

ABL3600 Series

Air Bearing, Linear Motor Stage

Large clear aperture

Full preload on all axes

Dual linear-motor-driven X and Y axes

Noncontact linear encoder for high accuracy



The ABL3600 dual-axis, large aperture, open-frame, air-bearing stage addresses the unique needs of scanning microscopy and mask and wafer inspection.

Design and Construction

The combination of high stiffness air bearings and dual linear-motor-driven axes provides an XY open-frame stage with exceptional performance characteristics. The ABL3600 represents a major upgrade in performance over traditional mechanical bearing open-frame stages.

As with all Aerotech air-bearing systems, proprietary manufacturing techniques are used to produce stages with unsurpassed geometric characteristics including straightness, flatness, pitch, roll, and yaw. The ABL3600 is manufactured in Aerotech's state-of-the-art production facility, and is machined with exacting tolerances that are unachievable by conventional methods.

Brushless Linear Servomotor

The ABL3600 incorporates a high-power linear motor to meet the needs of the most demanding applications. This results in a stage with all of the advantages of a direct-drive mechanism: zero backlash, no windup, exceptional acceleration, zero friction, and outstanding servo stiffness. Many applications require extreme stability of motion that can only be met with a linear motor drive. Since the drive train has zero friction and no recirculating elements, the ABL3600 is ideal for scanning, imaging, or any other precision application.

High-Accuracy Linear Encoder Feedback

The standard feedback device is a high-resolution, noncontact, linear encoder. This noncontact encoder offers exceptional repeatability and stability over a range of operating conditions. Both digital and analog output versions are available.

Cable Management

Years of research have resulted in what is universally considered to be the best cable management system (CMS) in the industry. We carefully optimize the cable bend radius and utilize only the highest quality cable 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.

Custom Designs

Aerotech has engineered and manufactured custom high-performance systems to meet customers' needs and specifications for a variety of applications. We can draw on over 35 years of motion control and positioning system experience to produce the ideal solution for your application.

ABL3600 Series SPECIFICATIONS

Basic Model		ABL36025
Total Travel		250 mm x 250 mm
Drive System		Linear Brushless Servomotor (Bottom Axis: BLM-142-A; Top Axis:BLM-142-A)
Bus Voltage		Up to 160 VDC
Continuous Current (bridge and gantry axes)	A _{pk}	Up to 3.10 A
	A _{rms}	Up to 2.19 A
Feedback		Noncontact Linear Encoder
Resolution		0.001 μm - 0.2 μm
Maximum Travel Speed ⁽¹⁾		200 mm/s
Maximum Linear Acceleration (no load)		0.25 g (2.5 m/s ²)
Maximum Load ⁽²⁾	Horizontal	30.0 kg
Accuracy ⁽³⁾	LN	±1 μm
Repeatability ⁽³⁾		±0.2 μm
Straightness	Max Deviation	±0.5 μm
Flatness	Max Deviation	±1 μm
Pitch/Roll		3 arc sec
Yaw		0.5 arc sec
Nominal Stage Weight (includes integral granite base)		1105 kg
Moving Mass	Upper Axis	37.3 kg
	Lower Axis	96.5 kg
Orthogonality		5 arc sec
Operating Pressure ⁽⁴⁾		60 psi (+0, -5 psi)
Air Consumption ⁽⁵⁾		66 SLPM (2.3 SCFM)
Material		Aluminum
Finish		Hard Coated (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.
- 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 dew point, and filtered to 0.25 μm or better; recommend nitrogen at 99.9% purity.
- Requires vacuum preload.
- Specifications are for single-axis systems, measured 25 mm above the tabletop. Performance of multi-axis systems is payload and workpoint dependent. Consult factory for multi-axis or non-standard applications.