

MICRO SWITCH™ LSX Series

Explosion-Proof Hazardous Area Switches



DESCRIPTION

MICRO SWITCH™ LSX switches are for use either indoors or outdoors in hazardous atmospheres as they are a completely sealed, explosion-proof device. An optional mounting plate provides the same tracking and mounting as the standard HDLS. The majority of HDLS operating heads and circuitry options are available on the LSX. Standard HDLS levers are used, but because of explosion-proof requirements, only nylon rollers or

other non-sparking material can be selected. Plunger and cat whisker types listed in the LSX order guide are non-sparking materials. The MICRO SWITCH™ LSX withstands pressure of an internal explosion and cools the exploding gases below the kindling temperature of the explosive atmosphere. Flame paths are provided by the cover-housing threads and an extended plunger between the switch cavity and head.

FEATURES AND BENEFITS

- Sealing - NEMA 1, 3, 4, 6, 7 (Class 1, Division 1, Groups B, C, D), 9 (Class 2, Division 1, Groups E, F, G), 13
- Tracking interchangeability with MICRO SWITCH™ ML-E1 and HDLS
- Variety of heads and non-sparking actuators
- Field adjustability matches switch to application
- Momentary, maintained, sequential, or center neutral action
- 10 A continuous carry electrical rating
- Choice of silver or gold contacts
- 0.5 in or 0.75 in conduit opening
- UL Listed, file #E61730
- CSA Certified, file #LR57327
- Internal grounding screw

APPLICATIONS

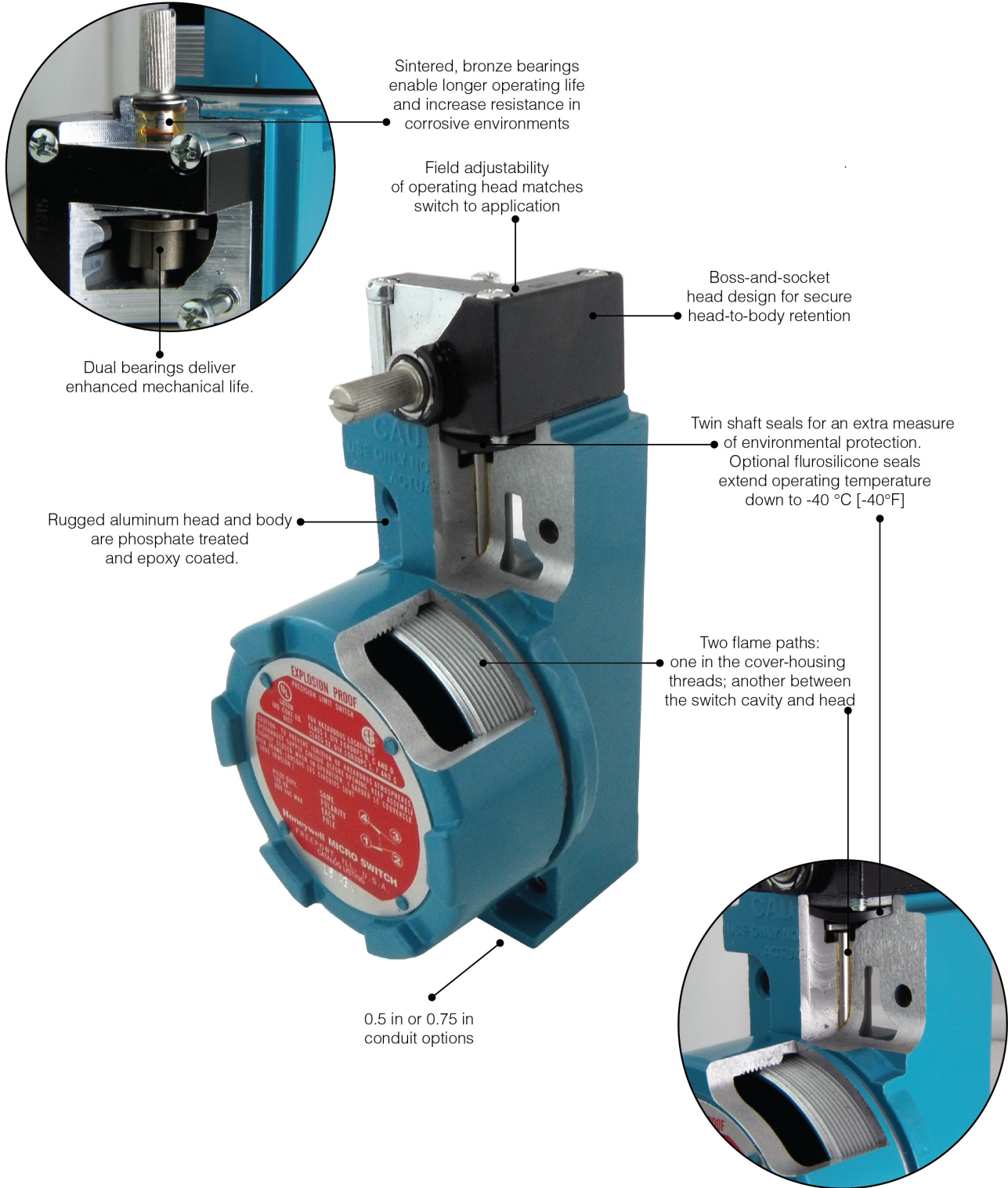
- Control valves and actuators
- Petroleum plants
- Chemical plants
- Waste treatment
- Hazardous waste handling

