

Swagelok® Ball Valve Actuation Options



- Rack and pinion pneumatic actuators, solenoid valves, and limit switches
- ISO 5211-compliant pneumatic actuators, solenoid valves, limit switches, and position sensors
- Complete actuated assemblies and kits for field assembly available

Contents

Swagelok Ball Valve Actuation Options	2
Ordering Multiple Ball Valve Actuation Options	2
Swagelok 130 and 150 Series Pneumatic Actuators	3
Solenoid Valves for Swagelok 130 and 150 Series Pneumatic Actuators	5
Limit Switches for Swagelok 130 and 150 Series Pneumatic Actuators	7
Swagelok ISO 5211-Compliant Pneumatic Actuators	10
Solenoid Valves for Swagelok ISO 5211-Compliant Pneumatic Actuators	12
Limit Switches for Swagelok ISO 5211-Compliant Pneumatic Actuators	14
Position Sensors for Swagelok ISO 5211-Compliant Pneumatic Actuators	16

Swagelok Ball Valve Actuation Options

Swagelok offers a range of accessories to enhance instrumentation and process ball valve performance and control, including pneumatic actuators, solenoid valves, limit switches, and position sensors.

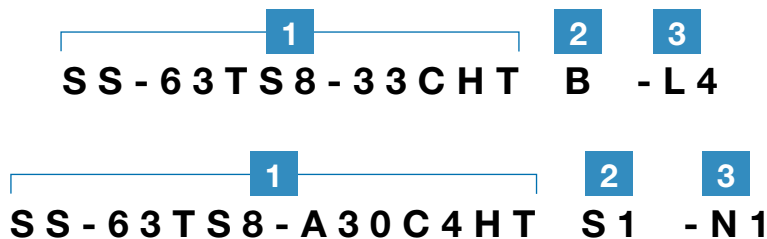
- **Pneumatic actuators** are available in both our standard 130 and 150 series rack and pinion models and in our ISO 5211-compliant models.
 - **Solenoid valves** attach to the actuator to create an electropneumatically actuated assembly.
 - **Limit switches** indicate actuator position by means of an electrical signal.
 - **Position sensors** provide visual status of a valve.
- Factory assemblies and kits for field assembly are available.

Regional Ordering Information

Pneumatic actuators and position sensors in this product catalog are available to customers worldwide. Limit switches and solenoid valves meet voltage and approval requirements associated with the North American region. A wide variety of limit switches and solenoid valves to meet the voltage and approval requirements of your region are available. For the products you need please contact your authorized Swagelok sales and service representative.

Ordering Multiple Ball Valve Actuation Options

Swagelok ball valves are available with multiple actuation options to meet specific system requirements. Add designators in the order shown. Contact your authorized Swagelok representative with any questions.



- 1 Valve-Actuator-Solenoid Operation** (pages 6 and 13)
- 2 Solenoid Voltage** (pages 6 and 13)
- 3 Limit Switch or Position Sensor** (limit switches—pages 7, 8, and 14; position sensor—page 16)

⚠ 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.

Swagelok 130 and 150 Series Pneumatic Actuators

Features

- 90° actuation
 - 2-way (straight and angle) flow paths
 - 3-way (L and H special flow paths)
 - 4-way flow paths
- 180° actuation for other 3-way flow paths
- Spring-return and double-acting models available
- Special service actuators
 - High temperature
 - Low temperature
 - Nonfluorocarbon
- Low-pressure spring-return actuators for lower-pressure air are available. Contact your authorized Swagelok representative.



**Swagelok 133 Series
Pneumatic Actuator**
(spring-return model shown)

Swagelok Ball Valve
(60 series valve shown)

Technical Data

Service Ratings

Actuator Service	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	0 to 400 (-17 to 204)		100 (6.8)
Low temperature	-40 to 200 (-40 to 93)		165 (11.3)
Nonfluorocarbon	-20 to 200 (-28 to 93)		165 (11.3)

For minimum required actuator operating pressures, see individual Swagelok ball valve product catalogs.

Air Displacement

Actuator Model	Volume in. ³ (cm ³)
90° Actuation	
131	1.5 (24.6)
133	4.9 (80.3)
135	15.5 (254)
180° Actuation	
151	3.0 (49.2)
153	9.6 (157)
155	30.5 (500)

Approximate Weight

Actuator and mounting kit

Actuator Model	Weight lb (kg)
Spring Return	
131, 151	1.5 (0.7)
133, 153	3.8 (1.7)
135, 155	12.5 (5.7)
Double Acting	
131, 151	1.3 (0.6)
133, 153	2.5 (1.1)
135, 155	9.7 (4.4)

Swagelok Pneumatic Actuators

Materials of Construction

Component	Actuator Service			
	Standard	High Temperature	Low Temperature	Non-fluorocarbon
	Material			
Body, cap	Anodized cast aluminum alloy with black urethane exterior finish			
Piston	Cast aluminum alloy			
Output shaft	Hardened 416 SS			
Shaft bushing(s) (131, 133, 151, and 153 series—2; 135 and 155 series—1)	Bronze	PEEK	Bronze	PEEK
O-rings	Buna N	Fluorocarbon FKM	Buna C	Ethylene propylene
Spring	Zinc phosphate-plated alloy steel			
Internal screw	131, 133, 151, and 153 series—cadmium-plated steel; 135 and 155 series—steel			
Cap screws	Cadmium-plated steel			
Retaining rings	Cadmium- or zinc-plated steel			
Roll pin (131, 133, 151, and 153 series)	420 SS			
Wall mount bracket	Stainless steel			
Lubricant	Multipurpose hydrocarbon	PTFE-based	Hydrocarbon-based	Silicone-based

Ordering Information

Swagelok pneumatic actuators are available factory assembled to valves or in kits for field assembly. See the Swagelok ball valve catalogs for complete ordering instructions, including suggested actuators and necessary mounting components.

