

# ABL/ABLH9000 Series

## Air Bearing, Linear Motor Stage

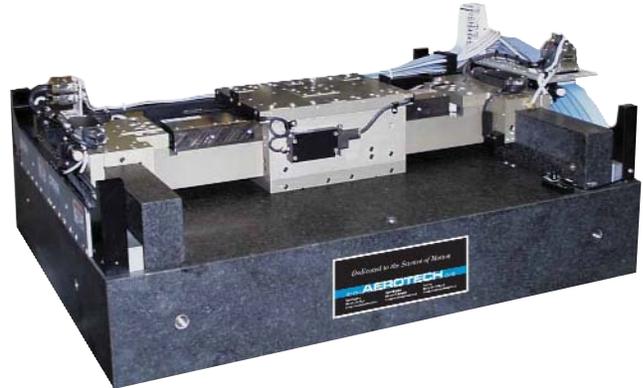
Full preload on all axes

Dual linear-motor-driven Y axes

Travel to 1.2 meter x 1.2 meter

Linear encoder or laser interferometer feedback

Active yaw control



The ABL/ABLH9000 is simply the world's highest performance air bearing. Designed to meet the exacting requirements of wafer, flat panel display, and optical inspection and fabrication, the ABL/ABLH9000 sets new standards of performance.

### Air-Bearing Design

The ABL/ABLH9000 incorporates an active preload on both vertical and horizontal surfaces. The opposing thin-film pressure maintains the bearing nominal gap tolerance. This design, in addition to the large air-bearing surface that distributes the load over a large surface area, results in a stage with outstanding stiffness that is ideal for heavy or offset loading.

Proprietary manufacturing techniques result in a stage with unsurpassed geometrical characteristics. The air bearing has an inherent averaging effect that maximizes performance. The thin film will fill small surface voids and allow for other irregularities. This characteristic yields superior pitch, roll, yaw, straightness, and flatness specifications.

### 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 ironless forcer, 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.

### Zero Maintenance

Our totally noncontact air bearing, noncontact linear motor drive, and noncontact feedback device ensure years of maintenance-free operation at the high performance levels expected of Aerotech equipment. Because there is no mechanical contact between moving elements, the ABL/ABLH9000 experiences no wear or reduction in performance over time. Service life is virtually unlimited and since there is no lubrication – only clean, dry gas – air bearings are ideal for cleanroom and medical applications.

### 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.

## ABL/ABLH9000 Series SPECIFICATIONS

Basic Model		ABL90300-300	ABL90500-500	ABLH90750-750	ABLH91000-1000	ABLH91200-1200
Total Travel		300 mm x 300 mm	500 mm x 500 mm	750 mm x 750 mm	1000 mm x 1000 mm	1200 mm x 1200 mm
Drive System		Linear Brushless Servomotor (Bridge Axis: BLM-142-A, Gantry Axis: BLM-142-A)		Linear Brushless Servomotor (Bridge Axis: BLM-325-A, Gantry Axis: BLMH-262-A)		
Bus Voltage		up to 160 VDC				
Continuous Current (Bridge Axis)	A <sub>pk</sub>	up to 3.10 A		up to 6.20 A		
	A <sub>rms</sub>	up to 2.19 A		up to 4.38 A		
Continuous Current (Gantry Axis)	A <sub>pk</sub>	up to 3.10 A		up to 5.50 A		
	A <sub>rms</sub>	up to 2.19 A		up to 3.89 A		
Feedback		Noncontact Linear Encoder				
Resolution		1 nm - 1.0 μm				
Maximum Travel Speed <sup>(1)</sup>		500 mm/s				
Maximum Acceleration (no load)		1 g (10 m/s <sup>2</sup> )				
Maximum Load <sup>(2)</sup>		30.0 kg		125.0 kg		
Accuracy <sup>(3)</sup>	LN	±0.5 μm	±0.75 μm	±0.85 μm	±1.0 μm	±1.25 μm
	LZR	Standard ±10 ppm; Compensated ±1.5 ppm <sup>(4)</sup>	Contact an Aerotech Application Engineer for further details			
Repeatability <sup>(3)</sup>	LN	±0.1 μm		±0.2 μm		
Straightness and Flatness <sup>(5)</sup>	Max Deviation	±0.5 μm	±1.5 μm	±2.0 μm	±2.5 μm	±3.0 μm
Pitch/Roll/Yaw		2 arc sec	3.5 arc sec	4.5 arc sec	5.5 arc sec	6 arc sec
Stage Mass		320 kg	690.0 kg	3200.0 kg	4130.0 kg	5200.0 kg
Moving Mass	Bridge	9.5 kg		35.0 kg		
	Gantry	44.0 kg	57.0 kg	120.0 kg	130.0 kg	140.0 kg
Orthogonality		2 arc sec	3 arc sec	3.5 arc sec	4 arc sec	5 arc sec
Operating Pressure <sup>(6)</sup>		551.6 kPa + 0, -34 kPa				
Air Consumption <sup>(7)</sup>		45 SLPM		85 SLPM		
Material <sup>(8)</sup>		Aluminum				
Finish		Hard Coating (62 Rockwell Hardness )				

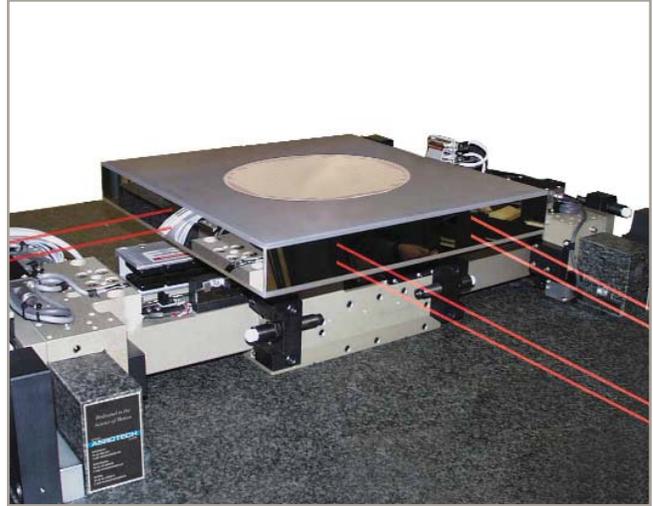
Notes:

- Maximum speed based on stage capability; maximum application velocity may be limited by system data rate and system resolution.
- Maximum load based on bearing capability; maximum application load may be limited by acceleration requirements.
- Available with Aerotech controllers and HALAR Calibration option.
- Requires environmental compensation.
- Requires HALSF option.
- To protect air bearing against under-pressure, an in-line pressure switch tied to motion controller E-stop input is recommended.
- Air supply must be clean, dry to 0° F dewpoint and filtered to 0.25 μm or better; recommend nitrogen at 99.9% purity.
- Optional construction materials include ceramic, invar, stainless, and titanium.
- 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.

## ABL/ABLH9000 Series SPECIFICATIONS



*ABL/ABLH9000 systems are available with custom granite assemblies, travel lengths, and cable management schemes.*



*Multi-axis interferometer feedback is available to control X and Y position, as well as Y-axis yaw. Use of a remote detector allows one laser source to be used for multiple axes.*

*Please contact an Aerotech Application Engineer for ordering information on the ABL/ABLH9000 series.*