Mechanically Jointed Rodless Cylinder with Protective Cover

Series MY1\[
\varnothing16, \varnothing20, \varnothing25, \varnothing32, \varnothing40, \varnothing50, \varnothing63
\]

Introducing our mechanically jointed rodless cylinder with a superior dustproof, water-resistant protective cover.
# Mechanically Jointed Rodless Cylinder with Protective Cover

**Items marked with an "*" are for Series MY1\[WK\] (with side seal) only.**

## Variations

<table>
<thead>
<tr>
<th>Series</th>
<th>Guide type</th>
<th>Cover</th>
<th>Bore sizes (mm)</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>MY1MW</td>
<td>Slide bearing</td>
<td>With protective cover</td>
<td>16, 20, 25, 32</td>
<td>- Centralized piping</td>
</tr>
<tr>
<td>MY1MWK</td>
<td>Slide bearing</td>
<td>With protective cover + side seal</td>
<td>40, 50, 63</td>
<td>- Stroke adjusting unit</td>
</tr>
<tr>
<td>MY1CW</td>
<td>Cam follower guide</td>
<td>With protective cover</td>
<td>16, 20, 25, 32</td>
<td>- Side support</td>
</tr>
<tr>
<td>MY1CWK</td>
<td>Cam follower guide</td>
<td>With protective cover + side seal</td>
<td>40, 50, 63</td>
<td></td>
</tr>
</tbody>
</table>

Features 1
In environments where the cylinder is exposed to dust particles and water spray or splash, its dustproof, water-resistant cover offers superior protection.

Side seals provide greater lateral dustproofing and water resistance.

The cover in no way interferes with the installation of base cylinder options.

Cover units and side seal units can be installed on the already existing Series MY1M/MY1C.

Protective cover only minimally adds to overall length.

Water-resistant solid state switches can be mounted onto the ø25 to ø40 models.

**Stroke availability**

Strokes may be selected in increments of 1mm.

**Stroke adjusting unit**

Strokes can be adjusted either at one end or both ends.
- With adjusting bolts
- With low load shock absorber + Adjusting bolts (L unit)

**Centralized piping**

Piping ports are concentrated on one side.

**Side supports**

Side supports prevent cylinder tube from sagging in long stroke applications.

**Interchangeable mounting**

Cylinder and work piece mounting interchangeability is possible between Series MY1MW and MY1CW.
### Mechanically Jointed Rodless Cylinder with Protective Cover

**Series MY1□W**

Slide Bearing Guide Type/Cam Follower Guide Type

- ø16, ø20, ø25, ø32, ø40, ø50, ø63

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#### How to Order

**Guide type**
- M: Slide bearing guide
- C: Cam follower guide

**With protective cover**
- Nil: Without protective cover
- G: Centralized piping

**Side seal**
- Nil: Without side seal
- K: With side seal

**Cylinder bore size**
- 16: 16mm
- 20: 20mm
- 25: 25mm
- 32: 32mm
- 40: 40mm
- 50: 50mm
- 63: 63mm

**Stroke**
- 300: Refer to the standard stroke table on page 2.

**Piping**
- Nil: Standard

**Applicable auto switches**

- **Auto switch type**
  - Nil: Without auto switch
  - S: Solid state switch

- **Number of auto switches**
  - Nil: 2 pcs.
  - S: 1pc.

- **Note**
  - "S" is available when stroke adjusting units are A and L.

**Number of stroke adjusting units**
- Nil: Both ends
- S: One end

**Slide Bearing Guide Type/Cam Follower Guide Type**

- MY1□W

**Applicable auto switches:** Refer to pages 12 through 20 for detailed auto switch specifications.

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#### Shock absorbers part numbers for L unit

<table>
<thead>
<tr>
<th>Bore size (mm)</th>
<th>16</th>
<th>20</th>
<th>25</th>
<th>32</th>
<th>40</th>
<th>50</th>
<th>63</th>
</tr>
</thead>
<tbody>
<tr>
<td>L unit</td>
<td>RB0806</td>
<td>RB1007</td>
<td>RB1412</td>
<td>RB2015</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**How to Order**

1. **Guide type**
   - M: Slide bearing guide
   - C: Cam follower guide

2. **With protective cover**
   - Nil: Without protective cover
   - G: Centralized piping

3. **Side seal**
   - Nil: Without side seal
   - K: With side seal

4. **Cylinder bore size**
   - 16: 16mm
   - 20: 20mm
   - 25: 25mm
   - 32: 32mm
   - 40: 40mm
   - 50: 50mm
   - 63: 63mm

5. **Stroke**
   - 300: Refer to the standard stroke table on page 2.

6. **Piping**
   - Nil: Standard

---

#### Applicable auto switches:

**For ø16, ø20**

<table>
<thead>
<tr>
<th>Auto switch type</th>
<th>Lead voltage</th>
<th>Auto switch type</th>
<th>Load wire length</th>
<th>Applicable loads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special function</td>
<td>Electrical entry</td>
<td>Wiring (output)</td>
<td>Electrical entry direction</td>
<td>Perpendicular</td>
</tr>
<tr>
<td>Grommet</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2-wire</td>
<td>24V</td>
<td>12V</td>
<td>100V or less</td>
</tr>
<tr>
<td></td>
<td>3-wire</td>
<td>24V</td>
<td>12V</td>
<td>100V or less</td>
</tr>
<tr>
<td></td>
<td>3-wire</td>
<td>24V</td>
<td>12V</td>
<td>100V or less</td>
</tr>
<tr>
<td></td>
<td>3-wire</td>
<td>24V</td>
<td>12V</td>
<td>100V or less</td>
</tr>
</tbody>
</table>

**For ø25, ø32, ø40, ø50, ø63**

<table>
<thead>
<tr>
<th>Auto switch type</th>
<th>Lead voltage</th>
<th>Auto switch type</th>
<th>Load wire length</th>
<th>Applicable loads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special function</td>
<td>Electrical entry</td>
<td>Wiring (output)</td>
<td>Electrical entry direction</td>
<td>Perpendicular</td>
</tr>
<tr>
<td>Grommet</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2-wire</td>
<td>24V</td>
<td>12V</td>
<td>100V or less</td>
</tr>
<tr>
<td></td>
<td>3-wire</td>
<td>24V</td>
<td>12V</td>
<td>100V or less</td>
</tr>
<tr>
<td></td>
<td>3-wire</td>
<td>24V</td>
<td>12V</td>
<td>100V or less</td>
</tr>
<tr>
<td></td>
<td>3-wire</td>
<td>24V</td>
<td>12V</td>
<td>100V or less</td>
</tr>
</tbody>
</table>

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**Note**

- "S" is available when stroke adjusting units are A and L.
- For ø16 to ø40, stroke adjusting units are A and L.
- For ø50 and ø63, stroke adjusting units are A and L.

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**For ø50 and ø63**

<table>
<thead>
<tr>
<th>Auto switch type</th>
<th>Lead voltage</th>
<th>Auto switch type</th>
<th>Load wire length</th>
<th>Applicable loads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special function</td>
<td>Electrical entry</td>
<td>Wiring (output)</td>
<td>Electrical entry direction</td>
<td>Perpendicular</td>
</tr>
<tr>
<td>Grommet</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2-wire</td>
<td>24V</td>
<td>12V</td>
<td>100V or less</td>
</tr>
<tr>
<td></td>
<td>3-wire</td>
<td>24V</td>
<td>12V</td>
<td>100V or less</td>
</tr>
<tr>
<td></td>
<td>3-wire</td>
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<td>12V</td>
<td>100V or less</td>
</tr>
<tr>
<td></td>
<td>3-wire</td>
<td>24V</td>
<td>12V</td>
<td>100V or less</td>
</tr>
</tbody>
</table>

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**Note**

- "S" is available when stroke adjusting units are A and L.
- For ø16 to ø40, stroke adjusting units are A and L.
- For ø50 and ø63, stroke adjusting units are A and L.
### Specifications

<table>
<thead>
<tr>
<th>Bore size (mm)</th>
<th>16</th>
<th>20</th>
<th>25</th>
<th>32</th>
<th>40</th>
<th>50</th>
<th>63</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid</td>
<td>Air</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Double acting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating pressure range</td>
<td>MY1MW: 0.15 to 0.8MPa; MY1CW: 0.1 to 0.8MPa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proof pressure</td>
<td>1.2MPa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient and fluid temperature</td>
<td>5° to 60°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cushion</td>
<td>Air cushion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubrication</td>
<td>Non-lube</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke length tolerance</td>
<td>1000 or less (\frac{1}{4}); 1001 to 3000 (\frac{1}{2}); 2701 to 5000 (\frac{3}{4})</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port size</td>
<td>M5 x 0.8</td>
<td>Rc 1/8</td>
<td>Rc 1/4</td>
<td>Rc 3/8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front/Side ports</td>
<td>ø4</td>
<td>ø5</td>
<td>ø6</td>
<td>ø8</td>
<td>ø10</td>
<td>ø11</td>
<td></td>
</tr>
<tr>
<td>Bottom ports (centralized piping type only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Stroke Adjusting Unit Specifications

<table>
<thead>
<tr>
<th>Bore size (mm)</th>
<th>16</th>
<th>20</th>
<th>25</th>
<th>32</th>
<th>40</th>
<th>50</th>
<th>63</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit symbol</td>
<td>A</td>
<td>L</td>
<td>A</td>
<td>L</td>
<td>A</td>
<td>L</td>
<td>A</td>
</tr>
<tr>
<td>Configuration and shock absorber</td>
<td>With adjusting bolt</td>
<td>With adjusting bolt</td>
<td>With adjusting bolt</td>
<td>With adjusting bolt</td>
<td>With adjusting bolt</td>
<td>With adjusting bolt</td>
<td>With adjusting bolt</td>
</tr>
<tr>
<td>Fine stroke adjustment range (mm)</td>
<td>0 to –5.6</td>
<td>0 to –6</td>
<td>0 to –11.5</td>
<td>0 to –12</td>
<td>0 to –16</td>
<td>0 to –20</td>
<td>0 to –25</td>
</tr>
<tr>
<td>Stroke adjustment range</td>
<td>When exceeding the fine stroke adjustment range: Use Made to Order specifications &quot;-X416&quot; and &quot;-X417&quot;. (Refer to page 21 for details.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Shock Absorber Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>RB 0806</th>
<th>RB 1007</th>
<th>RB 1412</th>
<th>RB 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. energy absorption (J)</td>
<td>2.9</td>
<td>5.9</td>
<td>19.6</td>
<td>58.8</td>
</tr>
<tr>
<td>Stroke absorption (mm)</td>
<td>6</td>
<td>7</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Max. impact speed (mm/s)</td>
<td>1500</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. operating frequency (cycle/min)</td>
<td>80</td>
<td>70</td>
<td>45</td>
<td>25</td>
</tr>
<tr>
<td>Spring force (N)</td>
<td>Extended: 1.96</td>
<td>4.22</td>
<td>6.86</td>
<td>8.34</td>
</tr>
<tr>
<td></td>
<td>Retracted: 4.22</td>
<td>6.86</td>
<td>15.98</td>
<td>20.50</td>
</tr>
<tr>
<td>Operating temperature range (°C)</td>
<td>5 to 60</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Piston Speed

<table>
<thead>
<tr>
<th>Bore sizes (mm)</th>
<th>16 to 63</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without stroke adjusting unit</td>
<td>100 to 1000mm/s</td>
</tr>
<tr>
<td>Stroke adjusting unit</td>
<td>A unit: 100 to 1000mm/s; L unit: 100 to 1500mm/s</td>
</tr>
</tbody>
</table>

Note 1) The air cushion capacity will be reduced when the stroke adjustment range is increased by the adjusting bolt. When exceeding the air cushion stroke ranges shown on page 28, the piston speed should be 100 to 200mm/s.

Note 2) The piston speed is 100 to 1000mm/s for centralized piping.

Note 3) Cylinders should be operated at a speed within the absorption capacity range. Please refer to page 28.

