Single-Axis Z
Nanopositioning Stages

ANT95LZ

Achieve Superior Nanometer-Scale Vertical Motion

ANT95LZ stages are specifically engineered to provide nanometer-level motion and positioning performance in the vertical orientation. With a user-adjustable, ultra low-friction pneumatic counterbalance, they are best-in-class in combining resolution, accuracy, repeatability, size and reliability. Their impressive dynamic capabilities and enhanced load-carrying capacity make ANT95LZ stages an excellent choice when you need superior vertical motion.

Key Applications

ANT95LZ is ideal for multi-axis applications that require high precision and dynamic positioning performance, including:

- Photonics assembly and inspection
- Fiber alignment and optimization
- Optics manufacturing, testing and inspection
- Sensor testing and qualification
- Semiconductor processing and inspection
- Research and laboratory applications

KEY FEATURES:

- Delivers **NANOMETER-LEVEL POSITIONING PERFORMANCE** over travel lengths up to 50 mm
- Achieves **MINIMUM INCREMENTAL MOTION TO 1 nm**
- Offsets payloads up to 5 kg for precise performance in the vertical direction with **USER-ADJUSTABLE, ULTRA LOW-FRICTION COUNTERBALANCE**
- Features high-precision crossed-roller bearings for **EXCELLENT DYNAMIC PERFORMANCE & GENEROUS LOAD CAPACITY**
- **MAXIMIZES PROCESS THROUGHPUT & RELIABILITY** with ironless direct-drive linear motor

ANT95LZ SERIES SPECIFICATIONS

Mechanical Specifications		ANT95LZ-025	ANT95LZ-050
Travel		25 mm	50 mm
Accuracy[1]	Base Performance (-PL1)	±4.0 µm	
	Plus Performance (-PL2)	±300 nm (-E1, -E2) ±200 nm (-E4)	
Repeatability (Bidirectional)[1]		±75 nm	
Resolution (Minimum Incremental Motion)		2 nm (-E1) 1 nm (-E4)	
Straightness[1]		±2.25 µm	±3.0 µm
Flatness[1]		±3.5 µm	±4.0 µm
Pitch		10 arc sec	
Roll		10 arc sec	
Yaw		5 arc sec	
Maximum Speed		200 mm/s (-E1, -E4) 145 mm/s (-E2)	
Maximum Acceleration (No Load)		1 g	
In-Position Stability[2]		<2 nm (-E1) <1 nm (-E4)	
Load Capacity[3]	Vertical	5 kg	
Moving Mass		0.51 kg	0.69 kg
Stage Mass		2.11 kg	2.71 kg
MTBF (Mean Time Between Failure)		30,000 Hours	
Material		Anodized Aluminum	

Notes:
1. Certified with each stage.
2. In-position stability is reported as 3-sigma value. Requires a 1 Vpp encoder.
3. Payload specifications assume payload is centered on-axis.
4. Specifications are reported for a single axis measured 25 mm above the tabletop. Performance of multi-axis systems depends on the payload and workpoint. Consult factory for multi-axis or non-standard applications.
5. PLUS performance requires the use of an Aerotech controller.
6. To ensure the achievement and repeatability of specifications over an extended period of time, environmental temperature must be controlled to within 0.25°C per 24 hours. Consult factory for more information.
7. Air supply for pneumatic counterbalance must be clean, dry to 0°F dewpoint, and filtered to 0.25 µm or better. Aerotech recommends using nitrogen at 99.9% purity. Supply pressure is determined by the amount of payload carried by the stage.

