

ANT-LX Series

Mechanical Bearing, Linear Motor Stage

Available in X, XY, XYZ, and many other combinations

2.5 nm linear resolution with Automation 3200

Turnkey drive and control electronics

Noncontact, non-cogging, direct-drive

Ultra-quiet linear servo drives

High speed, real-time axis calibration



Introduction

Aerotech's Nanotranslation Crossed-Roller (ANT-LX) stages are the best in class in combining speed, accuracy, resolution, repeatability, reliability, and size. As an evolution of the popular ANT stage family, ANT-LX linear stages exhibit enhanced motion performance over Aerotech's first generation ANT series. Product improvements such as 5 g acceleration, 500 mm/s velocity, enhanced load capacity, and standardized, universal base mounting patterns allow the use of this flexible stage family in an even wider range of configurations than its predecessors.

Noncontact Direct-Drive

All of the original ANT series' direct-drive advantages have been preserved in the LX family. Only noncontact direct-drive technology offers the robust, accurate, and high-speed positioning necessary for mass production of precision devices. ANT-LX stages utilize advanced direct-drive technology pioneered by Aerotech to achieve the highest level of positioning performance. This direct-drive technology is high-performance, non-cogging, noncontact, high-speed, high-resolution, and high-accuracy, and the use of crossed-roller bearing elements allows even higher precision, smaller incremental moves to be accomplished reliably and repeatably. This unique drive and bearing combination, packaged in an extremely small-profile

footprint, offers tangible advantages in many applications such as fiber alignment, optical delay element actuation, and scanning processing demanding smooth motion.

Flexible System Design

The ANT-LX family has universal mounting and tabletop patterns that allow for easy system integration. Two, three, or more axes can be easily combined for flexible system designs and multi-axis configurations. Both 25 mm and 50 mm travel versions are available and can be integrated without the need for interface plates, preserving low profile system designs.

System Characteristics

Outstanding accuracy, position repeatability, and in-position stability require high system resolution. The ANT-LX stage's industry-leading 2.5 nm or better closed-loop resolution provides this high level of performance. Advanced, real-time axis calibration systems allow the highest level of system accuracy. High-speed, 40 MHz electronic circuitry enables extremely fast positioning, over 500 mm per second, even at 2.5 nanometer resolution. Excellent in-position stability, assisted by high-quality, no-creep linear bearings, enables virtually maintenance-free operation over the life of the product. Aerotech's direct-drive technology has no hysteresis or backlash, enabling accurate and repeatable nanometer-scale motion.

