

ALS130 Series

Mechanical Bearing, Linear Motor Stage

- Bi-directional repeatability to 0.1 μm
- Direct-drive linear motor for ultra-precise motion
- High-accuracy noncontact linear encoder
- Crossed-roller bearings for smooth motion
- Outstanding performance in a small footprint



The ALS130, with its low profile and outstanding performance characteristics, is the ultimate solution for high-accuracy alignment and inspection stations.

Linear Motor Drive

Unlike many stages that utilize a side-drive lead screw, the ALS130 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 ALS130 to a peak unloaded acceleration of 1 g and a maximum velocity of 300 mm/s. The result is a high-accuracy device with outstanding throughput that significantly outperforms comparable high-accuracy screw-driven stages.

Outstanding Resolution

For alignment applications, outstanding step-to-step resolution is critical. The ALS130 meets this demand with a resolution of 10 nm when coupled with Aerotech controls. The direct-drive linear motor allows the ALS130 to make precise, small resolution steps. This is particularly important in alignment applications where step accuracy is critical.

Superior Geometry

Aerotech’s ultra-stiff construction and compact, two-piece design results in a stage with unmatched geometrical tolerances. As a result, straightness and flatness for the standard stage is $< \pm 2 \mu\text{m}$ over the entire travel.

Smooth Travel

Designed for smooth, vibration-free motion, the ALS130 utilizes precision crossed-roller bearings for outstanding smoothness of motion. Since neither the bearing system nor the drive system utilize any recirculating elements, the ALS130 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 ALS130 was designed for outstanding long-term performance. Both the linear motor and linear encoder are noncontact devices, which means 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

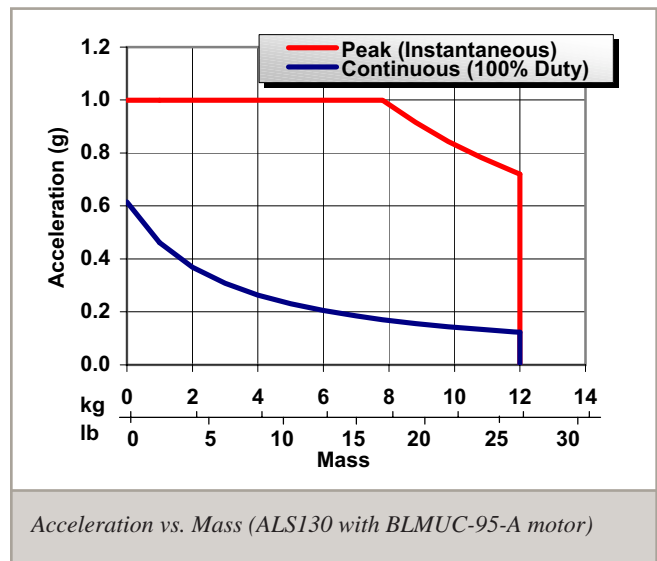
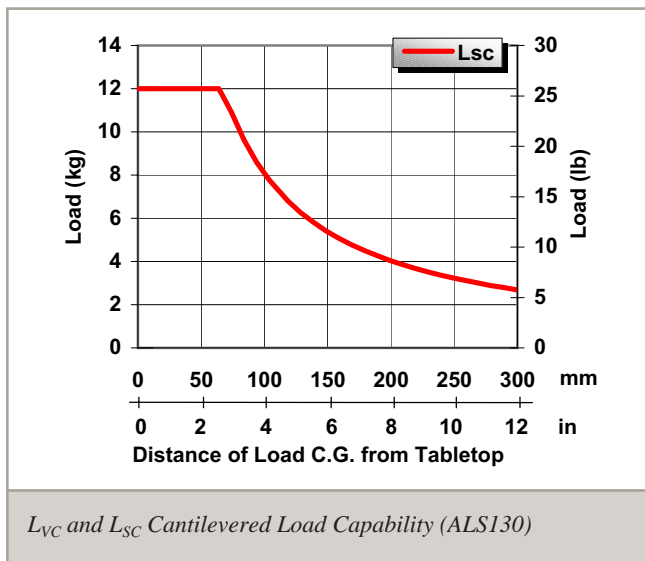
ALS130 series stages are easily configured as XY assemblies. Options include precision orthogonality alignment to 5 arc seconds and available vertical axis solutions.

