

## MICRO SWITCH™ Specialty Large Basic Switches

BS | DT | MN | MT | TB Series

004956

Issue 3

Datasheet



### DESCRIPTION

MICRO SWITCH™ premium specialty large snap-action switches are designed for repeatability and enhanced life. These series of precision switches feature application-specific characteristics. From double-break circuitry to handling power duty electrical loads, MICRO SWITCH™ premium large snap-action switches are suitable for a variety of applications.

BS Series switches offer alternatives to solve challenging switch applications. These unique solutions can provide adjustable operating characteristics, sequential outputs, or impact actuation (no external plunger).

DT Series switches consist of two independent single-pole double throw (SPDT) contacts in one housing controlled by an integral common actuator. The DPDT contact configuration provides a contact for the control circuit and a different contact for the signal or auxiliary circuit.

MT Series magnetic blow-out switches are designed to switch high-capacity (125 Vdc/250 Vdc) electrical loads. An integral magnet around the contact gap deflects the arc away from the contacts, extending switch life. Vents between the cover and housing allow the hot gas to escape.

Easy to gang mount, MN Series single pole double throw double-break switches are for use with limit or control mechanisms on machine tools, presses, or other equipment.

MICRO SWITCH™ TB Series miniature single pole double throw double break switches offer a means of controlling circuits similar to the MN Series switches except in a smaller package.

### DIFFERENTIATION

- Double pole switch options in small package for increased application flexibility
- Double break switch options in compact design requires less space on equipment
- -55 °C [-67 °F] low temperature capability for harsh outdoor or cold room applications

### FEATURES

- Double pole design in small package allows for control of two independent circuits (DT Series and MN Series)
- Switch design with adjustable operating characteristics (BS Series)
- Higher dc current capacity at 125 Vdc and 250 Vdc with magnetic blow-out contact design (MT Series)
- Compact switch package with double-break contacts (MN Series and TB Series)
- Variety of integral plunger and lever options or auxiliary plunger and lever options
- Most switches mount on the common 25,4 mm [1.00 in] centers
- Metal or plastic enclosures available to prevent contact with switch terminals
- Select switch series with a temperature range of -55 °C to 85 °C [-67 °F to 185 °F]
- Agency certifications with CSA and UL for select catalog listings
- MIL-PRF-8805 for select DT Series catalog listings

### POTENTIAL APPLICATIONS

- Temperature and pressure switch assemblies
- Motor and solenoid dc control circuits
- Welder control circuits
- Switch element in machine tools
- Switch element in manually operated devices

### VALUE TO CUSTOMERS

- Can control two independent circuits in a small package (DT Series and TB Series)
- Unique switch design with adjustable operating characteristics (BS Series)
- Magnetic blow-out contact design permits control of dc circuits in a small package size (MT Series)
- Double break switch design adds element of redundancy within small switch package (MN series and TB Series)

### PORTFOLIO

The five different series of premium specialty large basic switches (BS Series, DT Series, MN Series, MT Series, and TB Series) complements the four different families of premium large basic switch series ([BA Series](#), [BE Series](#), [BM Series](#), and [BZ Series](#)).

# MICRO SWITCH™ Specialty Large Basic Switches BS | DT | MN | MT | TB Series

Table 1. Specifications

| Series                   | BS Series                                                                         | DT Series                                                                         | MT Series                                                                           | MN Series                                                                           | TB Series                                                                           |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                          |  |  |    |  |  |
| Differentiator           | adjustable switch characteristics or special circuitry                            | same size as the MICRO SWITCH™ BZ Series, but double pole double throw (DPDT)     | designed for power duty dc loads                                                    | double-break contacts                                                               | smaller double-break package                                                        |
| Use                      | pressure or temperature switch assemblies                                         | design permits several different wiring configurations                            | control circuits to switch high capacity (125 Vdc and 250 Vdc) systems              | limit or control mechanisms                                                         | limit or control mechanisms                                                         |
| Ampere rating            | Up to 20 A                                                                        | 10 A                                                                              | 10 A                                                                                | 15 A                                                                                | 10 A                                                                                |
| Circuitry                | SPDT, SPNC                                                                        | DPDT                                                                              | SPDT                                                                                | SPDT DB                                                                             | SPDT-DB, DPDT-DB                                                                    |
| Operating force          | Up to 9,73 N [35 oz]                                                              | 3,34 N to 5,56 N [12.0 oz to 20.0 oz] max.                                        | 3,34 N to 5,00 N [12 oz to 18 oz] max.                                              | 1,95 N to 3,1 N [7 oz to 11 oz]                                                     | 1,95 N to 3,89 N [7 oz to 14 oz] max.                                               |
| Termination              | solder, screw                                                                     | screw                                                                             | solder, screw                                                                       | screw                                                                               | solder, screw                                                                       |
| Actuator                 | impact actuation (no plunger), pin plunger (SST), overtravel plunger (SST)        | pin plunger, straight plunger, straight lever, reversed lever, roller lever       | pin plunger, straight lever, roller lever, flexible leaf, flexible leaf with roller | pin plunger                                                                         | pin plunger                                                                         |
| Voltage                  | up to 480 Vac                                                                     | 125 Vac, 250 Vac, 28 Vdc                                                          | 125 Vdc, 250 Vdc                                                                    | 480 Vac                                                                             | 250 Vac                                                                             |
| Agency approvals         | UL, CSA (most models)                                                             | UL recognized; CSA certified, MIL-PRF-8805                                        | UL recognized                                                                       | UL recognized; CSA certified                                                        | UL recognized, CSA certified                                                        |
| Operating temperature    | -55 °C to 85 °C [-67 °F to 185 °F]                                                | -55 °C to 85 °C [-67 °F to 185 °F]                                                | -55 °C to 82 °C [-67 °F to 180 °F]                                                  | -55 °C to 85 °C [-67 °F to 185 °F]                                                  | -55 °C to 125 °C [-67 °F to 257 °F]                                                 |
| Contact material         | silver                                                                            | silver                                                                            | silver                                                                              | silver                                                                              | silver                                                                              |
| Housing                  | phenolic                                                                          | general purpose phenolic                                                          | arc resistant melamine                                                              | general purpose phenolic                                                            | general purpose phenolic                                                            |
| Expected mechanical life | Up to 20,000,000 operations at 95 % survival                                      | 3,000,000 operations                                                              | 100,000 operations                                                                  | 10,000,000 cycles                                                                   | 7,000,000 operations                                                                |