Electrical Specifications	ANT95LZ-025	ANT95LZ-050
Drive System	Brushless Linear Servomotor	
Feedback	Noncontact Linear Encoder 1 Vpp with 20 µm signal period (-E1) Digital RS422 with 5 nm electrical resolution (-E2) 1 Vpp with 4 µm signal period (-E4)	
Maximum Bus Voltage	±40 VDC	
Limit Switches	5 V, Normally Closed	
Home Switch	Near Center	

ANT95LZ SERIES ORDERING INFORMATION

Travel (Required)

-025	25 mm travel
-050	50 mm travel

Feedback (Required)

-E1	Incremental linear encoder, 1 Vpp amplified sine output
-E2	Incremental linear encoder, digital RS422 output, 5 nm electrical resolution
-E4	Incremental linear encoder, 1 Vpp amplified sine output, high-performance

Cable Orientation (Required)

-CBL1	Right-hand cable exit
-CBL2	Left-hand cable exit

Performance Grade (Required)

-PL1	Base performance
-PL2	High-accuracy performance, PLUS

Integration (Required)

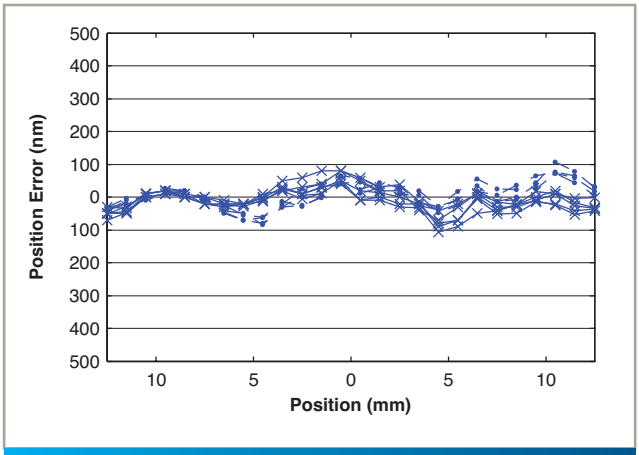
Aerotech offers both standard and custom integration services to help you get your system fully operational as quickly as possible. The following standard integration options are available for this system. Please consult Aerotech if you are unsure what level of integration is required, or if you desire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

-TAS **Integration - Test as system**
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.

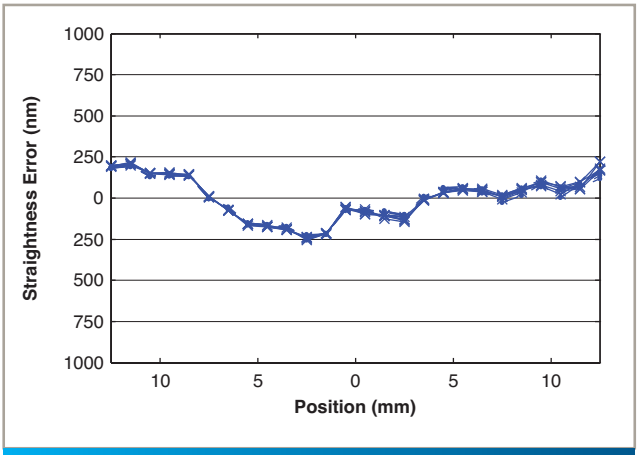
-TAC **Integration - Test as components**
Testing and integration of individual items as discrete components that ship together. This is typically used for spare parts, replacement parts, or items that will not be used together. These components may or may not be part of a larger system.

