

AVS100/AVSI100 Series

Vertical Translation Stage

Long-life linear guide bearing system

Submicron closed-loop positioning

Low-cost high performance stage

6, 13, and 25 mm travel models

Precision-ground ball screw

Integral or removable motor



Aerotech's AVS100/AVSI100 series stages offer the ideal solution for applications that require very small incremental movements in elevation above a horizontal plane. Low profiles and precise motion capability make these stages ideal for use in semiconductor wafer inspection and testing, fiber optics assembly and inspection, automated tool alignment, machine vision inspection systems, and laser machining applications.

The AVSI100 series stages provide identical performance to the AVS100 stages, but in an even smaller footprint. The AVSI100 integrates the motor directly with the drive screw with no motor coupling. This makes the stage significantly shorter in length.

Quality Design Provides Superior Performance

The AVS100/AVSI100 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 AVS100/AVSI100 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 AVS100/AVSI100 series to achieve submicron resolution and still maintain a compact profile. The optional HALAR 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 AVS100/AVSI100 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. The AVS100/AVSI100 series stages provide a space-saving alternative to traditional XYZ systems and are equally suited to laboratory and industrial applications. Optional stage finishes are available for various environments, including vacuum preparation.

Additional Standard Features

All AVS100/AVSI100 series stages are equipped standard with integral limit switches and mechanical hard stops. The stage tabletop is treated with a Teflon®-impregnated hardcoat (Rockwell 62 hardness) that is scratch-resistant and provides outstanding protection in the harshest environments. The stage itself has a black anodize finish.

Motor and Drives

The AVS100/AVSI100 series includes Aerotech's high performance NEMA 23 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.

AVS100/AVSI100 Series SPECIFICATIONS

Basic Model		AVS/AVSI106	AVS/AVSI113	AVS/AVSI125
Travel		6 mm	13 mm	25 mm
Drive System		Precision Ball Screw/Brushless Servomotor (BMS60-A-D25-E1000H)		
Bus Voltage		Up to 160 VDC		
Continuous Current	A _{pk}	2.3 A		
	A _{rms}	1.6 A		
Resolution	1000-line driver output encoder (AVS)	0.53 μ m @ 4000 steps/rev motor resolution		
	1000-line amplified sine output encoder (AVSI)	5.3 nm - 0.106 μ m		
	2500-line line driver output encoder (AVSI)	0.2 μ m @ 10,000 steps/rev motor resolution		
Maximum Travel Speed		50 mm/s (2 in/s)		
Effective Lead		2.12 mm/rev		
Maximum Load ⁽¹⁾		25.0 kg (55.0 lb)		
Accuracy	Standard	$\pm 1.5 \mu$ m ($\pm 60 \mu$ in)	$\pm 3.0 \mu$ m ($\pm 120 \mu$ in)	$\pm 5.0 \mu$ m ($\pm 200 \mu$ in)
	HALAR ⁽²⁾	$\pm 1.0 \mu$ m ($\pm 40 \mu$ in)		
Repeatability (Bidirectional)	Standard	$\pm 1.0 \mu$ m ($\pm 40 \mu$ in)		
	HALAR ⁽²⁾	$\pm 0.75 \mu$ m ($\pm 30 \mu$ in)		
Straightness and Flatness (Maximum Deviation)		$\pm 1.5 \mu$ m ($\pm 60 \mu$ in)	$\pm 3.0 \mu$ m ($\pm 120 \mu$ in)	$\pm 5.0 \mu$ m ($\pm 200 \mu$ in)
Pitch and Roll		± 5 arc sec	± 7.5 arc sec	± 10 arc sec
Nominal Stage Weight (With Motor)		4.1 kg (9 lb)	6.1 kg (13.4 lb)	10.5 kg (23 lb)
Construction		Aluminum/Black Anodize/Hardcoat Table		

Notes:

