ALS130H Series

Mechanical Bearing, Linear Motor Stage

- Bi-directional repeatability to 75 nm
- Direct-drive linear motor for ultra-precise motion
- High-accuracy noncontact glass scale linear encoder
- Anti-cage creep cross-roller bearings for smooth motion
- Outstanding performance in a small footprint
- 23 N (5.2 lb) continuous force linear servomotor

The ALS130H, with its sub-nanometer resolution, superior bi-directional repeatability, and exceptional low-velocity performance, is the unparalleled solution for high performance test, measurement, inspection, and other demanding applications.

Linear Motor Drive

Unlike many stages that utilize a side-drive lead screw, the ALS130H employs a center-driven, non-cogging linear motor as the driving element. Since the linear motor is a direct-drive device, there is no backlash, windup, or "stiction" that is normally associated with a lead screw or ball-screw drive.

The linear motor drive also offers the advantage of higher speeds and accelerations. The compact yet powerful linear motor drives the ALS130H to a peak unloaded acceleration of 1 g and a maximum velocity of 300 mm/s. The result is a high-performance stage with outstanding throughput that significantly outperforms comparable high-accuracy screw-driven stages.

Exceptional Resolution

For alignment applications, outstanding step-to-step resolution is critical. The ALS130H meets this demand with a resolution of 0.5 nm when coupled with Aerotech controls.

The direct-drive linear motor allows the ALS130H to make precise, small resolution steps. This is particularly important in alignment applications where step accuracy is critical. Furthermore, the linear motor and high resolution encoder system also provides excellent in-position stability.

Superior Geometry

Aerotech's ultra-stiff construction and compact two-piece design result in a stage with unmatched geometrical tolerances. As a result, straightness and flatness for the standard stage is <±2 µm over the entire travel.

Smooth Travel

Designed for smooth, vibration-free motion, the ALS130H utilizes precision anti-cage creep cross-roller bearings for outstanding smoothness of motion. Since neither the bearing system nor the drive system utilize any recirculating elements, the ALS130H exhibits the outstanding ripple-free motion required for scanning and inspection applications.

Designed for Long Life

Like all stages in the Aerotech product family, the ALS130H was designed for outstanding long-term performance. Both the linear motor and linear encoder are noncontact devices - they not only exhibit long-life, but are totally maintenance free. A moving magnet track design eliminates the need for cable management, further improving long-term reliability.

Precision Alignment

ALS130H series stages are easily configured as XY assemblies. Options include precision orthogonality alignment to 5 arc seconds and available vertical axis solutions.

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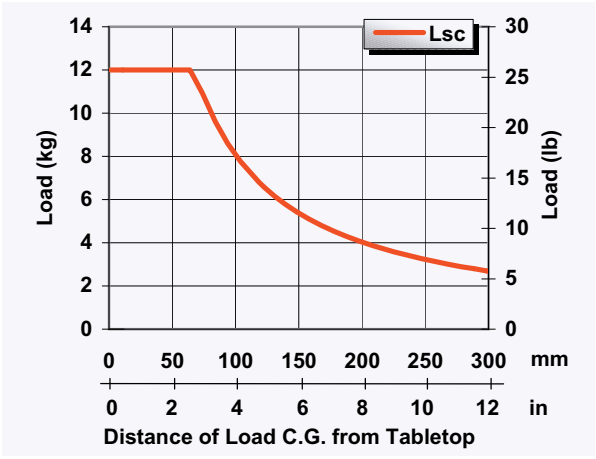
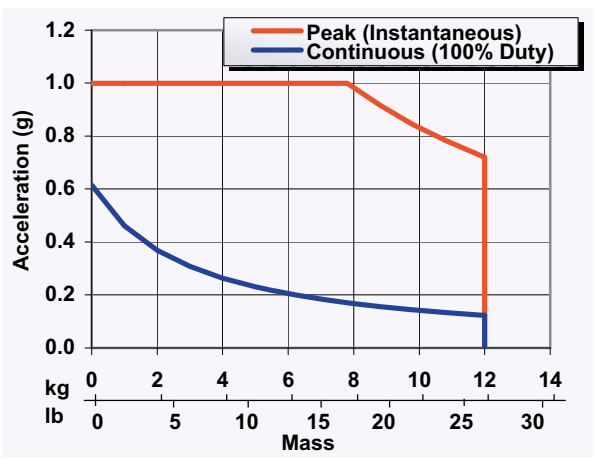
ALS130H Series SPECIFICATIONS

