



Two-Axis XY Nanopositioning Stages **ANT95XY**

Ultra-Smooth Motion, Compact Form Factor

Our ultra-compact ANT95XY stages deliver superior planar performance with excellent geometric characteristics, thanks to an integrated two-axis design. Equipped with high-stiffness crossed-roller bearings, high-resolution position feedback and ironless linear motors to achieve the smoothest, most precise motion in its class, ANT95XY stages can be further enhanced with ultra high-accuracy 2D calibration to optimize your high-precision inspection or manufacturing process.

Key Applications

ANT95XY 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:

- ◆ **OPTIMIZES ORTHOGONALITY, STRAIGHTNESS & FLATNESS** with integrated XY design
- ◆ Guarantees **TWO-DIMENSIONAL ACCURACY OF ± 250 nm** or better with ULTRA calibration option
- ◆ Achieves **MINIMUM INCREMENTAL MOTION TO 0.5 nm**
- ◆ Features high-precision crossed-roller bearings for **EXCELLENT DYNAMIC PERFORMANCE & GENEROUS LOAD CAPACITY**
- ◆ **MAXIMIZES PROCESS THROUGHPUT & RELIABILITY** with ironless direct-drive linear motor
- ◆ **ABSOLUTE** and **ULTRA-HIGH RESOLUTION** incremental encoder options are available

ANT95XY SERIES SPECIFICATIONS

| Mechanical Specifications | | ANT95XY-025 | ANT95XY-050 |
|--|---|--|---------------|
| Travel | | 25 mm x 25 mm | 50 mm x 50 mm |
| Accuracy⁽¹⁾ | Base Performance (-PL1) | ±2.5 µm | |
| | Plus Performance (-PL3)⁽²⁾ | ±250 nm (-E1, -E2, -E3) ±200 nm (-E4) | |
| | Ultra Performance (-PL4)⁽²⁾ | ±250 nm (-E1, -E2, -E3) ±200 nm (-E4) | |
| Repeatability (Bidirectional)⁽¹⁾ | | ±75 nm | |
| Resolution (Minimum Incremental Motion) | | 1 nm (-E1) 5 nm (-E3) 0.5 nm (-E4) | |
| Straightness⁽¹⁾ | Base Performance (-PL1) | ±1.0 µm | |
| | Plus Performance (-PL3)⁽²⁾ | ±1.0 µm | |
| | Ultra Performance (-PL4)⁽²⁾ | ±250 nm | |
| Flatness⁽¹⁾ | | ±1.0 µm | |
| Pitch | | 10 arc sec | |
| Roll | | 10 arc sec | |
| Yaw | | 5 arc sec | |
| Orthogonality⁽²⁾ | Base Performance (-PL1) | 10 arc sec | |
| | Plus Performance (-PL3) | 3 arc sec | |
| | Ultra Performance (-PL4) | 1 arc sec | |
| | | 500 mm/s (Upper Axis: -E1, -E3, -E4) 145 mm/s (Upper Axis: -E2) | |
| Maximum Acceleration (No Load) | | 4.5 g | 2.75 g |
| Speed Stability | | See graph for typical performance | |
| Settling Time | | See graph for typical performance | |
| In-Position Stability⁽³⁾ | | <1 nm (-E1) <5 nm (-E3) <0.5 nm (-E4) | |
| Load Capacity⁽⁴⁾ | | 4 kg | 6 kg |
| Moving Mass | Upper Axis | 0.45 kg | 0.83 kg |
| | Lower Axis | 1.30 kg | 2.33 kg |
| Stage Mass | | 1.92 kg | 3.47 kg |
| Material | | Anodized Aluminum | |
| MTBF (Mean Time Between Failure) | | 30,000 Hours | |

Notes:

1. Certified with each stage.
2. Requires the use of an Aerotech controller.
3. In-position stability is reported as 3-sigma value. Requires a 1 Vpp encoder.
4. Payload specifications assume payload is centered on-axis.
5. Specifications for BASE and PLUS are reported per-axis, measured 25 mm above the tabletop. Specifications for ULTRA are reported as XY, measured 25 mm above the tabletop. Performance depends on the payload and workpoint. Consult factory for more information.
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.

| Electrical Specifications | ANT95XY-025 | ANT95XY-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) BiSS-C absolute + incremental 1 Vpp linear dual-track encoder (-E3) 1 Vpp with 4 µm signal period (-E4) | |
| Maximum Bus Voltage | ±40 VDC | |
| Limit Switches | 5 V, Normally Closed | |
| Home Switch | Near Center | |

ANT95XY SERIES ORDERING INFORMATION

Travel (Required)

- 025 25 mm x 25 mm travel
- 050 50 mm x 50 mm travel

Feedback (Required)

- E1 Incremental linear encoders, 1 Vpp amplified sine output
- E2 Incremental linear encoders, digital RS422 output, 5 nm electrical resolution
- E3 Absolute + Incremental 1 Vpp linear dual-track encoder
- E4 Incremental linear encoders, 1 Vpp amplified sine output, high-performance

Mounting Plate (Optional)

- MP Mounting plate

Performance Grade (Required)

- PL1 Base performance
- PL3 High-accuracy performance, PLUS
- PL4 Ultra high-accuracy performance, ULTRA

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.