- *One-Piece Instrumentation Ball Valves—40G Series and 40 Series, MS-02-331*
- *Ball Valves, General Purpose and Special Application—60 Series, MS-01-146*
- *Trunnion Ball Valves—83 and H83 Series, MS-01-166*
- *Swagelok Alternative Fuel Service (AFS) Ball Valves For High-Pressure, High-Flow Applications, MS-02-303*
- *Multipurpose Ball Valves—SK Series, MS-02-345*

Solenoid Valves for Swagelok 130 and 150 Series Pneumatic Actuators

Solenoid valves for Swagelok 130 and 150 series actuators are manufactured by MAC Valves.

Features

Available for use with:

- Spring-return pneumatic actuators (3-way, 2-position)
- Double-acting pneumatic actuators (4-way, 2-position).

Technical Data

For additional technical information, see MAC® 900 series (standard solenoid) and MAC 200 series (explosion-proof solenoid) product literature.

Actuation Pressure

25^① to 150 psig (1.7 to 10.3 bar)

- ① 25 psig (1.7 bar) is the minimum requirement for the solenoid valve. See valve product catalogs for minimum actuator pressure requirements.

Temperature Range

0 to 120°F (-17 to 48°C)

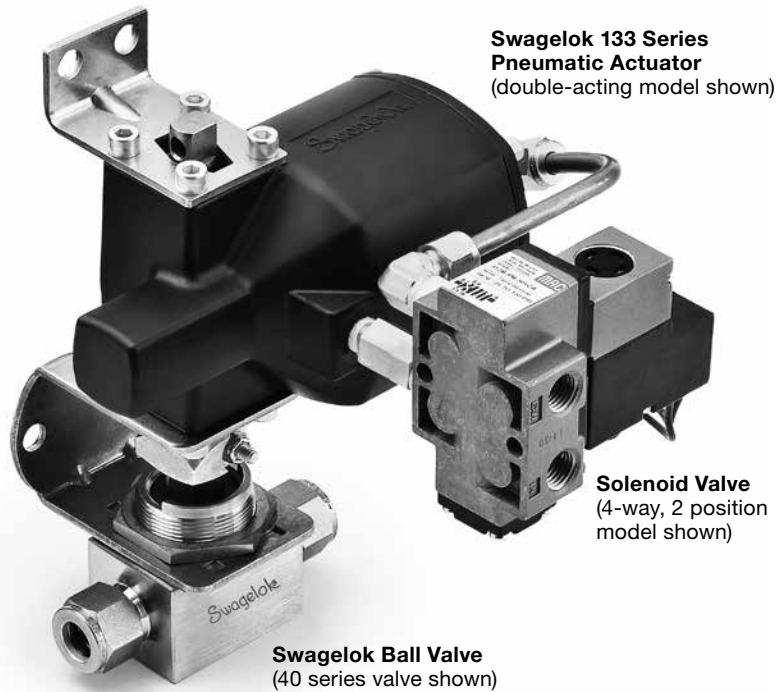
Electrical Data

- General-purpose, class A coil, continuous duty, encapsulated
- 18 AWG lead wires, 18 in. (46 cm) long
- 1/2 in. female NPS electrical conduit connection (enclosure)
- MAC 200 explosion-proof models—CSA (Canada and U.S.A.) compliance:
 - Division 1, Class I, Groups B, C and D
 - Class II, Groups E, F, and G.

Materials of Construction

Component	Material
Solenoid body, spool, poppet	Aluminum
Spool O-ring	Buna N
Fasteners	Zinc-plated alloy steel
Lubricants	Silicone- and PTFE-based

Solenoid valves are assembled with brass Swagelok fittings. Copper tubing is used with double-acting actuators.



Swagelok 133 Series Pneumatic Actuator
(double-acting model shown)

Solenoid Valve
(4-way, 2 position model shown)

Swagelok Ball Valve
(40 series valve shown)

Operating Modes

Air pressure is required to cycle the ball valve. See valve product catalogs for minimum actuator pressure requirements.

Actuator / Solenoid Operation	Valve Position		Designator
	Solenoid Energized	Solenoid De-energized	
2-Way (90°) Actuation			
Spring-return, normally closed / energized to open	Open	Closed	C
Spring-return, normally open / energized to close	Closed	Open	O
Double-acting / energized to open	Open	Closed	DC
Double-acting / energized to close	Closed	Open	DO
3-Way (90° and 180°) Actuation			
Spring-return / energized to switch	Opposite port	Initial position	S
Double-acting / energized to switch	Opposite port	Initial position	D

⚠ Warning:

Following a significant loss of air pressure to *spring-return actuators*, the ball valve will return to the solenoid de-energized position, whether the solenoid is energized or not.

Following a significant loss of air pressure to *double-acting actuators*, the ball valve may cycle.

Solenoid Valves for Swagelok 130 and 150 Series Pneumatic Actuators

Ordering Information

Factory-Assembled Valves with Solenoids

Typical Ordering Number

A B C D
SS-63TS8-33 C HT B

A Valve-Actuator Ordering Number

Build a Swagelok ball valve-pneumatic actuator assembly ordering number from the product catalog.

B Actuator / Solenoid Operation

(see page 5)

2-Way (90°) Actuation

C = Spring return, normally closed / energized to open 90°

DC = Double-acting / energized to open

DO = Double-acting / energized to close

O = Spring return, normally open / energized to close

3-Way (90° and 180°) Actuation

D = Double acting / energized to switch

S = Spring return, switching / energized to switch 180°

C Actuator Service

FP = Fusible plug^①

HT = High temperature^②

LT = Low temperature

NF = Nonfluorocarbon^③

None = Standard

^① Available for 60 series fire series (A60T) valves: a fail-safe pneumatic actuator that contains a Swagelok fusible plug and a Swagelok mud-dauber fitting. The fusible plug melts if the external temperature reaches 280°F (137°C), relieving pressure in the actuator and allowing the valve to cycle closed.

