

ATS5000 Series

Mechanical Bearing, Ball-Screw Stage

Rugged Construction

Hard-coated tabletop and waycovers

Optional high-accuracy, noncontact linear encoder

Sealed design with optional air purge

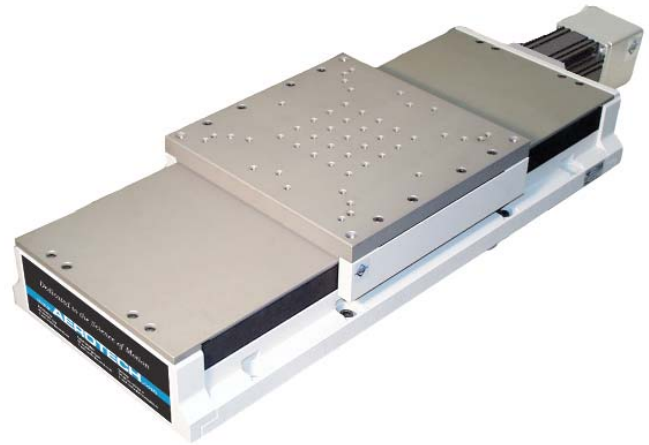
The ATS5000 was designed to meet the needs of the most demanding applications. A rigid base, fully sealed metal waycovers, and high-performance brushless servomotor make the ATS5000 the stage of choice in industrial applications such as laser machining, ceramic scribing, or any other application requiring high accuracy in a production environment.

Rugged Construction

The greatest attention to detail is evident in all aspects of the ATS5000's design. The tabletop utilizes stainless steel Helicoil™ inserts to protect mounting holes against thread wear.

An integral metal waycover is provided to protect the stage from hot sparks or debris. Both the metal waycover and tabletop are treated with a hardcoat (Rockwell 62 hardness) that is scratch-resistant and provides outstanding protection in the harshest applications.

To further provide the stage with protection from a caustic environment, the ATS5000 utilizes Aerotech's unique tensioned side-strap system. The straps are in a vertical orientation that prevents debris from accumulating on top of them, and are tensioned to create a tight seal. An optional air-purge fitting is available that allows air to be forced into the body of the stage. This creates a positive pressure that prevents any particulate, no matter how fine, from entering the stage.



To aid in system assembly, the base mounting holes are located outboard of the stage. Therefore, the stage can be mounted without removing the hardcover.

High Performance

The base of the ATS5000 is machined from special aluminum alloy tooling plate to provide high stiffness and long-term stability. Sealed linear motion guide bearings with integral wipers are incorporated to provide excellent payload capability and long-life, even with heavy offset loads.

Noncontact linear encoders with submicron repeatabilities are available on all ATS5000 series stages. Optional HALAR and HALSF factory calibration options are available that further increase the standard accuracy, straightness, and flatness specifications to even finer precision.

Motor and Drives

Included with all ATS5000 series stages is Aerotech's high performance BM series brushless servomotor. Aerotech manufactures a wide range of matching drives and controls to provide a fully integrated and optimized solution. Optional brushless and slotless (BMS series), NEMA 34 DC brush, and microstepping motors are also offered.

For maximum performance, a linear motor version is available – please refer to the ALS5000.

