ATS100 Series

Mechanical Bearing, Ball-Screw 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 HALAR option, the ATS100 is capable of submicron accuracy and an impressive repeatability of 0.3 µm.

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.

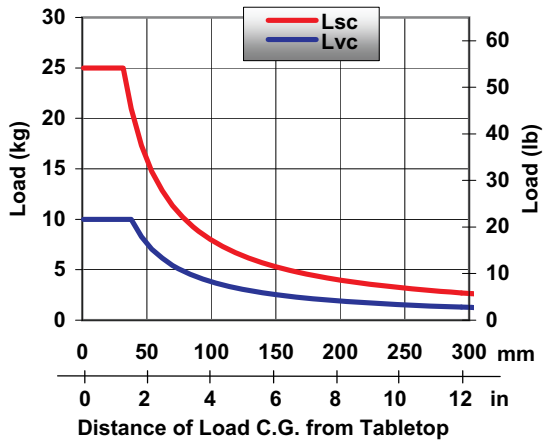
Options

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[1]			100 mm/s (4 in/s)			
Maximum Load[2]	Horizontal		25.0 kg (55.1 lb)			
	Vertical		10.0 kg (22.0 lb)			
	Side		10.0 kg (22.0 lb)			
Accuracy	HALAR[3]		±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)	HALAR[3]		±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			

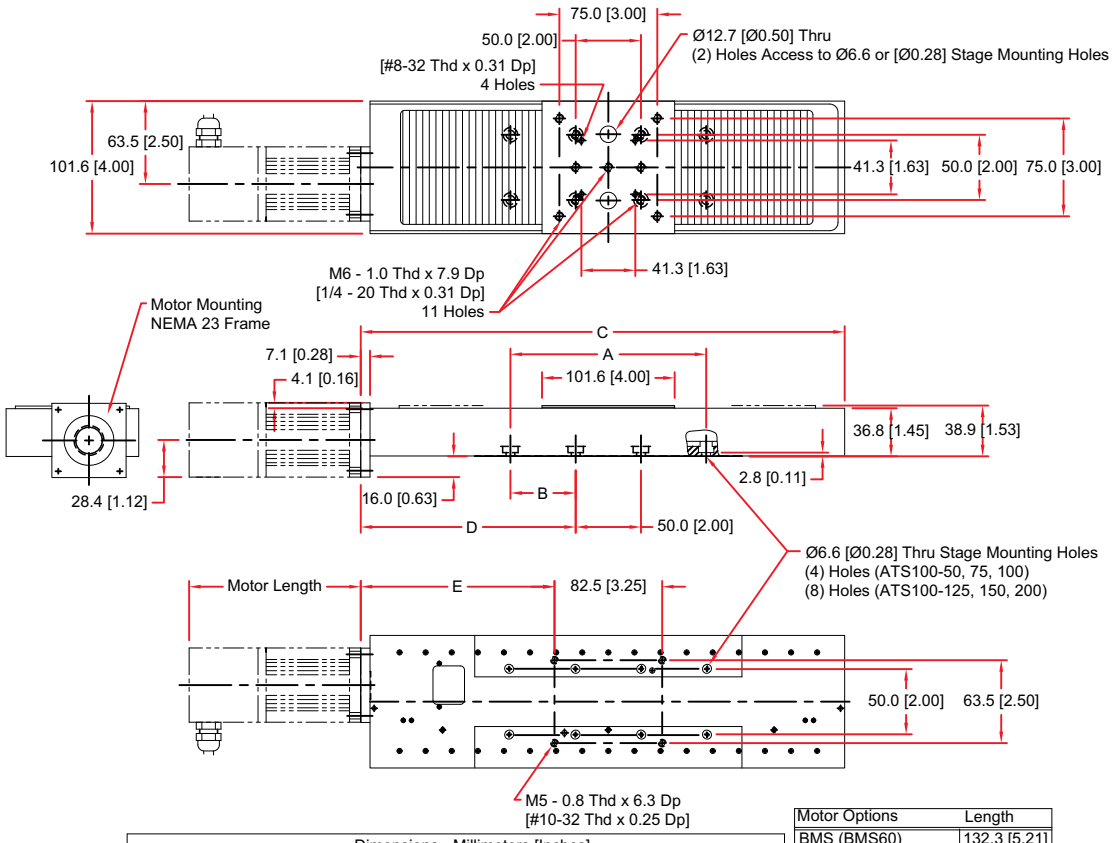
Notes:
1. Excessive duty cycle may impact stage accuracy.
2. Payload specifications are for single axis systems and based on ball screw and bearing life of 2500 km (100 million inches) of travel.
3. Available with Aerotech controllers.
4.Specifications are for single-axis systems, measured 25 mm above the tabletop. Performance of multi-axis systems is payload and workpoint dependent. Consult factory for multi-axis or non-standard applications.



