Put some pep in your step...

Your unique motion challenges call for revolutionary Portescap solutions. Leveraging over 70 years of experience in precision micro motor technology, we put your ideas in motion.

Our disc magnet motors provide exceptional dynamic performance unparalleled by any other stepper in the market. The unique thin disc magnet enables finer step resolutions in a given envelope, significantly higher acceleration and greater top speed than conventional steppers.

Disc magnet motors excel in applications that require the precision of a stepper and the speed and acceleration of a Brushless DC motor. Closing the loop provides a competitive advantage against a servo solution. Whatever your next design challenge, Portescap can deliver the right power and precision in the smallest of spaces.
The exceptional possibilities offered by our line of disc magnet stepper motors are unequalled by any other kind of stepper motor.

Their advanced technology, developed by Portescap in Switzerland, allows for truly exceptional dynamic performance. The rotor of these motors consists of a rare earth magnet having the shape of a thin disc which is axially magnetized.

A specific magnetization method allows for a high number of magnetic poles, optimized for the motor size, giving much smaller step angles than conventional two-phase permanent magnet stepper motors.

Their very low moment of inertia results in outstanding acceleration and dynamic behaviour. These features, together with high peak speeds, mean that any incremental movement is carried out in the shortest possible time. Low inertia also means high start and stop frequencies allowing to save time during the first step and solve motion problems without applying a ramp.

<table>
<thead>
<tr>
<th>Model</th>
<th>Ø mm (inch)</th>
<th>L mm (inch)</th>
<th>Holding Torque mNm (oz-in)</th>
<th>Step Angle +/- 10%</th>
<th>Weight g (lbs)</th>
<th>Available with:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Various Windings</td>
</tr>
<tr>
<td>P010 064</td>
<td>10 (0.39)</td>
<td>16.4 (0.65)</td>
<td>1.85 (0.26)</td>
<td>15°</td>
<td>9 (0.02)</td>
<td>Yes</td>
</tr>
<tr>
<td>P010 104</td>
<td>10 (0.39)</td>
<td>16.4 (0.65)</td>
<td>1.85 (0.26)</td>
<td>9°</td>
<td>9 (0.02)</td>
<td>Yes</td>
</tr>
<tr>
<td>P110 064</td>
<td>16 (0.63)</td>
<td>19 (0.75)</td>
<td>7.0 (1.0)</td>
<td>15°</td>
<td>23 (0.05)</td>
<td>Yes</td>
</tr>
<tr>
<td>P110 104</td>
<td>16 (0.63)</td>
<td>19 (0.75)</td>
<td>6.1 (0.86)</td>
<td>9°</td>
<td>23 (0.05)</td>
<td>Yes</td>
</tr>
<tr>
<td>P310</td>
<td>32 (1.26)</td>
<td>17.4 (0.69)</td>
<td>14 (2.0)</td>
<td>6°</td>
<td>40 (0.09)</td>
<td>Yes</td>
</tr>
<tr>
<td>P430</td>
<td>39 (1.54)</td>
<td>26.4 (1.04)</td>
<td>60 (8.5)</td>
<td>3.6°</td>
<td>100 (0.22)</td>
<td>Yes</td>
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<tr>
<td>P520</td>
<td>52 (2.05)</td>
<td>23.1 (0.91)</td>
<td>120 (17)</td>
<td>3.6°</td>
<td>180 (0.40)</td>
<td>Yes</td>
</tr>
<tr>
<td>P530</td>
<td>52 (2.05)</td>
<td>32.6 (1.28)</td>
<td>175 (25)</td>
<td>3.6°</td>
<td>250 (0.55)</td>
<td>Yes</td>
</tr>
<tr>
<td>P532</td>
<td>52 (2.05)</td>
<td>32.6 (1.28)</td>
<td>205 (29)</td>
<td>3.6°</td>
<td>250 (0.55)</td>
<td>Yes</td>
</tr>
<tr>
<td>P760</td>
<td>81 (3.19)</td>
<td>57.6 (2.27)</td>
<td>325 (46)</td>
<td>7.5°</td>
<td>700 (1.54)</td>
<td>Yes</td>
</tr>
<tr>
<td>P852</td>
<td>90.9 (3.58)</td>
<td>48.3 (1.90)</td>
<td>1,060 (150)</td>
<td>1.8°</td>
<td>1,000 (2.19)</td>
<td>Yes</td>
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</tbody>
</table>

