

MICRO SWITCH Hazardous Area Switches

BX | BX2 Series

002306 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 $90^{\circ}\,\text{apart}$
- 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.

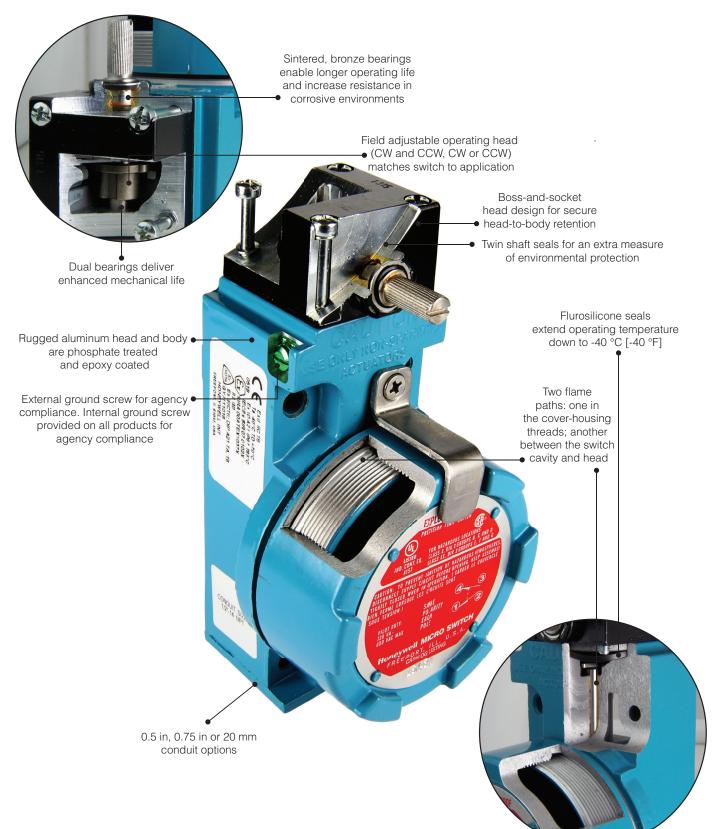


Figure 2. MICRO SWITCH BX Series Product Nomenclature

BX Switch Type	Conduit Threads	F Head Style*	3K Body/Basic Switch Code	Actuator Modification	Actuator Options
BX Series Aluminum	1/2 or 3/4 NPT**	A * Side rotary; momentary	1A 3NC/1NO, slow acting, 3/4 -14 NPT	1 CW rotation	1A * Fixed Ø 0.75 in x 0.25 in W nylon roller, 1.5 in radius, front mount
Hazardous Area	4 20 mm	B Top rotary; momentary	3NC/1NO, slow acting, 3/4 -14 NPT gold-plated contacts	2 CCW rotation	1C * 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	3E 1NC/1NO, snap action, 1/2 -14 NPT gold-plated contacts	3 Right-oriented actuator head assembly	2A * Adjustable, Ø 0.75 in x 0.25 in W nylon roller. front mount
BX2 Series Stainless	NOTE: if 1/2 NPT or 3/4 NPT conduit is desired, no code is	D* Top roller plunger, momentary	3K 1NC/1NO, snap action, 1/2 - 14 NPT	4 Left-oriented actuator head assembly	2C * Adjustable, Ø 0.75 in x 0.25 in W nylon roller. back mount
Steel Hazardous	necessary. Leave- blank.	E * Side pin plunger; momentary	⁴ 4K 1NC/1NO, snap action, 3/4 - 14 NPT	5 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
2	Body/Basic Switch column does not	Side rotary, momentary low PT, low torque	4M 2NC/2NO, snap action, sequential, 3/4 - 14 NPT	8 Roller parallel to mounting surface	3S Yoke, Ø 0.75 in x 0.25 in W nylon rollers, same side, back mount
	apply.	J Wobble stick	4N 2NC/2NO, snap action, center neutral, 3/4 - 14 NPT		4M Hub rod, aluminum
		K Cat whisker	4S 2NC/2NO, snap action, 3/4 -14 NPT gold-plated contacts		5A Offset, Ø 0.75 in x 0.25 in W nylon roller, back mount
		 Side rotary; sequential, momentary 	4T 2NC/2NO, snap action, sequential, 3/4 - 14 NPT, gold-plated contacts		5C Offset, Ø 0.75 in x 0.25 in W nylon roller, front mount
		Side rotary; central neutral, momentary	4U 2NC/2NO, snap action, center neutral, 3/4 -14 NPT, gold-plated contacts		7A Plastic wobble stick
		N* Side rotary; maintained	^A 7L 2NC/2NO, snap action, 1/2 - 14 NPT		8A Cat whisker, 5.5 in
		Side rotary, momentary low PT and DT	1/2 - 14 NPT		
		R * Side rotary, momentary low torque	gold-plated contacts		
		V Top pin plunger, adjustable, momentary	gota plated contacts		
		Side pin plunger, adjustable, momentary	Δ 2NC/2NO, snap action, center neutral, 1/2 -14 NPT, gold-plated contacts		