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O.F. • Operating force  
R.F. • Release force  
P.T. • Pretravel  
O.T. • Overtravel  
D.T. • Differential travel  
O.P. • Operating position

Table 2. BS Series Order Guide

|                                                                                   | Catalog Listing | Description                  | Electrical Data and Code | O.F. N [oz]                    | R.F. min. N [oz] | P.T. max. mm [in] | O.T. min. mm [in]          | D.T. mm [in] | O.P. max. mm [in] |
|-----------------------------------------------------------------------------------|-----------------|------------------------------|--------------------------|--------------------------------|------------------|-------------------|----------------------------|--------------|-------------------|
|  | 4BS3            | Impact actuated (no plunger) | –                        | 0,39 [1.41],<br>5 to 8 G force | 0,20 [0.71]      | –                 | –                          | –            | –                 |
|  | 6BS1-B          | SPST-NO sequential           | 10 A<br>E                | 12,5 [45]                      | 2,78 [10]        | –                 | –                          | –            | –                 |
|  | 10BS210         | Adjustable characteristics   | 20 A<br>F                | 3,06 to 5,56 [11 to 20]        | 2,78 [10]        | 0,25 [0.010]      | Max. setting, 0,18 [0.007] | 16,3 [0.64]  | 16,3 [0.64]       |

Table 3. 6BS1-B Electrical Ratings and UL Code

| Code | Circuitry          | Electrical Data and UL Code      |
|------|--------------------|----------------------------------|
| E    | SPST-NO sequential | 10 A, 125 Vac to 250 Vac         |
|      |                    | 1/3 HP, 125 Vac; 3/4 HP, 250 Vac |
|      |                    | 1/2 A, 125 Vdc; 1/4 A, 250 Vdc   |
|      |                    | UL Code L115                     |

Figure 1. 6BS1-B Sequence of Operation

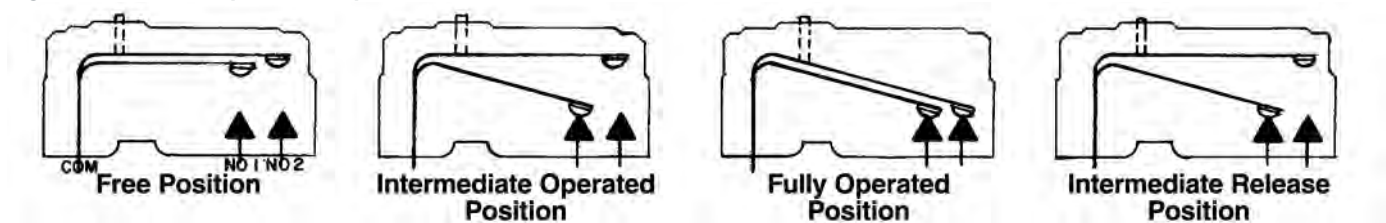


Table 4. 10BS210 Electrical Ratings and UL Code

| Code | Circuitry | Electrical Data and UL Code     |
|------|-----------|---------------------------------|
| F    | SPDT      | 20 A, 125 Vac, 250 Vac, 480 Vac |
|      |           | 3/4 HP, 125 Vac; 1½ HP, 250 Vac |
|      |           | UL Code L17                     |

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D.T. • Differential travel  
O.P. • Operating position

Table 5. DT Series Order Guide

|                                                                                  | Catalog Listing                     | Description                                          | Electrical Data and Code | O.F. N [oz]               | R.F. min. N [oz] | P.T. max. mm [in] | O.T. min. mm [in] | D.T. mm [in]                  | O.P.* mm [in]             |
|----------------------------------------------------------------------------------|-------------------------------------|------------------------------------------------------|--------------------------|---------------------------|------------------|-------------------|-------------------|-------------------------------|---------------------------|
|  | <b>DT-2R-A7</b><br><b>MS25008-1</b> | Pin plunger, MIL-PRF-8805 applications               | 10 A A                   | 3,35 to 5,56 [12 to 20]   | 0,56 [2]         | 1,91 [0.075]      | 0,13 [0.005]      | 1,02 to 1,52 [0.040 to 0.060] | 15,6 ±0,38 [0.615 ±0.015] |
|                                                                                  | <b>DT-2RS1-A7</b>                   | Straight plunger                                     | 10 A A                   | 3,35 to 5,56 [12 to 20]   | 0,28 [1]         | 1,91 [0.075]      | 0,51 [0.020]      | 1,02 to 1,52 [0.040 to 0.060] | 28,2 ±0,38 [1.11 ±0.015]  |
|                                                                                  | <b>DT-2RV3-A7</b>                   | Straight lever, reversed lever position              | 10 A A                   | 1,11 to 1,95 [4 to 7]     | 0,14 [0.5]       | 6,86 [0.270]      | 0,25 [0.010]      | 2,92 to 4,83 [0.115 to 0.190] | 18,3 [0.719]              |
|                                                                                  | <b>DT-2RV-A7</b>                    | Straight lever                                       | 10 A A                   | 0,97 to 1,67 [3.5 to 6]   | 0,28 [1]         | 25,4 [1]          | 1,57 [0.062]      | 12,4 to 19,2 [0.490 to 0.755] | 21,8 [0.859]              |
|                                                                                  | <b>DT-2RV216-A7</b>                 | Roller lever (centered SST roller)                   | 10 A A                   | 11,1 [2.5]                | 1,11 [4]         | 1,02 [0.040]      | 0,13 [0.005]      | 0,51 to 0,76 [0.020 to 0.030] | 31 [1.219]                |
|                                                                                  | <b>DT-2RV22-A7</b>                  | 26,2 mm [1.03 in] roller lever (SST roller)          | 10 A A                   | 2,5 to 3,89 [9 to 14]     | 0,83 [3]         | 9,9 [0.39]        | 0,79 [0.031]      | 4,95 to 7,75 [0.195 to 0.305] | 30,2 ±0,38 [1.188 ±0.015] |
|                                                                                  | <b>DT-2RV212-A7</b>                 | 30,2 mm [1.19 in] reversed roller lever (SST roller) | 10 A A                   | 2,5 to 4,17 [9 to 15]     | 0,42 [1.5]       | 3,3 [0.130]       | 0,13 [0.005]      | 1,27 to 2,16 [0.050 to 0.085] | 29,4 [1.156]              |
|                                                                                  | <b>DT-2RV23-A7</b>                  | 48,22 [1.9 in] reversed roller lever (SST roller)    | 10 A A                   | 1,53 to 2,64 [5.5 to 9.5] | 0,21 [0.75]      | 4,45 [0.175]      | 0,25 [0.010]      | 2,16 to 3,43 [0.085 to 0.135] | 29,4 [1.156]              |
|                                                                                  | <b>DT-2RV2-A7</b>                   | 48,3 mm [1.90 in] roller lever (SST roller)          | 10 A A                   | 1,25 to 2,09 [4.5 to 7.5] | 0,42 [1.5]       | 18,27 [0.72]      | 1,19 [0.047]      | 9,27 to 14,4 [0.365 to 0.565] | 31,8 [1.250]              |