^② Suggested for 60 series steam service (S60P) and thermal service (T60M) valves.

^③ Suggested for factory-assembled valves with UHMWPE seats and packing.

D Solenoid Voltage

B = 12 V (dc)

C = 24 V (dc)

D = 110 / 120 V (ac)

E = 220 / 240 V (ac)

J = Explosion proof 24 V (dc) / 120 V (ac) for spring-return actuator

K = Explosion proof 24 V (dc) / 120 V (ac) for double-acting actuator

Solenoids for Field Assembly

Solenoid pneumatic ports are 1/4 in. female NPT connections.

Kits for mounting solenoids to Swagelok 130 and 150 series pneumatic actuators are available separately.

Solenoid Voltage	Solenoid Ordering Number
12 V (dc)	A-SVMF4-C12D
24 V (dc)	A-SVMF4-C24D
110 / 120 V (ac)	MS-SVMF4-C120A
220 / 240 V (ac)	MS-SVMF4-C240A
Explosion proof 24 V (dc) / 120 V (ac), spring-return actuator	MS-SV-64
Explosion proof 24 V (dc) / 120 V (ac), double-acting actuator	MS-SV-55

Solenoid Mounting Kits

Solenoid kits for mounting to Swagelok 130 or 150 series pneumatic actuators contain all connections needed for direct mounting and manufacturer instructions.

Actuator Series	Spring-Return Actuator	Double-Acting Actuator
131, 151	MS-1K-SOL-31S	MS-1K-SOL-31D
133, 153	MS-1K-SOL-33S	MS-1K-SOL-33D
135, 155	MS-1K-SOL-35S	MS-1K-SOL-35D

Solenoid mounting kits for spring-return actuators include a brass hex reducing nipple and steel flush plug.

■ MS-SV-64 solenoid requires only a Swagelok hex reducing nipple:

- **B-4-HRN-2** for 131 / 151 and 133 / 153 series actuators
- **B-8-HRN-4** for 135 / 155 series actuators.

Double-acting actuator solenoid kits include brass hex reducing nipple, brass Swagelok male elbows, and pre-bent copper tubing.

Limit Switches for Swagelok 130 and 150 Series Pneumatic Actuators— Honeywell® MICRO SWITCH™ Models

Features

- Available for any Swagelok ball valve 130 or 150 series pneumatic actuator assembly.

Technical Data

For additional technical information, see Honeywell MICRO SWITCH product literature.

Temperature Rating

-13 to 185°F (-25 to 85°C)

Electrical Data

- Meets specifications for NEC Class I (NEMA 7), Division I, Groups C and D; and NEC Class II (NEMA 9), Division I, Groups E, F, and G.
- L1 model—two switches: SPDT (single-pole, double-throw) circuit
- L2 model—two switches: DPDT (double-pole, double-throw) circuit
- UL listed and CSA certified.

Electrical Ratings

UL / CSA rating: L23

20 A; 120, 240, or 480 V (ac), inductive and resistive

1 hp, 120 V (ac); 2 hp, 240 V (ac)

0.5 A, 125 V (dc); 0.25 A, 250 V (dc) resistive

Materials of Construction

Component	Material
Housing	Epoxy-coated aluminum
Coupling	Anodized aluminum
Actuator bracket	Stainless steel
O-rings	Buna N

Ordering Information

Factory-Assembled Valves with Limit Switches

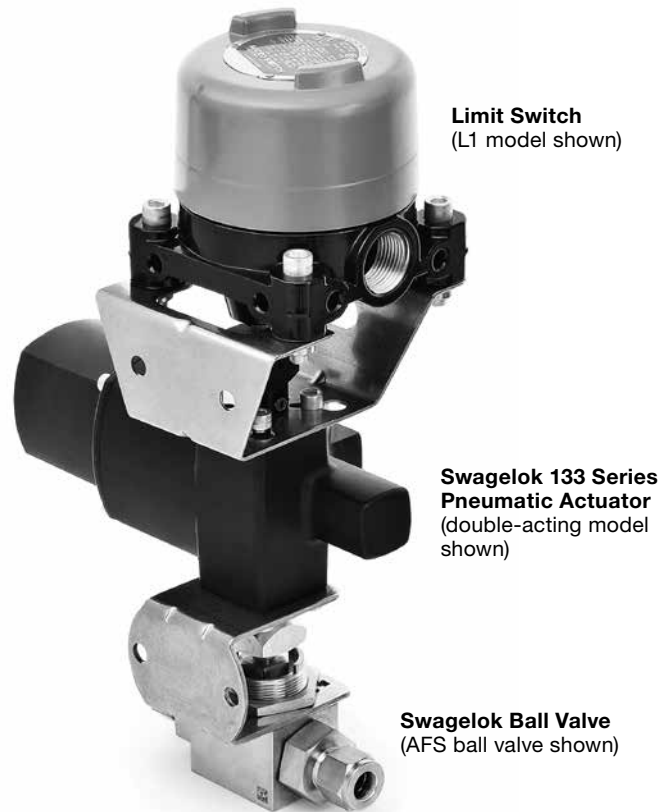
To order a Swagelok 130 or 150 series actuator and valve factory-assembled with a limit switch, add a limit switch designator from the table at right to the ordering number.

Examples: SS-45F8-33C-**L1** for a 45 series valve with normally closed pneumatic actuator and limit switch with two SPDT switches

SS-63TS8-33D-**L2** for a 63 series valve with double-acting pneumatic actuator and limit switch with two DPDT switches

Limit Switch Kits for Field Assembly

Select a kit ordering number from the table at right. Limit switch kits contain limit switch, actuator bracket, coupling, mounting plate, and instructions.