1. Higher load possible with larger motor on the AVS series stage.

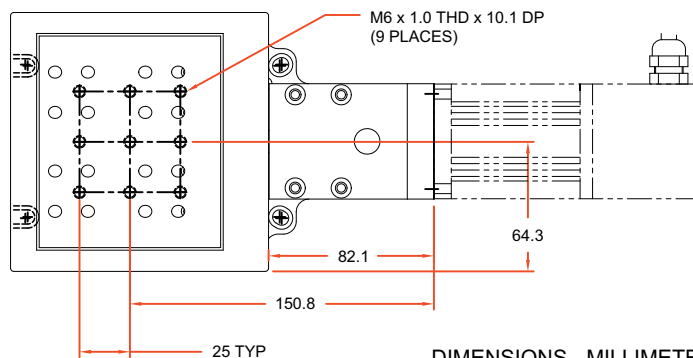
2. Requires Aerotech controller.

3. Specifications are for single-axis systems, measured 50 mm above the tabletop. Performance of multi-axis systems is payload and workpoint dependent. Consult factory for multi-axis or non-standard applications.

4. For inverted operation, consult factory.

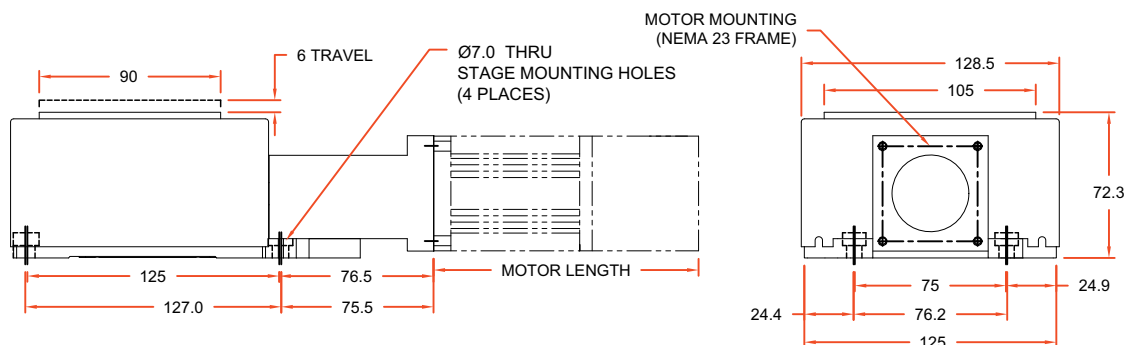
AVS106/AVSI106 DIMENSIONS

AVS106

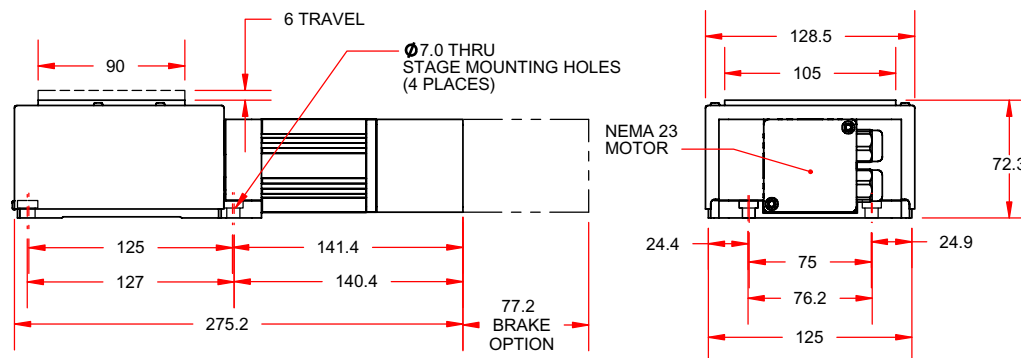
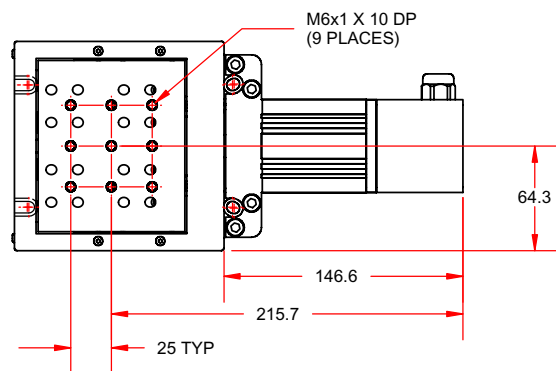


MOTOR OPTIONS	LENGTH
BMS (BMS60)	132.3
*See Motor Section for Alternate Motors and More Details.	