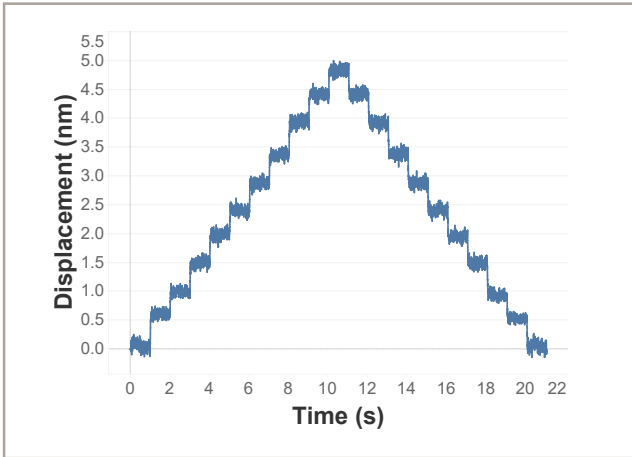
-TAS Integration - Test as system

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.

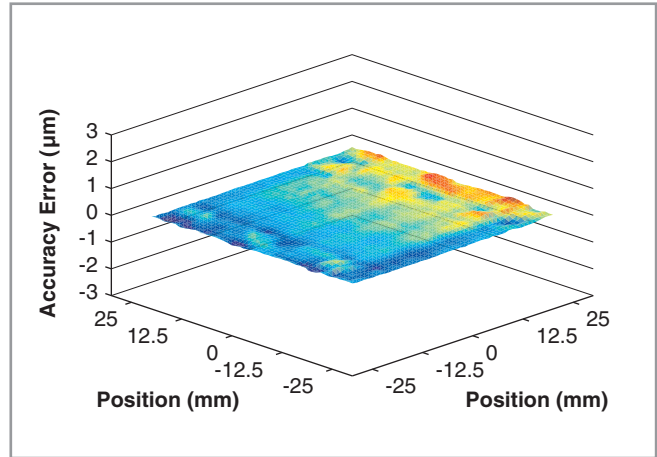
-TAC Integration - Test as components

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.

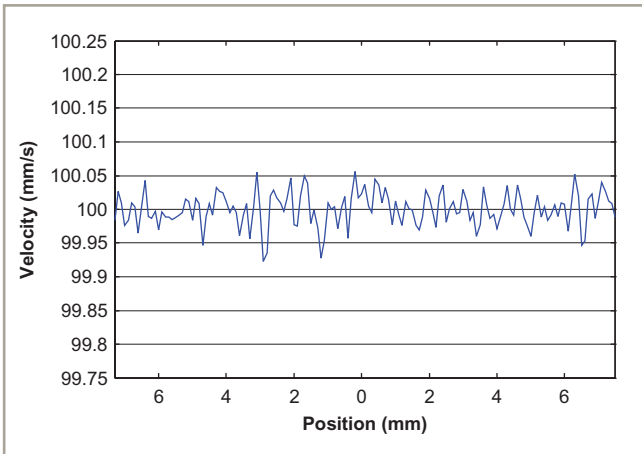
ANT95XY SERIES PERFORMANCE



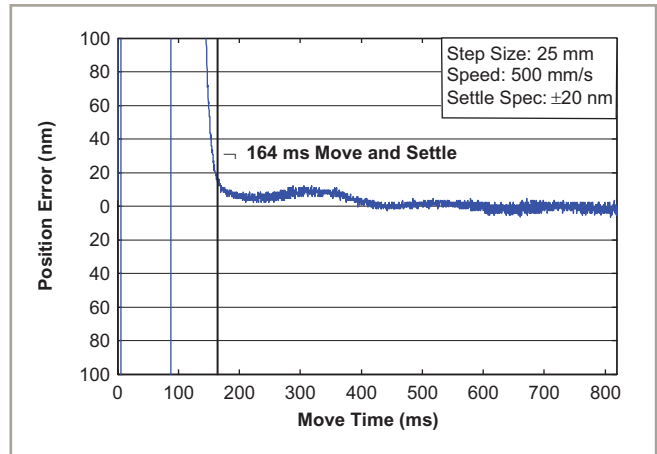
ANT95XY-025-E4 lower axis 0.5 nm step plot. Best-in-class resolution and exceptional in-position stability for large-travel stages.



