



## Air Bearing, Direct-Drive Vertical Translation Stage

# ABL1500Z

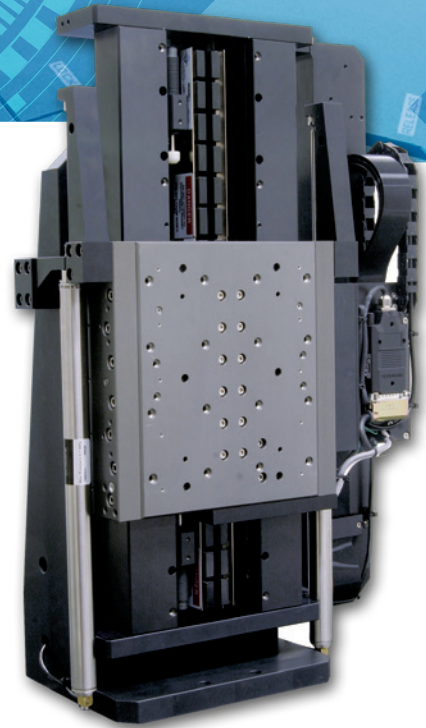
### Outstanding Vertical Motion

ABL1500Z is the vertical translation variant of the industry-leading ABL1500 linear air bearing stage family. Featuring large air-bearing surfaces with air-on-air preload, ABL1500Z provides excellent stiffness, payload capacity and geometric motion characteristics. Horizontal and vertical straightness, pitch, yaw and roll performance are second to none. Dual, symmetrically oriented pneumatic counterbalances can be easily adjusted to accommodate a wide payload range without inducing angular errors. Ironless linear motors eliminate cogging effects, resulting in ultra-smooth, reliable vertical motion.

### Key Applications

ABL1500Z air-bearing stages are ideal for applications requiring vertical motion with impeccable precision, repeatability and reliability, including:

- ◆ Semiconductor & electronics manufacturing
- ◆ Wafer inspection & metrology
- ◆ Silicon photonics alignment
- ◆ Precision metrology & surface profiling
- ◆ Synchrotron & beamline instrumentation
- ◆ X-ray and CT sample positioning
- ◆ Bonding & advanced packaging



### KEY FEATURES:

- ◆ Travel options from **50–200 mm**
- ◆ Supports payloads up to **15 KG** with user-adjustable pneumatic counterbalances
- ◆ Ironless linear motor provides **ULTRA-SMOOTH MOTION** with zero cogging
- ◆ Optional 4  $\mu$ m encoder scale option provides **SUB-NANOMETER RESOLUTION** for superior **DYNAMIC ACCURACY AND VELOCITY STABILITY**
- ◆ **EASY TO INTEGRATE** with other ABL1500 stages and more to build multi-axis systems

## ABL1500Z Series SPECIFICATIONS

Mechanical Specifications			ABL1500Z-050	ABL1500Z-100	ABL1500Z-150	ABL1500Z-200
Travel			50 mm	100 mm	150 mm	200 mm
Accuracy <sup>(1)</sup>	E1	Calibrated (-PL2)	±0.3 µm	±0.3 µm	±0.4 µm	±0.5 µm
		Standard	±2.0 µm	±3.0 µm	±5.0 µm	±8.0 µm
	E3	Calibrated (-PL2)	±0.2 µm	±0.2 µm	±0.3 µm	±0.5 µm
		Standard	±1.5 µm	±2.5 µm	±4.0 µm	±6.0 µm
Repeatability (Bi-Directional) <sup>(1)</sup>	E1		±0.1 µm		±0.15 µm	±0.2 µm
	E3		±0.1 µm		±0.15 µm	±0.2 µm
Straightness <sup>(1)</sup>			±0.4 µm	±0.6 µm	±0.8 µm	±1.0 µm
Flatness <sup>(1)</sup>			±0.4 µm	±0.6 µm	±0.8 µm	±1.0 µm
Pitch			±1 arc sec	±1.5 arc sec	±2 arc sec	±2.5 arc sec
Roll			±1 arc sec	±1.5 arc sec	±2 arc sec	±2.5 arc sec
Yaw			±1 arc sec	±1.5 arc sec	±2 arc sec	±2.5 arc sec
Maximum Speed			300 mm/s			
Maximum Acceleration			2 g (No Load)			
Maximum Force (Continuous)			93.6 N			
Load Capacity <sup>(2)</sup>			15 kg			
Operating Pressure			80 psi (5.5 bar) ±5 psig (0.3 bar)			
Air Consumption			Stage: 24-30 slpm @ 551 kPa; Counterbalance: 60 slpm maximum			
Moving Mass (No Load)			5.9 kg			
Stage Mass			23.8 kg	26.6 kg	28.5 kg	30.5 kg
Material			Hardcoat Anodized Aluminum			
MTBF (Mean Time Between Failure)			20,000 Hours			

Notes:

1. Certified with each stage.
2. Axis orientation for on-axis loading is listed.
3. 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.
4. To protect air bearing against under-pressure, an in-line pressure switch tied to the motion controller/amplifier 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.

Electrical Specifications	
Drive System	Brushless Linear Servomotor
Feedback	Noncontact Linear Encoder (see signal period options on Order Information page)
Maximum Bus Voltage	up to 80 VDC
Limit Switches	5 V, Normally Closed
Home Switch	Near Center

## ABL1500Z Series ORDERING OPTIONS

### Travel (Required)

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- 050 50 mm travel
- 100 100 mm travel
- 150 150 mm travel
- 200 200 mm travel

### Feedback (Required)

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- E1 Incremental linear encoder, 1 Vpp amplified sine output
- E2 Incremental linear encoder, 0.1  $\mu$ m TTL line driver output
- E3 High-accuracy incremental linear encoder, 1 Vpp amplified sine output

### Cable Management (Required)

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- CMS1 Single axis cable management system
- CMS2 Cable management system for ZT assembly

### Metrology (Required)

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- PL1 Metrology, uncalibrated with performance plots
- PL2 Metrology, calibrated (HALAR) with performance plots

### Integration (Required)

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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 spareparts, 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 Separate Line Item)

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- ALIGN-NPA Non-precision XY assembly
- ALIGN-PA10 XY assembly; 10 arc sec orthogonality. Alignment to within 7 microns orthogonality for short travel stages.
- ALIGN-PA5 XY assembly; 5 arc sec orthogonality. Alignment to within 3 microns orthogonality for short travel stages.
- ABF Air-bearing filtration kit

# ABL1500Z Series DIMENSIONS

## ABL1500Z

