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## **MICRO SWITCH Hazardous Area Switches**

002306

BX | BX2 Series Issue 8

**Datasheet** 



#### **DESCRIPTION**

The MICRO SWITCH BX/BX2 Series are designed for applications in hazardous or explosive environments requiring a rugged, durable switch virtually anywhere in the world. To comply with explosion-proof switching requirements, the flame path within the switch housing is designed to contain and cool escaping hot gases and fumes that could cause an explosion outside of the switch. Regardless of where the equipment or machinery is designed, built, or installed, BX and BX2 Series products carry global agency coverage.

Honeywell offers two versions of the BX series switch: the standard BX Series features an aluminum housing, while the BX2 series features a 316L stainless steel housing. The stainless steel housing adds additional resistance against corrosion in applications exposed to aggressive, caustic agents, as well as those often present in chemical processing plants, off-shore/near-shore sites, and other hazardous areas. Both products are weather sealed for outdoor use and designed for explosive gas/dust environments. All operating heads of the BX/BX2 Series are field adjustable at 90° increments.

### **DIFFERENTIATION**

- Top-of-the-line environmental sealing combined with Honeywell expertise for hazardous location package design provides the right product for the right application
- Exclusive teller tab on levers ensures proper torque. When the tab cannot be moved, the lever is tight enough to prevent slippage

## **FEATURES**

- Approvals: UL, CSA, ATEX (CE), IEC Ex, INMETRO (Brazil), NEPSI Ex (China), KOSHA (select listings - Korea), and EAC (formerly GOST-R, Russia)
- Sealed to IP67, NEMA 1, 3, 4, 6, 13
- Industry-leading breadth of products
- Two rugged designs are available: aluminum or corrosionresistant stainless steel head and body
- A diaphragm seal between head and body provides an extra measure of protection
- Optional fluorocarbon seals are available for harsh chemical or higher temperature environments
- Secure head-to-body retention with the head in any one of four positions 90° apart
- Self-lifting pressure plate terminals saves wiring time.
- Wide variety of non-sparking actuators, switch options, and head styles for design flexibility
- Rotary actuated heads are field adjustable for CW actuation, CCW actuation, or both to reduce inventory
- Choice of silver or gold-plated contacts

### **APPLICATIONS**

- Grain elevators
- · Control valves and actuators
- · Off-shore and on-shore drilling
- Pipelines
- Petrochemical and chemical plants
- Water treatment plants
- · Paint booths
- Conveyors (above-ground)
- · Pulp and paper
- · Hazardous waste handling

### **VALUE TO CUSTOMERS**

- Around-the-world use in hazardous areas with international approvals: UL, CSA, ATEX (CE), IEC Ex, INMETRO, KOSHA, NEPSI Ex (China), and EAC (formerly GOST-R, Russia)
- Industry-leading breadth of product offering that includes: BX (aluminum housing) and BX2 (stainless steel housing) limit switches for hazardous locations
- 303 stainless steel operating shaft on sintered bronze bearing for enhanced mechanical life and operational reliability

### **PORTFOLIO**

Honeywell offers a wide range of limit switches in different size packages and hazardous environments. These limit switches include the BX/BX2 Series, CX Series, EX Series, LSX Series, GXS Series, and 14CE100 Series. To view the entire product portfolio, click here.

Figure 1. MICRO SWITCH BX Series Features and Options

The MICRO SWITCH BX2 limit switch has similar features, except a 316L stainless steel head and body without epoxy coating.



Figure 2. MICRO SWITCH BX Series Product Nomenclature

вх		F	зк		_
Switch Type	Conduit Threads	Head Style*	Body/Basic Switch Code	Actuator Modification	Actuator Options
<b>BX</b> Series Aluminum	½ or ¾ NPT**	A * Side rotary; momentary	<b>1A</b> 3NC/1NO, slow acting, 3/4 -14 NPT	1 CW rotation	Fixed Ø 0.75 in x 0.25 in W nylon roller, 1.5 in radius, front mount
Hazardous Area	<b>4</b> 20 mm	B Top rotary; momentary	3NC/1NO, slow acting, 3/4-14 NPT gold-plated contacts	2 CCW rotation	Fixed Ø 0.75 in x 0.25 in W nylon roller, 1.5 in radius, back mount
Limit Switch	** see Body/Basic Switch Code column	C * Top pin plunger, momentary	1NC/1NO, snap action, 1/2 -14 NPT gold-plated contacts	Right-oriented actuator head assembly	Adjustable, Ø 0.75 in x  O.25 in W nylon roller. front mount
<b>BX2</b> Series Stainless	NOTE: if 1/2 NPT or 3/4 NPT conduit is desired, no code is	* Top roller plunger, momentary	<b>3K</b> 1NC/1NO, snap action, 1/2 - 14 NPT	Left-oriented actuator head assembly	* Adjustable, Ø 0.75 in x 0.25 in W nylon roller. back mount
Steel Hazardous	necessary. Leave- blank.	E * Side pin plunger; momentary	<sup>Δ</sup> <b>4K</b> 1NC/1NO, snap action, 3/4 - 14 NPT	Head assembled with actuator to mounting surface	Adjustable, Ø 1.0 in x 0.5 in W nylon roller, front mount
Area Limit Switch	If conduit code "4" in this column is selected, conduit in	* Side roller plunger; momentary	4L 2NC/2NO, snap action, 3/4 - 14 NPT	6 Roller perpendicular to mounting surface	Adjustable, Ø 1.0 in x 0.5 in W nylon roller, back mount
Zimie owieori	Body/Basic Switch column does not	* Side rotary, momentary low PT, low torque	2NC/2NO, snap action, sequential, 3/4 - 14 NPT	8 Roller parallel to mounting surface	Yoke, Ø 0.75 in x 0.25 in W nylon rollers, same side, back mount
	apply.	J Wobble stick	2NC/2NO, snap action, center neutral, 3/4 - 14 NPT		4M Hub rod, aluminum
		Cat whisker	2NC/2NO, snap action, 3/4-14 NPT gold-plated contacts		Offset, Ø 0.75 in x 0.25 in W nylon roller, back mount
		* Side rotary; sequential, momentary	2NC/2NO, snap action, sequential, 3/4-14 NPT, gold-plated contacts		Offset, Ø 0.75 in x 0.25 in W nylon roller, front mount
		Side rotary; central neutral, momentary	2NC/2NO, snap action, center neutral, 3/4 -14 NPT, gold-plated contacts		<b>7A</b> Plastic wobble stick
		N * Side rotary; maintained	Δ 2NC/2NO, snap action, 1/2 - 14 NPT		Cat whisker, 5.5 in
		P* Side rotary, momentary low PT and DT	7N 2NC/2NO, snap action, center neutral, 1/2 - 14 NPT		
		R * Side rotary, momentary low torque	gold-plated contacts		
		V Top pin plunger, adjustable, momentary	gota platea contacts		
			V 2010 (2010 11		