ANT95LZ SERIES SPECIFICATIONS

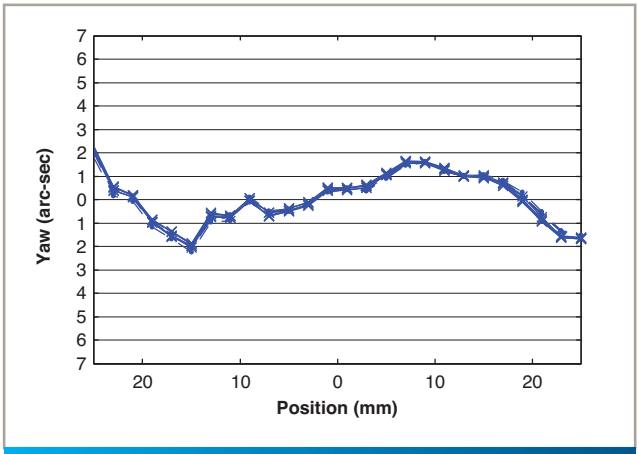
ANT95LZ SERIES PERFORMANCE



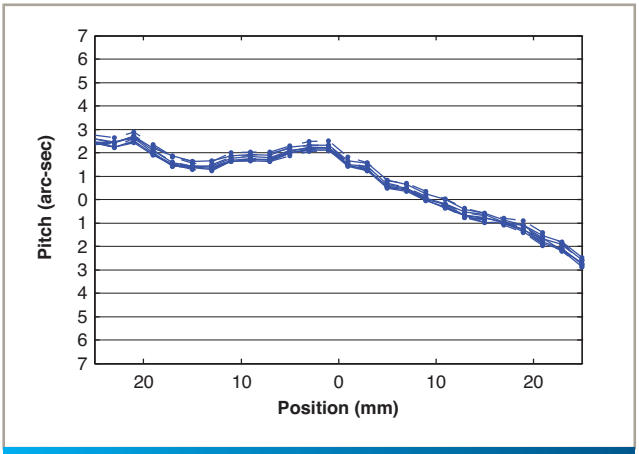
ANT95LZ-025-PL2 accuracy and repeatability. This multiple test run over an extended period of time shows the high level of system accuracy and repeatability.



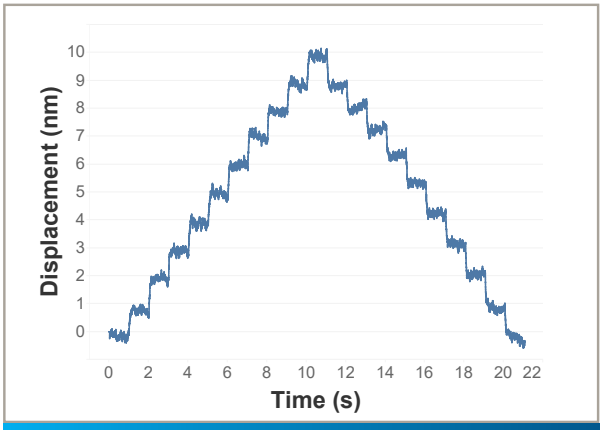
ANT95LZ-025-PL2 straightness error, five runs, bi-directional. Exceptional and highly repeatable – five times more accurate than the stated specification.



ANT95LZ-050-PL2 yaw, five runs, bi-directional. Highly repeatable, minimal yaw error enhances system positioning accuracy.



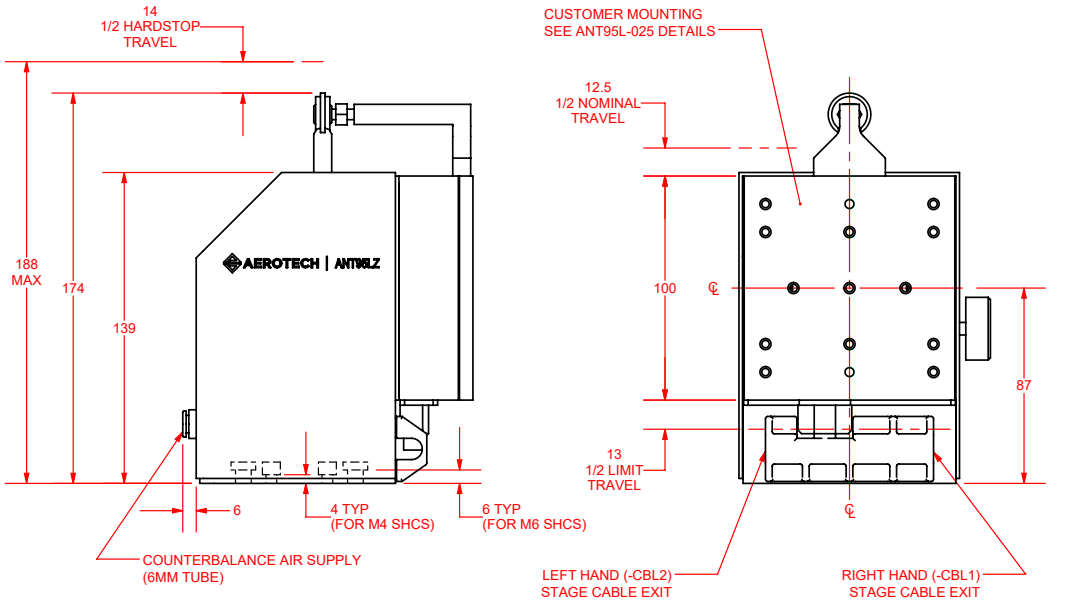
ANT95LZ-050-PL2 pitch, five runs, bi-directional. Excellent repeatability/accuracy contribute to improved processing.

