



Single-Axis Direct-Drive Nanopositioning Stage **ANT180L**



Achieve Nanometer-Scale Performance with Longer Travel

ANT180L stages are the leading solution for addressing your nanometer-level motion and positioning needs. They deliver superior accuracy, repeatability and speed -- all with the utmost reliability. Compared to our smaller ANT130L and ANT95L models, ANT180L offers longer travel lengths and higher payload capacities. With impressive dynamic capabilities and ample load capacity, ANT180L stages are the preferred choice for integrating linear motion into high-precision industrial and research processes.

Key Applications

ANT180L stages are ideal for high-precision and high-dynamic positioning applications, including:

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

KEY FEATURES:

- ◆ Delivers **NANOMETER-LEVEL PERFORMANCE** over travel lengths up to 360 mm
- ◆ Capable of **MINIMUM INCREMENTAL MOTION TO 1 NM**
- ◆ High-precision crossed-roller bearings for **EXCELLENT DYNAMIC PERFORMANCE & AMPLE LOAD CAPACITY** up to 30 kg
- ◆ Ironless direct-drive motor **MAXIMIZES PROCESS THROUGHPUT & RELIABILITY**
- ◆ **INTEGRATES EASILY** into multi-axis assemblies with optional cable management system

ANT180L SERIES SPECIFICATIONS

| Mechanical Specifications | | | ANT180L-160 | ANT180L-210 | ANT180L-260 | ANT180L-360 |
|---|---|------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Travel | | | 160 mm | 210 mm | 260 mm | 360 mm |
| Accuracy ⁽¹⁾ | High-Accuracy Incremental Encoder (-E3) | PLUS | ±150 nm | ±150 nm | ±200 nm | ±200 nm |
| | | Base | ±2.0 µm | ±2.5 µm | ±3.0 µm | ±3.5 µm |
| | Incremental Encoder (-E1) | PLUS | ±300 nm | ±300 nm | ±350 nm | ±350 nm |
| | | Base | ±4.0 µm | ±5.0 µm | ±6.0 µm | ±7.0 µm |
| Resolution (Minimum Incremental Motion) | High-Accuracy Incremental Encoder (-E3) | | 1 nm | 1 nm | 1 nm | 1 nm |
| | Incremental Encoder (-E1) | | 3 nm | 3 nm | 3 nm | 3 nm |
| Repeatability (Bi-Directional) ⁽¹⁾ | High-Accuracy Incremental Encoder (-E3) | | ±100 nm | ±100 nm | ±125 nm | ±125 nm |
| | Incremental Encoder (-E1) | | ±150 nm | ±150 nm | ±175 nm | ±175 nm |
| Straightness ⁽¹⁾ | | | ±1.0 µm | ±1.25 µm | ±1.5 µm | ±1.75 µm |
| Flatness ⁽¹⁾ | | | ±1.0 µm | ±1.25 µm | ±1.5 µm | ±1.75 µm |
| Pitch | | | 14 arc sec | 14 arc sec | 16 arc sec | 16 arc sec |
| Roll | | | 14 arc sec | 14 arc sec | 16 arc sec | 16 arc sec |
| Yaw | | | 10 arc sec | 10 arc sec | 12 arc sec | 12 arc sec |
| Maximum Speed | | | 500 mm/s | 500 mm/s | 500 mm/s | 500 mm/s |
| Maximum Acceleration | | | 2 g - 20 m/s ² (No Load) | 2 g - 20 m/s ² (No Load) | 2 g - 20 m/s ² (No Load) | 2 g - 20 m/s ² (No Load) |
| Speed Stability | | | See graph for typical performance | | | |
| Settling Time | | | See graph for typical performance | | | |
| Maximum Force (Continuous) | | | 110.5 N | 110.5 N | 110.5 N | 110.5 N |
| Load Capacity ⁽³⁾ | Horizontal | | 30 kg | 30 kg | 30 kg | 30 kg |
| | Side | | 20 kg | 20 kg | 20 kg | 20 kg |
| Moving Mass | | | 6.6 kg | 7.8 kg | 9.2 kg | 11.7 kg |
| Stage Mass | | | 12.8 kg | 14.9 kg | 17.6 kg | 22.4 kg |
| Material | | | Aluminum Body/Black Hardcoat Finish | | | |
| MTBF (Mean Time Between Failure) | | | 30,000 Hours | | | |