\* Except where stated ±0,76 mm [±0.030 in]

Table 6. DT Series Electrical Ratings and UL Code

| Code | Circuitry                                                                           | Electrical Data and UL Code |
|------|-------------------------------------------------------------------------------------|-----------------------------|
| A    | DPDT                                                                                | 10 A, 125 Vac or 250 Vac    |
|      |  | 0.3 A, 125 Vdc              |
|      |                                                                                     | 0.15 A, 250 Vdc             |
|      |                                                                                     | UL Code L59                 |

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D.T. • Differential travel  
O.P. • Operating position

Table 7. MT Series Order Guide

|                                                                                   | Catalog Listing     | Description                                     | Electrical Data and Code | O.F. N [oz]            | R.F. min. N [oz] | P.T. max. mm [in] | O.T. min. mm [in] | D.T. mm [in]                 | O.P. max.* mm [in]        |
|-----------------------------------------------------------------------------------|---------------------|-------------------------------------------------|--------------------------|------------------------|------------------|-------------------|-------------------|------------------------------|---------------------------|
|  | <b>MT-4R-A28</b>    | Pin plunger                                     | 10 A B                   | 3,34 to 5,0 [12 to 18] | 1,39 [5]         | 1,02 [0.04]       | 0,13 [0.005]      | 0,1 to 0,18 [0.004 to 0.007] | 15,9 ±0,38 [0.625 ±0.015] |
|                                                                                   | <b>MT-4RV-A28</b>   | Straight lever                                  | 10 A B                   | 0,56 [2]               | 0,14 [0.5]       | 12,7 [0.5]        | 1,19 [0.047]      | 2,16 [0.085]                 | 19,1 [0.75]               |
|                                                                                   | <b>MT-4RV2-A28</b>  | 48,3 mm [1.90 in] lever with SST roller         | 10 A B                   | 0,76 [2.75]            | 0,07 [0.25]      | 8,89 [0.35]       | 0,79 [0.031]      | 1,65 [0.065]                 | 30,2 [1.188]              |
|                                                                                   | <b>MT-4RV22-A28</b> | 26,2 mm [1.03 in] lever with SST roller         | 10 A B                   | 1,25 [4.5]             | 0,28 [1]         | 5,08 [0.20]       | 0,38 [0.015]      | 0,89 [0.035]                 | 31,3 [1.234]              |
|                                                                                   | <b>MT-4RL-A28</b>   | 49,5 mm [1.95 in] flexible leaf                 | 10 A B                   | 3,34 [12]              | 0,28 [1]         | 6,35 [0.25]       | 1,52 [0.060] max. | –                            | 19,1 [0.75]               |
|                                                                                   | <b>MT-4RL2-A28</b>  | 46,2 mm [1.82 in] flexible leaf with SST roller | 10 A B                   | 3,34 [12]              | 0,28 [1]         | 6,35 [0.25]       | 1,52 [0.060] max. | –                            | 30,2 [1.188]              |

\* ±0,76 mm [±0.030 in]

Table 8. MT Series Electrical Ratings and UL Code

| Code | Circuitry                                                                           | Electrical Data and UL Code                                                                                     |
|------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| B    |  | Rating established with switch non-polarized<br>10 A, 125 Vac or Vdc;<br>1/4 HP, 125 Vac or Vdc<br>UL Code L168 |
|      |                                                                                     | Non-polarized:<br>10 A res. or 1/4 HP, 125 Vdc;<br>3 A max. res. 250 Vdc                                        |
|      |                                                                                     | Polarized*:<br>10 A res. or 1/2 HP, 125 Vdc;<br>3 A max. res., 250 Vdc                                          |

\*To polarize, connect negative side of line to common terminal.  
To achieve the same effect, mount switch with brass screws, using a non-magnetic barrier (at least 1/4 N thick) between the switch and mounting surface

