Lincoln Motor Polygon Assemblies
Polygonal Scanners

**Product Highlights**

Lincoln high-performance motor polygon assemblies (MPA) are designed and assembled from an extensive selection of mirror, bearing, and motor technologies to meet your most demanding high-speed scanning applications.

Our precision-machined polygon mirrors are available in multiple geometries up to 12 in (305mm) diameter and 128 facets, with optical coatings to optimize reflectivity for wavelengths of 350 - 10,600 nm. Integrated with our aerodynamic, aerostatic, and conventional ball bearing scanner motor systems, our Lincoln polygonal scanners support a wide range of mirror masses and rotational speed requirements. AC hysteresis synchronous motors provide simple and dependable rotor integrity through a broad range of rotational speeds, and our DC brushless designs offer superior operating characteristics in the most frequently specified speed ranges with high efficiency, high torque output, and excellent positional accuracy.

**Polygonal Scan Head for Ultra-High Speed Applications**

- Bi-directional operation in any attitude
- High-speed mirror rotation, up to 55,000 rpm
- Tight tracking accuracy and long life operation
- Wavelengths from 350 – 10,600 nm
# Lincoln Motor Polygon Assemblies

## Polygonal Scanners

### Air Bearings

<table>
<thead>
<tr>
<th>Product</th>
<th>P1AB</th>
<th>SA24C</th>
<th>SA24</th>
<th>PHCAB</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Highlights</strong></td>
<td>Compact</td>
<td>High Speed</td>
<td>Mid to High Speed</td>
<td>Compact to High Speed</td>
</tr>
<tr>
<td>Min Speed (RPM)</td>
<td>10,000</td>
<td>6,000</td>
<td>8,000</td>
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<tr>
<td>Max Speed (RPM)</td>
<td>28,000</td>
<td>24,000</td>
<td>55,000</td>
<td>30,000</td>
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<tr>
<td>Mirror Size (thk x Dia) Max In.</td>
<td>0.30 X 1.80</td>
<td>0.40 X 3.00</td>
<td>0.40 X 3.00</td>
<td>1.00 X 5.00</td>
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<td>Bearing Type</td>
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<td>Aerodynamic</td>
<td>Aerodynamic</td>
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<tr>
<td>Dynamic Track (Arc Sec.)</td>
<td>≤40</td>
<td>≤20</td>
<td>≤10</td>
<td>≤10</td>
</tr>
<tr>
<td>Speed Stability, Typ. (speed and load dependent)</td>
<td>&lt; 0.05%</td>
<td>&lt; 0.02%</td>
<td>&lt; 0.02%</td>
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<tr>
<td>Housing Design</td>
<td>Cantilevered</td>
<td>Cantilevered</td>
<td>Captured</td>
<td>Cantilevered</td>
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<tr>
<td>Encoder Option</td>
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<td>No</td>
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</table>

### Compact Ball Bearing

<table>
<thead>
<tr>
<th>Product</th>
<th>P1BB</th>
<th>SB5C</th>
<th>SB5</th>
<th>XLIM</th>
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<tbody>
<tr>
<td><strong>Highlights</strong></td>
<td>Compact Low Speed</td>
<td>Compact Low Speed</td>
<td>Compact Low Speed</td>
<td>Compact Low to Mid Speed</td>
</tr>
<tr>
<td>Min Speed (RPM)</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Max Speed (RPM)</td>
<td>10,000</td>
<td>15,000</td>
<td>15,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Mirror Size (thk x Dia) Max In.</td>
<td>1.00 X 3.00</td>
<td>1.00 X 3.00</td>
<td>0.40 X 3.00</td>
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<tr>
<td>Dynamic Track (Arc Sec.)</td>
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<td>≤20</td>
<td>≤10</td>
<td>≤10</td>
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<tr>
<td>Speed Stability, Typ. (speed and load dependent)</td>
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<td>&lt; 0.02%</td>
<td>&lt; 0.02%</td>
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<tr>
<td>Housing Design</td>
<td>Cantilevered</td>
<td>Cantilevered</td>
<td>Captured</td>
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<tr>
<td>Encoder Option</td>
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### Large Mirror Ball Bearing