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Figure 1. MICRO SWITCH™ LSX SERIES FEATURES AND OPTIONS



Explosion-Proof, Hazardous Area Limit Switches

MICRO SWITCH™ LSX SERIES PRODUCT NOMENCLATURE

LSX Switch Type	J Head Style	3K Circuitry and Conduit Connection	Modification Code	7A Actuator Options
LSX Series Hazardous Area Switch	A Side rotary; momentary	3E 1NO/1NC, 1/2-14NPT, gold contacts	1 CW rotation	1 Fixed roller, 1.5 in radius
	B Top rotary; momentary	3K 1NO/1NC, 1/2-14NPT	2 CCW rotation	1A Fixed 0.75 in x 0.25 in nylon roller, 1.5 in radius
	C Top plunger, plain	3N SPNC direct acting, 1/2-14NPT	3 Head assembled with actuator to right side	1C Fixed 0.75 in x 0.25 in nylon roller, 1.5 in radius
	D Top plunger, roller	4K 1NO/1NC, 3/4-14NPT	4 Head assembled with actuator to left side	2 Adjustable, rollerless
	E Side plunger plain; momentary	4L 2NO/2NC, 3/4-14NPT	5 Head assembled with actuator toward mounting surface	2A Adjustable, 0.75 in x 0.25 in nylon roller
	F Side plunger roller; momentary	4M 2NO/2NC, 3/4-14NPT, sequential operation	6 Roller perpendicular to mounting surface	2C Adjustable, 0.75 in x 0.25 in nylon roller
	H Side rotary, momentary; low PT, low torque	4N 2NO/2NC, 3/4-14NPT, center neutral	8 Roller on side plunger in vertical position	2J Adjustable, 1.0 in x 0.5 in nylon roller
	J Wobble stick	4S 2NO/2NC, 3/4-14NPT, gold contacts		2K Adjustable, 0.5 in x 0.25 in nylon roller
	K Whisker	4T 2NO/2NC, 3/4-14NPT, gold contacts, sequential operation		3E Yoke, 0.75 in x 0.25 in nylon roller
	L Side rotary; sequential	4U 2NO/2NC, 3/4-14NPT, gold contacts, center neutral		3M Yoke, 0.75 in x 0.25 in nylon roller
	M Side rotary; central neutral	7L 2NO/2NC, 1/2-14NPT		3S Yoke, 0.75 in x 0.25 in nylon roller, same side
	N Side rotary; maintained	7M 2NO/2NC, 1/2-14NPT, sequential operation		4 Hub only
	P Side rotary, momentary; low PT and DT	7N 2NO/2NC, 1/2-14NPT, center neutral		4M Hub rod, aluminum
	R Side rotary, momentary; low torque	7S 2NO/2NC, 1/2-14NPT, gold contacts		5 Offset, rollerless
	U Side rotary, low pre-travel	7T 2NO/2NC, 1/2-14NPT, gold contacts, sequential operation		5A Offset, 0.75 in x 0.25 in nylon roller
	V Top plunger, adjustable	7U 2NO/2NC, 1/2-14NPT, gold contacts, center neutral		5C Offset, 0.75 in x 0.25 in nylon roller
W Side plunger, adjustable			7A Plastic wobble stick	
			8A Whisker, 5.5 in	
			9A Fixed, 0.75 in x 0.25 in nylon roller, open, 1.33 in radius	
			9C Fixed, 0.75 in x 0.25 in nylon roller, closed, 1.33 in radius	

