

# AVS1000 Series

## Vertical Lift Stage

High-load lift stage with aperture

Submicron closed-loop positioning

Excellent pitch and yaw characteristics over full travel

5 mm travel; custom designs for alternate travels available

Optional cleanroom and ESD protection

Precision-ground ball screw for high performance



*The AVS1000 provides precise elevation of a load in a vertical plane.*

Aerotech's AVS1000 series stages offer the ideal solution for applications that require moving large or heavy loads over very small incremental movements in elevation above a horizontal plane. Low profiles and precise motion capability make these stages ideal for use in semiconductor manufacturing and inspection, automated tool alignment, machine vision inspection systems, and laser machining applications.

### Quality Design Provides Superior Performance

The AVS1000 series provides precise elevation of a load in a vertical plane using a moving wedge design. The precision machined wedge block converts horizontal movement from a precision-ground ball screw to vertical elevation of the AVS1000 series tabletop.

Sealed linear motion guide bearings with integral wipers are incorporated to provide excellent payload capability, long life, and smooth, precision motion. Stable and parallel vertical motion with no rocking or horizontal deviation of the platform is ensured.

Careful design of the wedge angle and bearing system allows the AVS1000 series to achieve submicron resolution and still maintain a compact profile. The optional factory calibration option is available to further increase standard accuracy and repeatability.

### A Better Approach to Vertical Motion

The vertical lift approach offers an alternative to traditional Z-plane oriented stages. Not only do the AVS1000 series stages offer a lower profile, but the load can also be accessed easily from any side. And by centering the payload over the bearings, there are no cantilevering effects.

### Motor and Drives

The AVS1000 series includes Aerotech's high performance NEMA 34 frame-size BMS series brushless, slotless servomotor. The slotless motor has zero cogging and therefore is optimized for applications requiring very smooth motion.

Aerotech manufactures a wide range of matching drives and controls to provide a fully integrated and optimized motion solution.

## AVS1000 Series SPECIFICATIONS

Mechanical Specifications		AVS1000-05	AVS1000-10
Travel		5 mm	10 mm
Accuracy <sup>(1)</sup>	Standard	±2.0 µm	±4.0 µm
	Calibrated	±1.0 µm	±1.0 µm
Resolution		5 nm	
Repeatability (Bidirectional) <sup>(1)</sup>		±0.5 µm	
Straightness <sup>(2)</sup>		±0.5 µm	±1.0 µm
Pitch <sup>(2)</sup>		±5 arc sec	±7.5 arc sec
Roll <sup>(2)</sup>		±5 arc sec	±7.5 arc sec
Yaw <sup>(2)</sup>		±5 arc sec	±7.5 arc sec
Maximum Speed		20 mm/s	
Maximum Acceleration		0.05 g	
Load Capacity <sup>(3)</sup>	Vertical	135 kg	
Material		Aluminum	
MTBF (Mean Time Between Failure)		15,000 Hours	

Notes:

1. Certified with each stage.
2. Specifications are for no load condition. Pitch, roll, and straightness may be affected by amount and centering of the load.
3. Load must be centered within the stage aperture.
4. 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.