# MICRO SWITCH™ Specialty Large Basic Switches BS | DT | MN | MT | TB Series

Table 9. MN Series Order Guide

|                                                                                   | Catalog Listing | Description     | Electrical Data and Code | O.F. N [oz]             | R.F. min. N [oz] | P.T. max. mm [in] | O.T. min. mm [in] | D.T. mm [in]                  | O.P.* max. mm [in] |
|-----------------------------------------------------------------------------------|-----------------|-----------------|--------------------------|-------------------------|------------------|-------------------|-------------------|-------------------------------|--------------------|
|  | <b>3MN1</b>     | General purpose | 15 A C                   | 3,34 to 5,56 [12 to 20] | 1,67 [6]         | 1,52 [0.060]      | 2,03 [0.080]      | 0,38 to 0,63 [0.015 to 0.025] | 2,16 [0.085]       |
|                                                                                   | <b>3MN6</b>     | Lower force     | 15 A C                   | 1,95 to 3,1 [7 to 11]   | 1,11 [4]         | 1,52 [0.060]      | 2,03 [0.080]      | 0,38 to 0,63 [0.015 to 0.025] | 2,16 [0.085]       |

\* ±0,38 mm [±0.015 in]

Table 10. MN Series Electrical Ratings and UL Code

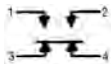
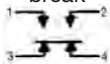
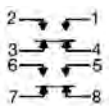
| Code | Circuitry                                                                         | Electrical Data and UL File 22779           |
|------|-----------------------------------------------------------------------------------|---------------------------------------------|
| C    |  | 15 A, 120 Vac, 240 Vac, 480 Vac, or 600 Vac |
|      |                                                                                   | 1/2 HP, 120 Vac; 1 HP, 240 Vac              |
|      |                                                                                   | 0.8 A, 115 Vdc                              |
|      |                                                                                   | 0.4 A, 230 Vdc                              |

Table 11. TB Series Order Guide

|                                                                                     | Catalog Listing | Description                                       | Electrical Data and Code | O.F. N [oz]            | R.F. min. N [oz] | P.T. max. mm [in] | O.T. min. mm [in] | D.T. mm [in]                  | O.P.* max. mm [in] |
|-------------------------------------------------------------------------------------|-----------------|---------------------------------------------------|--------------------------|------------------------|------------------|-------------------|-------------------|-------------------------------|--------------------|
|  | <b>1TB1-1</b>   | Two-circuit, doublebreak, end screw terminals     | 10 A D                   | 1,95 to 3,61 [7 to 13] | 1,11 [4]         | 1,52 [0.060]      | 0,25 [0.010]      | 0,25 to 0,64 [0.010 to 0.025] | 11,7 [0.460]       |
|                                                                                     | <b>1TB1-2</b>   | Two-circuit, doublebreak, end solder terminals    | 10 A D                   | 1,95 to 3,61 [7 to 13] | 1,11 [4]         | 1,52 [0.060]      | 0,25 [0.010]      | 0,25 to 0,64 [0.010 to 0.025] | 11,7 [0.460]       |
|                                                                                     | <b>1TB1-3</b>   | Two-circuit, doublebreak, front solder terminals  | 10 A D                   | 1,95 to 3,61 [7 to 13] | 1,11 [4]         | 1,52 [0.060]      | 0,25 [0.010]      | 0,25 to 0,64 [0.010 to 0.025] | 11,7 [0.460]       |
|                                                                                     | <b>41TB5-3</b>  | Four-circuit, doublebreak, front solder terminals | 10 A D                   | 5,56 to 10 [20 to 36]  | 2,22 [8]         | 1,78 [0.070]      | 0,25 [0.010]      | 0,64 to 1,14 [0.025 to 0.045] | 4,70 [0.185]       |

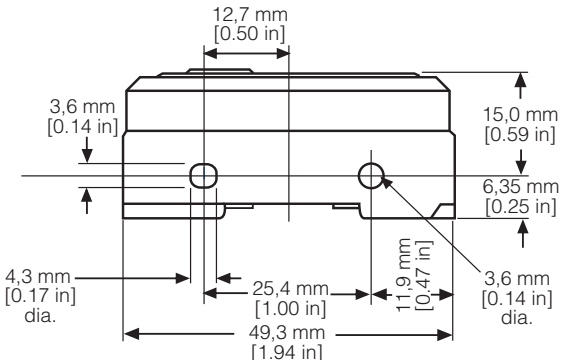
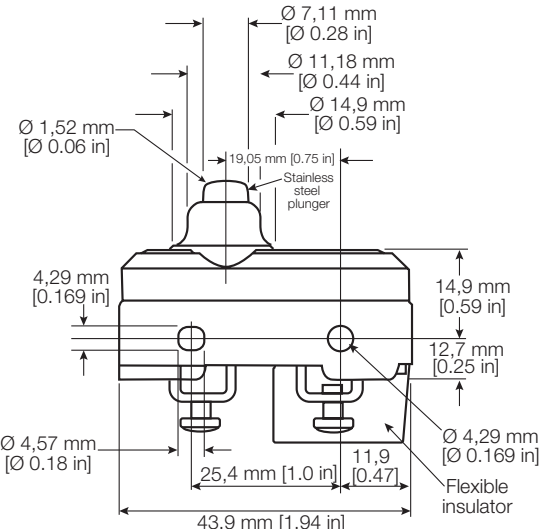
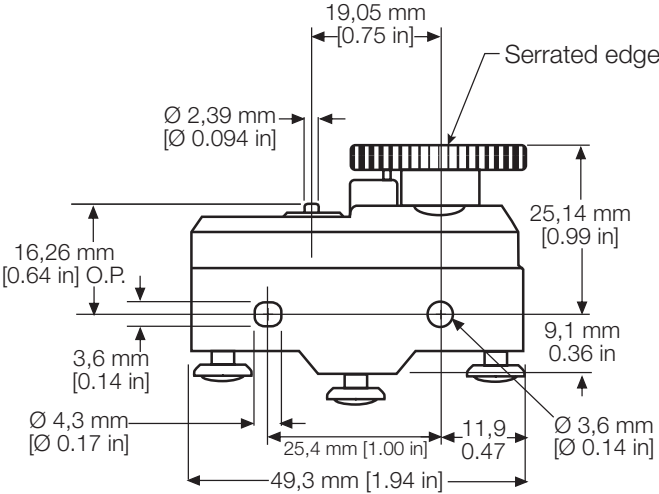
\* ±0,38 mm [±0.015 in]