DIMENSIONS - MILLIMETERS [INCHES]

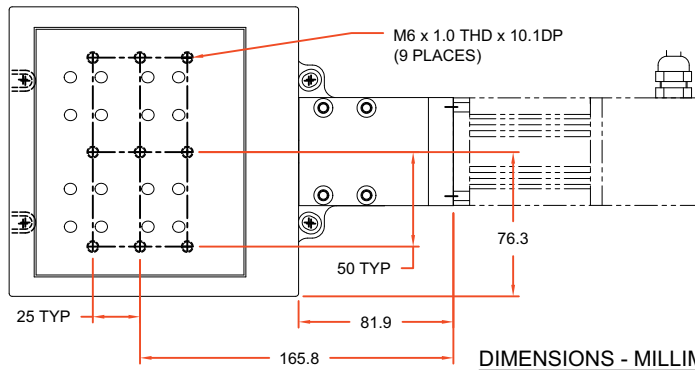


AVSI106



AVS113/AVSI113 DIMENSIONS

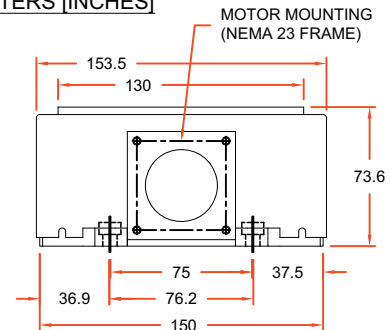
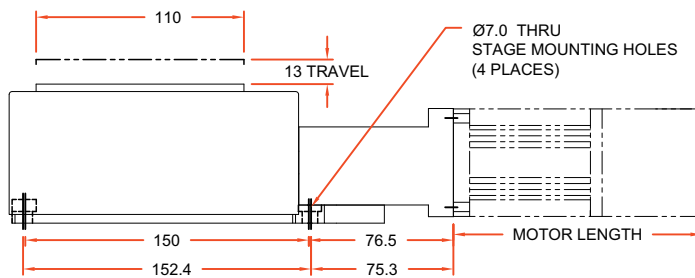
AVS113



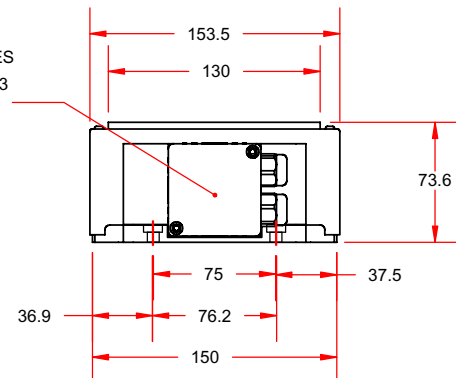
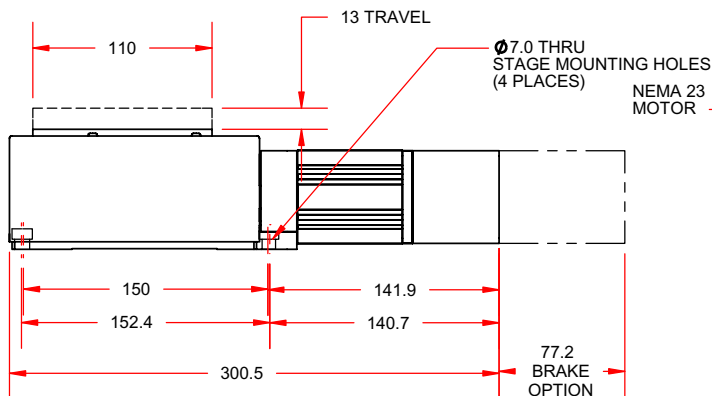
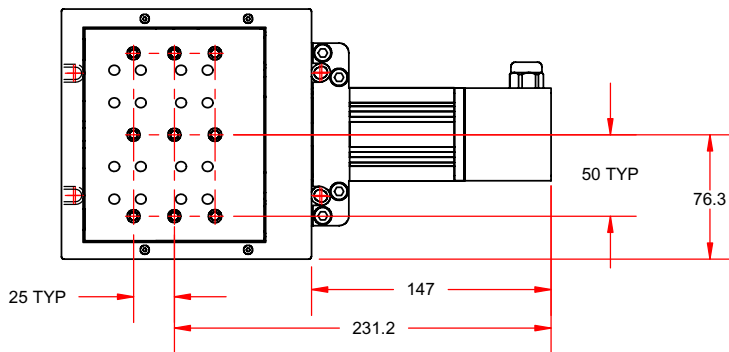
MOTOR OPTIONS	LENGTH
BMS (BMS60)	132.3 [5.21]