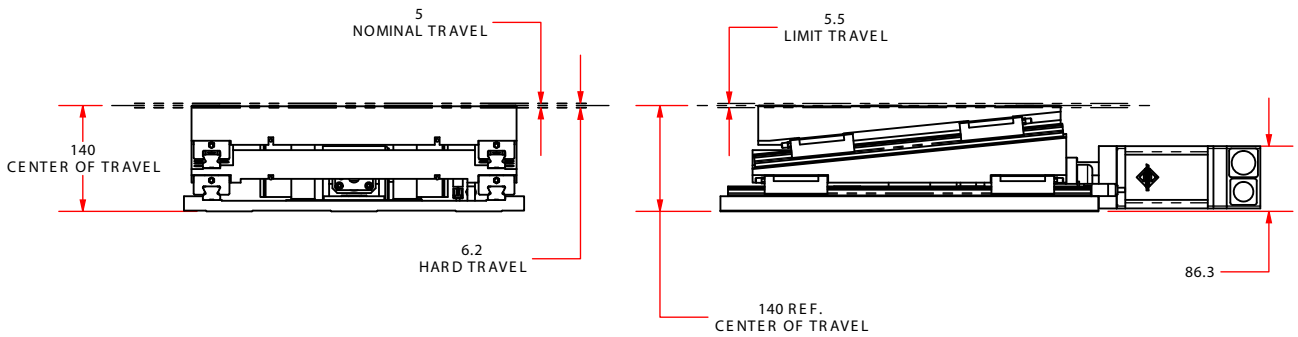
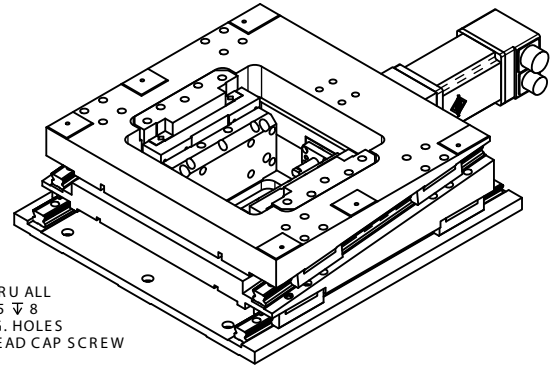
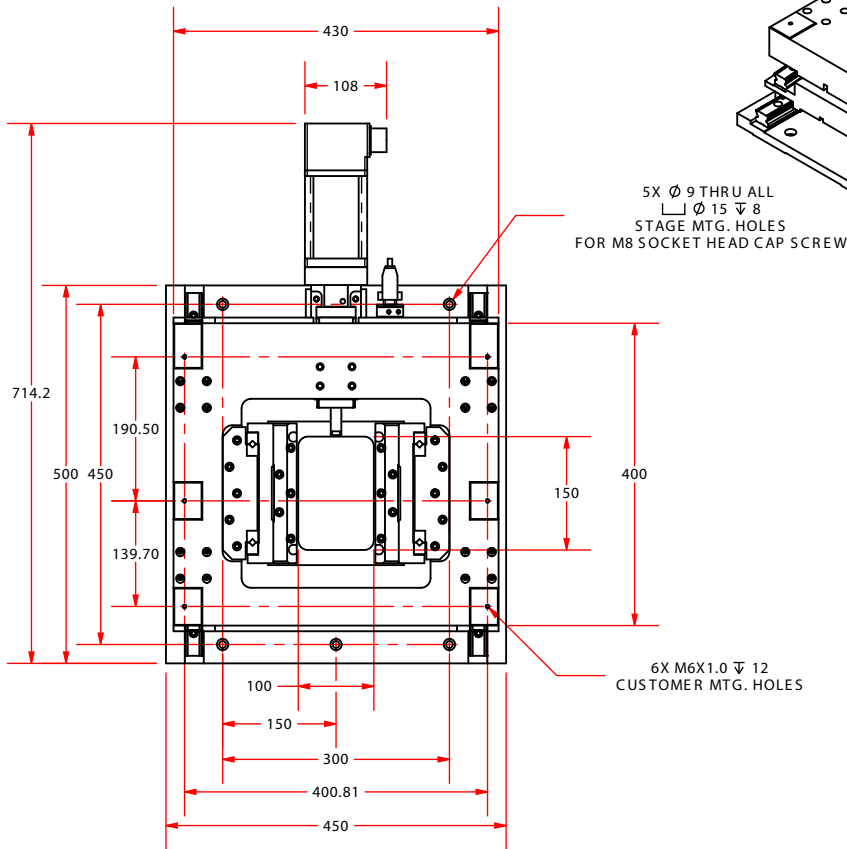
Electrical Specifications	
Drive System	Brushless Rotary Servomotor
Feedback	Noncontact Linear Encoder
Maximum Bus Voltage	up to 320 VDC
Limit Switches	5 V, Normally Closed

Recommended Controller		
Multi-Axis	A3200	Ndrive MP/Ndrive CP/Ndrive HLe/Npaq MXR
	Ensemble	Ensemble MP/Ensemble CP/Ensemble HLe/Epaq
Single Axis	Soloist	Soloist MP/Soloist CP/Soloist HLe

Notes:

1. Linear amplifiers are required to achieve the listed specifications. Other options are available.

# AVS1000 DIMENSIONS



DIMENSIONS: MILLIMETERS

NOTES:

1. SOME DIMENSIONS MAY VARY BASED ON CUSTOMER REQUIREMENTS. CONTACT AEROTECH FOR DETAILS.

## AVS1000 Series ORDERING INFORMATION

### AVS1000 Mechanical-Bearing Ball-Screw Lift Stage

#### Travel (Required)

---

-05 5 mm travel

Note: Custom travels available; consult Aerotech for more information.

#### Motor (Optional)

---

-M1 BMS280 brushless servomotor and 1000-line TTL encoder  
 -M2 BMS280 brushless servomotor and 1000-line TTL encoder with brake  
 -M3 BMS280 brushless servomotor and 1000-line 1 Vpp encoder  
 -M4 BMS280 brushless servomotor and 1000-line 1 Vpp encoder with brake

#### Limits (Required)

---

-LI1 Normally-closed limit switches; 9-Pin D connector  
 -LI2 Normally-closed limit switches; flying leads  
 -LI3 Normally-open limit switches; 9-Pin D connector  
 -LI4 Normally-open limit switches; flying leads

#### 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.