# MICRO SWITCH Hazardous Area Switches 



## 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, $B X$ and BX2 Series products carry global agency coverage.

Honeywell offers two versions of the $B X$ 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 $B X / B \times 2$ Series are field adjustable at $90^{\circ}$ 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 $90^{\circ}$ 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 316 L stainless steel head and body without epoxy coating.


## MICRO SWITCH Hazardous Area Switches, BX I BX2 Series

Figure 2. MICRO SWITCH BX Series Product Nomenclature


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

| BXA3K | standard, side-rotary switch |
| :--- | :--- |
| BXAC3K | completely FC-sealed version of BXA3K |

Table 1. Specifications

| Characteristic | Parameter |
| :---: | :---: |
| Product type | MICRO SWITCH hazardous area limit switches |
| Actuators | Side pin plunger Side pin plunger - adjustable Side roller plunger <br> Side rotary Side rotary maintained Top pin plunger <br> Top pin plunger - adjustable Top roller plunger Top rotary <br> 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 <br> 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: $-40^{\circ} \mathrm{C}$ to $70^{\circ} \mathrm{C}\left[-40^{\circ} \mathrm{F}\right.$ to $\left.158^{\circ} \mathrm{F}\right]$ Optional with fluorocarbon seals: $-12^{\circ} \mathrm{C}$ to $70^{\circ} \mathrm{C}\left[10^{\circ} \mathrm{F}\right.$ to $\left.158^{\circ} \mathrm{F}\right]$ |
| ATEX/IEC Ex protection class | II 2 GD, Ex d IIC T6 Gb, Ex tb IIIC T85 ${ }^{\circ} \mathrm{C}$ Db |
| UNSPSC code | 302119 |
| UNSPSC commodity | 302119 Switches and controls and relays |

* Reference operating head styles on page 6 for exceptions.

Table 2. Agency Certifications

|  |  | ATEX (CE) ${ }^{2}$ <br> Europe | CSA, UL, or cULus ${ }^{3}$ Canada, USA | IEC Ex ${ }^{1}$ <br> International | KOSHA <br> Korea | NEPSI EX ${ }^{2}$ China | INMETRO² Brazil | EAC ${ }^{4}$ <br> Russia <br> (formerly <br> GOST-R) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  | INMETRO |  |
|  | Conduit |  |  |  |  |  |  |  |
| BX Series (aluminum) | M20 | - |  | $\bullet$ | - | $\bullet$ | - | $\bullet$ |
|  | NPT | - | $\bullet$ | - | - | $\bullet$ | - | - |
| BX2 Series <br> (stainless steel) | M20 | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ | $\bullet$ | - | - |
|  | NPT | $\bullet$ | - | $\bullet$ | - | $\bullet$ | - | - |

[^0]
## MICRO SWITCH Hazardous Area Switches, BX I BX2 Series

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

| Electrical Rating | Circuitry | Vac | Amps at 0.35 Power Factor Make | Amps at 0.35 <br> Power Factor <br> Break |
| :---: | :---: | :---: | :---: | :---: |
| AC15, | $\begin{aligned} & \text { SPDT } \\ & \text { DPDT } \end{aligned}$ | 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- <br> cal <br> Rating | Cir- <br> cuitry | Vdc | Make \& Break <br> Amps <br> Inductive | Make \& Break <br> Amps <br> 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 <br> Inductive | Amps <br> Resistive |
| :---: | :---: | :---: | :---: |
| SPDT, DPDT | 24 | 10 | 10 |

Switch Contact Styles, Double Break


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

|  | CENTER NEUTRAL <br> (Momentary) <br> (3) <br> SPDT Double Break <br> each direction |
| :---: | :---: | :---: | :---: | :---: |

NOTE: Same polarity each pole

Low Temperature Limits
For all MICRO SWITCH BX/BX2 styles, the upper temperature limit is $70^{\circ} \mathrm{C}\left[158^{\circ} \mathrm{F}\right]$, while the lower temperature limit is per the table below.

| Operating Head Styles | MICRO SWITCH BX/BX2 |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Standard (Fluorosilicone) |  | Optional (Flurocarbon Sealed) |  |
|  | $-40^{\circ} \mathrm{C}$ [-40 $\left.{ }^{\circ} \mathrm{F}\right]$ | $-29^{\circ} \mathrm{C}\left[-20^{\circ} \mathrm{F}\right]$ | $-12{ }^{\circ} \mathrm{C}\left[10^{\circ} \mathrm{F}\right]$ | $-1{ }^{\circ} \mathrm{C}$ [ $\left.30{ }^{\circ} \mathrm{F}\right]$ |
| 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 | - |  | - |  |

## MICRO SWITCH Hazardous Area Switches, BX I BX2 Series

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, $90^{\circ}$ increments. All are momentary action except maintained head (BXN/BX2N Series).


BXA/BX2A - Standard: $60^{\circ}$ minimum overtravel, $15^{\circ}$ maximum pretravel, $5^{\circ}$ (single pole) and $7^{\circ}$ (double pole) maximum differential travel.

BXR/BX2R - Low operating torque: $60^{\circ}$ minimum overtravel, $15^{\circ}$ 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: $68^{\circ}$ minimum overtravel, $9^{\circ}$ maximum pretravel, $3^{\circ}$ (single pole) and $4^{\circ}$ (double pole) maximum differential travel.
BXH/BX2H - Low torque, low differential travel: $68^{\circ}$ minimum overtravel. Features low operating torque and narrow differential travel.
BXL/BX2L - Sequential operation: $48^{\circ}$ minimum overtravel. Delayed action between operation of two poles.

