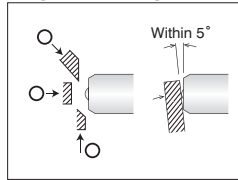


Precision Limit Switches

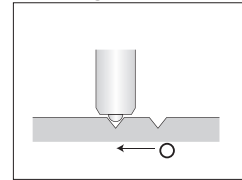
Ball Plunger Limit Switches

- Indexing positioning ball plunger combined with touch switch for confirmation signal
- Dual function reduces number of components required
- 10 micron (μm) repeat accuracy
- Angled/Sliding Touch
- Higher contact force ideal for indexing

Angled/Sliding Touch



Indexing Touch



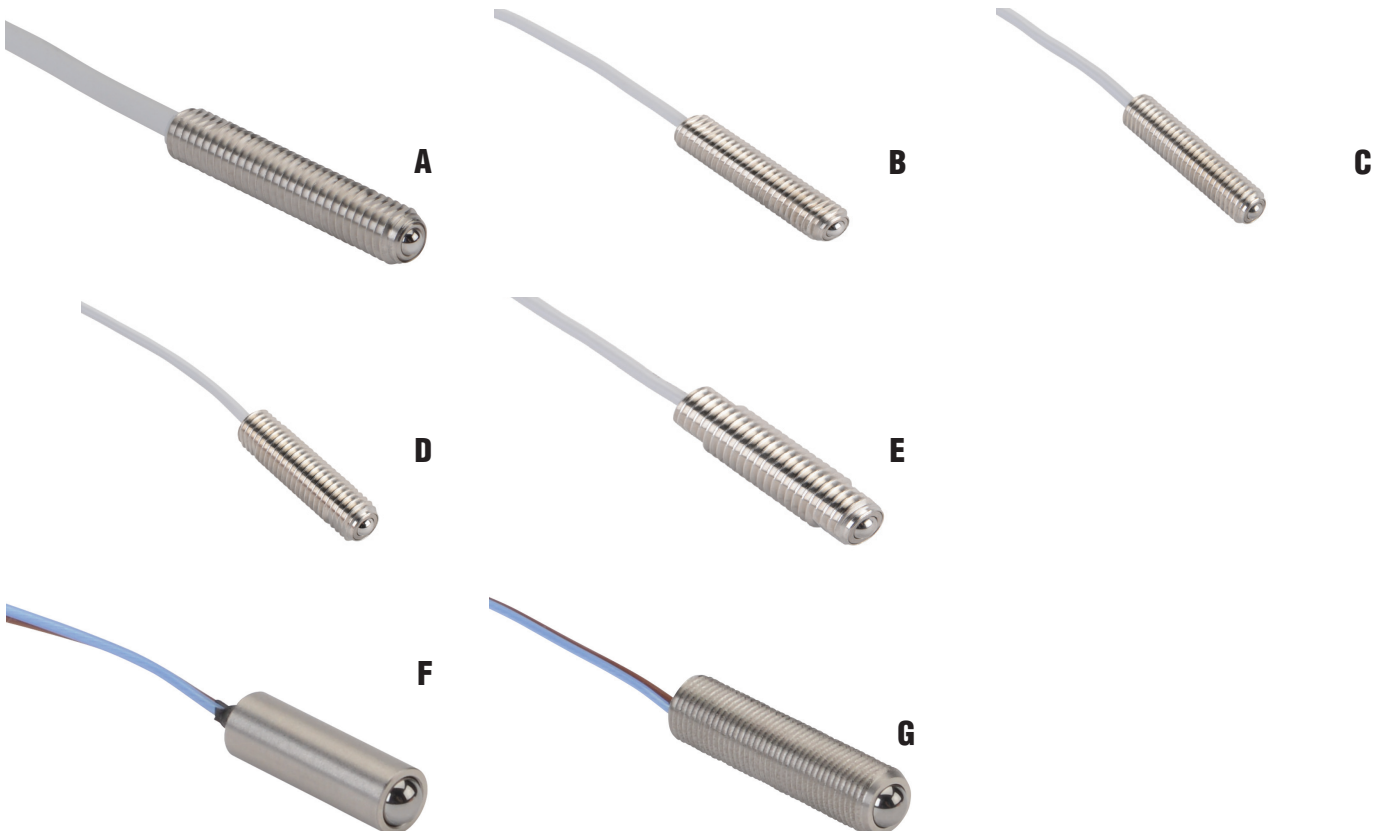
○ indicates correct target approach and orientation.
 × indicates approach and orientation that should be avoided.