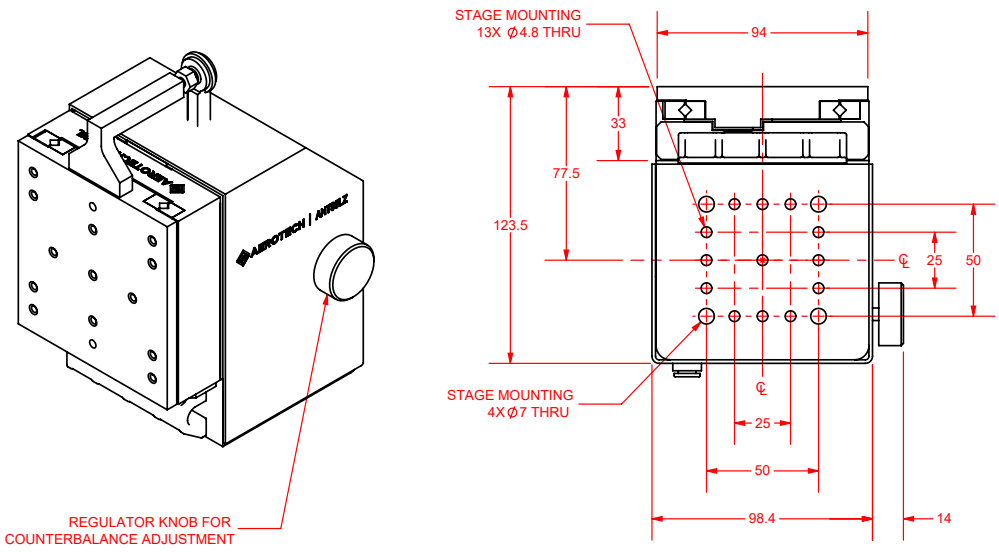


ANT95LZ-025-PL2 1 nm step plot. Best-in-class resolution and exceptional in-position stability for large-travel stages.