2NC/2NO, snap action, center neutral, 1/2 -14 NPT,

gold-plated contacts

 $\Delta$  Not available with conduit code 4.

adjustable, momentary

To order fluorocarbon versions, insert the additional letter  ${\bf C}$  in the appropriate places in the standard catalog listing, as shown below:

ВХАЗК	standard, side-rotary switch
BXA <u>C</u> 3K	completely FC-sealed version of BXA3K

 $<sup>^{\</sup>star}$  BX2 stainless steel "head styles" and "actuators" available

Table 1. Specifications

Characteristic	Parameter					
Product type	MICRO SWITCH hazardous area limit switches					
Actuators	Side pin plunger Side pin plunger - adjustable Side roller plunger Side rotary Side rotary maintained Top pin plunger Top pin plunger - adjustable 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 2NC 2NO DPDT snap action, double break, sequential 2NC 2NO DPDT snap action, double break, center neutral 3NC 1NO slow action, double break					
Electrical	10 A thermal Single and double pole: AC15 A600; DC13 R300 (see table on page 5)					
Housing material	Aluminum (BX) or Stainless Stee	l (BX2)				
Termination types	0.5 in - 14 NPT conduit 0.75 in - 14 NPT conduit 20 mm conduit					
Housing type	BX/BX2 non-plug-in					
Sealing	NEMA 1, 3, 4, 6, 13; IP67					
Operating temperature*	Standard with fluorosilicone seals: -40 °C to 70 °C [-40 °F to 158 °F]  Optional with fluorocarbon seals: -12 °C to 70 °C [10 °F to 158 °F]					
ATEX/IEC Ex protection class	II 2 GD, Ex d IIC T6 Gb, Ex tb IIIC T85°C Db					
UNSPSC code	302119					
UNSPSC commodity	302119 Switches and controls a	nd relays				

<sup>\*</sup> Reference operating head styles on page 6 for exceptions.

**Table 2. Agency Certifications** 

		ATEX (CE) <sup>2</sup> Europe	CSA , UL, or cULus <sup>3</sup> Canada, USA	IEC Ex <sup>1</sup> International	KOSHA Korea	NEPSI EX <sup>2</sup> China	INMETRO <sup>2</sup> Brazil	EAC <sup>4</sup> Russia (formerly GOST-R)
		(ξ <sub>x</sub> )	C UL US	IECEX	<b>S</b> s	Ex NEPSI	INMETRO	EAC
	Conduit		'		'			
BX Series	M20	•		•	•	•	•	•
(aluminum)	NPT	•	•	•	•	•	•	•
BX2 Series	M20	•	•	•	•	•	•	•
(stainless steel)	NPT	•	•	•	•	•	•	•

<sup>&</sup>lt;sup>1</sup> ATEX & IEC Ex: II 2 GD; Ex d IIC T6 Gb; Ex tb IIIC T85°C Db; Ta -40 °C to 70 °C or -12 °C to 70 °C (dependent on seal material)

<sup>&</sup>lt;sup>2</sup> NEPSI Ex: GYJ111016

<sup>&</sup>lt;sup>3</sup> CSA, cUL, UL: NEMA 7 (Gas) Div 1&2, Class I, Groups B, C, & D; NEMA 9 (Dust) Div 1&2, Class II, Groups E, F, & G

<sup>&</sup>lt;sup>4</sup> Russia Custom Union Certification per **HAH/IO «ЦСВЭ» POCC** RU.0001.11**ΓБ**05; 1Ex d IIC T6 Gb X, Ex tb IIIC T85°C Db

MICRO SWITCH BX and BX2 Series Electrical Ratings 10 A continuous carry; ac Volts; Pilot Duty: AC15, A600

Electri- cal Rating	Cir- cuitry	on the imposition		Amps at 0.35 Power Factor Break
AC15, A600	SPDT DPDT	120	60	6
		240	30	3
		480	15	1.5
		600	12	1.2

MICRO SWITCH BX and BX2 Series Electrical Ratings dc Volts; Pilot Duty: DC13, R300

Electri- cal Rating	Cir- cuitry	Vdc	Make & Break Amps Inductive	Make & Break Amps Resistive
DC13,	SPDT	120	0.25	0.8
R300	DPDT	240	0.15	0.4

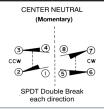
MICRO SWITCH BX and BX2 limit switches are capable of the following low voltage dc loads

Circuitry	Vdc	Amps Ar Inductive Resi	
SPDT, DPDT	24	10	10

**Switch Contact Styles, Double Break** 

SPDT (1NC/1NO)	DPDT (2NC/2NO)
④ ③ SPDT ② Double Break	① Bed Double Break

Center Neutral (SPDT each direction) Pole 1 operates CCW; Pole 2 operates CW



NOTE: Same polarity each pole

### **Low Temperature Limits**

For all MICRO SWITCH BX/BX2 styles, the upper temperature limit is 70 °C [158 °F], while the lower temperature limit is per the table below.

