# ANT95LZ Series

# Single-Axis Z Direct-Drive Nanopositioning Stages

Nanometer performance in a large travel format (25 and 50 mm)

High resolution (2 nm), repeatability (75 nm), and accuracy (300 nm)

In-position stability of <2 nm

Anti-creep crossed-roller bearings

High dynamic performance

# nano Motion Technology



### Introduction

Aerotech's ANT series stages are the world's first nanometerlevel positioning systems with greater than 25 mm travel. The ANT95LZ crossed-roller stages are the best-in-class in combining speed, accuracy, resolution, repeatability, reliability, and size, and are offered in two accuracy grades.

## Noncontact Direct-Drive

Only noncontact direct-drive technology offers the robust, accurate, and high-speed positioning necessary for mass production of precision devices. ANT95LZ stages utilize advanced direct-drive technology pioneered by Aerotech to achieve the highest level of positioning performance for highprecision positioning, disk-drive fabrication, fiber alignment, optical delay element actuation, sensor testing, and scanning processes that demand smooth and precise motion.

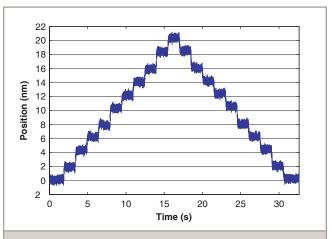
The ANT95LZ stages use a nearly frictionless counterbalance mechanism to maintain performance levels while minimizing motor heating. The counterbalance is user-adjustable from 0 to 5 kg.

## Flexible System Design

The ANT95LZ 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.

# System Characteristics

Outstanding accuracy, position repeatability, and in-position stability require high system resolution. The ANT95LZ stage's industry-leading 2 nm minimum incremental step size provides this high level of performance. Excellent in-position stability is assisted by high-quality, anti-creep, crossed-roller bearings. The stage offers 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.



ANT95LZ-050-PLUS 2 nm step plot with 100 Hz filter. Bestin-class resolution and exceptional in-position stability for large travel stages.

# **ANT95LZ Series SPECIFICATIONS**

		ANT95-25-L-Z	ANT95-50-L-Z
Travel		25 mm (1 in)	50 mm (2 in)
Accuracy <sup>(1)</sup>	Basic	±4.0 μm (±160 μin)	±4.0 μm (±160 μin)
	PLUS	±300 nm (±12 μin)	±300 nm (±12 μin)
Resolution (Minimum Incremental Motion)		2 nm	2 nm
Repeatability (Bi-Direction	al) <sup>(1)</sup> Basic	±100 nm	±100 nm
	PLUS	±75 nm	±75 nm
Repeatability (Uni-Directional)		±50 nm	±50 nm
Straightness <sup>(1)</sup>		±2.25 μm (±90 μin)	±3.0 μm (±120 μin)
Flatness <sup>(1)</sup>		±3.5 μm (±140 μin)	±4.0 μm (±160 μin)
Pitch		10 arc sec	10 arc sec
Roll		10 arc sec	10 arc sec
Yaw		5 arc sec	5 arc sec
Maximum Speed		200 mm/s (8 in/s)	200 mm/s (8 in/s)
Maximum Acceleration		1 g - 10 m/s²(No Load)	1 g - 10 m/s² (No Load)
In-Position Stability <sup>(2)</sup>		<2 nm (<0.08 µin)	<2 nm (<0.08 μin)
Maximum Force (Continuous)		7.75 N	9.5 N
Load Capacity <sup>(3)</sup> Ve	rtical	5.0 kg (11 lb)	5.0 kg (11 lb)
Moving Mass		0.46 kg (1.0 lb)	0.52 kg (1.1 lb)
Stage Mass		1.9 kg (4.3 lb)	2.5 kg (5.5 lb)
Material		Aluminum Body/Black Hardcoat Finish	
MTBF (Mean Time Between Failure)		30,000 Hours	

Notes:

Certified with each stage.
In-Position Jitter listing is 3σ value.
Axis orientation for on-axis loading is listed.

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.

5. -PLUS requires the use of an Aerotech controller.

