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## Two-Axis Air-Bearing Direct-Drive Linear Stage **PlanarHD**

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### High Throughput with Ultra-Precise Geometric Performance

The PlanarHD is a high-dynamic, planar-style XY air-bearing stage designed to increase your process throughput while offering the highest possible precision. Engineered to achieve the semiconductor industry's most demanding motion requirements, PlanarHD offers a variety of advanced features and capabilities to give you a competitive advantage.

### Key Applications

PlanarHD is ideal for applications that require high dynamics and ultra-high positioning performance, including:

- ◆ Semiconductor processing
- ◆ Wafer inspection & metrology
- ◆ Scanning probe microscopy
- ◆ Atomic force microscopy
- ◆ Thin film measurement

### KEY FEATURES:

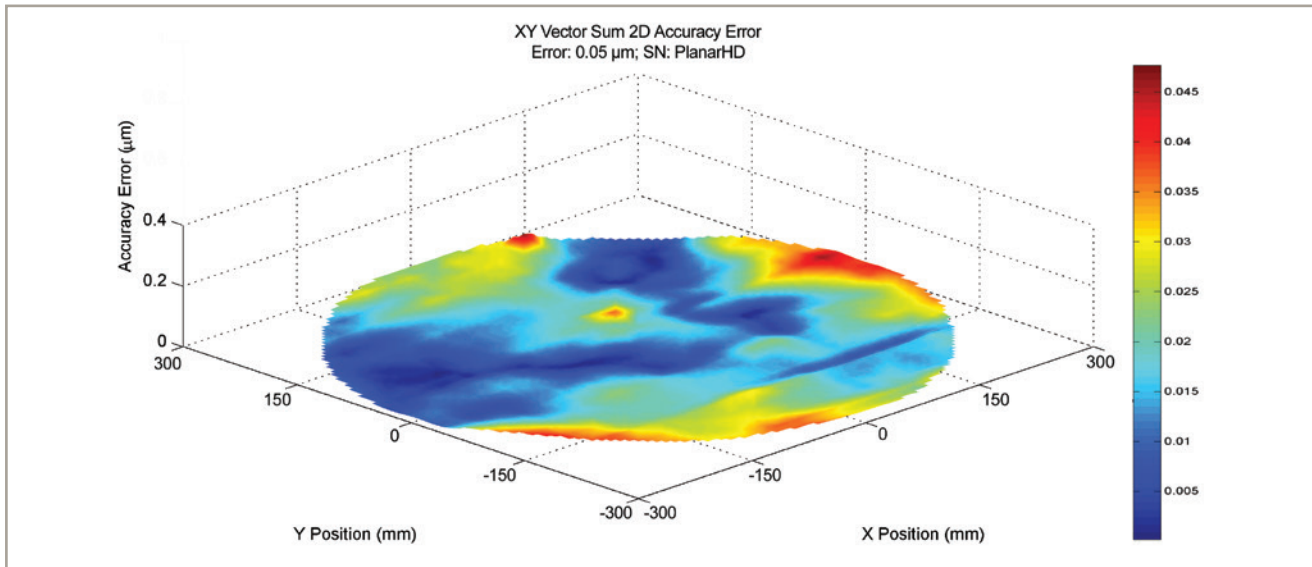
- ◆ **MAXIMIZES THROUGHPUT** with velocity to 2 m/s & acceleration to 5 g
- ◆ Incorporates active yaw & orthogonality control for **MAXIMUM PRECISION**
- ◆ **IMPROVES TURNAROUND TIME** with dual linear-motor H-bridge design
- ◆ Maintains thermal stability with optional **AIR- & WATER-COOLING FEATURES** for optimal performance
- ◆ Optimizes move-and-settle time & contouring performance with available **ENHANCED THROUGHPUT MODULE**
- ◆ Available with **LASER INTERFEROMETER FEEDBACK** for best performance at the wafer plane

## PlanarHD SPECIFICATIONS

Basic Model		PlanarHD
Travel <sup>(7)</sup>	Scan Axis	500 mm
	Step Axis	500 mm
Accuracy (Zero Expansion Scale) <sup>(1)</sup>		±300 nm
Repeatability (Long Term)		±50 nm
XYZ Position Stability (On Air)		20 nm
Granite Base Thickness		250 mm
Rated Payload (Maintaining Dynamic Specifications)		5 kg
Maximum Payload <sup>(2)</sup>		30 kg
Maximum Velocity with Rated Payload <sup>(3)</sup>	Scan Axis	2000 mm/s
Peak Acceleration with Rated Payload	Scan Axis	5 g (50 m/s <sup>2</sup> )
RMS Acceleration with Rated Payload	Scan Axis	1.25 g (12 m/s <sup>2</sup> )
Stiffness, First Natural Frequency, Rated Payload		>330 Hz
Pitch		3.5 arc sec
Roll		3.5 arc sec
Yaw		3.5 arc sec
XY Orthogonality <sup>(4)</sup>		1 arc sec
MTBF		>40,000 hours