ANT95XY-050-PL4 – exceptional 2D system accuracy with Aerotech's ULTRA version.

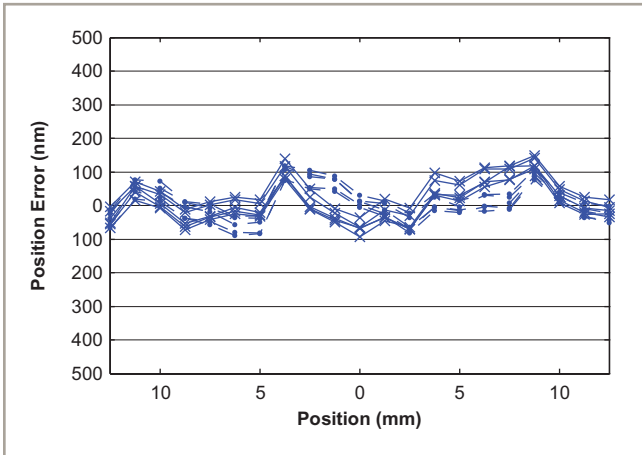


ANT95XY-025-PL3 velocity performance at 100 mm/s and 1 kg payload for the X (lower) axis. This outstanding speed stability enhances most scanning or laser machining applications.

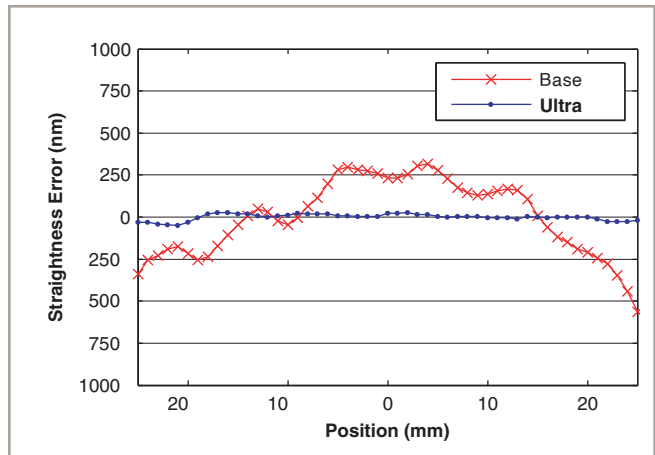


ANT95XY-025-PL3 step and settle performance at full travel and 1 kg payload for the X (lower) axis. Industry-best settling times significantly improve throughput for most applications.

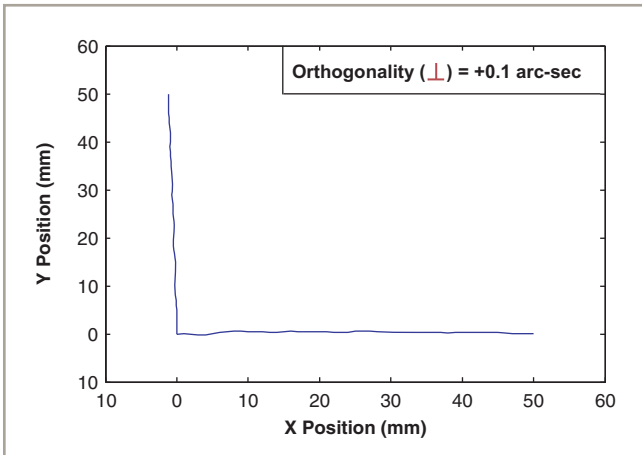
ANT95XY SERIES PERFORMANCE



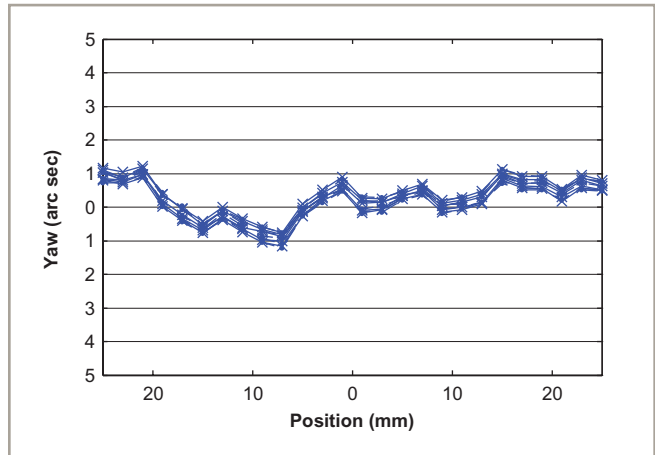
ANT95XY-025-PL3 accuracy and repeatability, five runs, bi-directional for the X (lower) axis. The total accuracy of 240 nm over 25 mm travel is significantly better than other offerings and half of its stated specification.