#### Standard Strokes

<table>
<thead>
<tr>
<th>Bore sizes (mm)</th>
<th>Standard strokes (mm)*</th>
<th>Max. manufacturable stroke (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>100, 200, 300, 400, 500, 600, 700</td>
<td>3000</td>
</tr>
<tr>
<td>20, 25, 32, 40, 50, 63</td>
<td>800, 900, 1000, 1200, 1400, 1600</td>
<td>1800, 2000</td>
</tr>
</tbody>
</table>

* Strokes can be manufactured in 1mm increments, up to the maximum stroke. If the required stroke length exceeds 2000mm, please indicate "-XB11" at the end of the ordering number. Refer to the Made to Order specifications on page 21 for details.
### Theoretical Output

<table>
<thead>
<tr>
<th>Bore size (mm)</th>
<th>Poten area (mm²)</th>
<th>Operating pressure (MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>16</td>
<td>200</td>
<td>40</td>
</tr>
<tr>
<td>20</td>
<td>314</td>
<td>62</td>
</tr>
<tr>
<td>25</td>
<td>490</td>
<td>98</td>
</tr>
<tr>
<td>32</td>
<td>804</td>
<td>161</td>
</tr>
<tr>
<td>40</td>
<td>1256</td>
<td>251</td>
</tr>
<tr>
<td>50</td>
<td>1962</td>
<td>392</td>
</tr>
<tr>
<td>63</td>
<td>3115</td>
<td>623</td>
</tr>
</tbody>
</table>

### Weights

<table>
<thead>
<tr>
<th>Bore size (mm)</th>
<th>MY1MW</th>
<th>MY1CW</th>
<th>Side support weight (per set)</th>
<th>Stroke adjusting unit weight (per unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic weight</td>
<td>Add. weight per 50mm stroke</td>
<td>Basic weight</td>
<td>Add. weight per 50mm stroke</td>
<td>Type A and B</td>
</tr>
<tr>
<td>16</td>
<td>1.25</td>
<td>0.16</td>
<td>1.25</td>
<td>0.16</td>
</tr>
<tr>
<td>20</td>
<td>1.90</td>
<td>0.19</td>
<td>1.85</td>
<td>0.18</td>
</tr>
<tr>
<td>25</td>
<td>2.56</td>
<td>0.28</td>
<td>2.50</td>
<td>0.28</td>
</tr>
<tr>
<td>32</td>
<td>4.75</td>
<td>0.43</td>
<td>4.62</td>
<td>0.42</td>
</tr>
<tr>
<td>40</td>
<td>7.79</td>
<td>0.61</td>
<td>7.51</td>
<td>0.57</td>
</tr>
<tr>
<td>50</td>
<td>13.53</td>
<td>0.83</td>
<td>13.61</td>
<td>0.82</td>
</tr>
<tr>
<td>63</td>
<td>21.84</td>
<td>1.18</td>
<td>21.94</td>
<td>1.17</td>
</tr>
</tbody>
</table>

**Calculation method** — Example: MY1MW25-300A

- Basic weight: 1.25 kg
- Additional weight per 50mm stroke: 0.28 kg
- Cylinder stroke: 300 mm
- Stroke: 2.56 + 0.28 × 300 ÷ 50 + 0.07 × 2 = Approx. 4.38 kg
- Weight of A unit: 0.07 kg

### Options

#### Stroke adjusting unit model numbers

<table>
<thead>
<tr>
<th>Bore size (mm)</th>
<th>Unit type</th>
<th>MYM-A16A</th>
<th>MYM-A20A</th>
<th>MYM-A25A</th>
<th>MYM-A32A</th>
<th>MYM-A40A</th>
<th>MYM-A50A</th>
<th>MYM-A63A</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>A unit</td>
<td>MYM-A16A</td>
<td>MYM-A20A</td>
<td>MYM-A25A</td>
<td>MYM-A32A</td>
<td>MYM-A40A</td>
<td>MYM-A50A</td>
<td>MYM-A63A</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>50</td>
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<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

#### Side support model numbers

<table>
<thead>
<tr>
<th>Bore size (mm)</th>
<th>Side support A</th>
<th>Side support B</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>MY-S16A</td>
<td>MY-S16B</td>
</tr>
<tr>
<td>20</td>
<td>MY-S20A</td>
<td>MY-S20B</td>
</tr>
<tr>
<td>25</td>
<td>MY-S25A</td>
<td>MY-S25B</td>
</tr>
<tr>
<td>32</td>
<td>MY-S32A</td>
<td>MY-S32B</td>
</tr>
<tr>
<td>40</td>
<td>MY-S40A</td>
<td>MY-S40B</td>
</tr>
<tr>
<td>50</td>
<td>MY-S50A</td>
<td>MY-S50B</td>
</tr>
<tr>
<td>63</td>
<td>MY-S63A</td>
<td>MY-S63B</td>
</tr>
</tbody>
</table>

Refer to page 9 for detailed information on dimensions.
Mechanically Jointed Rodless Cylinder
with Protective Cover

Series MY1\(\text{□}\)W

Construction

MY1\(\text{□}\)W

MY1\(\text{□}\)WK with side seal

Parts list

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
<th>ø16</th>
<th>ø20</th>
<th>ø25</th>
<th>ø32</th>
<th>ø40</th>
<th>ø50</th>
<th>ø63</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Slide table</td>
<td>Aluminum</td>
<td>Hard anodized</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2</td>
<td>Cover</td>
<td>Aluminum</td>
<td>Hard anodized</td>
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<tr>
<td>3</td>
<td>End plate</td>
<td>Aluminum</td>
<td>Hard anodized</td>
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<tr>
<td>4</td>
<td>Belt clamp</td>
<td>Special resin</td>
<td></td>
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<td>5</td>
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<td>Special resin</td>
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<td>6</td>
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<td></td>
<td>ø25 to ø40</td>
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<tr>
<td>7</td>
<td>Spacer</td>
<td>Stainless steel</td>
<td>(ø25 to ø40)</td>
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<tr>
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<td>Chromium molybdenum steel</td>
<td>Nickel plated</td>
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<td>9</td>
<td>Hexagon socket</td>
<td>Chromium molybdenum steel</td>
<td>Nickel plated</td>
<td></td>
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<td>10</td>
<td>Rodless cylinder</td>
<td>—</td>
<td>MY1M/MY1C</td>
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<td>11</td>
<td>Side seal unit</td>
<td>Special resin</td>
<td>MY16-A</td>
<td>MY16-A</td>
<td>MY25-A</td>
<td>MY25-A</td>
<td>—</td>
<td>—</td>
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<tr>
<td>12</td>
<td>Seal guide A</td>
<td>Special resin</td>
<td>MY16-B</td>
<td>MY16-B</td>
<td>MY25-B</td>
<td>MY25-B</td>
<td>—</td>
<td>—</td>
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<tr>
<td>13</td>
<td>Seal guide B</td>
<td>Special resin</td>
<td>MY16-C</td>
<td>MY16-C</td>
<td>MY25-C</td>
<td>MY25-C</td>
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<tr>
<td>14</td>
<td>Spacer</td>
<td>Stainless steel</td>
<td>MY16-D</td>
<td>MY16-D</td>
<td>MY25-D</td>
<td>MY25-D</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>15</td>
<td>Hexagon socket</td>
<td>Chromium molybdenum steel</td>
<td>Nickel plated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

Seal list

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Qty.</th>
<th>ø16</th>
<th>ø20</th>
<th>ø25</th>
<th>ø32</th>
<th>ø40</th>
<th>ø50</th>
<th>ø63</th>
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<tr>
<td>12</td>
<td>Seal belt</td>
<td>Special resin</td>
<td>1</td>
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<td>MY16-16A</td>
<td>MY16-16A</td>
<td>MY16-16A</td>
<td>MY16-16A</td>
<td>MY16-16A</td>
<td>MY16-16A</td>
</tr>
<tr>
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<td>Dust seal band</td>
<td>Stainless steel</td>
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<td>MY16-16B</td>
<td>MY16-16B</td>
<td>MY16-16B</td>
<td>MY16-16B</td>
<td>MY16-16B</td>
<td>MY16-16B</td>
<td>MY16-16B</td>
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<tr>
<td>15</td>
<td>Piston seal</td>
<td>NBR</td>
<td>2</td>
<td>GMY16</td>
<td>GMY16</td>
<td>GMY16</td>
<td>GMY16</td>
<td>GMY16</td>
<td>GMY16</td>
<td>GMY16</td>
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<tr>
<td>17</td>
<td>Tube gasket</td>
<td>NBR</td>
<td>2</td>
<td>P12</td>
<td>P12</td>
<td>P12</td>
<td>P12</td>
<td>P12</td>
<td>P12</td>
<td>P12</td>
</tr>
<tr>
<td>18</td>
<td>O-ring</td>
<td>NBR</td>
<td>2</td>
<td>ø7 x ø4 x ø1.5</td>
<td>ø7 x ø4 x ø1.5</td>
<td>ø7 x ø4 x ø1.5</td>
<td>ø7 x ø4 x ø1.5</td>
<td>ø7 x ø4 x ø1.5</td>
<td>ø7 x ø4 x ø1.5</td>
<td>ø7 x ø4 x ø1.5</td>
</tr>
<tr>
<td>19</td>
<td>O-ring</td>
<td>NBR</td>
<td>4</td>
<td>ø7 x ø4 x ø1.5</td>
<td>ø7 x ø4 x ø1.5</td>
<td>ø7 x ø4 x ø1.5</td>
<td>ø7 x ø4 x ø1.5</td>
<td>ø7 x ø4 x ø1.5</td>
<td>ø7 x ø4 x ø1.5</td>
<td>ø7 x ø4 x ø1.5</td>
</tr>
<tr>
<td>20</td>
<td>Side seal assembly</td>
<td>Polyurethane</td>
<td>2</td>
<td>MYM-16-16B</td>
<td>MYM-16-16B</td>
<td>MYM-16-16B</td>
<td>MYM-16-16B</td>
<td>MYM-16-16B</td>
<td>MYM-16-16B</td>
<td>MYM-16-16B</td>
</tr>
</tbody>
</table>

Note) Two types of dust seal band are available. Verify which type to use for ordering since the part number differs depending on the treatment of the hexagon socket head set screw.

(A) Black zinc chromated → MY□□-CB/stroke
(B) Nickel plated → MY□□-BW-stroke

SMC
Dimensions: Ø16, Ø20

Bore size (mm) | A | B | C | CH | G | GA | GB | H | J | K | L | LD | LH | LL | LW | M | MM | N | NC | NE | NH | NW
16 | 90 | 6 | 3.5 | 25 | 13.5 | 8.5 | 16.2 | 52 | M5 x 0.8 | 10 | 110 | 3.6 | 38 | 35 | 84 | 6 | M4 x 0.7 | 20 | 14 | 49.5 | 16.5 | 56
20 | 110 | 7.5 | 4.5 | 26 | 12.5 | — | 20 | 58 | M6 x 1 | 12 | 130 | 4.8 | 39 | 45 | 88 | 7.5 | M5 x 0.8 | 25 | 17 | 55.5 | 21.7 | 60

Bore size (mm) | PA | PB | PG | PP | Q | QQ | QW | RR | SS | TT | UU | VV | W | WW | YW | Z
---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
16 | 40 | 94 | 3.5 | 7.5 | 153 | 9 | 48 | 11 | 2.5 | 15 | 14 | 10 | 102 | 13 | 54 | 180
20 | 50 | 100 | 4.5 | 11.5 | 191 | 10 | 45 | 14.5 | 5 | 18 | 12 | 12.5 | 110 | 14 | 58 | 220

Hole sizes for centralized piping on the bottom

| Bore size (mm) | S | WX | Y | Applicable O-ring |
---|---|---|---|---|
16 | 9 | 30 | 6.5 | C6
20 | 6.5 | 32 | 8 | C6

(Mounting side should be machined to these dimensions.)
Mechanically Jointed Rodless Cylinder
with Protective Cover

Series MY1□W

Dimensions: \( \varnothing 25, \varnothing 32, \varnothing 40 \)

Hole sizes for centralized piping on the bottom

<table>
<thead>
<tr>
<th>Bore size (mm)</th>
<th>D</th>
<th>d</th>
<th>WX</th>
<th>Y</th>
<th>S</th>
<th>Applicable O-ring</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>11.4</td>
<td>6</td>
<td>38</td>
<td>9</td>
<td>4</td>
<td>C9</td>
</tr>
<tr>
<td>32</td>
<td>11.4</td>
<td>6</td>
<td>48</td>
<td>11</td>
<td>6</td>
<td>C9</td>
</tr>
<tr>
<td>40</td>
<td>13.4</td>
<td>8</td>
<td>54</td>
<td>14</td>
<td>9</td>
<td>C11.2</td>
</tr>
</tbody>
</table>

(Mounting side should be machined to these dimensions.)
Series MY1□W

Dimensions: Ø50, Ø63

**Centralized piping**

- **Bore size (mm)**: 50, 63
  - **A**: 212, 245
  - **B**: 17, 19
  - **C**: 10.5, 12
  - **CH**: 41.5, 47
  - **G**: 27, 29.5
  - **GA**: 25, 27.5
  - **GB**: 37.5, 39.5
  - **GC**: 12, 15
  - **H**: M14 x 2, M16 x 2
  - **J**: 28, 32
  - **K**: 250, 290
  - **L**: 11, 14
  - **LD**: 57, 65
  - **LH**: 87, 100
  - **LL**: 168, 200
  - **LW**: M8 x 1.25, M10 x 1.25
  - **M**: 47, 54
  - **MM**: 122, 147
  - **N**: 50, 56
  - **NC**: 60, 70
  - **NE**: 44
  - **NH**: 60

- **WX**: 74, 92
- **Y**: 18

**Hole sizes for centralized piping on the bottom**

- **Bore size (mm)**: 50, 63
  - **S**: 8, 9
  - **WX**: 74, 92
  - **Y**: 18

  (Mounting side should be machined to these dimensions.)

