

# ATS100 Series

## Mechanical Bearing, Screw-Driven Linear Stage

Long life linear motion guide bearing system

Ultra-fine resolution

Integral bellows waycovers

Low profile, compact design

Includes brushless, slotless motor



The ATS100 series motor-driven linear stages provide the high resolution and repeatability required for semiconductor wafer testing and fabrication, automated microscope inspection systems, and precision micromachining applications.

### Outstanding Construction Features

ATS100 series stages are machined from a special cast aluminum alloy to provide a high strength-to-weight ratio, and long-term stability. The base is a box design that provides exceptional stiffness and stability.

ATS100 series stages employ a precision-ground ball screw pre-loaded to eliminate backlash, and its nut has wipers to prevent contamination and maintain high accuracy throughout the life of the stage. High-quality, pre-loaded duplex bearings are used to eliminate axial play.

All ATS100 series stages incorporate Linear Motion Guide (LMG) bearings to provide high load capability and high stiffness. The LMG design provides a compact stage with continuous carriage support over the entire travel and good cantilevered load capability. Integral wipers on the bearing trucks help ensure stage travel life. Highly accurate optical limit switches and end stops are also standard.

Integral bellows-type waycovers protect the drive and bearing system from contamination. Metal surfaces are protected with an attractive clear anodized finish. Both metric (standard) and English mounting and bolt-hole patterns are available.

### High Accuracy

The ATS100 sets the standard for precision performance in a compact package. With the -PL2 option, the ATS100 is capable of submicron accuracy and an impressive repeatability of 0.3  $\mu\text{m}$ .

### Motors and Drives

Included with the ATS100 series stages are Aerotech's BMS series brushless rotary motors. This motor has all of the advantages of a brushless motor – high acceleration, no brushes to wear, and lower heating – yet has zero cogging for extremely smooth motion and accuracy.

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

### Options

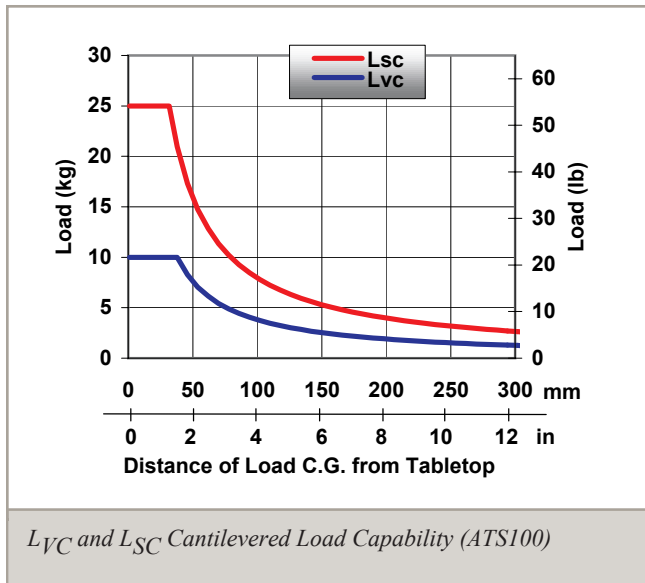
Standard options include a precision right-angle bracket for multi-axis assembly, and vacuum preparation to  $10^{-6}$  torr.

