Air Bearing, Direct-Drive Linear Stage with Bellows

ABL1500WB-B

Ultra-Precise Motion with High Load Capacity

The ABL1500WB-B linear air-bearing stage features an integrated bellows waycover to mitigate the risk of contamination in processes that generate debris, ensuring a long, productive service life free from particulate-induced performance degradation. Like the ABL1500WB, it's equipped with dual ironless linear motors, ideal for use as the lower axis of an XY assembly. ABL1500WB-B offers exceptionally high stiffness and load capacity, plus superior geometric performance.

Key Applications

ABL1500WB-B air-bearing, linear motor stages are ideal for applications in leading-edge industries, including:

- Semiconductor manufacturing & inspection
- Lithography
- Surface metrology
- Photonic device manufacturing
- Advanced packaging
- Laser microprocessing
- Synchrotron, beamline & other research applications

KEY FEATURES:

- Integrated bellows waycover **PROTECTS AGAINST CONTAMINATION**
- Travel options from **200–500 mm**
- Wide-body design supports payloads up to **60 kg**
- Dual ironless linear motors provide **HIGH FORCE OUTPUT & ULTRA-SMOOTH MOTION** with zero cogging
- Optional 4 µm encoder scale option provides sub-nanometer resolution for **SUPERIOR DYNAMIC ACCURACY & VELOCITY STABILITY**
- Rated for **NORMAL- & SIDE-MOUNTING**
- **EASY TO INTEGRATE** with other ABL1500 stages & more to build multi-axis systems

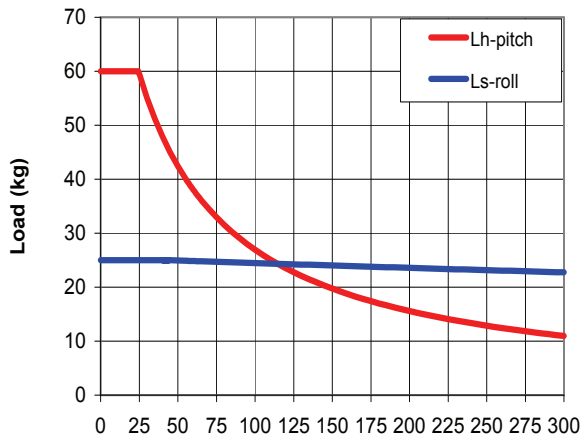
ABL1500WB-B Series SPECIFICATIONS

Mechanical Specifications			ABL1500WB-B-200	ABL1500WB-B-300	ABL1500WB-B-400	ABL1500WB-B-500
Travel			200 mm	300 mm	400 mm	500 mm
Accuracy[1]	**E1**	**Calibrated (-PL2)**	±0.7 µm	±0.7 µm	±0.8 µm	±0.8 µm
		Standard	±8.0 µm	±12.0 µm	±16.0 µm	±20.0 µm
	E3	**Calibrated (-PL2)**	±0.5 µm	±0.6 µm	±0.75 µm	±0.75 µm
		Standard	±5.0 µm	±5.0 µm	±5.0 µm	±5.0 µm
Repeatability (Bi-Directional)[1]	**E1**		±0.25 µm	±0.25 µm	±0.3 µm	±0.3 µm
	E3		±0.25 µm	±0.25 µm	±0.3 µm	±0.3 µm
Straightness[1]			±0.5 µm	±0.75 µm	±1.5 µm	±2.0 µm
Flatness[1]			±0.5 µm	±0.75 µm	±1.5 µm	±2.0 µm
Pitch			±2 arc sec	±3 arc sec	±4 arc sec	±5 arc sec
Roll			±2 arc sec	±3 arc sec	±4 arc sec	±5 arc sec
Yaw			±2 arc sec	±3 arc sec	±4 arc sec	±5 arc sec
Maximum Speed	**E1**		2 m/s			
	E3		1.2 m/s			
Maximum Acceleration			2 g (No Load)			
Maximum Force (Continuous)			187.2 N			
Load Capacity[2]	**Horizontal**		60 kg			
	Side		25 kg			
Operating Pressure			80 psi (5.5 bar) ±5 psig (0.3 bar)			
Air Consumption			32-40 slpm @ 551 kPa			
Moving Mass (No Load)			13.7 kg			
Stage Mass			50.2 kg	56.8 kg	64.0 kg	70.8 kg
Material			Hardcoat Anodized Aluminum			
MTBF (Mean Time Between Failure)			30,000 Hours			

