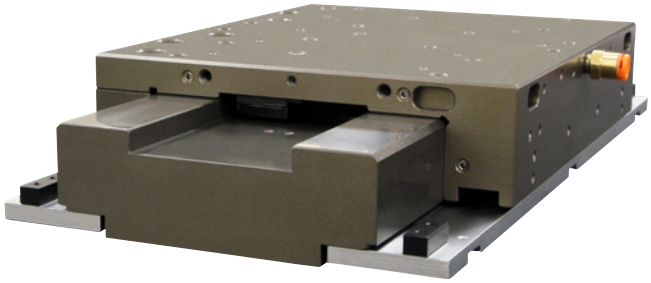
ABL1000 Series

Air-Bearing, Direct-Drive Linear Stage

- Designed for high-performance alignment and assembly
- 0.5 nm closed-loop resolution
- Fully preloaded air-bearing
- Low-noise linear amplifiers
- Complete noncontact design



ABL1000 series stages shown in an XY assembly configuration.

ABL1000 series stages are the highest performance miniature air-bearing stages available. Aerotech has combined industry-leading precision motion control and positioning system experience with the latest technologies to produce a truly outstanding miniature, linear air-bearing stage.

Linear Stage

The linear positioner is a fully preloaded, noncontact design. Inherently frictionless, air bearings have proven to be the standard in precision applications. Driven by a noncontact linear brushless servomotor, this stage proves the ultimate solution whether the application requires small, accurate steps or constant smooth velocity. Superior magnetic field and motor coil design result in the highest force output of any miniature air-bearing stage. This stage offers superior servo performance and features a robust and perturbation-free cable management system.

Feedback and Control System

A wide selection of state-of-the-art controllers are available along with a variety of high-performance linear and PWM amplifiers.

Options

Convenient rack or panel-mount amplifiers are offered with all systems. Aerotech's expert technical staff is experienced in custom system designs and will work with you to generate a system to meet the unique needs of your application.

ABL1000 Series SPECIFICATIONS

ABL1000		ABL1000-025	ABL1000-050	ABL1000-100
Total Travel		25 mm	50 mm	100 mm
Drive System		Linear Brushless Servomotor		
Resolution	-E2 Encoder	0.5 nm		
	-E1 Encoder	2.5 nm		
Maximum Travel Speed [1]		300 mm/s		
Maximum Linear Acceleration		1 g - 10 m/s^2 (no load)		
Maximum Load [2]	Horizontal	15.0 kg		
Accuracy	-E2 Encoder	±0.2 µm[3] ±1 µm	±0.2 µm [3] ±1 µm	±0.2 µm[3] ±2 µm
	-E1 Encoder	±0.3 µm [3] ±2 µm	±0.3 µm [3] ±2 µm	±0.3 µm [3] ±5 µm
Repeatability	-E2 Encoder [3]	±50 nm (±2 µin)		
	-E1 Encoder	±50 nm [3]; ±100 nm		
Straightness and Flatness [4]		±0.25 µm	±0.25 µm	±0.4 µm
Pitch and Yaw		±0.25 arc sec	±0.50 arc sec	±1.0 arc sec
Nominal Stage Weight		4.5 kg	5.5 kg	6.4 kg
Moving Mass		1.9 kg		
Operating Pressure [5]		80 psi ±5 psi		
Air Consumption [6][7]		17.5 SLPM	17.5 SLPM	17.5 SLPM
Material		Hardcoat Anodized Aluminum		

Notes:
1. Maximum speed based on stage capability; maximum application velocity may be limited by system data rate and system resolution.
2. Max load for XY configuration is 10.0 kg
3. Values with Aerotech controls and -PL2 metrology option.
4. Dependent on flatness of stage mounting surface.
5. To protect air bearing against under-pressure, an in-line pressure switch tied to the controller E-stop input is required.
6. Air supply must be clean, dry to 0° F dew point, and filtered to 0.25 µm or better; recommend nitrogen at 99.99% purity.
7. Maximum expected air consumption for single axis.
8. Specifications are for single-axis systems, measured 25 mm above the tabletop. Performance of multi-axis systems is payload and workpoint dependent. Cc or non-standard applications.

