

ANT130-L Series nano Motion Technology

Mechanical Bearing, Linear Motor Stage

Noncontact, non-cogging, frictionless direct-drive – zero backlash or hysteresis

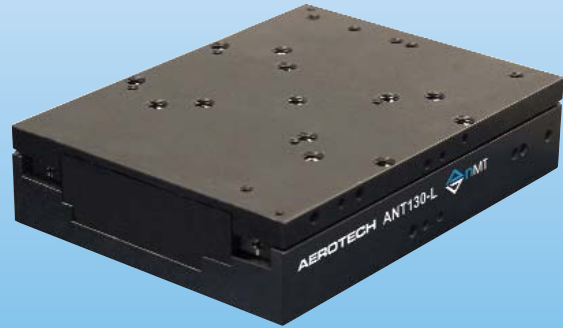
High resolution (1 nm), repeatability (50 nm), and accuracy (250 nm)

In-position stability of 3 nm

Anti-creep cross-roller bearings

High dynamic performance

Large selection – 8 models in travel and accuracy



The ANT130-L series stages offer best-in-class performance in speed, accuracy, resolution, repeatability, reliability, travel range, and are offered in two accuracy grades. With its low profile and outstanding performance characteristics, the ANT130-L is the ultimate solution for high-accuracy alignment, inspection, positioning, and measurement stations.

Noncontact Direct-Drive

Unlike many stages that utilize a lead- or ball-screw drive, the ANT130-L employs a center-driven, non-cogging, noncontact linear motor and encoder as the driving element. Since the linear motor is a direct-drive device, there is no backlash, windup, or “stiction” that is normally associated with a lead- or ball-screw drive.

The linear motor drive also offers the advantage of higher speeds and accelerations. The compact yet powerful linear motor drives the ANT130-L to a peak unloaded acceleration of 1 g and a maximum velocity of 350 mm/s. The result is a high-accuracy device with outstanding throughput that significantly outperforms comparable high-accuracy screw-driven or other stages in its class.

Outstanding Resolution

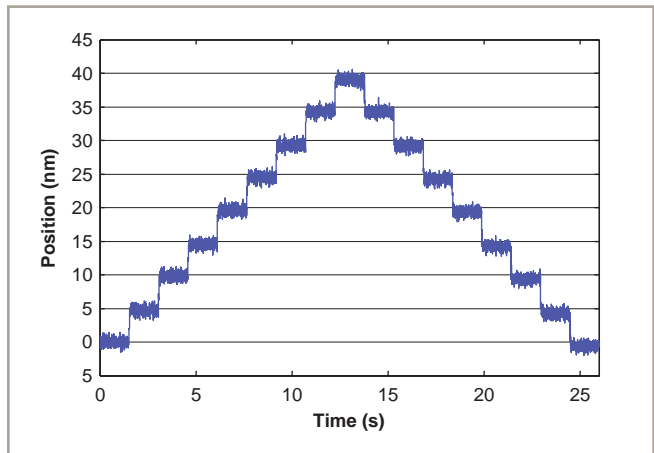
For alignment applications, outstanding step-to-step resolution is critical. The ANT130-L meets this demand with an incremental step size of 1 nm when coupled with Aerotech drives and controls. The direct-drive linear motor allows the ANT130-L to make precise, small resolution steps. This is particularly important in alignment applications where step accuracy is critical.

Designed for Long Life

Like all stages in the Aerotech product family, the ANT130-L was designed for outstanding long-term performance. Both the linear motor and linear encoder are noncontact devices, which means they not only exhibit long-life but are totally maintenance free. A moving magnet track design eliminates the need for cable management, further improving long-term reliability.

Precision Alignment

ANT130-L series stages are easily configured as XY assemblies. Options include precision orthogonality alignment to 5 arc seconds and available vertical axis solutions.



ANT130-60-L-H 5 nm step plot. Best-in-class resolution and exceptional in-position stability for large travel stages.