---

**Dimensions**:

- Ø50, Ø63

**Centralized piping**

- **Bore size (mm)**: 50, 63
  - **A**: 212, 245
  - **B**: 17, 19
  - **C**: 10.5, 12
  - **CH**: 41.5, 47
  - **G**: 27, 29.5
  - **GA**: 25, 27.5
  - **GB**: 37.5, 39.5
  - **GC**: 12, 15
  - **H**: M14 x 2, M16 x 2
  - **J**: 28, 32
  - **K**: 250, 290
  - **L**: 11, 14
  - **LD**: 57, 65
  - **LH**: 87, 100
  - **LL**: 168, 200
  - **LW**: M8 x 1.25, M10 x 1.25
  - **M**: 47, 54
  - **MM**: 122, 147
  - **N**: 50, 56
  - **NC**: 60, 70
  - **NE**: 44
  - **NH**: 60

- **WX**: 74, 92
- **Y**: 18

**Hole sizes for centralized piping on the bottom**

- **Bore size (mm)**: 50, 63
  - **S**: 8, 9
  - **WX**: 74, 92
  - **Y**: 18

  (Mounting side should be machined to these dimensions.)
Stroke Adjusting Unit
With adjusting bolt
MY1□W  Bore size  Stroke  A

<table>
<thead>
<tr>
<th>Model</th>
<th>E</th>
<th>EA</th>
<th>EB</th>
<th>EC</th>
<th>EY</th>
<th>h</th>
<th>TT</th>
<th>W</th>
</tr>
</thead>
<tbody>
<tr>
<td>MY1□W16</td>
<td>14.6</td>
<td>7</td>
<td>30</td>
<td>5.8</td>
<td>39.5</td>
<td>3.6</td>
<td>5.4 (Max. 11)</td>
<td>58</td>
</tr>
<tr>
<td>MY1□W20</td>
<td>20</td>
<td>10</td>
<td>32</td>
<td>5.8</td>
<td>45.5</td>
<td>3.6</td>
<td>5 (Max. 11)</td>
<td>58</td>
</tr>
<tr>
<td>MY1□W25</td>
<td>24</td>
<td>12</td>
<td>38</td>
<td>6.5</td>
<td>53.5</td>
<td>3.5</td>
<td>5 (Max. 16.5)</td>
<td>70</td>
</tr>
<tr>
<td>MY1□W32</td>
<td>29</td>
<td>14</td>
<td>50</td>
<td>8.5</td>
<td>67</td>
<td>4.5</td>
<td>8 (Max. 20)</td>
<td>88</td>
</tr>
<tr>
<td>MY1□W40</td>
<td>35</td>
<td>17</td>
<td>57</td>
<td>10</td>
<td>83</td>
<td>4.5</td>
<td>10 (Max. 25)</td>
<td>104</td>
</tr>
<tr>
<td>MY1□W50</td>
<td>40</td>
<td>20</td>
<td>66</td>
<td>14</td>
<td>106</td>
<td>5.5</td>
<td>13 (Max. 33)</td>
<td>128</td>
</tr>
<tr>
<td>MY1□W63</td>
<td>52</td>
<td>26</td>
<td>77</td>
<td>14</td>
<td>129</td>
<td>5.5</td>
<td>13 (Max. 38)</td>
<td>152</td>
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</tbody>
</table>

With low load shock absorber + Adjusting bolts
MY1□W  Bore size  Stroke  L

<table>
<thead>
<tr>
<th>Model</th>
<th>E</th>
<th>EA</th>
<th>EB</th>
<th>EC</th>
<th>EY</th>
<th>F</th>
<th>h</th>
<th>S</th>
<th>T</th>
<th>TT</th>
<th>W</th>
</tr>
</thead>
<tbody>
<tr>
<td>MY1□W16</td>
<td>14.6</td>
<td>7</td>
<td>30</td>
<td>5.8</td>
<td>39.5</td>
<td>4</td>
<td>3.6</td>
<td>40.8</td>
<td>6</td>
<td>5.4 (Max. 11)</td>
<td>58</td>
</tr>
<tr>
<td>MY1□W20</td>
<td>20</td>
<td>10</td>
<td>32</td>
<td>5.8</td>
<td>45.5</td>
<td>4</td>
<td>3.6</td>
<td>40.8</td>
<td>6</td>
<td>5 (Max. 11)</td>
<td>58</td>
</tr>
<tr>
<td>MY1□W25</td>
<td>24</td>
<td>12</td>
<td>38</td>
<td>6.5</td>
<td>53.5</td>
<td>6</td>
<td>3.5</td>
<td>46.7</td>
<td>7</td>
<td>5 (Max. 16.5)</td>
<td>70</td>
</tr>
<tr>
<td>MY1□W32</td>
<td>29</td>
<td>14</td>
<td>50</td>
<td>8.5</td>
<td>67</td>
<td>6</td>
<td>4.5</td>
<td>67.3</td>
<td>12</td>
<td>8 (Max. 20)</td>
<td>88</td>
</tr>
<tr>
<td>MY1□W40</td>
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<td>17</td>
<td>57</td>
<td>10</td>
<td>83</td>
<td>6</td>
<td>4.5</td>
<td>67.3</td>
<td>12</td>
<td>9 (Max. 25)</td>
<td>104</td>
</tr>
<tr>
<td>MY1□W50</td>
<td>40</td>
<td>20</td>
<td>66</td>
<td>14</td>
<td>106</td>
<td>6</td>
<td>5.5</td>
<td>73.2</td>
<td>15</td>
<td>13 (Max. 33)</td>
<td>128</td>
</tr>
<tr>
<td>MY1□W63</td>
<td>52</td>
<td>26</td>
<td>77</td>
<td>14</td>
<td>129</td>
<td>6</td>
<td>5.5</td>
<td>73.2</td>
<td>15</td>
<td>13 (Max. 38)</td>
<td>152</td>
</tr>
</tbody>
</table>

Shock absorber unit model
RB0806
RB0806
RB1007
RB1412
RB1412
RB2015
RB2015
Side Supports

Guide for Side Support Application

During long stroke operation, the cylinder tube may deflect due to its own weight and/or load weight. In such cases, install a side support at the intermediate stroke position. The spacing of the side support must be no more than the values shown in the graphs at right.

⚠️ Caution

1. If the cylinder mounting surfaces are not measured accurately, using a side support may cause poor operation. Make sure to level the cylinder tube when mounting the cylinder. For long stroke operation involving vibration and impact, the use of side supports is recommended, even if the spacing value is within the allowable limits shown in the graphs.

2. Support brackets are not for mounting. They should be used only to provide support.
**Auto Switch Proper Mounting Position for Stroke End Detection**

**MY1CW 16, 20**

**MY1MW 16, 20**

---

**Reed switch**

D-A90(V), D-A93(V), D-A96(V)

**Solid state switch**

D-F9N(V), D-F9P(V), D-F9B(V)

**D-F9NW(V), D-F9PW(V), D-F9BW(V)**

<table>
<thead>
<tr>
<th>Mounting position</th>
<th>φ25</th>
<th>φ32</th>
<th>φ40</th>
<th>φ50</th>
<th>φ63</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>70</td>
<td>90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>90</td>
<td>110</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Operating range (Note)

11 7.5

---

**MY1MW 25, 32, 40, 50, 63**

---

**Reed switch**

D-Z73, D-Z76, D-Z80

**Solid state switch**

D-Y59, D-Y69, D-Y7P(V)

D-Y7NW(V), D-Y7PW(V), D-Y7BW(V)

**D-Y7BAL**

<table>
<thead>
<tr>
<th>Mounting position</th>
<th>φ25</th>
<th>φ32</th>
<th>φ40</th>
<th>φ50</th>
<th>φ63</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>139.5</td>
<td>164.5</td>
<td>229.5</td>
<td>278.5</td>
<td>323.5</td>
</tr>
<tr>
<td>B</td>
<td>80.5</td>
<td>95.5</td>
<td>110.5</td>
<td>121.5</td>
<td>136.5</td>
</tr>
</tbody>
</table>

Operating range (Note)

12 12 12 11.5 11.5

Perpendicular electrical entry is not available for φ50 and φ63.

**D-Y69A, D-Y69B, D-Y7PV**

<table>
<thead>
<tr>
<th>Mounting position</th>
<th>φ25</th>
<th>φ32</th>
<th>φ40</th>
<th>φ50</th>
<th>φ63</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>139.5</td>
<td>164.5</td>
<td>229.5</td>
<td>278.5</td>
<td>323.5</td>
</tr>
<tr>
<td>B</td>
<td>80.5</td>
<td>95.5</td>
<td>110.5</td>
<td>121.5</td>
<td>136.5</td>
</tr>
</tbody>
</table>

Operating range (Note)

5 5 5 5.5 5.5

---

**MY1CW 25, 32, 40, 50, 63**

---

**Reed switch**

D-Z73, D-Z76, D-Z80

**Solid state switch**

D-Y59, D-Y69, D-Y7P(V)

D-Y7NW(V), D-Y7PW(V), D-Y7BW(V)

**D-Y7BAL**

<table>
<thead>
<tr>
<th>Mounting position</th>
<th>φ25</th>
<th>φ32</th>
<th>φ40</th>
<th>φ50</th>
<th>φ63</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>97.5</td>
<td>127.5</td>
<td>157.5</td>
<td>278.5</td>
<td>323.5</td>
</tr>
<tr>
<td>B</td>
<td>122.5</td>
<td>152.5</td>
<td>182.5</td>
<td>212.5</td>
<td>236.5</td>
</tr>
</tbody>
</table>

Operating range (Note)

12 12 12 11.5 11.5

Perpendicular electrical entry is not available for φ50 and φ63.

**D-Y69A, D-Y69B, D-Y7PV**

<table>
<thead>
<tr>
<th>Mounting position</th>
<th>φ25</th>
<th>φ32</th>
<th>φ40</th>
<th>φ50</th>
<th>φ63</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>97.5</td>
<td>127.5</td>
<td>157.5</td>
<td>278.5</td>
<td>323.5</td>
</tr>
<tr>
<td>B</td>
<td>122.5</td>
<td>152.5</td>
<td>182.5</td>
<td>212.5</td>
<td>236.5</td>
</tr>
</tbody>
</table>

Operating range (Note)

5 5 5 5.5 5.5

---

Note) The operating range is a guide that includes hysteresis, and therefore, is not guaranteed. The range may vary greatly (as much as ±30%) depending on the operating environment.
Auto Switch Mounting & Installation of Lead Wire Cover (ø50, ø63)

⚠️ Caution
Be sure to install a lead wire cover on the auto switches for size ø50 and ø63 cylinders.
Install a lead wire cover following the instructions provided below to prevent the lead wire from interfering with the slider.
Lead wire cover is packaged together with size ø50 and ø63 cylinders equipped with auto switches.

For ordering the lead wire cover separately, use the following part number:
MYM63GAR6386-1640 (Length: 2m)

1. Auto switch mounting position
Up to 4 auto switches can be mounted on one side of the cylinder (total of 8 switches on both sides).
When multiple auto switches are used, be sure to use the lead wire groove and pull the lead wires out from the edge of the cylinder. (Bold lines in Figure 1 indicate lead wires.)

Figure 1. Auto switch mounting position

2. How to mount auto switch/install lead wire cover
1. Insert and slide in the auto switch from the side of the cylinder and secure it with the screw provided. (Refer to Figure 2.)

2. Cut the lead wire cover to the desired length using a cutter or tube cutter. (Refer to Figure 1.)

3. First place the lead wires into the lead wire cover. Then, install a lead wire cover onto a cylinder body. (Refer to Figure 3.)

4. Make sure that the lead wires do not interfere with the slide table at any stroke range.

Figure 2. Auto switch mounting

Figure 3. Installation of lead wire cover
**Auto Switch Common Specifications**

<table>
<thead>
<tr>
<th>Type</th>
<th>Reed switch</th>
<th>Solid state switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leakage current</td>
<td>None</td>
<td>3-wire: 100(\mu)A or less, 2-wire: 0.8mA or less</td>
</tr>
<tr>
<td>Operating time</td>
<td>1.2ms</td>
<td>1ms or less</td>
</tr>
<tr>
<td>Impact resistance</td>
<td>300m/s²</td>
<td>1000m/s²</td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>50M(\Omega) or more at 500VDC (between lead wire and case)</td>
<td></td>
</tr>
<tr>
<td>Withstand voltage</td>
<td>1500VAC for 1 min.</td>
<td>1000VAC for 1 min.</td>
</tr>
<tr>
<td>(between lead wire and case)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>–10(^\circ) to 60(^\circ)C</td>
<td></td>
</tr>
<tr>
<td>Enclosure</td>
<td>IEC529 standard IP67, JIS C0920: Watertight construction</td>
<td></td>
</tr>
</tbody>
</table>

**Lead Wire Lengths**

<table>
<thead>
<tr>
<th>Lead wire length indication</th>
<th>Lead wire length</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Example) D-F9P L</td>
<td>Nil 0.5m, L 3m</td>
</tr>
</tbody>
</table>

Notes:
- Lead wire length Z (5m) applicable auto switches
- Reed switch: D-Z73
- Solid state switch: All types are produced upon receipt of order.
- For D-Y5, D-Y6, and D-Y7, flexible wire specification is standard.
- To designate flexible wire specification for the D-F9 type, add "-61" after the lead wire length.

(Example) D-F9PL-61

Flexible specification

**Contact Protection Box: CD-P11, CD-P12**

<Applicable switch type>

Reed switches do not have built-in contact protection circuits.

A contact protection box should be used in any of the following conditions, otherwise, the life of the contacts may be reduced (they may stay on continuously).

1. Operated load is an induction load.
2. The length of wiring to the load is 5m or more.
3. The load voltage is 100VAC or 200VAC.