L_{VC} and L_{SC} Cantilevered Load Capability (ATS100)

ATS100s shown in common XYZ orientation. An optional fail-safe brake is available for heavy vertical loads.

ATS100 Series DIMENSIONS



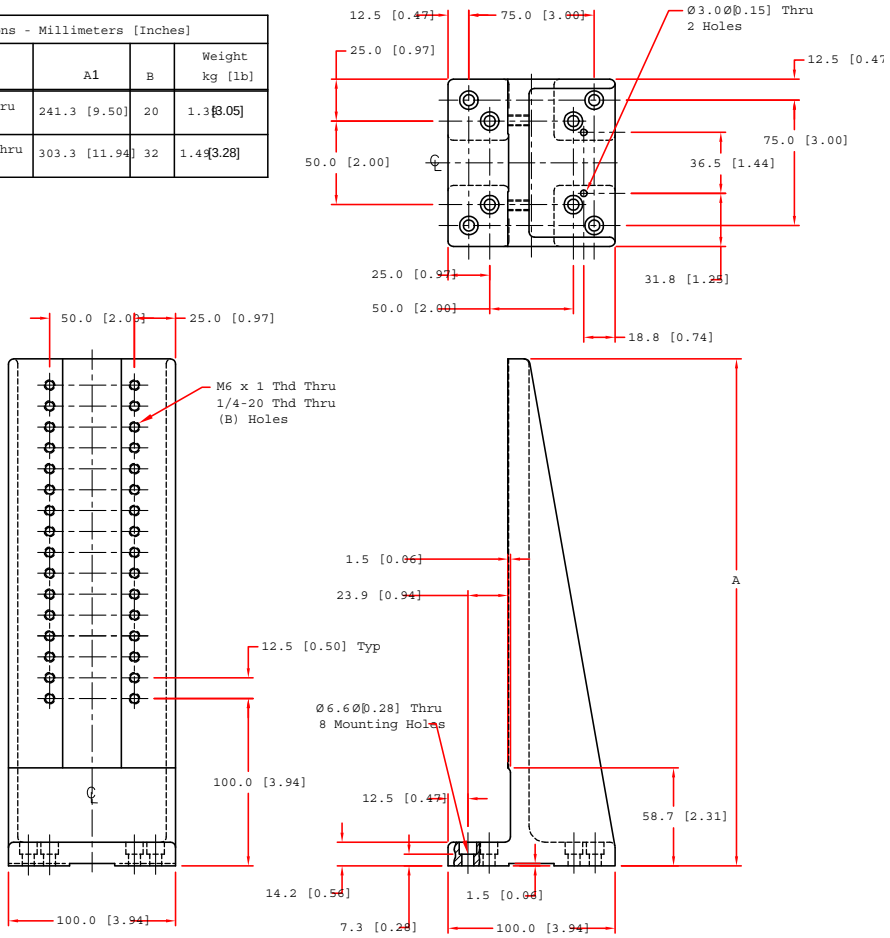
Dimensions - Millimeters [Inches]						
Base Model	Total Travel	A	B	C	D	E
ATS100-50	50.0 [2.00]	-		218.4 [8.60]	88.5 [3.48]	72.3 [2.84]
ATS100-100	100.0 [4.00]	-		269.2 [10.60]	113.9 [4.48]	97.7 [3.84]
ATS100-150	150.0 [6.00]	150.0 [6.00]	50.0 [2.00]	320.0 [12.60]	139.3 [5.48]	123.1 [4.84]
ATS100-200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

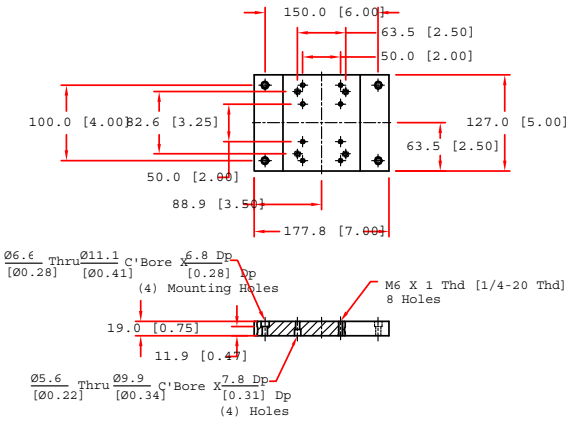
ATS100 Series – HDZ1 Bracket and MP100 DIMENSIONS

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	1.38 [3.05]
HDZ1L	ATS100-150 thru ATS100-200	303.3 [11.94]	32	1.49 [3.28]



MP100



Dimensions - Millimeters [Inches]	
Basic Model	Recommended For
MP100 Mtg Plate	ATS100-50, -100, -150 & ATS100-200

