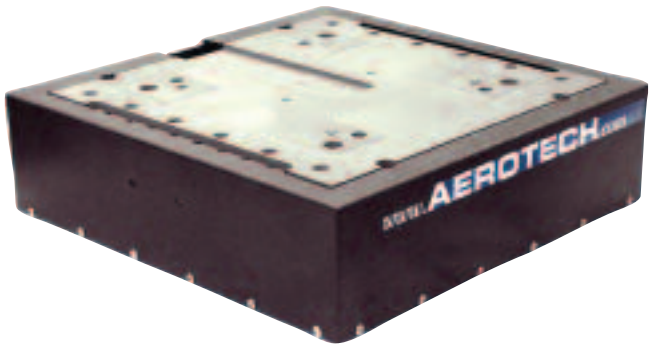
AVL1000 Series

Mechanical-Bearing Direct-Drive Lift Stage

- High load-carrying capability
- High stiffness
- Noncontact direct drive
- High accuracy
- Integral pneumatic counterbalance
- Easily configured with ARA1000 for multi-axis applications



Aerotech's AVL1000 represents a significant breakthrough for applications such as flat panel display processing that require Z articulation for large payloads. Multi-axis systems with high load inertia can suffer from mechanical stability problems that limit total machine throughput. The AVL1000 eliminates this problem through a proprietary design that significantly increases stage stiffness. The AVL1000 has a wide footprint that increases stiffness by separating the bearing elements as far as possible. This design also incorporates mechanical elements that fully constrain the carriage and virtually eliminate undesired motion.

Superior Mechanical Design

The AVL1000 utilizes a wedge design mounted on high-stiffness bearings to achieve high lateral and rotational rigidity. All elements of the AVL1000 were selected to operate in a 24/7 industrial environment and, unlike screw--based vertical stages, the AVL1000 requires no maintenance and will ensure years of trouble-free operation.

Brushless Direct-Drive

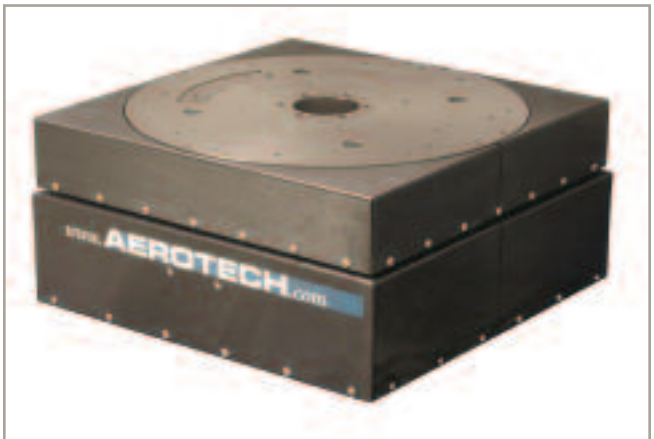
To maximize positioning performance, the AVL1000 uses Aerotech's BLM series brushless, slotless linear motor. This motor has all the advantages of a brushless direct-drive motor — no brushes to wear, no gear trains to maintain, and high acceleration and high speeds. The AVL1000 is ideal for high-bandwidth autofocus applications because the motor produces no cogging force.

High Accuracy

Positioning performance is assured by using a precision linear encoder that results in 0.5 nm resolution. The motor and encoder are directly coupled together, increasing the accuracy of the stage by eliminating mechanical hysteresis.

Flexible Configurations

Aerotech also manufactures a wide range of servo amplifiers, advanced controllers, as well as a full line of complementary stage systems to provide a complete, integrated package.

