36.6)	3.09 (78.5)	2.18 (55.4)
45	A30 (90°)	4.20 (107)	2.19 (55.6)	2.46 (62.5)	6.04 (153)	3.33 (84.6)	2.66 (67.6)	1.42 (36.1)	1.72 (43.7)	3.63 (92.2)	2.59 (65.8)
45X	A30 (180°)	4.20 (107)	2.19 (55.6)	2.46 (62.5)	8.50 (216)	3.33 (84.6)	2.66 (67.6)	1.42 (36.1)	1.72 (43.7)	3.63 (92.2)	2.59 (65.8)

① X designates switching (3-way) valve.

Options for Pneumatic Actuators

For Field Assembly or Factory Assembly

■ Solenoid Valves

attach to the actuator to create an electropneumatically actuated ball valve assembly. For more information, see the Swagelok *Solenoid Valves for Electropneumatically Actuated Ball Valves* catalog, MS-02-41.

■ Position Indicators

provide visual status of a valve. For more information, contact your authorized Swagelok representative.

■ 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). For more information, see the Swagelok *Limit Switches* catalog, MS-06-39.

■ Valve with No Handle Stop and No Handle (40G Series)

provides increased accessibility to packing bolt.

To order, add **-NHS** to the valve ordering number.

Example: SS-43GS4-NHS

For more information on actuator options, contact your authorized Swagelok representative.

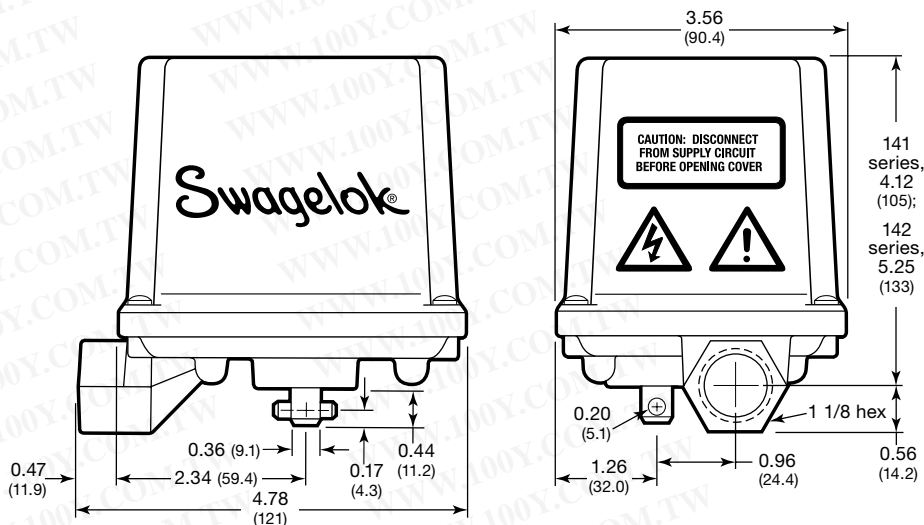
Electric Actuators



Swagelok electric actuators can be used to control the position of Swagelok instrumentation ball valves; alternating- and direct-current models are available. An electrical signal is used to change valve position from remote locations. Integral limit switches provide an output signal of the valve position, even between positions. The drive shaft of these actuators rotates in one direction.

Dimensions

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



See the Swagelok *Electric Actuators* catalog, MS-01-35, for features, testing, materials of construction, technical data, and dimensions.

Electric actuators are not available on angle-pattern valves and vented valves.

⚠ DO NOT USE THESE ACTUATORS ON VENTED BALL VALVES. THE DRIVE SHAFT OF THESE ACTUATORS ROTATES IN ONE DIRECTION.

⚠ Not CE marked.

Ordering Information

Factory-Assembled Valve and Actuator

- Choose the actuator series that corresponds with the selected valve series.

Valve Series ^①	Actuator Series
41G, 41GX, 42G, 42GX, 41, 41X, 42, 42X	141
43G, 43GX, 43, 43X, 44, 44X	142

^① X designates switching (3-way) valve.

Example: A **41G** series valve requires a **141** series actuator.