ATS100 Series ORDERING INFORMATION

Ordering Example

ATS100	-050		-20P	-M	-BMS		-2	-NC		
Series	Travel (mm)	Stage Construction Options	Drive Screw	Tabletop	Motor	Foldback Options	Motor Orientation	Limits	Coupling	Options
	-50 -100 -150 -200	/VAC3 /VAC6 /STEEL	-20P	-M -U	-NM -SM -BMS -BMS-BRK -BMS-AS -BMS-AS-BRK -BM -BM-BRK BM-AS -BM-AS-BRK	-FB025 -FB025-BRK	-0 -2 -3 -4 -5 -8 -12	-NC-9DU -NC-FLY -NO-9DU -NO-FLY	-C025 -C0375 -NONE	-MP100U -MP100U/VAC -MP100M -MP100M/VAC

ATS100 Series Linear Ball-Screw Stage

ATS100	The ATS100 series motor-driven linear stages provide the high resolution and repeatability required for a broad array of industrial applications. ATS100 series stages employ a precision-ground ball screw, which is 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.
ATS100-50	50 mm (2 in) travel stage with limits
ATS100-100	100 mm (4 in) travel stage with limits
ATS100-150	150 mm (6 in) travel stage with limits
ATS100-200	200 mm (8 in) travel stage with limits

Stage Construction Options (Optional)

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

Drive Screw (Required)

-20P	2 mm/rev precision-ground ball screw

Tabletop (Required)

-M	Tabletop with metric dimension mounting pattern and holes; stage mounting base holes slotted for English and metric installation
-U	Tabletop with English dimension mounting pattern and holes; stage mounting base holes slotted for English and metric installation

Motor (Required)

-NM	No motor or encoder
-SM	Stepping motor with connector and home marker pulse (50SMB2-HM/)
-BMS	Brushless servo motor with 2500-line encoder (BMS60-A-D25-E2500H)
-BMS-BRK	Brushless servo motor with 2500-line encoder and motor-mounted brake (BMS60-A-D25-E2500H-BK1)
-BMS-AS	Brushless servo motor with 1000-line amplfied sine encoder (BMS60-A-D25-E1000ASH)
-BMS-AS-BRK	Brushless servo motor with 1000-line amplified sine encoder and motor-mounted brake (BMS60-A-D25-E1000ASH-BK1)
-BM	Brushless servo motor with connectors and 2500-line encoder (BM75-D25-E2500H)
-BM-BRK	Brushless servo motor with connectors, 2500-line encoder, and motor-mounted brake (BM75-D25-E2500H-BK1)
-BM-AS	Brushless servo motor with connectors and 1000-line encoder (BM75-D25-E1000ASH)
-BM-AS-BRK	Brushless servo motor with connectors, 1000-line encoder, and motor-mounted brake (BM75-D25-E1000ASH-BK1)

Foldback Options (Optional)

-FB025	Foldback kit for 1/4" diameter shaft NEMA 23 motor
-FB025-BRK	Foldback kit with brake for 1/4" diameter shaft NEMA 23 motor

ATS100 Series ORDERING INFORMATION

Motor Orientation (Required)

-0	No motor
-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 fold-back (requires "FB" option, standard orientation)
-12	Left side fold-back (requires "FB" option, optional orientation)

Limits (Required)

-NC-9DU	Normally closed end of travel limit switches; 9-pin D connector
-NC-FLY	Normally closed end of travel limit switches; flying leads
-NO-9DU	Normally open end of travel limit switches; 9-pin D connector
-NO-FLY	Normally open end of travel limit switches; flying leads

Coupling (Required)

-C025	0.25 in coupling
-C0375	0.375 in coupling (required for BMS100 / BM130 motor)
-NONE	No motor coupling

Note: Coupling -NONE must be selected with all -FB options

Options

-MP100U	English base mounting plate
-MP100U/VAC	VAC6 prepared English base mounting plate
-MP100M	Metric base mounting plate
-MP100M/VAC	VAC6 prepared metric base mounting plate

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
HDZ1	English right angle L-bracket (ATS100-50 thru ATS100-100)
HDZ1U/VAC6	VAC6 prepared English right angle L-bracket (ATS100-50 thru ATS100-100)
HDZ1M	Metric right angle L-bracket (ATS100-50 thru ATS100-100)
HDZ1M/VAC6	VAC6 prepared metric right angle L-bracket (ATS100-50 thru ATS100-100)
HDZ1L	English right angle L-bracket (ATS100-150 thru ATS100-200)
HDZ1L/VAC6	VAC6 prepared English right angle L-bracket (ATS100-150 thru ATS100-200)
HDZ1LM	Metric right angle L-bracket (ATS100-150 thru ATS100-200)
HDZ1LM/VAC6	VAC6 prepared metric right angle L-bracket (ATS100-150 thru ATS100-200)
HALAR	High-accuracy system linear error correction for accuracy and repeatability
HALSF	High-accuracy system improved straightness and flatness