**Specifications**

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Load voltage</th>
<th>Max. load current</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD-P11</td>
<td>100VAC</td>
<td>25mA</td>
</tr>
<tr>
<td>CD-P12</td>
<td>200VAC</td>
<td>12.5mA</td>
</tr>
<tr>
<td></td>
<td>24VDC</td>
<td>50mA</td>
</tr>
</tbody>
</table>

▲ Lead wire length — Switch connection side: 0.5m 
Load connection side: 0.5m

**Internal circuits**

**CD-P11**

- Surge absorber
- Choke coil
- OUT Brown [Red]
- OUT Blue [Black]

**CD-P12**

- Choke coil
- Zener diodes
- OUT (+) Brown [Red]
- OUT (–) Blue [Black]

**Dimensions**

**Connection for Contact Protection Box**

To connect a switch unit to a contact protection box, connect the lead wire from the side of the contact protection box marked SWITCH to the lead wire coming out of the switch unit.

The switch unit should be kept as close as possible to the contact protection box with a lead wire that is no more than 1 meter in length.
Reed Switches: Direct Mounting Type
D-A90(V), D-A93(V), D-A96(V)

### Specifications

<table>
<thead>
<tr>
<th>Auto switch part no.</th>
<th>D-A90</th>
<th>D-A90V</th>
<th>D-A93</th>
<th>D-A93V</th>
<th>D-A96</th>
<th>D-A96V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical entry direction</td>
<td>In-line</td>
<td>Perpendicular</td>
<td>In-line</td>
<td>Perpendicular</td>
<td>In-line</td>
<td>Perpendicular</td>
</tr>
<tr>
<td>Wiring type</td>
<td>2-wire</td>
<td>3-wire</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applicable load</td>
<td>IC circuit, Relay, PLC</td>
<td>Relay, PLC</td>
<td>IC circuit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load voltage</td>
<td>24VDC or less/50mA</td>
<td>48VDC or less/40mA</td>
<td>100VAC/5 to 40mA</td>
<td>4 to 8VDC/20mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load current and Max. load current</td>
<td>( )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal resistance/Internal voltage drop</td>
<td>1Ω or less (includes 3m lead wire length)</td>
<td>2.7V or less</td>
<td>0.8V or less</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator light</td>
<td>None</td>
<td>Red LED lights when ON</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Internal circuits**
  - **D-A90(V)**
    - D-A90(V): 0.18mm² x 2 cores (Brown, Blue [Red, Black])
  - **D-A93(V)**
    - D-A93(V): 0.15mm² x 3 cores (Brown, Black, Blue [Red, Black, White])
  - **D-A96(V)**
    - D-A96(V): 0.15mm² x 3 cores (Brown, Black, Blue [Red, Black, White])

- **Contact protection box**
  - CD-P11
  - CD-P12

- **Indicator light**
  - None

- **Red LED lights when ON**

- **Load wire**
  - Oilproof heavy duty vinyl cord: ø2.7, 0.5m

- **Insulation resistance**
  - 50MΩ or more at 500VDC (between lead wire and case)

- **Withstand voltage**
  - 1000VAC for 1 min. (between lead wire and case)

- **Operating time**
  - 1.2ms

- **Ambient temperature**
  - –10°C to 60°C

- **Impact resistance**
  - 300m/s²

- **Leakage current**
  - 0

- **Enclosure**
  - IEC529 standard IP67 (JISC0920) watertight

Note: Refer to page 12 for lead wire lengths.

### Weights

<table>
<thead>
<tr>
<th>Auto switch part no.</th>
<th>D-A90</th>
<th>D-A90V</th>
<th>D-A93</th>
<th>D-A93V</th>
<th>D-A96</th>
<th>D-A96V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead wire length: 0.5m</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Lead wire length: 3m</td>
<td>35</td>
<td>35</td>
<td>30</td>
<td>35</td>
<td>41</td>
<td>41</td>
</tr>
</tbody>
</table>

### Dimensions

**D-A90, D-A93, D-A96**

**D-A90(V), D-A93(V), D-A96(V)**

The dimension inside ( ) is for D-A93.
## Specifications

### With indicator light

<table>
<thead>
<tr>
<th>Auto switch part no.</th>
<th>D-Z73</th>
<th>D-Z76</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto switch part no.</td>
<td>D-Z73</td>
<td>D-Z76</td>
</tr>
<tr>
<td>Electrical entry direction</td>
<td>In-line</td>
<td>3-wire</td>
</tr>
<tr>
<td>Wiring type</td>
<td>2-wire</td>
<td>3-wire</td>
</tr>
<tr>
<td>Applicable load</td>
<td>Relay, PLC</td>
<td>IC circuit</td>
</tr>
<tr>
<td>Load voltage</td>
<td>24VDC</td>
<td>100VAC</td>
</tr>
<tr>
<td>Maximum load current</td>
<td>5 to 40mA</td>
<td>5 to 20mA</td>
</tr>
<tr>
<td>Contact protection circuit</td>
<td>Not available</td>
<td>3-wire</td>
</tr>
<tr>
<td>Internal voltage drop</td>
<td>2.4V or less (up to 20mA), 3V or less (up to 40mA)</td>
<td>0.8V or less</td>
</tr>
<tr>
<td>Indicator light</td>
<td>Red LED lights when ON</td>
<td></td>
</tr>
</tbody>
</table>

### Without indicator light

<table>
<thead>
<tr>
<th>Auto switch part no.</th>
<th>D-Z80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto switch part no.</td>
<td>D-Z80</td>
</tr>
<tr>
<td>Electrical entry direction</td>
<td>In-line</td>
</tr>
<tr>
<td>Wiring type</td>
<td>2-wire</td>
</tr>
<tr>
<td>Applicable load</td>
<td>Relay, PLC, IC circuit</td>
</tr>
<tr>
<td>Load voltage</td>
<td>24VDC or less</td>
</tr>
<tr>
<td>Maximum load current</td>
<td>50mA</td>
</tr>
<tr>
<td>Contact protection circuit</td>
<td>Not available</td>
</tr>
<tr>
<td>Internal resistance</td>
<td>1Ω or less (includes 5m lead wire length)</td>
</tr>
</tbody>
</table>

### Internal circuits

- **D-Z73**
  - LED (Red)
  - Resistance
  - Contact protection box (CD-P11, CD-P12)
  - OUT (+) Brown (Red)
  - OUT (–) Blue (Black)

- **D-Z76**
  - DC power (+) Brown (Red)
  - Load Black (White)
  - OUT (+) Brown (Red)
  - OUT (–) Blue (Black)

- **D-Z80**
  - Contact protection box (CD-P11, CD-P12)
  - OUT (+) Brown (Red)
  - OUT (–) Blue (Black)

### Weights

<table>
<thead>
<tr>
<th>Auto switch part no.</th>
<th>Lead wire length: 0.5m</th>
<th>Lead wire length: 3m</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-Z73</td>
<td>6</td>
<td>31</td>
</tr>
<tr>
<td>D-Z76</td>
<td>10</td>
<td>55</td>
</tr>
<tr>
<td>D-Z80</td>
<td>9</td>
<td>49</td>
</tr>
</tbody>
</table>

### Dimensions

- **D-Z73**
  - M2.5 x 4 slotted set screw
  - 12.5 Most sensitive position

- **D-Z76, D-Z80**
  - M2.5 x 4 slotted set screw
  - 12.5 Most sensitive position

---

**Note:** Refer to page 12 for lead wire lengths.
# Solid State Switches: Direct Mounting Type

## D-F9N(V), D-F9P(V), D-F9B(V)

### Specifications

<table>
<thead>
<tr>
<th>Auto switch part no.</th>
<th>D-F9N</th>
<th>D-F9NV</th>
<th>D-F9P</th>
<th>D-F9PV</th>
<th>D-F9B</th>
<th>D-F9BV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical entry direction</td>
<td>In-line</td>
<td>Perpendicular</td>
<td>In-line</td>
<td>Perpendicular</td>
<td>In-line</td>
<td>Perpendicular</td>
</tr>
<tr>
<td>Wiring type</td>
<td>3-wire</td>
<td>2-wire</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output type</td>
<td>NPN</td>
<td>PNP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applicable load</td>
<td>IC circuit, Relay, PLC</td>
<td>24VDC relay, PLC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>5, 12, 24VDC (4.5 to 28VDC)</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>10mA or less</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load voltage</td>
<td>28VDC or less</td>
<td>24VDC (10 to 28VDC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load current</td>
<td>40mA or less</td>
<td>80mA or less</td>
<td>5 to 40mA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal voltage drop</td>
<td>1.5V or less (0.8V or less at 10mA load current)</td>
<td>0.8V or less</td>
<td>4V or less</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leakage current</td>
<td>100μA or less at 24VDC</td>
<td>0.8mA or less</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Lead wire .......... Oilproof heavy duty vinyl cord: ø2.7, 0.5m  
  - D-F9N(V), D-F9P(V): 0.15mm² x 3 cores (Brown, Black, Blue [Red, White, Black])  
  - D-F9B(V): 0.18mm² x 2 cores (Brown, Blue [Red, Black])  

Note: Refer to page 12 for auto switch common specifications and lead wire lengths.

### Weights

<table>
<thead>
<tr>
<th>Auto switch part no.</th>
<th>D-F9N</th>
<th>D-F9P</th>
<th>D-F9B</th>
<th>D-F9NV</th>
<th>D-F9PV</th>
<th>D-F9BV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead wire length: 0.5m</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Lead wire length: 3m</td>
<td>37</td>
<td>37</td>
<td>31</td>
<td>37</td>
<td>37</td>
<td>31</td>
</tr>
</tbody>
</table>

### Dimensions

#### D-F9N, D-F9P, D-F9B

![Diagram](image)

- M2.5 x 4 Slotted set screw

#### D-F9NV, D-F9PV, D-F9BV

![Diagram](image)

- M2.5 x 4 Slotted set screw

---

*Grommet*
Solid State Switches with 2-Color Display: Direct Mounting Type
D-F9NW(V), D-F9PW(V), D-F9BW(V)

Specifications

<table>
<thead>
<tr>
<th>D-F9NW, D-F9NWV (with indicator light)</th>
<th>Auto switch part no.</th>
<th>D-F9NW</th>
<th>D-F9NWV</th>
<th>D-F9PW</th>
<th>D-F9PWV</th>
<th>D-F9BW</th>
<th>D-F9BWV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical entry director</td>
<td>In-line</td>
<td>Perpendicular</td>
<td>In-line</td>
<td>Perpendicular</td>
<td>In-line</td>
<td>Perpendicular</td>
<td></td>
</tr>
<tr>
<td>Wiring type</td>
<td>3-wire</td>
<td>NPN</td>
<td>IC circuit, Relay, PLC</td>
<td>24VDC relay, PLC</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>5, 12, 24VDC (4.5 to 28VDC)</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>10mA or less</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load voltage</td>
<td>28VDC or less</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load current</td>
<td>40mA or less</td>
<td>80mA or less</td>
<td>5 to 40mA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal voltage drop</td>
<td>1.5V or less</td>
<td>0.8V or less at 10mA load current</td>
<td>4V or less</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leakage current</td>
<td>100μA or less at 24VDC</td>
<td>0.8mA or less</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator light</td>
<td>Operating position …</td>
<td>Red LED lights up</td>
<td>Optimum operating position …</td>
<td>Green LED lights up</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Lead wire ........ Oilproof heavy duty vinyl cord: ø2.7, 0.5m
  D-F9NW(V), D-F9PW(V): 0.15mm² x 3 cores (Brown, Black, Blue [Red, White, Black])
  D-F9BW(V): 0.18mm² x 2 cores (Brown, Blue [Red, Black])

Note) Refer to page 12 for auto switch common specifications and lead wire lengths.

Weights

<table>
<thead>
<tr>
<th>Auto switch part no.</th>
<th>D-F9NW</th>
<th>D-F9NWV</th>
<th>D-F9PW</th>
<th>D-F9PWV</th>
<th>D-F9BW</th>
<th>D-F9BWV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead wire length: 0.5m</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Lead wire length: 3m</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>32</td>
<td>32</td>
</tr>
</tbody>
</table>

Dimensions

D-F9NW, D-F9PW, D-F9BW

D-F9NWV, D-F9PWV, D-F9BWV

Indicator light

Operating range

ON

Indicator light

Indicator light

Most sensitive position

M2.5 x 4 Slotted set screw
Solid State Switches: Direct Mounting Type
D-Y59A, D-Y69A, D-Y7P(V)

Specifications

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical entry direction</td>
<td>In-line</td>
<td>Perpendicular</td>
<td>In-line</td>
<td>Perpendicular</td>
<td>In-line</td>
<td>Perpendicular</td>
</tr>
<tr>
<td>Wiring type</td>
<td>3-wire</td>
<td>2-wire</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output type</td>
<td>NPN</td>
<td>PNP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applicable load</td>
<td>IC circuit, Relay, PLC</td>
<td>24VDC relay, PLC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>5, 12, 24VDC (4.5 to 28VDC)</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>10mA or less</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load voltage</td>
<td>28VDC or less</td>
<td>24VDC (10 to 28VDC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load current</td>
<td>40mA or less</td>
<td>80mA or less</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal voltage drop</td>
<td>1.5V or less (0.8V or less at 10mA load current)</td>
<td>0.8V or less</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leakage current</td>
<td>100µA or less at 24VDC</td>
<td>0.8mA or less at 24VDC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator light</td>
<td>—</td>
<td>Red LED lights when ON</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Lead wires: Oilproof heavy-duty flexible vinyl cord, ø3.4, 0.5m, D-Y59A, D-Y69A, D-Y7P(V): 0.15mm² x 3 cores (Brown, Black, Blue [Red, White, Black]), D-Y59B, D-Y69B: 0.15mm² x 2 cores (Brown, Blue [Red, Black])

Note: Refer to page 12 for solid state auto switch common specifications and lead wire lengths.