ATS5000 Series SPECIFICATIONS

Basic Model		ATS50030	ATS50045	ATS50060	ATS50075	ATS50090	ATS50100		
Total Travel		300 mm (12 in)	450 mm (18 in)	600 mm (24 in)	750 mm (30 in)	900 mm (36 in)	1000 mm (40 in)		
Drive System		Super-Precision Ground Ball Screw/Brushless Servomotor (BM250-MS-E1000H)							
Bus Voltage		Up to 320 VDC							
Continuous Current	A _{pk}	Up to 10.5 A							
	A _{pk}	Up to 7.4 A							
Feedback		Noncontact Rotary Encoder (1000 line)							
Resolution	4 mm/rev Lead	1.0 μm (40 μin) @ 4000 steps/rev Motor Resolution							
	0.2 in/rev Lead	1.25 μm (50 μin) @ 4000 steps/rev Motor Resolution							
	LN Linear Encoder	0.001 μm - 0.2 μm (0.04 μin - 8 μin)							
	LT Linear Encoder	0.005 μm - 1.0 μm (0.2 μin - 40 μin)							
Maximum Travel Speed ⁽¹⁾	4 mm/rev Lead	250 mm/s (10 in/s)			200 mm/s (8 in/s)				
	0.2 in/rev Lead	300 mm/s (12 in/s)		250 mm/s (10 in/s)	200 mm/s (8 in/s)				
Maximum Load	Horizontal	135.0 kg (300 lb)							
	Vertical	45.0 kg (100 lb)							
	Side	45.0 kg (100 lb)							
Accuracy	Ball Screw	HALAR ⁽³⁾	±1.0 μm (±40 μin)	±1.5 μm (±60 μin)	±2.0 μm (±80 μin)	±2.0 μm (±80 μin)	±3.0 μm (±120 μin)	±3.0 μm (±120 μin)	
		Standard	+0.0, -12.0 μm (+0, -480 μin)	+0.0, -18.0 μm (+0, -720 μin)	+0.0, -24.0 μm (+0, -960 μin)	+0.0, -30.0 μm (+0, -1200 μin)	+0.0, -36.0 μm (+0, -1280 μin)	+0.0, -36.0 μm (+0, -1440 μin)	
	LN	HALAR ⁽³⁾	±1.0 μm (±40 μin)						
		Standard	±5.0 μm (±200 μin)						
	LT	HALAR ⁽³⁾	±1.0 μm (±40 μin)						
		Standard	±12.0 μm (±480 μin)	±18.0 μm (±720 μin)	±24.0 μm (±960 μin)	±30.0 μm (±1200 μin)	±36.0 μm (±1440 μin)	±40.0 μm (±1600 μin)	
	Repeatability (Bidirectional)	Ball Screw	HALAR ⁽³⁾	±0.5 μm (±20 μin)					
			Standard	±1.0 μm (±40 μin)					
LN		±0.5 μm (±20 μin)							
LT		±0.5 μm (±20 μin)							
Straightness and Flatness	Differential	HALSF	1.0 μm/25 mm (40 μin/in)						
		Standard	2.0 μm/25 mm (80 μin/in)						
	Maximum Deviation	HALSF	±1.5 μm (±60 μin)	±2.5 μm (±100 μin)	±3.0 μm (±120 μin)	±3.5 μm (±140 μin)	±4.5 μm (±180 μin)	±5.0 μm (±200 μin)	
		Standard	±3.0 μm (±120 μin)	±4.0 μm (±160 μin)	±6.0 μm (±240 μin)	±7.0 μm (±280 μin)	±8.0 μm (±320 μin)	±9.0 μm (±360 μin)	
Pitch and Yaw		10 arc sec	14 arc sec	17 arc sec	20 arc sec	25 arc sec	25 arc sec		
Nominal Stage Weight	Less Motor	35.0 kg (77 lb)	42 kg (93 lb)	50 kg (109 lb)	62 kg (136 lb)	68 kg (148 lb)	72 kg (159 lb)		
	With Motor	39.0 kg (85 lb)	46 kg (101 lb)	54 kg (117 lb)	66 kg (144 lb)	71 kg (156 lb)	76 kg (167 lb)		
Construction		Aluminum Body/Stage; Hardcoated Table (62 Rockwell Hardness); Textured Epoxy (Polane-T) Pebble Grey Paint							

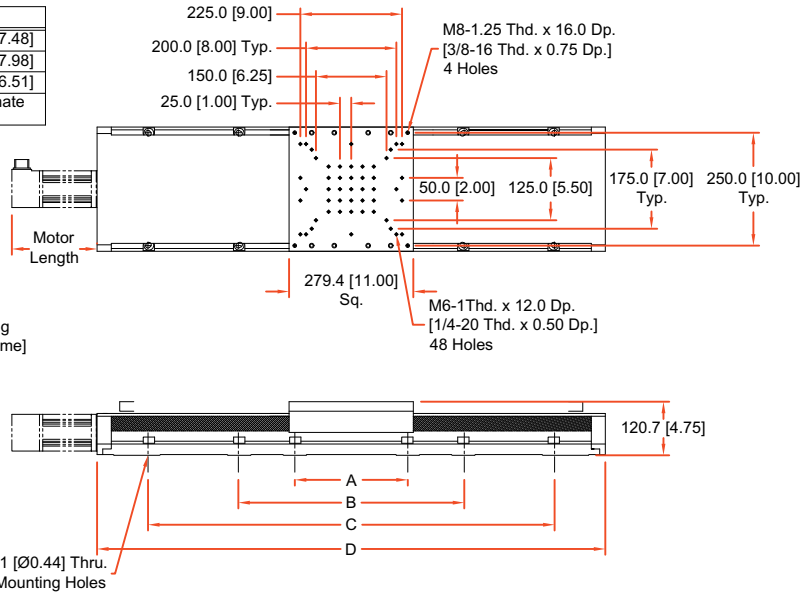
Notes:

- Excessive duty cycle may impact stage accuracy.
- Payload specifications are for single-axis system and based on ball screw and bearing life of 2500 km (100 million inches) of travel.
- Available with Aerotech controllers.
- 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.