Notes:

1. Certified with each stage.
2. Axis orientation for on-axis loading is listed.
3. 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.
4. -PLUS requires the use of an Aerotech controller.
5. Specifications are -E1 and -E3 only. Consult factory for other options

| Electrical Specifications | ANT180L-160 | ANT180L-210 | ANT180L-260 | ANT180L-360 |
|---------------------------|---|-------------|-------------|-------------|
| Drive System | Brushless Linear Servomotor | | | |
| Feedback | Noncontact Linear Encoder (see options on Order Information page) | | | |
| Maximum Bus Voltage | -CN1: 80 VDC, -CN2: 160 VDC | | | |
| Limit Switches | 5 V, Normally Open | | | |
| Home Switch | Near Center | | | |

ANT180L SERIES ORDERING INFORMATION

Travel (Required)

| | |
|------|---------------------|
| -160 | 160 mm travel stage |
| -210 | 210 mm travel stage |
| -260 | 260 mm travel stage |
| -360 | 360 mm travel stage |

Feedback (Required)

| | |
|-----|---|
| -E1 | Incremental encoder, 1 Vpp |
| -E2 | Incremental encoder, 0.1 μ m TTL output |
| -E3 | High-accuracy incremental encoder, 1 Vpp |

Cable Management (Optional)

| | |
|-------|---|
| -CMS1 | Cable management system for XY assembly - order with lower-axis only |
| -CMS2 | Cable management system for XY assembly w/6 mm air line - order with lower-axis only |
| -CMS3 | Cable management system for XYZ assembly - order with lower-axis only |
| -CMS4 | Cable management system for XYZ assembly w/6 mm air line - order with lower-axis only |
| -CMS5 | Cable management system for XY assembly - order with upper-axis only |
| -CMS6 | Cable management system for XY assembly w/6 mm air line - order with upper-axis only |
| -CMS7 | Cable management system for XYZ assembly - order with upper-axis only |
| -CMS8 | Cable management system for XYZ assembly w/6 mm air line - order with upper-axis only |

Metrology (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

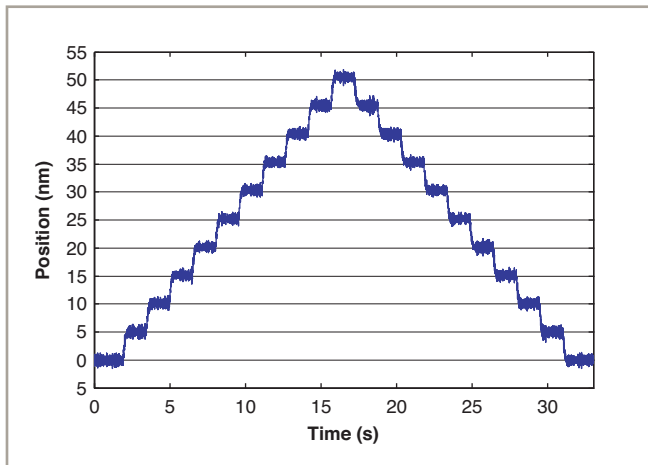
Testing and integration of individual items as discrete components that ship together. This is typically used for spare parts, replacement parts, or items that will not be used together. These components may or may not be part of a larger system.

Accessories (to be ordered as separate line item)

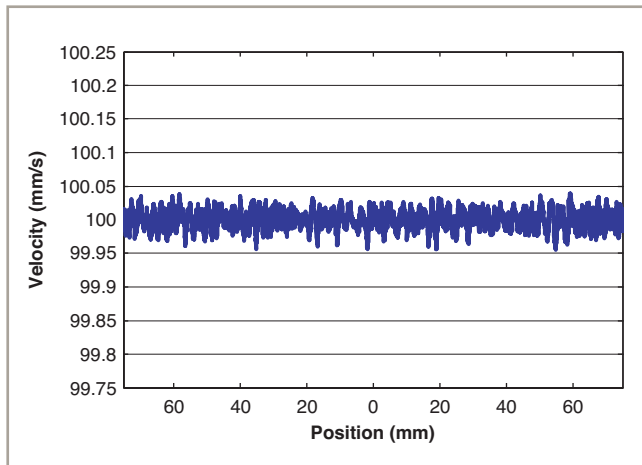
| | |
|------------|---------------------------------------|
| ALIGN-PA10 | XY assembly; 10 arc sec orthogonality |
| ALIGN-PA5 | XY assembly; 5 arc sec orthogonality |