Weights

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead wire length 0.5m</td>
<td>10</td>
<td>9</td>
<td>10</td>
<td>9</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Lead wire length 3m</td>
<td>53</td>
<td>50</td>
<td>53</td>
<td>50</td>
<td>53</td>
<td></td>
</tr>
</tbody>
</table>

Dimensions

D-Y59A, D-Y7P, D-Y59B

D-Y69A, D-Y7PV, D-Y69B

Internal circuits

D-Y59A, D-Y69A

D-Y7P(V)

D-Y59B, D-Y69B

Note: Refer to page 12 for solid state auto switch common specifications and lead wire lengths.
Solid State Switches with 2-Color Display:
Direct Mounting Type
D-Y7NW(V), D-Y7PW(V), D-Y7BW(V)

**Specifications**

<table>
<thead>
<tr>
<th>Auto switch part no.</th>
<th>D-Y7NW</th>
<th>D-Y7NWV</th>
<th>D-Y7PW</th>
<th>D-Y7PWV</th>
<th>D-Y7BW</th>
<th>D-Y7BWV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical entry direction</td>
<td>In-line</td>
<td>Perpendicular</td>
<td>In-line</td>
<td>Perpendicular</td>
<td>In-line</td>
<td>Perpendicular</td>
</tr>
<tr>
<td>Wiring type</td>
<td>NPN</td>
<td>3-wire</td>
<td>PNP</td>
<td>2-wire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applicable load</td>
<td>IC circuit, Relay, PLC</td>
<td>—</td>
<td>24VDC relay, PLC</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>5, 12, 24VDC (4.5 to 28VDC)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>10mA or less</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load voltage</td>
<td>28VDC or less</td>
<td>—</td>
<td>24VDC (10 to 28VDC)</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load current</td>
<td>40mA or less</td>
<td>80mA or less</td>
<td>5 to 40mA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal voltage drop</td>
<td>1.5V or less (0.8V or less at 10mA load current)</td>
<td>0.8V or less</td>
<td>4V or less</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leakage current</td>
<td>100µA or less at 24VDC</td>
<td>0.8mA or less at 24VDC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Indicator light**
  - Operating position ................................. Red LED lights up
  - Optimum operating position ............... Green LED lights up

**Weights**

<table>
<thead>
<tr>
<th>Auto switch part no.</th>
<th>D-Y7NW</th>
<th>D-Y7PW</th>
<th>D-Y7BW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead wire length: 0.5m</td>
<td>11</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Lead wire length: 3m</td>
<td>54</td>
<td>54</td>
<td>54</td>
</tr>
</tbody>
</table>

**Dimensions**

- **D-Y7NW**
  - M2.5 x 4 Slotted set screw
  - Indicator light
  - 12.5 Most sensitive position

- **D-Y7NWV**
  - M2.5 x 4 Slotted set screw
  - Indicator light
  - 12.5 Most sensitive position

**Internal circuits**

- **D-Y7NW(V)**
  - Main circuit of switch
  - DC (+) Brown [Red]
  - DC (-) Blue [Black]
  - OUT Black [White]

- **D-Y7PW(V)**
  - Main circuit of switch
  - DC (+) Brown [Red]
  - DC (-) Blue [Black]
  - OUT Black [White]

- **D-Y7BW(V)**
  - Main circuit of switch
  - DC (+) Brown [Red]
  - DC (-) Blue [Black]
  - OUT Black [White]

**Grommet**

The optimum operating position can be determined by the color of the light.
(Red ➔ Green ➔ Red)

**Weights**

<table>
<thead>
<tr>
<th>Auto switch part no.</th>
<th>D-Y7NW</th>
<th>D-Y7PW</th>
<th>D-Y7BW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead wire length: 0.5m</td>
<td>11</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Lead wire length: 3m</td>
<td>54</td>
<td>54</td>
<td>54</td>
</tr>
</tbody>
</table>

**Dimensions**

- **D-Y7NW**
  - M2.5 x 4 Slotted set screw
  - Indicator light
  - 12.5 Most sensitive position

- **D-Y7NWV**
  - M2.5 x 4 Slotted set screw
  - Indicator light
  - 12.5 Most sensitive position

**Note:** Refer to page 12 for solid state switch common specifications and lead wire lengths.
Water-Resistant
Solid State Switches with 2-Color Display
D-Y7BAL 2-Wire Type

Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>D-Y7BAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto switch part no.</td>
<td>2-wire</td>
</tr>
<tr>
<td>Wiring type</td>
<td></td>
</tr>
<tr>
<td>Applicable load</td>
<td>24VDC relay, PLC</td>
</tr>
<tr>
<td>Load voltage</td>
<td>24VDC (10 to 28VDC)</td>
</tr>
<tr>
<td>Load current</td>
<td>5 to 40mA</td>
</tr>
<tr>
<td>Internal voltage drop</td>
<td>4V or less</td>
</tr>
<tr>
<td>Leakage current</td>
<td>0.8mA or less at 24VDC</td>
</tr>
</tbody>
</table>
| Indicator light                         | Operating position .............. Red LED lights up  
                                        | Optimum operating position .............. Green LED lights up |
| Operating time                          | 1ms or less      |
| Lead wires                               | Oilproof heavy-duty flexible vinyl cable, ø3.4, 0.15mm², 2 cores (Brown, Blue [Red, Black]), 3m |
| Impact resistance                        | 10000m/s²       |
| Insulation resistance                   | 50MΩ or more at 500VDC (between lead wire and case) |
| Withstand voltage                       | 1000VAC for 1 min. (between lead wire and case) |
| Ambient temperature                     | -10°C to 60°C    |
| Enclosure                                | IEC529 standard IP67 (JISC0920) watertight |

Weights

<table>
<thead>
<tr>
<th>Weights</th>
<th>(g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto switch part no.</td>
<td>D-Y7BAL</td>
</tr>
<tr>
<td>Lead wire length 3m</td>
<td>54</td>
</tr>
</tbody>
</table>

Dimensions

- Operating range: 1ms or less
- Lead wires: Oilproof heavy-duty flexible vinyl cable, ø3.4, 0.15mm², 2 cores (Brown, Blue [Red, Black]), 3m
- Impact resistance: 10000m/s²
- Insulation resistance: 50MΩ or more at 500VDC (between lead wire and case)
- Withstand voltage: 1000VAC for 1 min. (between lead wire and case)
- Ambient temperature: -10°C to 60°C
- Enclosure: IEC529 standard IP67 (JISC0920) watertight
Basic Wiring

Sink input specifications

2-wire with 2-switch AND connection

Example: Power supply is 24VDC. Internal voltage drop in switch is 4V.

Leakage current from switch is 1mA.

Example: Load impedance is 3 kΩ.

Connection Examples for AND (Series) and OR (Parallel)

The connection method will vary depending on the applicable PLC input specifications.

The indicator lights will light up when both switches are turned ON.

2-wire with 2-switch OR connection

<Solid state>

<Reed switch>

Because there is no current leakage, the load voltage will not increase when turned OFF. However, depending on the number of switches in the ON state, the indicator lights may sometimes grow dim or not light up because of the dispersion and reduction of the current flowing to the switches.
**Series MY1□W**

Made to Order Specifications

Contact SMC for detailed dimensions, specifications, and lead times.

1. **Long stroke**

   Available with long strokes exceeding standard stroke range. The stroke can be set in 1mm increments.

   Stroke range: 2001 to 3000mm

   Example) MY1MW40G-2999L-Z73-XB11

2. **Dust seal band NBR lining specification**

   The standard vinyl chloride lining specification is changed to NBR lining for improved oil resistance and peeling resistance.

   Note) Consult with SMC for specific details on oil resistance.

   Example) MY1MW40G-300L-Z73-XC67

   For ordering dust seal band (NBR lining) only

   MY□ Bore size □ Stroke N B N

   Dust seal band hexagon socket head set screw thread

   Nil | Black zinc chromated

   W | Nickel plated

   Refer to “Dust seal band” under the seal parts on the construction page of each series for details.

3. **Holder mounting bracket**

   Holder mounting brackets are used to fix the stroke adjusting unit at an intermediate stroke position.

   Holder mounting bracket ① -X416  Holder mounting bracket ② -X417

   **Fine stroke adjustment range** (mm)

<table>
<thead>
<tr>
<th>Bore size (mm)</th>
<th>Spacer length (X416)</th>
<th>Adjustment range</th>
<th>Spacer length (X417)</th>
<th>Adjustment range</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>5.6</td>
<td>–5.6 to –11.2</td>
<td>11.2</td>
<td>–11.2 to –16.8</td>
</tr>
<tr>
<td>20</td>
<td>6</td>
<td>–6 to –12</td>
<td>12</td>
<td>–12 to –18</td>
</tr>
<tr>
<td>25</td>
<td>11.5</td>
<td>–11.5 to –23</td>
<td>23</td>
<td>–23 to –34.5</td>
</tr>
<tr>
<td>32</td>
<td>12</td>
<td>–12 to –24</td>
<td>24</td>
<td>–24 to –36</td>
</tr>
<tr>
<td>40</td>
<td>16</td>
<td>–16 to –32</td>
<td>32</td>
<td>–32 to –48</td>
</tr>
<tr>
<td>50</td>
<td>20</td>
<td>–20 to –40</td>
<td>40</td>
<td>–40 to –60</td>
</tr>
<tr>
<td>63</td>
<td>25</td>
<td>–25 to –50</td>
<td>50</td>
<td>–50 to –75</td>
</tr>
</tbody>
</table>

   (Any fine strokes outside the parameters in the adjustment ranges above are considered to be a special order and processed accordingly.)

   **MY1 W Bore size 300 L –X416**

   **Combination symbol**

   Refer to the table below for applicable symbols.

   **Stroke adjusting unit**

   Refer to the table below for applicable symbols.

   **Holder mounting bracket**

   Refer to the table below for applicable symbols.

   **Combination description**

<table>
<thead>
<tr>
<th>Holder mounting bracket</th>
<th>Combination Symbol</th>
<th>Mounting pcs.</th>
<th>Combination description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X416</td>
<td>Nil 1</td>
<td>X416 on one side</td>
<td></td>
</tr>
<tr>
<td>A, L</td>
<td>W 2</td>
<td>X416 on both sides</td>
<td></td>
</tr>
<tr>
<td>Z 1</td>
<td>X416 on one side, X417 on the other side</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 1</td>
<td>X416 on A unit side</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L 1</td>
<td>X416 on L unit side</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 1</td>
<td>X416 on A unit side, X417 on the other side</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 1</td>
<td>X416 on A unit side, X417 on the other side</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L 1</td>
<td>X417 on one side</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 1</td>
<td>X417 on both sides</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L 1</td>
<td>X417 on L unit side</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   (Any fine strokes outside the parameters in the adjustment ranges above are considered to be a special order and processed accordingly.)

   **Note** For AS and LS, stroke adjusting unit is mounted on one side only.
Example

• For L units with one each of X416 and X417
  MY1/W25G-300L-X416Z

• For A and L units, where X417 is mounted on the A unit side only and nothing is mounted on the L unit side.
  MY1/W25G-300AH-X417A

How to order stroke adjusting unit or holder mounting bracket by itself:

MYM-A16A - X417

○ Combination symbol
  N Nil
  N Holder mounting bracket only
  X416 Holder mounting bracket (1)
  X417 Holder mounting bracket (2)

Example

• Stroke adjusting unit with holder mounting bracket
  MYM-A25L-X416 (L unit for MY1/W25 and X416 bracket)

• Holder mounting bracket only
  MYM-A25L-X416N (MY1/W25 and X416 bracket for L unit)

Copper-free specification

Copper-free compatible.
Note) Not available for cylinders with side seal (MY1/WK).

20 -MY1 M W Bore size Stroke Auto switch type No. of auto switches

- Series: Bore size
  M Side bearing guide type
  C Cam follower guide type
  10 16 20 25 32 40 50 63 80 100
### Standards for Tentative Model Selection

<table>
<thead>
<tr>
<th>Cylinder model</th>
<th>Guide type</th>
<th>Standards for guide selection</th>
<th>Graphs for related allowable values</th>
</tr>
</thead>
<tbody>
<tr>
<td>MY1MW</td>
<td>Slide bearing guide</td>
<td>Slide table accuracy approx. ±0.12mm (Note)</td>
<td>Refer to page 26</td>
</tr>
<tr>
<td>MY1CW</td>
<td>Cam follower guide</td>
<td>Slide table accuracy approx. ±0.05mm (Note)</td>
<td>Refer to page 27</td>
</tr>
</tbody>
</table>

* These accuracy values for each guide should be used only as a guide during selection. Contact SMC when guaranteed accuracy for MY1CW is required.

Note) “Accuracy” here means displacement of the slide table (at stroke end) when 50% of the allowable moment shown in the catalog is applied (reference value).

### Selection Flow Chart

1. **Operating conditions**
   - m: Load weight (kg)
   - V: Speed (mm/s)
   - P: Operating pressure (MPa)

2. **Tentative selection of cylinder model**
   - MY1MW: Slide bearing guide type
   - MY1CW: Cam follower guide type

3. **Load weight**
   - m ≤ m max.
   - **YES**
   - **NO** Select larger cylinder size.

4. **Determination of allowable moment**
   - Σα ≤ 1
   - **YES**
   - **NO** Select larger cylinder size.