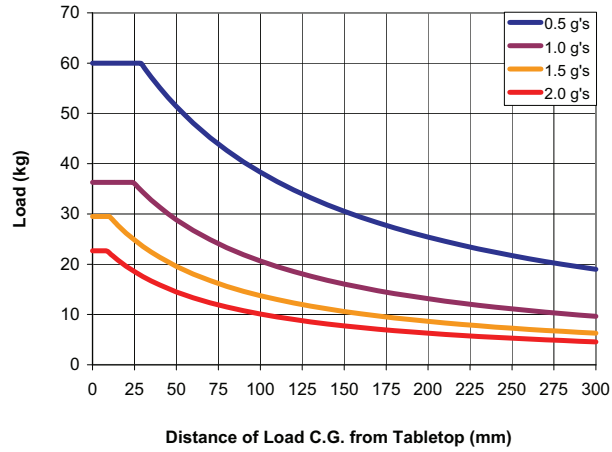
Notes:

1. Certified with each stage.
2. Axis orientation for on-axis loading is listed.
3. Specifications are for single-axis systems measured 25 mm aove 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.
6. For XY configurations utilizing an ABL1500-B as the upper axis and an ABL1500WB-B as the lower axis, the maximum upper axis travel is 300 mm.

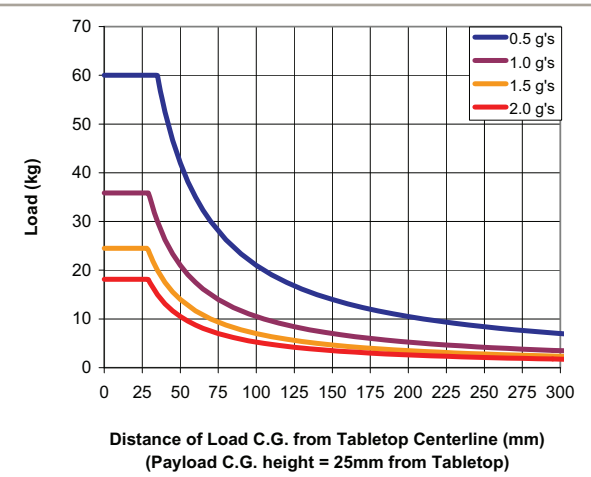
Electrical Specifications	
Drive System	Brushless Linear Servomotor
Feedback	Noncontact Linear Encoder (see signal period options on Order Information page)
Maximum Bus Voltage	up to 80 VDC
Limit Switches	5 V, Normally Closed
Home Switch	Near Center



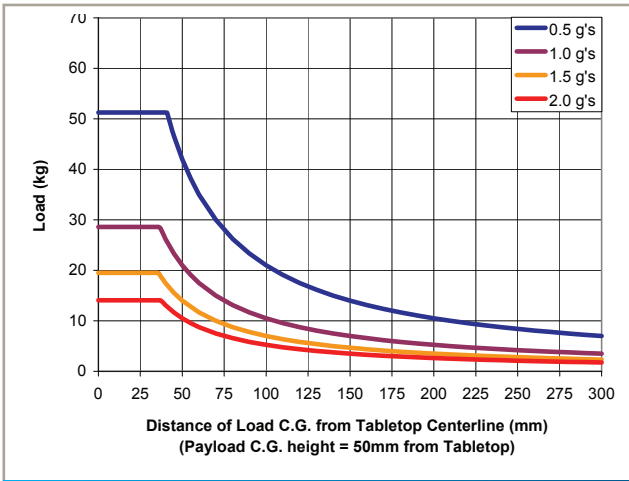
Cantilevered load capability (static conditions) for the ABL1500WB.



Pitch offsets with varying C.O.G. height and laterally centered payload.



Yaw offsets with payload C.O.G. 25 mm above the tabletop.



Yaw offsets with payload C.O.G. 50 mm above the tabletop.

Travel (Required)

-200	200 mm travel
-300	300 mm travel
-400	400 mm travel
-500	500 mm travel

Feedback (Required)

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

Cable Management (Required)

-CMS1	Single axis cable management system
-CMS2	Cable management system for XY assembly
-CMS3	Cable management system for XIO, 2 extra cables, 1 extra air
-CMS4	Cable management system for XYZ assembly
-CMS5	Cable management system for XYIO, 2 extra cables, 1 extra air

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.