Basic Model		ALS130H-025	ALS130H-050	ALS130H-100	ALS130H-150
Total Travel		25 mm (1 in)	50 mm (2 in)	100 mm (4 in)	150 mm (6 in)
Drive System		Linear Brushless Servomotor (BLMUC-95-A)			
Bus Voltage		Up to 80 VDC			
Continuous Current	A_{pk}	2.94			
	A_{rms}	2.08			
Feedback		Noncontact Linear Encoder			
Resolution		0.5 nm - 1.0 µm (0.02 µin - 40 µin)			
Maximum Travel Speed[1]		300 mm/s (12 in/s)			
Maximum Linear Acceleration		1g (10 m/s^2) (384 in/s^2) (No Load)			
Maximum Load[2]	Horizontal	12.0 kg (26.5 lb)			
	Side	10.0 kg (22.0 lb)			
Accuracy	HALAR[3]	±0.3 µm (±12 µin)			
	Standard	±1.0 µm (±40 µin)	±1.0 µm (±40 µin)	±2.0 µm (±80 µin)	±3.0 µm (±120 µin)
Repeatability	Mean	75 nm			
	Peak to Peak	±100 nm			
Straightness and Flatness	Maximum Deviation	±1.0 µm (±40 µin)	±1.0 µm (±40 µin)	±1.5 µm (±60 µin)	±2.0 µm (±80 µin)
Pitch		5 arc sec	6 arc sec	8 arc sec	10 arc sec
Roll		5 arc sec	6 arc sec	8 arc sec	10 arc sec
Yaw		3 arc sec	3 arc sec	4 arc sec	5 arc sec
Nominal Stage Weight		3.0 kg (6.5 lb)	3.0 kg (6.5 lb)	3.8 kg (8.4 lb)	4.6 kg (10.1 lb)
Moving Mass		0.9 kg (2.0 lb)	1.1 kg (2.4 lb)	1.3 kg (2.9 lb)	1.6 kg (3.5 lb)
Construction		Aluminum Body/Black Anodize Finish			

Notes:
1. Maximum speed based on stage capability. Maximum application velocity may be limited by system data rate and system resolution.
2. Maximum load based on bearing capability. Maximum application load may be limited by acceleration requirements.
3. Available with Aerotech controllers.
4. 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.



L_{VC} and L_{SC} Cantilevered Load Capability (ALS130H)



Acceleration vs. Mass (ALS130H with BLMUC-95-A motor)

