

ABG10000 Series

Air-Bearing Direct-Drive Cartesian Gantry System

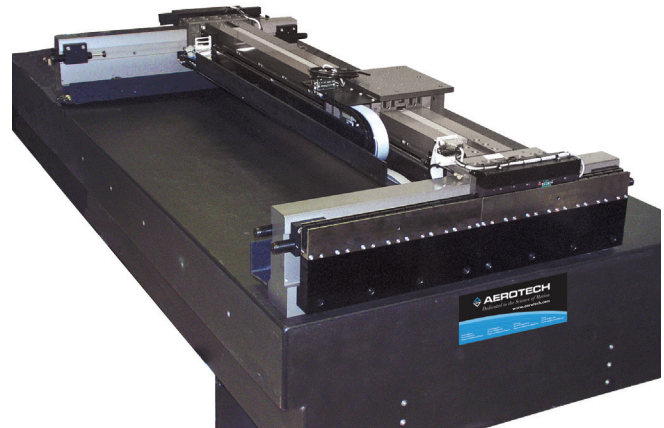
Air bearings for ultra smooth motion

All axes are fully preloaded

Dual linear-motor-driven lower axis

Travel to 1 m x 1 m

Options include: z axis, vibration isolation, machine base, and control enclosure



The ABG10000 air-bearing gantry puts Aerotech's core technologies and extensive manufacturing capability to work for you, providing outstanding performance and versatility in a wide range of automation applications.

These systems are used in applications such as high-speed pick-and-place, automated assembly, vision inspection, dispensing stations, and high-accuracy inspection.

Linear Motor/Linear Encoder

Aerotech's high-performance BLM series brushless linear servomotors drive the ABG10000 to speeds of 1 m/s and accelerations of 0.5 g. Feedback is from a rugged noncontact optical linear encoder.

Air-Bearing Design

The ABG10000 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.

Rugged Design

Since the linear motor is a noncontact device, there is no backlash, wear, or maintenance. The air bearings are

magnetically preloaded and assembled to provide optimized stiffness and load distribution.

Cable Management System

Extensive R&D has resulted in an optimized cable management system (CMS) that has been field-proven to be the industry's most reliable design. Large bend radii and high-flex cables ensure that the air-bearing gantry provides millions of cycles of maintenance-free operation. In the unlikely event of a component failure, a modular design ensures that part replacement is fast and easy.

Turnkey Operation

Aerotech's years of experience manufacturing precision positioning and control systems can be leveraged by acquiring a turnkey system. Typical options include a Z stage, vibration isolation, machine base, and a control enclosure.

Aerotech also manufactures a wide range of high-performance amplifiers and advanced motion controllers that are optimized for use with the ABG10000.

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 many years of motion control and positioning system experience to produce the ideal solution for your application.