To order high temperature versions, insert the additional letters **Y** and **C** in the appropriate places in the standard catalog listing, as shown below:

LSXA3K	standard, side-rotary plug-in switch
LSXYAC3K	completely FC-sealed version of LSXA3K

To order low temperature versions, insert the additional letters **Y** and **B** in the appropriate places in the standard catalog listing, as shown below:

LSXA3K	standard, side-rotary plug-in switch
LSXYAB3K	low-temperature version of LSXA3K

For more details, please see page 18.

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Figure 3. MICRO SWITCH™ LSX SERIES PRODUCT DIMENSIONS • mm [in]

SIDE ROTARY - HEAD CODES: A, H, L, M, N, P, Q, R, AND U

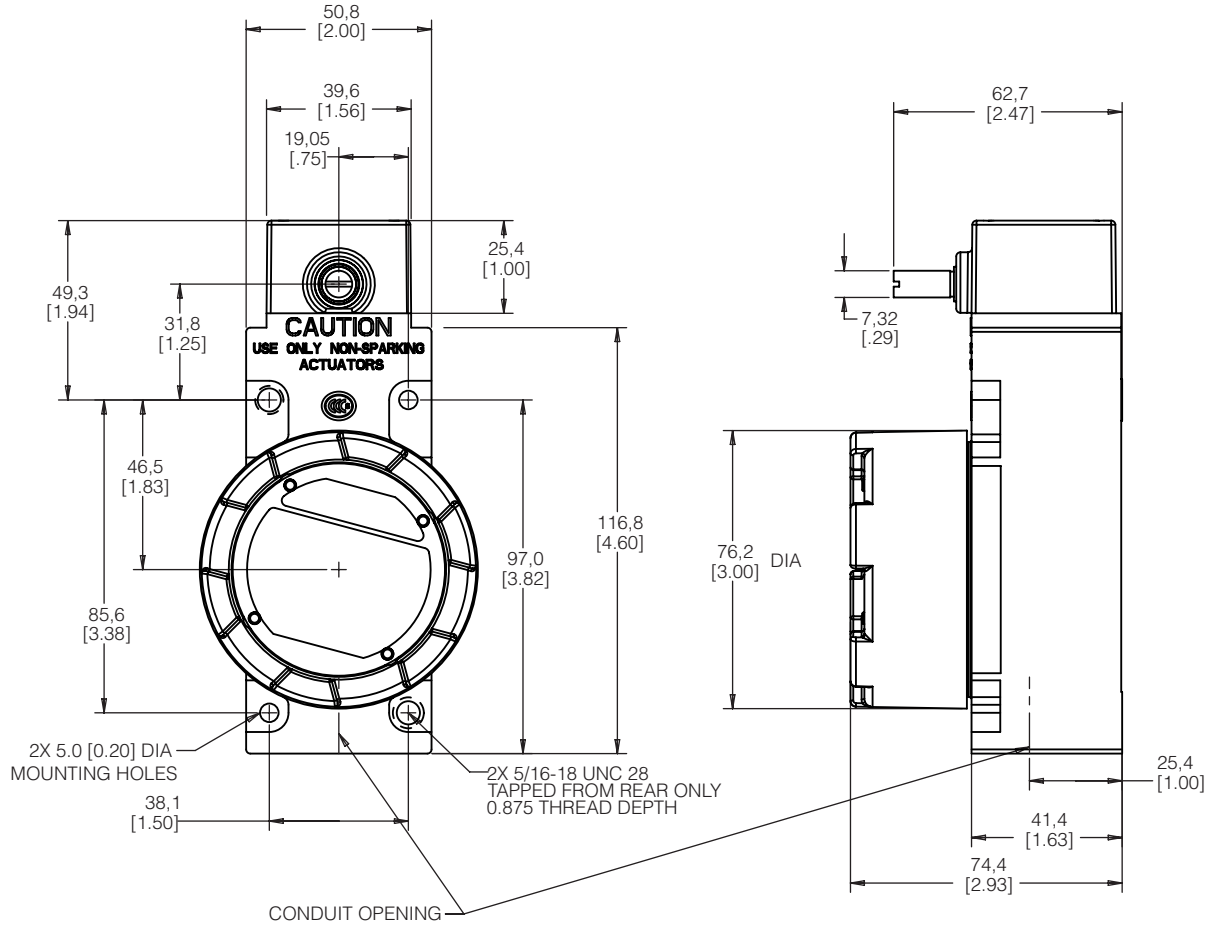
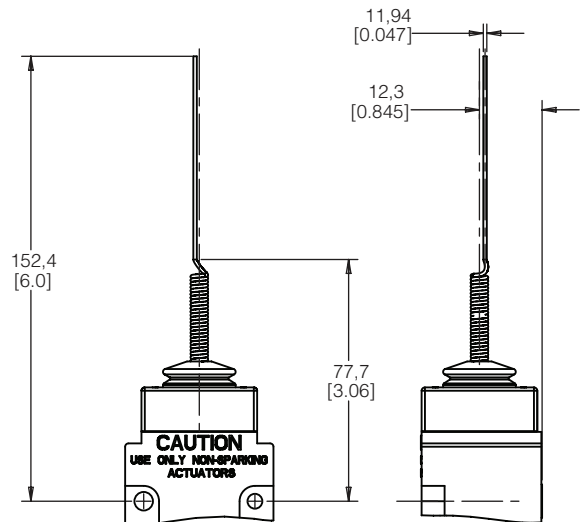
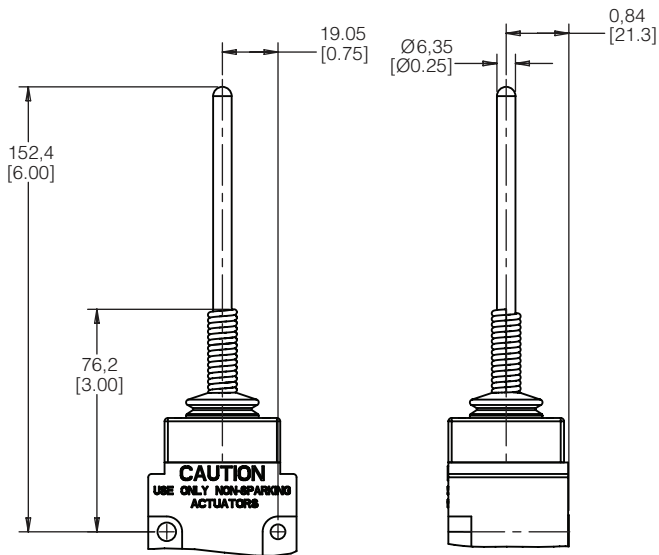


Figure 4. MICRO SWITCH™ LSX SERIES WOBBLE STICK, HEAD CODE J • mm [in]

Figure 5. MICRO SWITCH™ LSX SERIES CAT WHISKER WOBBLE, HEAD CODE K • mm [in]



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Figure 6. MICRO SWITCH™ LSX SERIES TOP ROTARY, HEAD CODE B • mm [in]

