

ANT130-5-V Series nano Motion Technology

Mechanical Bearing, Linear Motor Vertical Lift Stage

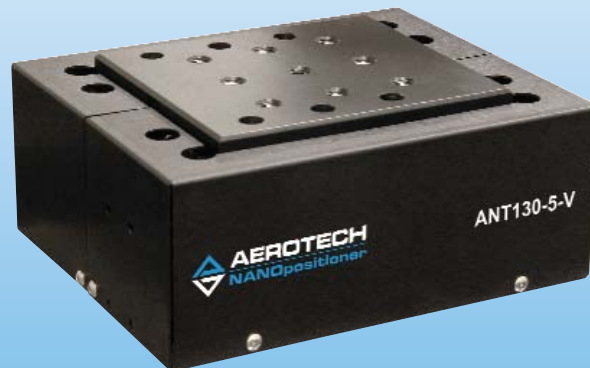
Nanometer performance with 5 mm vertical travel

High resolution (2 nm), repeatability (100 nm), and accuracy (200 nm)

In-position stability of 1 nm

Anti-creep crossed-roller bearings

High dynamic performance



Introduction

Aerotech's ANT130 series stages are the world's first nanometer-level positioning systems with multi-millimeter travel. The ANT130-5-V and ANT130-5-V-PLUS are linear-motor-driven wedge-style vertical lift stages. The stage is designed to be seamlessly integrated with other stages in the ANT130 family for superior multi-axis performance.

Benefits of Aerotech's Noncontact Direct-Drive Design

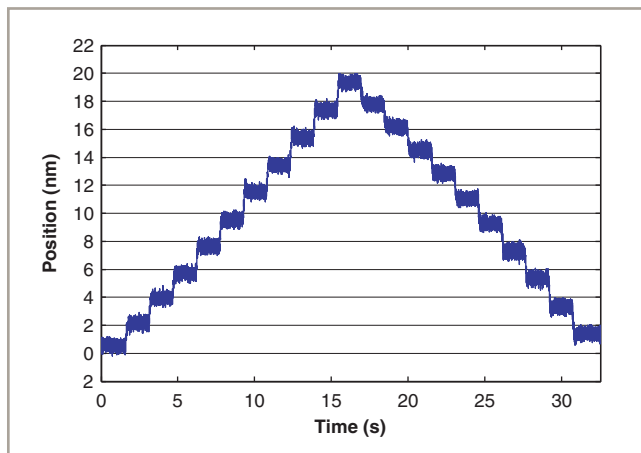
All of the original ANT series' direct-drive advantages have been preserved in the ANT130-5-V family. Only noncontact direct-drive technology offers the robust, accurate, and high-speed positioning necessary for mass production of precision devices. ANT130-5-V stages utilize advanced direct-drive technology 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. This unique drive and bearing combination, packaged in an extremely small-profile and footprint, offers tangible advantages in many applications such as high-precision positioning, disk-drive fabrication, fiber alignment, optical delay element actuation, sensor testing, and scanning processes that demand smooth and precise motion.

Easy Stage Mounting and System Integration

The ANT130-5-V 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.

Outstanding Stage Characteristics

Outstanding accuracy, position repeatability, and in-position stability require high system resolution. The ANT130-5-V stage's industry-leading 2 nm minimum incremental step size provides this high level of performance. Excellent in-position stability, assisted by high-quality, anti-creep crossed-roller 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.



ANT130-5-V-PLUS 2 nm step plot. Best-in-class resolution and exceptional in-position stability for large travel stages.