ABL1000 Series SPECIFICATIONS

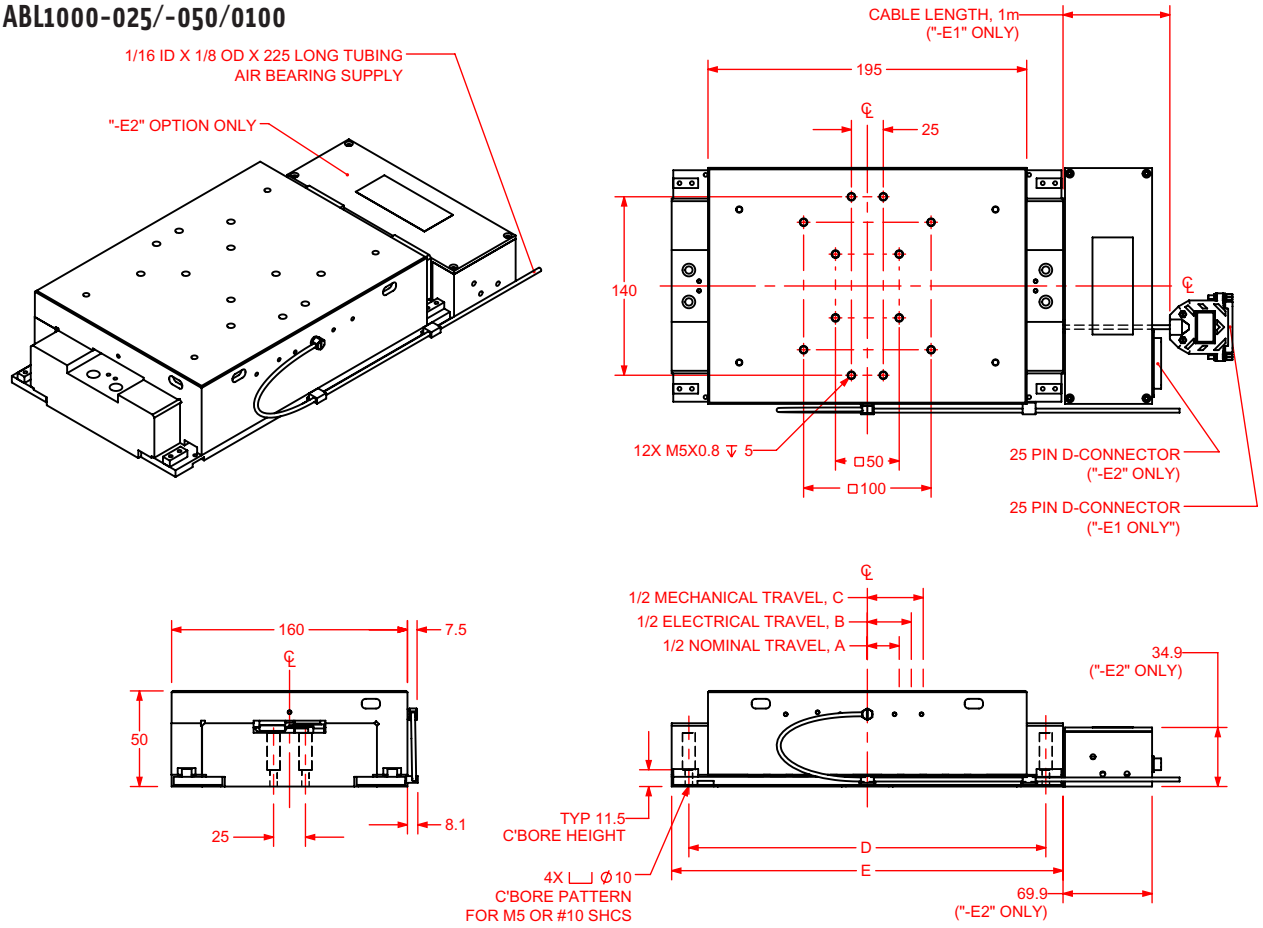
ABL1000WB		ABL1000WB-050	ABL1000WB-100	ABL1000WB-150
Nominal Travel		50 mm	100 mm	150 mm
Drive System		Linear Brushless Servomotor		
Resolution	-E2 Encoder	0.5 nm		
	-E1 Encoder	2.5 nm		
Maximum Travel Speed (1)		300 mm/s		
Maximum Linear Acceleration		1 g - 10 m/s^2 (no load)		
Maximum Load (2)	Horizontal	15.0 kg (33.0 lb)		
Accuracy	-E2 Encoder	±0.2 µm (3) ±1 µm	±0.2 µm (3) ±1 µm	±0.2 µm (3) ±2 µm
	-E1 Encoder	±0.3 µm (3) ±2 µm	±0.3 µm (3) ±2 µm	±0.3 µm (3) ±5 µm
Repeatability	-E2 Encoder (3)	±50 nm (±2 µin)		
	-E1 Encoder	±50 nm (3) ; ±100 nm		
Straightness and Flatness (4)		±0.25 µm	±0.25 µm	±0.4 µm
Pitch and Yaw		±0.25 arc sec	±0.50 arc sec	±1.0 arc sec
Nominal Stage Weight		9.7 kg	10.7 kg	11.6 kg
Moving Mass		4.3 kg		
Operating Pressure (5)		80 psi ±5 psi		
Air Consumption (6)(7)		13.2 SLPM	13.2 SLPM	13.2 SLPM
Material		Hardcoat Anodized Aluminum		