- See the **Actuator Specifications** table in the Swagelok *Electric Actuators* catalog, MS-01-35. Based on the actuator series, select the preferred voltage/frequency/conduit connection for the required actuator.
Example: **120 V (ac)/60 Hz/1/2 in. NPT**
- Identify the valve flow path.
Example: **2-way**
- Add the actuator designator to the valve ordering number.
Example: **SS-41GS2-41AC**

Actuator Kits for Field Assembly

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

- Identify the valve series.
- Follow steps 1 through 3 in the **Factory-Assembled Valve and Actuator** ordering information.
- Replace the dash in the actuator designator with **MS-1**.
Example: **MS-141AC**
- Select the mounting bracket kit ordering number from the table below. Kits include mounting brackets, cap screws, coupling, and instructions.

Valve Series ^①	Mounting Bracket Kit Ordering Number
41G, 41GX, 42G, 42GX	SS-MB-41G ^②
43G, 43GX	SS-MB-43G
41, 41X, 42, 42X	MS-MB-41 ^②
43, 43X	MS-MB-43
44, 44X	MS-MB-44-131

^① X designates switching (3-way) valve.

^② 42G series and 42 series valves with VCO or VCR end connections mounted to a Swagelok electric actuator are only available factory assembled.

Process Options

Production Tests

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

Examples: SS-43GS4-**PT**
B-43S4-**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	40G series—valves are hydrostatically tested with deionized water at 1.5 times the rated pressure of the valve. No visible leakage is permitted. 40 series—valves are hydrostatically tested with deionized water at the rated pressure of the valve. No visible leakage is permitted.
-W31	Valves are helium leak tested at a pressure of 1×10^{-4} Torr. The maximum allowable leak rate is 4×10^{-9} std cm ³ /s.

Special Cleaning and Packaging (SC-11)

40G series and 40 series valves are available with optional cleaning and packaging in accordance with Swagelok *Special Cleaning and Packaging (SC-11)*, MS-06-63, to ensure compliance with product cleanliness requirements stated in ASTM G93 Level C.

40G Series

Special cleaning of 40G series valves changes the low-temperature rating from -65°F (-53°C) to -30°F (-34°C).

40 Series

Special cleaning of 40 series valves does not affect the temperature rating.

Ordering Information

To order, add **-SC11** to the valve ordering number.

Examples: SS-43GS4-**SC11**
B-43S4-**SC11**

Oxygen Service Hazards

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

Valves Assembled Without Lubrication

40G series and 40 series ball valves assembled without lubrication are cleaned and packaged in accordance with Swagelok *Special Cleaning and Packaging (SC-11)*, MS-06-63.

40G Series

40G series valves assembled without lubrication have a pressure rating of 500 psig (34.4 bar).

40 Series

40 series valves assembled without lubrication have a pressure rating of 200 psig (13.7 bar). Brass valves are assembled with stainless steel rings, discs, and ball stem.

Ordering Information

To order, add **-1466** to the valve ordering number.

Examples: SS-43GS4-**1466**
B-43S4-**1466**

⚠ 44 and 45 series valves assembled without lubrication have a significantly higher actuation torque than valves assembled with lubrication.

Service Options

Low-Temperature Service

40G Series

The standard 40G series valve low-temperature rating is -65°F (-53°C).

40 Series

Live-loaded PFA (all sizes) and UHMWPE (41, 42, and 43 series sizes) packing are available to extend the low-temperature rating to -65°F (-53°C). See the Swagelok *Live-Loaded 40 Series Ball Valves for Low-Temperature Service* catalog, MS-02-109.

Sour Gas Service

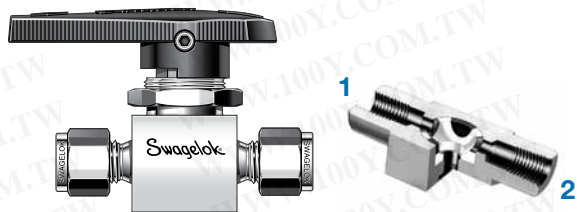
40G series and 40 series valves for sour gas service are available. Materials are selected in accordance with NACE MR0175/ISO 15156.