Table 12. TB Series Electrical Ratings and UL Code

| Code | Circuitry                                                                                                         | Electrical Data                                             |
|------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| D    | Two-circuit, double break<br>  | 10 A, 125 Vac or 250 Vac;<br>1/2 HP, 125 Vac<br>UL Code L25 |
|      | Four-circuit, double break<br> |                                                             |

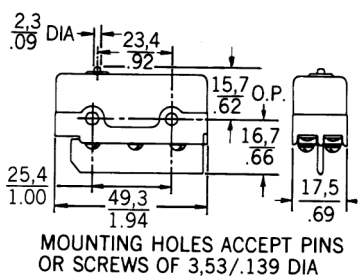
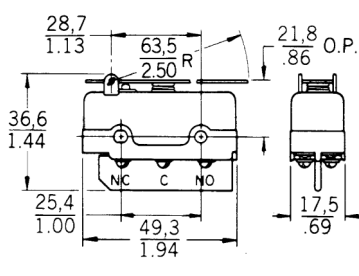
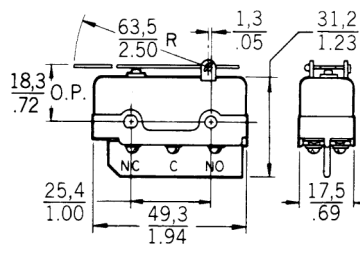
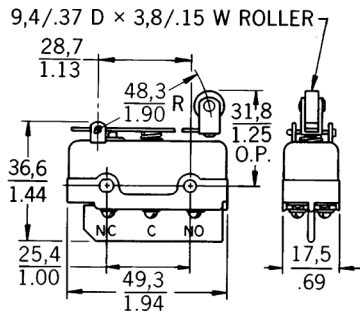
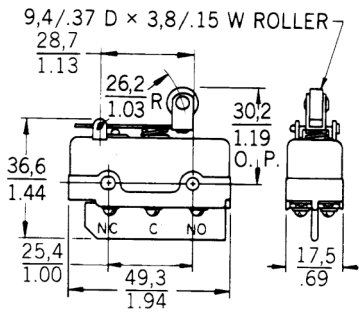
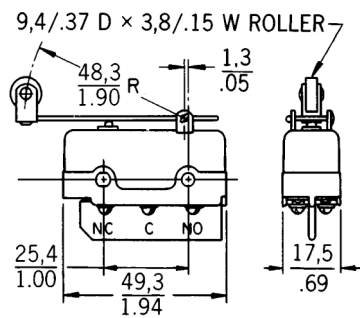
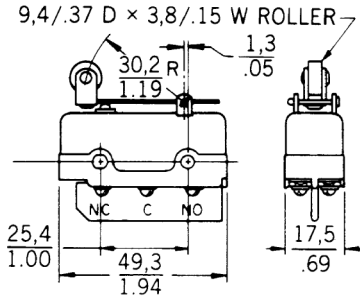
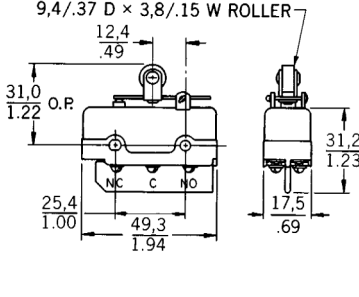
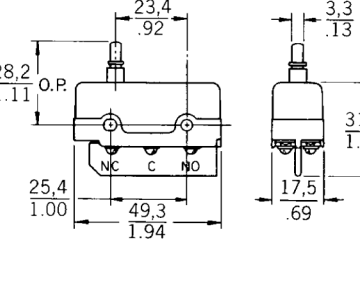
# MICRO SWITCH™ Specialty Large Basic Switches BS | DT | MN | MT | TB Series

Table 13. BS Series • Standard Actuator Options, Terminals, and Dimensions mm [in]

| 4BS3                                                                               | 6BS1-B (sequential)                                                                |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|   |  |
| 10BS210 (adjustable characteristics)                                               |                                                                                    |
|  |                                                                                    |

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Table 14. DT Series • Standard Actuator Options, Screw Terminals, and Dimensions mm [in]

