

# AHL9000 Series

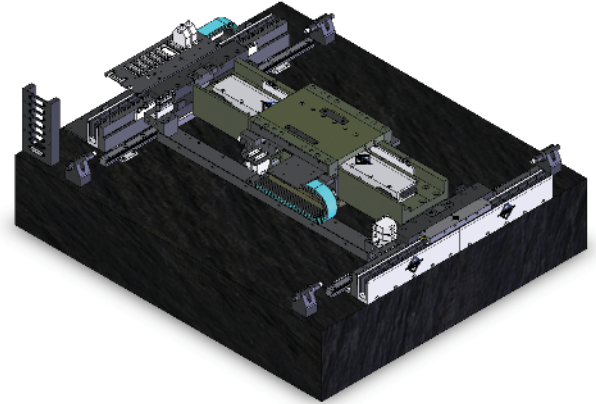
## Hybrid Bearing, Linear Motor Stage

Air-bearing scan axis; mechanical-bearing step axis

Dual linear-motor-driven step axis

Travel to 1.2 meter x 1.2 meter

Linear encoder or laser interferometer feedback



The AHL9000 is the latest addition to Aerotech's family of air-bearing stages and is an excellent choice for applications that require careful balancing of price and performance. This stage has been designed for demanding applications that require excellent step and scan performance. Applications include wafer inspection, flat panel display manufacturing, and optical inspection and fabrication.

### Hybrid-Bearing Design

The AHL9000's scan axis was designed using proven air-bearing technology developed for the ABL9000 planar air bearing. This axis uses active preload on both the vertical and horizontal surfaces in order to provide outstanding stiffness and dynamic performance. The AHL9000 also takes advantage of the cost-effectiveness of a mechanical bearing step axis. The combination of these two bearing technologies in one stage provides a system that is optimized for step and scan operation.

### Linear Motor Drive

The driving force behind this stage is Aerotech's BLM series brushless linear servomotor. Aerotech's long history and experience as a motor manufacturer is reflected in this

latest design. The BLM utilizes an ironlessforcer, which means there is zero cogging and no attractive forces, resulting in unsurpassed smoothness of motion. Capable of generating high force and velocity, the BLM represents the ultimate combination of power and performance.

### High Performance

Noncontact linear encoders with submicron repeatabilities are standard on all AHL9000 series stages. Optional 2D factory calibration is available to further increase the standard accuracy, straightness, and yaw specifications to even finer precision.

### Cable Management

We carefully optimize the cable bend radius to ensure years of trouble-free operation. In the unlikely event of failure, Aerotech's modular design makes cable replacement quick and easy with minimal downtime.

To facilitate integration into the final system, we include all customer-required cables, air hoses, etc. in our CMS bundle. Both ends are fully connectorized for simple integration into the customer's machine.

## AHL9000 Series SPECIFICATIONS

Basic Model		AHL90350-350
Total Travel		350 mm x 350 mm
Drive System		Linear Brushless Servomotor (Bridge Axis: BLM-264-A, Gantry Axis: BLM-203-A)
Bus Voltage		up to 160 VDC
Continuous Current (Bridge Axis)	A <sub>pk</sub>	up to 5.10 A
	A <sub>rms</sub>	up to 3.61 A
Continuous Current (Gantry Axis)	A <sub>pk</sub>	up to 5.30 A
	A <sub>rms</sub>	up to 3.75 A
Feedback		Noncontact Linear Encoder (LT or LN)
Resolution		0.0005 µm - 1.0 µm
Maximum Travel Speed <sup>(1)</sup>		1000 mm/s
Maximum Acceleration (no load)		1.0 g - 10 m/s <sup>2</sup>
Maximum Load <sup>(2)</sup>		30.0 kg
Accuracy <sup>(3)</sup>	LT	±1.5 µm
	LN	±1.0 µm
Repeatability <sup>(3)</sup>	LT	±0.5 µm
	LN	±0.2 µm
Straightness (Y Axis)	Max Deviation	0.6 µm
Flatness	Max Deviation	0.6 µm
Pitch/Roll/Yaw		3 arc sec
Stage Mass		535 kg
Moving Mass	Bridge	9.7 kg
	Gantry	34.0 kg
Orthogonality		2 arc sec
Operating Pressure <sup>(4)</sup>		551.6 kPa +0, -34 kPa
Air Consumption <sup>(5)</sup>		33 SLPM
Material <sup>(6)</sup>		Aluminum
Finish		Hard Coating (62 Rockwell Hardness )

Notes:

1. Maximum speed based on stage capability; maximum application velocity may be limited by system data rate and system resolution.
2. Maximum load based on bearing capability; maximum application load may be limited by acceleration requirements.
3. Available with Aerotech controllers and HALAR Calibration option.
4. To protect air bearing against under-pressure, an in-line pressure switch tied to motion controller E-stop input is recommended.
5. Air supply must be clean, dry to 0° F dewpoint and filtered to 0.25 µm or better; recommend nitrogen at 99.9% purity.
6. Optional construction materials include ceramic, invar, stainless, and titanium.
7. Specifications are for single-axis systems, measured 50 mm above the tabletop. Performance of multi-axis systems is payload and workpoint dependent. Consult factory for multi-axis or non-standard applications.

*Please contact an Aerotech Application Engineer for ordering information on the AHL9000.*