Innovative Motion Control

The VULCANO XYZ3T\textsuperscript{H} stacked platform is a 9 axes platform moving in X, Y, Z, Tip-Tilt and Theta directions. It is a mechanical bearing stage integrating ironcore linear motors as well as high precision optical encoders, and mainly dedicated to point-to-point applications.

The VULCANO XY part of it is a three-piece-design stacked system resulting in a cost engineered solution combining high dynamics, great bidirectional repeatability, and outstanding position stability.

The bottom axis is composed of two linear motors controlled in a gantry mode moving on three decoupled linear bearings. The upper linear motor lays on a stiff and light baseplate allowing travels up to 650 mm.

The stage is modular and can be outfitted with the module best suited to each individual application.

The standard platform shown above includes an ETEL Z3T\textsuperscript{H} combined module on the XY assembly. The Z3T\textsuperscript{H} combined module provides 364° Theta rotation, a Tip-Tilt correction over ±0.1° and dual Z-axes: a coarse Z axis for wafer loading and unloading, and a fine Z axis for precision motion. The Z3T\textsuperscript{H} module allows a reduction of XY move and settle times and a correction of the stage flatness.

Other modules moving in Theta or ZTheta can also be considered.

### PERFORMANCE

<table>
<thead>
<tr>
<th></th>
<th>Y1-Y2</th>
<th>X</th>
<th>FINE Z</th>
<th>TIP-TILT</th>
<th>COARSE Z</th>
<th>THETA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total stroke</td>
<td>490 mm</td>
<td>420 mm</td>
<td>±2 mm</td>
<td>±0.1°</td>
<td>12 mm</td>
<td>364°</td>
</tr>
<tr>
<td>Speed</td>
<td>Up to 1.5 m/s</td>
<td>Up to 1.5 m/s</td>
<td>0.05 m/s</td>
<td>-</td>
<td>0.1 m/s</td>
<td>10 rad/s</td>
</tr>
<tr>
<td>Acceleration</td>
<td>Up to 2.5 g</td>
<td>Up to 2.5 g</td>
<td>0.1 g</td>
<td>-</td>
<td>0.2 g</td>
<td>55 rad/s²</td>
</tr>
<tr>
<td>Position stability</td>
<td>&lt;±1 nm</td>
<td>&lt;±1 nm</td>
<td>±2 nm</td>
<td>±0.004 arcsec</td>
<td>-</td>
<td>±0.004 arcsec</td>
</tr>
<tr>
<td>Bidir. repeatability</td>
<td>Down to ±250 nm</td>
<td>±10 nm</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>±0.35 arcsec</td>
</tr>
<tr>
<td>Move and settle times 25 mm within ±100 nm</td>
<td>&lt;130 ms</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Typical payload</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.15 kg</td>
<td>1 kg</td>
</tr>
</tbody>
</table>

### PRODUCT HIGHLIGHTS

- Compact footprint
- Nanometer position stability
- High dynamics: 2.5 g, 1.5 m/s
- Low move and settle times
- ISO1 clean room compatible
- Tip-Tilt correction over ±0.1°
- Double Z integration
- Built-in gravity compensator in Z
- Outstanding Z straightness
- Enhanced Z repeatability and jitter
- Ability to correct stage flatness
- Built-in vacuum supply at chuck level

### TYPICAL APPLICATIONS

The use of this platform is suitable for, but not limited to:

- Wafer Process Control applications such as Overlay Metrology, Critical Dimension and Thin film Metrology
- Advanced packaging applications