ANT130-L/ANT130-L-H Series SPECIFICATIONS

| Mechanical Specifications | ANT130-35-L | ANT130-35-L-H | ANT130-60-L | ANT130-60-L-H |
|---|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Travel | 35 mm | 35 mm | 60 mm | 60 mm |
| Accuracy ⁽¹⁾ | ±2 µm (±80 µin) | ±250 nm (±10 µin) | ±2 µm (±80 µin) | ±250 nm (±10 µin) |
| Resolution | 1 nm | 1 nm | 1 nm | 1 nm |
| Repeatability (Bi-Directional) ⁽¹⁾ | ±100 nm | ±50 nm | ±100 nm | ±50 nm |
| Straightness ⁽¹⁾ | ±1.0 µm (±40 µin) | ±1.0 µm (±40 µin) | ±1.0 µm (±40 µin) | ±1.0 µm (±40 µin) |
| Flatness ⁽¹⁾ | ±1.0 µm (±40 µin) | ±1.0 µm (±40 µin) | ±1.0 µm (±40 µin) | ±1.0 µm (±40 µin) |
| Pitch | 5 arc sec | 5 arc sec | 6 arc sec | 6 arc sec |
| Roll | 5 arc sec | 5 arc sec | 6 arc sec | 6 arc sec |
| Yaw | 3 arc sec | 3 arc sec | 3 arc sec | 3 arc sec |
| Maximum Speed | 350 mm/s (14 in/s) | 350 mm/s (14 in/s) | 350 mm/s (14 in/s) | 350 mm/s (14 in/s) |
| Maximum Acceleration | 1 g - 10 m/s ² (No Load) | 1 g - 10 m/s ² (No Load) | 1 g - 10 m/s ² (No Load) | 1 g - 10 m/s ² (No Load) |
| Speed Stability | See graph for typical performance | | | |
| Settling Time | See graph for typical performance | | | |
| In-Position Stability ⁽²⁾ | 3 nm | 3 nm | 3 nm | 3 nm |
| Maximum Force (Continuous) | 23 N | 23 N | 23 N | 23 N |
| Load Capacity ⁽³⁾ | Horizontal | 12.0 kg (26.5 lb) | 12.0 kg (26.5 lb) | 12.0 kg (26.5 lb) |
| | Side | 10 kg | 10 kg | 10 kg |
| Moving Mass | 1.2 kg (2.6 lb) | 1.2 kg (2.6 lb) | 1.4 kg (3.1 lb) | 1.4 kg (3.1 lb) |
| Stage Mass | 2.1 kg (4.6 lb) | 2.1 kg (4.6 lb) | 2.5 kg (5.5 lb) | 2.5 kg (5.5 lb) |
| Material | Aluminum Body/Black Hardcoat Finish | | | |
| MTBF (Mean Time Between Failure) | 30,000 Hours | | | |

Notes:

1. Certified with each stage.
2. In-Position Jitter listing is 3σ value.
3. Axis orientation for on-axis loading is listed.
4. 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.
5. -H requires the use of an Aerotech controller.

| Mechanical Specifications | ANT130-110-L | ANT130-110-L-H | ANT130-160-L | ANT130-160-L-H |
|---|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Travel | 110 mm | 110 mm | 160 mm | 160 mm |
| Accuracy ⁽¹⁾ | ±4 µm (±160 µin) | ±300 nm (±12 µin) | ±6 µm (±240 µin) | ±300 nm (±12 µin) |
| Resolution | 1 nm | 1 nm | 1 nm | 1 nm |
| Repeatability (Bi-Directional) ⁽¹⁾ | ±100 nm | ±50 nm | ±100 nm | ±50 nm |
| Straightness ⁽¹⁾ | ±1.5 µm (±60 µin) | ±1.5 µm (±60 µin) | ±2.0 µm (±80 µin) | ±2.0 µm (±80 µin) |
| Flatness ⁽¹⁾ | ±1.5 µm (±60 µin) | ±1.5 µm (±60 µin) | ±2.0 µm (±80 µin) | ±2.0 µm (±80 µin) |
| Pitch | 8 arc sec | 8 arc sec | 10 arc sec | 10 arc sec |
| Roll | 8 arc sec | 8 arc sec | 10 arc sec | 10 arc sec |
| Yaw | 4 arc sec | 4 arc sec | 5 arc sec | 5 arc sec |
| Maximum Speed | 350 mm/s (14 in/s) | 350 mm/s (14 in/s) | 350 mm/s (14 in/s) | 350 mm/s (14 in/s) |
| Maximum Acceleration | 1 g - 10 m/s ² (No Load) | 1 g - 10 m/s ² (No Load) | 1 g - 10 m/s ² (No Load) | 1 g - 10 m/s ² (No Load) |
| Speed Stability | See graph for typical performance | | | |
| Settling Time | See graph for typical performance | | | |
| In-Position Stability ⁽²⁾ | 3 nm | 3 nm | 3 nm | 3 nm |
| Maximum Force (Continuous) | 23 N | 23 N | 23 N | 23 N |
| Load Capacity ⁽³⁾ | Horizontal | 12.0 kg (26.5 lb) | 12.0 kg (26.5 lb) | 12.0 kg (26.5 lb) |
| | Side | 10 kg | 10 kg | 10 kg |
| Moving Mass | 1.9 kg (4.2 lb) | 1.9 kg (4.2 lb) | 2.3 kg (5.1 lb) | 2.3 kg (5.1 lb) |
| Stage Mass | 3.3 kg (7.3 lb) | 3.3 kg (7.3 lb) | 3.9 kg (8.6 lb) | 3.9 kg (8.6 lb) |
| Material | Aluminum Body/Black Hardcoat Finish | | | |
| MTBF (Mean Time Between Failure) | 30,000 Hours | | | |