Dimensions

See page 9.

Limit Switch Model	Actuator Model	Limit Switch Designator	Kit Ordering Number
L1 (Honeywell SPDT)	131, 151	L1	MS-LSK-A1-131
	133, 153		MS-LSK-A1-133
	135, 155		MS-LSK-A1-135
L2 (Honeywell DPDT)	131, 151	L2	MS-LSK-A2-131
	133, 153		MS-LSK-A2-133
	135, 155		MS-LSK-A2-135

Limit Switches for Swagelok 130 and 150 Series Pneumatic Actuators—Westlock Models

Features

- Available for any Swagelok ball valve 130 or 150 series pneumatic actuator assembly.

Technical Data

For additional technical information, see Westlock® AccuTrak™ product literature.

Temperature Rating

-40 to 185°F (-40 to 85°C)

Electrical Data

L4 and L3B / L3BX Models

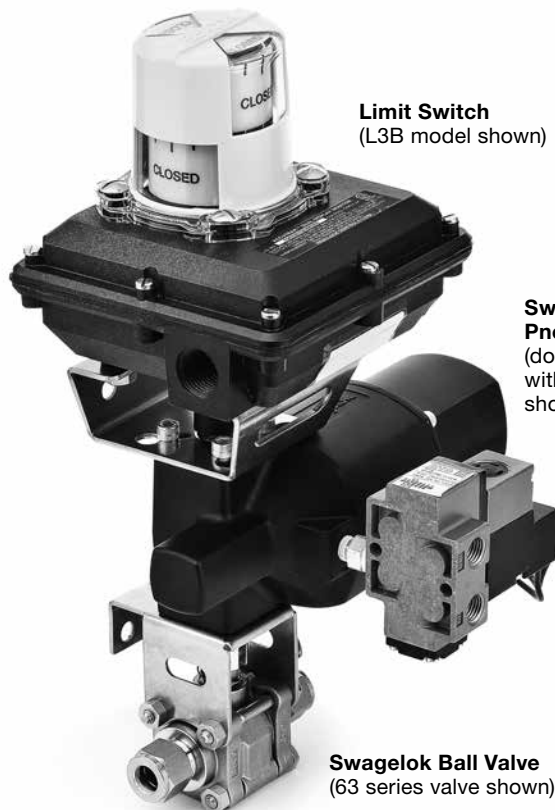
- NEMA 4, 4X: General purpose and watertight
- One 1/2 in. female NPT conduit
- Two SPDT switches

L5 and L5B / L5BX Models

- NEMA 4, 4X, 7, 9—UL, CSA: Combination explosion-proof and watertight, Class I, Groups C, D; Class II, Groups E, F, G; Div 1, 2
- Two 3/4 in. female NPT conduits
- Two SPDT switches

Materials of Construction

Component	Material
Housing	Polyester-coated die-cast aluminum (L5, L5B / L5BX models); glass-filled nylon resin (L4, L3B / L3BX models)
Shaft, fasteners	Stainless steel
Beacon monitor (optional)	Copolyester



Dimensions

See next page.

Ordering Information

Factory-Assembled Valves with Limit Switches

To order a Swagelok 130 or 150 series actuator and valve factory-assembled with a limit switch, add a limit switch designator from the table at right to the ordering number.

Examples: SS-63TS8-33D-L4 for a 63 series valve with 133 series double-acting actuator and AccuTrak 1040 limit switch
 SS-43GXS4-51S-L3BX for a 3-way 43G series valves with 151 series spring-return actuator, AccuTrak 1040 limit switch, and Beacon monitor

Limit Switch Kits for Field Assembly

Select a kit ordering number from the table at right. Kits contain limit switch, mounting bracket, fasteners, and manufacturer instructions.

Limit Switch Model	Limit Switch Designators		Kit Ordering Numbers	
	130 Series	150 Series	130 Series	150 Series
L4 (Westlock AccuTrak 1040)	-L4		MS-LSK-L4	
L3B / L3BX L4 with Beacon monitor ^①	-L3B	-L3BX	MS-LSK-L3B	MS-LSK-L3BX
L5 (Westlock AccuTrak 2007)	-L5		MS-LSK-L5	
L5B / L5BX L5 with Beacon monitor ^①	-L5B	-L5BX	MS-LSK-L5B	MS-LSK-L5BX

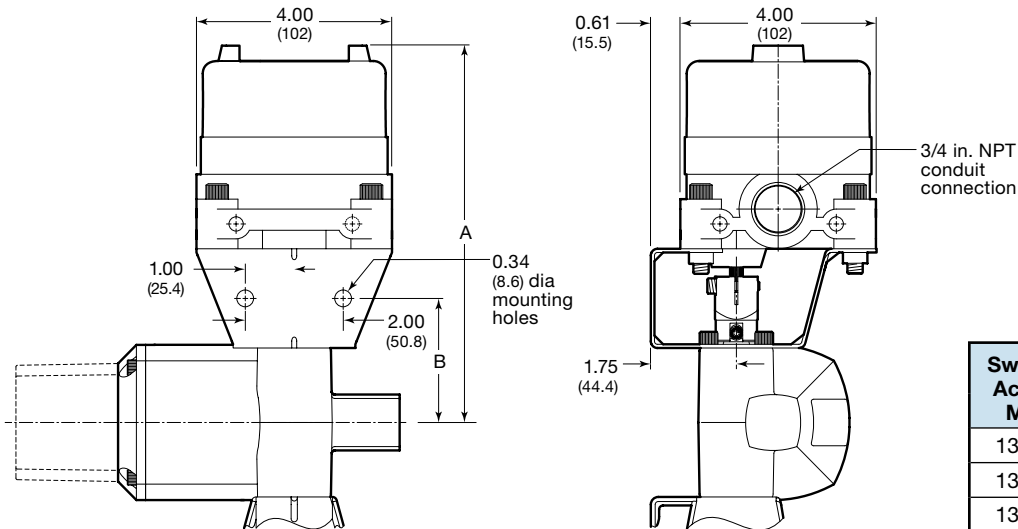
^① Contact your authorized Swagelok representative to order a limit switch kit with a Beacon monitor for a 3-way valve with special flow path or for any 4-way or 5-way multipoint valve.