ANT95LZ-025 DIMENSIONS

ANT95LZ-025

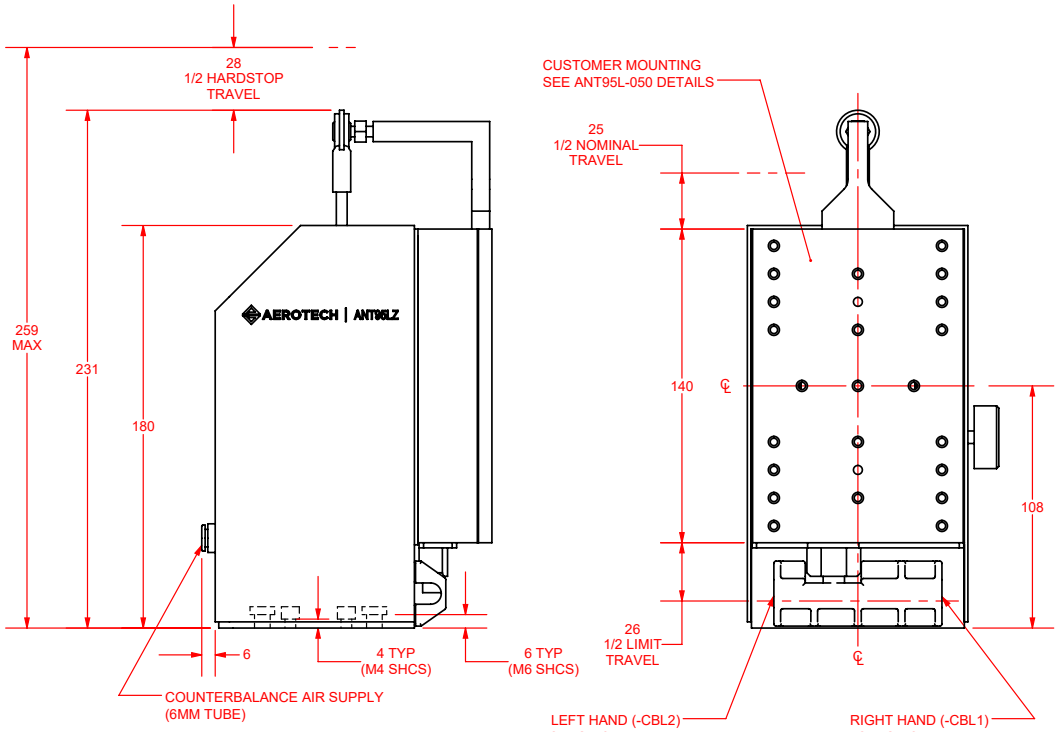


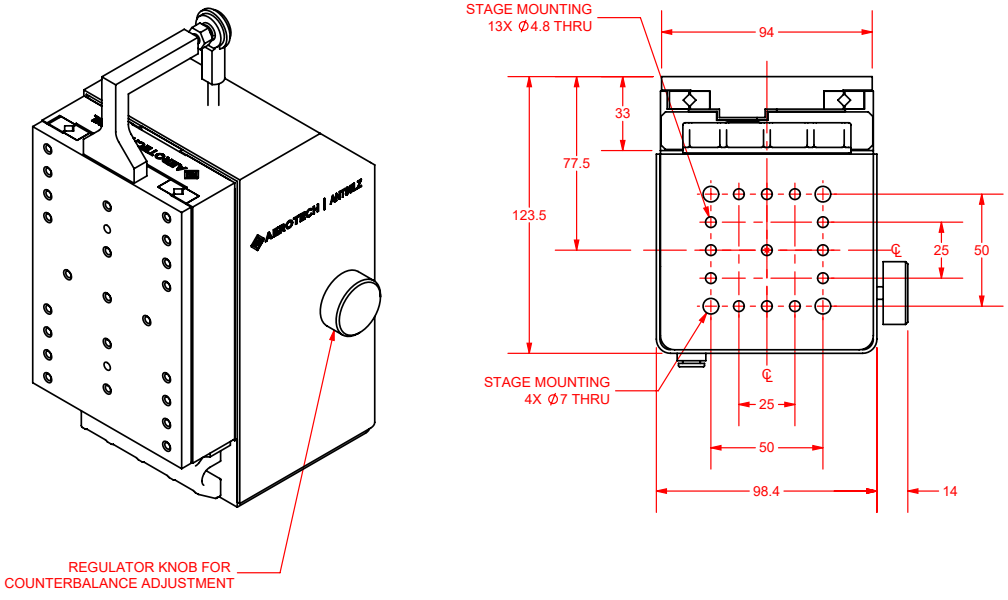


DIMENSIONS: MILLIMETERS

ANT95LZ-050 DIMENSIONS

ANT95LZ-050





DIMENSIONS: MILLIMETERS