| DT Series: Pin plunger                                                                                                                                                                                                                                                                               | DT Series: Straight lever                                                                                                                                                                                                                                                                     | DT Series: Straight lever (reversed)                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>2.3<br/>.09 DIA</p> <p>23.4<br/>.92</p> <p>15.7<br/>.62 O.P.</p> <p>16.7<br/>.66</p> <p>25.4<br/>1.00</p> <p>49.3<br/>1.94</p> <p>17.5<br/>.69</p> <p>MOUNTING HOLES ACCEPT PINS OR SCREWS OF 3.53/.139 DIA</p> |  <p>28.7<br/>1.13</p> <p>63.5<br/>2.50 R</p> <p>21.8<br/>.86 O.P.</p> <p>36.6<br/>1.44</p> <p>25.4<br/>1.00</p> <p>49.3<br/>1.94</p> <p>17.5<br/>.69</p> <p>NC C NO</p>                                      |  <p>63.5<br/>2.50 R</p> <p>1.3<br/>.05</p> <p>31.2<br/>1.23</p> <p>18.3<br/>.72 O.P.</p> <p>25.4<br/>1.00</p> <p>49.3<br/>1.94</p> <p>17.5<br/>.69</p> <p>NC C NO</p>                                      |
| DT Series: Roller lever                                                                                                                                                                                                                                                                              | DT Series: Roller lever                                                                                                                                                                                                                                                                       | DT Series: Roller lever (reversed)                                                                                                                                                                                                                                                            |
|  <p>9.4/.37 D × 3.8/.15 W ROLLER</p> <p>28.7<br/>1.13</p> <p>48.3<br/>1.90 R</p> <p>31.8<br/>1.25 O.P.</p> <p>36.6<br/>1.44</p> <p>25.4<br/>1.00</p> <p>49.3<br/>1.94</p> <p>17.5<br/>.69</p> <p>NC C NO</p>        |  <p>9.4/.37 D × 3.8/.15 W ROLLER</p> <p>28.7<br/>1.13</p> <p>26.2<br/>1.03 R</p> <p>30.2<br/>1.19 O.P.</p> <p>36.6<br/>1.44</p> <p>25.4<br/>1.00</p> <p>49.3<br/>1.94</p> <p>17.5<br/>.69</p> <p>NC C NO</p> |  <p>9.4/.37 D × 3.8/.15 W ROLLER</p> <p>48.3<br/>1.90 R</p> <p>1.3<br/>.05</p> <p>31.8<br/>1.25 O.P.</p> <p>36.6<br/>1.44</p> <p>25.4<br/>1.00</p> <p>49.3<br/>1.94</p> <p>17.5<br/>.69</p> <p>NC C NO</p> |
| DT Series: Roller lever (reversed)                                                                                                                                                                                                                                                                   | DT Series: Roller lever (reversed)                                                                                                                                                                                                                                                            | DT Series: Straight plunger                                                                                                                                                                                                                                                                   |
|  <p>9.4/.37 D × 3.8/.15 W ROLLER</p> <p>30.2<br/>1.19 R</p> <p>1.3<br/>.05</p> <p>31.8<br/>1.25 O.P.</p> <p>25.4<br/>1.00</p> <p>49.3<br/>1.94</p> <p>17.5<br/>.69</p> <p>NC C NO</p>                             |  <p>9.4/.37 D × 3.8/.15 W ROLLER</p> <p>12.4<br/>.49</p> <p>31.0<br/>1.22 O.P.</p> <p>31.2<br/>1.23</p> <p>25.4<br/>1.00</p> <p>49.3<br/>1.94</p> <p>17.5<br/>.69</p> <p>NC C NO</p>                       |  <p>23.4<br/>.92</p> <p>3.3<br/>.13 DIA</p> <p>28.2<br/>1.11 O.P.</p> <p>31.2<br/>1.23</p> <p>25.4<br/>1.00</p> <p>49.3<br/>1.94</p> <p>17.5<br/>.69</p> <p>NC C NO</p>                                  |

# MICRO SWITCH™ Specialty Large Basic Switches BS | DT | MN | MT | TB Series

Table 15. MT Series • Standard Actuator Options, Terminals, and Dimensions mm [in]

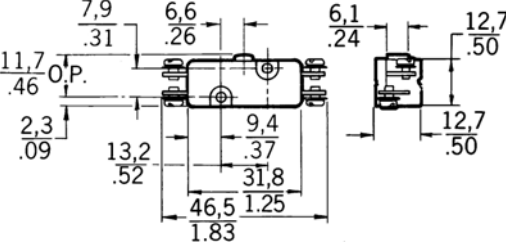
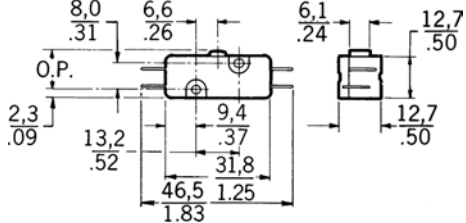
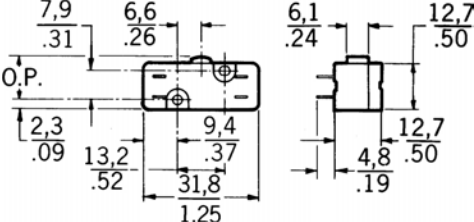
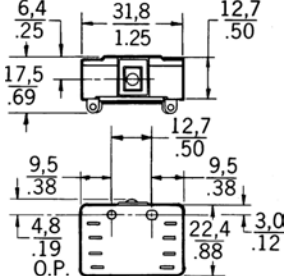
| MT Series: Pin plunger                                                                                                                                                                                                                                                                                                                                                           | MT Series: Straight lever                                                                                                                                                                                                                                                                                                                                                                                                                             | MT Series: Roller lever                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Technical drawing of the MT Series Pin plunger actuator. The front view shows a rectangular body with a pin plunger on top. Dimensions include: 16.0 / .63 (top pin), 23.4 / .92 (body width), 2.3 / .09 (pin diameter), 25.4 / 1.00 (body height), 49.3 / 1.94 (body width), 17.5 / .69 (terminal width), and 33.0 / 1.30 (terminal height).</p>                             | <p>Technical drawing of the MT Series Straight lever actuator. The front view shows a rectangular body with a straight lever on top. Dimensions include: 28.7 / 1.13 (lever height), 63.5 / 2.50 (lever length), 19.0 / .75 (O.P. height), 37.3 / 1.47 (body height), 25.4 / 1.00 (body height), 49.3 / 1.94 (body width), 17.5 / .69 (terminal width), and 33.0 / 1.30 (terminal height).</p>                                                        | <p>Technical drawing of the MT Series Roller lever actuator. The front view shows a rectangular body with a roller lever on top. Dimensions include: 9.4 / .37 D x 3.8 / .15 W ROLLER (roller dimensions), 28.7 / 1.13 (lever height), 48.3 / 1.90 (lever length), 19.0 / .75 (O.P. height), 37.3 / 1.47 (body height), 25.4 / 1.00 (body height), 49.3 / 1.94 (body width), 17.5 / .69 (terminal width), and 33.0 / 1.30 (terminal height).</p> |
| MT Series: Flexible leaf lever                                                                                                                                                                                                                                                                                                                                                   | MT Series: Flexible leaf roller lever                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <p>Technical drawing of the MT Series Flexible leaf lever actuator. The front view shows a rectangular body with a flexible leaf lever on top. Dimensions include: 49.5 / 1.95 (lever length), 33.0 / 1.30 (terminal height), 19.0 / .75 (O.P. height), 25.4 / 1.00 (body height), 49.3 / 1.94 (body width), 17.5 / .69 (terminal width), and 33.0 / 1.30 (terminal height).</p> | <p>Technical drawing of the MT Series Flexible leaf roller lever actuator. The front view shows a rectangular body with a flexible leaf roller lever on top. Dimensions include: 9.4 / .37 D x 3.8 / .15 W ROLLER (roller dimensions), 46.2 / 1.82 (lever length), 30.2 / 1.19 (O.P. height), 33.0 / 1.30 (terminal height), 25.4 / 1.00 (body height), 49.3 / 1.94 (body width), 17.5 / .69 (terminal width), and 33.0 / 1.30 (terminal height).</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

