



Single-Axis Linear Nanopositioning Stages **ANT95L**



Achieve Superior Nanometer-Scale Motion

ANT95L linear stages are the leading solution for addressing your nanometer-level motion and positioning needs. Available in a variety of configurations, they are best-in-class in combining resolution, accuracy, repeatability, size and reliability. Plus, with impressive dynamic capabilities and an enhanced load-carrying capacity, ANT95L stages are an excellent choice to amplify your process.

Key Applications

ANT95L stages are ideal for high-precision and high-dynamic positioning applications, 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 100 mm
- ◆ Achieves **MINIMUM INCREMENTAL MOTION TO 0.5 nm**
- ◆ Features high-precision crossed-roller bearings for **EXCELLENT DYNAMIC PERFORMANCE & GENEROUS LOAD CAPACITY**
- ◆ **OPTIMIZES PROCESS THROUGHPUT & MAXIMIZES RELIABILITY** with ironless direct-drive linear motor
- ◆ Integrates easily into **MULTI-AXIS ASSEMBLIES** & motion subsystems
- ◆ **ABSOLUTE** and **ULTRA-HIGH RESOLUTION** incremental encoder options are available

ANT95L SERIES SPECIFICATIONS

| Mechanical Specifications | | ANT95L-025 | | ANT95L-050 | ANT95L-075 | ANT95L-100 |
|--|-------------------------|---|--|------------|--|------------|
| Travel | | 25 mm | | 50 mm | 75 mm | 100 mm |
| Accuracy ⁽¹⁾ | Base Performance (-PL1) | ±2.5 µm | | | ±4.0 µm | ±5.0 µm |
| | Plus Performance (-PL2) | ±250 nm (-E1, -E2, -E3) ±175 nm (-E4) | | | ±275 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⁾ | | ±1.0 µm | | | ±2.0 µm | ±2.5 µm |
| Flatness ⁽¹⁾ | | ±1.0 µm | | | ±2.0 µm | ±2.5 µm |
| Pitch | | 10 arc sec | | | | |
| Roll | | 10 arc sec | | | | |
| Yaw | | 5 arc sec | | | | |
| Maximum Speed | | 500 mm/s (-E1, -E3, -E4) 145 mm/s (-E2) | | | | |
| Maximum Acceleration (No Load) | | 5 g | | 4 g | 3 g | |
| Speed Stability | | See graph for typical performance | | | | |
| Settling Time | | See graph for typical performance | | | | |
| In-Position Stability ⁽²⁾ | | <1 nm (-E1) <5 nm (-E3) <0.5 nm (-E4) | | | | |
| Load Capacity ⁽³⁾ | Horizontal | 5 kg | | 7 kg | | |
| | Side | 5 kg | | | | |
| Moving Mass | | 0.45 kg | | 0.63 kg | 0.74 kg | 0.95 kg |
| Stage Mass | | 0.96 kg | | 1.36 kg | 1.59 kg | 2.03 kg |
| Material | | Anodized Aluminum | | | | |
| MTBF (Mean Time Between Failure) | | 30,000 Hours | | | | |

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 for single-axis systems measured 25 mm above the tabletop. Performance of combined 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.
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 | ANT95L-025 | ANT95L-050 | ANT95L-075 | ANT95L-100 |
|---------------------------|--|------------|------------|------------|
| 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 | $\pm 40 \text{ VDC}$ | | | |
| Limit Switches | 5 V, Normally Closed | | | |
| Home Switch | Near Center | | | |

ANT95L SERIES ORDERING INFORMATION

Travel (Required)

| | |
|------|---------------|
| -025 | 25 mm travel |
| -050 | 50 mm travel |
| -075 | 75 mm travel |
| -100 | 100 mm travel |

Feedback (Required)

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

Mounting Plate (Optional)

| | |
|-----|----------------|
| -MP | Mounting plate |
|-----|----------------|

Performance Grade (Required)

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

Integration (Required)