5. **Examination of cushioning mechanism at stroke end**
   - **YES**
   - **NO** Select larger cylinder size.

6. **Air cushion**
   - **NO**
   - **YES**

7. **Stroke adjusting unit**
   - **NO**
   - **YES**

8. **Examination of port variations and auto switch mounting (type)**
   - **NO**
   - **YES**

9. **Model selection completed**

10. **External cushioning unit**
    - **NO**
    - **YES**

11. **Standard or centralized piping**
    - **NO**
    - **YES**

* For external cushioning unit, the installation of a suitable cushioning mechanism near the load center of gravity by the customer’s side is recommended. The model selection procedure described in this page is applicable to all mechanically jointed rodless cylinders. Refer to the separate instruction manual for further details. If you have any questions, please contact SMC.
Types of Moment Applied to Rodless Cylinders

Multiple moments may be generated depending on the mounting orientation, load, and position of the center of gravity.

Coordinates and moments

![Diagram showing coordinates and moments](image)

**Static moment**

**Horizontal mounting**

![Diagram of horizontal mounting](image)

**Ceiling mounting**

![Diagram of ceiling mounting](image)

**Wall mounting**

![Diagram of wall mounting](image)

**Vertical mounting**

![Diagram of vertical mounting](image)

**Note:**

- **g:** Gravitational acceleration
- **μa:** Average speed

### Static moment

- **Horizontal:**
  - Static load: \( m \)
  - \( M_1 \): \( m_1 \times g \times X \)
  - \( M_2 \): \( m_2 \times g \times X \)
  - \( M_3 \): \( m_3 \times g \times Y \)

- **Ceiling:**
  - \( M_1 \): \( m_1 \times g \times X \)
  - \( M_2 \): \( m_2 \times g \times Y \)
  - \( M_3 \): \( m_3 \times g \times Z \)

- **Wall:**
  - \( M_1 \): \( m_1 \times g \times X \)
  - \( M_2 \): \( m_2 \times g \times Y \)
  - \( M_3 \): \( m_3 \times g \times Z \)

- **Vertical:**
  - \( M_1 \): \( m_1 \times g \times X \)
  - \( M_2 \): \( m_2 \times g \times Y \)
  - \( M_3 \): \( m_3 \times g \times Z \)

**Note:**

- "\( m_4 \)" is a weight movable by thrust. Use 0.3 to 0.7 times the thrust (varies depending on the operating speed) as a guide for actual use.

### Dynamic moment

- **Horizontal:**
  - \( M_1 \): \( 1.4 \times \mu_a \times m_4 \times g \)
  - \( M_2 \): \( 1.4 \times \mu_a \times m_4 \times g \)

- **Ceiling:**
  - \( M_1 \): \( \frac{1}{3} \times F_E \times X \)

- **Wall:**
  - \( M_1 \): \( \frac{1}{3} \times F_E \times Y \)

- **Vertical:**
  - Dynamic moment \( M_1 \) is not generated.

**Note:**

- Regardless of the mounting orientation, dynamic moment is calculated using the formulas above.
### Maximum Allowable Moment/Maximum Load Weight

#### Maximum allowable moment

Select the moment from within the range of limits shown in the graphs. Note that the maximum load weight value may sometimes exceed even the operating limits shown in the graphs. Therefore, check the allowable load for the selected conditions.

#### Maximum load weight

Select the load weight from within the range of limits shown in the graphs. Note that the maximum allowable moment value may sometimes exceed even the operating limits shown in the graphs. Therefore, also check the allowable moment for the selected conditions.

### Table: Maximum allowable moment and maximum load weight

<table>
<thead>
<tr>
<th>Model</th>
<th>Bore size (mm)</th>
<th>Maximum allowable moment (N·m)</th>
<th>Maximum load weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M1</td>
<td>M2</td>
<td>M3</td>
</tr>
<tr>
<td>MY1MW</td>
<td>16</td>
<td>6.0</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>10</td>
<td>5.2</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>15</td>
<td>9.0</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>59</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>115</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>63</td>
<td>140</td>
<td>60</td>
</tr>
<tr>
<td>MY1CW</td>
<td>16</td>
<td>6.0</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>10</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>15</td>
<td>8.5</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>30</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>60</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>115</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>63</td>
<td>150</td>
<td>50</td>
</tr>
</tbody>
</table>

The above values are the maximum allowable values for moment and load. Refer to each graph on pages 26 and 27 regarding the maximum allowable moment and maximum load weight for a particular piston speed.

### Load weight (kg)

- **m1**: Maximum allowable load
- **m2**: Static moment
- **m3**: Dynamic moment

### Note

Note 1) Moment caused by the load equivalent to impact at the stroke end (at the time of impact with stopper).

Note 2) Moment caused by the load equivalent to impact at the stroke end (at the time of impact with stopper).

Note 3) Depending on the shape of the work piece, multiple moments may be generated. In such cases, the total sum of the load factors (Σα) is the total of all such moments.

Note 4) Average load coefficient (+ 1/3).

Note 5) This coefficient is for averaging the maximum load moment at the time of stopper impact in order to calculate the cylinder's service life.

### Calculation of guide load factor

1. Three factors must be considered when computing calculations for selection:
   a) Maximum load weight
   b) Static moment
   c) Dynamic moment (at the time of impact with stopper)

To evaluate, use the following formulas:

- **Calculate m** max for (1) from the maximum allowable load graph (m1, m2, and m3), and **Mmax** for (2) and (3) from the maximum allowable moment graph (M1, M2, and M3).

### Formulas

- **Load mass (m)**
  
  \[ m = \frac{1.4}{3} \cdot 100 \cdot F \cdot a \cdot g \cdot m \]

- **Static moment (M)**
  
  \[ M = \frac{1.4}{100} \cdot a \cdot g \cdot m \]

- **Dynamic moment (M)**
  
  \[ M = \frac{1}{3} \cdot 100 \cdot F \cdot L \cdot 0.05 \cdot a \cdot a \cdot g \cdot m \]

2. Reference formulas [Dynamic moment at impact]

Use the following formulas to calculate dynamic moment when taking stopper impact into consideration.

- **Load mass (kg)**
- **F**: Load (N)
- **Fe**: Load equivalent to impact (impact with stopper)
- **Ua**: Average speed (mm/s)
- **M**: Static moment (N·m)

### Caution

- The cylinder should be mounted in m orientation if maximum dustproofing is required.

3. Refer to pages 30 and 31 for detailed selection procedures.
Maximum Allowable Moment: MY1MW

MY1MW: M1

MY1MW: M2

MY1MW: M3

Maximum Load Weight: MY1MW

MY1MW: m1

MY1MW: m2

MY1MW: m3
Series MY1\_W

Maximum Allowable Moment/Maximum Load Weight

Maximum Allowable Moment: MY1CW

**MY1CW: M\_1**

**MY1CW: M\_2**

**MY1CW: M\_3**

Maximum Load Weight: MY1CW

**MY1CW: m\_1**

**MY1CW: m\_2**

**MY1CW: m\_3**
Cushion Capacity

**Cushion selection**

*<Air cushion>*

Air cushions are a standard feature for mechanically jointed rodless cylinders. The air cushion mechanism is incorporated to prevent excessive impact of the piston at the stroke end during high speed operation. The purpose of air cushion, thus, is not to decelerate the piston near the stroke end. The ranges of load and speed that air cushions can absorb are within the air cushion limit lines shown in the graphs.

*<Stroke adjusting unit with shock absorber>*

Use this unit when operating with a load or speed exceeding the air cushion limit line, or when cushioning is required outside of the effective air cushion stroke range due to stroke adjustment.

*<L unit>*

Use this unit when the cylinder stroke is outside of the effective air cushion range even if the load and speed are within the air cushion limit line, or when the cylinder is operated in a load and speed range above the air cushion limit line or below the L-unit limit line.

---

**Absorption capacity of air cushion and stroke adjusting units**

<table>
<thead>
<tr>
<th>Bore size (mm)</th>
<th>Cushion stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>25</td>
<td>15</td>
</tr>
<tr>
<td>32</td>
<td>19</td>
</tr>
<tr>
<td>40</td>
<td>24</td>
</tr>
<tr>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>63</td>
<td>37</td>
</tr>
</tbody>
</table>

---

**Caution**

1. Perform stroke adjustment using the adjusting bolt as shown in the picture below.

   When the effective stroke of the shock absorber decreases due to stroke adjustment, the absorption capacity decreases dramatically. Adjust the adjusting bolt so that it is secure at a position where it protrudes approximately 0.5mm beyond the shock absorber.

2. Do not use a shock absorber and air cushion together.
Calculation of absorbed energy for stroke adjusting unit with shock absorber

\[ E = E_1 + E_2 \]

**Symbols**
- \( \upsilon \): Speed of impacting object (m/s)
- \( m \): Weight of impacting object (kg)
- \( F \): Cylinder thrust (N)
- \( g \): Gravitational acceleration (9.8m/s²)
- \( s \): Shock absorber stroke (m)

*Note* The speed of the impacting object is measured at the moment of impact with the shock absorber.

---

**Specific Product Precautions**

Be sure to read before handling. Refer to pages 32 through 38 for Safety Instructions and Auto Switch Precautions.

**Caution**

Take precautions to avoid getting your hands caught in the unit during adjustment.

When using a product with stroke adjusting unit, the space between the slide table (slider) and the stroke adjusting unit is very narrow. Care should be taken to avoid the danger of hands getting caught in this small space.

---

**Tightening torque for stroke adjusting unit holding bolts**

<table>
<thead>
<tr>
<th>Bore size (mm)</th>
<th>Unit</th>
<th>Tightening torque (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>A</td>
<td>0.6</td>
</tr>
<tr>
<td>20</td>
<td>A</td>
<td>1.5</td>
</tr>
<tr>
<td>25</td>
<td>A</td>
<td>3.0</td>
</tr>
<tr>
<td>32</td>
<td>A</td>
<td>5.0</td>
</tr>
<tr>
<td>40</td>
<td>A</td>
<td>12.0</td>
</tr>
<tr>
<td>50</td>
<td>A</td>
<td>12.0</td>
</tr>
<tr>
<td>63</td>
<td>A</td>
<td>24.0</td>
</tr>
</tbody>
</table>

**Tightening torque for stroke adjusting unit lock plate holding bolts**

<table>
<thead>
<tr>
<th>Bore size (mm)</th>
<th>Unit</th>
<th>Tightening torque (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>L</td>
<td>1.2</td>
</tr>
<tr>
<td>32</td>
<td>L</td>
<td>3.3</td>
</tr>
<tr>
<td>40</td>
<td>L</td>
<td>3.3</td>
</tr>
</tbody>
</table>

**Caution**

Do not operate with the stroke adjusting unit fixed in an intermediate position.

When the stroke adjusting unit is fixed in an intermediate position, slippage can occur depending on the amount of energy released at the moment of an impact. In such cases, the use of adjusting bolt mounting brackets, available per Made to Order specifications – X 416 and – X 417, is recommended. Consult with SMC for other lengths. (Refer to "Tightening torque for stroke adjusting unit holding bolts" values in the chart at the upper left corner of this page.)

---

**Fastening of unit**

The unit can be secured by evenly tightening the four unit holding bolts.

---

**Stroke adjustment with adjusting bolt**

Loosen the adjusting bolt lock nut, and adjust the stroke from the lock plate side using a hexagon wrench. Retighten the lock nut.

**Stroke adjustment with shock absorber**

Loosen the two lock plate holding bolts and adjust the stroke by turning the shock absorber. Then, evenly tighten the lock plate holding bolts to secure the shock absorber.

Avoid excessive tightening of the holding bolts (except for ø16, ø20, ø50, and ø63). (Refer to "Tightening torque for stroke adjusting unit lock plate holding bolts" above left.)

Note) Although the lock plate may slightly bend due to tightening of the lock plate holding bolt, this does not affect the shock absorber and locking function.
### Series MY1□W

**Model Selection 2**

This section illustrates the standard model selection procedure using the actual operating conditions as one of the examples.