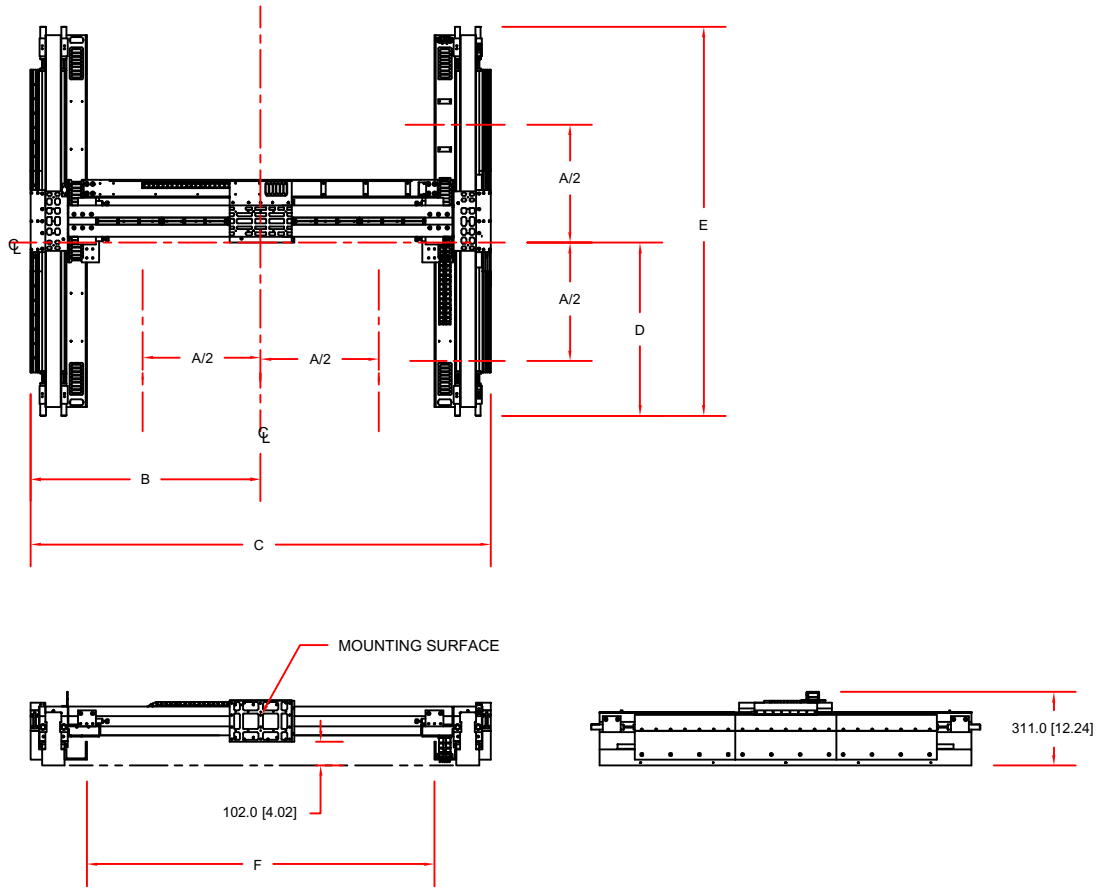
ABG1000 Series SPECIFICATIONS

Basic Model	ABG1000-250-250	ABG1000-500-500	ABG1000-750-750	ABG1000-1000-1000
Travel	250 mm x 250 mm	500 mm x 500 mm	750 mm x 750 mm	1000 mm x 1000 mm
Bus Voltage	Up to 320 VDC			
Accuracy ⁽¹⁾⁽²⁾	±2 µm			
Repeatability (Bi-Directional) ⁽¹⁾⁽²⁾	±0.5 µm			
Straightness ⁽³⁾	±1 µm	±2 µm	±2 µm	±3 µm
Flatness ⁽³⁾	±4 µm	±6 µm	±12 µm	±14 µm
Roll ⁽³⁾	±2 arc sec	±3 arc sec	±4 arc sec	±5 arc sec
Pitch ⁽³⁾	±6 arc sec	±8 arc sec	±13 arc sec	±15 arc sec
Yaw ⁽³⁾	±1 arc sec	±2 arc sec	±3 arc sec	±4.5 arc sec
Maximum Speed ⁽⁴⁾	1000 mm/s			
Maximum Acceleration	0.5 g - 5 m/s ² (193 in/s ²)			
Moving Mass	Bridge	9 kg	9 kg	9 kg
	Gantry	64 kg	70 kg	84 kg
Orthogonality	5 arc sec			
Operating Pressure ⁽⁵⁾	80 psig +0 psig -5 psig			
Air Consumption ⁽⁶⁾	56.6 SLPM (2.0 SCFM)			
Material	Aluminum			
Finish	Hard Coating			
Stage Mass (not including risers or granite base)	260 kg	282 kg	303 kg	325 kg

Notes

1. Measured at center of travel.
2. Available with Aerotech motion controller and calibration.
3. Maximum application load may be limited by performance requirements; no load specifications are shown.
4. Maximum speed based on stage capability; maximum application velocity may be limited by system data rate and system resolution.
5. To protect air bearing against under-pressure, an in-line pressure switch tied to 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.

ABG10000 Series DIMENSIONS



Basic Model	Total Travel	Dimensions - Millimeters [Inches]				
	A	B	C	D	E	F
ABG10000-250-250	250.0 [10.00]	614.1 [24.18]	1228.2 [48.35]	357.3 [14.07]	897.4 [35.33]	750.6 [29.55]
ABG10000-500-500	500.0 [20.00]	764.1 [30.08]	1528.2 [60.17]	482.3 [18.99]	1147.4 [45.17]	1050.6 [41.36]
ABG10000-750-750	750.0 [30.00]	854.1 [33.63]	1708.2 [67.25]	607.3 [23.91]	1397.4 [55.02]	1230.6 [48.45]
ABG10000-1000-1000	1000.0 [40.00]	974.1 [38.35]	1948.2 [76.70]	732.3 [28.83]	1647.4 [64.86]	1470.6 [57.90]

ABG10000 Series ORDERING INFORMATION

ABG10000 Air-Bearing Direct-Drive Cartesian Gantry System

AGS10000-xxxx-yyyy ABG10000 air-bearing direct-drive cartesian gantry system, XXXX mm lower-axis travel, YYYY mm upper-axis travel

Feedback (Required)

-E1 Lower axis: dual incremental linear encoders; 1 V_{pp} amplified sine output (one per spar)
Upper axis: single incremental linear encoder; 1 V_{pp} amplified sine output

-E2 Lower axis: dual high-accuracy incremental linear encoders; 1 V_{pp} amplified sine output (one per spar)
Upper axis: single high-accuracy incremental linear encoder; 1 V_{pp} amplified sine output

Limits (Required)

-LI1 Normally-closed end-of-travel limit switches, 5 VDC

-LI2 Normally-open end-of-travel limit switches, 5 VDC

Metrology (Required)

-PL2 Standard performance - includes plots for accuracy and straightness/flatness

-PL6 Standard performance - includes plot for accuracy only

Integration (Required)

Aerotech offers both standard and custom integration services to help you get your system fully operational as quickly as possible. The following standard integration options are available for this system. Please consult Aerotech if you are unsure what level of integration is required, or if you desire custom integration support with your system.

-TAS Integration - Test as system
Testing, integration, and documentation of a group of components as a complete system that will be used together (ex: drive, controller, and stage). This includes parameter file generation, system tuning, and documentation of the system configuration.

-TAC Integration - Test as components
Testing and integration of individual items as discrete components that ship together. This is typically used for spare parts, replacement parts, or items that will not be used together. These components may or may not be part of a larger system.

Accessories (to be ordered as a separate line item)

ABF Air bearing filtration kit