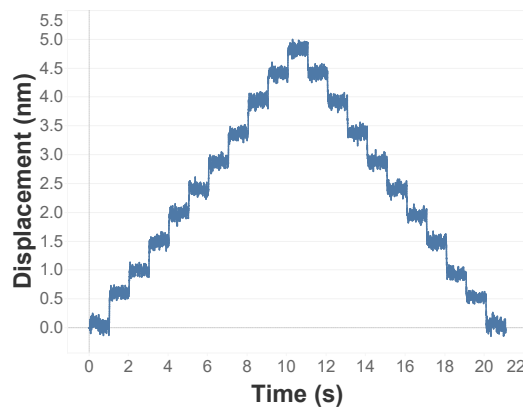
Aerotech offers both standard and custom integration services to help you get your system fully operational as quickly as possible. The following standard integration options are available for this system. Please consult Aerotech if you are unsure what level of integration is required, or if you desire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

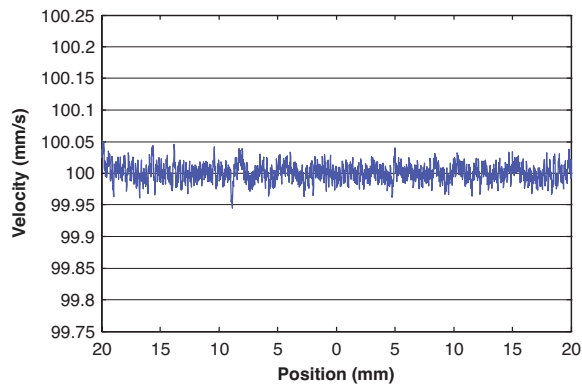
Testing and integration of individual items as discrete components that ship together. This is typically used for spare parts, replacement parts, or items that will not be used together. These components may or may not be part of a larger system.



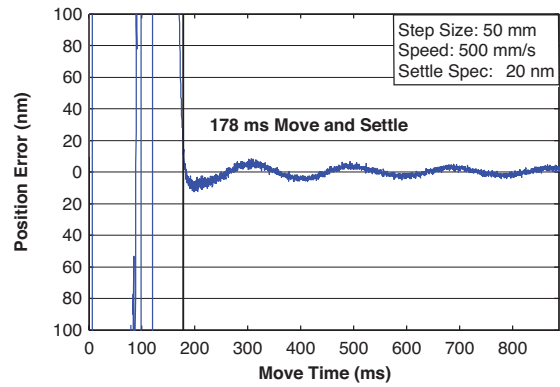
ANT95L-025-PL2 0.5 nm step plot. Best-in-class resolution and exceptional in-position stability for large-travel stages.

ANT95L SERIES SPECIFICATIONS

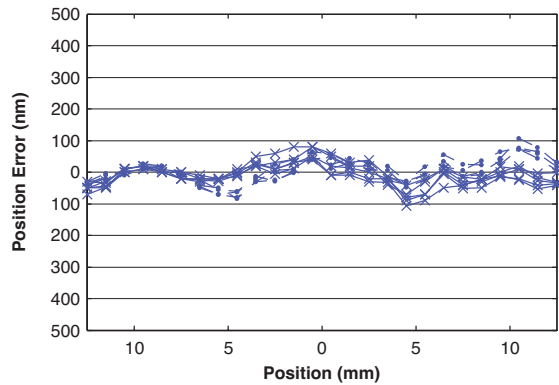
ANT95L SERIES PERFORMANCE



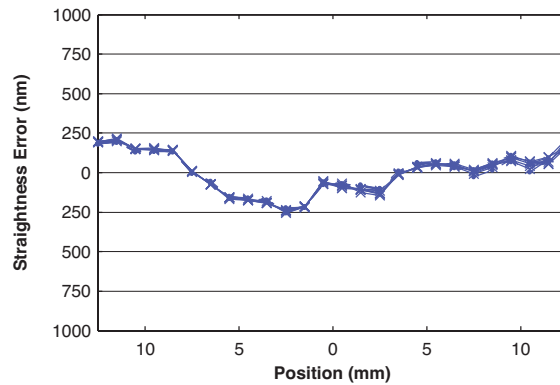
ANT95L-050-PL2 velocity performance at 100 mm/s and 1 kg payload. Excellent speed stability is another feature of the ANT series stages.



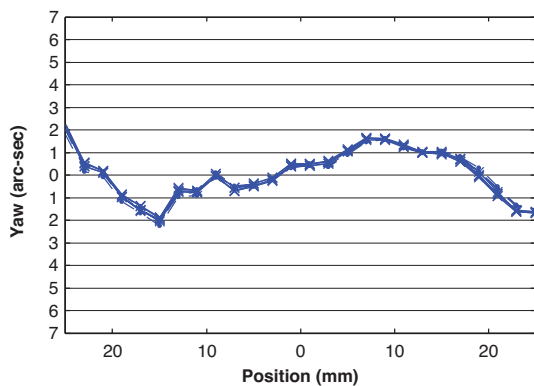
ANT95L-050-PL2 step and settle performance at full travel and 1 kg payload. Outstanding settling time enhances throughput of most applications.