# ATS100 Series SPECIFICATIONS

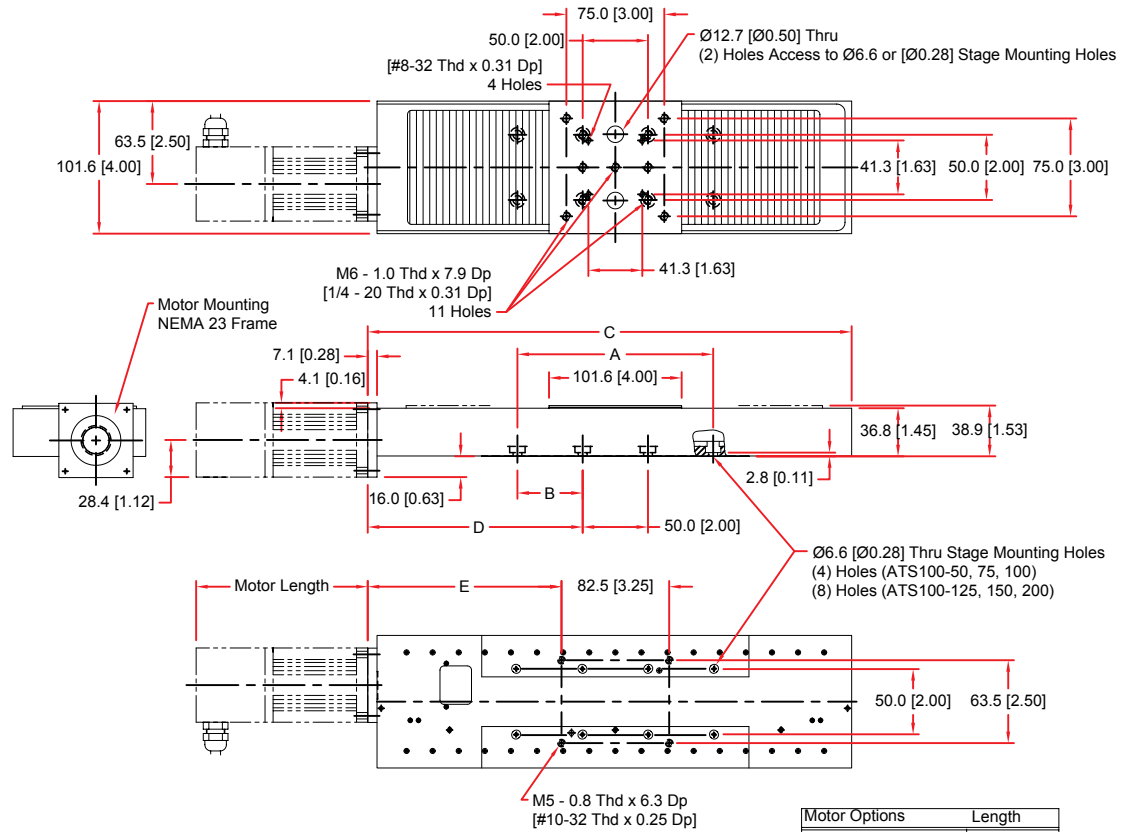
Basic Model		ATS100-050	ATS100-100	ATS100-150	ATS100-200	
Total Travel		50 mm (2 in)	100 mm (4 in)	150 mm (6 in)	200 mm (8 in)	
Maximum Travel Speed <sup>(1)</sup>		100 mm/s (4 in/s)				
Maximum Load <sup>(2)</sup>	Horizontal	25.0 kg (55.1 lb)				
	Vertical	10.0 kg (22.0 lb)				
	Side	10.0 kg (22.0 lb)				
Accuracy	Calibrated <sup>(3)</sup>	±0.5 µm (±20 µin)	±0.5 µm (±20 µin)	±0.75 µm (±30 µin)	±1.0 µm (±40 µin)	
	Standard	±2.0 µm (±80 µin)	±3.0 µm (±120 µin)	±5.0 µm (±200 µin)	±6.0 µm (±240 µin)	
Repeatability (Bidirectional)	Calibrated <sup>(3)</sup>	±0.3 µm (±12 µin)				
	Standard	±0.7 µm (±30 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	±0.5 µm (±20 µin)	±1.0 µm (±40 µin)	±1.5 µm (±60 µin)	±1.75 µm (±70 µin)
		Standard	±1.0 µm (±40 µin)	±2.0 µm (±80 µin)	±2.0 µm (±80 µin)	±3.0 µm (±120 µin)
Pitch and Yaw		5 arc sec	8 arc sec	10 arc sec	12 arc sec	
Nominal Stage Weight	Less Motor	1.6 kg (3.5 lb)	1.7 kg (3.7 lb)	1.8 kg (4.0 lb)	2.0 kg (4.4 lb)	
	With Motor	2.7 kg (6.0 lb)	2.8 kg (6.2 lb)	2.9 kg (6.4 lb)	3.1 kg (6.8 lb)	
Construction		Aluminum Body/Stage and Table; Clear Anodize Finish				

**Notes:**

- Excessive duty cycle may impact stage accuracy.
- Payload specifications are for single axis systems 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 25 mm above the tabletop. Performance of multi-axis systems is payload and workpoint dependent. Consult factory for multi-axis or non-standard applications.



