## AG Series Angular Grippers

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Features and Benefits</td>
<td>3</td>
</tr>
<tr>
<td>How to Order</td>
<td>4</td>
</tr>
<tr>
<td>Dimensions</td>
<td>5</td>
</tr>
<tr>
<td>Specifications and Load Ratings</td>
<td>6</td>
</tr>
<tr>
<td>Sensing Part Numbers</td>
<td>7</td>
</tr>
<tr>
<td>Quick Disconnect Cables</td>
<td>8</td>
</tr>
</tbody>
</table>
AG-Series Angular Grippers

Designed to handle real world angular gripper applications

The AG-Series Angular Gripper utilizes a double acting piston with a dual pivot system. The piston has a single center pivot that drives each gripper jaw open and closed. The gripper jaws have an independent stationary pivot which each jaw arcs about. The ratio between the piston and jaw pivots has been optimized for maximum operating performance.

The AG-Series Angular Gripper is a cartridge style design. The cartridge design utilizes a minimum number of components, seven major components in all. The cartridge design offers the greatest grip force to size ratio over other conventional designs.

A. Body:
Cartridge design produced from extruded alloy aluminum.
Hardcoat anodized with PTFE, reduced friction, reduced wear
High finish bores for increased seal life
Sensor mounting rail for easy access mounting (not available on AG010)
Lightweight, durable, long life

B. Piston:
Single piece, stainless steel design
Corrosion resistant
Magnetic sensing band standard on ALL sizes

C. Jaws:
Hardened alloy steel with lubrication
Keyway slot for tooling location
32 degree jaw motion
Each jaw travels 1 degree beyond center

D. Pivot Pins:
Hardened alloy steel
Reduced friction, low wear, increased service life
Supported by polymer bushings
How to Order

Gripper Series

<table>
<thead>
<tr>
<th>Series</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>010</td>
<td>9 lbs.</td>
</tr>
<tr>
<td>020</td>
<td>22 lbs.</td>
</tr>
<tr>
<td>035</td>
<td>35 lbs.</td>
</tr>
</tbody>
</table>

Seal Type

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Buna-N Seals</td>
</tr>
</tbody>
</table>

Example order:

**Part Number:** AG020A13A1*

Part Description: 22 pound grip force angular gripper, Buna-N seals, reed switch open position, no option.

*When ordering, DO NOT use spaces or dashes.

When ordering additional seal kits:

<table>
<thead>
<tr>
<th>Seal Kit Series</th>
<th>Buna-N Seal Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG010A</td>
<td>AGSKB-010A</td>
</tr>
<tr>
<td>AG020A</td>
<td>AGSKB-020A</td>
</tr>
<tr>
<td>AG035A</td>
<td>AGSKB-035A</td>
</tr>
</tbody>
</table>
Angular Grippers

Dimensions: Inches (mm)

AG Series Dimensions

<table>
<thead>
<tr>
<th>AG010A</th>
<th>AG020A</th>
<th>AG035A</th>
</tr>
</thead>
<tbody>
<tr>
<td>inches</td>
<td>mm</td>
<td>inches</td>
</tr>
<tr>
<td>A 0.78</td>
<td>20.0</td>
<td>1.10</td>
</tr>
<tr>
<td>B 1.35</td>
<td>34.4</td>
<td>1.83</td>
</tr>
<tr>
<td>C 1.06</td>
<td>27.0</td>
<td>1.38</td>
</tr>
<tr>
<td>D 0.28</td>
<td>7.0</td>
<td>0.43</td>
</tr>
<tr>
<td>E 0.20</td>
<td>5.0</td>
<td>0.27</td>
</tr>
<tr>
<td>F 0.39</td>
<td>10.0</td>
<td>0.55</td>
</tr>
<tr>
<td>G 0.16</td>
<td>4.0</td>
<td>0.27</td>
</tr>
<tr>
<td>H 0.03</td>
<td>0.8</td>
<td>0.04</td>
</tr>
<tr>
<td>J 0.08</td>
<td>2.0</td>
<td>0.12</td>
</tr>
<tr>
<td>K 0.16</td>
<td>4.0</td>
<td>0.23</td>
</tr>
<tr>
<td>L 0.26</td>
<td>6.5</td>
<td>0.37</td>
</tr>
<tr>
<td>M 0.26</td>
<td>6.5</td>
<td>0.37</td>
</tr>
<tr>
<td>N 0.98</td>
<td>2.5</td>
<td>0.197</td>
</tr>
<tr>
<td>P M3x0.5</td>
<td></td>
<td>M3x0.5</td>
</tr>
<tr>
<td>R 0.079</td>
<td>2.0</td>
<td>0.1</td>
</tr>
<tr>
<td>S 0.42</td>
<td>10.7</td>
<td>0.57</td>
</tr>
<tr>
<td>T 0.13</td>
<td>3.2</td>
<td>0.18</td>
</tr>
<tr>
<td>U 0.08</td>
<td>2.0</td>
<td>0.08</td>
</tr>
<tr>
<td>V M3</td>
<td></td>
<td>M3</td>
</tr>
<tr>
<td>W M2x0.4</td>
<td></td>
<td>M3x0.5</td>
</tr>
</tbody>
</table>
AG-Series Gripper Performance Data