Limit Switches for Swagelok 130 and 150 Series Pneumatic Actuators

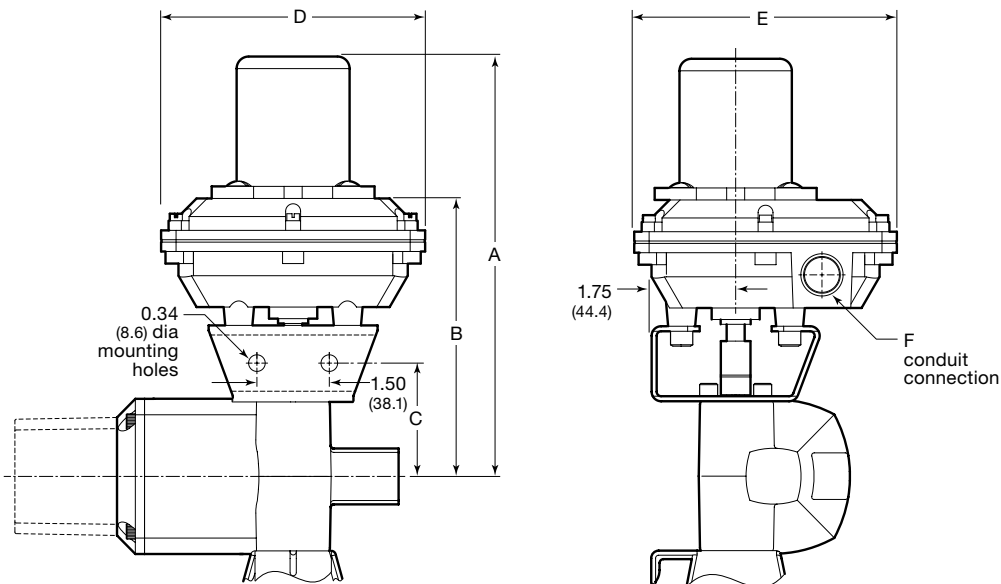
Dimensions

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

Honeywell Limit Switches



Westlock Limit Switches



Limit Switch Model	Dimensions, in. (mm)											
	131, 151 Actuators			133, 153 Actuators			135, 155 Actuators			D	E	F
	A	B	C	A	B	C	A	B	C			
L4	—	5.32 (135)	1.91 (48.5)	—	5.76 (126)	2.34 (59.4)	—	6.51 (165)	3.09 (78.5)	5.47 (139)	5.47 (139)	1/2 in. NPT
L3B, L3BX	8.26 (210)	—	1.91 (48.5)	8.70 (221)	—	2.34 (59.4)	9.45 (240)	—	3.09 (78.5)	5.47 (139)	5.47 (139)	1/2 in. NPT
L5	—	6.00 (152)	1.91 (48.5)	—	6.44 (164)	2.34 (59.4)	—	7.19 (183)	3.09 (78.5)	6.13 (156)	6.42 (163)	3/4 in. NPT
L5B, L5BX	8.94 (227)	—	1.91 (48.5)	9.38 (238)	—	2.34 (59.4)	10.1 (257)	—	3.09 (78.5)	6.13 (156)	6.42 (163)	3/4 in. NPT

Swagelok ISO 5211-Compliant Pneumatic Actuators

Features

- 90° actuation
 - 2-way (straight and angle) flow paths
 - 3-way (L and H special flow paths)
 - 4-way flow paths
- 180° actuation for other 3-way flow paths
- Spring-return and double-acting models available
- High-temperature service actuators available



**Swagelok A15
Pneumatic Actuator**

**Swagelok Ball Valve
(40 series valve shown)**

Service Ratings

Maximum actuator pressure is 116 psig (8.0 bar).

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

Certifications

Factory-assembled Swagelok valve-actuator assemblies can be ATEX certified on request at the time of quotation.

ATEX certification is not available for field assemblies.

Materials of Construction

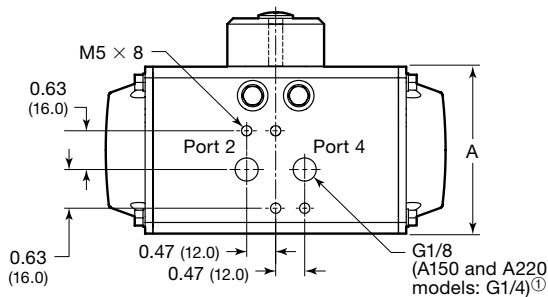
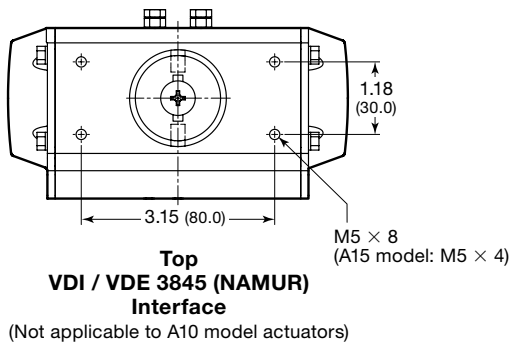
Component	Actuator Service	
	Standard	High Temperature
	Material	
Housing	Aluminum	
End cap	Cast aluminum	
Plug	Buna N	
O-rings	Buna N	Fluorocarbon FKM (FPM)
Drive shaft	Alloy C-22	
Spring cartridge	SiCr spring alloy steel	
Cap screws	304 SS	
Position indicator	Glass-reinforced polypropylene	

Additional materials may be available. Contact your authorized Swagelok representative.