Table 16. MN Series • Standard Actuator Options, Terminals, and Dimensions mm [in]

| MN Series: Pin plunger                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Technical drawing of the MN Series Pin plunger actuator. The front view shows a rectangular body with a pin plunger on top. Dimensions include: 54.1 / 2.13 (top pin), 63.5 / 2.50 (body width), 26.9 / 1.06 (body width), 8.9 / .35 (pin diameter), 3.8 / .15 DIA MTG HOLES (2) (mounting holes), 8.4 / .33 (body height), 17.3 / .68 (terminal width), 2.3 / .09 (O.P. height), 30.5 / 1.20 (body height), and 17.3 / .68 (terminal height).</p> |

MICRO SWITCH™ Specialty Large Basic Switches BS | DT | MN | MT | TB Series

Table 17. TB Series • Standard Actuator Options, Terminals, and Dimensions mm [in]

|                                                                                   |                                                                                     |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>TB Series: Pin plunger, screw terminals</b>                                    | <b>TB Series: Pin plunger, solder terminals</b>                                     |
|  |   |
| <b>TB Series: Pin plunger, solder terminals (front)</b>                           | <b>TB Series: Pin plunger, solder terminals (front), four circuit</b>               |
|  |  |

## MICRO SWITCH™ Specialty Large Basic Switches BS | DT | MN | MT | TB Series

Table 18. Large Snap-Action Switch Accessories • Brackets

| Description             | 8MA1                                                                                                              | 8MA2                                                                               | 17MA1-B                                                                                                                      |
|-------------------------|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
|                         |                                  |  |                                           |
| <b>Description</b>      | Adjustable mounting bracket with adjustment slot on left                                                          | Adjustable mounting bracket with adjustment slot on right                          | Conversion mounting bracket                                                                                                  |
| <b>Housing material</b> | Steel                                                                                                             | Steel                                                                              | Corrosion-resistant metal                                                                                                    |
| <b>Measurements</b>     | 60,2 mm W x 21,3 mm H x 7,4 mm D [2.37 in W x 0.84 in H x 0.29 in D]                                              |                                                                                    | 66,8 mm W x 19,0 mm D [2.63 in W x 0.75 in D]                                                                                |
| <b>Features</b>         | sturdy plated steel construction; fast, easy screwdriver adjustment; can be used with all standard basic switches |                                                                                    | converts standard basic switches from side to top mount; corrosion resistant; snaps into switch mounting holes without tools |

Table 19. Large Snap-Action Switch Accessories • Zinc Die-Cast Enclosures

| Description             | 3PA1                                                                                                                                 | 3PA28                                                                                                                               | 3PA2                                                                                                                                                                           |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         |                                                    |                                                  |                                                                                            |
| <b>Description</b>      | mounted from either side through 3,55 mm [0.140 in] dia. holes on 25,4 mm [1.0 in] centers; conduit/hub 0.5 – 14 NPT internal thread | mounted from either side through 3,55 mm [0.140 in] dia. holes on 25,4 mm [1.0 in] centers. 1/2-14 NPSM internal thread conduit hub | switch secured in enclosure; two 4,37 mm [0.172 in] dia. holes in flange accept #8 screws for mounting on 41,3 mm [1.625 in] centers; conduit/hub 0.5 – 14 NPT internal thread |
| <b>Housing material</b> | die-cast zinc enclosure (side mount)                                                                                                 | die-cast zinc enclosure (side mount)                                                                                                | die-cast zinc enclosure (flange mount)                                                                                                                                         |
| <b>Measurements</b>     | 74,8 mm W x 42,9 mm H x 25,4 mm D [2.95 in W x 1.69 in H x 1.00 in D]                                                                | 74,8 mm W x 42,9 mm H x 25,4 mm D [2.95 in W x 1.69 in H x 1.00 in D]                                                               | 74,8 mm W x 42,9 mm H x 25,4 mm D [2.95 in W x 1.69 in H x 1.00 in D]                                                                                                          |
| <b>Sealing/Features</b> | NEMA 1; IP40; protects the switch from physical abuse and personnel from contact with exposed terminals                              |                                                                                                                                     |                                                                                                                                                                                |

Table 20. Large Snap-Action Switch Accessories • Plastic Terminal Enclosures

| Description             | 5PA1                                                                                                               | 5PA2                                                                                 | 5PA3                                                                                                             |
|-------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
|                         |                                 |  |                             |
| <b>Description</b>      | Plastic terminal enclosure used with solder terminal switches                                                      | Plastic terminal enclosure used with screw terminal switches                         | Plastic terminal enclosure used with either solder or screw terminal switches with auxiliary actuators assembled |
| <b>Housing material</b> | plastic                                                                                                            | plastic                                                                              | plastic                                                                                                          |
| <b>Measurements</b>     | 52,8 mm W x 16,1 mm H [2.08 in W x 0.64 in H]                                                                      | 52,8 mm W x 20,2 mm H x 21,0 mm D [2.08 in W x 0.80 in H x 0.83 in D]                | 52,8 mm W x 20,2 mm H x 21,0 mm D [2.08 in W x 0.80 in H x 0.83 in D]                                            |
| <b>Sealing/Features</b> | NEMA 1, IP40; easy to use; screw & solder terminal versions; protect personnel from contact with exposed terminals |                                                                                      |                                                                                                                  |