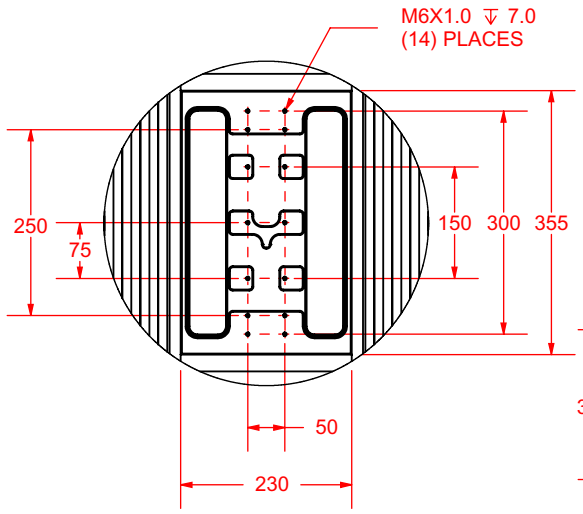
-TAC **Integration - Test as components**
Testing and integration of individual items as discrete components that ship together. This is typically used for spareparts, replacement parts, or items that will not be used together. These components may or may not be part of a larger system.

Accessories (To Be Ordered As Separate Line Item)

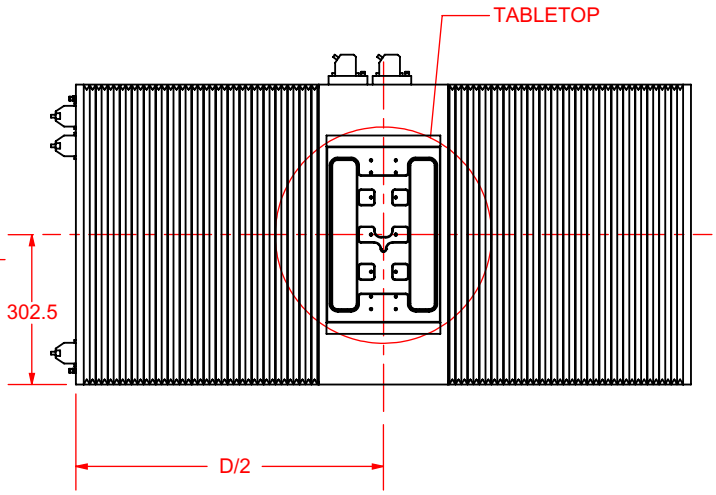
ALIGN-NPA	Non-precision XY assembly
ALIGN-PA10	XY assembly; 10 arc sec orthogonality. Alignment to within 7 microns orthogonality for short travel stages.
ALIGN-PA5	XY assembly; 5 arc sec orthogonality. Alignment to within 3 microns orthogonality for short travel stages.
ABF	Air-bearing filtration kit