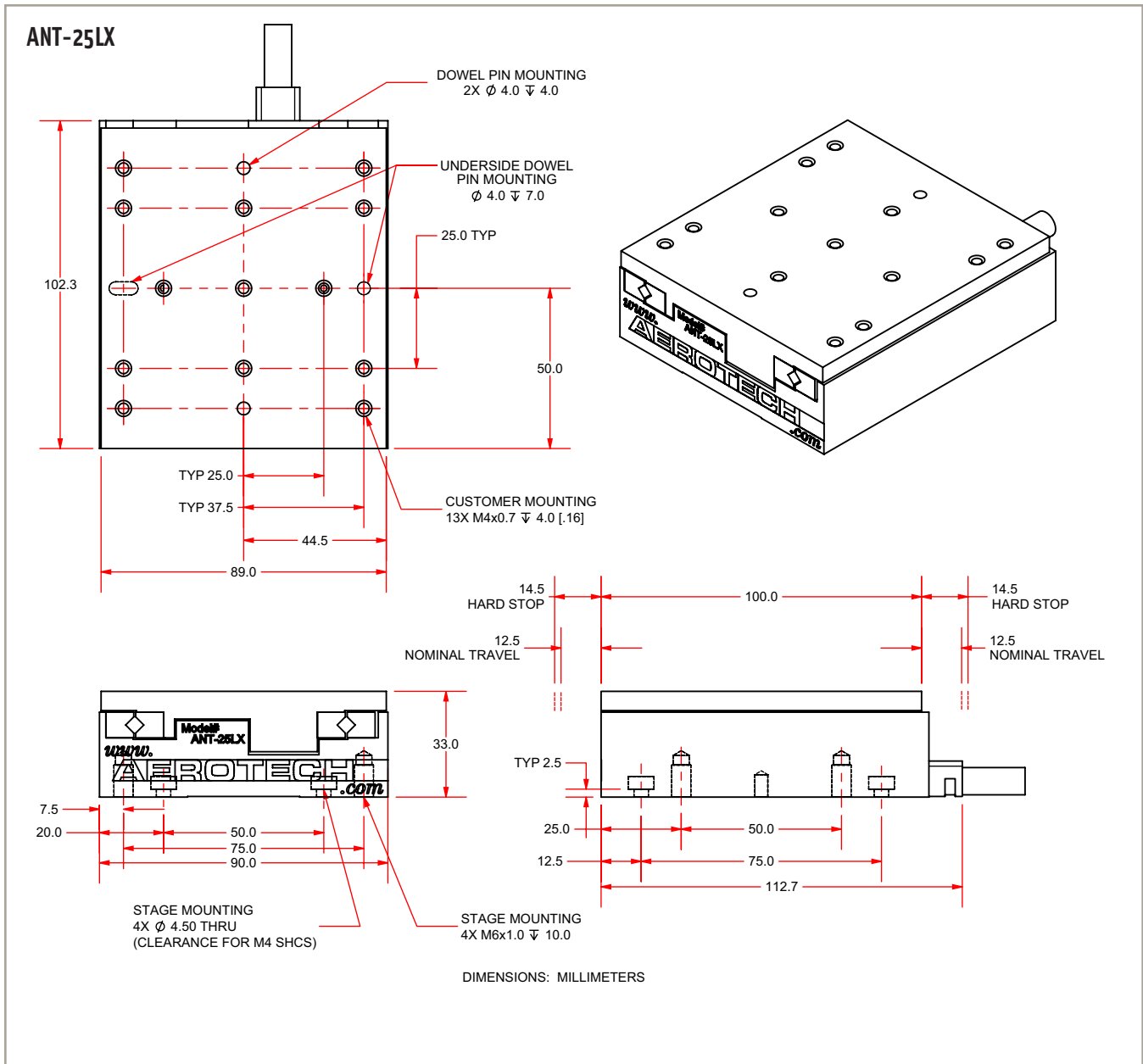
ANT-LX Series SPECIFICATIONS

		ANT-25LX	ANT-50LX
Total Travel		25 mm (1 in)	50 mm (2 in)
Drive System		Linear Brushless Servomotor	
Bus Voltage		up to 80 VDC	
Continuous Current	A_{pk}	up to 3.1 A	up to 2.9 A
	A_{rms}	up to 2.2 A	up to 2.1 A
BEMF, line-line, max.	V/m/sec	2.86	3.78
	V/in/sec	0.073	0.096
Force Constant, Sinusoidal Drive	N/A (lb/A), pk	2.48 (0.56)	3.29 (0.74)
	N/A (lb/A), rms	3.51 (0.79)	4.65 (1.04)
Resistance, 25°C, line-line	Ohms	4	5.2
Resistance, 125°C, line-line	Ohms	5.6	7.28
Inductance, line-line	mH	0.51	0.70
Magnetic Pole Pitch	mm (inch)	16 (0.63)	
Feedback		Noncontact Linear Encoder	
Resolution		0.0025 μm - 1 μm (0.1 μin - 40 μin)	
Maximum Travel Speed⁽¹⁾		500 mm/s (8 in/s)	
Maximum Linear Acceleration		5 g - 50 m/s ² (no load)	
Maximum Load⁽²⁾	Horizontal	8.0 kg (18 lb)	
	Side	5.0 kg (11 lb)	
Accuracy	Standard	±3.0 μm (±120 μin)	
	HALAR⁽³⁾	±0.3 μm (±12 μin)	
Repeatability	Standard	±0.1 μm (±4 μin)	
	HALAR⁽³⁾	±0.05 μm (±2 μin)	
Straightness and Flatness⁽⁴⁾	Differential	±0.5 μm/25 mm (±20 μin/in)	
	Max Deviation	±1.5 μm (±60 μin)	±2.0 μm (±80 μin)
Pitch and Yaw⁽⁵⁾		5 arc sec	
Nominal Stage Weight		0.8 kg (1.8 lb)	1.2 kg (2.7 lb)
Moving Mass		0.46 kg (1.0 lb)	0.52 kg (1.1 lb)
Construction		Aluminum Body/Black Anodize Finish/Hardcoat	

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 (especially flatness) apply under light loading only.
5. Value applies to unloaded stage.
6. 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.

ANT-25LX DIMENSIONS



ANT-LX Series ORDERING INFORMATION

ANT-LX Series Linear Stage

ANT-LX Aerotech's Nanotranslation Crossed-Roller (ANT-LX) linear positioner

Linear Stage Travel (X,Y)

ANT-25LX	25 mm (1 in) travel stage with proprietary direct-drive motor technology, 20 micron pitch sinusoidal output linear encoder and limits
ANT-50LX	50 mm (2 in) travel stage with proprietary direct-drive motor technology, 20 micron pitch sinusoidal output linear encoder and limits

ANT-50LX DIMENSIONS