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

Examples: SS-42GF2-**SG**
SS-44F4-**SG**

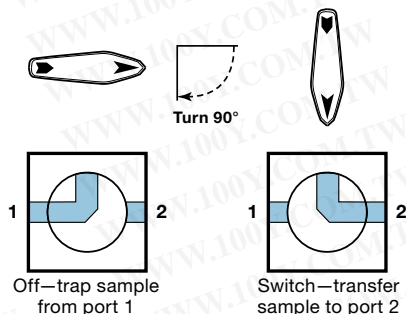
Flow Path Options

Two-Port Paths



L Flow Path

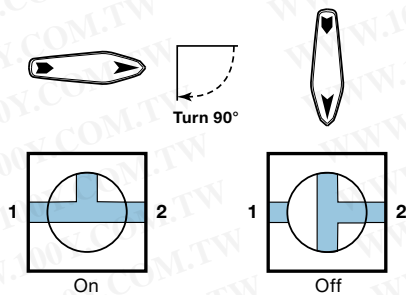
Angle porting can transfer a sample from port 1 to port 2.



Valve Series	Orifice in. (mm)	Approx Ball Volume in. ³ (cm ³)	Pressure Rating psig (bar)	Flow Path Designator
41G, 41	0.040 (1.02)	0.0004 (0.007)	2500 (172)	L
42G, 42	0.047 (1.19)	0.0005 (0.008)		
43G	0.062 (1.57)	0.0012 (0.020)		
43	0.062 (1.57)	0.0013 (0.021)		
44	0.125 (3.18)	0.0073 (0.120)	1500 (103)	
45	0.281 (7.14)	0.0473 (0.775)		

HL Flow Path

Tee porting is used for inline, on-off service when fluid must not be trapped in the stem cavity. System fluid can be evacuated through port 2 when the valve is in the off position.



Valve Series	Orifice in. (mm)	Pressure Rating psig (bar)	Flow Path Designator
41G, 41	0.093 (2.36)	2500 (172)	HL
42G, 42	0.125 (3.18)		
43G, 43	0.187 (4.75)		
44	0.281 (7.14)	1500 (103)	
45	0.406 (10.3)		

Warning: Cross-port flow may occur in two- and three-port valves with L and HL flow paths and orifices larger than 0.049 in. (1.24 mm).

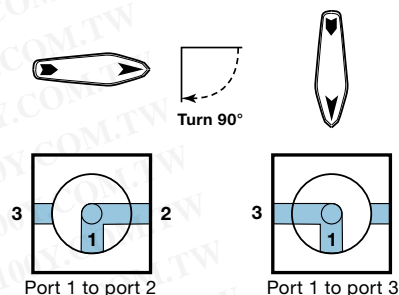
To eliminate cross-port flow, specify a smaller orifice. See **Ordering Information**, page 26.

Three-Port Paths



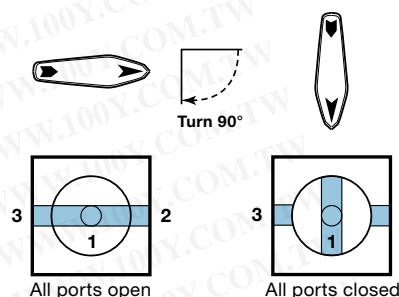
L Flow Path

Angle porting allows switching of port 1 to port 2 or port 1 to port 3 when the handle is rotated 90°. THERE IS NO OFF POSITION.

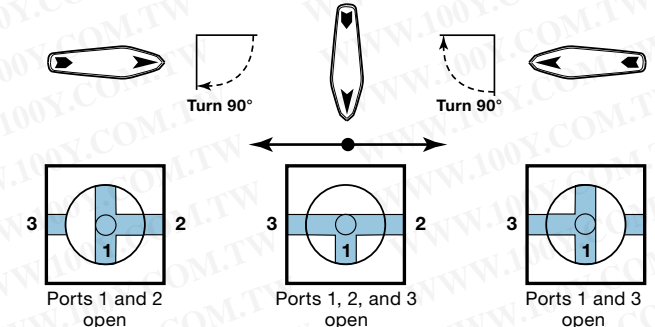


H Flow Path

Tee porting with a leg to the bottom port (port 1) allows ports 1, 2, and 3 to be open or closed at the same time.



HL Flow Path

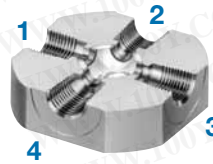


Tee porting with a leg to the bottom port (port 1) enables selection of ports 1 and 2; 1 and 3; or 1, 2, and 3. THERE IS NO OFF POSITION.

