ANT130-L Series

Single-Axis Linear Direct-Drive Nanopositioning Stages

nano Motion Technology

Nanometer-level performance in a large travel format

High resolution (1 nm), repeatability (75 nm), and accuracy (250 nm)

In-position stability of <1 nm

Anti-creep crossed-roller bearings

High dynamic performance

Large selection – 8 models in travel and accuracy

Introduction

The ANT130-L series stages offer nanometer-level performance in travels up to 160 mm. 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

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

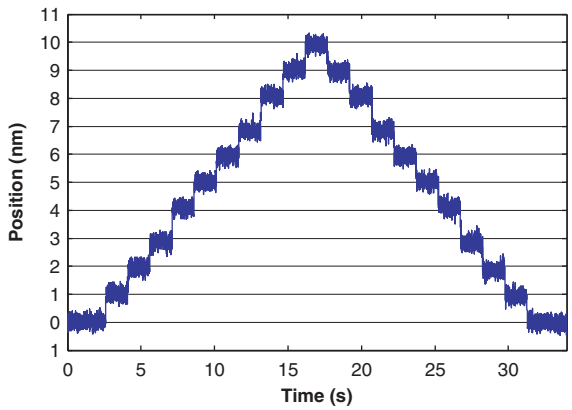
For alignment applications, outstanding step-to-step resolution is critical. The ANT130-L meets this demand with an incremental step size of 1 nm when coupled with Aerotech drives and controls. The direct-drive linear motor allows the ANT130-L to make precise, small resolution steps. This is particularly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

Precision Alignment

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



ANT130-060-L-PLUS 1 nm step plot with 100 Hz filter. These stages offer best-in-class resolution and exceptional in-position stability for large travels.

ANT130-L/ANT130-L-PLUS Series SPECIFICATIONS

Mechanical Specifications		ANT130-035-L	ANT130-035-L-PLUS	ANT130-060-L	ANT130-060-L-PLUS
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 (0.04 µin)	1 nm (0.04 µin)	1 nm (0.04 µin)	1 nm (0.04 µin)
Repeatability (Bi-Directional)[1]		±100 nm (±4 µin)	±75 nm (±3 µin)	±100 nm (±4 µin)	±75 nm (±3 µin)
Repeatability (Uni-Directional)		±25 nm (±1 µin)	±25 nm (±1 µin)	±25 nm (±1 µin)	±25 nm (±1 µin)
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		10 arc sec	10 arc sec	10 arc sec	10 arc sec
Roll		10 arc sec	10 arc sec	10 arc sec	10 arc sec
Yaw		5 arc sec	5 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/s² (No Load)	1 g - 10 m/s² (No Load)	1 g - 10 m/s² (No Load)	1 g - 10 m/s² (No Load)
Speed Stability		See graph for typical performance			
Settling Time		See graph for typical performance			
In-Position Stability[2]		<1 nm (<0.04 µin)	<1 nm (<0.04 µin)	<1 nm (<0.04 µin)	<1 nm (<0.04 µin)
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)	12.0 kg (26.5 lb)
	Side	10 kg (22 lb)	10 kg (22 lb)	10 kg (22 lb)	10 kg (22 lb)
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 3 sigma value.
3. Axis orientation for on-axis loading is listed.
• 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.
• -PLUS requires the use of an Aerotech controller.