Notes:
1. Maximum speed based on stage capability; maximum application velocity may be limited by system data rate and system resolution.
2. Max load for XY configuration is 10.0 kg
3. Values with Aerotech controls and -PL2 metrology option.
4. Dependent on flatness of stage mounting surface.
5. To protect air bearing against under-pressure, an in-line pressure switch tied to the controller E-stop input is required.
6. Air supply must be clean, dry to 0° F dew point, and filtered to 0.25 µm or better; recommend nitrogen at 99.99% purity.
7. Maximum expected air consumption for single axis.
8. Specifications are for single-axis systems, measured 25 mm above the tabletop. Performance of multi-axis systems is payload and workpoint dependent. Co or non-standard applications.

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

ABL1000 Series DIMENSIONS

ABL1000-025/-050/0100



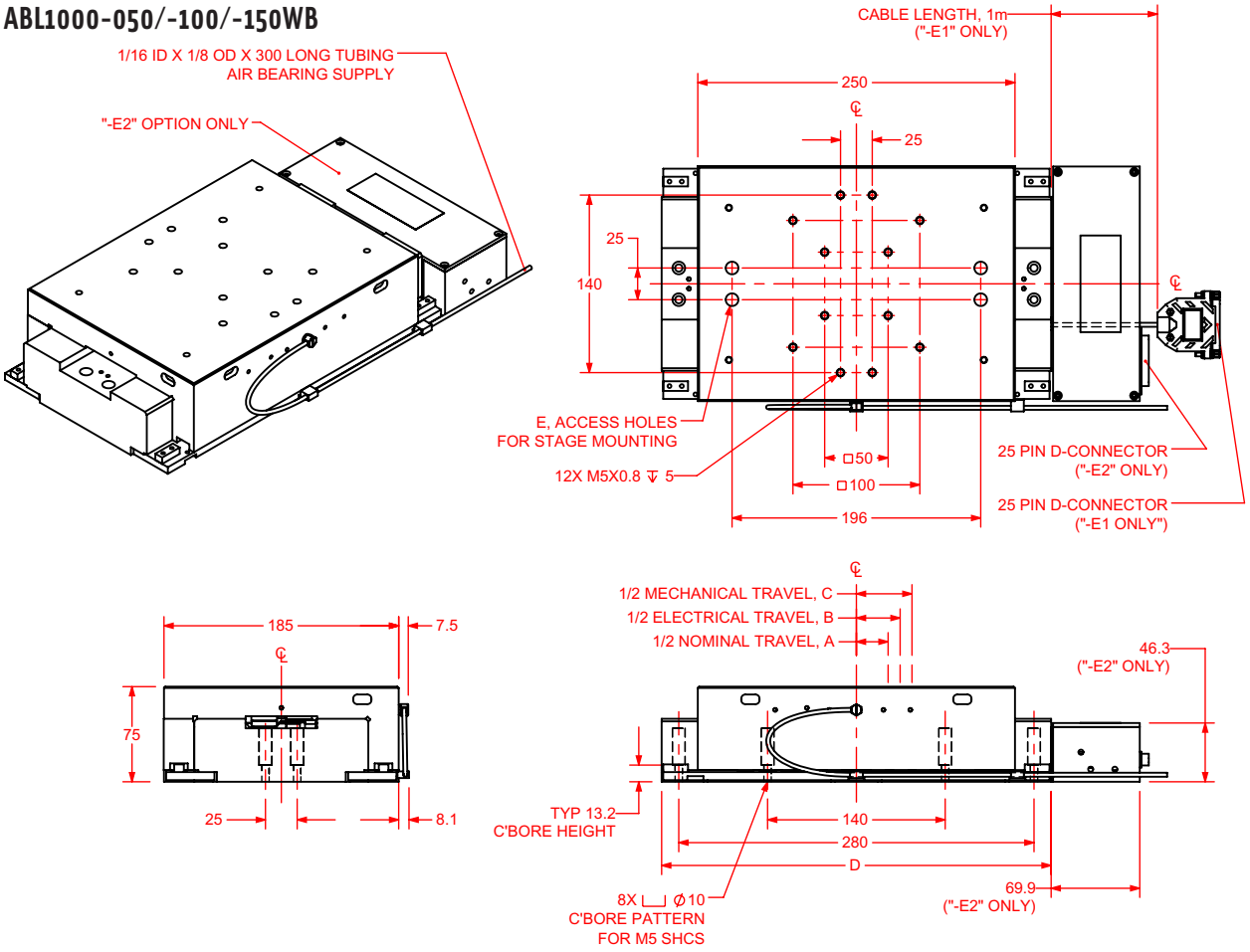
STAGE SHOWN AT MID TRAVEL

MODEL	TOTAL TRAVEL	A 1/2 NOMINAL TRAVEL	B 1/2 ELECTRICAL TRAVEL	C 1/2 MECHANICAL TRAVEL	D STAGE MOUNTING	E STAGE BASE LENGTH
ABL1000-025	25	12.5	15	20	165	235
ABL1000-050	50	25	27.5	32.5	140	260
ABL1000-100	100	50	51	57.5	140	310

DIMENSIONS: MILLIMETERS

ABL1000 Series DIMENSIONS

ABL1000-050/-100/-150WB



STAGE SHOWN AT MID TRAVEL

MODEL	TOTAL TRAVEL	A 1/2 NOMINAL TRAVEL	B 1/2 ELECTRICAL TRAVEL	C 1/2 MECHANICAL TRAVEL	D STAGE BASE LENGTH	E STAGE MOUNTING ACCESS HOLES
ABL1000WB-050	50	25.0	25.7	28.4	307	4X Ø10 THRU
ABL1000WB-100	100	50.0	50.7	53.4	357	4X Ø10 THRU