ANT130-5-V/ANT130-5-V-PLUS SPECIFICATIONS

| Mechanical Specifications | | ANT130-5-V |
|---|----------|--|
| Travel | | 5 mm |
| Accuracy ⁽¹⁾ | Standard | ±2 µm |
| | PLUS | ±200 nm |
| Resolution | | 2 nm |
| Repeatability (Bi-Directional) ⁽¹⁾ | Standard | ±150 nm |
| | PLUS | ±100 nm |
| Repeatability (Uni-Directional) | | ±75 nm |
| Straightness ⁽²⁾ | | ±1.0 µm (±40 µin) |
| Pitch ⁽¹⁾ | | 20 arc sec |
| Roll | | 10 arc sec |
| Yaw ⁽¹⁾ | | 10 arc sec |
| Maximum Speed | | 75 mm/s (3 in/s) |
| Maximum Acceleration | | 0.7 g - 7 m/s ² (No Load) |
| Settling Time | | See graphs for typical performance |
| In-Position Stability ⁽³⁾ | | 1 nm |
| Maximum Force (Continuous) | | 100 N |
| Load Capacity ⁽⁴⁾ | | 3.0 kg |
| Moving Mass | | 1.8 kg (4 lb) |
| Stage Mass | | 3.1 kg (7 lb) |
| Material | | Aluminum Body/Black Hardcoat Finish/Black Anodize Finish |
| MTBF (Mean Time Between Failure) | | 30,000 Hours |

Notes:

1. Certified with each stage.
2. Measured perpendicular or parallel to wedge direction.
3. In-Position Stability listing is 3 sigma value.
4. Assumes loading along axis of travel.
5. 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.
6. -PLUS requires the use of an Aerotech controller.

| Electrical Specifications | ANT130-5-V |
|---------------------------|-----------------------------|
| Drive System | Brushless Linear Servomotor |
| Feedback | Noncontact Linear Encoder |
| Maximum Bus Voltage | ±40 VDC |
| Limit Switches | 5 V, Normally Closed |
| Home Switch | Near Center |

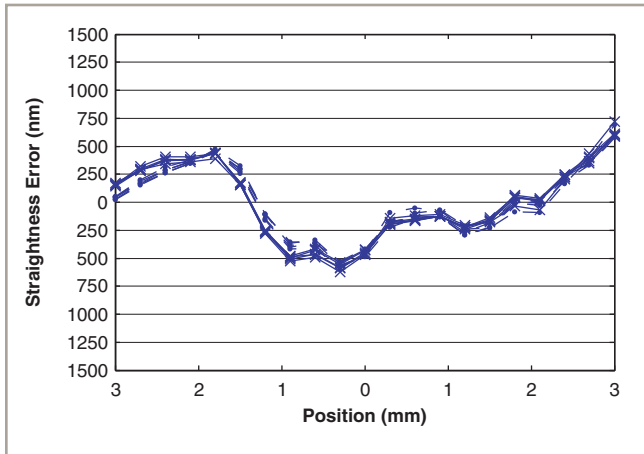
| Recommended Controller | | ANT130-5-V |
|------------------------|----------|--|
| Multi-Axis | A3200 | Npaq-MXR Npaq MR-MXH Ndrive ML-MXH |
| | Ensemble | Epaq-MXH Epaq MR-MXH Ensemble ML-MXH |
| Single Axis | Soloist | Soloist ML-MXH |

Notes:

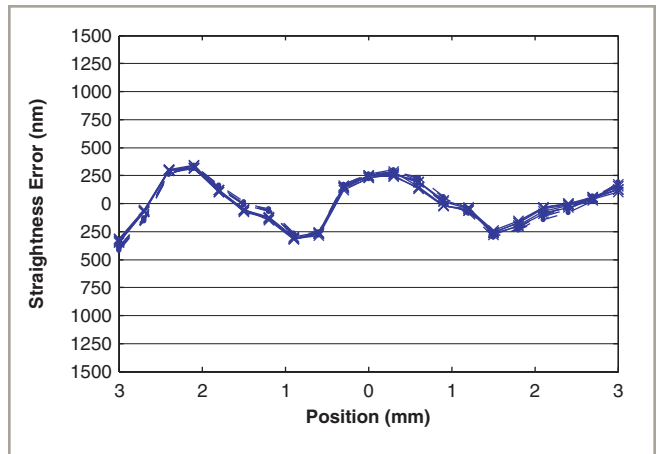
1. Linear amplifiers are required to achieve the listed specifications. Other options are available.

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 Sales Engineering for more information.