	MICRO SWITCH BX/BX2						
	Standard (Fl	uorosilicone)	Optional (Flurocarbon Sealed)				
Operating Head Styles	-40 °C [-40°F]	-29 °C [-20 °F]	-12 °C [10°F]	-1 °C [30 °F]			
BXA, BX2A - Side Rotary Momentary	•		•				
BXB - Top Rotary		•		•			
BXC, BX2C - Top Pin Plunger	•		•				
BXD, BX2D - Top Roller Plunger	•		•				
BXE, BX2E - Side Pin Plunger	•		•				
BXF, BX2F - Side Roller Plunger	•		•				
BXH, BX2H - Side Rotary, Low Pretravel and Torque		•		•			
BXJ - Wobble Stick		•		•			
BXK - Cat Whisker		•		•			
BXL, BX2L - Side Rotary, Sequential Operation	•		•				
BXM, BX2M - Side Rotary, Center Neutral	•		•				
BXN, BX2N - Side Rotary, Maintained		•		•			
BXP, BX2P - Side Rotary, Low Pretravel	•		•				
BXR, BX2R - Side Rotary, Low Torque		•		•			
BXV - Top Adjustable Plunger	•		•				
BXW - Side Adjustable Plunger	•		•				

### Fluorocarbon Sealed Switches (optional)

Fluorocarbon (FC)-sealed switches have an FC o-ring between the threaded cover and body. Rotary types have an extra FC seal on the operating shaft, while plunger versions have FC boot seals. They are for use in applications where the environment includes fire-resistant synthetic fluids, synthetic fluids, water-based fluids, and petroleum-based fluids. The additional FC seals also promote longer operating life for rotary-actuated BX/BX2 switches in applications where the temperatures are normally elevated.

To order, insert the additional letter **C** in the appropriate places in the standard catalog listing, as shown below:

<b>BXA3K</b> standard, side-rotary switch				
BXA <u>C</u> 3K	FC-sealed version of BXA3K			
BX2A3K	standard, stainless steel side-rotary switch			
BX2AC3K	Fluorocarbon-sealed version of BX2A3K			

### MICRO SWITCH BX/BX2 Series Operating Heads\*

**SIDE ROTARY:** Heads may be positioned in any one of four positions, 90° increments. All are momentary action except maintained head (BXN/BX2N Series).



BXA/BX2A - Standard: 60° minimum overtravel, 15° maximum pretravel, 5° (single pole) and 7° (double pole) maximum differential travel.

BXR/BX2R - Low operating torque: 60° minimum overtravel, 15° maximum pretravel, 0.19 Nm [1.7 in lb] maximum operating torque.

BXN/BX2N - Maintained contact: Maintained on counterclockwise rotation and reset on clockwise rotation, and vice versa.

BXP/BX2P - Low differential: 68° minimum overtravel, 9° maximum pretravel, 3° (single pole) and 4° (double pole) maximum differential travel.

BXH/BX2H - Low torque, low differential travel: 68° minimum overtravel. Features low operating torque and narrow differential travel.

**BXL/BX2L - Sequential operation:** 48° minimum overtravel. Delayed action between operation of two poles.

**BXM/BX2M - Center neutral:** 57° minimum overtravel. One pole operates on the clockwise rotation, and the other pole on the counterclockwise rotation.

\*BX Series epoxy-coated zinc heads are shown for illustration. BX2 Series heads are 316L stainless steel.

**TOP ROTARY:** Available levers provide greater versatility. Heads may be positioned in any one of four positions, 90° increments. All are momentary action.



BXB: With 100° minimum overtravel. Various levers that fit side rotary shafts may be used on the top rotary shaft. Switch is suitable when increased overtravel is required.

**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. All are momentary action.



BXC/BX2C - Top pin plunger: A copper alloy plunger for in-line actuating motion. Oil-tight seals on plunger and between the operating head and housing keep out coolant, dust, and chips.



BXD/BX2D - Top roller plunger: A copper alloy roller plunger is adjustable to 90° angles to accept cam or slide operation from any of two directions. Boot seal on the plunger.



BXV - Adjustable top pin plunger: A copper alloy adjustable 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.

## MICRO SWITCH BX/BX2 Series Operating Heads

SIDE PLUNGERS: Available with 4,83 mm [0.19 in] minimum overtravel. Side plungers are offered in pin plunger, adjustable pin plunger, and a roller plunger. All are momentary action.



BXE/BX2E - Side pin plunger: A copper alloy plunger for actuating motion inline with the plunger travel. Actuating head may be rotated 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.

WOBBLE LEVER ACTUATING HEADS: Heads come with either a Delrin® plastic rod or copper alloy cat whisker. Any movement of the lever (except pull) will actuate the switch.



BXK - Plastic rod: Recommended where possible scratching or marring by the actuator is to be avoided.



**BXJ - Cat whisker:** Copper alloy actuator designed for low operating force applications.



BXF/BX2F - Side roller plunger: A copper alloy roller plunger fits close quarters under cams and slides. The head may be rotated in any of four positions, 90° apart. The roller can be turned verti-<u>cal or horizontal to the switch</u>. Boot seal on plunger.



BXW - 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].

### SIDE ROTARY • MICRO SWITCH BX/BX2 SERIES ORDER GUIDE/RECOMMENDED LISTINGS

BXA /BX2A • St CW/CCW Mom		Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
		Aluminum	1NC-1NO	Silver	0.5-14 NPT	вхазк
	15° 1-2	Aluminum	1NC-1NO	Gold plate	0.5-14 NPT	вхазе
		Aluminum	1NC-1NO	Silver	0.75-14 NPT	BXA4K
	1-2 0° 10° 75°	Aluminum	1NC-1NO	Silver	20 mm	вх4А3К
	Pretravel • 15° max.	Aluminum	1NC-1NO	Gold plate	20 mm	BX4A3E
	Diff. travel (SPDT) • 5° max. Diff travel (DPDT) • 7° max.	Stainless Steel	1NC-1NO	Silver	0.5-14 NPT	BX2A3K
	Overtravel • 60° min. Oper. torque • 0,45 Nm [4 in-lb] max.	Stainless Steel	1NC-1NO	Silver	20 mm	BX24A3K
	*Oper. temp • -40 °C to 70 °C [-40 °F to 158 °F]	Aluminum	2NC-2NO	Silver	0.75-14 NPT	BXA4L
1-2/5-6 3-4/7-8 3-4/7-8 1-2/5-6		Aluminum	2NC-2NO	Silver	20 mm	BX4A4L
	3-4/7-8	Aluminum	2NC-2NO	Gold plate	0.5-14 NPT	BXA7S
		Aluminum	2NC-2NO	Gold plate	0.75-14 NPT	BXA4S
		Stainless Steel	2NC-2NO	Silver	0.75-14 NPT	BX2A4L
BXP/BX2P • Lo CW/CCW Mom		Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
	9° 1-2 3-4 3-4 1-2	Aluminum	1NC-1NO	Silver	0.5-14 NPT	вхрзк
	0° 6° 75°  Pretravel • 9° max.  Diff. travel (SPDT) • 3° max.  Diff. travel (DPDT) • 4° max.  Overtravel • 66° min.	Aluminum	2NC-2NO	Silver	0.75-14 NPT	BXP4L
	Oper. torque • 0,45 Nm [4 in-lb] max.  *Oper. temp • -40 °C to 70 °C [-40 °F to 158 °F]	Stainless Steel	2NC-2NO	Silver	0.75-14 NPT	BX2P4L
	1-2/5-6 3-4/7-8 3-4/7-8 1-2/5-6 0° 5° 75°	Stainless Steel	2NC-2NO	Silver	20 mm	BX24P4L