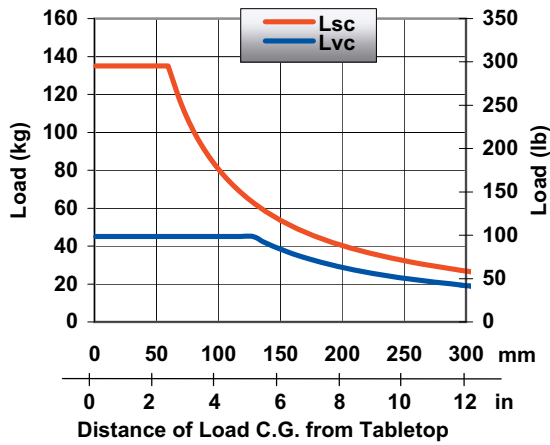
ATS5000 Series SPECIFICATIONS and DIMENSIONS

Motor Options	Length
BM (BM250-MS)	190.0 [7.48]
DC (1135LT-MSOF)	202.7 [7.98]
SM (310SMB3-HM)	165.4 [6.51]

*See Motor Section for Alternate Motors and More Details.

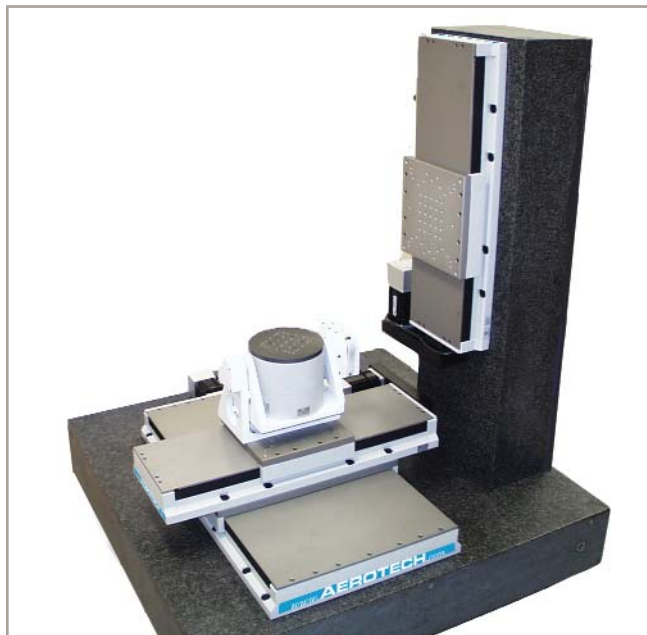
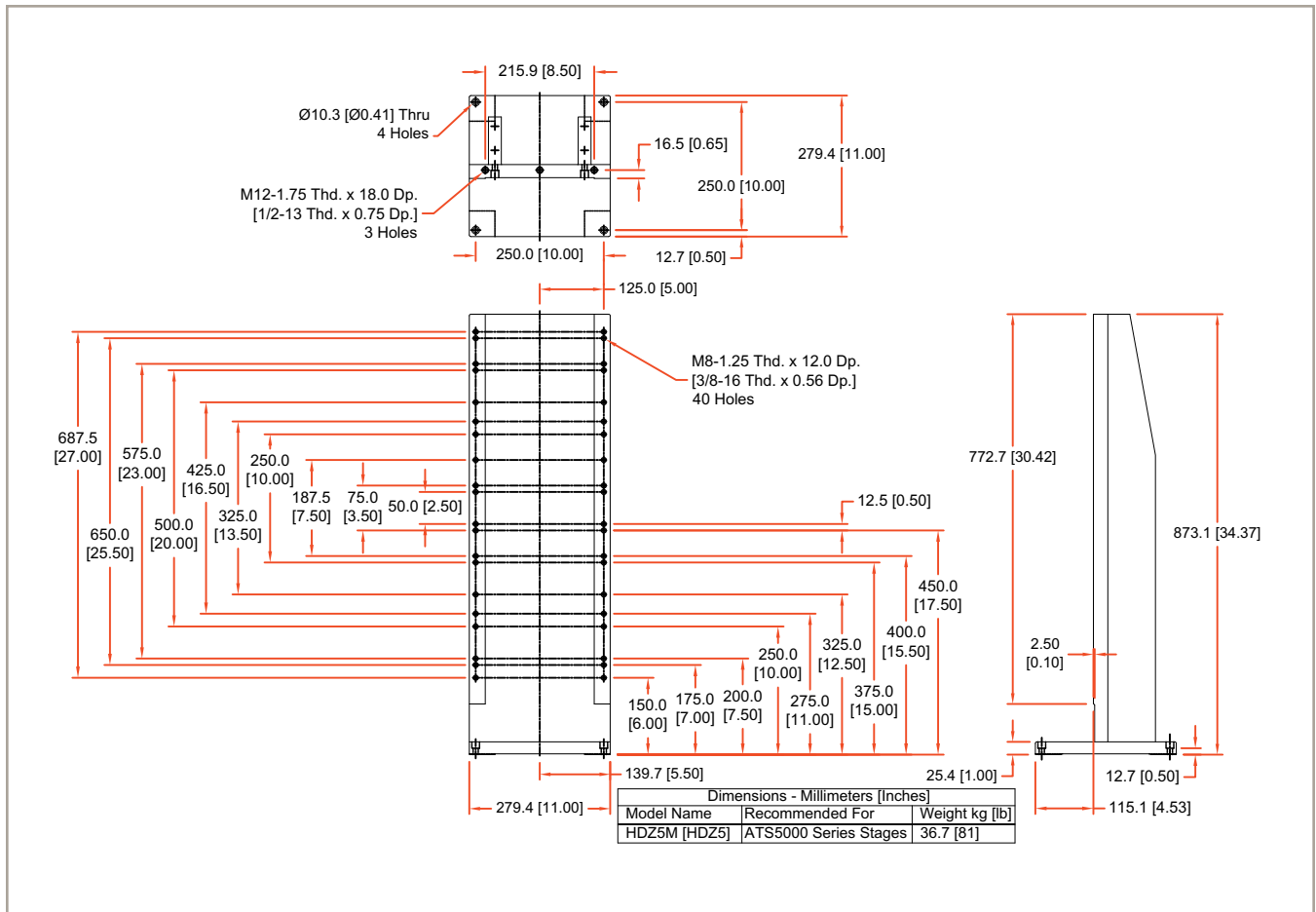


