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ATS2000 Series

Mechanical Bearing, Ball-Screw Stage

- Sealed design with optional air purge
- Hard-coated tabletop and waycovers
- Optional high-accuracy, noncontact linear encoder
- Long-life linear motion guide bearing system



The ATS2000 is a compact, high-performance stage that is as accurate as it is reliable. A rigid base, fully sealed metal waycovers, and high-performance brushless servomotor make the ATS2000 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

Based on the same platform as the larger ATS5000 series, the ATS2000 has many of the same design features. 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 ATS2000 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.

High Performance

Sealed linear motion guide bearings with integral wipers are incorporated to provide excellent payload capability and long life. Noncontact linear encoders with submicron repeatabilities are available on all ATS2000 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 ATS2000 series stages is Aerotech's high performance BMS series brushless, slotless servomotor. Aerotech manufactures a wide range of matching drives and controls to provide a fully integrated and optimized solution.

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ATS2000 Series SPECIFICATIONS

Basic Model			ATS20010	ATS20015	ATS20020	ATS20025	ATS20030
Total Travel			100 mm (4 in)	150 mm (6 in)	200 mm (8 in)	250 mm (10 in)	300 mm (12 in)
Drive System			Super-Precision Ground Ball Screw/Brushless Servomotor (BMS60-A-D25-E1000H)				
Bus Voltage			Up to 160 VDC				
Continuous Current	A_{pk}		Up to 2.3 A				
	A_{rms}		Up to 1.6 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				
	LT Linear Encoder		0.005 µm-1.0 µm (0.2 µin-40 µin)				
Maximum Travel Speed[1]	4 mm/rev Lead		220 mm/s (8.7 in/s)				
	0.2 in/rev Lead		280 mm/s (11 in/s)				
Maximum Load[2]	Horizontal		80.0 kg (176.4 lb)				
	Vertical		40.0 kg (88.2 lb)				
	Side		40.0 kg (88.2 lb)				
Accuracy	Ball Screw	HALAR[3]	±1.0 µm (±40 µin)				
		Standard	+2.0, -4.0 µm (+80, -160 µin)	+2.0, -5.0 µm (+80, -200 µin)	+2.0, -8.0 µm (+80, -320 µin)	+2.0, -10.0 µm (+80, -400 µin)	+2.0, -12.0 µm (+80, -480 µin)
	LT	HALAR[3]	±1.0 µm (±40 µin)				
		Standard	±5.0 µm (±200 µin)				
Repeatability (Bidirectional)	Ball Screw	HALAR[3]	±0.5 µm (±20 µin)				
		Standard	±1.0 µm (±40 µin)				
	LT		±0.5 µm (±20 µin)				
Straightness and Flatness		HALSF	±1.0 µm (±40 µin)	±1.5 µm (±60 µin)	±2.0 µm (±80 µin)	±3.0 µm (±120 µin)	±3.0 µm (±120 µin)
		Standard	±2.0 µm (±80 µin)	±3.0 µm (±120 µin)	±4.0 µm (±160 µin)	±5.0 µm (±200 µin)	±5.0 µm (±200 µin)
Pitch and Yaw			6 arc sec	8 arc sec	10 arc sec	12 arc sec	14 arc sec
Nominal Stage Weight	Less Motor		9.5 kg (20.9 lb)	11.0 kg (24.3 lb)	12.0 kg (26.5 lb)	13.5 kg (29.8 lb)	15.0 kg (33.1 lb)
	With Motor		10.6 kg (23.4 lb)	12.1 kg (26.7 lb)	13.1 kg (28.9 lb)	14.6 kg (32.2 lb)	16.1 kg (35.5 lb)
Construction			Aluminum Body/Stage; Hard Coated Table (62 Rockwell Hardness); Textured Epoxy (Polane-T) Pebble Grey Paint				