<table>
<thead>
<tr>
<th></th>
<th>AG010A</th>
<th>AG020A</th>
<th>AG035A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grip Force</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>open @ 100 PSI</td>
<td>11 lbs</td>
<td>28 lbs</td>
<td>44 lbs</td>
</tr>
<tr>
<td>close @ 100 PSI</td>
<td>9 lbs</td>
<td>22 lbs</td>
<td>35 lbs</td>
</tr>
<tr>
<td><strong>Jaw Travel</strong></td>
<td>32 degrees</td>
<td>32 degrees</td>
<td>32 degrees</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>.13 oz</td>
<td>.5 oz.</td>
<td>6.3 oz</td>
</tr>
<tr>
<td><strong>Max Operating Pressure</strong></td>
<td>250 PSI</td>
<td>250 PSI</td>
<td>250 PSI</td>
</tr>
<tr>
<td><strong>Displacement</strong></td>
<td>.01 cu in</td>
<td>.04 cu in</td>
<td>.06 cu in</td>
</tr>
<tr>
<td><strong>Temp Range Buna-N Seals</strong></td>
<td>-30 F to 180 F</td>
<td>-30 F to 180 F</td>
<td>-30 F to 180 F</td>
</tr>
</tbody>
</table>

**Recommended Maximum Load Ratings**

<table>
<thead>
<tr>
<th></th>
<th>AG010A</th>
<th>AG020A</th>
<th>AG035A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Load Position A 4 in-lbs</td>
<td>.45 Nm</td>
<td>15 in-lbs</td>
<td>1.7 Nm</td>
</tr>
<tr>
<td>Max Load Position B 4 in-lbs</td>
<td>.45 Nm</td>
<td>12 in-lbs</td>
<td>1.4 Nm</td>
</tr>
<tr>
<td>Max Load Position C 12 lbs</td>
<td>5.5 Kgf</td>
<td>29 lbs</td>
<td>13 Kgf</td>
</tr>
</tbody>
</table>

**Grip Force VS. Finger Length**

\[
F = \frac{0.024 \times P}{(C+0.126)} \\
F = \frac{0.088 \times P}{(C+0.16)} \\
F = \frac{0.175 \times P}{(C+0.34)}
\]

\[
P = \text{PSI, } C = \text{in} \\
P = \text{PSI, } C = \text{in} \\
P = \text{PSI, } C = \text{in}
\]

\[
P = \text{bars, } C = \text{mm} \\
P = \text{bars, } C = \text{mm} \\
P = \text{bars, } C = \text{mm}
\]

Example AG020: Operating Pressure => P=80 PSI, Grip Distance => C=0.75 in
Grip Force (lbs) = \((0.088 \times 80) / (0.75 + 0.167) = 7.04/0.917 = 7.68 \text{ lbs}\n
Information subject to change without notice. For ordering information or regarding your local sales office visit www.numatics.com.
## Angular Grippers