# ATS100 Series DIMENSIONS



Dimensions - Millimeters [Inches]						
Base Model	Total Travel	A	B	C	D	E
ATS100-50	50.0 [2.00]	-	-	218.4 [8.60]	88.5 [3.48]	72.3 [2.84]
ATS100-100	100.0 [4.00]	-	-	269.2 [10.60]	113.9 [4.48]	97.7 [3.84]
ATS100-150	150.0 [6.00]	150.0 [6.00]	50.0 [2.00]	320.0 [12.60]	139.3 [5.48]	123.1 [4.84]
ATS100-200	200.0 [8.00]	150.0 [6.00]	50.0 [2.00]	370.8 [14.60]	164.7 [6.48]	148.5 [5.84]

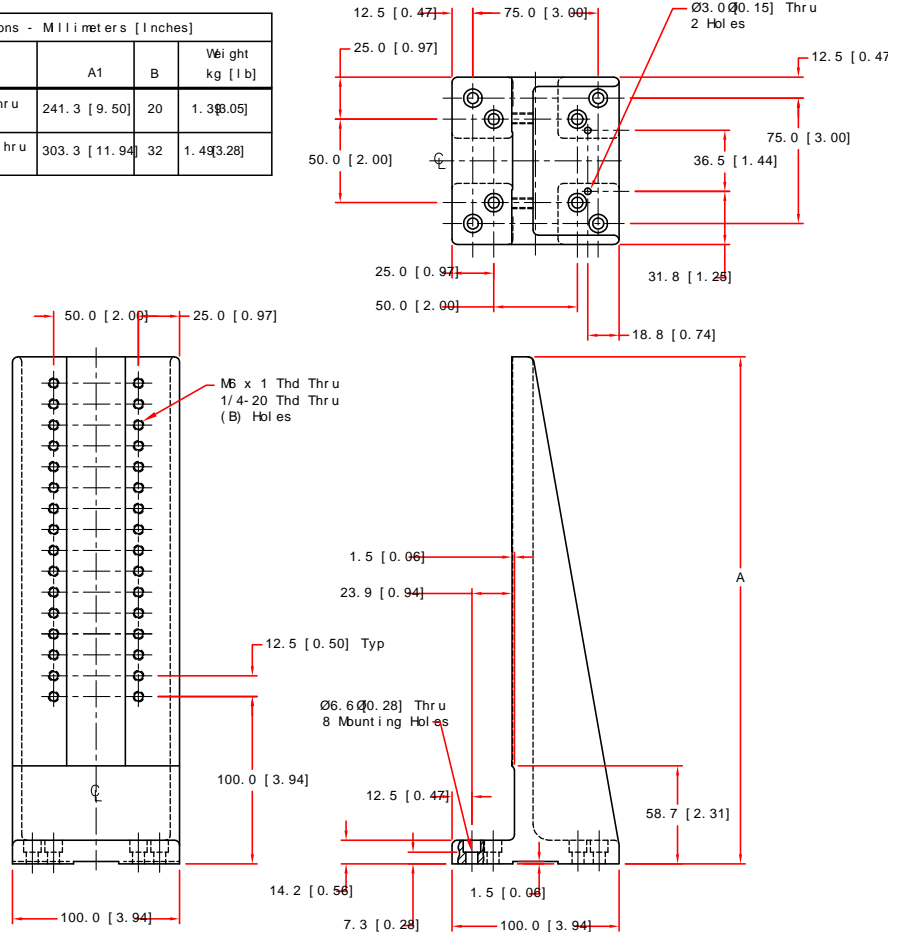
Motor Options	Length
BMS (BMS60)	132.3 [5.21]
SM (50SMB2-HM)	84.3 [3.32]
DC (1035LT-MSOF)	158.2 [6.23]

\*See Motor Section for Alternate Motors and More Details.

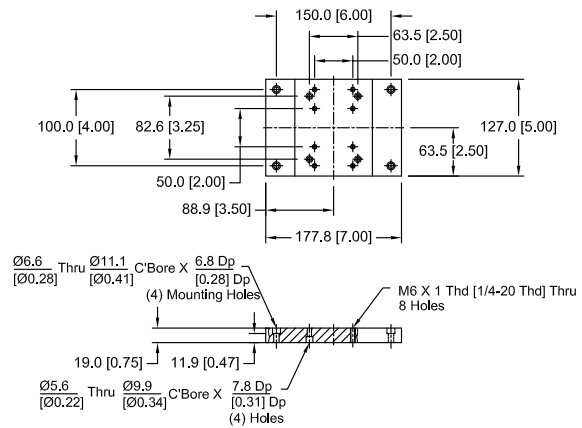
# ATS100 Series – HDZ1 Bracket and MP100 DIMENSIONS