Swagelok ISO 5211-Compliant Pneumatic Actuators

Dimensions

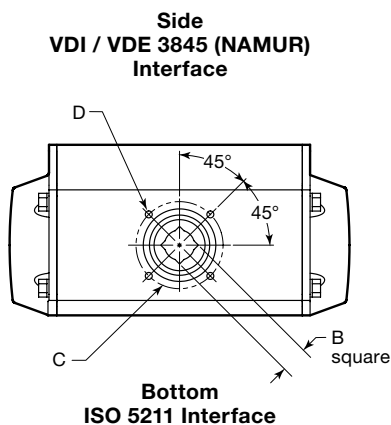
Dimensions, in inches (millimeters) and pounds (kilograms), are for reference only and are subject to change.



① To connect remote-mounted solenoids to 1/4 in. Swagelok tube fittings, order Swagelok male ISO / BSP parallel thread (RS) connectors and gaskets:

For G1/8 port: **SS-400-1-2RS** connector and **SS-2-RS-2V** gasket

For G1/4 port: **SS-400-1-4RS** connector and **SS-4-RS-2V** gasket



90° Actuation

Actuator Kit	Weight lb (kg)
MS-A10-DA-DIN	1.7 (0.75)
MS-A10-4-DIN	1.9 (0.88)
MS-A10-5-DIN	1.9 (0.89)
MS-A15-DA-DIN	2.4 (1.1)
MS-A15-3-DIN	2.6 (1.2)
MS-A15-4-DIN	2.6 (1.2)
MS-A30-DA-DIN	3.5 (1.6)
MS-A30-3-DIN	3.8 (1.7)
MS-A30-4-DIN	4.0 (1.8)
MS-A60-DA-DIN	6.0 (2.7)
MS-A60-3-DIN	6.4 (2.9)
MS-A60-4-DIN	6.4 (2.9)
MS-A60-5-DIN	6.6 (3.0)
MS-A100-DA-DIN	8.4 (3.8)
MS-A100-4-DIN	9.3 (4.2)
MS-A100-5-DIN	9.5 (4.3)
MS-A150-5-DIN	13.0 (5.9)
MS-A220-4-DIN ^①	19.8 (9.0)

① Requires adapter insert **MS-ADH22/17**, available separately, to reduce actuator coupling receptacle to 0.67 in. (17 mm) square.

180° Actuation

Actuator Kit	Weight lb (kg)
MS-A15-XDA-DIN	4.6 (2.1)
MS-A30-XDA-DIN	7.5 (3.4)
MS-A60-XDA-DIN	13.0 (5.9)
MS-A100-XDA-DIN	18.5 (8.4)

Ordering Information

Swagelok ISO 5211-compliant pneumatic actuators are available factory assembled to valves or in kits for field assembly. See the Swagelok ball valve catalogs for complete ordering instructions, including suggested actuators and necessary mounting components.

- *One-Piece Instrumentation Ball Valves—40G Series and 40 Series, MS-02-331*
- *Ball Valves, General Purpose and Special Application—60 Series, MS-01-146*
- *Trunnion Ball Valves—83 and H83 Series, MS-01-166*
- *Swagelok Alternative Fuel Service (AFS) Ball Valves For High-Pressure, High-Flow Applications, MS-02-303*
- *Multipurpose Ball Valves—SK Series, MS-02-345*
- *Medium-Pressure Ball Valves—FKB Series, MS-02-354.*

Actuator Model	ISO 5211 Flange Size	Dimensions, in. (mm)			
		A	B	C	D
A10	F04	2.60 (66.0)	0.43 (11)	1.65 (42)	M5 × 8
A15	F04	2.72 (69.0)	0.43 (11)	1.65 (42)	M5 × 8
A30	F05	3.35 (85.0)	0.55 (14)	1.97 (50)	M6 × 9
A60	F05	4.02 (102)	0.55 (14)	1.97 (50)	M6 × 9
A100	F07	4.53 (115)	0.67 (17)	2.76 (70)	M8 × 12
A150	F07	5.00 (127)	0.67 (17)	2.76 (70)	M8 × 12
A220	F07	5.71 (145)	0.86 (22)	2.76 (70)	M8 × 12

Solenoid Valves for Swagelok ISO 5211-Compliant Pneumatic Actuators

Solenoid valves for Swagelok ISO 5211-compliant actuators are manufactured by ASCO.

Features

- Available for A10 through A220 size Swagelok ISO 5211-compliant pneumatic actuators

Technical Data

For additional technical information, see ASCO series 8551 product literature.

Actuation Pressure

30^① to 150 psig (2.1 to 10.3 bar)

① 30 psig (2.1 bar) is the minimum requirement for the solenoid valve. See valve product catalogs for minimum actuator pressure requirements.

Temperature Range

- 120 and 240 V (ac) models: 5 to 140°F (-15 to 60°C)
- 12 and 24 V (dc) models: 5 to 77°F (-15 to 25°C)

Electrical Data

- NEMA 4–CSA: General purpose and watertight, meeting the requirements of Type 1, 2, 3, 3S, 4, and 4X.
- NEMA 7–UL, CSA, CE: Combination explosion proof and watertight, meeting the requirements 3, 3S, 4, 4X, 6, 6P, 7, and 9, Class I, Div 1 (Groups A–D) and Class I, Div 2 Type 9 (Groups E–G).



Swagelok A30 Pneumatic Actuator
(shown with position sensor)

Solenoid Valve

Swagelok Ball Valve
(63 series valve shown)

Materials of Construction

Component	Material
Solenoid body	Anodized aluminum
O-rings	Buna N

Solenoid Valves for Swagelok ISO 5211-Compliant Pneumatic Actuators

Ordering Information

Factory-Assembled Valves with Solenoids

Spring-Return Actuator Typical Ordering Number

A B C
SS-63TS8-A30C4 HT S1

A Valve Ordering Number

Build a Swagelok ball valve–
ISO 5211-compliant pneumatic actuator
assembly ordering number from the
product catalog.