Contact closed  $\blacksquare$ ; Contact open  $\square$ 

 $Actuating\ head is factory\ set for\ CW\ and\ CCW\ actuation.\ Easily\ field\ adjusted\ for\ CW\ or\ CCW\ per\ instructions\ included\ with\ switch.$ 

NOTE: Same polarity each pole.

<sup>\*</sup> Operating temperature range for standard fluorosilicone sealed switch. For optional fluorocarbon sealed switch, see temperature table, page 8. To order a fluorocarbon sealed version, insert the additional letter "C" in the standard catalog listing, as follows. The BXA3K limit switch is changed to a BXAC3K limit switch.

#### SIDE ROTARY • MICRO SWITCH BX/BX2 SERIES ORDER GUIDE/RECOMMENDED LISTINGS

BXR • Low Toro		Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
	15° 1-2 3-4 1-2 4 1-2	Aluminum	1NC-1NO	Silver	0.5-14 NPT	вхкзк
	0° 10° 75°  Pretravel • 15° max.  Diff. travel (SPDT) • 5° max.  Diff. travel (DPDT) • 7° max.	Aluminum	1NC-1NO	Gold plate	0.5-14 NPT	BXR3E
	Overtravel • 60° min.  Oper. torque • 0,19 Nm [1.7 in-lb] max.  *Oper. temp • -29 °C to 70 °C [-20 °F to 158 °F]  15°	Aluminum	2NC-2NO	Silver	0.75-14 NPT	BXR4L
	1-2/5-6 3-4/7-8 3-4/7-8 1-2/5-6 0° 8° 75°	Aluminum	2NC-2NO	Gold plate	0.75-14 NPT	BXR4S
BXH • Low Diff CW and CCW M	erential, Low Torque, Iomentary	Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
	9° 1-2 3-4 3-4 1-2 0° 6° 75°  Pretravel • 9° max. Diff. travel (SPDT) • 3° max. Diff. travel (DPDT) • 4° max. Overtravel • 66° min. Oper. torque • 0,19 Nm [1.7 in-lb] max. *Oper. temp • -29 °C to 70 °C [-20 °F to 158 °F] 9° 1-2/5-6 3-4/7-8 3-4/7-8 1-2/5-6 0° 5° 75°	Aluminum	2NC-2NO	Silver	0.75-14 NPT	BXH4L
BXB • Top Rota CW and CCW M		Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
	35°  1-2 3-4 3-4 1-2 0° 27° 135°  Pretravel • 35° max. Diff. travel (SPDT) • 8° max. Diff. travel (DPDT) • 12° max. Overtravel • 100° min. Oper. torque • 0,28 Nm [2.5 in-lb] max. *Oper. temp • -29 °C to 70 °C [-20 °F to 158 °F]  35°  1-2/5-6 3-4/7-8 3-4/7-8 3-4/7-8 1-2/5-6 0° 23° 135°	Aluminum	1NC-1NO	Silver	0.5-14 NPT	вхвзк

Contact closed **■**; Contact open **□** 

 $Actuating \ head is factory set for CW \ and \ CCW \ actuation. \ Easily \ field \ adjusted \ for \ CW \ per \ instructions \ included \ with \ switch.$ 

<sup>\*</sup>Operating temperature range for standard fluorosilicone sealed switch. For optional fluorocarbon sealed switch, see temperature table, page 8. To order a fluorocarbon sealed version, insert the additional letter "C" in the standard catalog listing, as follows. The BXA3K limit switch is changed to a BXAC3K limit switch.

### SIDE ROTARY • MICRO SWITCH BX/BX2 SERIES ORDER GUIDE/RECOMMENDED LISTINGS

BXN • Maintained, Two Position CCW (trip), CW (Reset)		Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
	65° 1-2 3-4 3-4	Aluminum	1NC-1NO	Silver	0.5-14 NPT	вхизк
	0° 25° 85° Pretravel • 65° max. Diff. travel • 40° max.	Aluminum	1NC-1NO	Silver	20 mm	BX4N3K
	Overtravel • 20° min.  Oper. torque • 0,45 Nm [4 in-lb] max.  *Oper. temp • -29 °C to 70 °C [-20 °F to 158 °F]  65°	Aluminum	2NC-2NO	Silver	0.75-14 NPT	BXN4L
	1-2/5-6 3-4/7-8 3-4/7-8 1-2/5-6 0° 25° 85°	Aluminum	2NC-2NO	Silver	20 mm	BX4N4L
BXM • Center N CW and CCW M		Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
	Pretravel • 18° max. Diff. travel • 10° max. Overtravel • 57° min. Oper. torque • 0,45 Nm [4 in-lb] max. *Oper. temp • -40 °C to 70 °C [-40 °F to 158 °F]  75° 18° 0° 75° 1-2 3-4	Aluminum	2NC-2NO	Silver	0.75-14 NPT	BXM4N
	3-4 1-2 CCW 8° CW 75° 0° 18° 75° 5-6 7-8 7-8 5-6 CCW 8° CW	Aluminum	2NC-2NO	Silver	20 mm	BX4M4N

Contact closed ■; Contact open □

NOTE: Same polarity each pole.

<sup>\*</sup>Operating temperature range for standard fluorosilicone sealed switch. For optional fluorocarbon sealed switch, see temperature table, page 8. To order a fluorocarbon sealed version, insert the additional letter "C" in the standard catalog listing, as follows. The BXA3K limit switch is changed to a BXAC3K limit switch.