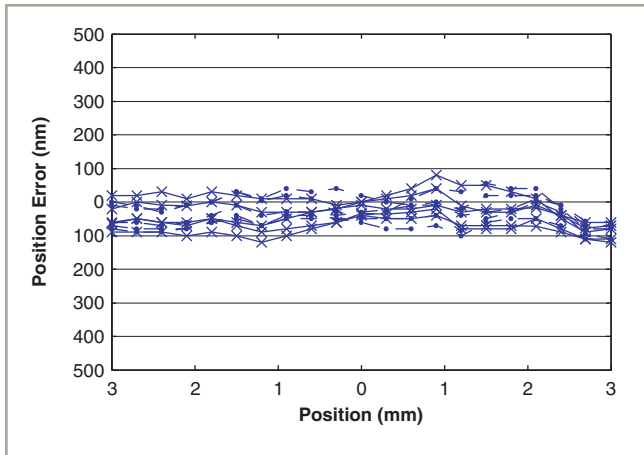
ANT130-5-V/ANT130-5-V-PLUS PERFORMANCE



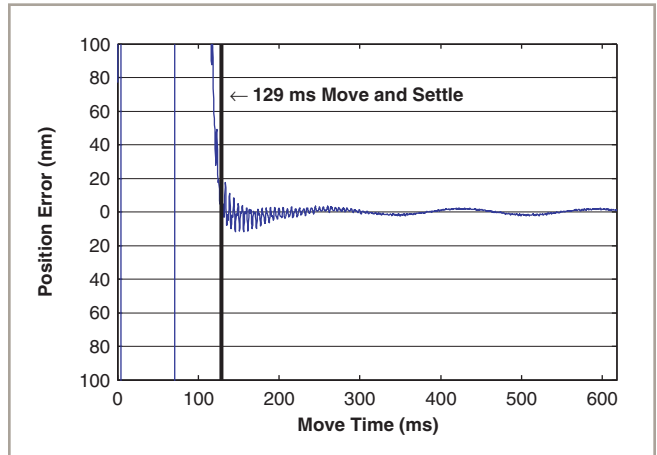
ANT130-5-V-PLUS straightness error, five runs, bi-directional, parallel to the wedge.



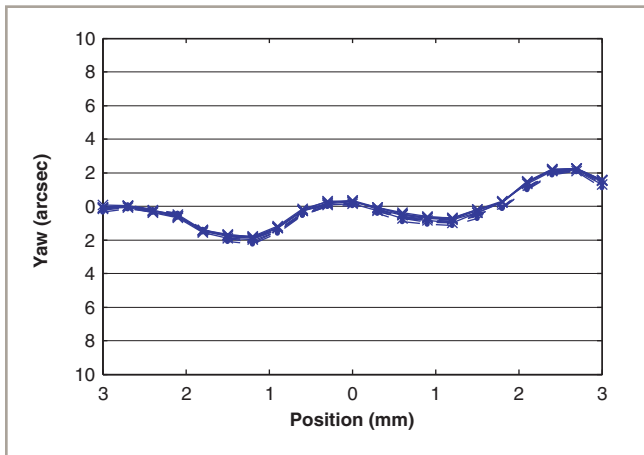
ANT130-5-V-PLUS straightness error, five runs, bi-directional, perpendicular to the wedge.



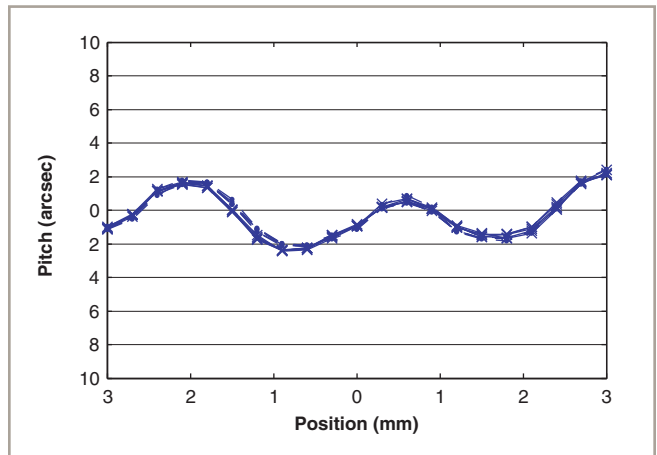
ANT130-5-V-PLUS accuracy and repeatability. This multiple test run over an extended period of time shows the high level of system accuracy and repeatability.



ANT130-5-V-PLUS step and settle performance at 75 mm/s, with a settle spec of ± 20 nm, and a step size of 5 mm. Outstanding settling time enhances throughput of most applications.