Notes:

1. Certified with each stage.
2. In-Position Jitter listing is 3σ value.
3. Axis orientation for on-axis loading is listed.
4. 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.
5. -H requires the use of an Aerotech controller.

ANT130-L/ANT130-L-H Series SPECIFICATIONS

| Electrical Specifications | ANT130-35-L ANT130-35-L-H | ANT130-60-L ANT130-60-L-H | ANT130-110-L ANT130-110-L-H | ANT130-160-L ANT130-160-L-H |
|---------------------------|------------------------------|------------------------------|--------------------------------|--------------------------------|
| Drive System | Brushless Linear Servomotor | | | |
| Feedback | Noncontact Linear Encoder | | | |
| Maximum Bus Voltage | ±40 VDC | | | |
| Limit Switches | 5 V, Normally Closed | | | |
| Home Switch | Near Center | | | |

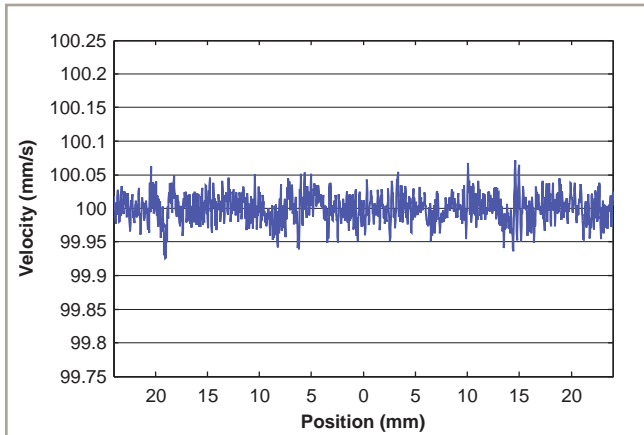
| Recommended Controller | | ANT130-35-L ANT130-35-L-H | ANT130-60-L ANT130-60-L-H | ANT130-110-L ANT130-110-L-H | ANT130-160-L ANT130-160-L-H |
|------------------------|----------|--|------------------------------|--------------------------------|--------------------------------|
| Multi-Axis | A3200 | Npaq-MXR Npaq MR-MXH Ndrive ML-MXH | | | |
| | Ensemble | Epaq-MXH Epaq MR-MXH Ensemble ML-MXH | | | |
| Single Axis | Soloist | Soloist ML-MXH | | | |

Notes:

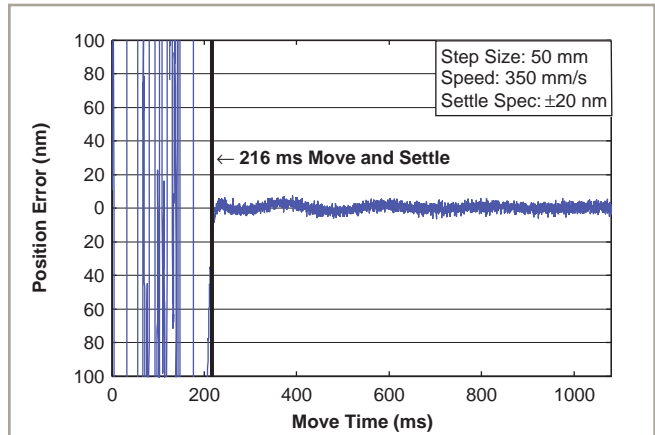
1. Linear amplifiers are required to achieve the listed specifications. Other options are available.

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.