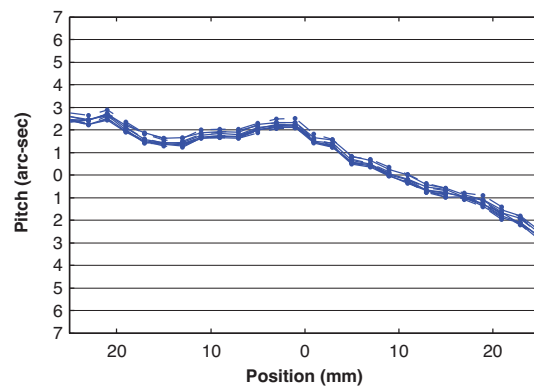
ANT95L-025-PL2 accuracy and repeatability. This multiple test run over an extended period of time shows the high level of system accuracy and repeatability.



ANT95L-025-PL2 straightness error, five runs, bi-directional. Exceptional and highly repeatable – five times more accurate than the stated specification.



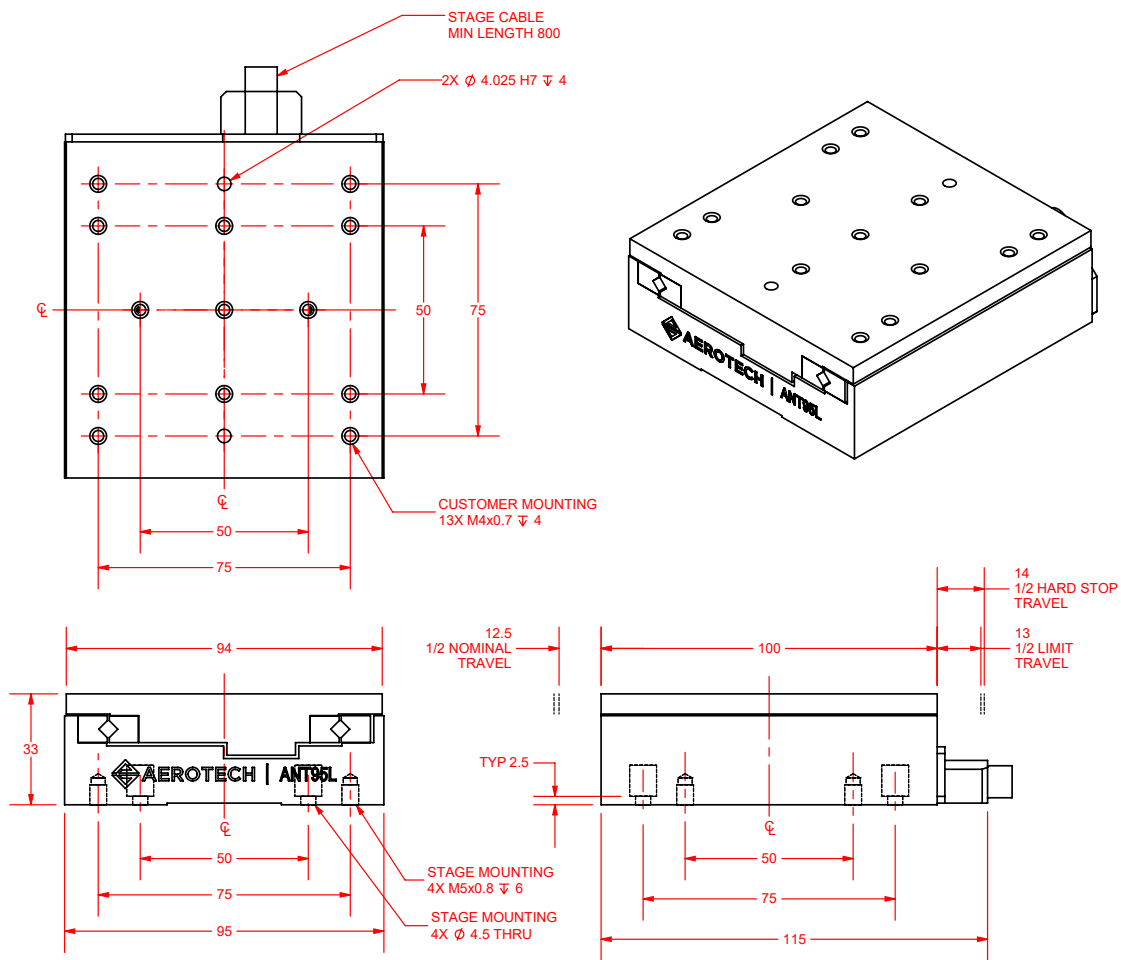
ANT95L-050-PL2 yaw, five runs, bi-directional. Highly repeatable, minimal yaw error enhances system positioning accuracy.