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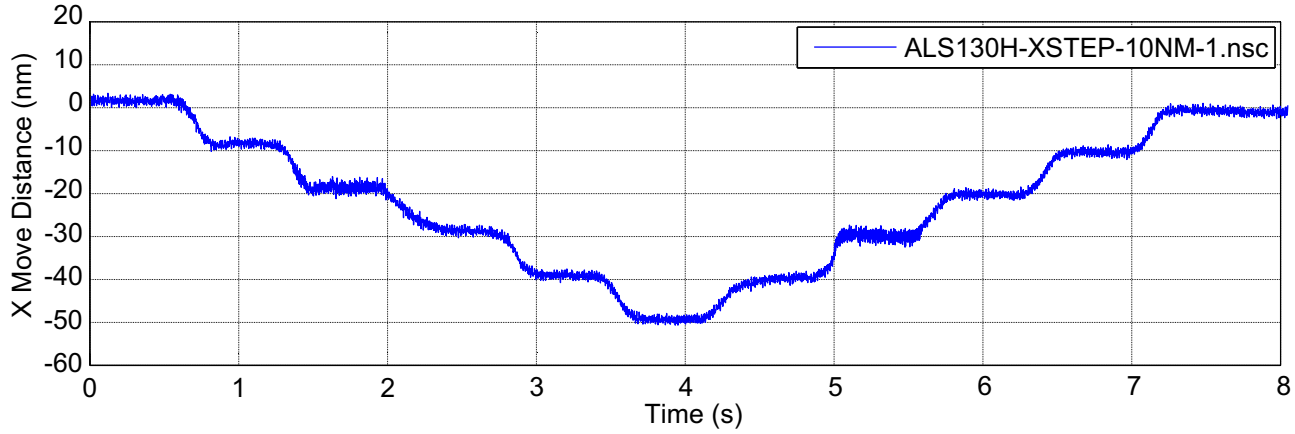
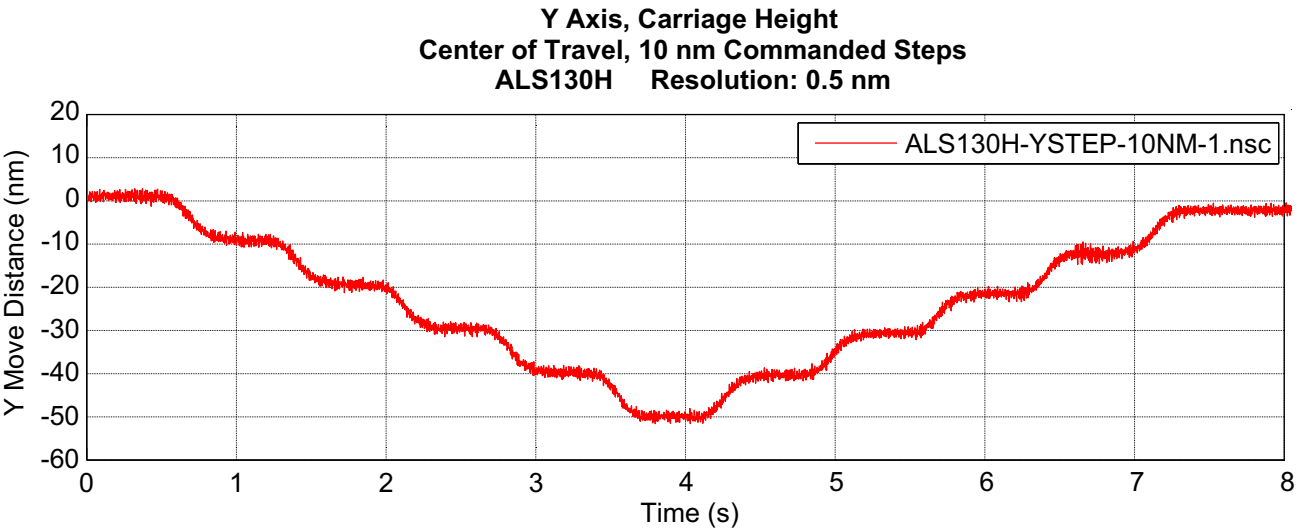
ALS130H Series SPECIFICATIONS





A3200 controller and NPAQ equipped with DL4010 linear amplifier.

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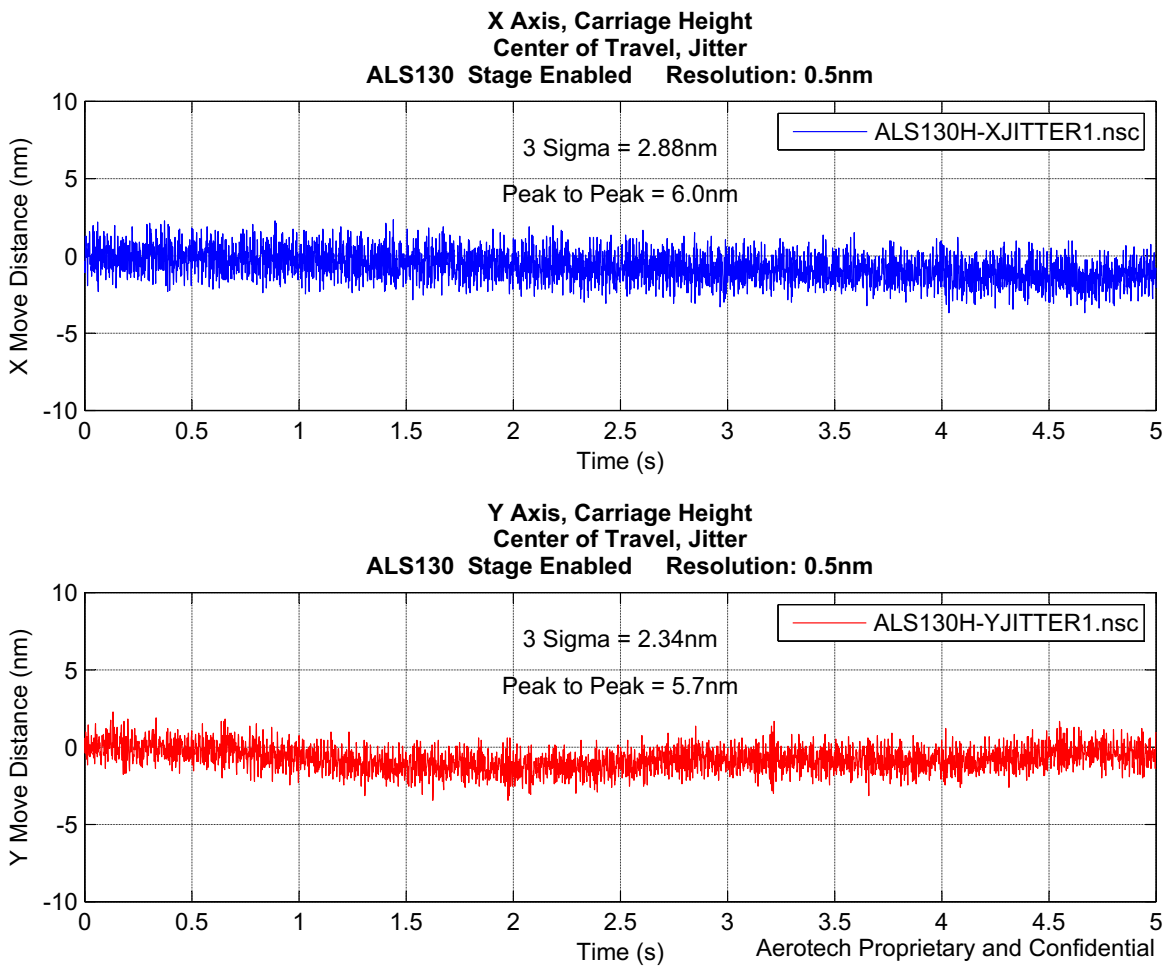