Ball Plunger Limit Switches Selection Chart

| Part Number | Price | Actuator/Head Type* | Barrel Type | Barrel Diameter/Thread* | Stroke | Switching Output | Contact Force | Sensor Dimension | Connection Type | Photo |
|--------------------------------------|---------|---------------------|-------------|-------------------------|--------|------------------|---------------|------------------------|------------------|-------|
| Indexing/Angled/Sliding Touch | | | | | | | | | | |
| BP060A-L | \$39.50 | Ø 3mm ball | Threaded | Ø M6×1.0 | 0.8 mm | N.O. | 8N (Max. 13N) | Figure 1 | Cable, 2m length | A |
| BP060A-LF | \$39.50 | | | | | | 1N | | | |
| BP080A-L | \$47.00 | Ø 4mm ball | | Ø M8×1.25 | 1mm | | 8-16N | Figure 2 | | C |
| BP080A-LF | \$47.00 | | | | | | 1N | | | |
| BP100A-L | \$50.00 | Ø 5mm ball | | Ø M10×1.5 | 1.2 mm | | 10-20N | Figure 3 | | D |
| BP100A-LF | \$50.00 | | | | | | 1N | | | |
| BP4SWA | \$56.50 | Ø 3mm ball | Smooth | Ø 4mm | 0.8 mm | 1N | Figure 4 | Core wire, 0.5m length | F | |
| BP5MWA | \$53.00 | | Threaded | M5×0.5 | 1mm | | Figure 5 | | G | |

* Ø = diameter

-L: LED indicator (mounted in cable 120mm from the switch)



Precision Limit Switches Dimensions

Ball Plunger: BP / BP4S / BP5M Series

Dimensions

mm [inches]

Figure 1
BP060A-L / BP060A-LF

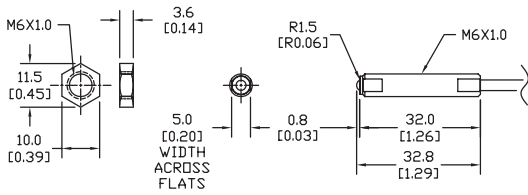


Figure 2
BP080A-L / BP080A-LF

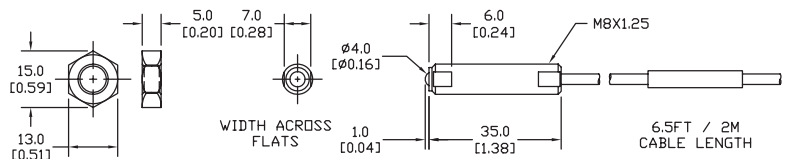


Figure 3
BP100A-L / BP100A-LF

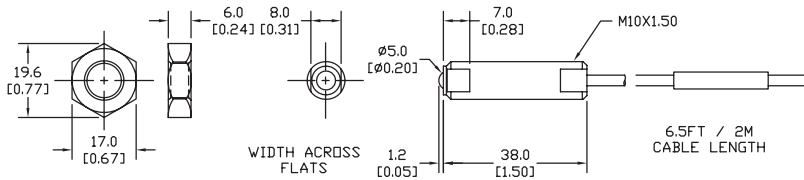


Figure 4
BP4SWA

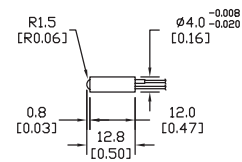
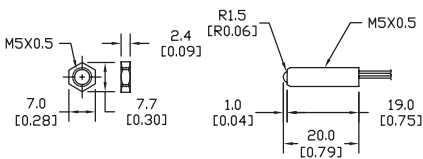