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

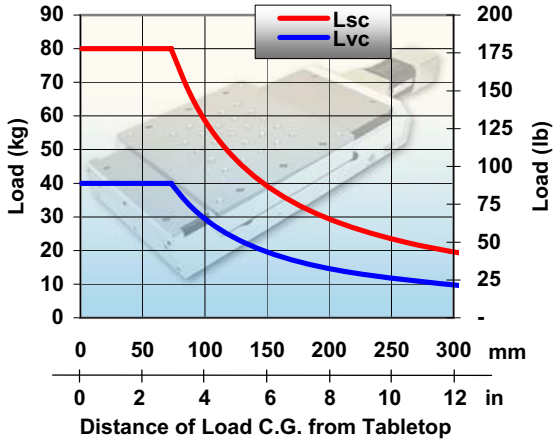
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ATS2000 Series SPECIFICATIONS and DIMENSIONS

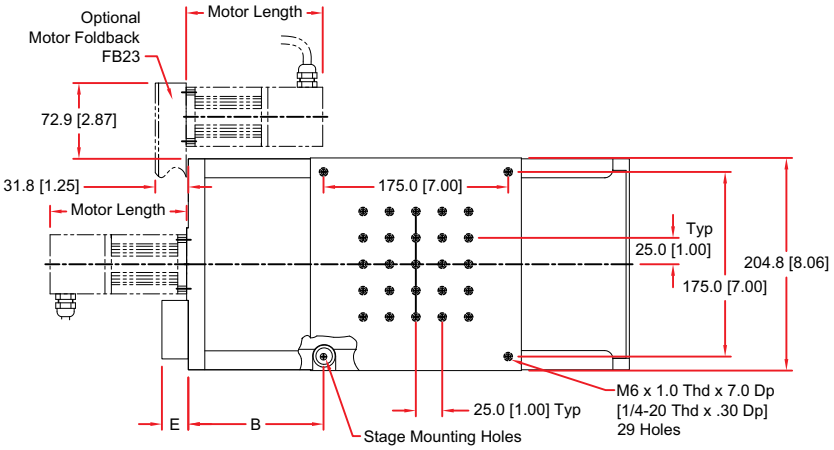


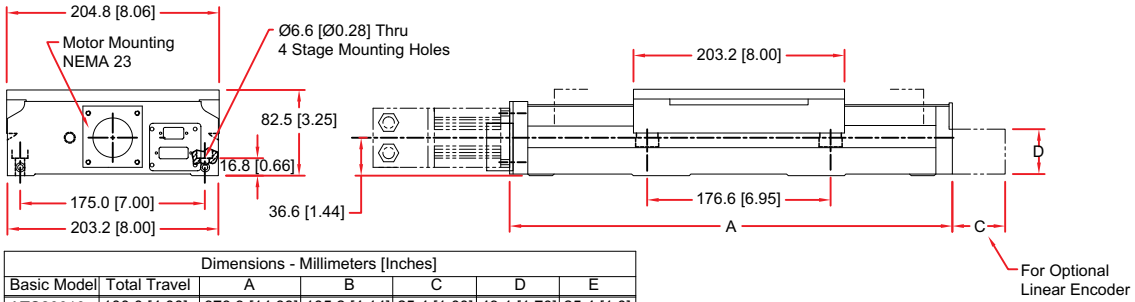
XY pair configured with optional high-accuracy noncontact linear encoders for optimal performance.



L_{VC} and L_{SC} Cantilevered Load Capability (ATS2000)

Motor Options	Length
BMS (BMS60)	132.3 [5.21]
DC (1050LT-MSOF)	178.6 [7.03]
SM (101SMB2-HM)	135.1 [5.32]
*See Motor Section for Alternate Motors and More Details.	