### AG SERIES

#### ELECTRICAL DESIGN
- AC/DC REED

#### OUTPUT
- Normally Open

#### OPERATING VOLTAGE
- 5-120 VAC/DC

#### CURRENT RATING
- 100 mA*

#### SHORT-CIRCUIT PROTECTION
- No

#### OVERLOAD PROTECTION
- No

#### REVERSE POLARITY PROTECTION
- Yes

#### VOLTAGE DROP
- < 5 V

#### REPEATABILITY
- ± .2mm

#### MAKETIME INCLUDING BOUNCE
- < .6 ms

#### BREAKTIME
- < .1 ms

#### SWITCHING POWER (MAX)
- 5 W

#### SWITCH FREQUENCY
- 1000 Hz

#### AMBIENT TEMPERATURE
- -25°C to 70°C

#### PROTECTION
- IP 67, II

#### HYSTERESIS
- .9mm

#### HOUSING MATERIAL
- PA (Polyamide) Black; Fastening Clamp: Stainless Steel

#### FUNCTION DISPLAY
- SWITCHING STATUS
- Yellow LED

#### CONNECTION
- Flying Leads, Pur Cable (2m Long, 2 x26 Gauge Wire)

#### REMARKS
- *External Protective Circuit for Inductive Load (Valve, Contactor, Etc.) Necessary; Conforms to 2008 NEC Section 725 III, Class 2 Circuits
- Clamping Screw with Combined Slot/Hexagon Socket Head AF 1.5. No LED Function in case of Polarity in DC Operation

#### ACCESSORIES
- Rubber Placehold, Cable Clip, and Cut Sheet To Be Provided with Every Switch

#### AGENCY APPROVALS
- RoHS

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#### ELECTRICAL DESIGN
- AC/DC REED

#### OUTPUT
- Normally Open

#### OPERATING VOLTAGE
- 5-60 VDC / 5-50 VAC #

#### CURRENT RATING
- 100 mA*

#### SHORT-CIRCUIT PROTECTION
- No

#### OVERLOAD PROTECTION
- No

#### REVERSE POLARITY PROTECTION
- Yes

#### VOLTAGE DROP
- < 5 V

#### REPEATABILITY
- ± .2mm

#### MAKETIME INCLUDING BOUNCE
- < .6 ms

#### BREAKTIME
- < .1 ms

#### SWITCHING POWER (MAX)
- 5 W

#### SWITCH FREQUENCY
- 1000 Hz

#### AMBIENT TEMPERATURE
- -25°C to 70°C

#### PROTECTION
- IP 67, II

#### HYSTERESIS
- .9mm

#### HOUSING MATERIAL
- PA (Polyamide) Black; Fastening Clamp: Stainless Steel

#### FUNCTION DISPLAY
- SWITCHING STATUS
- Yellow LED

#### CONNECTION
- M8 Connector, Pur Cable (.3m)

#### REMARKS
- *External Protective Circuit for Inductive Load (Valve, Contactor, Etc.) Necessary; Conforms to 2008 NEC Section 725 III, Class 2 Circuits
- # M8 Connector voltage limited to 5-60 VDC/ 5-50 VAC to conform with 2008 IEC 61076-2-104
- Clamping Screw with Combined Slot/Hexagon Socket Head AF 1.5. No LED Function in case of Polarity in DC Operation

#### ACCESSORIES
- Rubber Placehold, Cable Clip, and Cut Sheet To Be Provided with Every Switch

#### AGENCY APPROVALS
- RoHS
Angular Grippers

Quick Disconnect Cables

<table>
<thead>
<tr>
<th>Order Code</th>
<th>Type</th>
<th>Operating Voltage</th>
<th>Current Rating</th>
<th>Cable Material</th>
<th>Protection</th>
<th>Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>PXCST</td>
<td>Straight 5 m Cable (3 x 26 Gauge wire)</td>
<td>60 AC/75 DC</td>
<td>3 A</td>
<td>PUR</td>
<td>IP 68, III</td>
<td>M8</td>
</tr>
<tr>
<td>PXC90</td>
<td>90° 5 m Cable (3 x 26 Gauge wire)</td>
<td>60 AC/75 DC</td>
<td>3 A</td>
<td>PUR</td>
<td>IP 68, III</td>
<td>M8</td>
</tr>
</tbody>
</table>