*See Motor Section for Alternate Motors and More Details.

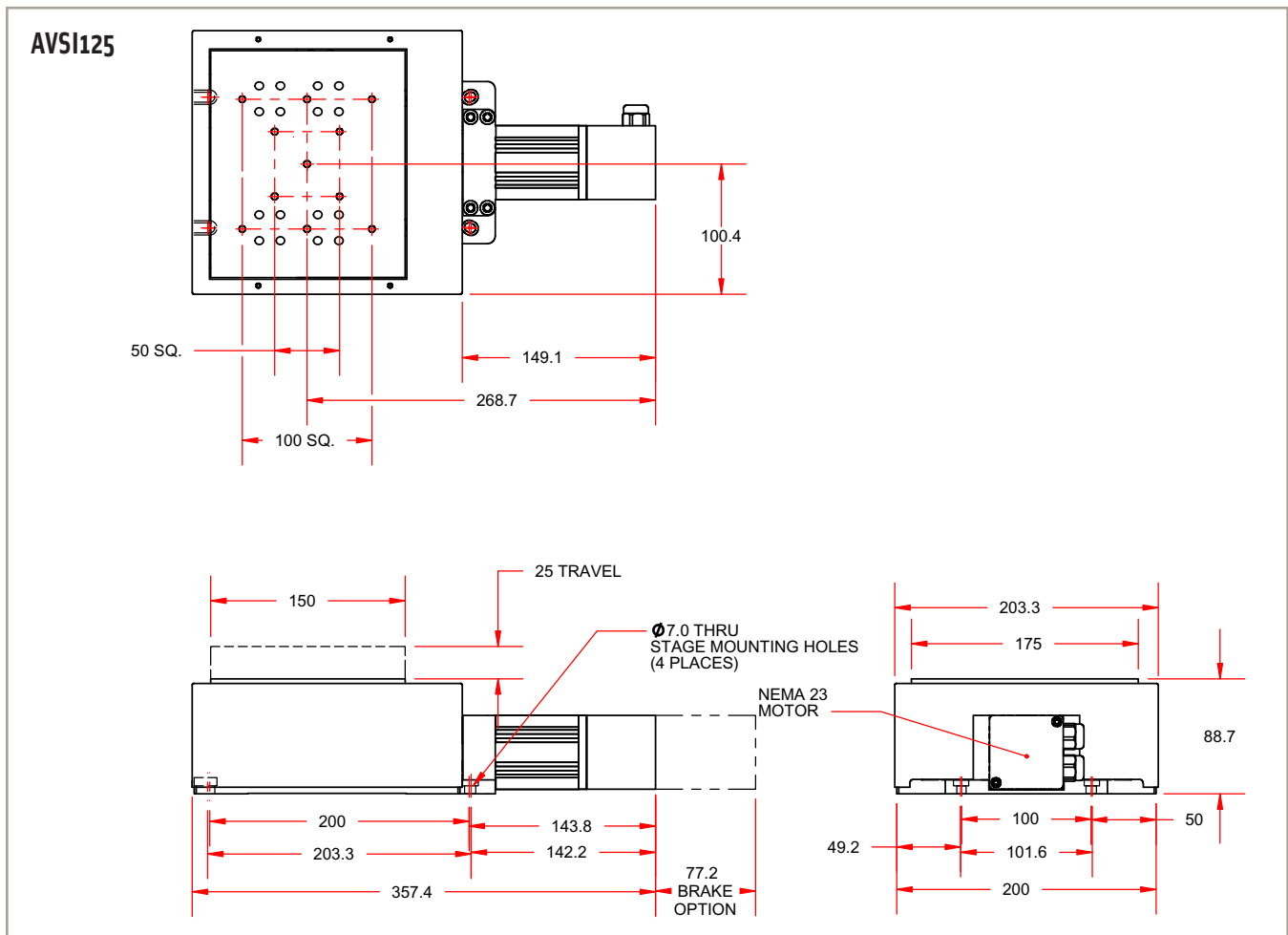
