APPLICATIONS:

RETRACTABLE PINS & LOCATORS
PUSHERS
CROWDERS
THRUSTERS
SMALL LIFTERS
SLIDES

ALUMINUM UNIT AVAILABLE

RELEASED: 8/30/21
**ORDERING INFORMATION**

**NOTE: ALL BOXES MUST BE FILLED IN FOR A COMPLETE PART NUMBER**

**Stroke**
- 025 25-150mm (25mm increments)

**Coupler**
- A Rap* (shortens nominal stroke by 2mm)
- B Rigid
  *Not available with High Precision option

**Actuator**
- 01 Pneumatic - Single Rod - NPT
- 02 Pneumatic - Single Rod - G Port

**Material**
- S Steel: Aluminum body, Steel mounting plates & ram
- A Aluminum: Aluminum body, mounting plates & ram

**Switch**
- 00 No Switch
- P1 Welker Smart Stops
- LX See Welker Cylinder Switch Chart

**Precision Stroke**
- X Standard Precision
- P High Precision (not available with Rap Coupler option)

**Port Rotation**
- 1 Port in Position 1
- 3 Port in Position 3

**Standard Options - All other options may affect price & delivery.**

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**SHIM CHART**

<table>
<thead>
<tr>
<th>WHOLE MILLIMETER CODES</th>
<th>QUARTER MM CODES</th>
</tr>
</thead>
<tbody>
<tr>
<td>THK (mm)</td>
<td>CODE</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>

**Switch**

<table>
<thead>
<tr>
<th>Cylinder Switches</th>
<th>Part Number</th>
<th>Manufacturer</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L3</td>
<td>SWITCH L3*</td>
<td>Welker</td>
<td>4-Wire, 4-Pin, DC (PNP) M12 X 1 Quick Disconnect</td>
</tr>
<tr>
<td>L5</td>
<td>MKS113</td>
<td>ifm Eector</td>
<td>3-Wire, 4-Pin, DC (NPN) M12 X 1 Quick Disconnect</td>
</tr>
</tbody>
</table>

**Standard Switch Option - All other options may affect price and delivery**

*Note that some mid and low frequency DC resistance applications (i.e. aluminum resistance welding applications) may cause a fault. In these applications, it is recommended that the sensor be ignored/bypassed during the welding cycle.

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**WEIGHTS (WEIGHTS SHOWN ARE APPROXIMATE, VARY WITH OPTIONS)**

<table>
<thead>
<tr>
<th>STROKE</th>
<th>STEEL</th>
<th>ALUMINUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>25mm</td>
<td>81 lbs</td>
<td>43.5 lbs</td>
</tr>
<tr>
<td>50mm</td>
<td>83 lbs</td>
<td>44 lbs</td>
</tr>
<tr>
<td>75mm</td>
<td>86 lbs</td>
<td>45 lbs</td>
</tr>
<tr>
<td>100mm</td>
<td>89 lbs</td>
<td>45.5 lbs</td>
</tr>
<tr>
<td>125mm</td>
<td>90.5 lbs</td>
<td>46 lbs</td>
</tr>
<tr>
<td>150mm</td>
<td>94.5 lbs</td>
<td>48 lbs</td>
</tr>
</tbody>
</table>

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**ENGINEERED PRODUCTS**

(800) 229-0890 www.welkerproducts.com
**WELKER SMART STOP**

**WELKER SMART STOP** does all stopping & sensing functions in one part. **SMART STOP** minimizes engineering, field set up and operator adjustment time.

**WELKER SMART STOP** eliminates:
- Need for separate mounts, brackets & flags.
- Need for switch adjustments when shimming.
- Improper adjustment of outboard switches.
- Outboard switch vibrating loose in bracket.
- Protecting outboard proxes from being stepped on or bent in tools.