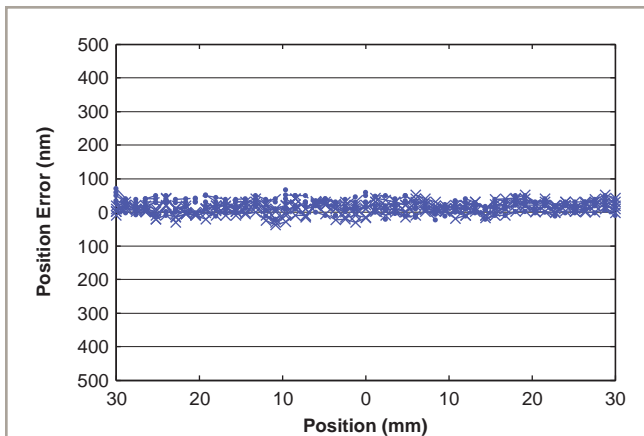
ANT130-L/ANT130-L-H Series PERFORMANCE



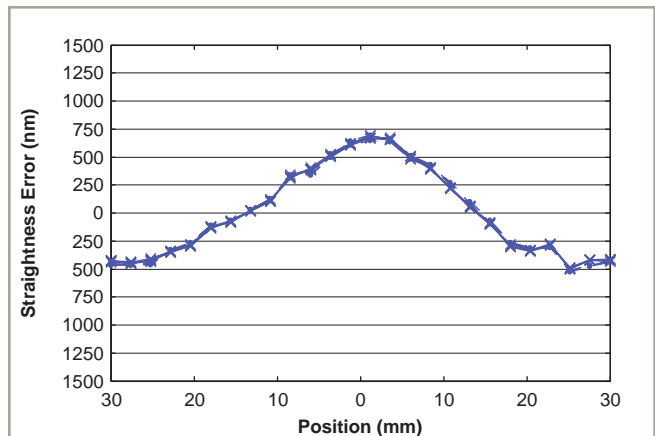
ANT130-60-L-H velocity performance at 100 mm/s and 1 kg payload. Excellent speed stability is another feature of the ANT Series stages.



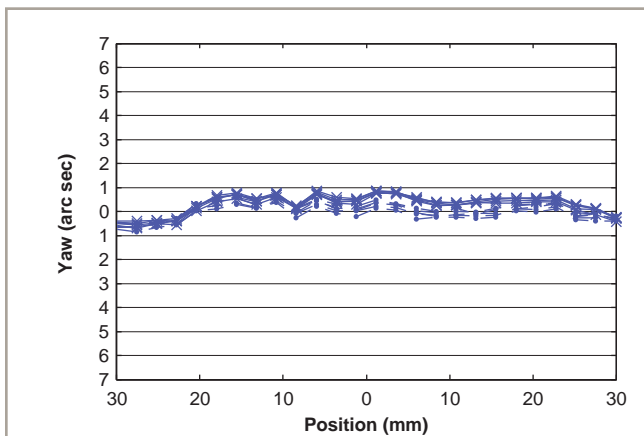
ANT130-60-L-H step and settle performance with 1 kg payload. Outstanding settling time enhances throughput of most applications.



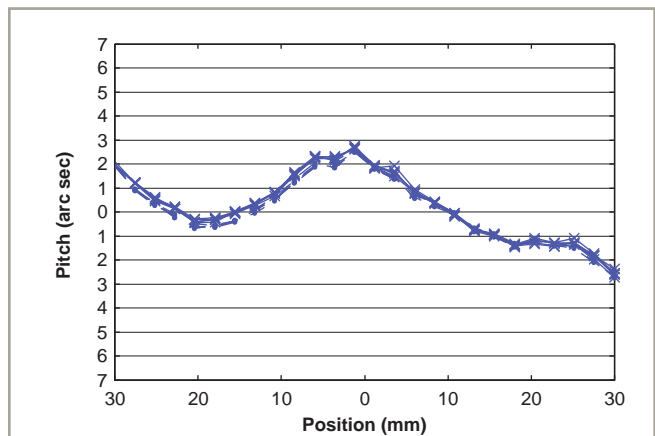
ANT130-60-L-H accuracy and repeatability, five runs, bi-directional over an extended period of time shows the high level of system accuracy and repeatability.



ANT130-60-L-H straightness error, five runs, bi-directional. Exceptional and highly repeatable performance is assured with minimal straightness error.