B Actuator Service

None = Standard
HT = High temperature

C Solenoid Voltage

S1 = 120 V (ac) / NEMA 4
S2 = 24 V (dc) / NEMA 4
S3 = 240 V (ac) / NEMA 4
S4 = 12 V (dc) / NEMA 4
S5 = 120 V (ac) / NEMA 4, NEMA 7
S6 = 24 V (dc) / NEMA 4, NEMA 7

Double-Acting Actuator Typical Ordering Number

A B C D
SS-63TS8-A30D C HT S1

A Valve Ordering Number

Build a Swagelok ball valve–
ISO 5211-compliant pneumatic actuator
assembly ordering number from the
product catalog.

C Actuator Service

None = Standard
HT = High temperature

D Solenoid Voltage

S1 = 120 V (ac) / NEMA 4
S2 = 24 V (dc) / NEMA 4
S3 = 240 V (ac) / NEMA 4
S4 = 12 V (dc) / NEMA 4
S5 = 120 V (ac) / NEMA 4, NEMA 7
S6 = 24 V (dc) / NEMA 4, NEMA 7

B Solenoid Operation

C = Energized to open
O = Energized to close

Solenoid Kits for Field Assembly

Kits contain fasteners, adapter plates to assemble for either spring-return or double-acting actuation, and manufacturer instructions.

Solenoid Voltage	Kit Ordering Number
12 V (dc) / NEMA 4	MS-SV-S4
24 V (dc) / NEMA 4	MS-SV-S2
120 V (ac) / NEMA 4	MS-SV-S1
240 V (ac) / NEMA 4	MS-SV-S3
24 V (dc) / NEMA 4, NEMA 7	MS-SV-S6
120 V (ac) / NEMA 4, NEMA 7	MS-SV-S5

Limit Switches for Swagelok ISO 5211-Compliant Pneumatic Actuators

Limit switches for Swagelok ISO 5211-compliant pneumatic actuators are manufactured by Westlock.

Features

- Available for A15 through A220 size Swagelok ISO 5211-compliant pneumatic actuators

Technical Data

For additional technical information, see Westlock AccuTrak product literature.

Temperature Rating

-40 to 185°F (-40 to 85°C)

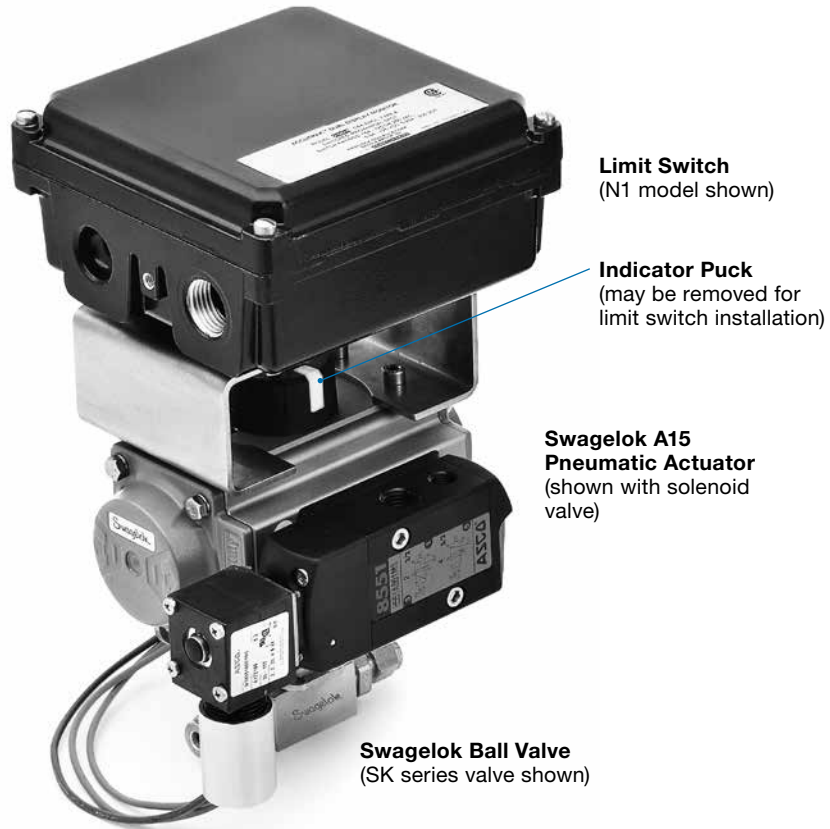
Electrical Data

N1 and N1B Models

- NEMA 4, 4X: General purpose and watertight
- One 1/2 in. female NPT conduit
- Two SPDT switches

N2 and N2B Models

- NEMA 4, 4X, 7, 9—UL, CSA: Combination explosion-proof and watertight, Class I, Groups C, D; Class II, Groups E, F, G; Div 1, 2
- Two 3/4 in. female NPT conduits
- Two SPDT switches



Materials of Construction

Component	Material
Housing	Polyester-coated die-cast aluminum (N1, N2, N2B models); glass-filled nylon resin (N1B model)
Shaft, fasteners	Stainless steel
Beacon monitor (optional)	Copolyester

Ordering Information

Factory-Assembled Valves with Limit Switches

To order a Swagelok ISO 5211-compliant actuator and valve factory-assembled with a limit switch, add **-N1** or **-N2** to the ordering number.

Example: SS-63TS8-A30C4-**N1**

To order a limit switch with Beacon monitor, add **B** for a 2-way valve.

Example: SS-63TS8-A30C4-**N1B**

Contact your authorized Swagelok representative to order a limit switch with a Beacon monitor for a 3-way valve.