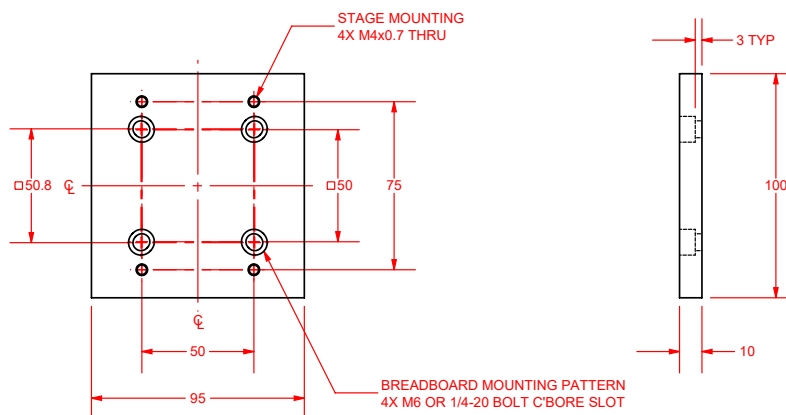
ANT95L-050-PL2 pitch, five runs, bi-directional. Excellent repeatability/accuracy contribute to improved processing.

ANT95L-025 DIMENSIONS

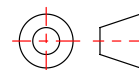
ANT95L-025



-MP (MOUNTING PLATE, BREADBOARD)