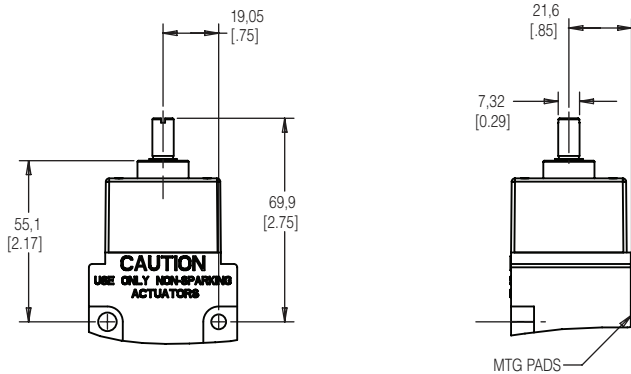


Figure 7. MICRO SWITCH™ LSX SERIES TOP PIN PLUNGER, HEAD CODE C • mm [in]

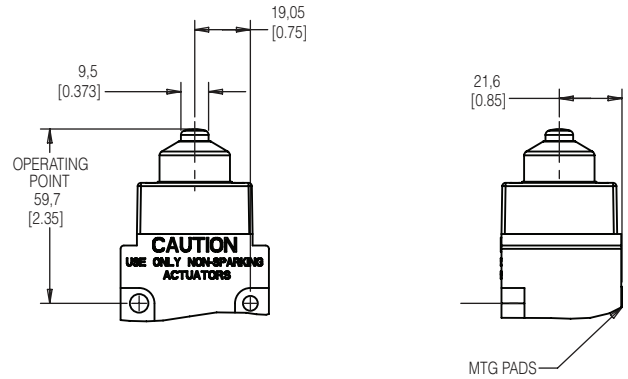


Figure 8. MICRO SWITCH™ LSX SERIES TOP ROLLER PLUNGER, HEAD CODE D • mm [in]

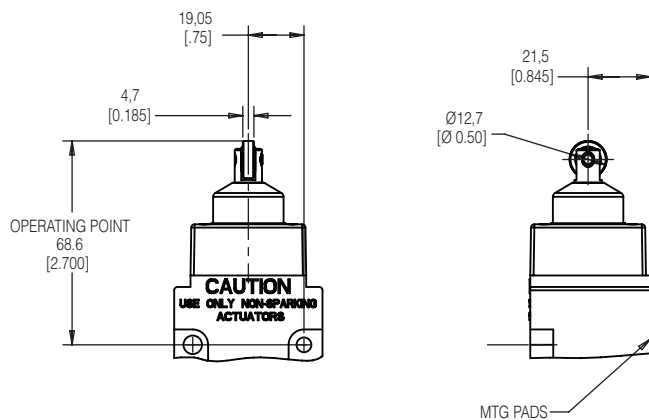


Figure 9. MICRO SWITCH™ LSX SERIES SIDE PLUNGER, HEAD CODE E • mm [in]

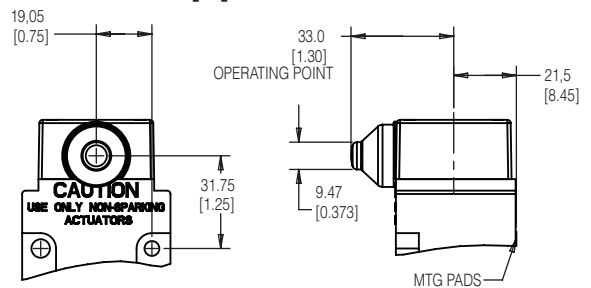


Figure 11. MICRO SWITCH™ LSX SERIES ADJUSTABLE TOP PIN PLUNGER, HEAD CODE V • mm [in]

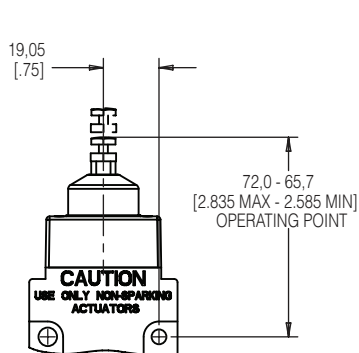


Figure 10. MICRO SWITCH™ LSX SERIES SIDE ROLLER PLUNGER, HEAD CODE F • mm [in]

