MOUNTING INSTRUCTIONS: SERIES 160 ESCAPEMENTS

- Premount the unit using two cap screws with flat washers (A) through the optional slotted mounting hole into pretapped holes in the mounting surface. Tighten until snug.
- Adjust the escapement forward or back until the parts are releasing properly. Tighten the screws (A) to maintain the position of the unit (slotted mounting only).
- Transfer punch the locations for the second set of mounting holes to be drilled and tapped (B).
- Roll or dowel pins (C) can be used for final position if required.
- The optional stroke adjustment screws (D) can be used to fine tune the retracted position.

TOOLING IDEAS

The threaded hole in the end of rod option -0 can be used to attach simple tooling made from turned bar stock.

Flat stock can be attached to specified mounting surfaces in one of four positions.

APPLICATION EXAMPLES

PHD Escapements provide a simple, reliable means to isolate and release parts from various types of feeding mechanisms. This application shows the escapement being used vertically over a gravity parts feeder. The tooling is designed to handle parts that are wider than the distance between the escapement rods. The built-in sequence of the rods ensures that only one part is released at a time.

PHD Escapements can also be located at the side of a feeder track by allowing clearance holes in the side of the track. The stroke adjustment is used to limit the retract stroke of the escapement rods. This allows the escapement to be adjusted to allow for flush with the side of the feeder track when the escapement rod is retracted. This adjustment limits excess travel and reduces cycle time.

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Arnold-Sommerfeld-Ring 2
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Phone (02401) 850-230 • Fax (02401) 805-232

FOR ADDITIONAL TECHNICAL ASSISTANCE, CALL OR VISIT OUR WEB SITE:

1-800-624-8511 • 260-747-6151
**SERIES 160 DOUBLE ROD ESCAPEMENTS**

**STANDARD DUTY**

<table>
<thead>
<tr>
<th>SPECIFICATIONS</th>
<th>SERIES 160x</th>
<th>1601x</th>
<th>1602x</th>
<th>1603x</th>
<th>1604x</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEIGHT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>85 lb [38 kg]</td>
<td>65 lb [30 kg]</td>
<td>1.95 lb [110 g]</td>
<td>1.95 lb [110 g]</td>
<td>1.95 lb [110 g]</td>
<td>2.5 lb [1.1 kg]</td>
</tr>
<tr>
<td>FORCE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>322 lb f/in [8.0 N/mm]</td>
<td>334 lb f/in [8.4 N/mm]</td>
<td>356 lb f/in [8.9 N/mm]</td>
<td>356 lb f/in [8.9 N/mm]</td>
<td>528 lb f/in [12.6 N/mm]</td>
<td></td>
</tr>
<tr>
<td>PRESSURE</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>INTERNAL TENSION</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 in [51 mm]</td>
<td>2 in [51 mm]</td>
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<td>2 in [51 mm]</td>
<td>2 in [51 mm]</td>
<td>2 in [51 mm]</td>
</tr>
</tbody>
</table>

**HEAVY DUTY**

<table>
<thead>
<tr>
<th>SPECIFICATIONS</th>
<th>SERIES 160x</th>
<th>1601x</th>
<th>1602x</th>
<th>1603x</th>
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</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>PRESSURE</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>INTERNAL TENSION</td>
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<td></td>
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</tr>
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</tr>
</tbody>
</table>

**MAINTENANCE**

As with most PHD products, the units are field repairable. Rebuild kits and main structural components are available as needed for extended service.

**LUBRICATION**

All units are permanently lubricated at the factory and can be used with non-lubricated or lubricated air. Seals are compatible with standard petroleum-based oils used for lubrication.

**WORKING PRINCIPLE**

PHD Escapements are internally ported allowing both double-acting stroked rods to be operated by a single 4 port, 2 position valve. The sequence of rod motions allows parts being hot continuously from a magazine or feeder to be separated or grouped for subsequent processing.

**TYPICAL OPERATION**

**ACTIVATED VALVE POSITION**

Rod A extends.

**RETURN TO INITIAL VALVE POSITION**

Rod B extends.

**RETURN TO INITIAL VALVE POSITION**

Internal sequence mechanism allows rod B to retract only after rod A is fully extended.

**HALL EFFECT SWITCH READY 1601x, 1602x, & 1604x**

This option equips the escapement with magnets on both rods for use with PHD Series 5360 Hall Effect Switches. These switches mount easily to the escapement using "T" slots in the body. Not available on 16002 and 16003 units. Switches must be ordered separately.

**OPTIONS:**

- **OPTION 1:** Through-4 Reference Drawing
- **OPTION 2:** Switch Ready 16002 & 16003 Units Only

**TYPICAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>SERIES 5360 &amp; SERIES 5360A &amp; 5360B</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPERATING PRINCIPLE</td>
<td>Hall Effect</td>
</tr>
<tr>
<td>ACTUATED BY</td>
<td>Moving Magnet</td>
</tr>
<tr>
<td>INPUT VOLTAGE</td>
<td>4.5 to 24 VDC</td>
</tr>
<tr>
<td>OUTPUT TYPE</td>
<td>NPN (Sink)</td>
</tr>
<tr>
<td>CURRENT RATING</td>
<td>20 mA Max. 100 mA Max.</td>
</tr>
<tr>
<td>VOLTAGE DROP</td>
<td>.5 VDC max.</td>
</tr>
<tr>
<td>SWITCH BURDEN</td>
<td>12 mA max.</td>
</tr>
<tr>
<td>ENVIRONMENTAL</td>
<td>IEC/IP67</td>
</tr>
<tr>
<td>OPERATING TEMP</td>
<td>0° to 80°C</td>
</tr>
</tbody>
</table>

**OPTIONS:**

- **OPTION 1:** Through-4 Reference Drawing
- **OPTION 2:** Switch Ready 16002 & 16003 Units Only

**OPTIONS-1 THROUGH-4**

**REFERENCE DRAWING**

**SHOWN AS OPTION-2**

**SWITCH READY 16002 & 16003 UNITS ONLY**

This option equips the escapement with magnets on both rods for use with either 4 mm round or 6 mm square metal sensing proximity switches on the Series 16002 and 16003 Escapements. Proximity switches and mounting kits must be ordered separately. See Switches and Sensors section of PHD's main catalog for switch applications.

**NOTE:** Switch targets must be supplied by the end user (see below).

**ENGINEERING DATA:**

**SERIES 160 DOUBLE ROD ESCAPEMENTS**

**BREAKAWAY**

The breakaway pressure is 20 psi [1.5 bar] at zero load.

**OPERATING TEMPERATURES**

Series 160 Escapements are recommended for use in temperatures from -20°F to 180°F [-29°F to +86°C]. Consult PHD for temperatures beyond this range.

**LUBRICATION**

All units are permanently lubricated at the factory and can be used with non-lubricated or lubricated air. Seals are compatible with standard petroleum-based oils used for lubrication.

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**SERIES 160 ESCAPEMENTS**

- **TYPE: DOUBLE ROD**
- **STANDARD DUTY**
- **HEAVY DUTY**
- **MAINTENANCE**
- **LUBRICATION**
- **WORKING PRINCIPLE**
- **TYPICAL OPERATION**
- **HALL EFFECT SWITCH READY 1601x, 1602x, & 1604x**
- **OPTIONS:**
  - **OPTION 1:** Through-4 Reference Drawing
  - **OPTION 2:** Switch Ready 16002 & 16003 Units Only
- **TYPICAL SPECIFICATIONS**
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  - **TYPE: DOUBLE ROD**
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