# MICRO SWITCH™ Specialty Large Basic Switches BS | DT | MN | MT | TB Series

Table 21. Auxiliary Actuator Order Guide

|                                                                                     | Catalog Listing | Description                                                                                                        | For Use With | Overtravel min. mm [in]    | Operating Position* mm [in]                     | Free Position mm [in] |
|-------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------|--------------|----------------------------|-------------------------------------------------|-----------------------|
|    | JR              | Roller lever for “S” plunger type DT switches only. Permits cam operation                                          | DT           | 11,1 mm [0.437 in]         | 44,45 mm $\pm$ 3,18 mm [1.75 in $\pm$ 0.125 in] | –                     |
|    | ADD3721R        | Adjustable roller lever. Tang on top of actuator can be bent to adjust O.P. and F.P.                               | DT, MT       | 9,53 mm [0.375 in] approx. | 39,6 mm [1.562 in] approx.                      | 46,03 mm [1.812 in]   |
|    | MCD2711         | Straight plunger. Panel mount                                                                                      | DT, MT       | 3,58 mm [0.141 in]         | 27,79 mm [1.094 in]                             | 30,18 mm [1.188 in]   |
|    | MCD2711H        | Sealed straight plunger. Panel mount. Elastomer boot seal keeps out liquid splash and dirt. Furnished unassembled. | DT, MT       | 3,58 mm [0.141 in]         | 27,79 mm [1.094 in]                             | 30,18 mm [1.188 in]   |
|   | MD3211Q         | Roller plunger. Panel mount. Roller parallel to long axis of the switch                                            | DT, MT       | 3,18 mm [0.125 in]         | 35,7 mm [1.406 in]                              | 37,69 mm [1.484 in]   |
|  | MD3211Q1        | Cross roller plunger. Panel mount. Roller perpendicular to long axis of the switch                                 | DT, MT       | 3,18 mm [0.125 in]         | 35,7 mm [1.406 in]                              | 37,69 mm [1.484 in]   |
|  | MCD7711         | High overtravel plunger. Panel mount                                                                               | DT, MT       | 18,26 mm [0.719 in]        | 69,1 mm [2.719 in]                              | 71,42 mm [2.812 in]   |

\* Except where stated  $\pm$ 1,14 mm [ $\pm$ 0.045 in]

NOTE: All actuators are for use with pin plunger types only, except catalog listing JR.

## OPERATING CHARACTERISTICS

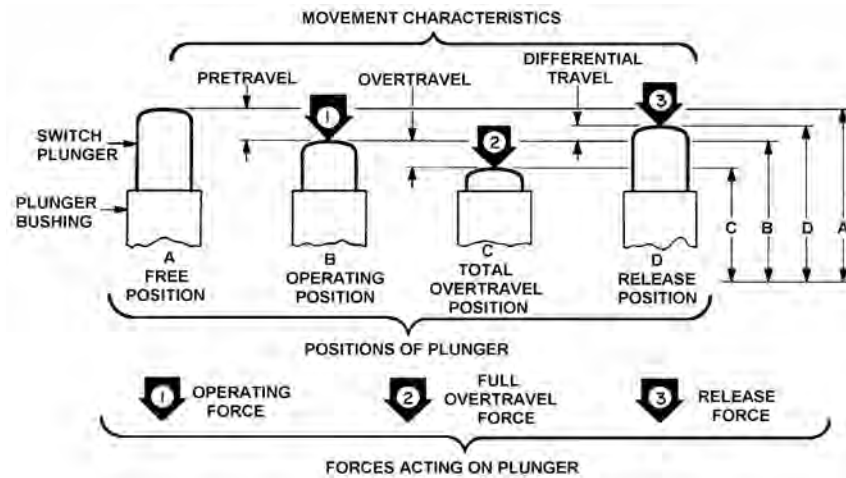


Table 22. Operating Characteristics Definitions

| Characteristic                | Description                                                                                                                                                                                                                                                                                                       |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Differential Travel-DT</b> | Plunger or actuator travel from point where contacts “snap-over” to point where they “snap-back.”                                                                                                                                                                                                                 |
| <b>Free Position-FP</b>       | Position of switch plunger or actuator when no external force is applied.                                                                                                                                                                                                                                         |
| <b>Full Overtravel Force</b>  | Force required to attain full overtravel of actuator.                                                                                                                                                                                                                                                             |
| <b>Operating Position-OP</b>  | Position of switch plunger or actuator at which point contacts snap from normal to operated position. With flexible or adjustable actuators, the operating position is measured from the end of the lever or its maximum length. Location of operating position measurement shown on mounting dimension drawings. |
| <b>Operating Force-OF</b>     | Amount of force applied to switch plunger or actuator to cause the contact “snap-over.” Note in the case of adjustable actuators, the force is measured from the maximum length position of the lever.                                                                                                            |
| <b>Overtravel-OT</b>          | Plunger or actuator travel safely available beyond operating position.                                                                                                                                                                                                                                            |
| <b>Pretravel-PT</b>           | Distance or angle traveled in moving plunger or actuator from free position to operating position.                                                                                                                                                                                                                |
| <b>Release Force-RF</b>       | Amount of force still applied to switch plunger or actuator at the moment contacts snap from operated position to non-operated position.                                                                                                                                                                          |
| <b>Total Travel</b>           | Distance from actuator free position to overtravel limit position.                                                                                                                                                                                                                                                |

## ADDITIONAL MATERIALS

The following associated literature is available on the Honeywell web site at [sensing.honeywell.com](http://sensing.honeywell.com):

- Product installation instructions
- Product application-specific information
  - Sensors and switches for potential HVAC/R applications
  - Sensors and switches for valve monitors and valve indicators
  - Sensors and switches in oil rig applications
  - Sensors and switches in sanitary valves
- Applying basic switches
- Low energy switching guide
- Product range guide

### Find out more

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**[honeywell.com](http://honeywell.com)**

## **WARNING** **PERSONAL INJURY**

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**

## **WARNING** **MISUSE OF DOCUMENTATION**

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**

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