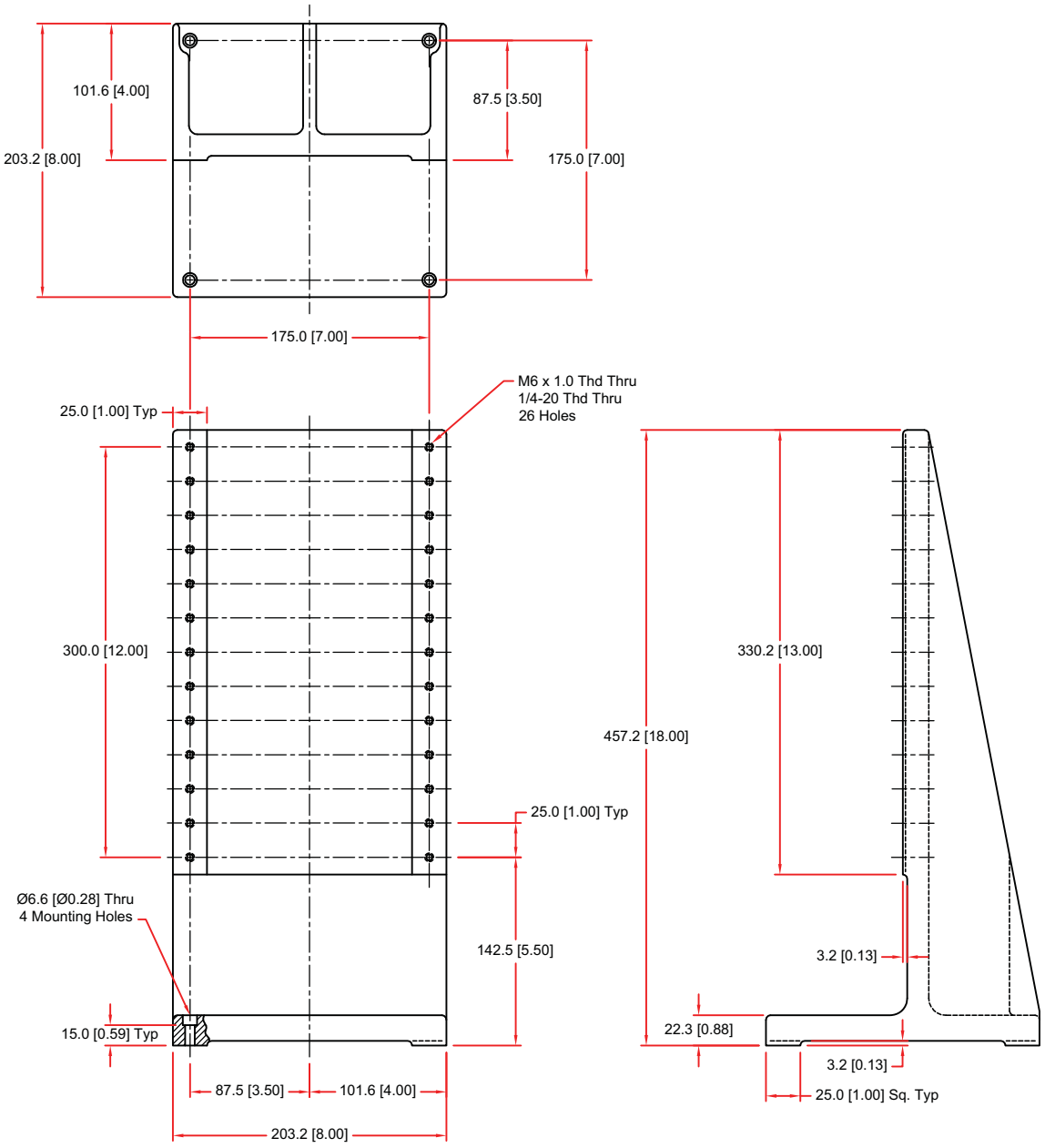
Dimensions - Millimeters [Inches]						
Basic Model	Total Travel	A	B	C	D	E
ATS20010	100.0 [4.00]	378.3 [14.89]	105.2 [4.14]	25.4 [1.00]	43.1 [1.70]	25.4 [1.0]
ATS20015	150.0 [6.00]	429.1 [16.89]	130.6 [5.14]	25.4 [1.00]	43.1 [1.70]	25.4 [1.0]
ATS20020	200.0 [8.00]	479.9 [18.89]	156.0[6.14]	25.4 [1.00]	43.1 [1.70]	25.4 [1.0]
ATS20025	250.0 [10.00]	530.7 [20.89]	181.4[7.14]	50.8 [2.00]	43.1 [1.70]	25.4 [1.0]
ATS20030	300.0 [12.00]	581.4 [22.89]	206.8 [8.14]	76.2 [3.00]	43.1 [1.70]	25.4 [1.0]