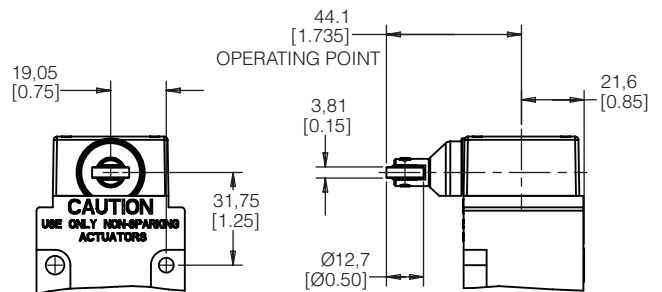
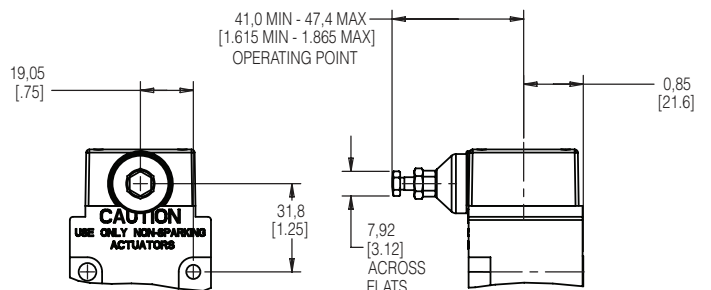


Figure 12. MICRO SWITCH™ LSX SERIES ADJUSTABLE SIDE PIN PLUNGER, HEAD CODE W • mm [in]



MICRO SWITCH™ LSX Series

Table 1. General MICRO SWITCH™ LSX Series Specifications

Characteristic	Parameter												
Product Type	MICRO SWITCH™ Hazardous Area Limit Switches												
Actuators	<table border="0"> <tr> <td>Side plunger - adjustable</td> <td>Side plunger - pin</td> <td>Side roller plunger</td> </tr> <tr> <td>Side rotary</td> <td>Side rotary maintained</td> <td>Top plunger - adjustable</td> </tr> <tr> <td>Top plunger - pin</td> <td>Top roller plunger</td> <td>Top rotary</td> </tr> <tr> <td>Wobble - cat whisker</td> <td>Wobble - plastic rod</td> <td></td> </tr> </table>	Side plunger - adjustable	Side plunger - pin	Side roller plunger	Side rotary	Side rotary maintained	Top plunger - adjustable	Top plunger - pin	Top roller plunger	Top rotary	Wobble - cat whisker	Wobble - plastic rod	
Side plunger - adjustable	Side plunger - pin	Side roller plunger											
Side rotary	Side rotary maintained	Top plunger - adjustable											
Top plunger - pin	Top roller plunger	Top rotary											
Wobble - cat whisker	Wobble - plastic rod												
Circuitry	1NC 1NO SPDT snap action, double break 2NC 2NO DPDT snap action, double break SNPC direct acting 2NC 2NO DPDT sequential 2NC 2NO DPDT center neutral												
Electrical	10 A thermal Single and double pole: AC15 A600; DC13 R300												
Housing Material	Aluminum												
Termination Types	0.5 in - 14NPT conduit 0.75 in - 14NPT conduit												
Housing Type	LSX Non-Plug-in												
Sealing	NEMA 1, 3, 4, 6, 7 (Class 1, Division 1, Groups B, C, D), 9 (Class 2, Division 1, Groups E, F, G), 13												
Operating Temperature	-12 °C to 121 °C [10 °F to 250 °F];												
Agency Approvals and Standards	UL, CSA												
Hazardous Area Designations	Div. 1 & 2, Class I, Groups B, C, & D Div. 1 & 2, Class II, Groups E, F, & G												
UNSPSC Code	302119												
UNSPSC Commodity	302119 Switches and controls and relays												

Explosion-Proof, Hazardous Area Limit Switches

MICRO SWITCH™ LSX SERIES OPERATING HEADS

SIDE ROTARY: Available levers provide greater versatility. Heads may be positioned with shaft on any side. All are momentary action except maintained head (LSN Series).