ANT95XY-025 straightness error comparison between the BASE and ULTRA models shows a dramatic improvement in this specification.



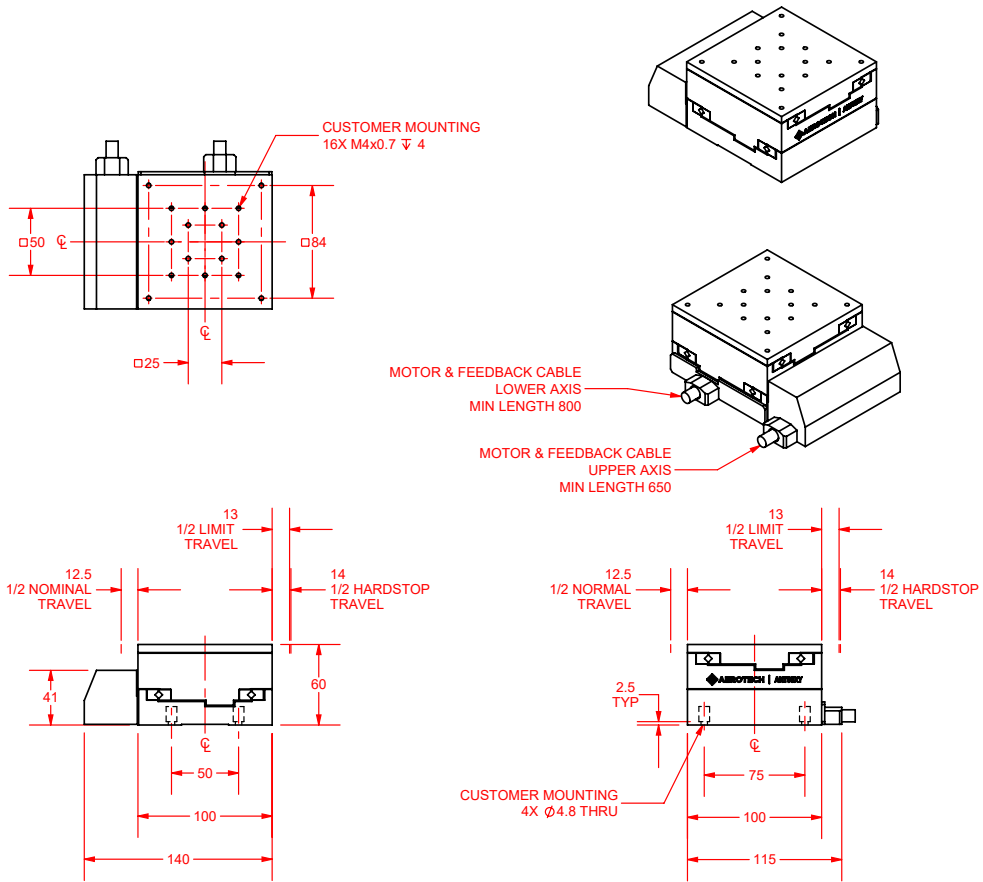
ANT95XY-050-PL4 orthogonality. The plot is exaggerated 10,000X for clarity. The ULTRA model orthogonality is a twenty-fold improvement over the BASE model orthogonality.



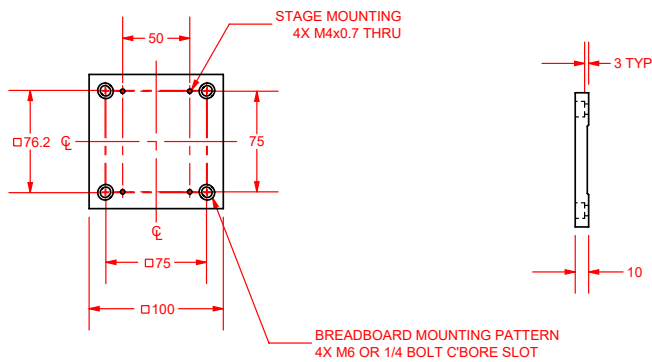
ANT95XY-050-PL3 Y (upper) axis yaw, five runs, bi-directional. Highly repeatable, lowest angular error over full travel.