 Δ Not available with conduit code 4.

 * BX2 stainless steel "head styles" and "actuators" available

To order fluorocarbon versions, insert the additional letter **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

Table 1. Specifications

Characteristic	Parameter							
Product type	MICRO SWITCH hazardous area limit switches							
Actuators	Side pin plunger Side rotary Top pin plunger - adjustable Wobble - cat whisker	Side roller plunger Top pin plunger Top rotary						
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 Steel (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						

* Reference operating head styles on page 6 for exceptions.

Table 2. Agency Certifications

		ATEX (CE) ² Europe	CSA , UL, or cULus ³ Canada, USA	IEC Ex ¹ International	KOSHA Korea	NEPSI EX ² China	INMETRO ² Brazil	EAC ⁴ Russia (formerly GOST-R)
		C E Ex	C UL US	IECE x	€ s	Ex NEPSI	INMETRO	EAC
	Conduit							
BX Series	M20	•		•	•	•	•	•
(aluminum)	NPT	•	•	•	•	•	•	•
BX2 Series (stainless steel)	M20	•	•	•	•	•	•	•
	NPT	•	•	•	•	•	•	•

¹ 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) ² NEPSI Ex: GYJ111016

³ 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

⁴ Russia Custom Union Certification per HAHIO «LICBЭ» POCC RU.0001.11ГБ05; 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	Vac	Amps at 0.35 Power Factor Make	Amps at 0.35 Power Factor Break
AC15, A600	SPDT DPDT	120	60	6
		240	30	3
		600 DPD1		15
		600	12	1.2

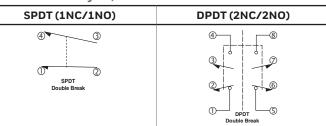
MICRO SWITCH BX and BX2 Series Electrical Ratings dc Volts; Pilot Duty: DC13, R300

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

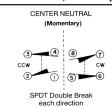
MICRO SWITCH BX and BX2 limit switches are capable of the following low voltage dc loads

Circuitry	Vdc	Amps Inductive	Amps Resistive
SPDT, DPDT	24	10	10

Switch Contact Styles, 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.

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

ВХАЗК	standard, side-rotary switch			
BXAC3K FC-sealed version of BXA3K				
BX2A3K	standard, stainless steel side-rotary switch			
BX2A <u>C</u> 3K	Fluorocarbon-sealed version of BX2A3K			

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.

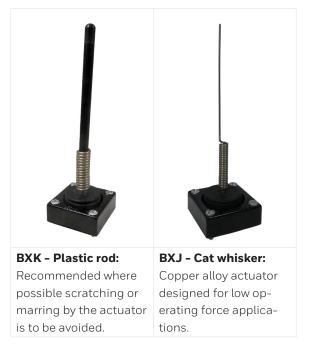
WOBBLE LEVER ACTUATING HEADS: Heads come with either a Delrin[®] plastic rod or copper alloy cat whisker. Any movement of the lever (except pull) will actuate the switch.