## Table 3. Common levers for use with MICRO SWITCH BX Rotary Switches\*

Levers for use with side-rotary-actuated switches are available in a wide choice of sizes and materials. The most common listings are shown below. Rollers may be on either side of the lever to best match the external actuating mechanism.



<sup>\*</sup> Non-sparking rollers and actuators must be used in hazardous areas.

<sup>\*\*</sup> May require orientation of switch and lever to enable gravity to help restore switch's free position.

Table 4. BX/BX2 Series Lever Order Guide

	Catalog Listing	Material	Roller Dia. mm [in]	Roller Width mm [in]	Roller Mounting
	Fixed 38,1 [	1.5] inch rad	ius	[]	
	LSZ51	Rollerless	n/a	n/a 6,35	n/a
	LSZ51A	Nylon	19 [0.75]	[0.25]	Front
	LSZ51C	Nylon	19 [0.75]	6,35 [0.25]	Back
	LSZ51F	Nylon	25,4 [1.0]	12,7 [0.50]	Front
3	LSZ51G	Nylon	38,1 [1.5]	6,35 [0.25]	Front
1 4	LSZ51J	Nylon	25,4 [1.0]	12,7 [0.50]	Back
V	LSZ51M	Nylon	19 [0.75]	31,7 [1.25]	Back
	LSZ51P	Nylon	19 [0.75]	12,7 [0.50]	Front
	LS2Z51A (sst)	Nylon	19 [0.75]	6,35 [0.25]	Front
	LS2Z51C (sst)	Nylon	19 [0.75]	6,35 [0.25]	Back
	LS2Z51E (sst)	Copper alloy	19 [0.75]	6,35 [0.25]	Front
	LS2Z51F (sst)	Copper alloy	19 [0.75]	6,35 [0.25]	Back
	-	38,1 [1.5] in t			- /-
	LSZ52 LSZ52A	Rollerless Nylon	n/a 19 [0.75]	n/a 6,35	n/a Back
	LSZ52C	Nylon	19 [0.75]	[0.25] 6,35	Front
	LSZ52E	Nylon	19 [0.75]	33,0	Front
	LSZ52J	Nylon	25,4 [1.0]	[1.30] 12,7 [0.50]	Front
	LSZ52K	Nylon	38,1 [1.5]	6,35 [0.25]	Front
	LSZ52M	Nylon	50,8 [2.0]	6,35	Front
	LSZ52N	Nylon	19 [0.75]	[0.25] 12,7 [0.50]	Front
	LS2Z52A (sst)	Nylon	19 [0.75]	6,35 [0.25]	Front
	LS2Z52C (sst)	Nylon	19 [0.75]	6,35 [0.25]	Back
	LS2Z52E (sst)	Copper alloy	19 [0.75]	6,35 [0.25]	Front
	LS2Z52F (sst)	Copper alloy	19 [0.75]	6,35 [0.25]	Back
	Yoke - 38,1	[1.5] in radiu	IS	[0.20]	
	LSZ53A	Nylon	19 [0.75]	6,35 [0.25]	Front/Back
	LSZ53E	Nylon	19 [0.75]	6,35 [0.25]	Back/Front
	LSZ53M	Nylon	19 [0.75]	31,7 [1.25]	Back/Front
	LSZ53S	Nylon	19 [0.75]	6,35 [0.25]	Back/Back
	Rod				
	LSZ54	Hub only	n/a	n/a	n/a
	LSZ54M	Alum, 140 mm [5.5 in]	Ø 3,2 [Ø 0.125]	n/a	n/a
	LSZ54N	Stainless, 330 mm [13 in]	Ø 3,2 [Ø 0.125]	n/a	n/a
	LSZ54P	Plastic rod, 305 mm [12 in]	Ø6,85 [Ø 0.27]	n/a	n/a
Inc	LSZ54W	Plastic rod, 183 mm [7.2 in]	Ø6,85 [Ø 0.27]	n/a	n/a

	Catalog Listing	Material	Roller Dia. mm [in]	Roller Width mm [in]	Roller Mounting		
	Offset - 38	,1 [1.5] in rad	ius				
	LSZ55	Rollerless	n/a	n/a	n/a		
	LSZ55A	Nylon	19 [0.75]	6,35 [0.25]	Back		
9	LSZ55C	Nylon	19 [0.75]	6,35 [0.25]	Front		
76	LSZ55E	Nylon	19 [0.75]	12,7 [0.50]	Front		
,	LSZ55K	Nylon	38,1 [1.5]	6,35 [0.25]	Front		
	Short fixed	- 1.3 in radiu	s				
	LSZ59A	Nylon	19 [0.75]	6,35 [0.25]	Front		
3	LSZ59C	Nylon	19 [0.75]	6,35 [0.25]	Back		
	One-way ro	oller lever					
	LSZ60A	Nylon	19 [0.75]	6,35 [0.25]	Front		
	Flexible loc	р					
$\cap$	LSZ61	Ø 4,8 [Ø 0.19 ] Nylatron	152 mm [6	152 mm [6 in] flexible loop			
\	LSZ618	Ø 4,8 [Ø 0.19 ] Nylatron	241 mm [9.5 in] flexible loop				
	LSZ54	Hub only	n/a	n/a	n/a		
	Spring rod						
	LSZ68	Delrin rod, 305 mm [12 in]	Ø 6,35 [0.25]	n/a	n/a		
	LSZ617	Delrin rod, 406 mm [16 in]	Ø 6,35 [0.25]	n/a	n/a		
	LSZ686	Delrin rod, 152 mm [6 in]	Ø 6,35 [0.25]	n/a	n/a		
	Rubber roll	er levers					
	LSZ51Y 38,1 [1.5] radius (standard)	Rubber	50 [2.0]	12,7 [0.5]	front		
	LSZ55Y 38,1 [1.5] radius (offset)	Rubber	50 [2.0]	12,7 [0.5]	front		
	LSZ52Y 38,1 to 89 [1.5 to 3.5] radius (adjustable)	Rubber	50 [2.0]	12,7 [0.5]	front		
	Plastic roll	er levers					
- 1	LSZ67AA (conveyor)*	Plastic	38,1 [1.5]	96,5 [3.8]	n/a		

<sup>\*</sup> May require orientation of switch and lever to enable gravity to help restore switch to free position.