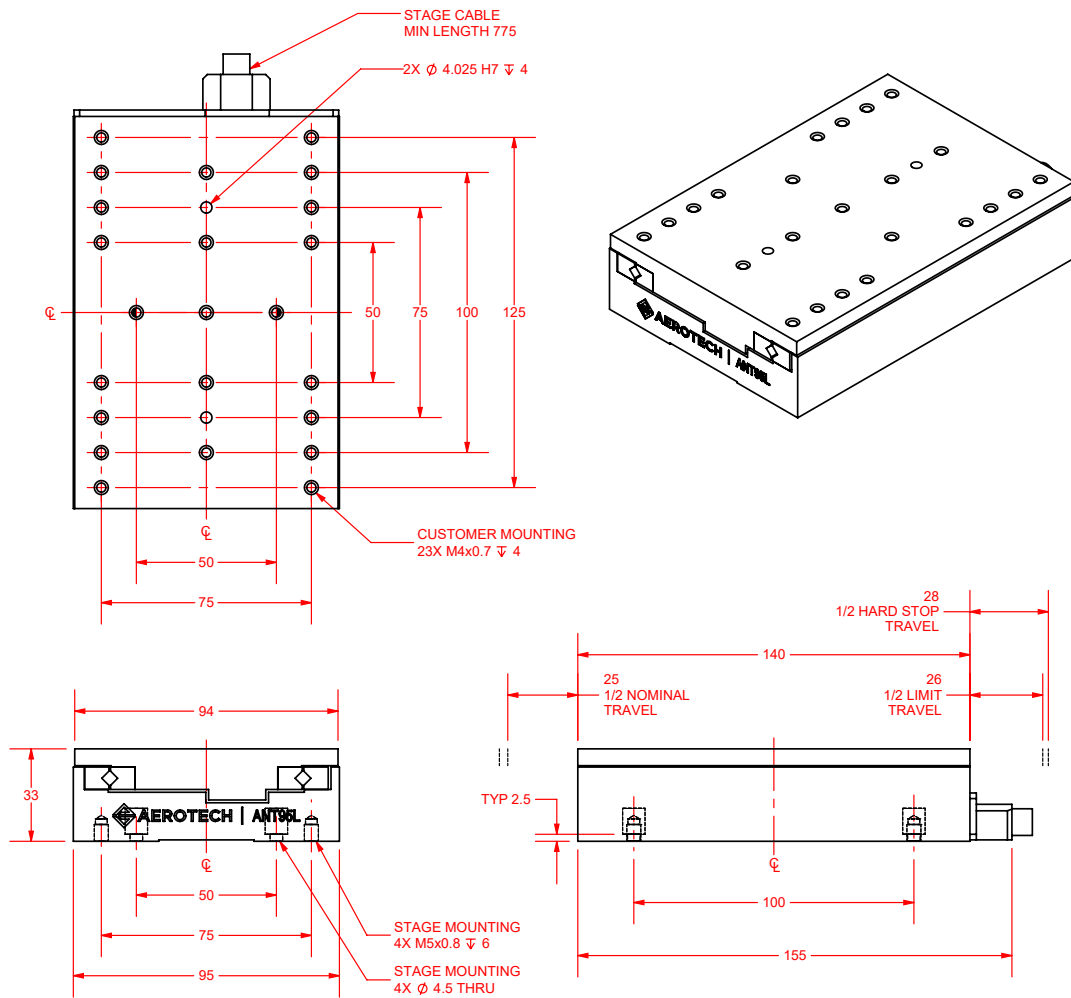


DIMENSIONS: MILLIMETERS

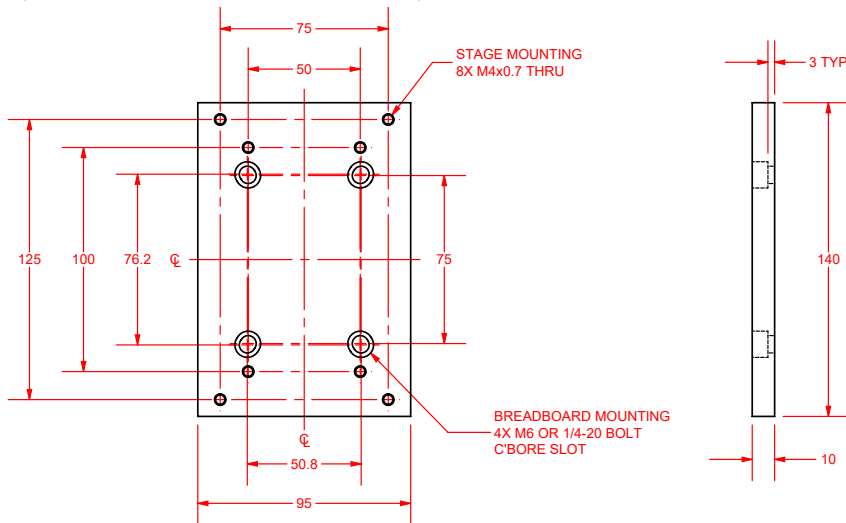


ANT95L-050 DIMENSIONS

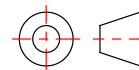
ANT95L-050



MP (MOUNTING PLATE, BREADBOARD)