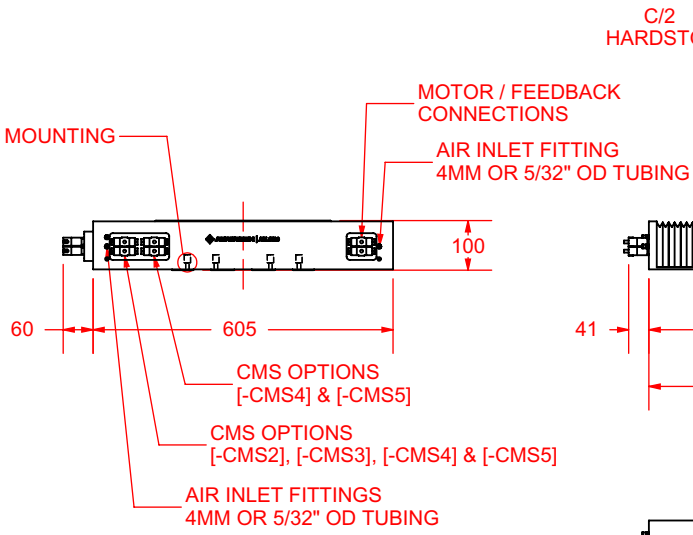
ABL1500WB-B Series DIMENSIONS

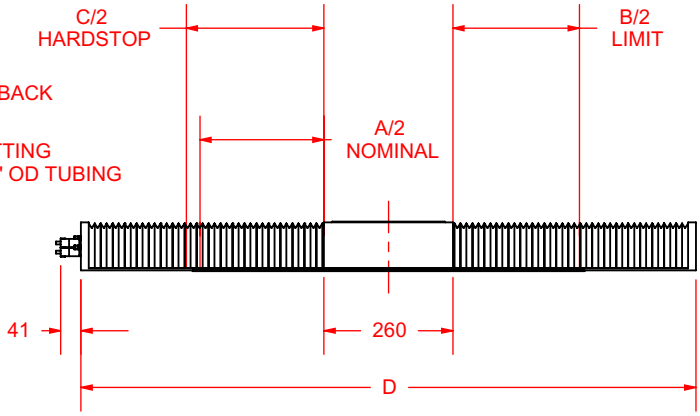
ABL1500WB-B

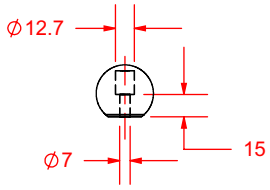


DETAIL TABLETOP
MOUNTING PATTERN CENTERED
ON CARRIAGE
SCALE 1 : 10

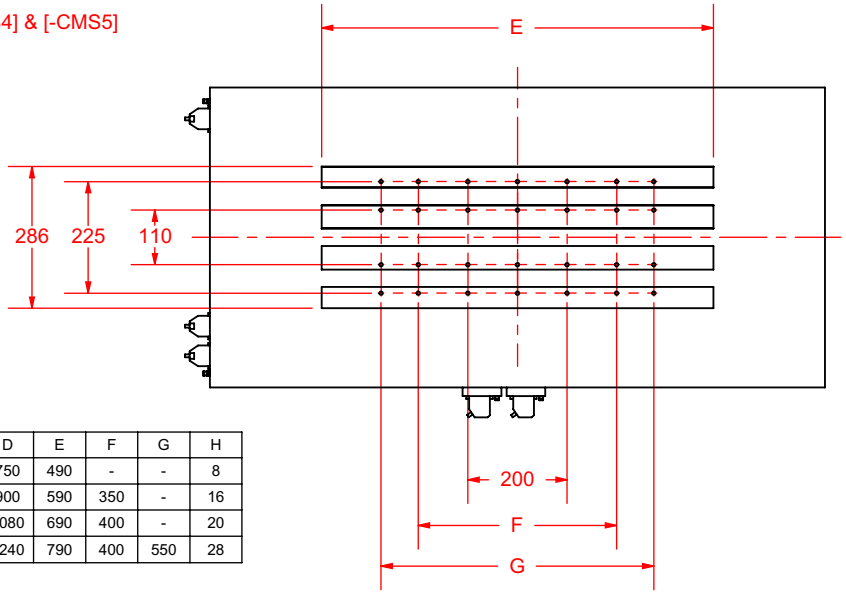








DETAIL MOUNTING HOLES
(H) PLACES
SCALE 1 : 5

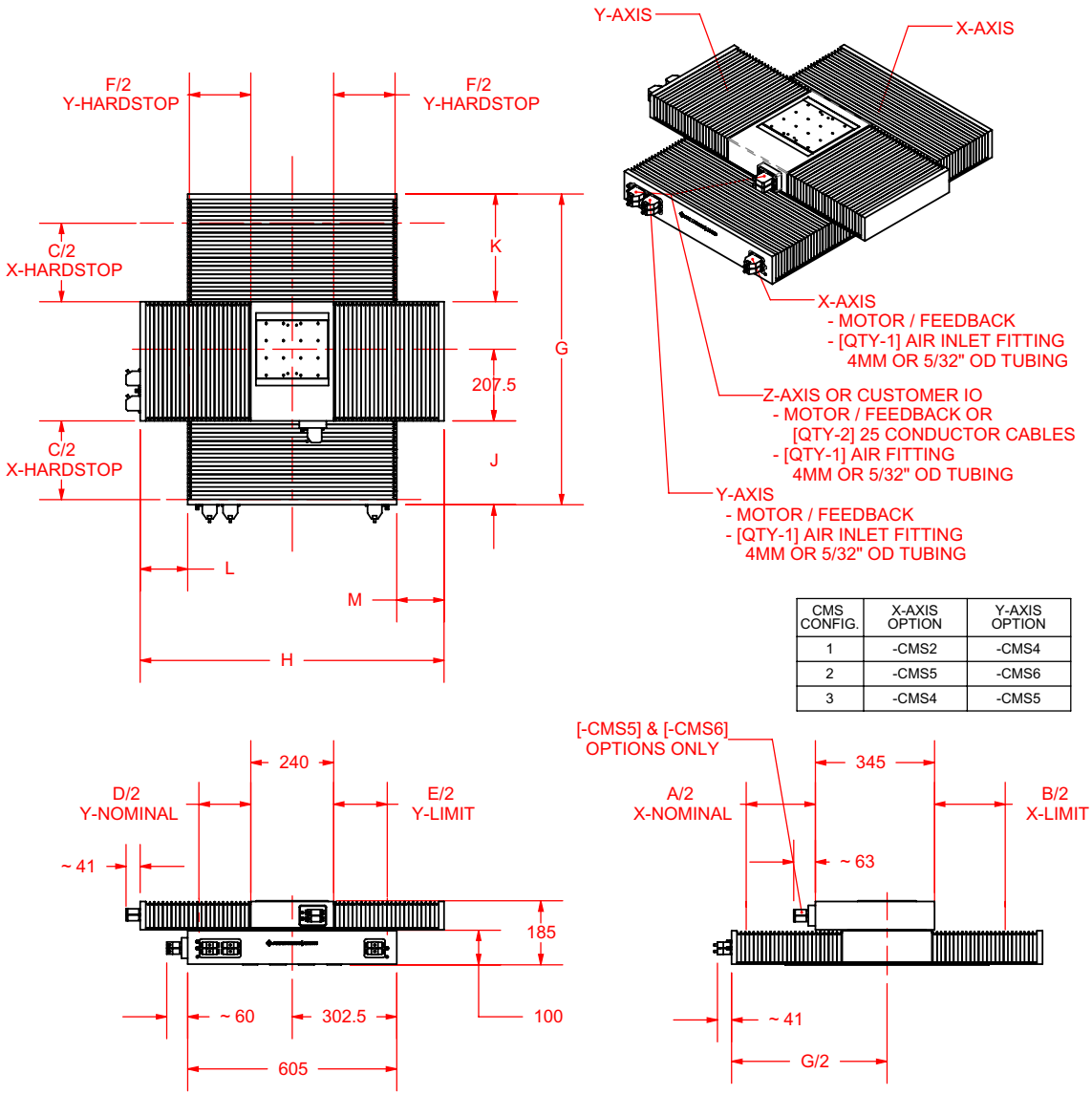


MODEL #	A	B	C	D	E	F	G	H
ABL1500WB-B-200	200	210	255	750	490	-	-	8
ABL1500WB-B-300	300	310	355	900	590	350	-	16
ABL1500WB-B-400	400	410	455	1080	690	400	-	20
ALB1500WB-B-500	500	510	555	1240	790	400	550	28

DIMENSIONS: MILLIMETERS

ABL1500WB-B Series DIMENSIONS

ABL1500WB-B-XY



CMS CONFIG.	X-AXIS OPTION	Y-AXIS OPTION
1	-CMS2	-CMS4
2	-CMS5	-CMS6
3	-CMS4	-CMS5

** REFER TO ABL1500WB-B SINGLE AXIS CATALOG DRAWING FOR SYSTEM MOUNTING INFORMATION. **

** REFER TO ABL1500-B SINGLE AXIS CATALOG DRAWING FOR TABLETOP MOUNTING INFORMATION. **

MODEL #		A	B	C	D	E	F	G	H	J	K	L	M
X-AXIS	Y-AXIS												