---

#### Calculation of Guide Load Factor

1. **Operating conditions**

   - **Cylinder**
     - MY1MW40-500
   - **Average operating speed** $\nu_a$ = 200mm/s
   - **Mounting orientation**
     - Horizontal mounting

   ![Connection plate](image1)
   - $W_a$: Connection plate $t = 10$ (880g)
   - $W_c$: MHL2-16D1 (795g)
   - $W_b$: MGGLB25-200 (4.35kg)
   - $W_d$: Work piece (500g)

2. **Load blocking**

3. **Composite center of gravity calculation**

   \[
   m_1 = \sum m_n = 0.88 + 4.35 + 0.795 + 0.5 = 6.525\text{kg}
   \]

   \[
   X = \frac{1}{m_1} \times \sum (m_n \times X_n) = \frac{1}{6.525} \times (0.88 \times 65 + 4.35 \times 150 + 0.795 \times 150 + 0.5 \times 150) = 138.5\text{mm}
   \]

   \[
   Y = \frac{1}{m_1} \times \sum (m_n \times Y_n) = \frac{1}{6.525} \times (0.88 \times 0 + 4.35 \times 0 + 0.795 \times 111 + 0.5 \times 210) = 29.6\text{mm}
   \]

   \[
   Z = \frac{1}{m_1} \times \sum (m_n \times Z_n) = \frac{1}{6.525} \times (0.88 \times 5 + 4.35 \times 42.5 + 0.795 \times 42.5 + 0.5 \times 42.5) = 37.4\text{mm}
   \]

4. **Calculation of load factor for static load**

   - **$m_1$: Weight**
     \[
     m_1 \text{ max (from} \text{1) of graph MY1MW: } m_1 \text{ on page 31) = 84 (kg)}
     \]
     Load factor $\alpha_1 = m_1/m_1 \text{ max} = 6.525/84 = 0.08$

   - **$M_1$: Moment**
     \[
     M_1 \text{ max (from} \text{2) of graph MY1MW: } M_1 \text{ on page 31) = 59 (N} \cdot \text{m)}
     \]
     \[
     M_1 = m_1 \times g \times X = 6.525 \times 9.8 \times 138.5 \times 10^{-3} = 8.86 \text{ (N} \cdot \text{m)}
     \]
     Load factor $\alpha_2 = M_1/M_1 \text{ max} = 8.86/59 = 0.15$
**Calculation of Guide Load Factor**

**M₂: Moment**

\[
M_2 \text{ max (from ③ of graph MY1MW: } M_2) = 24 \text{ (N} \cdot \text{m)}
\]

\[
M_3 = m_1 \times g \times Y = 6.525 \times 9.8 \times 29.6 \times 10^{-3} = 1.89 \text{ (N} \cdot \text{m)}
\]

Load factor \( \alpha_3 = M_2/M_3 \text{ max} = 1.89/24 = 0.08 \)

---

**5 Calculation of load factor for dynamic moment**

**Equivalent load \( F_E \) at impact**

\[
F_E = \frac{1.4}{100} \times \upsilon_a \times g \times m = \frac{1.4}{100} \times 200 \times 9.8 \times 6.525 = 179.1 \text{ (N)}
\]

**M₁E: Moment**

\[
M_{1E} \text{ max (from ④ of graph MY1MW: } M_1 \text{ where } 1.4 \upsilon_a = 280\text{mm/s)} = 42.1 \text{ (N} \cdot \text{m)}
\]

Load factor \( \alpha_4 = M_{1E}/M_1 \text{ max} = 2.23/42.1 = 0.05 \)

---

**M₃E: Moment**

\[
M_{3E} \text{ max (from ⑤ of graph MY1MW: } M_3 \text{ where } 1.4 \upsilon_a = 280\text{mm/s)} = 5.7 \text{ (N} \cdot \text{m)}
\]

Load factor \( \alpha_5 = M_{3E}/M_3 \text{ max} = 1.77/5.7 = 0.31 \)

---

**6 Sum and examination of guide load factors**

\[
\Sigma \alpha = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 = 0.67 \leq 1
\]

The above calculation is within the allowable value, and therefore the selected model can be used. Select a shock absorber separately.

In an actual calculation, when the total sum of guide load factors \( \Sigma \alpha \) in the formula above is more than 1, consider either decreasing the speed, increasing the bore size, or changing the product series. This calculation can be easily made using the "SMC Pneumatics CAD System".
Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by a label of "Caution", "Warning", or "Danger". To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

⚠️ Caution : Operator error could result in injury or equipment damage.

⚠️ Warning : Operator error could result in serious injury or loss of life.

⚠️ Danger : In extreme conditions, there is a possible result of serious injury or loss of life.

Note 1) ISO 4414: Pneumatic fluid power – Recommendations for the application of equipment to transmission and control systems

Note 2) JIS B 8370: General Rules for Pneumatic Equipment

⚠️ Warning

1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.
   Since the products specified here are used in various operating conditions, their compatibility with the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements.

2. Only trained personnel should operate pneumatically operated machinery and equipment.
   Compressed air can be dangerous if handled incorrectly. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.
   1. Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
   2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
   3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc. (Bleed air into the system gradually to create back pressure.)

4. Contact SMC if the product is to be used in any of the following conditions:
   1. Conditions and environments beyond the given specifications, or if product is used outdoors.
   2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, press applications, or safety equipment.
   3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.
### Design

1. **Warning**
   - There is a danger of sudden or erratic action by cylinders if sliding parts of machinery are twisted and changes in forces occur.
   - In such cases, bodily injury may occur, e.g., by catching hands or feet in the machinery, or damage to the machinery itself may occur. Therefore, the machinery should be adjusted to operate smoothly and designed to prevent such dangers.

2. Securely tighten all stationary parts and connected parts so that they will not become loose.
   - Especially when a cylinder operates with high frequency or is installed where there is a lot of vibration, ensure that all parts remain secure.

3. **A deceleration circuit or shock absorber may be required.**
   - When a driven object is operated at high speed or the load is heavy, a cylinder’s cushion will not be sufficient to absorb impact. Install a deceleration circuit to reduce the speed before cushioning, or install an external shock absorber to relieve impact. In this case, the rigidity of the machinery should also be examined.

4. **Take into account a possible drop in operating pressure due to a power outage.**
   - When a cylinder is used as a clamping mechanism, there is a danger of work pieces dropping if there is a decrease in clamping force due to a drop in circuit pressure caused by a power outage. Therefore, safety equipment should be installed to prevent damage to machinery and bodily injury. Suspension mechanisms and lifting devices also require drop prevention measures.

5. **Take into account a possible loss of power source.**
   - Measures should be taken to protect against bodily injury and equipment damage in the event that there is a loss of power to equipment controlled by air pressure, electricity, or hydraulics.

6. **Design circuitry to prevent sudden lurching of driven objects.**
   - Take special care when a cylinder is operated by an exhaust center type directional control valve or when it is starting up after residual pressure is exhausted from the circuit. The piston and its driven object will lurch at high speed if pressure is applied to one side of the cylinder because of the absence of air pressure inside the cylinder. Therefore, equipment should be selected and circuits designed to prevent sudden lurching because when this occurs, there is a danger of bodily injury, particularly to limbs, and/or damage to equipment.

7. **Take into account emergency stops.**
   - Design the system so that bodily injury and/or damage to machinery and equipment will not occur when machinery is stopped by a manual emergency stop or a safety device triggered by abnormal conditions.

8. **Consider a system’s action when operation is restarted after an emergency stop or an abnormal stop.**
   - Design machinery so that bodily injury or equipment damage will not occur upon restart of operation.
   - When the cylinder has to be reset at the starting position, install safe manual control equipment.

### Selection

1. **Warning**
   - Confirm the specifications.
   - The products featured in this catalog are designed for use in industrial compressed air systems. If the products are used in conditions where pressure and/or temperature are outside the range of specifications, damage and/or malfunction, may occur. Do not use in these conditions. (Refer to specifications.)
   - Consult with SMC if fluid other than compressed air is to be used.

2. **Intermediate stops**
   - When intermediate stopping of a cylinder piston is performed with a 3-position closed center type directional control valve, it is difficult to achieve stopping positions as accurately and precisely as with hydraulic pressure due to the compressibility of air.
   - Furthermore, since valves and cylinders are not guaranteed for zero air leakage, it may not be possible to hold a stopped position for an extended period of time. Contact SMC if it is necessary to hold a stopped position for an extended period.

1. **Caution**
   - Operate within the limits of the maximum usable stroke.
   - Refer to the cylinder model selection procedure for the maximum usable stroke.

2. **Operate the piston in such a way that collision damage will not occur at the stroke end.**
   - Operate within such a range that will prevent damage from occurring when a piston, having inertial force, stops by striking the cover at the stroke end. Refer to the cylinder model selection procedure for the maximum usable stroke.

3. **Use a speed controller to adjust the cylinder drive speed, gradually increasing from a low speed to the desired speed setting.**

4. **Provide intermediate supports for long stroke cylinders.**
   - Provide intermediate supports for cylinders with long strokes to prevent the rod from sagging due to deflection of the tube, vibration, and external loads.
1. Do not inadvertently move the guide adjusting unit.
   The guide is preadjusted at the factory so that readjustment is not required under normal operating conditions. Do not inadvertently move the the guide adjusting unit and change the setting.

2. Avoid operation that causes negative pressure inside the cylinder.
   Take precautions under operating conditions in which negative pressure is created inside the cylinder by external forces or inertial forces. Air leakage may occur due to separation of the seal belt.

3. Take precautions to avoid getting your hands caught in the unit.
   When using a cylinder with stroke adjusting unit, the space between the slide table and the stroke adjusting unit is very narrow. Care should be taken to avoid the danger of hands getting caught in this small space.

4. Do not operate while the stroke adjusting unit is fixed in an intermediate position.
   When the stroke adjusting unit is fixed in an intermediate position, slippage can occur depending on the amount of energy released at the time of an impact. In such cases, the use of the adjusting bolt mounting brackets, available per Made to Order specifications, is recommended.

Consult with SMC for other lengths.

1. Preparation before piping
   Before piping is connected, it should be thoroughly flushed out with air or water to remove chips, cutting oil, and other debris.

2. Wrapping of sealant tape
   When screwing together pipes and fittings, be certain that chips from the pipe threads and sealing material do not get inside the piping.
   Also, when sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

   Wrapping direction

   Wrap sealant tape

   Expose approx. 2 threads

1. Readjust using the cushion needle.
   Cushion needles are adjusted at the time of shipment. When the cylinder is put into service, the cushion needles should be readjusted based on factors such as the size of the load and the operating speed. When the cushion needles are turned clockwise, restriction of the air flow becomes greater and thus the cushioning effect also increases.

2. Do not operate with the cushion needles fully closed.
   Seals may be damaged.

1. Lubrication of non-lube type cylinder
   The cylinder is lubricated for life at the factory and can be used without any further lubrication. However, in the event that additional cylinder lubrication is required, be sure to use ISO VG32 Class 1 turbine oil (with no additives).
   Stopping lubrication later may lead to malfunctions because the new lubricant will cancel out the original lubricant. Therefore, additional lubrication must be continued once it has been started.
Warning
1. Use clean air.
   Do not use compressed air containing chemicals, synthetic oils containing organic solvents, salt, or corrosive gases, as this can cause damage or malfunctions.

Caution
1. Install air filters.
   Install air filters immediately upstream of valves. The filtration degree should be 5µm or finer.

2. Install an after-cooler, air dryer, or water separator (Drain Catch).
   Air that includes excessive drainage or condensate may cause malfunction of valves and other pneumatic equipment. To prevent this, install an after-cooler, air dryer, or water separator (Drain Catch).

3. Use the product within the specified range of fluid and ambient temperature.
   Take measures to prevent freezing when below 5°C, since moisture in circuits can freeze and cause damage to seals and lead to malfunctions.

Refer to SMC’s “Air Preparation System” catalog for further details on compressed air quality.

Warning
1. Do not use in environments where there is a danger of corrosion.
   Refer to the construction drawings to verify cylinder materials.

Caution
1. Performance inspection and service according to the procedures indicated in the instruction manual.
   Improper handling and maintenance may cause malfunctioning and damage of machinery or equipment to occur.

2. Removal of components, and supply/exhaust of compressed air
   Before any machinery or equipment is removed, first ensure that the appropriate measures are in place to prevent the fall or erratic movement of driven objects and equipment, then cut off the electric power and reduce the pressure in the system to zero. Only then should you proceed with the removal of any machinery and equipment.
   When machinery is restarted, proceed with caution after confirming that appropriate measures are in place to prevent cylinders from lurching.

Caution
1. Filter drainage
   Drain out condensate from air filters regularly.
**Warning**

1. Confirm the specifications.
   Read the specifications carefully and use the product appropriately. The product may be damaged or malfunction if it is used outside the range of specifications for load current, voltage, temperature, or impact.

2. Take precautions when multiple cylinders are used close together.
   When two or more auto switch cylinders are lined up in close proximity to each other, magnetic field interference may cause the switches to malfunction. Maintain a minimum cylinder separation of 40mm. (When the allowable interval is specified for each cylinder series, use the indicated value.)

3. Monitor the length of time that a switch is ON at an intermediate stroke position.
   When an auto switch is placed at an intermediate position of the stroke and a load is driven at the time the piston passes, the auto switch will operate, but if the speed is too great the operating time will be shortened and the load may not operate properly. The maximum detectable piston speed is:

   \[
   V(\text{mm/s}) = \frac{\text{Auto switch operating range (mm)}}{\text{Load operating time (ms)}} \times 1000
   \]

4. Keep wiring as short as possible.
   **<Reed switches>**
   As the length of the wiring to a load gets longer, the rush current at switching ON becomes greater, and this may shorten the product's life. (The switch will stay ON all the time.)
   Use a contact protection box when the wire length is 5m or longer.
   **<Solid state switches>**
   Although wire length should not affect switch function, use a wire that is 100m or shorter.

5. Monitor the internal voltage drop of the switch.
   **<Reed switches>**
   1) Switches with an indicator light (except D-A96, D-A96V, D-Z76)
      - If auto switches are connected in series as shown below, take note that there will be a large voltage drop because of internal resistance in the light emitting diodes. (Refer to internal voltage drop in the auto switch specifications.)
      - The voltage drop will be "n" times larger when "n" auto switches are connected.
      Even though an auto switch operates normally, the load may not operate.

   **<Solid state switches>**
   2) Similarly, when operating below a specified voltage, it is possible that the load may be ineffective even though the auto switch function is normal. Therefore, the formula below should be satisfied after confirming the minimum operating voltage of the load.

   \[
   \text{Supply voltage} - \text{Internal voltage drop of switch} > \text{Minimum operating voltage of load}
   \]

   2) If the internal resistance of a light emitting diode causes a problem, select a switch without an indicator light (D-A90, D-A90V, D-Z80).
   **<Solid state switches>**
   3) Generally, the internal voltage drop will be greater with a 2-wire solid state auto switch than with a reed switch. Take the same precautions as in 1) above.
   Also note that a 12VDC relay is not applicable.