## TOP PLUNGER • MICRO SWITCH BX/BX2 SERIES ORDER GUIDE/RECOMMENDED LISTINGS All top plungers are momentary action.

BX <u>C</u> /BX2 <u>C</u> • Top Pin Plunger		Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
	1,78 mm [0.07 in]	Aluminum	1NC-1NO	Silver	0.5-14 NPT	вхсзк
	1-2 3-4 3-4	Aluminum	1NC-1NO	Silver	0.75-14 NPT	вхс4к
	1-2 0 in 1,4 mm 6,6 mm [0.055 in] [0.26 in]	Aluminum	1NC-1NO	Silver	20 mm	вх4С3К
САОПОМ	Pretravel • 1,78 mm [0.07 in] max.  Diff. travel (SPDT) • 0,38 mm [0.015 in] max.	Aluminum	1NC-1NO	Gold plate	20mm	вх4С3Е
	Diff travel (DPDT) • 0,51 mm [0.020 in] max. Overtravel • 4,83 mm [0.190 in] min.	Aluminum	2NC-2NO	Silver	0.75-14 NPT	BXC4L
	Oper. point • 58,5 ±0,76 mm [2.305 ±0.030 in] Oper. force • 17,8 N [4 lb] max. *Oper. temp • -40 °C to 70 °C [-40 °F to 158 °F]	Aluminum	2NC-2NO	Silver	20 mm	BX4C4L
	1,78 mm [0.07 in]	Aluminum	2NC-2NO	Gold plate	20 mm	BX4C49
	1-2/5-6 3-4/7-8 3-4/7-8	Stainless steel	2NC-2NO	Silver	0.75-14 NPT	BX2C4L
	1-2/5-6 0 in 1,27 mm 6,6 mm [0.05 in] (0.26 in]	Stainless steel	2NC-2NO	Silver	20 mm	BX24C4
	Top Roller Plunger ed at 90° increments)	Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
	1,78 mm [0.07 in]	Aluminum	1NC-1NO	Silver	0.5-14 NPT	вхрзк
	3-4 3-4 1-2	Aluminum	1NC-1NO	Silver	20 mm	BX4D3I
	0 in 1,4 mm 6,6 mm [0.055 in] [0.26 in]  Pretravel • 1,78 mm [0.07 in] max.	Aluminum	1NC-1NO	Gold plate	20 mm	BX4D3I
	Diff. travel (SPDT) • 0,38 mm [0.015 in] max. Diff travel (DPDT) • 0,51 mm [0.020 in] max.	Aluminum	2NC-2NO	Silver	0.75-14 NPT	BXD4L
	Overtravel • 4,83 mm [0.190 in] min.  Oper. point • 68,6 ±1,02 mm [2.70 ±0.040 in]  Oper. force • 17,8 N [4 lb] max.	Aluminum	2NC-2NO	Silver	20 mm	BX4D4I
The same and the s	*Oper.temp • -40 °C to 70 °C [-40 °F to 158 °F] 1,78 mm [0.07 in]	Aluminum	2NC-2NO	Gold plate	20 mm	BX4D4
	1-2/5-6 3-4/7-8	Stainless steel	2NC-2NO	Silver	0.75-14 NPT	BX2D4I
	1-2/5-6 0 in 1,27 mm 6,6 mm [0.05 in] [0.26 in]	Stainless steel	2NC-2NO	Silver	20 mm	BX24D4
3X <u>V</u> • Top Ad	justable Plunger	Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
	Pretravel • 1,78 mm [0.07 in] max.  Diff. travel (SPDT) • 0,38 mm [0.015 in] max.  Diff travel (DPDT) • 0,51 mm [0.020 in] max.  Overtravel • 4,83 mm [0.190 in] min.  Oper. point • 65,66 [2.585] min; 72,01 [2.835] max.  Oper. force • 17,8 N [4 lb] max.  *Oper. temp • -40 °C to 70 °C [-40 °F to 158 °F]  1-2/5-6  3-4/7-8  1-2/5-6  3-4/7-8  1-2/5-6  0 in 1.27 mm [0.05 in]  6.6 mm [0.05 in]	Aluminum	2NC-2NO	Silver	0.75-14 NPT	BXV4L

Contact closed ■; Contact open □ NOTE: Same polarity each pole.

<sup>\*</sup>Operating temperature range for standard fluorosilicone sealed switch. For optional fluorocarbon sealed switch, see temperature table, page 8. To order a fluorocarbon sealed version, insert the additional letter "C" in the standard catalog listing, as follows. The BXA3K limit switch is changed to a BXAC3K limit switch.

### SIDE PLUNGER • MICRO SWITCH BX/BX2 SERIES ORDER GUIDE/RECOMMENDED LISTINGS

All side plungers are momentary action.

BX <u>E</u> /BX2 <u>E</u> • 9	Side Pin Plunger	Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
	2,54 mm [0.10 in] 1-2 3-4	Aluminum	1NC-1NO	Silver	0.5-14 NPT	вхезк
	3-4 1-2 0 in 1,4 mm 7,36 mm [0.055 in] [0.29 in]	Aluminum	1NC-1NO	Gold plate	0.5-14 NPT	вхезе
	Pretravel • 2,54 mm [0.10 in] max. Diff. travel • 1,14 mm [0.045 in] max. Overtravel • 4,83 mm [0.190 in] min.	Stainless steel	1NC-1NO	Silver	0.5-14 NPT	BX2E3
The state of the s	Oper. point • 33,02 ±0,76 mm [1.30 ±0.030 in] Oper. force • 26,79 N [6 lb] max. *Oper. temp • -40 °C to 70 °C [-40 °F to 158 °F]	Stainless steel	1NC-1NO	Gold plate	0.5-14 NPT	BX2E3I
	2.54 mm [0.10 in] 1-2/5-6 3-4/7-8	Aluminum	2NC-2NO	Silver	0.75-14 NPT	BXE4L
	3-4/7-8 1-2/5-6 0 in 1,4 mm [0.055 in] 1,29 in [0.29 in]	Alumainum	2NC-2NO	Gold plate	0.75-14 NPT	BXE4S
3X <u>F</u> /BX2 <u>F</u> • \$	Side Roller Plunger	Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
	2,54 mm [0.10 in]	Aluminum	1NC-1NO	Silver	0.5-14 NPT	BXF3K
	3-4 1-2 0 in 1,4 mm 7,36 mm [0.055 in] [0.29 in]	Aluminum	1NC-1NO	Gold plate	0.5-14 NPT	BXF3E
	Pretravel • 2,54 mm [0.10 in] max. Diff. travel • 1,14 mm [0.045 in] max. Overtravel • 4,83 mm [0.190 in] min.	Stainless steel	1NC-1NO	Silver	0.5-14 NPT	BX2F3I
	Oper. point • 44,07 ±1,02 mm [1.735 in ±0.040 Oper. force • 26,79 N [6 lb] max.  *Oper. temp • -40 °C to 70 °C [-40 °F to 158 °F]	Stainless steel	1NC-1NO	Gold plate	0.5-14 NPT	BX2F3I
	2,54 mm [0.10 in] 1-2/5-6 3-4/7-8	Aluminum	2NC-2NO	Silver	0.75-14 NPT	BXF4L
	3-4/7-8 1-2/5-6 0 in 1,4 mm 7,36 mm	A.I	2NC-2NO	Gold plate	0.75-14 NPT	BXF4S