<b>Electrical Specifications</b>	ANT95LZ	
Drive System	Brushless Linear Servomotor	
Feedback	Noncontact Linear Encoder	
Maximum Bus Voltage	±40 VDC	
Limit Switches	5 V, Normally Closed	
Home Switch	Near Center	

<b>Recommended Controller</b>		ANT95LZ	
Multi-Axis	<u>A3200</u>	Npaq-MXR Npaq MR-MXH Ndrive ML-MXH	
	Ensemble	Epaq-MXH Epaq MR-MXH Ensemble ML-MXH	
Single Axis	<u>Soloist</u>	Soloist ML-MXH	

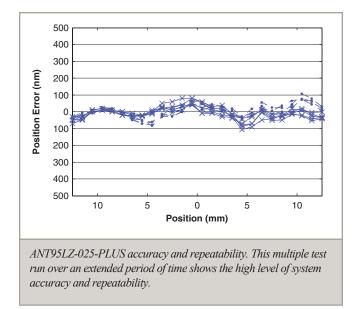
Notes:

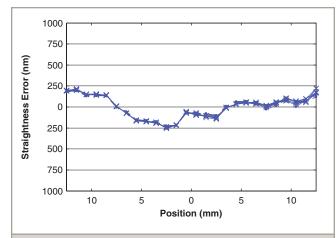
1. Linear amplifiers are required to achieve the listed specifications. Other options are available.

Note: To ensure the achievement and repeatability of specifications over an extended period of time, environmental temperature must be controlled to within 0.25°C/24 hours. If this is not possible, alternate products are available. Please consult Aerotech Application Engineering for more information.

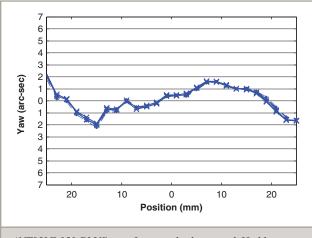
# NANO Technology ANT95LZ Series

# ANT95LZ Series PERFORMANCE

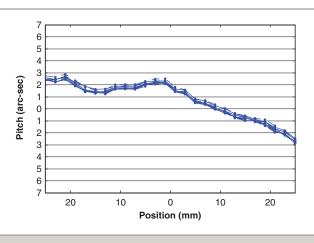




ANT95LZ-025-PLUS straightness error, five runs, bi-directional. Exceptional and highly repeatable – five times more accurate than the stated specification.



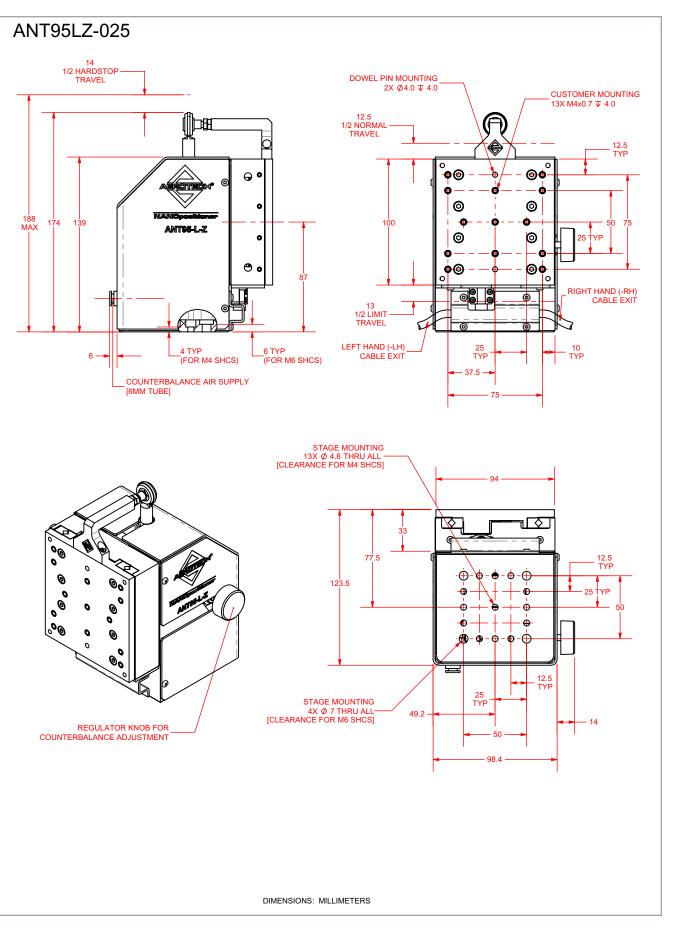
ANT95LZ-050-PLUS yaw, five runs, bi-directional. Highly repeatable, minimal yaw error enhances system positioning accuracy.