Valve Series	Orifice in. (mm)	Pressure Rating psig (bar)	Flow Path Designator
41GX, 41X	0.093 (2.36)	2500 (172)	L = Angle H = Tee (all ports open or closed) HL = Tee (no off position)
42GX, 42X	0.125 (3.18)		
43GX, 43X	0.187 (4.75)		
44X	0.281 (7.14)	1500 (103)	
45X	0.406 (10.3)		

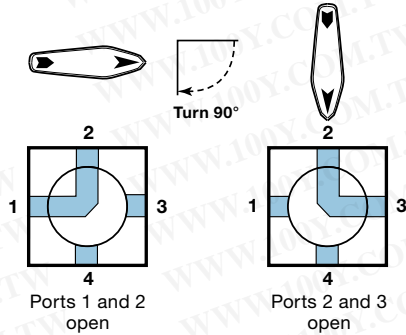
Flow Path Options (40 Series)

Four-Port Paths

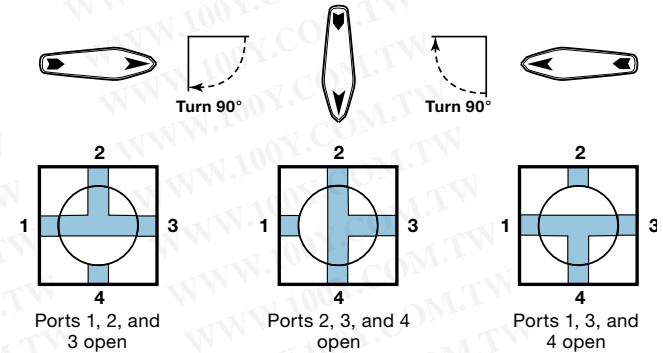


L Flow Path

Angle porting provided with four ports and 360° handle rotation; two adjacent ports are connected and the other two are closed.

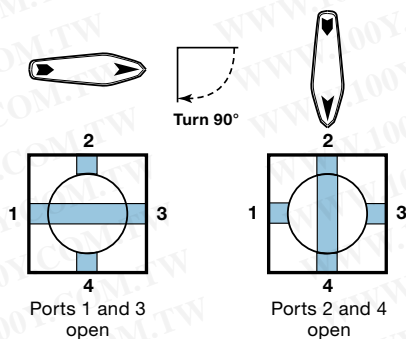


HL Flow Path



H Flow Path

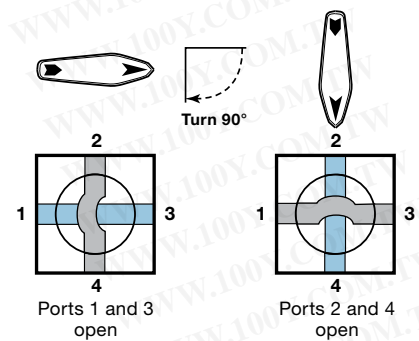
Straight-pattern porting can switch two streams on and off alternately or transfer a sample from ports 1 and 3 to ports 2 and 4.



Tee porting provided with four ports and 360° rotation of the handle; three adjacent ports can be connected at the same time and the remaining port is off.

HH Flow Path

Crossover ports allow continuous flow through ports 1 and 3 and continuous flow through ports 2 and 4.



Valve Series	Orifice in. (mm)	Pressure Rating psig (bar)	Flow Path Designator
43Y	0.062 (1.57)	2500 (172)	L = Angle H = Straight
45Y	L, H, HL: 0.281 (7.14) HH: 0.161 (4.09)	1500 (103)	HL = Tee HH = Crossover

Warning: Cross-port flow may occur in four-port valves.

To eliminate cross-port flow, specify a smaller orifice. See **Ordering Information**, page 26.