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. <u>The roller can be turned vertical 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

BX <u>A</u> /BX2 <u>A</u> • CW/CCW Mo		Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
		Aluminum	1NC-1NO	Silver	0.5-14 NPT	ВХАЗК
	15°	Aluminum	1NC-1NO	Gold plate	0.5-14 NPT	BXA3E
	1-2 3-4 3-4 3-4	Aluminum	1NC-1NO	Silver	0.75-14 NPT	BXA4K
	0° 10° 75°	Aluminum	1NC-1NO	Silver	20 mm	BX4A3K
	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	BX24A3
	*Oper. temp • -40 °C to 70 °C [-40 °F to 158 °F]	Aluminum	2NC-2NO	Silver	0.75-14 NPT	BXA4L
	15° 1-2/5-6	Aluminum	2NC-2NO	Silver	20 mm	BX4A4L
	3-4/7-8		2NC-2NO	Gold plate	0.5-14 NPT	BXA7S
	1-2/5-6 0° 8° 75°	Aluminum	2NC-2NO	Gold plate	0.75-14 NPT	BXA4S
		Stainless Steel	2NC-2NO	Silver	0.75-14 NPT	BX2A4L
BX <u>P</u> /BX2 <u>P</u> • CW/CCW Mo	Low Differential mentary	Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
	9° 1-2 3-4 3-4 1-2 0° 6° 75°	Aluminum	1NC-1NO	Silver	0.5-14 NPT	ВХРЗК
	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	BX2P4I
	9° 1-2/5-6 3-4/7-8 3-4/7-8 1-2/5-6 0° 5° 75°		2NC-2NO	Silver	20 mm	BX24P4

Contact closed ∎; Contact open □

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.

* 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

BX <u>R</u> • Low To CW and CCW		Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
	$ \begin{array}{c} 15^{\circ} \\ 1-2 \\ 3-4 \\ 3-4 \\ 1-2 \\ \hline \end{array} \qquad \qquad$	Aluminum	1NC-1NO	Silver	0.5-14 NPT	BXR3K
	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
BX <u>H</u> • Low Di CW and CCW	fferential, Low Torque, Momentary	Housing Material	Contacts (snap-action)	Contact Material	Conduit	Listing
	9° 1-2 3-4 3-4 1-2 0° 6° Pretravel • 9° max. Diff. travel (SPDT) • 3° max. Diff. travel (SPDT) • 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
BX <u>B</u> • Top Ro CW and CCW		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 (SPDT) • 12° max. Overtravel • 100° min. Oper. torque • 0.28 Nm [2.5 in-lb] max. *Oper. torque • 0.28 Nm [2.5 in-lb] max.	Aluminum	1NC-1NO	Silver	0.5-14 NPT	BXB3M

Contact closed ∎; Contact open □

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.

* 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

BX <u>N</u> • Maintain CCW (trip), CW	ed, Two Position (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	BXN3K
	1-2	$ \begin{array}{c} 1 \\ 65^{\circ} \\ 85^{\circ} \\ $	BX4N3K			
		Aluminum	2NC-2NO	Silver	0.75-14 NPT	BXN4L
	3-4/7-8 3-4/7-8 1-2/5-6	Aluminum	2NC-2NO	Silver	20 mm	BX4N4L
BX <u>M</u> • Center Neutral, CW and CCW Momentary		Housing Material		Contact Material	Conduit	Listing
	1-2	Aluminum	2NC-2NO	Silver	0.75-14 NPT	BXM4N
	1-2 CCW 8° CW 75° 0° 18° 75° 5 6	Aluminum	2NC-2NO	Silver	0.75-14 NPT 20 mm Conduit 0.75-14 NPT	BX4M4N

Contact closed ■; Contact open □

NOTE: Same polarity each pole.

* 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.