

ANT-LXV Series

Vertical Translation Stage

2.5 nm linear resolution

Turnkey drive and control electronics

Noncontact, non-cogging, direct-drive

Ultra-quiet linear servo drives

High speed, real-time axis calibration

Integral pneumatic counterbalance



Introduction

Aerotech's Nanotranslation Crossed-Roller Vertical (ANT-LXV) stages combine speed, accuracy, resolution, repeatability, and reliability within an extremely small footprint. ANT-LXV linear stages offer 2.5 nm resolution, 1 g acceleration, 500 mm/s velocity, 5 kg load capacity, and a standardized universal-base mounting pattern that allows the use of this flexible stage family in a wide range of configurations.

Noncontact Direct-Drive

ANT-LXV stages utilize advanced direct-drive technology pioneered by Aerotech to achieve the highest level of positioning performance. This direct-drive technology is non-cogging, noncontact, high-speed, high-resolution, and high-accuracy, and the use of crossed-roller bearing elements allows high 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 applications that demand smooth motion.

Flexible System Design

The ANT-LXV family has universal mounting and tabletop patterns that allow for easy system integration. It can be easily combined with other Aerotech stages to create multi-axis configurations.

System Characteristics

Outstanding accuracy, position repeatability, and in-position stability require high system resolution. The ANT-LXV offers industry-leading 2.5 nm or better closed-loop resolution, while 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, crossed-roller 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-LXV stages include an anti-stiction pneumatic counterbalance to hold position against gravity with very little motor current. An integrated precision regulator allows fine adjustment for a range of payloads.

ANT-LXV Series SPECIFICATIONS

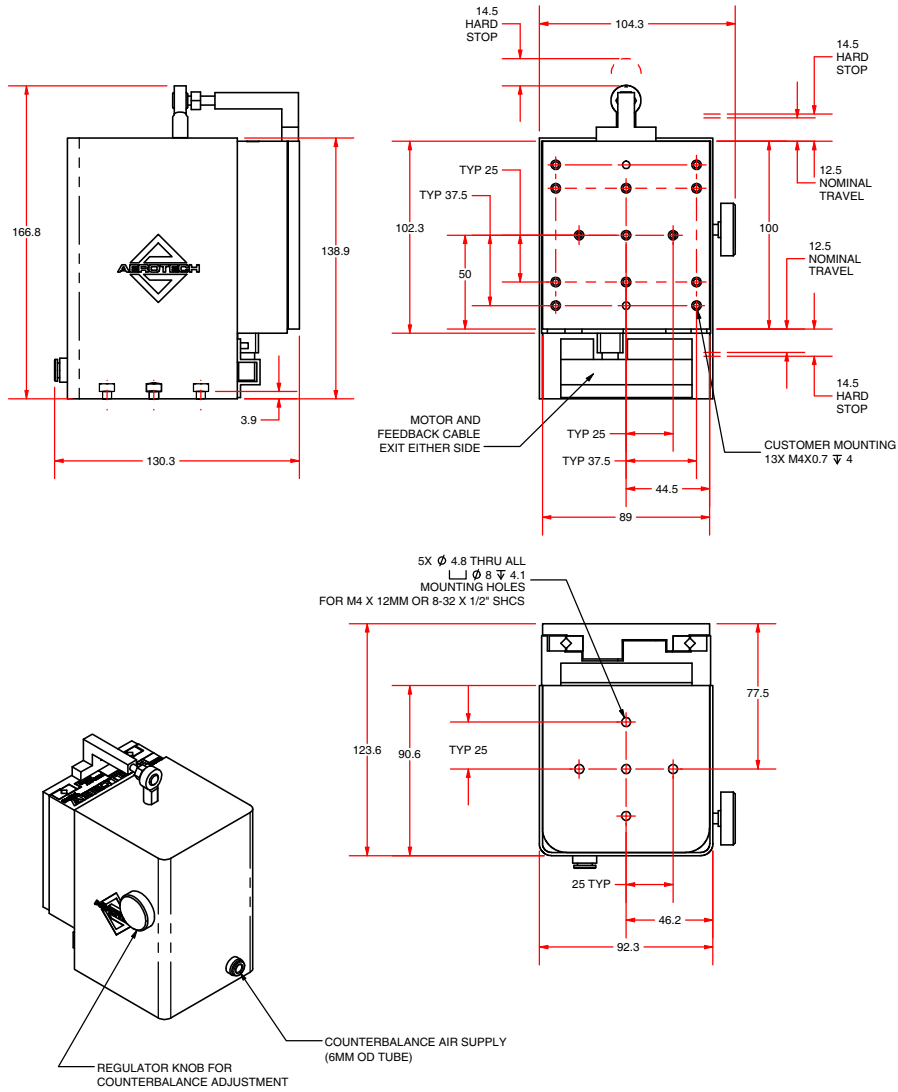
		ANT-25LXV	ANT-50LXV
Total Travel		25 mm (1 in)	50 mm (2 in)
Drive System		Linear Brushless Servomotor	
Bus Voltage		up to 80 VDC	
Continuous Current	A_{pk}	up to 3.1 A	up to 2.9 A
	A_{rms}	up to 2.2 A	up to 2.1 A
BEMF, line-line, max.	V/m/sec	2.86	3.78
	V/in/sec	0.073	0.096
Force Constant, Sinusoidal 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		1 g (10 m/s ²) (no load)	
Maximum Load⁽²⁾⁽³⁾	Vertical	5.0 kg (11 lb)	
	Standard	±4.0 μm (±160 μin)	
Accuracy	HALAR⁽⁴⁾	±0.3 μm (±12 μin)	
	Standard	±0.1 μm (±4 μin)	
Repeatability	HALAR⁽⁴⁾	±0.05 μm (±2 μin)	
	Differential	±0.75 μm/25 mm (±30 μin/in)	
Straightness and Flatness⁽⁵⁾	Max Deviation	±2.25 μm (±90 μin)	±3.0 μm (±120 μin)
	Pitch and Yaw⁽⁶⁾	7 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:

- Maximum speed based on stage capability; maximum application velocity may be limited by system data rate and system resolution.
- Maximum load based on bearing capability and counterbalance capacity; maximum application load may be limited by acceleration requirements.
- Load is counterbalanced by a pneumatic cylinder. Air supply must be filtered, dry, oil-less air (minimum 5 μm coalescing filter). The force factor for the cylinder is 452.5 N/MPa (0.307 lb/psi).
- Available with Aerotech controllers.
- Specifications (especially flatness) apply under light loading only.
- Value applies to unloaded stage.
- 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.

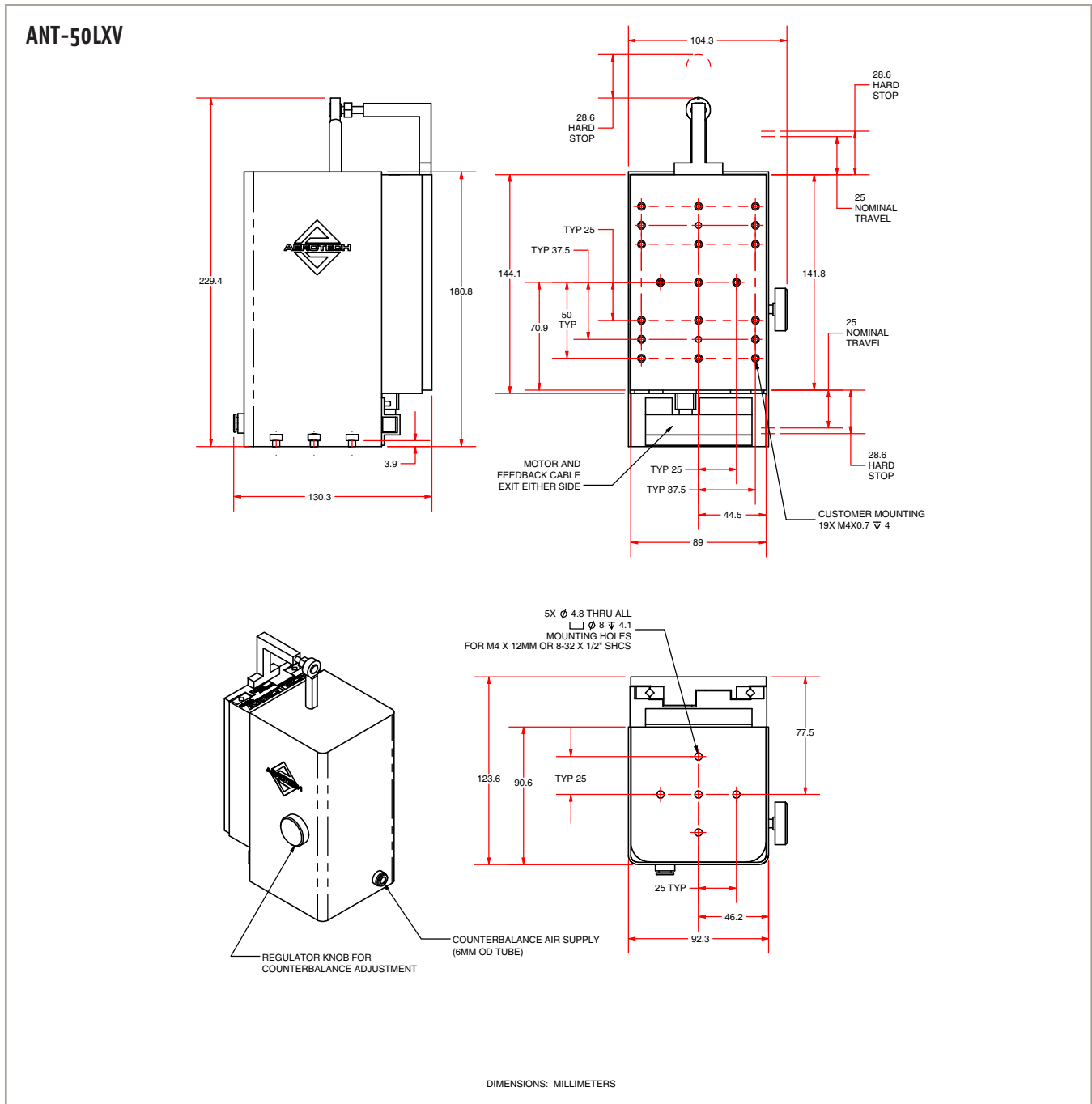
ANT-LXV Series DIMENSIONS

ANT-25LXV



DIMENSIONS: MILLIMETERS

ANT-LXV Series DIMENSIONS



ANT-LXV Series ORDERING-INFORMATION

Vertical Stage Travel (Z)

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

Note: Requires clean, dry air supply for pneumatic counterbalance. Air counterbalance pressure adjust valve included with 6 mm O.D. quick disconnect fitting.

Accessories (to be ordered as a separate line item)

HALAR	High-accuracy system, linear error correction for accuracy and repeatability
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