ANT180L SERIES SPECIFICATIONS

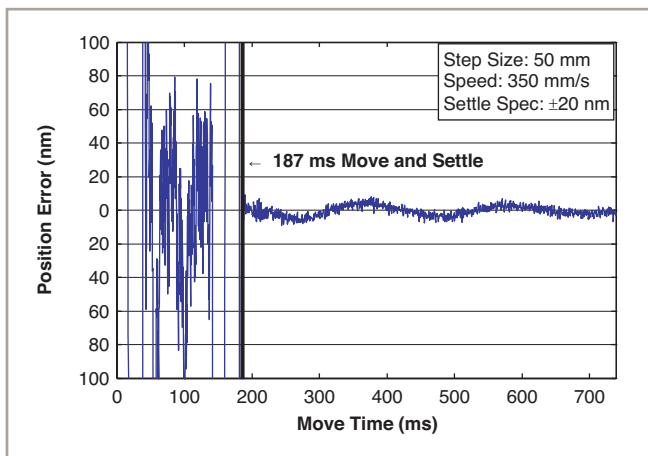
ANT180L SERIES PERFORMANCE



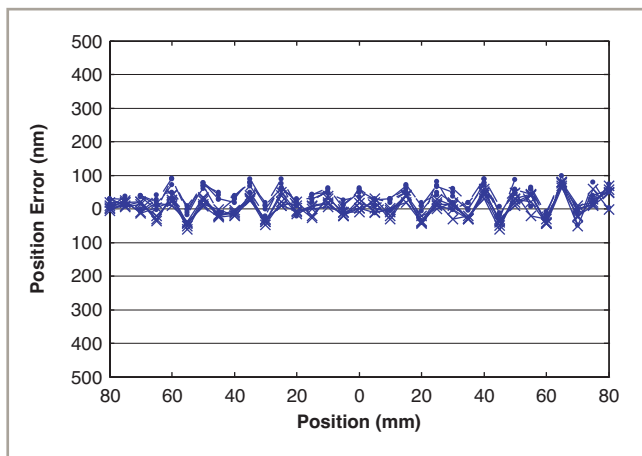
ANT180L 5 nm step plot. Best-in-class resolution and exceptional in-position stability for large travel stages. See additional performance graphs on the following pages.



ANT180L-160 velocity performance at 100 mm/s and 1 kg payload. Excellent speed stability is another feature of the ANT Series stages.



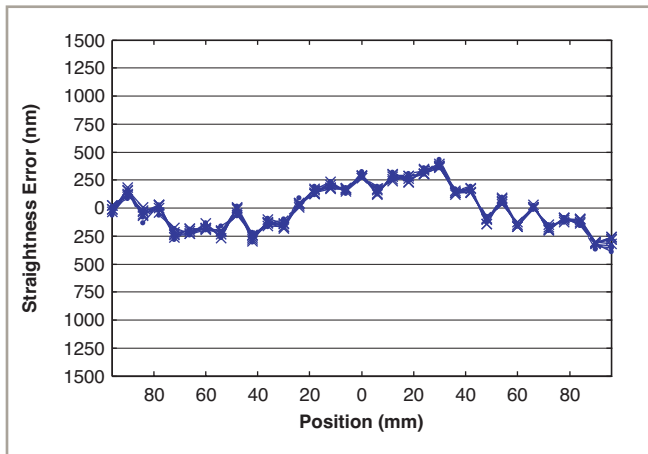
ANT180L-160 step and settle performance with 1 kg payload. Outstanding settling time enhances throughput of most applications.