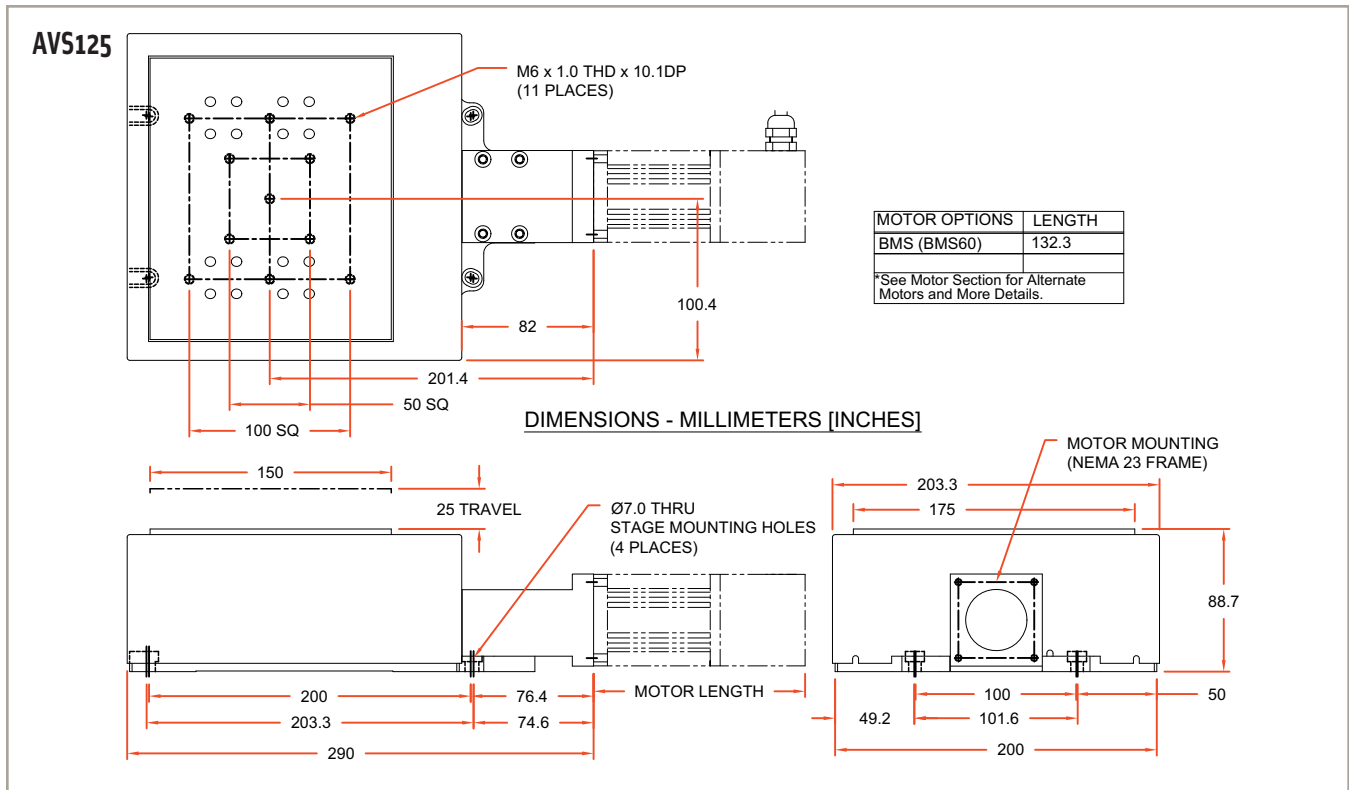
DIMENSIONS - MILLIMETERS [INCHES]