## HDZ1 Bracket

Dimensions - Millimeters [Inches]				
Basic Model	Recommended For	A1	B	Weight kg [lb]
HDZ1	ATS100- 50 thru ATS100- 100	241.3 [9.50]	20	1.388[05]
HDZ1L	ATS100- 150 thru ATS100- 200	303.3 [11.94]	32	1.49[3.28]



## MP100



Dimensions - Millimeters [Inches]	
Option	Description
-MP1	Metric dimensions. For all ATS100 stages.
-MP2	English dimensions. For all ATS100 stages.

**ATS100 Series ORDERING INFORMATION****Travel (Required)**

-050	50 mm
-100	100 mm
-150	150 mm
-200	200 mm

**Vacuum Preparation (Optional)**

-HV	High vacuum preparation to $10^{-6}$ Torr
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**Tabletop (Required)**

-TT1	Tabletop with metric dimension mounting pattern and holes
-TT2	Tabletop with English dimension mounting pattern and holes

**Motor (Optional)**

-M1	BMS60 brushless servomotor with 1000-line TTL encoder
-M2	SM60 high voltage stepper motor
-M3	BMS60 servo motor w/1000-line 1 Vpp encoder
-M4	BMS60 servo motor w/1000-line 1 Vpp encoder and holding brake
-M5	BM75 servo motor w/ 2500-line TTL encoder
-M6	BM75 servo motor w/ 2500-line TTL encoder and holding brake
-M7	BM75 servo motor w/ 1000-line 1 Vpp encoder
-M8	BM75 servo motor w/ 1000-line 1 Vpp encoder and holding brake
-M9	SM60 stepper motor, SM60-CN1-VT2
-M10	SM60 stepper motor w/ holding brake, SM60-CN1-VT2-BK

**Foldback (Optional)**

-FB1	Foldback kit for .250 inch diameter shaft NEMA 23 motor
-FB2	Foldback kit w/brake for .250 inch diameter shaft NEMA 23 motor

**Motor Orientation (Optional)**

-2	Bottom cable exit, optional orientation
-3	Left-side cable exit, standard orientation
-4	Top cable exit, optional orientation
-5	Right-side cable exit, optional orientation
-8	Right-side foldback, standard orientation
-12	Left-side foldback, optional orientation

**Limits (Required)**

-LI1	Normally-closed limit switches, 5 VDC with 9-pin D connector
-LI2	Normally-open limit switches, 5 VDC with 9-pin D connector
-LI3	Normally-open limit switches, 9-pin D connector
-LI4	Normally-open limit switches, flying leads

**Coupling (Optional)**

-CP1	Coupling for 0.250 inch diameter shaft
-CP2	Coupling for 0.375 inch diameter shaft

**Mounting Plate (Optional)**

-MP1	Mounting plate, metric
-MP2	Mounting plate, English

**Metrology (Optional)**

-PL1	Metrology, uncalibrated with performance plots
-PL2	Metrology, calibrated (HALAR) with performance plots

**Metrology - HALSF (Optional)**

-PL5	Metrology, horizontal/vertical straightness correction (HALSF)
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## ATS100 Series ORDERING INFORMATION

### 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	<p><b>Integration - Test as system</b></p> <p>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.</p>
-TAC	<p><b>Integration - Test as components</b></p> <p>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.</p>

### Accessories (to be ordered as a separate line item)

ALIGN-NPA	Non-precision XY assembly
ALIGN-NPAZ	Non-precision XZ or YZ assembly
ALIGN-PA10	XY assembly; 10 arc sec orthogonality. Alignment to within 7 microns orthogonality for short travel stages.
ALIGN-PA10Z	XZ or YZ assembly with L-bracket; 10 arc second orthogonality. Alignment to within 10 microns orthogonality for short travel stages.
ALIGN-PA5	XY assembly; 5 arc sec orthogonality. Alignment to within 3 microns orthogonality for short travel stages.
ALIGN-PA5Z	XZ or YZ assembly with L-bracket; 5 arc second orthogonality. Alignment to within 5 microns orthogonality for short travel stages.
HDZ2-AP1500	English right angle L-bracket - for ATS1500-100 and ATS1500-200 only
HDZ2M-AP1500	Metric right angle L-bracket - for ATS1500-100 and ATS1500-200 only