BXM/BX2M - Center neutral: $57^{\circ}$ 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 $\mathbf{C}$ in the appropriate places in the standard catalog listing, as shown below:

| BXA3K | standard, side-rotary switch |
| :--- | :--- |
| BXAC3K | FC-sealed version of BXA3K |
| BX2A3K | standard, stainless steel side-rotary switch |
| BX2AC3K | Fluorocarbon-sealed version of BX2A3K |

TOP ROTARY: Available levers provide greater versatility. Heads may be positioned in any one of four positions, $90^{\circ}$ increments. All are momentary action.


BXB: With $100^{\circ}$ 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 $4,83 \mathrm{~mm}$ [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 $90^{\circ}$ 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 $59,3 \mathrm{~mm}$ [2.085 in to 2.335 in ]. Seals are the same as the pin plunger.

## MICRO SWITCH Hazardous Area Switches, BX I BX2 Series

MICRO SWITCH BX/BX2 Series Operating Heads
SIDE PLUNGERS: Available with $4,83 \mathrm{~mm}$ [ 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, $90^{\circ}$ 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, $90^{\circ}$ apart. The roller can be turned vertical or horizontal to the switch. 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


[^1]SIDE ROTARY • MICRO SWITCH BX/BX2 SERIES ORDER GUIDE/RECOMMENDED LISTINGS

| BXR • Low Torque, CW and CCW Momentary |  | Housing Material | Contacts (snap-action) | Contact Material | Conduit | Listing |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Aluminum | 1NC-1NO | Silver | 0.5-14 NPT | BXR3K |
|  | $0^{\circ} 10^{\circ}$ <br> Pretravel $\cdot 15^{\circ}$ max. <br> Diff. travel (SPDT) • $5^{\circ}$ max. | Aluminum | 1NC-1NO | Gold plate | 0.5-14 NPT | BXR3E |
|  | Oper. torque $\cdot 0,19 \mathrm{Nm}[1.7 \mathrm{in}-\mathrm{lb}]$ max. <br> *Oper. temp - $-29^{\circ} \mathrm{C}$ to $70^{\circ} \mathrm{C}\left[-20^{\circ} \mathrm{F}\right.$ to $\left.158^{\circ} \mathrm{F}\right]$ | Aluminum | 2NC-2NO | Silver | 0.75-14 NPT | BXR4L |
|  |  | Aluminum | 2NC-2NO | Gold plate | 0.75-14 NPT | BXR4S |
| BXH • Low Differential, Low Torque, CW and CCW Momentary |  | Housing Material | Contacts (snap-action) | Contact Material | Conduit | Listing |
|  | Pretravel $\cdot 9^{\circ}$ max. <br> Diff. travel (SPDT) • $3^{\circ}$ max. <br> Diff. travel (DPDT) • $4^{\circ}$ max. <br> Overtravel $\cdot 66^{\circ}$ min. <br> Oper. torque $\cdot 0,19 \mathrm{Nm}[1.7 \mathrm{in}-\mathrm{lb}]$ max. <br> *Oper. temp $\cdot-29^{\circ} \mathrm{C}$ to $70^{\circ} \mathrm{C}\left[-20^{\circ} \mathrm{F}\right.$ to $\left.158^{\circ} \mathrm{F}\right]$ | Aluminum | 2NC-2NO | Silver | 0.75-14 NPT | BXH4L |
| BXB • Top Rotary, CW and CCW Momentary |  | Housing Material | Contacts (snap-action) | Contact Material | Conduit | Listing |
|  | Pretravel $\cdot 35^{\circ}$ max. <br> Diff. travel (SPDT) • $8^{\circ}$ max. <br> Diff. travel (DPDT) • $12^{\circ}$ max. <br> Overtravel $\cdot 100^{\circ}$ min. <br> Oper. torque $\bullet 0,28 \mathrm{Nm}[2.5 \mathrm{in}-\mathrm{lb}]$ max. <br> *Oper. temp $\cdot-29^{\circ} \mathrm{C}$ to $70^{\circ} \mathrm{C}\left[-20^{\circ} \mathrm{F}\right.$ to $\left.158^{\circ} \mathrm{F}\right]$ | Aluminum | 1NC-1NO | Silver | 0.5-14 NPT | BXB3K |

[^2]SIDE ROTARY • MICRO SWITCH BX/BX2 SERIES ORDER GUIDE/RECOMMENDED LISTINGS


Contact closed ■ Contact open $\square$
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.


[^0]:    ${ }^{1}$ ATEX \& IEC Ex: II 2 GD ; Ex d IIC T6 Gb; Ex tb IIIC $785^{\circ} \mathrm{C} \mathrm{Db;} \mathrm{Ta}-40^{\circ} \mathrm{C}$ to $70^{\circ} \mathrm{C}$ or $-12^{\circ} \mathrm{C}$ to $70^{\circ} \mathrm{C}$ (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 НАНИО «ЦСВЭ» POCC RU.0001.11ГБ05; 1Ex d IIC T6 Gb X, Ex tb IIIC $785^{\circ} \mathrm{C}$ Db

[^1]:    Contact closed ■; 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.

    * 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.

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