Contact closed  $\blacksquare$ ; Contact open  $\square$ NOTE: Same polarity each pole.

<sup>\*</sup>Operating temperature range for standard fluorosilicone sealed switch. For optional fluorocarbon sealed switch, see temperature table, page 8. To order a fluorocarbon sealed version, insert the additional letter "C" in the standard catalog listing, as follows. The BXA3K limit switch is changed to a BXAC limit switch.

### WOBBLE • MICRO SWITCH BX/BX2 SERIES ORDER GUIDE/RECOMMENDED LISTINGS

BX <u>J</u> • Wobble, F	Plastic Rod (7A Actuator)	Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
	12°	Aluminum	1NC-1NO	Silver	0.5-14 NPT	ВХЈЗК-7А
	3-4 1-2 0° 8° 40°	Aluminum	1NC-1NO	Silver	20 mm	ВХ4Ј3К-7А
GAI ITON	Actuator length • 152 mm [6 in] Pretravel • 25,4 mm [1.0 in] max.  Oper. force • 2,8 N [10 oz] max.  *Oper. temp • -29 °C to 70 °C [-20 °F to 158 °F]	Aluminum	1NC-1NO	Gold plate	0.5-14 NPT	BXJ3E-7A
	1-2/5-6 3-4/7-8	Aluminum	2NC-2NO	Silver	0.75-14 NPT	BXJ4L-7A
	3-4/7-8 1-2/5-6 0° 8° 40°	Aluminum	2NC-2NO	Silver	20 mm	BX4J4L-7A
BX <u>K</u> • Wobble, 0	Cat Whisker (8A Actuator)	Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
	25° 1-2 3-4 3-4 4 4	Aluminum	1NC-1NO	Silver	0.5-14 NPT	BXK3K-8A
	0° 15° 50°  Actuator length • 152 mm [6 in]  Pretravel • 50,8 mm [2.0 in] max.	Aluminum	1NC-1NO	Gold plate	0.5-14 NPT	BXK3E-8A
	Oper. force • 1,4 N [5 oz] max.  *Oper. temp • -29 °C to 70 °C [-20 °F to 158 °F]  25°  1-2/5-6  3 4/7 8	Aluminum	2NC-2NO	Silver	0.75-14 NPT	BXK4L-8A
	3-4/7-8 3-4/7-8 1-2/5-6 0° 15° 50°	Aluminum	2NC-2NO	Silver	20 mm	BX4K4L-8A

Contact closed  $\blacksquare$ ; Contact open  $\square$ NOTE: Same polarity each pole.

<sup>\*</sup> Operating temperature range for standard fluorosilicone sealed switch. For optional fluorocarbon sealed switch, see temperature table, page 8. To order a fluorocarbon sealed version, insert the additional letter "C" in the standard catalog listing, as follows. The BXA3K limit switch is changed to a BXAC3K limit switch.

### REPLACEMENT CONTACT BLOCKS

Circuitry	Replacement Contact Block
Single pole	LSXZ3K
Double pole	LSXZ3L
Sequence or central neutral	LSXZ3M

## REPLACEMENT HEADS for STANDARD

### **BX Switches**

Switch Type	Catalog Listing/Operating Head Only
BXA	LSZ1AB
BXB	LSZ1BB
BXC	LSXZ1CB
BXD	LSXZ1DB
BXE	LSXZ1EB
BXF	LSXZ1FB
BXH	LSZ1HB
BXJ	LSZ1JBGA
BXK	LSXZ1KBHA
BXL	LSZ1LB
BXM	LSZ1MB
BXP	LSZ1PB
BXR	LSZ1RB
BXV	LSXZ1VB
BXW	LSXZ1WB

### **ASSEMBLY MODIFICATIONS**

Momentary action rotary switches can be furnished in other than the normal assembled conditions. To specify modifications, add the numbers shown below to the catalog listings. Modification number suffixes are:

- Clockwise actuation only
- 2 Counterclockwise actuation only
- 3 Shaft to right of switch front
- 4 Shaft to left of switch front
- Shaft to back of switch

### For example,

Catalog listing BXA3K23 is a BXA3K switch adjusted for counterclockwise actuation only. The operating shaft is to the right side of the switch when viewing it from the front (label side). No lever.

### **PLUNGER ASSEMBLY MODIFICATIONS**

Add the following modification numbers to the catalog listing in the plunger switch:

- Side plunger to right of switch front
- Side plunger to left of switch front
- Side plunger to back of switch
- 6 Roller on top plungers perpendicular to mounting surface
- Roller on side plungers in vertical position 8

#### For example,

Catalog listing BXF3K3 is a BXF3K switch with the side roller plunger to the right side.