ABL1000WB-150	150	75.0	75.7	78.4	407	-

DIMENSIONS: MILLIMETERS

ABL1000 Air-Bearing Direct-Drive Linear Stage ORDERING INFORMATION

Travel (Required)

-025	25 mm travel
-050	50 mm travel
-100	100 mm travel

Feedback (Required)

-E1	Incremental linear encoder; 1 Vpp amplified sine output
-E2	High-accuracy incremental linear encoder; 1 Vpp amplified sine output

Cable Management (Optional)

-CMS1	Cable management system for single axis
-CMS2	Cable management system for lower (X) axis of XY assembly
-CMS3	Cable management system for upper (Y) axis of XY assembly
-CMS4	Cable management system for use with vertical (Z) or rotary (T) axis

Metrology (Required)

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

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

ABL1000WB Wide Body Air-Bearing Direct-Drive Linear Stage ORDERING INFORMATION

Travel (Required)

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

Feedback (Required)

-E1	Incremental linear encoder; 1 Vpp amplified sine output
-E2	High-accuracy incremental linear encoder; 1 Vpp amplified sine output

Cable Management (Optional)

-CMS1	Cable management system for single axis
-CMS2	Cable management system for lower (X) axis of XY assembly
-CMS3	Cable management system for upper (Y) axis of XY assembly

Metrology (Required)

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

Integration (Required)

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Accessories (to be ordered as a separate line item)

ABF	Air-bearing filtration kit