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ATS2000 Series – HDZ20 Bracket DIMENSIONS

HDZ20



Dimensions - Millimeters [Inches]			
Basic Model	Recommended For Series	Finish	Weight kg [lb]
HDZ20	ATS2000 (Linear) Stages & ADR200 (Rotary) Stages	Pebble Grey Spatter	8.18 [18.0]

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ATS2000 Series ORDERING INFORMATION

Ordering Example

ATS20	-010		-M	-40P	-BMS		-NC		
Series	**Travel (mm)**	**Stage Construction Options**	**Mounting and Grid Pattern**	**Drive Screw**	**Motor**	**Linear Encoder**	**Limits**	**Options**	**Coupling**
	-010 -015 -020 -025 -030	/VAC3 /VAC6	-M -U	-02P -40P	-BMS -SM -NM	-LTnnX5 -LTnnAS -LTNONE	-NC -NO	-BRK -FB -FB-BRK23 -P2 -FB/BMS100	-NO COUPLING -STD COUPLING -LGR MTR COUPLING

ATS2000 Series Linear Ball-Screw Stage

ATS20010	100 mm (4 in) travel stage with ground ball screw, recirculating bearings, and limits
ATS20015	150 mm (6 in) travel stage with ground ball screw, recirculating bearings, and limits
ATS20020	200 mm (8 in) travel stage with ground ball screw, recirculating bearings, and limits
ATS20025	250 mm (10 in) travel stage with ground ball screw, recirculating bearings, and limits
ATS20030	300 mm (12 in) travel stage with ground ball screw, recirculating bearings, and 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
-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

-BMS	Brushless servomotor with connectors and 1000-line encoder; requires cable (BMS60-A-D25-E1000H/)
-SM	Stepping motor with connector and home marker pulse (one per rev); requires cable (101SMB2-HM/)
-NM	No motor or encoder

Standard Linear Encoders

-LT10X5	Linear encoder for ATS20010, 1.0 micron, line driver output
-LT15X5	Linear encoder for ATS20015, 1.0 micron, line driver output
-LT20X5	Linear encoder for ATS20020, 1.0 micron, line driver output
-LT25X5	Linear encoder for ATS20025, 1.0 micron, line driver output
-LT30X5	Linear encoder for ATS20030, 1.0 micron, line driver output
-LT10AS	Linear encoder for ATS20010, amplified sine output, 1 Vpp (20 µm signal period); requires signal multiplier
-LT15AS	Linear encoder for ATS20015, amplified sine output, 1 Vpp (20 µm signal period); requires signal multiplier
-LT20AS	Linear encoder for ATS20020, amplified sine output, 1 Vpp (20 µm signal period); requires signal multiplier
-LT25AS	Linear encoder for ATS20025, amplified sine output, 1 Vpp (20 µm signal period); requires signal multiplier
-LT30AS	Linear encoder for ATS20030, amplified sine output, 1 Vpp (20 µm signal period); requires signal multiplier
-LTNONE	No linear encoder option

Limits

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

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ATS2000 Series ORDERING INFORMATION

Options

-BRK	24 VDC spring-set motor brake for NEMA 23 motor
-FB	Foldback motor kit for BMS60 motor (0.25 in shaft)
-FB-BRK23	Foldback motor kit for use with NEMA 23 brake (brake between stage and foldback)
-P2	Air-purge pressure fittings
-FB/BMS100	Fold-back motor kit for BMS100 motor (0.375 in shaft)

Coupling

-NO COUPLING	No coupling
-STD COUPLING	0.25 in coupling
-LGR MTR COUPLING	0.375 in coupling

Accessories (to be ordered as separate line item)

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
HDZ20	English right angle L-bracket to mount any ATS2000 series stage
HDZ20M	Metric right angle L-bracket to mount any ATS2000 series stage
HDZ20/VAC6	VAC6 prepared English right angle L-bracket to mount any ATS2000 series stage
HDZ20M/VAC6	VAC6 prepared metric right angle L-bracket to mount any ATS2000 series stage
HALAR	High-accuracy system — linear error correction for accuracy and repeatability
HALSF	High-accuracy system — improved straightness and flatness

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