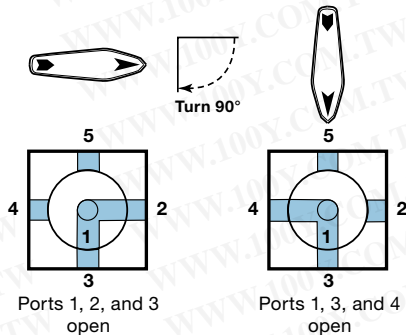
Flow Path Options (40 Series)

Five-Port Paths



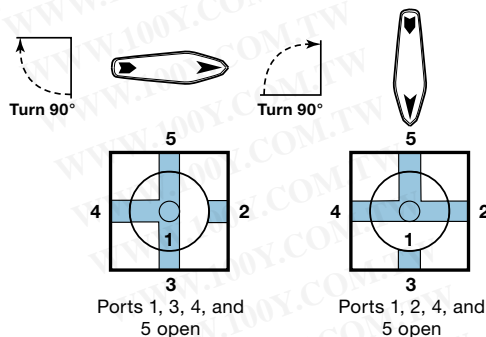
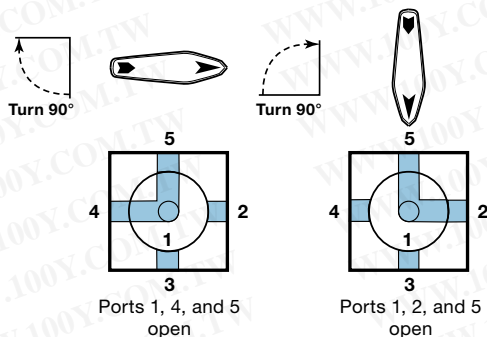
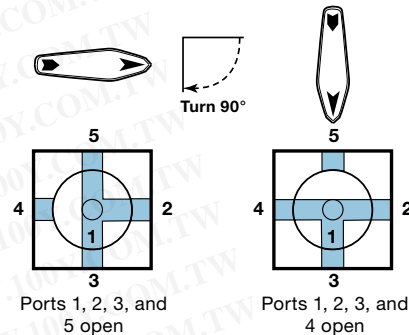
L Flow Path

Angle porting with a leg to the bottom port (port 1) allows two adjacent side ports to be open and the remaining two side ports to be closed. Switching can be done in 90° increments with 360° handle rotation.



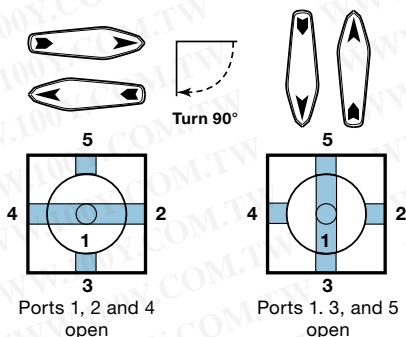
HL Flow Path

Tee porting in the ball with a leg to the bottom port (port 1) permits three side ports to be open while the fourth side port is closed. Switching can be done in 90° increments with 360° handle rotation.



H Flow Path

Tee porting in the ball with a leg to the bottom port (port 1) allows selection of ports 2 and 4 or 3 and 5 with 360° handle rotation.



Valve Series	Orifice in. (mm)	Pressure Rating psig (bar)	Flow Path Designator
43Z	0.062 (1.57)	2500 (172)	L = Angle
45Z	0.281 (7.14)	1500 (103)	H = Tee (2 ports close) HL = Tee (1 port closes)

Warning: Cross-port flow may occur in five-port valves.

To eliminate cross-port flow, specify a smaller orifice. See **Ordering Information**, page 26.

Flow Path Options

Ordering Information

40G Series

Two- and three-port flow paths are available. Insert a flow path designator into a 40G series ordering number as shown.

Examples: SS-41GLS2 for a two-port 41G series valve with **L** flow path
 SS-43GXHLS4 for a three-port 43G series valve with **HL** flow path

40 Series

Two- and three-port paths are available for brass and alloy 400 valves. Four- and five-port paths are available for stainless steel, brass, and alloy 400 valves.

Add a material designator and insert a flow path designator into a 40 series basic ordering number as shown.

Examples: **B**-41LS2 for a brass two-port 41 series valve with **L** flow path
SS-44XHS6 for a stainless steel three-port 44 series valve with **H** flow path

Material	Valve Series	Designator
316 SS	43Y, 43Z, 44, 44X, 45, 45X, 45Y, 45Z	SS
Alloy 400	41, 41X, 42, 42X, 43, 43X, 43Y, 43Z, 44, 44X, 45, 45X, 45Y, 45Z	M
Brass	41, 41X, 42, 42X, 43, 43X, 43Y, 43Z, 44, 44X, 45, 45X, 45Y, 45Z	B

Warning: Cross-port flow may occur in some sizes and flow paths.