Figure 5
BP5MWA



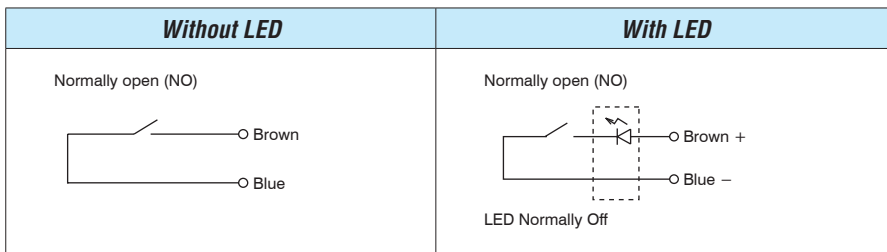
See our website, www.AutomationDirect.com, for complete Engineering drawings.

Precision Limit Switches

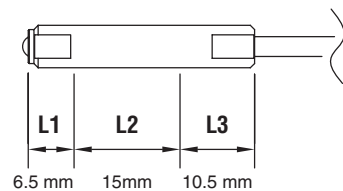
| Ball Plunger Limit Switches Specifications | | | | | |
|---|---|--------|--------|--|----------------------|
| | BP060A | BP080A | BP100A | BP4SWA | BP5MWA |
| Environmental | | | | | |
| Degree of Protection | IP40 | | | | |
| Temperature Range | Operating: 0–80°C (32–176°F) (Ice-free) | | | | |
| Mechanical Ratings | | | | | |
| Enclosure Material | 303 Stainless Steel | | | | |
| Pretravel | 0.3 mm | | | | |
| Torque (for nuts on threaded barrels, set screws on smooth barrels) | See Torque Limit Figure | | | NA | 1Nm |
| Oscillation | 10–55Hz total amplitude 1.5 for X, Y, Z each direction | | | | |
| Impact | 300 m/s ² for X, Y, Z each direction | | | | |
| Repeat Accuracy | Both On–Off, Off–On: 0.01 mm (range)(axial direction)* | | | | |
| Recommended Minimum Operating Speed | 10 mm/minute | | | | |
| Electrical Ratings | | | | | |
| Contact Life | 3 million operations | | | 1 million operations | 3 million operations |
| Contact Voltage | 5–24VDC | | | | |
| Steady Current Rating | 10mA or less | | | | |
| Max In-rush Current Rating | 10mA (limit current to protect LED indicator) | | | 20mA | |
| Connection Type | Cable: 2m Oil resistant Ø2.8/2 cores, Tensile strength 30N, minimum bending R7. | | | Core wire cable: 0.5m (x2), Oil resistant, Ø0.66, Tensile strength 15N | |
| Indicating | -L: LED indicator (mounted in cable 120mm from the switch) | | | N/A | |

* At operating speed 50-200 mm/minute. Operating speed slower than 10 mm/min is not recommended.

Circuit Diagrams



Torque Limits



Tightening torque for case screws and nuts

| Applicable model | L1 | | L2 | | L3 | |
|------------------|--------|-------------------|--------|-------------------|--------|-------------------|
| | length | Tightening torque | length | Tightening torque | length | Tightening torque |
| BP060A | 6.5 | 2.5N·m | 15 | 5N·m | 10.5 | 2.5N·m |
| BP080A | 8 | 5N·m | 21.5 | 10N·m | 5.5 | 5N·m |
| BP100A | 6.5 | 15N·m | 22.5 | 25N·m | 9 | 15N·m |

Caution

Use the lower torque (i.e. torque corresponding to L1 and L3) while tightening the bolt between lengths L1 and L2 or L2 and L3 in the picture. Please make sure to use a locknut if the bolt is likely to shift in position due to the vibrational impacts.