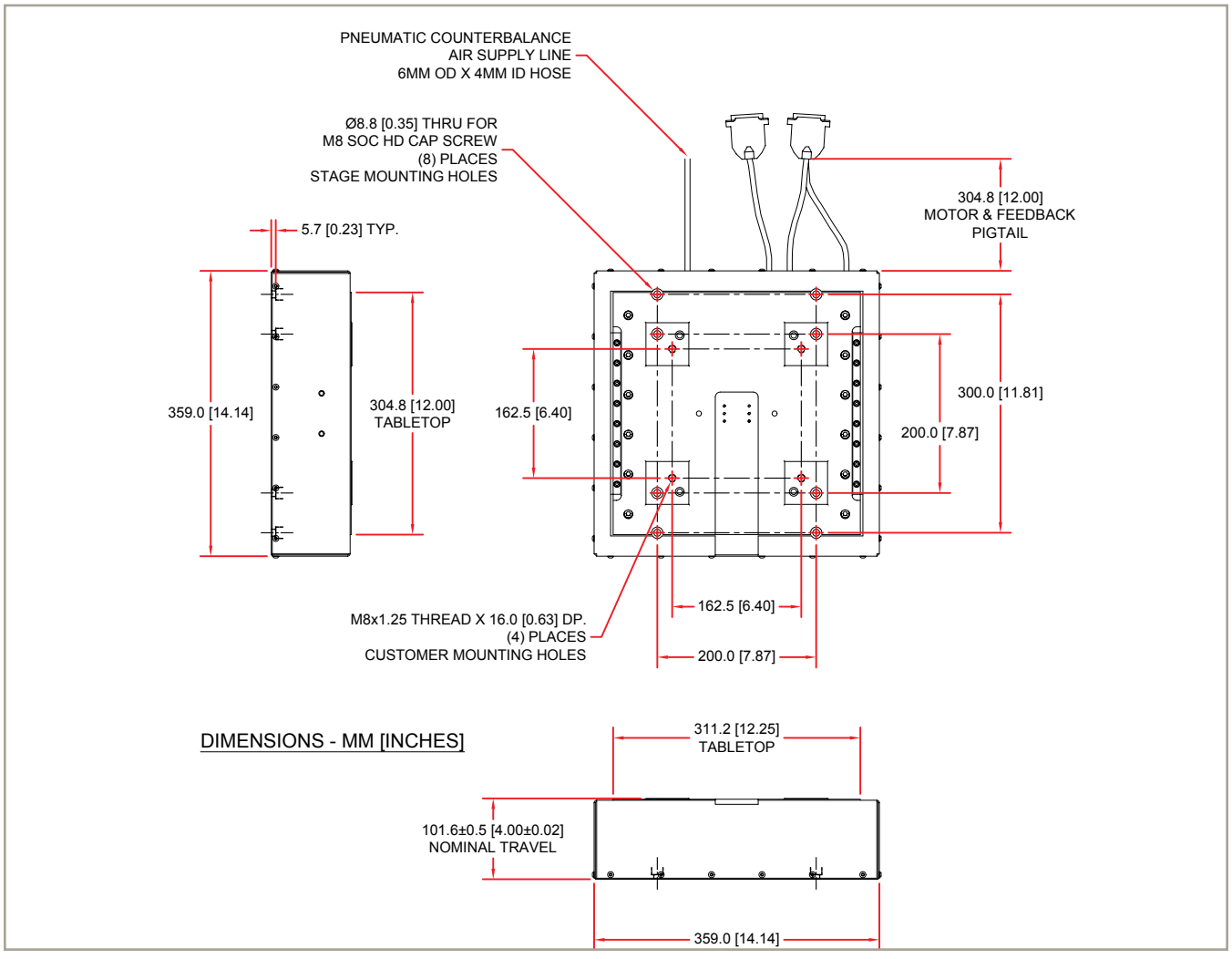


The AVL1000 and ARA1000 mounted together.

AVL1000 Series SPECIFICATIONS and DIMENSIONS

AVL1000	-1	-2
Travel	1 mm	2 mm
Motor Type	Linear Brushless Servomotor	
Bus Voltage	up to 160 VDC	
Accuracy[2]	±1 µm	
Repeatability (Bi-Directional)	±0.25 µm	
Straightness/Flatness	±1 µm	
Roll	3 arc sec	6 arc sec
Pitch	3 arc sec	6 arc sec
Yaw	3 arc sec	6 arc sec
Maximum Load	50 kg (requires use of integral pnuematic counterbalance)	
Moving Mass	10 kg	
Wedge Ratio	20:1	
Stage Mass	29 kg	
Material	Aluminum	
Finish	Black anodize covers; Hardcoat (62 Rockwell Hardness) tabletop	

Notes:
1. Requires Aerotech controller and calibration
2. For inverted operation, consult factory.



AVL1000 Series ORDERING INFORMATION

Travel (Required)

-1	1 mm travel
-2	2 mm travel

Limits (Required)

-LI1	Normally-closed limit switches
-LI2	Normally-open limit switches

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. This is typically used for spare parts, replacement parts, or items that will not be used or shipped together (ex: stage only). These components may or may not be part of a larger system.