AVSI113



AVS125/AVSI125 DIMENSIONS



AVS100 Series ORDERING INFORMATION

Ordering Example

AVS1	06	/VAC3	-M	-BMS	-NC	-FB
Series	Travel (mm)	Vacuum Preparation	Mounting and Grid Pattern	Motor	Limits	Options
	06	/VAC3	-M	-BMS	-NC	-FB
	13	/VAC6		-NM	-NO	-BRK23
	25			-SM	-9 DU	
					-FLY	

AVS100 Series Vertical Translation Stage

AVS106	6 mm (0.25 in) travel stage with limits
AVS113	13 mm (0.5 in) travel stage with limits
AVS125	25 mm (1 in) travel stage with limits

Stage Construction Options

/VAC3	Vacuum preparation of stage to 10^{-3} torr
/VAC6	Vacuum preparation of stage to 10^{-6} torr

Mounting and Grid Pattern

-M	Metric dimension mounting pattern and holes
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Motor

-BMS	Brushless servomotor with connectors and 1000-line line driver output encoder. (BMS60-A-D25-E1000H)
-NM	No motor or encoder
-SM	50SMB2-HM NEMA 23 stepper motor with home marker

Limits

-NC	Normally-closed end-of-travel and home limit switches (standard)
-NO	Normally-open end-of-travel and home limit switches
-9 DU	9-pin D limit connector (use with -BMS or -DC motor options)
-FLY	Flying lead limit wiring (use with -NM or -SM motor options)

Options

-FB	Foldback motor kit (not available with -IM versions)
-BRK23	24 VDC spring-set motor brake for NEMA 23 motor

Accessories

HALAR	High-accuracy system, linear error correction for accuracy and repeatability
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AVS100 Series ORDERING INFORMATION

Ordering Example

AVS11	06	/VAC3	-M	-NC	-IM2500H	-3
Series	Travel (mm)	Vacuum Preparation	Mounting and Grid Pattern	Limits	Motor	Options
	06	/VAC3	-M	-NC	-IM2500H	-3
	13	/VAC6		-NO	-IM1000AS	-5
	25				-IM2500H-BRK -IM1000AS-BRK	

AVS100 Series Vertical Translation Stage

AVS1106	6 mm (0.25 in) travel stage with limits
AVS1113	13 mm (0.5 in) travel stage with limits
AVS1125	25 mm (1 in) travel stage with limits

Stage Construction Options

/VAC3	Vacuum preparation of stage to 10^{-3} torr
/VAC6	Vacuum preparation of stage to 10^{-6} torr

Mounting and Grid Pattern

-M	Metric dimension mounting pattern and holes
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Limits

-NC	Normally-closed end-of-travel and home limit switches (standard)
-NO	Normally-open end-of-travel and home limit switches

Motor

-IM2500H	Integral motor based on BMS60 with 2500 line driver encoder
-IM1000AS	Integral motor based on BMS60 with 1000 amplified sine encoder
-IM2500H-BRK	Integral motor based on BMS60 with 2500 line driver encoder and 24 VDC holding brake
-IM1000AS-BRK	Integral motor based on BMS60 with 1000 amplified sine encoder and 24 VDC holding brake

Options – Cable Orientation

-3	Left cable exit
-5	Right cable exit