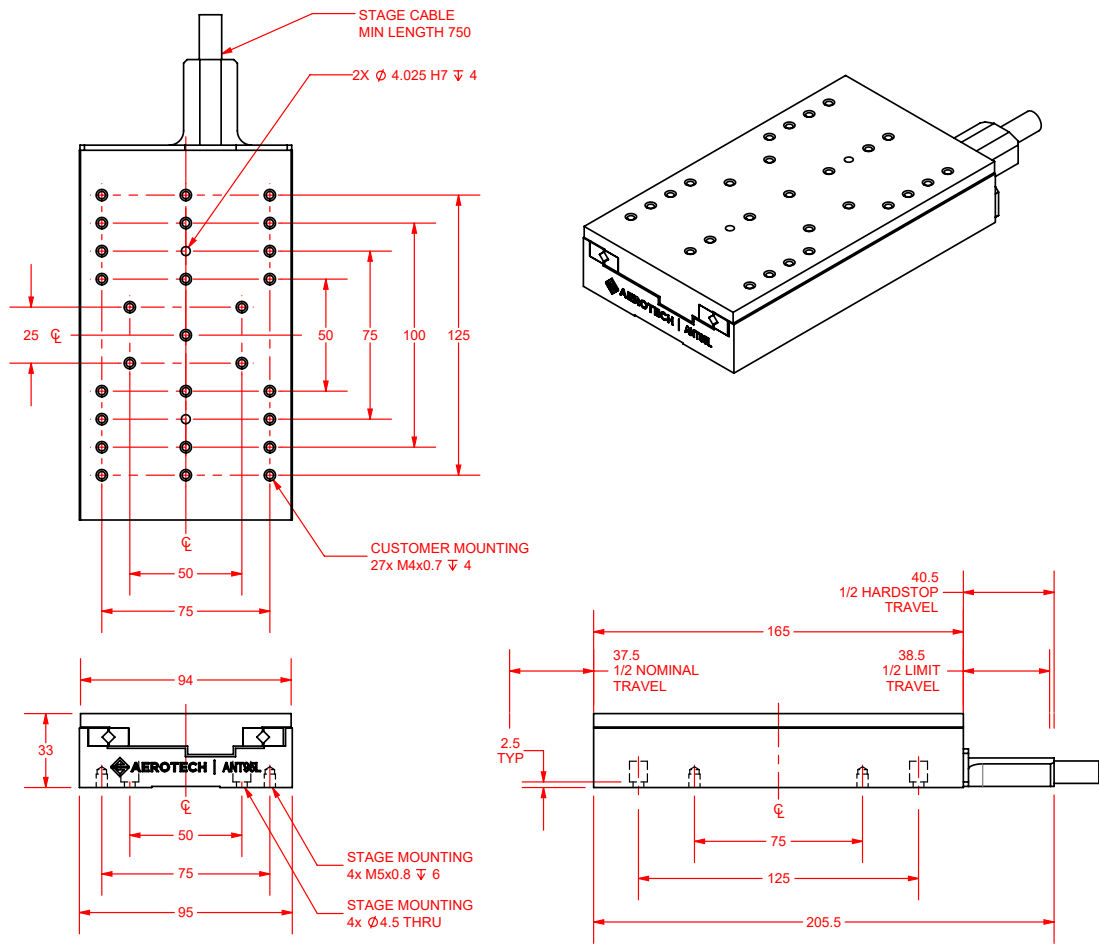


DIMENSIONS: MILLIMETERS

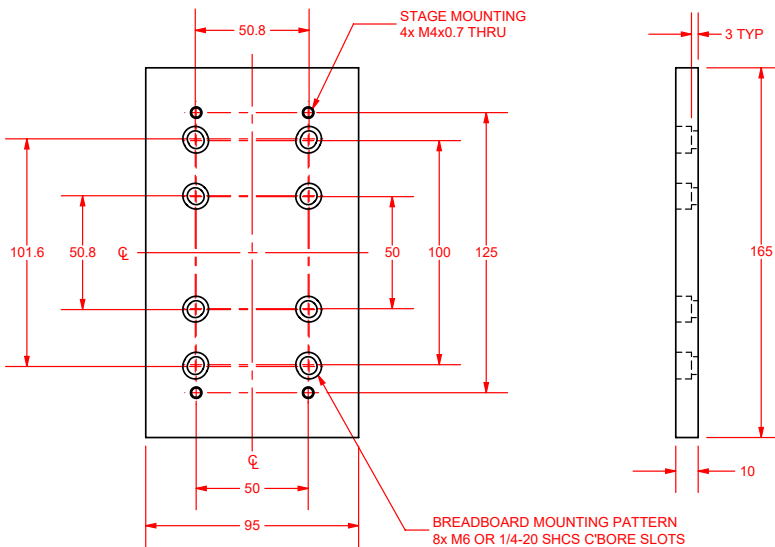


ANT95L-075 DIMENSIONS

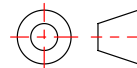
ANT95L-075



-MP (MOUNTING PLATE, BREADBOARD)