**Notes:**

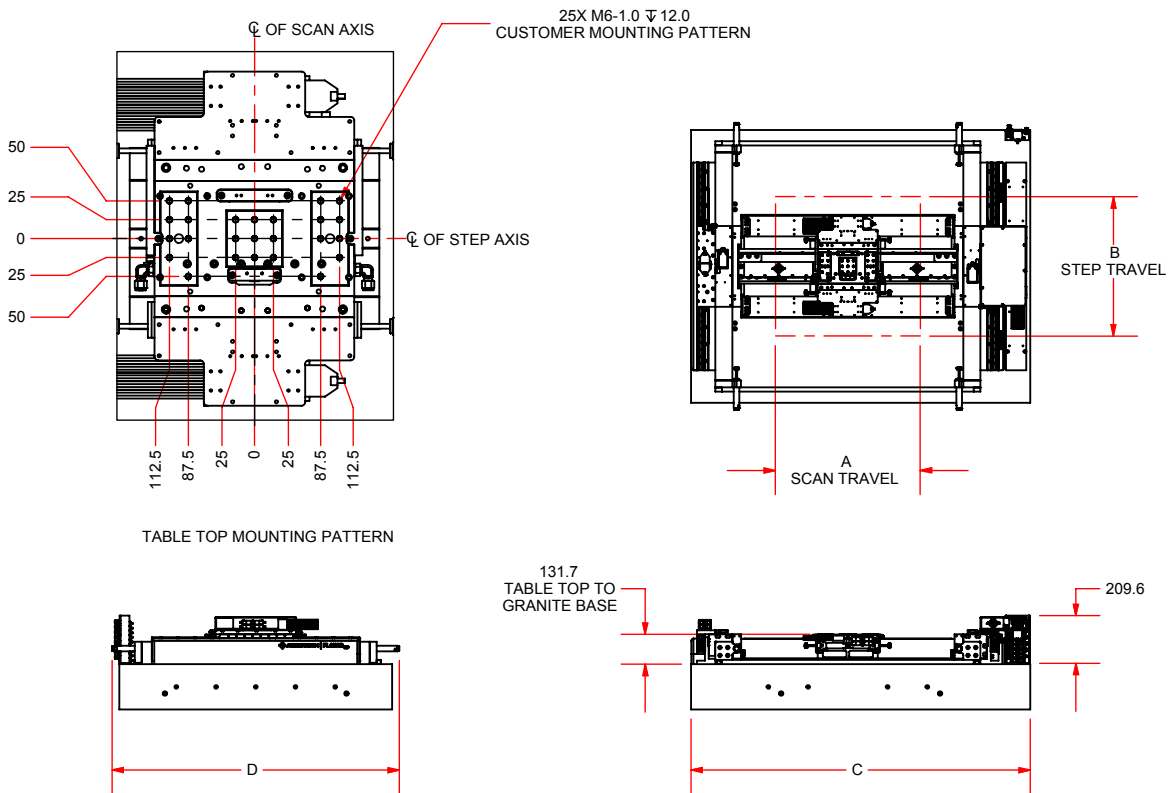
1. Available with Aerotech controllers and calibration.
2. Maximum load based on bearing capability; maximum application load may be limited by acceleration requirements.
3. Maximum speed based on stage capability; maximum application velocity may be limited by system data rate and system resolution.
4. Requires calibration.
5. To protect air bearing against under-pressure, an in-line pressure switch tied to motion controller E-stop input is recommended.
6. Air supply must be clean, dry to 0° F dewpoint and filtered to 0.25 µm or better; recommend nitrogen at 99.9% purity.
7. Travel can be customized to meet application-specific requirements. Consult Aerotech for other travel options.



Representative of custom artifact calibration method.

## PlanarHD DIMENSIONS

STAGE	A	B	C	D
PLANAR HD-350-350	350	350	1345	1116
PLANAR HD-350-500	350	500	1345	1266
PLANAR HD-350-650	350	650	1345	1416
PLANAR HD-500-350	500	350	1495	1116
PLANAR HD-500-500	500	500	1495	1266
PLANAR HD-500-650	500	650	1495	1416
PLANAR HD-650-350	650	350	1645	1116
PLANAR HD-650-500	650	500	1645	1266
PLANAR HD-650-650	650	650	1645	1416



DIMENSIONS: MILLIMETERS