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<tr>
<th>Product</th>
<th>XL</th>
<th>XLOB-5</th>
<th>XLOB-6</th>
<th>XLOB-6.5</th>
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<tr>
<td><strong>Highlights</strong></td>
<td>Large Mirror Capacity, Low to Mid Speed</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Min Speed (RPM)</td>
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<td>300</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Max Speed (RPM)</td>
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<td>15,000</td>
<td>15,000</td>
<td>15,000</td>
</tr>
<tr>
<td>Mirror Size (thk x Dia) Max In.</td>
<td>1.25 X 3.27</td>
<td>1.25 X 5.00</td>
<td>1.25 X 6.00</td>
<td>1.25 X 6.50</td>
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<tr>
<td>Bearing Type</td>
<td>Ball Bearing</td>
<td>Ball Bearing</td>
<td>Ball Bearing</td>
<td>Ball Bearing</td>
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<tr>
<td>Dynamic Track (Arc Sec.)</td>
<td>≤20</td>
<td>≤10</td>
<td>≤10</td>
<td>≤10</td>
</tr>
<tr>
<td>Speed Stability, Typ. (speed and load dependent)</td>
<td>&lt; 0.02%</td>
<td>&lt; 0.02%</td>
<td>&lt; 0.02%</td>
<td>&lt; 0.02%</td>
</tr>
<tr>
<td>Housing Design</td>
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<td>Captured</td>
<td>Captured</td>
<td>Captured</td>
</tr>
<tr>
<td>Encoder Option</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</tr>
</tbody>
</table>

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**Notes:**

All specifications subject to change without notice.
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P1AB

SA24C

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SA24

PHCAB

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**P1BB**

- **2.12in [53.8mm]**
- **2.36in [59.9mm]**
- **1.65in [42.0mm]**
- **.83in [21.0mm]**
- **1.97in [50.0mm]**
- **.98in [25.0mm]**
- **4X 6-32 UNC THRU**

**SB5C**

- **2.81in [71.5mm]**
- **.81in [20.6mm]**
- **.44in [11.1mm]**
- **1.63in [41.3mm]**
- **1.41in [35.7mm]**
- **.32in [8.1mm]**
- **.33in [8.4mm]**
- **.88in [22.2mm]**
- **1.77in [45.0mm]**
- **.11in [2.8mm]**
- **.16in [4.1mm]**
- **.45in [11.5mm]**
- **2.26in [57.3mm]**
- **1.91in [48.6mm]**
- **2.54in [64.6mm]**
- **2.784in [70.7mm]**

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XLOB-6

6.40in
[162.56mm]
5.25in
[133.35mm]

4X 1/4-20 UNC - 2B THRU

Φ 8.00in
[203.20mm]
Φ 6.40in
[162.56mm]

7.08in
[179.71mm]
.13in
[3.18mm]

ENCODER OPTIONAL

XLOB-6.5

7.00in
[177.8mm]
5.625in
[142.9mm]

4X Φ .266in [6.7mm] THRU

Φ 7.00in
[177.8mm]
Φ 7.52in
[190.9mm]

2.69in
[68.2mm]
.13in
[3.2mm]

ENCODER OPTIONAL

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About Cambridge Technology

With close to 50 years of expertise, Cambridge Technology designs, develops, and manufactures innovative beam steering solutions including polygon- and galvanometer-based optical scanning components, 2-axis and 3-axis scan heads, scanning subsystems, high power scanning heads, and controlling hardware and software. We excel in collaborating with our key OEM partners to engineer products that meet their needs from the largest engineering solution to the smallest component. Key market applications include advanced industrial processes like additive manufacturing, laser converting, laser marking, and via-hole drilling, and medical applications such as laser treatment and optical coherence tomography. Cambridge Technology is a Novanta company.