Basic Model	Total Travel	Dimensions -Millimeters [Inches]			
		A	B	C	D
ATS50030	300.0 [12.00]	250.0 [10.00]	500.0 [20.00]	-	685.8 [27.00]
ATS50045	450.0 [18.00]	250.0 [10.00]	500.0 [20.00]	-	838.2 [33.00]
ATS50060	600.0 [24.00]	250.0 [10.00]	500.0 [20.00]	-	990.6 [39.00]
ATS50075	750.0 [30.00]	250.0 [10.00]	500.0 [20.00]	910.0 [36.00]	1143.0 [45.00]
ATS50090	900.0 [36.00]	250.0 [10.00]	500.0 [20.00]	1060.0 [42.00]	1295.4 [51.00]
ATS50100	1000.0 [40.00]	250.0 [10.00]	500.0 [20.00]	1160.0 [46.00]	1397.0 [55.00]



L_{VC} and L_{SC} Cantilevered Load Capability (ATS5000)

ATS5000 Series – HDZ5 Bracket DIMENSIONS



Advanced production tool utilizing an ATS5000 wide-body, an ATS5000 with motor foldback kit, and a vertically mounted ATS5000 with motor foldback kit and fail-safe brake.

ATS5000 Series ORDERING INFORMATION

Ordering Example

ATS50	030		-M	-40P	-BM	-NC		
Series	Travel (mm)	Stage Construction Options	Mounting and Grid Pattern	Drive Screw	Motor	Limits	Linear Encoder	Options
	030	/VAC3	-M	-02P	-BM	-NC	-LTnnX5	-BRK34
	045	/VAC6	-U	-40P	-NM	-NO	-LTnnAS	-P5
	060	/STEEL			-BMS	-9DU	-LNnnAS	-FB
	075					-FLY		-FB-BRK
	090							
	100							