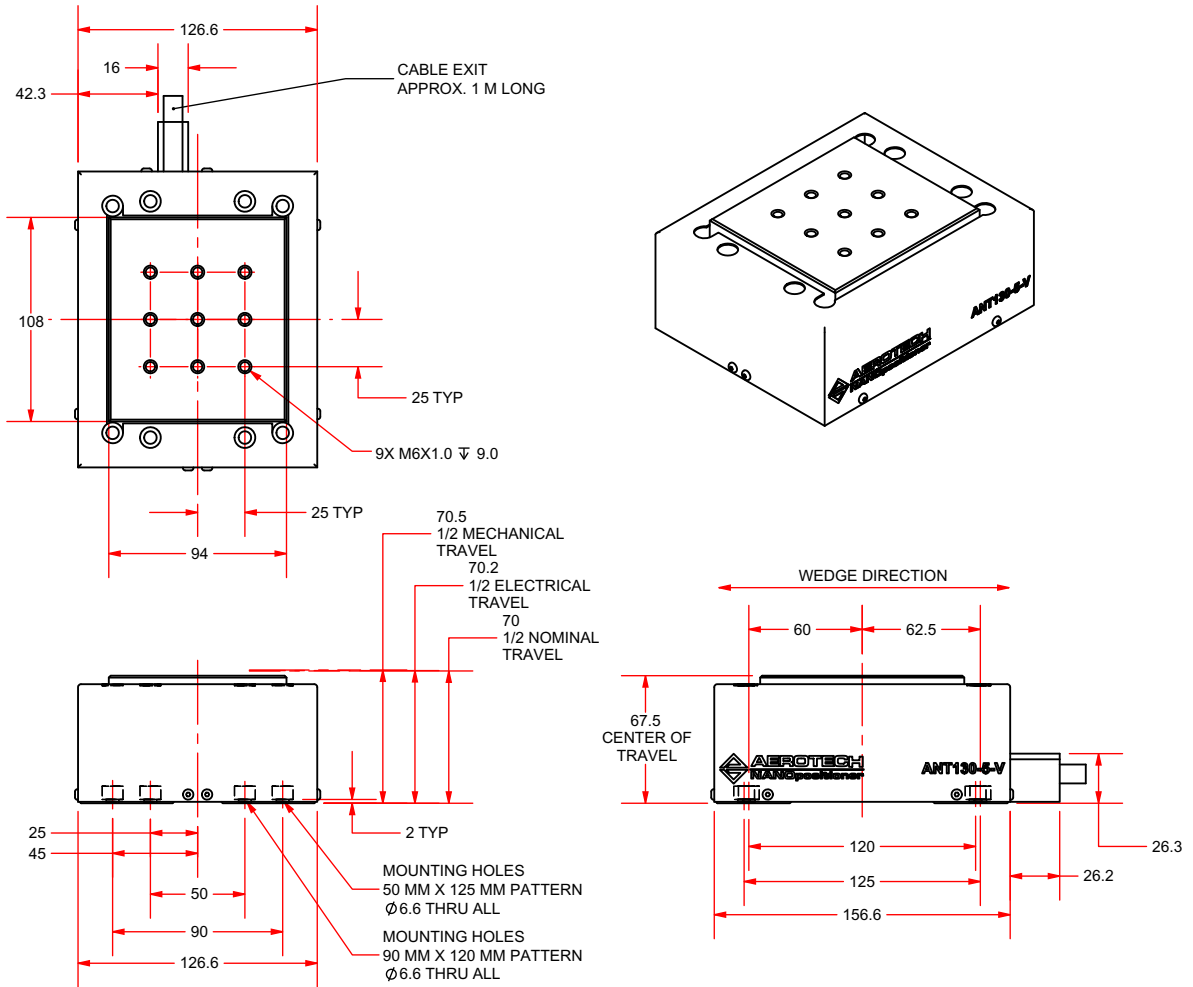


ANT130-5-V-PLUS yaw, five runs, bi-directional. Highly repeatable, minimal yaw error enhances system positioning accuracy.