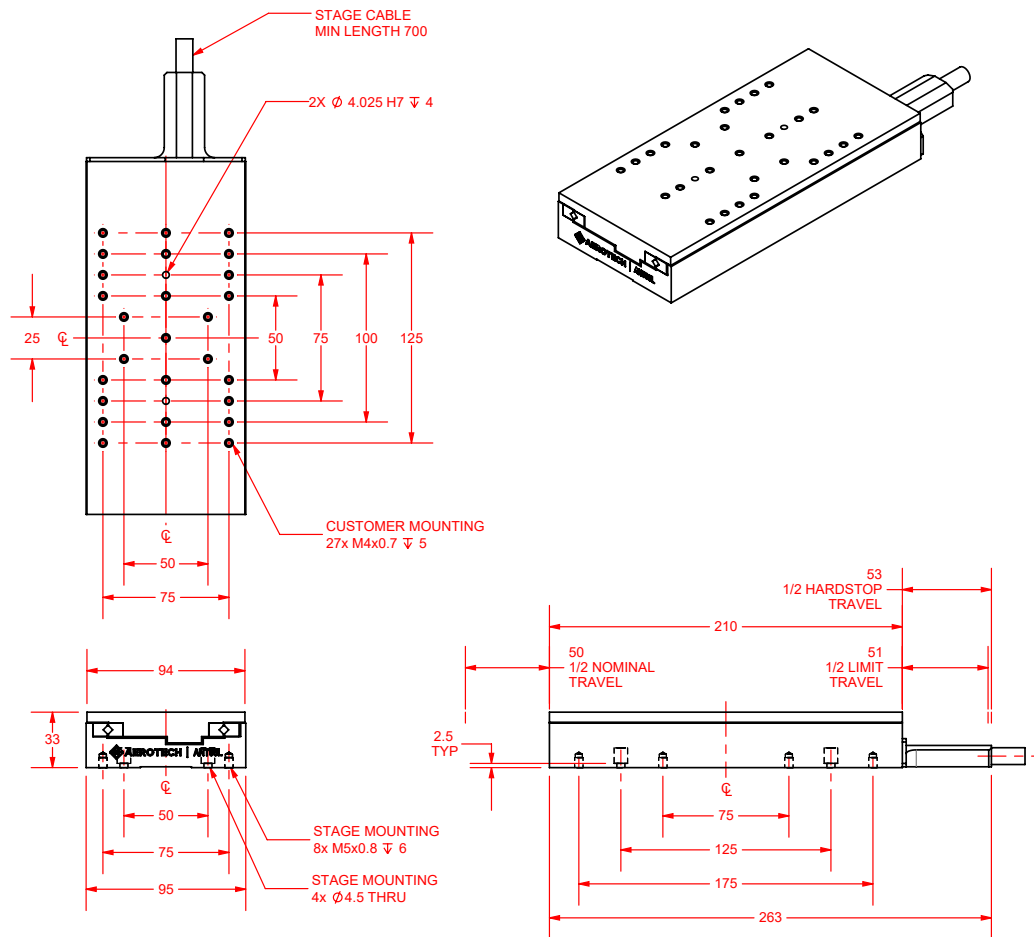


DIMENSIONS: MILLIMETERS

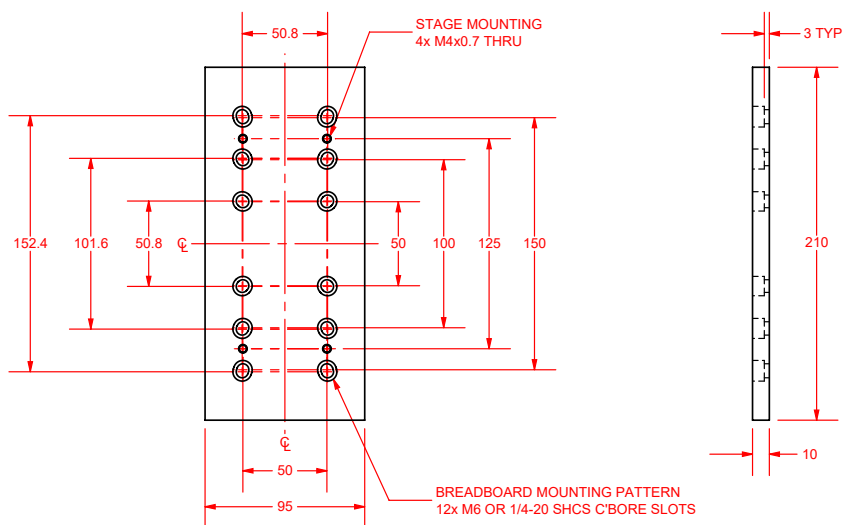


ANT95L-100 DIMENSIONS

ANT95L-100



-MP (MOUNTING PLATE, BREADBOARD)



DIMENSIONS: MILLIMETERS