ALS130 Series SPECIFICATIONS

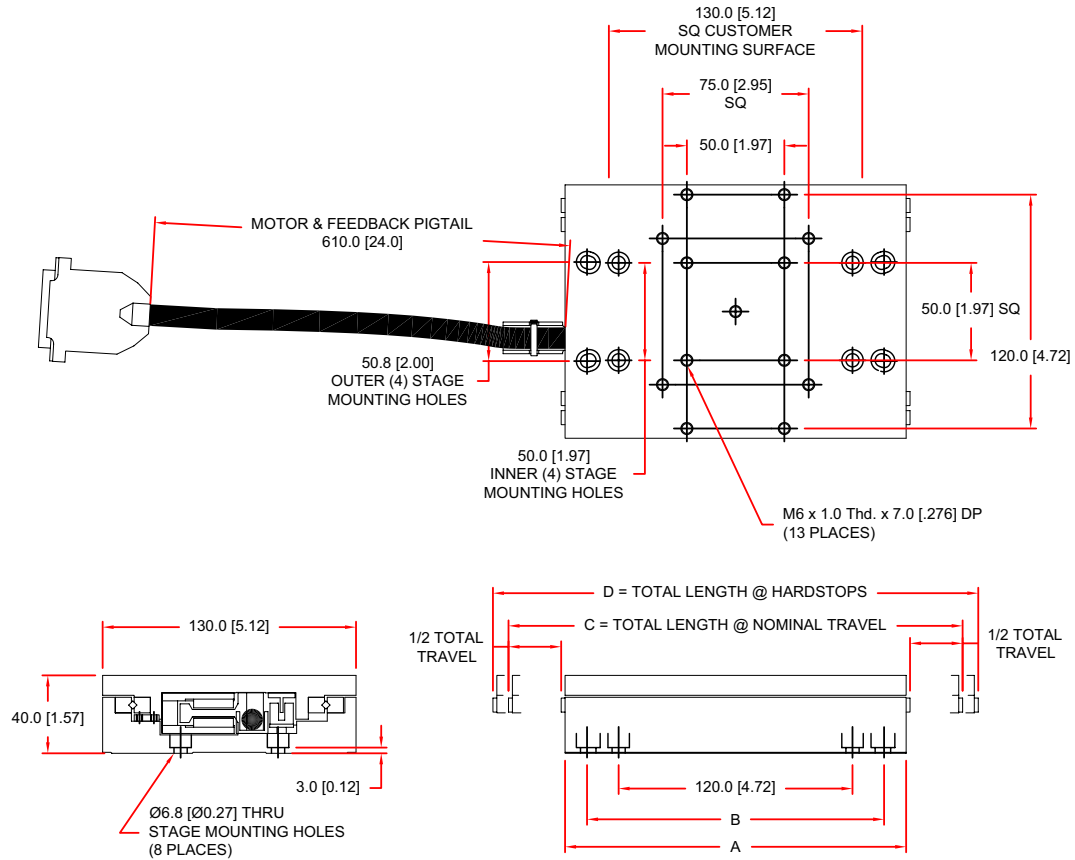
Basic Model		ALS130-025	ALS130-050	ALS130-100	ALS130-150
Total Travel		25 mm (1 in)	50 mm (2 in)	100 mm (4 in)	150 mm (6 in)
Drive System		Linear Brushless Servomotor (BLMUC-95-A)			
Bus Voltage		Up to 80 VDC with a single 25-pin D connector; Up to 160 VDC with split feedback and power – two 25-pin D connectors			
Continuous Current	A _{pk}	2.94			
	A _{rms}	2.08			
Feedback		Noncontact Linear Encoder			
Resolution		0.0025 μm - 1.0 μm (0.1 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	±2.0 μm (±80 μin)	±2.0 μm (±80 μin)	±4.0 μm (±160 μin)	±6.0 μm (±240 μin)
Repeatability		±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.



ALS130 Series DIMENSIONS



Basic Model	Total Travel	Dimensions - Millimeters [Inches]			
		A	B	C	D
ALS130-025	25.0 [1.00]	150.0 [5.91]	-----	179.0 [7.05]	195.0 [7.68]
ALS130-050	50.0 [2.00]	175.0 [6.89]	150.0 [5.91]	229.0 [9.02]	245.0 [9.65]
ALS130-100	100.0 [4.00]	225.0 [8.86]	150.0 [5.91]	329.0 [12.95]	345.0 [13.58]
ALS130-150	150.0 [6.00]	275.0 [10.83]	200.0 [7.87]	429.0 [16.89]	445.0 [17.52]



ALS130 Series ORDERING INFORMATION

Ordering Example

ALS130	-100	-LT10X50	-25DU	-NC	
Series	Travel (mm)	Linear Encoder	Output Cable Connectors	Limits	Options
	-025	-LTnnAS	-25DU	-NC	-XY-CMS
	-050	-LTnnX5	-4DU-25DU	-NO	
	-100	-LTnnX50			
	-150				

ALS130 Series Linear Motor Stage

ALS130-025	25 mm (1 in) travel stage with linear motor and limits
ALS130-050	50 mm (2 in) travel stage with linear motor and limits
ALS130-100	100 mm (4 in) travel stage with linear motor and limits
ALS130-150	150 mm (6 in) travel stage with linear motor and limits

Encoder

-LTAS	Linear encoder for ALS130 with amplified sine output 1 V _{pp} (20 μm signal period); requires external multiplier
-LTX5	Linear encoder for ALS130 with 1.0 μm digital TTL output
-LTX50	Linear encoder for ALS130 with 0.1 μm digital TTL output

Note: Amplified sine output (LTAS) linear encoders require external multiplier. External signal multipliers available with A3200 amplifier products.

Output Cable Connectors

-25DU	Single 25-pin D connector (standard)
-4DU-25DU	4-pin HPD and 25-pin D connectors

Note: -25DU single 25-pin connector option not valid for systems using bus voltages greater than 80 V.

Limits

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

Options

-XY-CMS	Cable management system
---------	-------------------------

Note: Not available with 25 mm travel stages. Only available with -25DU single 25-pin D connector option. Order with lower axis stage.

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