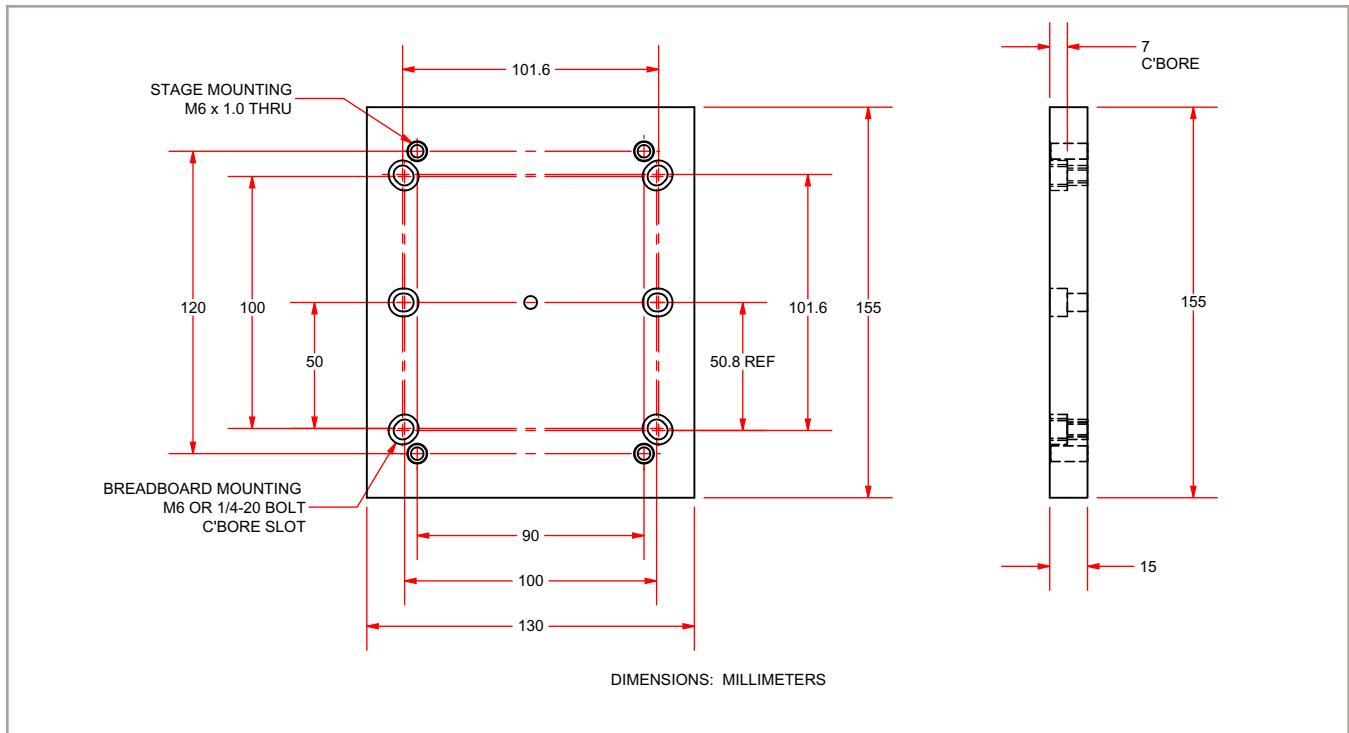
ANT130-5-V-PLUS pitch, five runs, bi-directional. Excellent repeatability/accuracy contribute to improved processing.

ANT130-5-V/ANT130-5-V-PLUS DIMENSIONS



DIMENSIONS: MILLIMETERS

ANT130-5-V/ANT130-5-V-PLUS Mounting Plate DIMENSIONS



ANT130-5-V/ANT130-5-V-PLUS ORDERING INFORMATION

ANT130-5-V Series Vertical Lift Stage

ANT130-5-V Aerotech's nanotranslation crossed-roller bearing vertical lift positioner

Linear Stage Travel (X,Y)

ANT130-5-V 5 mm vertical travel lift stage with proprietary direct-drive motor technology, 1 Vp-p sinusoidal output linear encoder and limits

ANT130-5-V-PLUS 5 mm vertical travel lift stage with proprietary direct-drive motor technology, 1 Vp-p sinusoidal output linear encoder and limits (High Accuracy Version)

Accessories

-MP-ANT130-5-V Breadboard mounting plate

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