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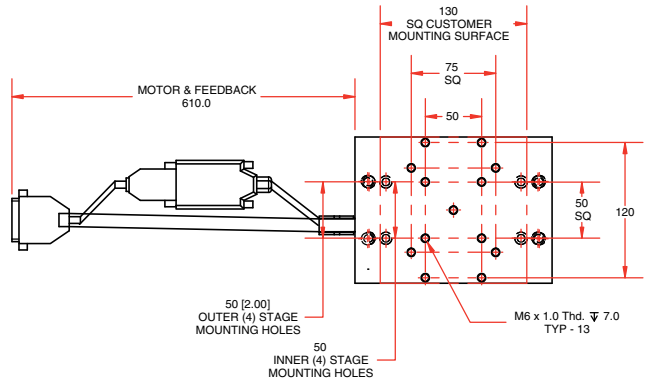
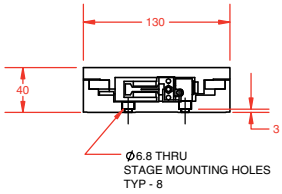
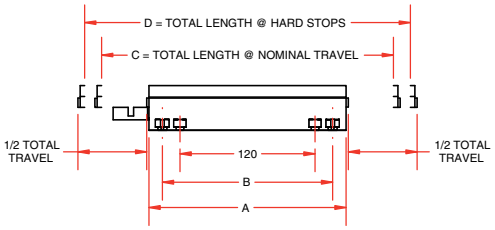
ALS130H Series DIMENSIONS







BASIC MODEL	TOTAL TRAVEL	DIMENSIONS - MM[IN]			
		A	B	C	D
ALS130H-025	25.0	150.0	----------	179.0	195.0
ALS130H-050	50.0	175.0	150.0[6.00]	229.0	245.0
ALS130H-100	100.0	225.0	150.0[6.00]	329.0	345.0
ALS130H-150	150.0	275.0	200.0[8.00]	429.0	445.0