Figure 3. MICRO SWITCH BX Series Side Rotary Product Dimensions • mm [in] Side Rotary - Head Codes: A, H, L, M, N, P, Q, AND R

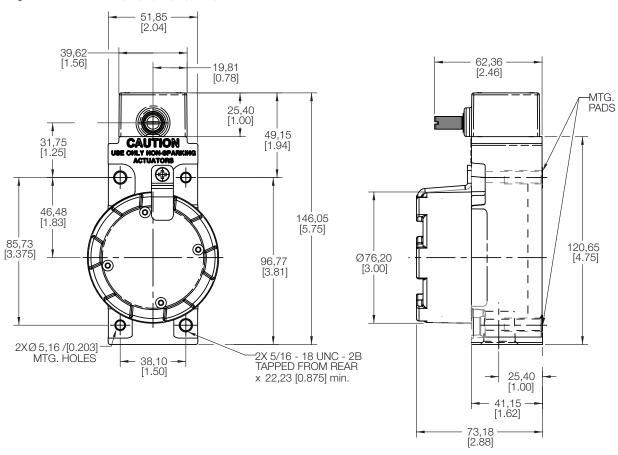


Figure 4. MICRO SWITCH BX Series Wobble Stick, Head Code J • mm [in]

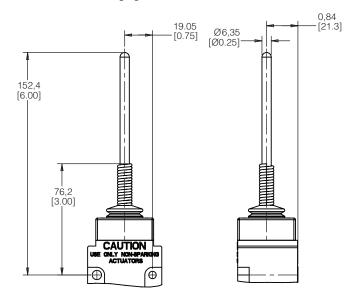
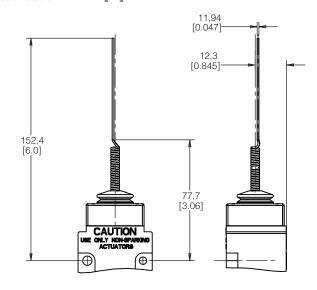


Figure 5. MICRO SWITCH BX SERIES Cat Whisker Wobble, Head Code K • mm [in]



[.85]

Figure 6. MICRO SWITCH BX Series Top Rotary, Head Code B • mm [in]

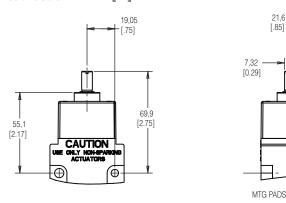


Figure 8. MICRO SWITCH BX Series Top Roller Plunger, Head Code D • mm [in]

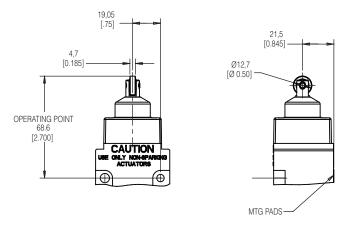


Figure 11. MICRO SWITCH BX Series Adjustable Top Pin Plunger, Head Code V • mm [in]

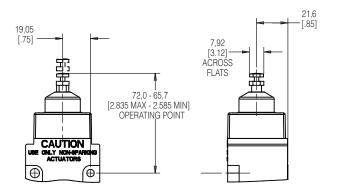


Figure 7. MICRO SWITCH BX Series Top Pin Plunger, Head Code C • mm [in]

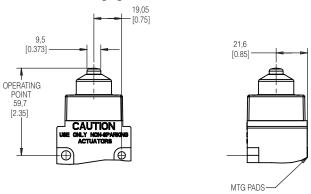


Figure 9. MICRO SWITCH BX Series Side Plunger, Head Code E • mm [in]

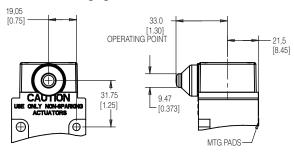


Figure 10. MICRO SWITCH BX Series Side Roller Plunger, Head Code F • mm [in]

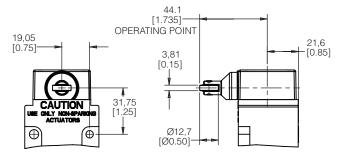


Figure 12. MICRO SWITCH BX Series Adjustable Side Pin Plunger, Head Code W • mm [in]

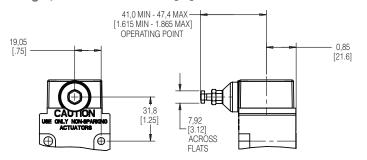


Figure 13. MICRO SWITCH BX2 Series Side Rotary Product Dimensions • mm [in] Side Rotary - Head Codes: A, P, AND R

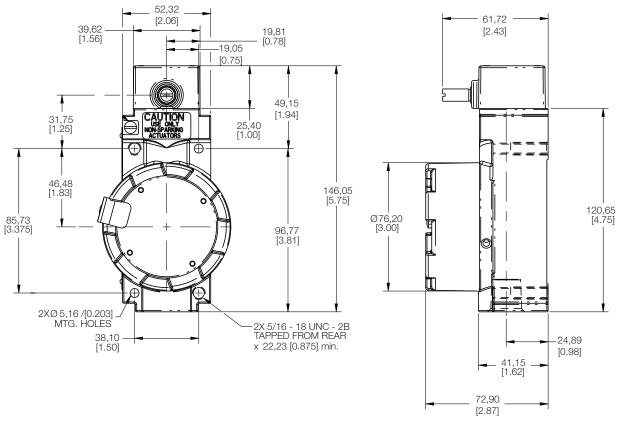


Figure 14. MICRO SWITCH BX2 Series Top Plunger Product Dimensions • mm [in] Top Plunger - Head Codes: C and D

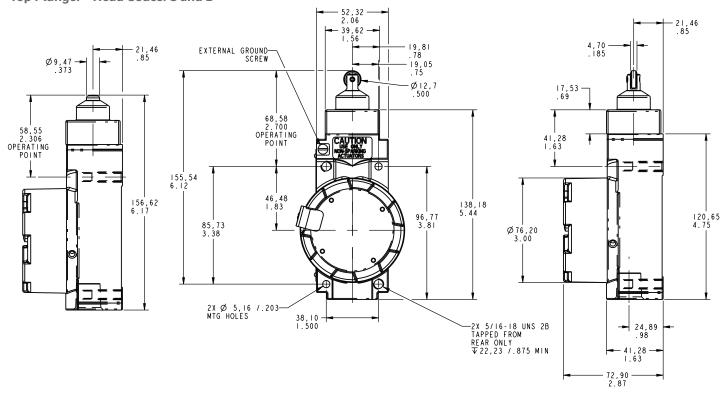


Figure 15. MICRO SWITCH BX2 Series Side Plunger Product Dimensions • mm [in] Side Plunger - Head Codes: E and F

