M-824 Hexapod Platform Parallel Kinematics Positioning System

Precision Parallel-Kinematics Micropositioner with Controller, Vacuum Versions

- Extremely Compact
- Travel Ranges to 45 mm (linear), 25° (rotation)
- Load Capacity to 10 kg, Self Locking Version
- Resolution to 7 nm
- Min. Incremental Motion to 300 nm
- Repeatability ±0.5 µm
- Velocity to 25 mm/sec
- Vacuum-Compatible Versions Available

### Technical Data

<table>
<thead>
<tr>
<th>Model</th>
<th>M-824.3DG</th>
<th>M-824.3PD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active axes</td>
<td>X, Y, Z, θx, θy, θz</td>
<td>X, Y, Z, θx, θy, θz</td>
</tr>
<tr>
<td><strong>Motion and positioning</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Travel range X, Y</td>
<td>±22.5 ±22.5 mm</td>
<td>±6 ±6 µrad</td>
</tr>
<tr>
<td>*Travel range Z</td>
<td>±12.5 ±12.5 mm</td>
<td>±6 ±6 µrad</td>
</tr>
<tr>
<td>*Travel range θx, θy</td>
<td>±7.5 ±7.5 °</td>
<td>±6 ±6 µrad</td>
</tr>
<tr>
<td>*Travel range θz</td>
<td>±12.5 ±12.5 °</td>
<td>±6 ±6 µrad</td>
</tr>
<tr>
<td>Single-actuator drive</td>
<td>DC-motor, gearhead</td>
<td>ActiveDrive™ DC Motor</td>
</tr>
<tr>
<td>Actuator stroke</td>
<td>±12.5 ±12.5 mm</td>
<td>mm</td>
</tr>
<tr>
<td>Single-actuator design resolution</td>
<td>0.007 0.5</td>
<td>µm</td>
</tr>
<tr>
<td>Integrated sensor</td>
<td>Rotary encoder</td>
<td>Rotary encoder</td>
</tr>
<tr>
<td>Sensor resolution</td>
<td>2048 2048 cts./rev.</td>
<td></td>
</tr>
<tr>
<td><strong>Min. incremental motion X, Y, Z</strong></td>
<td>0.3 1</td>
<td>µm</td>
</tr>
<tr>
<td><strong>Min. incremental motion θx, θy, θz</strong></td>
<td>3.5 12</td>
<td>µrad</td>
</tr>
<tr>
<td>Repeatability X, Y, Z</td>
<td>±0.5 ±0.5</td>
<td>µm</td>
</tr>
<tr>
<td>Repeatability θx, θy, θz</td>
<td>±6 ±6</td>
<td>µrad</td>
</tr>
<tr>
<td>Max. velocity X, Y, Z</td>
<td>1 25</td>
<td>mm/s</td>
</tr>
<tr>
<td>Max. velocity θx, θy, θz</td>
<td>11 270</td>
<td>mrad/s</td>
</tr>
<tr>
<td>Typ. velocity X, Y, Z</td>
<td>0.5 10</td>
<td>mm/s</td>
</tr>
<tr>
<td>Typ. velocity θx, θy, θz</td>
<td>5.5 55</td>
<td>mrad/s</td>
</tr>
<tr>
<td><strong>Mechanical properties</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Stiffness X, Y</td>
<td>1.7</td>
<td>1.7</td>
</tr>
<tr>
<td>Stiffness Z</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Load capacity (baseplate horizontal/any orientation)</td>
<td>10/5***</td>
<td>5/2.5</td>
</tr>
</tbody>
</table>

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*The travel ranges of the individual coordinates (X, Y, Z, θx, θy, θz) are interdependent.*

The data for each axis in this table shows its maximum travel, where all other axes are at their zero positions. If the other linear or rotational coordinates are not zero, the available travel may be less.

**Simultaneous motion of all 6 actuators!**

No moving cables (as in serial kinematics stacked systems) to introduce bending sources, torque and friction, which degrade positioning accuracy.

***Self Locking***

Technical data are specified at 20 ±3 °C. Data for vacuum versions may differ.