ABL1500WB-B-200	ABL1500-B-050	200	210	255	50	60	105	750	500	167.5	237.5	-	-
ABL1500WB-B-300		300	310	355				900		242.5	312.5		
ABL1500WB-B-400		400	410	455				1080		332.5	402.5		
ABL1500WB-B-500		500	510	555				1240		412.5	482.5		
ABL1500WB-B-200	ABL1500-B-100	200	210	255	100	110	155	750	550	167.5	237.5	-	-
ABL1500WB-B-300		300	310	355				900		242.5	312.5		
ABL1500WB-B-400		400	410	455				1080		332.5	402.5		
ABL1500WB-B-500		500	510	555				1240		412.5	482.5		
ABL1500WB-B-200	ABL1500-B-200	200	210	255	200	210	255	750	730	167.5	237.5	62.5	62.5
ABL1500WB-B-300		300	310	355				900		242.5	312.5		
ABL1500WB-B-400		400	410	455				1080		332.5	402.5		
ABL1500WB-B-500		500	510	555				1240		412.5	482.5		
ABL1500WB-B-200	ABL1500-B-300	200	210	255	300	310	355	750	880	167.5	237.5	137.5	137.5
ABL1500WB-B-300		300	310	355				900		242.5	312.5		
ABL1500WB-B-400		400	410	455				1080		332.5	402.5		
ABL1500WB-B-500		500	510	555				1240		412.5	482.5		

DIMENSIONS: MILLIMETERS