To eliminate cross-port flow, specify an orifice of:

- 0.049 in. for 41G, 42G, 43G, 41, 42, and 43 series valves whose standard orifice is larger than 0.049 in. (1.24 mm).

Examples: SS-43GHLS4-**049**
 B-43XLS4-**049**

- 0.093 in. for 44 and 45 series valves whose standard orifice is larger than 0.093 in. (2.36 mm).

Examples: SS-44LS6-**093**
 SS-45YHS8-**093**

Ordering Multiple Options and Accessories

Swagelok 40G series and 40 series instrumentation ball valves are available with a wide variety of options and accessories that enable valve configurations customized to meet specific system requirements. Just insert or add designators as shown.

Typical Ordering Number

1 **2** **3** **4** **5** **6** **7**
SS - 43G E V L S4 -LL-RD

1 Body Material

- B** = Brass (40 series only)
- M** = Alloy 400 (40 series only)
- SS** = 316 stainless steel (40G series, 44 series, 45 series)

2 Valve Series

On-Off (2-Way) (page 6)

- 41G, 42G, 43G,
- 41, 42, 43, 44, 45

Switching (3-Way) (page 8)

- 41GX, 42GX, 43GX,
- 41X, 42X, 43X, 44X, 45X

Switching (5-Way) (page 10)

- 43Z, 45Z

Switching (7-Way) (page 10)

- 43Z6

Crossover (4-Way) (page 11)

- 43Y, 45Y

Crossover (6-Way) (page 11)

- 43Y6

3 Packing Material

40G Series

- E** = UHMWPE
- None** = modified PTFE

40 Series

- None** = PTFE

4 Optional Vent Port

- V** = Vent port (page 14)

5 Optional Flow Path

- H, L, HH, HL** (page 23)

6 End Connections, Size

Swagelok Tube Fittings

Fractional, in.

- S1** = 1/16
- S2** = 1/8
- S4** = 1/4
- S6** = 3/8
- S8** = 1/2
- S12** = 3/4

Metric, mm

- S3MM** = 3
- S6MM** = 6
- S8MM** = 8
- S10MM** = 10
- S12MM** = 12

Female NPT

- F2** = 1/8 in.
- F4** = 1/4 in.
- F6** = 3/8 in.
- F8** = 1/2 in.

Female ISO/BSP Tapered

- F4RT** = 1/4 in.
- F6RT** = 3/8 in.
- F8RT** = 1/2 in.

Male NPT

- M4** = 1/4 in.

Male NPT to Swagelok Tube Fitting

- M4-S4** = 1/4 in.

VCO Fittings

- VCO4** = 1/4 in.

Integral Male VCR Fittings

- VCR4** = 1/4 in.
- VCR8** = 1/2 in.

7 Options and Accessories

Add multiple designators in *alphanumeric* order. Not all options available for all valves. See pages cited below.

- A** = Angle-pattern body (page 6)
- BL, -GR, -OG, -RD, -YW** = Nylon directional handle colors (page 12)
- K, -SHD, -SH, -BKB, -NH, -NHS, -LH, -LL, -LLC** = Handle options (pages 12 and 20)
- WVS2, -WVS4, . . . -WVS8M** = Swagelok tube fitting vent port connections (page 14)
- WV4T49-2, -WV6MT10-50M** = Tube stub vent port connections (page 14)
- SE2, -SE4, -SE6** = Stem extensions (page 14)
- WN1, -WN2** = Directional name plates (page 14)
- PT, -W20, -W31** = Production tests (page 22)
- SC11** = Special cleaning and packaging (page 22)
- 1466** = No lubrication/special cleaning and packaging (page 22)

Example Ordering Numbers

SS-43GEVS4-LL-PT-RD

for a 43G series valve with:

- UHMWPE packing
- vent port
- 1/4 in. Swagelok tube fitting end connections
- red latch-lock handle
- testing to a customer-specified pressure

SS-44XLF6-SH-WN1-1466

for a 3-way 44 series valve with:

- L flow path
- 3/8 in. female NPT end connections
- 316 stainless steel bar handle
- blank directional nameplate
- assembly without lubrication

勝特力材料 886-3-5753170
勝特力电子(上海) 86-21-34970699
勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

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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