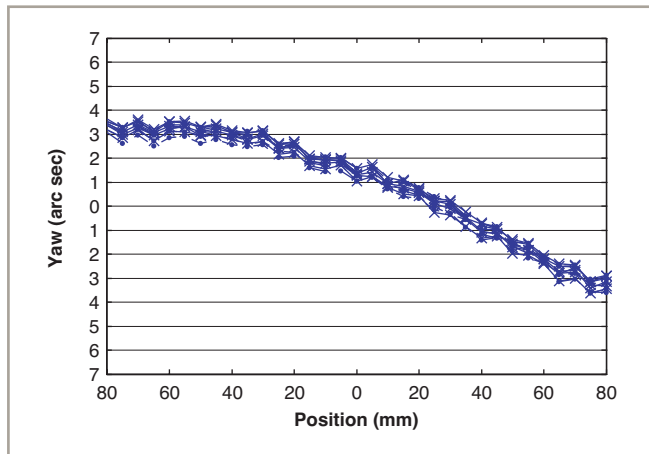
ANT180L-160 accuracy and repeatability, five runs, bi-directional over an extended period of time shows the high level of system accuracy and repeatability.

ANT180L SERIES SPECIFICATIONS

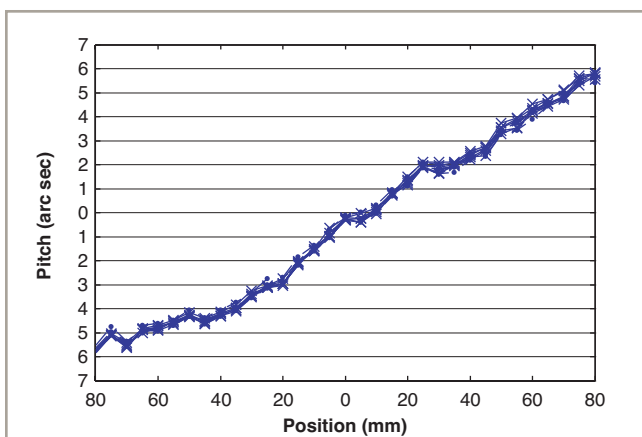
ANT180L SERIES PERFORMANCE



ANT180L-160 straightness error, one run, bi-directional. Exceptional and highly repeatable performance is assured with minimal straightness error.

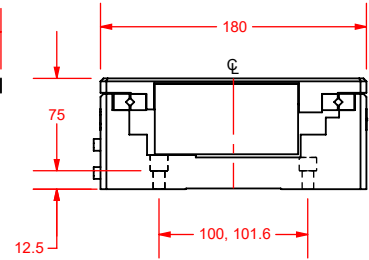
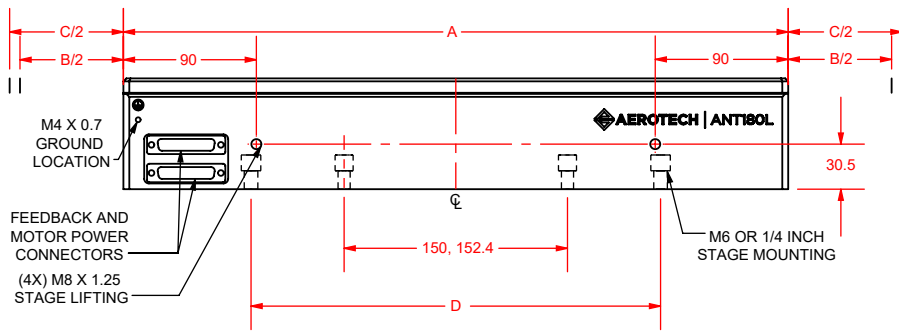
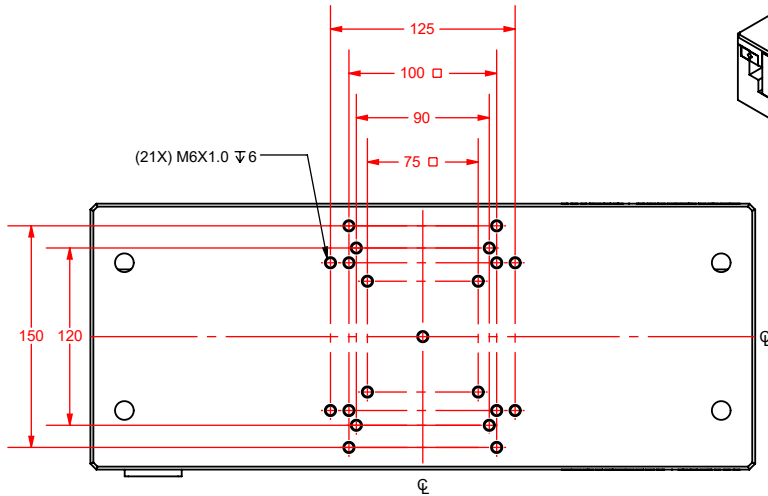
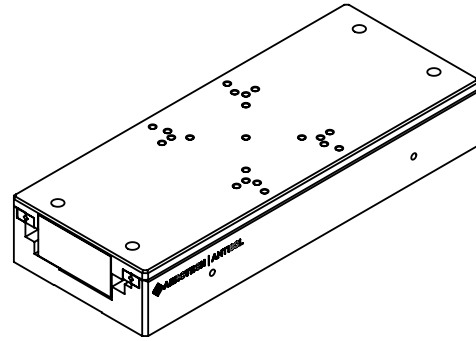