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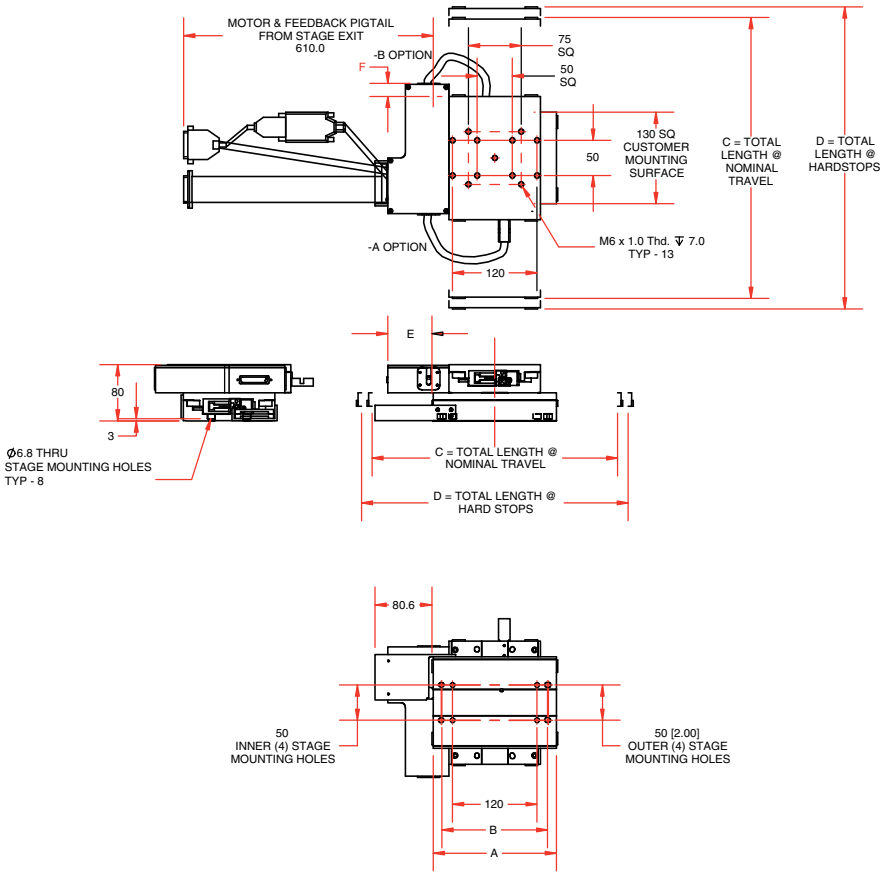
ALS130H XY Series DIMENSIONS

ALS130H shown in XY configuration.



BASIC MODEL	TOTAL TRAVEL	DIMENSIONS - MM[IN]					
		A	B	C	D	E	F
ALS130H-025	25.0	150.0	----------	179.0	195.0	75.0	31.1
ALS130H-050	50.0	175.0	150.0[6.00]	229.0	245.0	62.5	18.6
ALS130H-100	100.0	225.0	150.0[6.00]	329.0	345.0	37.5	----------
ALS130H-150	150.0	275.0	200.0[8.00]	429.0	445.0	12.5	----------

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ALS130H Series ORDERING INFORMATION

Ordering Example

ALS130H	-100		-NC
Series	Travel (mm)	Options	Limits
	-025 -050 -100 -150	-XY-CMS	-NC -NO

ALS130H Series Linear Motor Stage

ALS130H-025	25 mm (1 in) travel stage with linear motor, high-accuracy linear encoder with amplified sine output 1 Vpp (4 µm signal period), limits, and single 25-pin connector (-25DU)
ALS130H-050	50 mm (2 in) travel stage with linear motor, high-accuracy linear encoder with amplified sine output 1 Vpp (4 µm signal period), limits, and single 25-pin connector (-25DU)
ALS130H-100	100 mm (4 in) travel stage with linear motor, high-accuracy linear encoder with amplified sine output 1 Vpp (4 µm signal period), limits, and single 25-pin connector (-25DU)
ALS130H-150	150 mm (6 in) travel stage with linear motor, high-accuracy linear encoder with amplified sine output 1 Vpp (4 µm signal period), limits, and single 25-pin connector (-25DU)

Note: The amplified sine output linear encoder requires external multiplier. External signal multipliers available with A3200 amplifier products.
Note: -25DU single 25-pin connector not valid for systems using bus voltages greater than 80 V.

Options

-XY-CMS	Cable management system

Note: Not available with 25 mm travel stages. Order with lower axis stage.

Limits

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

Accessories (to be ordered as separate line item)

HALAR	High-accuracy system – linear error correction for accuracy and repeatability
ALIGNMENT-NPA	Non-precision XY assembly
ALIGNMENT-PA10	XY assembly; 10 arc sec orthogonal
ALIGNMENT-PA5	XY assembly; 5 arc sec orthogonal

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