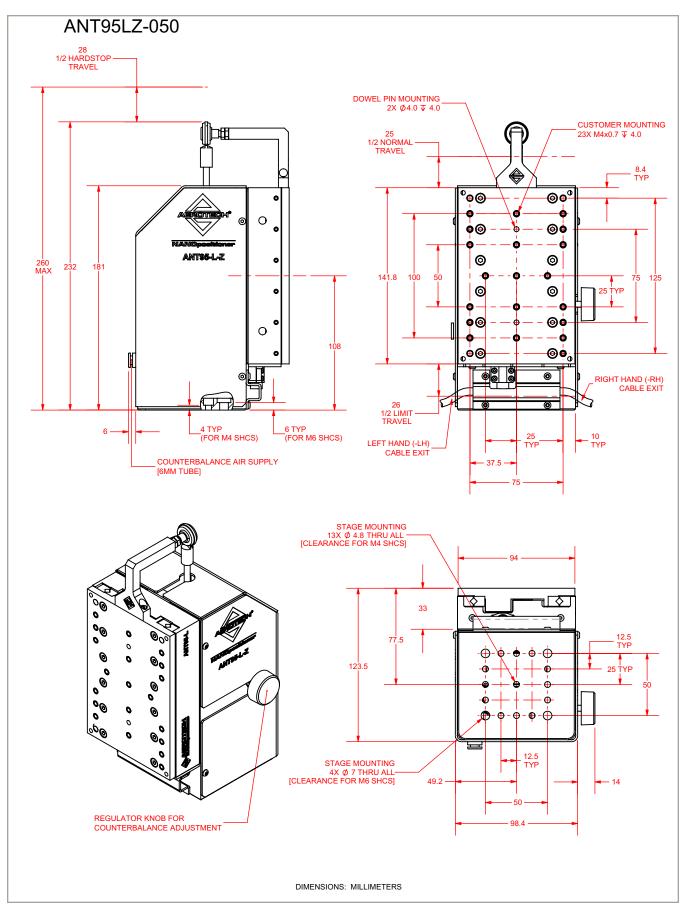
ANT95LZ-050-PLUS pitch, five runs, bi-directional. Excellent repeatability/accuracy contribute to improved processing.

## **ANT95LZ-025 DIMENSIONS**

# ANT95LZ Series NANO Technology



### ANT95LZ-050 DIMENSIONS



## ANT95LZ Series ORDERING INFORMATION

	25 mm travel			
-050 5	50 mm traval			
	50 mm travel			
Cable Orientation (Requ	uired)			
-CBL1 R	Right-hand cable exit			
-CBL2 L	Left-hand cable exit			
Performance Grade (Re	equired)			
-PL1 B	Base performance			
	High-accuracy performance, PLUS			

Aerotech offers both standard and custom integration services to help you get your system fully operational as quickly as possible. The following standard integration options are available for this system. Please consult Aerotech if you are unsure what level of integration is required, or if you desire custom integration support with your system.

	Integration - Test as system
-TAS	Testing, integration, and documentation of a group of components as a complete system that will be used together (ex: drive, controller, and stage). This includes parameter file generation, system tuning, and documentation of the system configuration.
	Integration - Test as components
-TAC	Testing and integration of individual items as discrete components. This is typically used for spare parts, replacement parts, or items that will not be used or shipped together (ex: stage only). These components may or may not be part of a larger system.