ANT180L-160 yaw, five runs, bi-directional. Highly repeatable, minimal yaw error enhances system positioning accuracy.



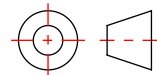
ANT180L-160 pitch, five runs, bi-directional. Excellent repeatability/accuracy contribute to improved processing.

ANT180L DIMENSIONS

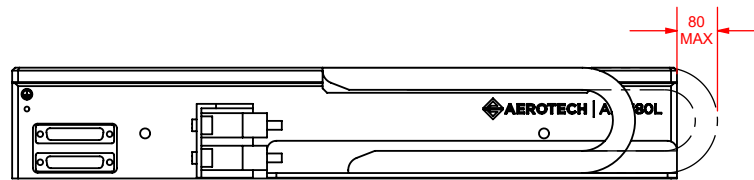
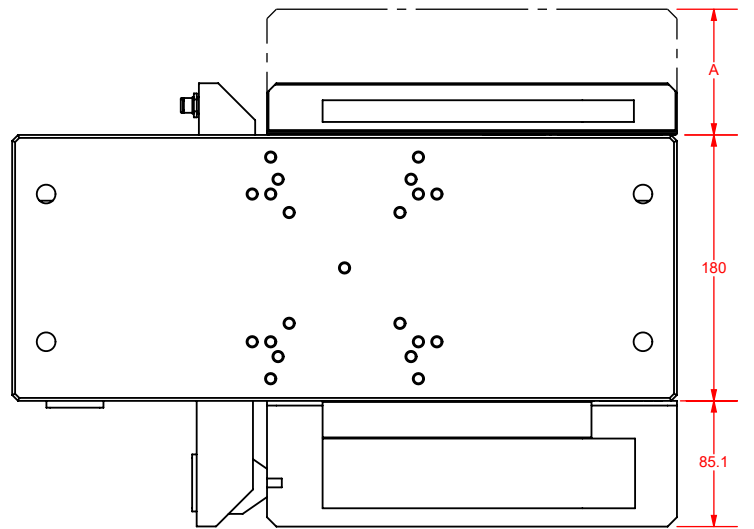


| STAGE MODEL | A = STAGE LENGTH | B = NOMINAL TRAVEL | C = HARDSTOP TRAVEL | D = MOUNTING SPACING |
|-------------|------------------|--------------------|---------------------|----------------------|
| ANT180L-160 | 325 | 160 | 174 | - |
| ANT180L-210 | 375 | 210 | 224 | 225, 228.6 |
| ANT180L-260 | 450 | 260 | 274 | 275, 279.4 |
| ANT180L-360 | 575 | 360 | 374 | 350, 355.6 |

DIMENSIONS: MILLIMETERS



ANT180L DIMENSIONS



| -CMS OPTION | A = CABLE TRAY WIDTH |
|-------------|----------------------|
| -CMS1 | - |
| -CMS2 | 35 |
| -CMS3 | 85.1 |
| -CMS4 | 85.1 |

DIMENSIONS: MILLIMETERS