ATS5000 Series Linear Ball-Screw Stage

ATS50030	300 mm (12 in) travel stage with ground ball screw and limits
ATS50045	450 mm (18 in) travel stage with ground ball screw and limits
ATS50060	600 mm (24 in) travel stage with ground ball screw and limits
ATS50075	750 mm (30 in) travel stage with ground ball screw and limits
ATS50090	900 mm (36 in) travel stage with ground ball screw and limits
ATS50100	1000 mm (40 in) travel stage with ground ball screw and limits

Stage Construction Options

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

Mounting and Grid Pattern

-M	Metric dimension mounting pattern and holes
-U	English dimension mounting pattern and holes

Drive Screw

-02P	0.2 inch per rev drive-screw lead
-40P	4 mm per rev drive-screw lead

Motor

-BM	Brushless servomotor with connectors and 1000-line encoder; requires cable (BM250-MS-E1000H)
-NM	No motor or encoder
-BMS	Brushless, slotless servomotor with connectors and 1000-line encoder; requires cable (BMS280-AH-MS-E1000H)

Limits

-NC	Normally-closed end of travel limit switches (standard)
-NO	Normally-open end of travel limit switches
-9DU	With 9-pin limit connector
-FLY	With flying leads

ATS5000 Series ORDERING INFORMATION

Standard Linear Encoders

-LT30AS	Linear encoder for ATS50030; amplified sine output 1 Vpp (20 µm signal period); requires signal multiplier
-LT45AS	Linear encoder for ATS50045; amplified sine output 1 Vpp (20 µm signal period); requires signal multiplier
-LT60AS	Linear encoder for ATS50060; amplified sine output 1 Vpp (20 µm signal period); requires signal multiplier
-LT75AS	Linear encoder for ATS50075; amplified sine output 1 Vpp (20 µm signal period); requires signal multiplier
-LT90AS	Linear encoder for ATS50090; amplified sine output 1 Vpp (20 µm signal period); requires signal multiplier
-LT100AS	Linear encoder for ATS50100; amplified sine output 1 Vpp (20 µm signal period); requires signal multiplier
-LT30X5	Linear encoder for ATS50030; 1.0 micron line driver output
-LT45X5	Linear encoder for ATS50045; 1.0 micron line driver output
-LT60X5	Linear encoder for ATS50060; 1.0 micron line driver output
-LT75X5	Linear encoder for ATS50075; 1.0 micron line driver output
-LT90X5	Linear encoder for ATS50090; 1.0 micron line driver output
-LT100X5	Linear encoder for ATS50100; 1.0 micron line driver output

High-Accuracy Linear Encoders

-LN30AS	High-accuracy linear encoder for ATS50030; amplified sine output 1 Vpp (4 µm signal period); requires signal multiplier
-LN45AS	High-accuracy linear encoder for ATS50045; amplified sine output 1 Vpp (4 µm signal period); requires signal multiplier
-LN60AS	High-accuracy linear encoder for ATS50060; amplified sine output 1 Vpp (4 µm signal period); requires signal multiplier
-LN75AS	High-accuracy linear encoder for ATS50075; amplified sine output 1 Vpp (4 µm signal period); requires signal multiplier
-LN90AS	High-accuracy linear encoder for ATS50090; amplified sine output 1 Vpp (4 µm signal period); requires signal multiplier
-LN100AS	High-accuracy linear encoder for ATS50100; amplified sine output 1 Vpp (4 µm signal period); requires signal multiplier

Note: Internal signal multiplier available with A3200 amplifier products.

Options

-BRK34	24 VDC spring-set motor brake for NEMA 34 motor
-P5	Air-purge pressure fittings
-FB	Foldback motor kit
-FB-BRK	Foldback motor kit for use with NEMA 34 brake (brake between stage and foldback)

Accessories (to be ordered as separate line item)

HDZ5	Right angle L-bracket to mount any ATS5000 series stage; English bolt pattern
HDZ5M	Right angle L-bracket to mount any ATS5000 series stage; metric bolt pattern
HALAR	High-accuracy system — linear error correction for accuracy and repeatability
HALSF	High-accuracy system — improved straightness and flatness
ALIGNMENT-NPA	Non-precision XY assembly
ALIGNMENT-NPAZ	Non-precision XZ or YZ assembly
ALIGNMENT-PA10	XY assembly; 10 arc sec orthogonal
ALIGNMENT-PA10Z	XZ or YZ assembly with L-bracket; 10 arc second orthogonal
ALIGNMENT-PA5	XY assembly; 5 arc sec orthogonal
ALIGNMENT-PA5Z	XZ or YZ assembly with L-bracket; 5 arc second orthogonal