**MODEL NO:**
- ASC020-PD FOR CROWNED, DRILL & C‘BORE FOR M10 SHCS + DC SWITCH
- ASC021-PD FOR CROWNED, M10X1.5 TAP + DC SWITCH
- ASF020-PD FOR FLAT, DRILL & C‘BORE FOR M10 SHCS + DC SWITCH
- ASF021-PD FOR FLAT, M10X1.5 TAP + DC SWITCH

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### General Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching function</td>
<td>Normally Open (NO)</td>
</tr>
<tr>
<td>Output type</td>
<td>PNP</td>
</tr>
<tr>
<td>Rated operating distance, sn</td>
<td>1.75mm</td>
</tr>
<tr>
<td>Output polarity</td>
<td>DC</td>
</tr>
<tr>
<td>Assured operating distance, sa</td>
<td>0 - 1.42 mm</td>
</tr>
<tr>
<td>Output type</td>
<td>3-wire</td>
</tr>
</tbody>
</table>

### Nominal Ratings

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage, U_B</td>
<td>5 - 30 V DC</td>
</tr>
<tr>
<td>Switching frequency, f</td>
<td>0 - 6000 Hz</td>
</tr>
<tr>
<td>Reverse polarity protection</td>
<td>Reverse polarity protected</td>
</tr>
<tr>
<td>Short-circuit protection</td>
<td>Pulsing</td>
</tr>
<tr>
<td>Voltage drop, U_d</td>
<td>≤ 1.5 V</td>
</tr>
<tr>
<td>Operating current, I_L</td>
<td>0 - 100 mA</td>
</tr>
<tr>
<td>Off-state current, I_r</td>
<td>0 - 0.2 mA</td>
</tr>
<tr>
<td>No-load supply current, I_0</td>
<td>≤ 15 mA</td>
</tr>
</tbody>
</table>

### Indicators/Operating Means

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage indicator</td>
<td>LED green</td>
</tr>
<tr>
<td>Switching state indicator</td>
<td>LED yellow</td>
</tr>
</tbody>
</table>

### Ambient Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-40 - 85 °C (-40 - 185 °F)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 - 85 °C (-40 - 185 °F)</td>
</tr>
</tbody>
</table>

### Mechanical Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection type</td>
<td>Connector plug, M12 x 1, 4-pin</td>
</tr>
<tr>
<td>Cable length</td>
<td>255mm</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP67</td>
</tr>
<tr>
<td>Cable material</td>
<td>Weld spatter resistant, robotic quality POC</td>
</tr>
<tr>
<td>Cable color</td>
<td>Orange</td>
</tr>
</tbody>
</table>
Shrouds: Safety orange steel shrouds are available for additional protection. Shrouds prevent undesirable buildup of contamination from welding and machining applications. Welker specifically recommends shroud usage in MIG, TIG and arc welding applications. Shrouds should only be removed if clearance problems exist and conditions permit. Consult Welker.

Wipers: The wiper is a custom molded moly impregnated urethane wiper. Welker recommends changing the wiper yearly. Specific applications may require more or less frequent wiper service.

Stroke: The stroke accuracy of shot pins is limited to that of the cylinder. Normal cylinder stroke accuracy is ± .015” (0.38mm). Rap couplings cause the unit to be 2mm less than the nominal stroke of the cylinder. The rap allows the cylinder to accelerate without load, acting like a slide hammer. The impact of the coupler helps free tooling from a bound condition, similar to a dowel puller.

Welker cylinders do not require lubrication.

Switch: DB4 is available only with solid state cylinder switch.

Repeatability: Shot pin units utilize a full contact bearing surface for high repeatability. Repeatability within ±.002” (0.05mm) part to part is achievable.

Wear: Defined as variance in position under load over time. Shot pin tests indicate maximum wear of .002” wear at 3 million cycles.

Loading and Deflection: Maximum deflection is ±.005” and is measured at the end of the ram up to the specified strokes and up to the loads and distances as shown below. Longer extensions can be used at lower tolerances and loads. Pins mounted closer to the body exhibit less deflection. For applications with longer strokes and higher loads, consult Welker.