   **<Solid state switches>**
   With a 2-wire solid state auto switch, current (leakage current) flows to the load to operate the internal circuit even when in the OFF state.
   If the condition given in the below formula is not met, the switch will not reset correctly (it stays ON).
   \[
   \text{Current to operate load (OFF condition)} > \text{Leakage current}
   \]
   Use a 3-wire switch if this condition cannot be satisfied. Moreover, leakage current flow to the load will be "n" times larger when "n" auto switches are connected in parallel.

7. Do not use a load that generates surge voltage.
   **<Reed switches>**
   If driving a load that generates surge voltage, such as a relay, use a switch with a built-in contact protection circuit or a contact protection box.
   **<Solid state switches>**
   Although a zener diode for surge protection is connected at the output side of a solid state auto switch, damage may still occur if a surge is applied repeatedly. When directly driving a load that generates surge, such as a relay or solenoid valve, use a switch with a built-in surge absorbing element.

8. Cautions for use in an interlock circuit
   When an auto switch is used for an interlock signal requiring high reliability, devise a double interlock system to safeguard against malfunctions by providing a mechanical protection function, or by also using another switch (sensor) together with the auto switch.
   Also perform periodic maintenance inspections and confirm proper operation.

9. Ensure sufficient clearance for maintenance activities.
   When designing an application, be sure to allow sufficient clearance for maintenance and inspections.
Warning

1. Do not drop or bump.
   Do not drop, bump, or apply excessive impacts (300m/s² or more for reed switches and 1000m/s² or more for solid state switches) while handling. Although the body of the switch may not be damaged, the inside of the switch could be damaged and cause a malfunction.

2. Do not carry a cylinder by the auto switch lead wires.
   Never carry a cylinder by its lead wires. This may not only cause broken lead wires, but it may cause internal elements of the switch to be damaged by the stress.

3. Mount switches using the proper tightening torque.
   When a switch is tightened beyond the range of tightening torque, the mounting screws, mounting bracket, or switch may be damaged.
   On the other hand, tightening below the range of tightening torque may allow the switch to slip out of position.

4. Mount a switch at the center of the operating range.
   Adjust the mounting position of an auto switch so that the piston stops at the center of the operating range (the range in which a switch is ON). (The mounting positions shown in the catalog indicate the optimum position at the stroke end.) If mounted at the end of the operating range (around the borderline of ON and OFF), the operation will be unstable.

Warning

1. Avoid repeatedly bending or stretching lead wires.
   Broken lead wires will result from repeatedly applying bending stress or stretching force to the lead wires.

2. Be sure to connect the load before power is applied.
   - 2-wire type
     If the power is turned on when an auto switch is not connected to a load, the switch will be instantly damaged because of excess current.

3. Confirm proper insulation of wiring.
   Be certain that there is no faulty wiring insulation (such as contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may occur due to excess current flow into a switch.

4. Do not wire in conjunction with power lines or high voltage lines.
   Wire separately from power lines or high voltage lines, avoiding parallel wiring or wiring in the same conduit with these lines. Control circuits containing auto switches may malfunction due to noise from these other lines.

Wiring

5. Do not allow short circuiting of loads.
   - Reed switches
     If the power is turned on with a load in a short circuited condition, the switch will be instantly damaged because of excess current flow into the switch.
   - Solid state switches
     PNP output type switches do not have built-in short circuit protection circuits. If loads are short circuited, the switches will be instantly damaged, as in the case of reed switches.
     * Take special care to avoid reverse wiring with the brown [red] power supply line and the black [white] output line on 3-wire type switches.

6. Avoid incorrect wiring.
   - Reed switches
     A 24VDC switch with indicator light has polarity. The brown [red] lead wire is (+), and the blue [black] lead wire is (–).
       1) If connections are reversed, the switch will still operate, but the light emitting diode will not light up.
       Also note that a current greater than the maximum specified one will damage a light emitting diode and make it inoperable.
       Applicable models: D-A93, D-A93V, D-Z73
   - Solid state switches
     1) Even if connections are reversed on a 2-wire type switch, the switch will still operate, but it is protected by a protection circuit, but it will remain in a normally on state. However, it is still necessary to avoid reversed connections since the switch will be damaged if a load shorts in this condition.
     2) Even if (+) and (–) power supply line connections are reversed on a 3-wire type switch, the switch will still be protected by a protection circuit. However, if the (+) power supply line is connected to the blue [black] wire and the (–) power supply line is connected to the black [white] wire, the switch will be damaged.

Lead wire color changes

Lead wire colors of SMC switches have been changed in order to meet NECA Standard 0402 for production beginning September, 1996 and thereafter. Please refer to the tables provided.

Special care should be taken regarding wire polarity during the time that the old colors still coexist with the new colors.

2-wire

<table>
<thead>
<tr>
<th>Old</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output (+)</td>
<td>Red Brown</td>
</tr>
<tr>
<td>Output (–)</td>
<td>Black Blue</td>
</tr>
</tbody>
</table>

3-wire

<table>
<thead>
<tr>
<th>Old</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply (+)</td>
<td>Red Brown</td>
</tr>
<tr>
<td>Power supply GND</td>
<td>Black Blue</td>
</tr>
<tr>
<td>Output</td>
<td>White Black</td>
</tr>
</tbody>
</table>

Solid state with diagnostic output

<table>
<thead>
<tr>
<th>Old</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply (+)</td>
<td>Red Brown</td>
</tr>
<tr>
<td>Power supply GND</td>
<td>Black Blue</td>
</tr>
<tr>
<td>Output</td>
<td>White Black</td>
</tr>
<tr>
<td>Diagnostic output</td>
<td>Yellow Orange</td>
</tr>
</tbody>
</table>

Solid state with latch type diagnostic output

<table>
<thead>
<tr>
<th>Old</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply (+)</td>
<td>Red Brown</td>
</tr>
<tr>
<td>Power supply GND</td>
<td>Black Blue</td>
</tr>
<tr>
<td>Output</td>
<td>White Black</td>
</tr>
<tr>
<td>Diagnostic output</td>
<td>Yellow Orange</td>
</tr>
</tbody>
</table>
Auto Switch Precautions 3
Be sure to read before handling.

### Operating Environment

#### Warning
1. **Never use in the presence of explosive gases.**
The construction of our auto switches does not make them explosion proof. Never use them in the presence of an explosive gas, as this may cause a serious explosion.

2. **Do not use in an area where a magnetic field is generated.**
Auto switches will malfunction or magnets inside cylinders will become demagnetized if used in such an environment. (Consult with SMC regarding the availability of magnetic field resistant auto switches.)

3. **Do not use in an environment where the auto switch will be continually exposed to water.**
Switches satisfy IEC standard IP67 construction (JIS C0920: watertight construction). Nevertheless, they should not be used in applications where they are continually exposed to water splash or spray. This may cause deterioration of the insulation or swelling of the potting resin inside switches and may lead to a malfunction.

4. **Do not use in an environment laden with oil or chemicals.**
Consult with SMC if auto switches will be used in an environment laden with coolants, cleaning solvents, various oils, or chemicals. If auto switches are used under these conditions for even a short time, they may be adversely affected by a deterioration of the insulation, a malfunction due to swelling of the potting resin, or hardening of the lead wires.

5. **Do not use in an environment with temperature cycles.**
Consult with SMC if switches are to be used where there are temperature cycles other than normal temperature changes, as they may be adversely affected internally.

6. **Do not use in an environment where there is excessive impact shock.**
   **<Reed switches>**
   When excessive impact (300m/s² or more) is applied to a reed switch during operation, the contact point may malfunction and generate or cut off a signal momentarily (1ms or less). Consult with SMC regarding the need to use a solid state switch depending on the environment.

7. **Do not use in an area where surges are generated.**
   **<Solid state switch>**
   When there are units (such as solenoid type lifters, high frequency induction furnaces, motors) that generate a large amount of surge in the area around cylinders with solid state auto switches, their proximity may cause deterioration or damage to the internal circuit elements of the switches. Avoid and protect against sources of surge generation and crossed lines.

8. **Avoid close contact with accumulated iron waste or magnetic substances.**
   When a large accumulated amount of ferrous waste such as machining chips or welding spatter, or a magnetic substance (something attracted by a magnet) is brought into close proximity to an cylinder with auto switches, this may cause the auto switches to malfunction due to a loss of the magnetic force inside the cylinder.

### Maintenance

#### Warning
1. **Perform the following maintenance inspection and services periodically in order to prevent possible danger due to unexpected auto switch malfunction.**
   1) Securely tighten switch mounting screws.
      If screws become loose or the mounting position is dislocated, retighten screws securely after readjusting the mounting position.
   2) Confirm that there is no damage to lead wires.
      To prevent faulty insulation, replace switches or repair lead wires if damage is discovered.
   3) Confirm that the green light on the 2-color indicator type switch lights up.
      Confirm that the Green LED is ON when stopped at the set position. If the Red LED is ON when stopped at the set position, the mounting position is not appropriate. Readjust the mounting position until the Green LED lights up.

### Other

#### Warning
1. Consult with SMC concerning water resistance, elasticity of lead wires, and usage at welding sites.
### Mounting

**Caution**

1. To obtain the best results from the cover, horizontal mounting is recommended.
   - With horizontal mounting (shown below), the entry of dirt and dust from the bottom of the cover is much less compared to other mounting orientations, making it much more efficient.

   ![Horizontal mounting](image)

2. When the cylinder is mounted from the top side or when strokes are to be adjusted by installing a stroke adjusting unit, the protective cover must be removed for these purposes.
   - Refer to page 40 for detailed assembly procedure.

### Operating Environment

**Caution**

1. Because of floating particles such as paper dust and coolant mist that may enter the inside of the cover.
   - Since there is a gap between the bottom of the cover and cylinder tube, take precautions when operating cylinders in environments where there is exposure to excessive amount of floating particles, water/oil splash, or chip spattering. If they enter inside the cover, malfunction may occur.

### Centralized Piping Port Variations

- Head cover piping connection can be freely selected to best suit different piping conditions.

<table>
<thead>
<tr>
<th>Applicable cylinders</th>
<th>Port variations</th>
</tr>
</thead>
<tbody>
<tr>
<td>MY1MW16, 20, 50, 63</td>
<td><img src="image" alt="Port variations diagram" /></td>
</tr>
<tr>
<td>MY1CW16, 20, 50, 63</td>
<td><img src="image" alt="Port variations diagram" /></td>
</tr>
<tr>
<td>MY1MW25, 32, 40</td>
<td><img src="image" alt="Port variations diagram" /></td>
</tr>
<tr>
<td>MY1CW25, 32, 40</td>
<td><img src="image" alt="Port variations diagram" /></td>
</tr>
</tbody>
</table>

- This port is not available for use.
  - (except for Ø50)

- Slide table operating direction:
  - Slide table operating direction

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1. Component check
Check the components.

2. Removal of cover
Remove the hexagon socket head button bolts and cover.

3. Body mounting/adjustment
Mount the cylinder body.
For cylinders with protective cover only (i.e., without side seal), reinstall the cover after the cylinder is mounted and adjusted. (Refer to Step 6 “Cover installation”.)

4. Temporary cover installation
1) Remove the hexagon socket head cap screws and one of the end plates.
2) Place the cover and temporarily secure it with the hexagon socket button head bolts.

5. Side seal installation
Slide the side seal assembly into the place from one end of the cylinder.
Stainless steel portions of the side seal assembly are very sharp. Take extra precautions when handling.

6. Cover installation
Reinstall the end plate and secure it.

---

### Cover tightening torque [N·m]

<table>
<thead>
<tr>
<th>Bore sizes</th>
<th>Thread size</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>ø16 to ø40</td>
<td>M3</td>
<td>0.6</td>
</tr>
<tr>
<td>ø50, ø63</td>
<td>M4</td>
<td>1.4</td>
</tr>
</tbody>
</table>

---

### End plate tightening torque [N·m]

<table>
<thead>
<tr>
<th>Bore size</th>
<th>Thread size</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>ø16</td>
<td>M3</td>
<td>0.6</td>
</tr>
<tr>
<td>ø20</td>
<td>M4</td>
<td>1.4</td>
</tr>
<tr>
<td>ø25</td>
<td>M5</td>
<td>2.8</td>
</tr>
<tr>
<td>ø32</td>
<td>M6</td>
<td>4.8</td>
</tr>
<tr>
<td>ø40</td>
<td>M6</td>
<td>4.8</td>
</tr>
<tr>
<td>ø50</td>
<td>M8</td>
<td>12</td>
</tr>
<tr>
<td>ø63</td>
<td>M10</td>
<td>24</td>
</tr>
</tbody>
</table>

---

**Notes:**
- When auto switches are included with a cylinder order, they are packaged together with the cylinder.
- The side seal all the way to the end of the head cover.
- Make sure the side seal assembly is facing in the right direction.
- The end plate is installed from the bottom side of the cover. Do not move the cover upward inadvertently during end plate installation.
- If there is no gap (clearance) between the slide table and cover (B, C in the drawing above) throughout the stroke range, loosen the hexagon socket head cap screw to readjust the cover, then retighten it.