### PRODUCT OFFERING

<table>
<thead>
<tr>
<th>Technology Features</th>
<th>Motor Characteristics</th>
<th>Advantages for the Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thin multipolar rare earth disc magnet</td>
<td>Low rotor inertia</td>
<td>High acceleration, high start and stop frequencies</td>
</tr>
<tr>
<td>Short iron circuit made of SiFe laminations Coils placed near the airgap</td>
<td>Low iron losses More torque at high step rates</td>
<td>High speeds High power to volume ratio</td>
</tr>
<tr>
<td>Simple magnetic circuit</td>
<td>No coupling between phases Sinusoidal torque function Low detent torque</td>
<td>Superior angular resolution in microstep mode</td>
</tr>
<tr>
<td>Optimally dimensioned iron circuit</td>
<td>Torque constant is linear up to 2 times nominal current</td>
<td>High peak torques Capability to boost current</td>
</tr>
</tbody>
</table>

### A WORLD OF APPLICATIONS

- Clinical Diagnostics
- Laboratory automation and pipettes
- Syringe pumps
- Insulin pumps
- Dental milling machines
- Prosthetics
- Pick and place mechanisms
- Positioning systems
- Electronic assembly feeders
- Die bonding
- Wafer handling
- Machine tools
- Yarn monitoring systems
- Electronic wire winding
- Thread guide mechanisms
- Optical attenuation and focus
- Aircraft docking systems
Disc Magnet Motor Performance

<table>
<thead>
<tr>
<th>Model</th>
<th>Units</th>
<th>Top Speed</th>
<th>Holding Torque</th>
<th>Detent Torque</th>
<th>Torque/Inertia Ratio</th>
<th>Angular Acceleration</th>
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</thead>
<tbody>
<tr>
<td>P010 064</td>
<td>RPM mNm</td>
<td>9,500</td>
<td>1.85</td>
<td>0.4</td>
<td>26.43</td>
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<td>P010 104</td>
<td>RPM mNm</td>
<td>9,500</td>
<td>1.85</td>
<td>0.4</td>
<td>26.43</td>
<td>265,000</td>
</tr>
<tr>
<td>P110 064</td>
<td>RPM mNm</td>
<td>9,500</td>
<td>7</td>
<td>1</td>
<td>17.50</td>
<td>167,000</td>
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<tr>
<td>P110 104</td>
<td>RPM mNm</td>
<td>9,500</td>
<td>6.1</td>
<td>1</td>
<td>17.50</td>
<td>167,000</td>
</tr>
<tr>
<td>P310</td>
<td>RPM mNm</td>
<td>11,500</td>
<td>14</td>
<td>2.5</td>
<td>16.28</td>
<td>140,000</td>
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<tr>
<td>P430</td>
<td>RPM mNm</td>
<td>7,000</td>
<td>60</td>
<td>3.5</td>
<td>20.00</td>
<td>200,000</td>
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<tr>
<td>P520</td>
<td>RPM mNm</td>
<td>7,000</td>
<td>120</td>
<td>10</td>
<td>10.00</td>
<td>100,000</td>
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<tr>
<td>P530</td>
<td>RPM mNm</td>
<td>6,000</td>
<td>175</td>
<td>10</td>
<td>14.58</td>
<td>141,000</td>
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<tr>
<td>P532</td>
<td>RPM mNm</td>
<td>6,000</td>
<td>205</td>
<td>28</td>
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<tr>
<td>P760</td>
<td>RPM mNm</td>
<td>4,000</td>
<td>325</td>
<td>20</td>
<td>19.12</td>
<td>190,000</td>
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</tbody>
</table>

Performance Comparison

NEMA17 short stack

2,000 210 11 5.25
Custom Motion Solutions

Sintered or ball bearings
Winding options
Shaft modifications - increase or decrease length, knurling
Longer leads and connectors
Gearheads for increased torque
Encoders for position verification
Lead screw shaft

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