ANT95XY-025 DIMENSIONS

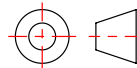
ANT95XY-025



-MP (MOUNTING PLATE, BREADBOARD)

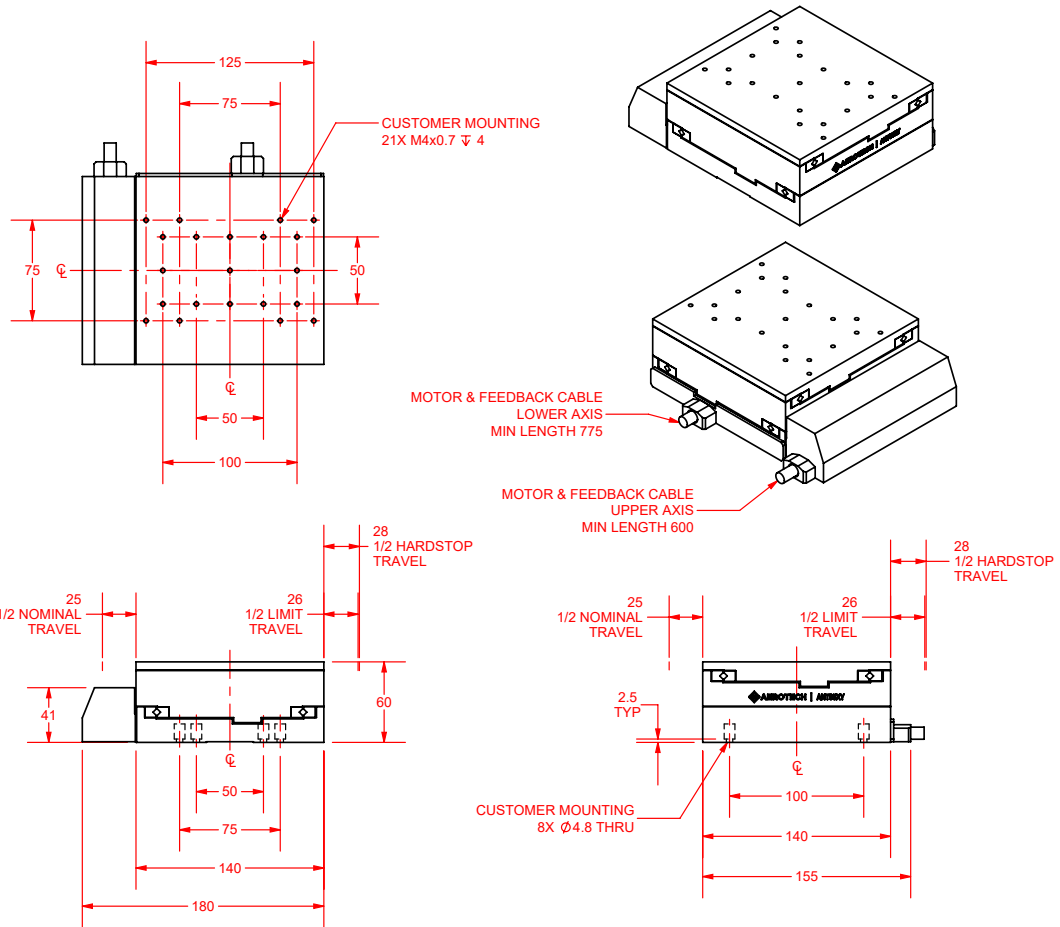


DIMENSIONS: MILLIMETERS

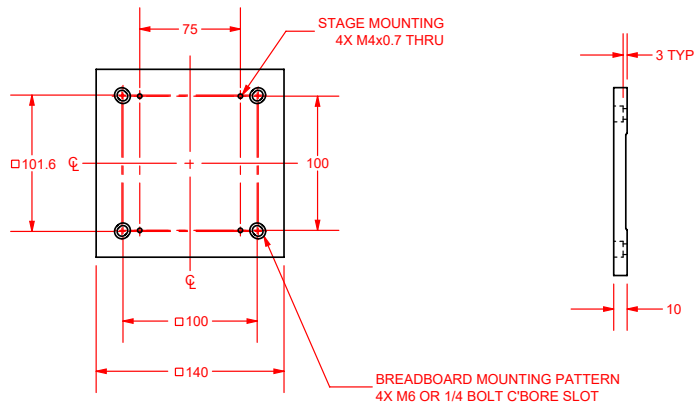


ANT95XY-050 DIMENSIONS

ANT95XY-050



-MP (MOUNTING PLATE, BREADBOARD)



DIMENSIONS: MILLIMETERS