LSXA - Standard: 60° minimum overtravel, 15° maximum pretravel, 5° (single pole) and 7° (double pole) maximum differential travel. Operating temperature range from -12 °C to 121 °C [10 °F to 250 °F].*

LSXR - Low operating torque: 60° minimum overtravel, 15° maximum pretravel, 0.19 Nm [1.7 in lb] maximum operating torque. Operating temperature range from -1 °C to 121 °C [250 °F to 250 °F].*

LSXN - Maintained contact: Maintained on counterclockwise rotation and reset on clockwise rotation, and vice versa. Operating temperature range from -1 °C to 121 °C [30 °F to 250 °F].

LSXP - Low differential: 68° minimum overtravel, 7° maximum pretravel, 3° (single pole) and 4° (double pole) maximum differential travel. Operating temperature range from -12 °C to 121 °C [10 °F to 250 °F].*

LSXH - Low torque, low differential travel: 68° minimum overtravel. Features low operating torque and narrow differential travel. Operating temperature range from -1 °C to 121 °C [30 °F to 250 °F].*

LSXL - Sequence action: 48° minimum overtravel. Delayed action between operation of two poles. Operating temperature range from -12 °C to 121 °C [10 °F to 250 °F].*

LSXM - Center neutral: 53° minimum overtravel. One set of contacts operates on the clockwise rotation, and another set on the counterclockwise rotation. Operating temperature range from -1 °C to 121 °C [30 °F to 250 °F].*

TOP ROTARY: Available levers provide greater versatility. Heads may be positioned with shaft on any side. All are momentary action except maintained head.



LSXB: With 100° minimum overtravel. Various levers that fit side rotary shafts may be used on the top rotary shaft. Switch is ideal when increased overtravel is required. Momentary action. Standard operating temperature range from -1 °C to 121 °C [30 °F to 250 °F].*

TOP PLUNGERS: Available with 4,83 mm [0.19 in] minimum overtravel. Top pin plungers are offered in pin plunger, an adjustable plunger, and a roller plunger. Standard temperature range of -12 °C to 93 °C [10 °F to 200 °F].



LSXC - Top pin plunger: A corrosion-resistant steel plunger for in-line actuating motion. Oil-tight seals on plunger and between the operating head and housing keep out coolant, dust, and chips. Momentary action.



LSXD - Top roller plunger: A corrosion-resistant steel roller and plunger that is adjustable to 90° angles to accept cam or slide operation from any of two directions. Boot seal on the plunger. Momentary action






LSXV - Adjustable top pin plunger: Provides easy application and saves on installation time. The operating points of the switch can be adjusted from 52,8 mm to 59,3 mm [2.085 in to 2.335 in]. Seals are the same as the pin plunger. Momentary action.

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MICRO SWITCH™ LSX SERIES OPERATING HEADS

SIDE PLUNGERS: Available with 4,83 mm [0.19 in] minimum overtravel. Side plungers are offered in plain plunger, an adjustable plain plunger, a roller plunger, and a maintained plunger. Standard temperature range of -12 °C to 93 °C [10 °F to 200 °F].

	<p>LSXE - Side pin plunger: For actuating motion inline with the plunger travel. Actuating head may be faced in any of four positions, 90° apart. A boot seal on the plunger and a gasket seal between the head and housing keep out coolant, dust, and chips. Momentary action.</p>
	<p>LSXF - Side roller plunger: Fits close quarters under cams and slides. The head may be faced in any of four positions, 90° apart. <u>The roller can be turned vertical or horizontal to the switch.</u> Boot seal on plunger. Momentary action.</p>

	<p>LSXW - Adjustable side pin plunger: Has the same features of the side plain plunger plus the means to adjust the operating points of the switch from 41 mm to 47,4 mm [1.615 in to 1.865 in]. Momentary action.</p>
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WOBBLE LEVER ACTUATING HEADS: Heads come with either a Delrin® plastic rod or steel cat whisker. Any movement of the lever (except pull) will actuate the switch. Standard temperature range of -12 °C to 93 °C [10 °F to 200 °F].