Limit Switch Kits for Field Assembly

Kits contain limit switch, mounting bracket, fasteners, and manufacturer instructions.

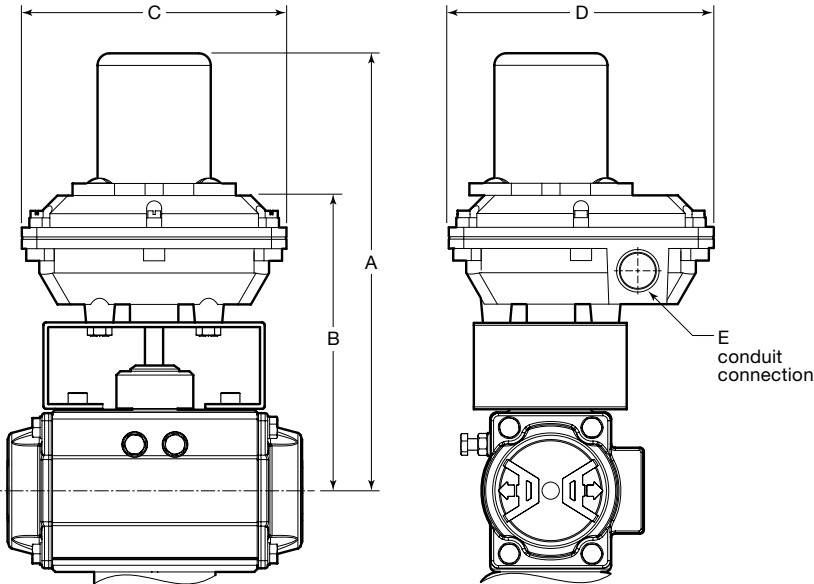
Limit Switch Model	Kit Ordering Numbers		
	A15 Actuator	A30 to A150 Actuators	A220 Actuator
N1 (Westlock AccuTrak 2004)	MS-LSK-N1-A15	MS-LSK-N1	MS-LSK-N1-A220
N1B Westlock AccuTrak 1040 with Beacon monitor ^①	MS-LSK-N1B-A15	MS-LSK-N1B	MS-LSK-N1B-A220
N2 (Westlock AccuTrak 2007)	MS-LSK-N2-A15	MS-LSK-N2	MS-LSK-N2-A220
N2B N2 limit switch with Beacon monitor ^①	MS-LSK-N2B-A15	MS-LSK-N2B	MS-LSK-N2B-A220

^① Contact your authorized Swagelok representative to order a limit switch kit with a Beacon monitor for a 3-way valve.

Limit Switches for Swagelok ISO 5211-Compliant Pneumatic Actuators

Dimensions

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



Limit Switch Model	Dimensions, in. (mm)														
	A15 Actuator		A30 Actuator		A60 Actuator		A100 Actuator		A150 Actuator		A220 Actuator		C	D	E
	A	B	A	B	A	B	A	B	A	B	A	B			
N1	—	5.77 (147)	—	6.09 (155)	—	6.42 (163)	—	6.68 (170)	—	6.91 (176)	—	7.65 (194)	5.47 (139)	5.47 (139)	1/2 in. NPT
N1B	8.71 (221)	—	9.03 (229)	—	9.36 (238)	—	9.62 (244)	—	9.85 (250)	—	10.6 (269)	—	5.47 (139)	5.47 (139)	1/2 in. NPT
N2	—	6.15 (164)	—	6.77 (172)	—	7.10 (254)	—	7.36 (187)	—	7.59 (193)	—	8.33 (212)	6.13 (156)	6.42 (163)	3/4 in. NPT
N2B	9.39 (239)	—	9.71 (247)	—	10.0 (254)	—	10.3 (262)	—	10.5 (267)	—	11.3 (287)	—	6.13 (156)	6.42 (163)	3/4 in. NPT

Position Sensors for Swagelok ISO 5211-Compliant Pneumatic Actuators

Position sensors for Swagelok ISO 5211-compliant pneumatic actuators are manufactured by Pepperl & Fuchs.

Features

- Available for A15 through A220 size Swagelok ISO 5211-compliant pneumatic actuators

Technical Data

For additional technical information, see Pepperl & Fuchs product literature.

Temperature Rating

- N9 model: -14 to 158°F (-25 to 70°C)
- N10 model: -14 to 212°F (-25 to 100°C)

Ordering Information

Factory-Assembled Valves with Position Sensors

To order an ISO-5211 compliant actuator and valve factory-assembled with a position sensor, add **-N9** or **-N10** to the ordering number.

Example: SS-63TS8-A30C4-**N9**

Electrical Data

- N9 model: general purpose—UL, CSA, CE; nonincendive—FM
- N10 model: intrinsically safe—UL, CSA, CE, FM, Ex

Electrical Connection

- Quick disconnect type V1
- Cord sets offered separately through Pepperl & Fuchs.



Material

- Housing: Crastin® PBS thermoplastic polyester resin

Position Sensor Kits for Field Assembly

Kits contain position sensor, fasteners, metal target, and manufacturer instructions.

Position Sensor Model	Kit Ordering Numbers ^①	
	A15 to A150 Actuators	A220 Actuator
N9 (Pepperl & Fuchs NBN3-F25-E8-V1)	MS-LSK-N9	MS-LSK-N9-A220
N10 (Pepperl & Fuchs NCN3-F25-N4-V1)	MS-LSK-N10	MS-LSK-N10-A220

^① For 3-way, 180° actuators, an additional metal target, available separately, is required.

Ordering number: **MS-PI-EISAMET**

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 valve components 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.

Swagelok—TM Swagelok Company
 AccuTrak, Westlock—TM Westlock Controls Corporation
 Crastin—TM DuPont
 MAC—TM MAC Valves
 Honeywell, MICRO SWITCH—TM Honeywell
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