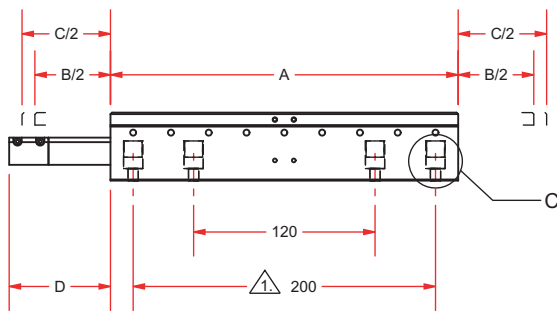
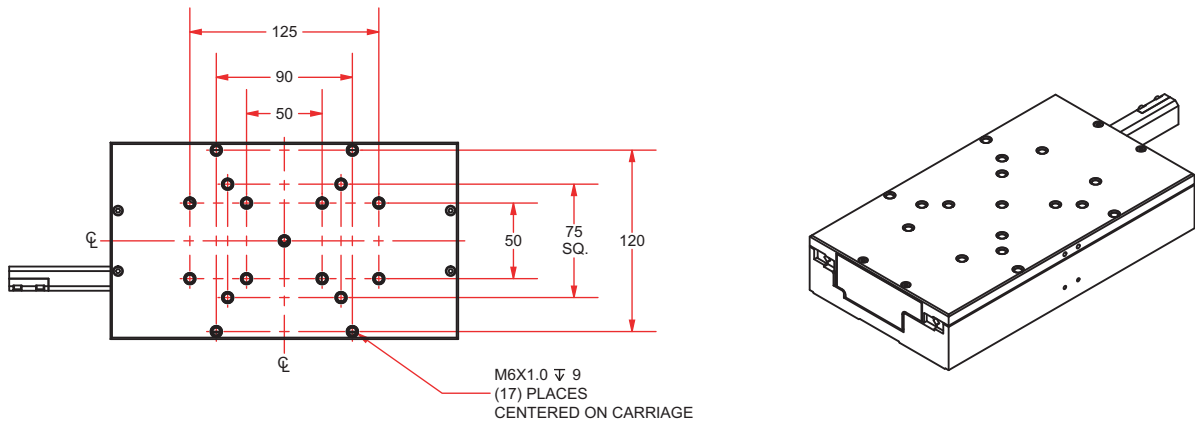


ANT130-60-L-H yaw, five runs, bi-directional. Highly repeatable, minimal yaw error enhances system positioning accuracy.

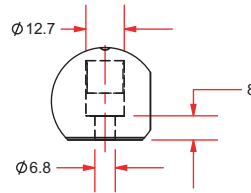
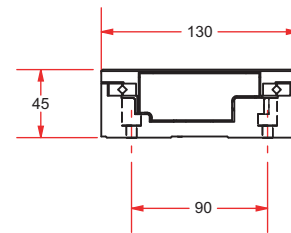


ANT130-60-L-H pitch, five runs, bi-directional. Excellent repeatability/accuracy contribute to improved processing.

ANT130-L/ANT130-L-H Series DIMENSIONS



\triangle ANT130-110-L AND ANT130-160-L ONLY



DETAIL C
 SCALE 2 : 5
 MOUNTING HOLES TYP.

| MODEL | A = STAGE LENGTH | B = NOMINAL TRAVEL | C = HARDSTOP TRAVEL | D |
|----------------|------------------|--------------------|---------------------|----|
| ANT130-035-L | 155 | 35 | 53 | 27 |
| ANT130-035-L-H | 155 | 35 | 53 | 27 |
| ANT130-060-L | 180 | 60 | 78 | 42 |
| ANT130-060-L-H | 180 | 60 | 78 | 42 |
| ANT130-110-L | 230 | 110 | 128 | 67 |
| ANT130-110-L-H | 230 | 110 | 128 | 67 |
| ANT130-160-L | 280 | 160 | 178 | 92 |
| ANT130-160-L-H | 280 | 160 | 178 | 92 |

DIMENSIONS: MILLIMETERS

ANT130-L/ANT130-L-H Series ORDERING INFORMATION

ANT130-L Series Linear Motor Stage

| | |
|----------------|--|
| ANT130-035-L | 35 mm travel stage with linear motor and limits |
| ANT130-035-L-H | 35 mm travel stage with linear motor and limits |
| ANT130-060-L | 60 mm travel stage with linear motor and limits |
| ANT130-060-L-H | 60 mm travel stage with linear motor and limits |
| ANT130-110-L | 110 mm travel stage with linear motor and limits |
| ANT130-110-L-H | 110 mm travel stage with linear motor and limits |
| ANT130-160-L | 160 mm travel stage with linear motor and limits |
| ANT130-160-L-H | 160 mm travel stage with linear motor and limits |

Accessories

- MP-ANT130-035/060 Breadboard mounting plate
- MP-ANT130-110/160 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