	
<p>LSXK - Plastic rod: Recommended where possible scratching or marring by the actuator is to be avoided.</p>	<p>LSXJ - Cat whisker: 300 Series SST actuator designed for low operating force applications.</p>

Explosion-Proof, Hazardous Area Limit Switches

Side Rotary

MICRO SWITCH™ LSX SERIES ORDER GUIDE/RECOMMENDED LISTINGS



Description	Standard (LSXA)		Low Differential (LSXP)		Low Torque (LSXR)		
	Standard		Low differential travel		Low operating torque		
	SPDT	DPDT	SPDT	DPDT	SPDT	DPDT	
<p> </p> <p> </p> <p> Contact closed ■ Contact open □ </p>	<p> </p>	<p> </p>	<p> </p>	<p> </p>	<p> </p>	<p> </p>	
Pretravel	15° max.	15° max.	9° max.	9° max.	15° max.	15° max.	
Different. travel	5° max.	7° max.	3° max.	4° max.	5° max.	7° max.	
Overtravel	60° min.	60° min.	66° min.	66° min.	60° min.	60° min.	
Oper. torque	0,45 Nm [4 in-lb] max.		0,45 Nm [4 in-lb] max.		0,19 Nm [1.7 in-lb] max.		
Action	Momentary, CW & CCW (Spring return)						
Op. temp range³	-12 °C to 121 °C [10 °F to 250 °F]				-1 °C to 121 °C [30 °F to 250 °F]		
Contacts	Conduit (NPT)						
Silver	0.5 in	LSXA3K	LSXA7L	LSXP3K	LSXP7L	LSXR3K	LSXR7L
Silver	0.75 in	LSXA4K	LSXA4L	LSXP4K	LSXP4L	LSXR4K	LSXR4L
Gold ¹	0.5 in	LSXA3E	-	LSXP3E	-	LSXR3E	-
Gold ¹	0.75 in	-	LSXA4S	-	LSXP4S	-	LSXR4S

¹ Gold-plated contacts

³ Completely fluorocarbon sealed switches are preferred for use in temperatures above 93 °C [200 °F] (for low temp or high temp, versions, see page 19)

To order a fluorocarbon sealed switch, insert the letters **Y** and **C** into the catalog listing as follows. The LSXA3K limit switch is changed to a LSXY**AC**3K limit switch.

MICRO SWITCH™ LSX Series

Side Rotary

MICRO SWITCH™ LSX SERIES ORDER GUIDE/RECOMMENDED LISTINGS



Description	Maint. Contact (LSXN)		Low Torque (LSXH)		
	Maintained, 2-pos ^{1,2} . Std.		Momentary, low torque		
	SPDT	DPDT	SPDT	DPDT	
Contact closed ■					
Contact open □					
Pretravel	65° max.		9° max.	9° max.	
Different. travel	30° max.	35° max.	3° max.	4° max.	
Overtravel	20° min.		66° min.	66° min.	
Oper. torque	0,45 Nm [4 in-lb]		0,19 Nm [1.7 in-lb] max.		
Action	Maintained		CW & CCW (Spring return)		
Op. temp range³	-1 °C to 121 °C [30 °F to 250 °F] (for low temp, high temp, or preloaded versions, see page 19)				
Contacts	Conduit (NPT)				
Silver	0.5 in	LSXN3K	LSXN7L	LSXH3K	LSXH7L
Silver	0.75 in	LSXN4K	LSXN4L	LSXH4K	LSXH4L
Gold ¹	0.5 in	LSXN3E	-	LSXH3E	-
Gold ¹	0.75 in	-	LSXN4S	-	LSXH4S

¹ Gold-plated contacts

³ Completely fluorocarbon sealed switches are preferred for use in temperatures above 93 °C [200 °F] (for low temp or high temp, versions, see page 19)

To order a fluorocarbon sealed switch, insert the letters **Y** and **C** into the catalog listing as follows. The LSXA3K limit switch is changed to a LSXYAC3K limit switch.