Mechanical Specifications		ANT130-110-L	ANT130-110-L-PLUS	ANT130-160-L	ANT130-160-L-PLUS
Travel		110 mm	110 mm	160 mm	160 mm
Accuracy[1]		±3 µm (±120 µin)	±300 nm (±12 µin)	±4 µm (±160 µin)	±300 nm (±12 µin)
Resolution		1 nm (0.04 µin)	1 nm (0.04 µin)	1 nm (0.04 µin)	1 nm (0.04 µin)
Repeatability (Bi-Directional)[1]		±100 nm (±4 µin)	±75 nm (±3 µin)	±100 nm (±4 µin)	±75 nm (±3 µin)
Repeatability (Uni-Directional)		±25 nm (±1 µin)	±25 nm (±1 µin)	±25 nm (±1 µin)	±25 nm (±1 µin)
Straightness[1]		±1.0 µm (±40 µin)	±1.0 µm (±40 µin)	±1.5 µm (±60 µin)	±1.5 µm (±60 µin)
Flatness[1]		±1.0 µm (±40 µin)	±1.0 µm (±40 µin)	±1.5 µm (±60 µin)	±1.5 µm (±60 µin)
Pitch		10 arc sec	10 arc sec	10 arc sec	10 arc sec
Roll		10 arc sec	10 arc sec	10 arc sec	10 arc sec
Yaw		5 arc sec	5 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/s² (No Load)	1 g - 10 m/s² (No Load)	1 g - 10 m/s² (No Load)	1 g - 10 m/s² (No Load)
Speed Stability		See graph for typical performance			
Settling Time		See graph for typical performance			
In-Position Stability[2]		<1 nm (<0.04 µin)	<1 nm (<0.04 µin)	<1 nm (<0.04 µin)	<1 nm (<0.04 µin)
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)	12.0 kg (26.5 lb)
	Side	10 kg (22 lb)	10 kg (22 lb)	10 kg (22 lb)	10 kg (22 lb)
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 3 sigma value.
3. Axis orientation for on-axis loading is listed.
• 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.
• -PLUS requires the use of an Aerotech controller.

ANT130-L/ANT130-L-PLUS Series SPECIFICATIONS

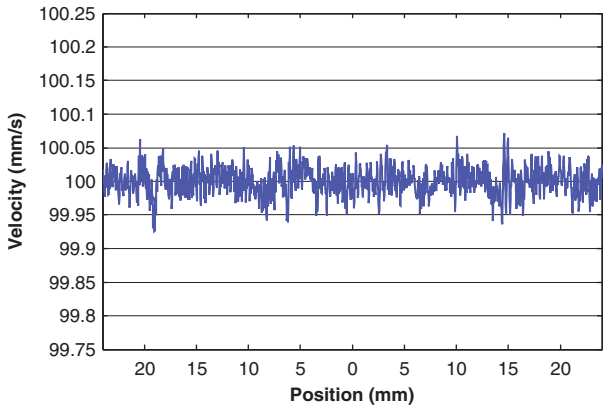
Electrical Specifications	ANT130-035-L ANT130-035-L-PLUS	ANT130-060-L ANT130-060-L-PLUS	ANT130-110-L ANT130-110-L-PLUS	ANT130-160-L ANT130-160-L-PLUS
Drive System	Brushless Linear Servomotor			
Feedback	Noncontact Linear Encoder			
Maximum Bus Voltage	±40 VDC			
Limit Switches	5 V, Normally Closed			
Home Switch	Near Center			

Recommended Controller		ANT130-035-L ANT130-035-L-PLUS	ANT130-060-L ANT130-060-L-PLUS	ANT130-110-L ANT130-110-L-PLUS	ANT130-160-L ANT130-160-L-PLUS
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			

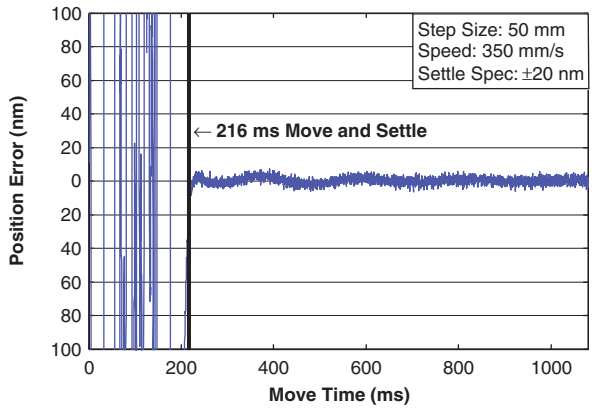
Notes:
1. Linear amplifiers are required to achieve the listed specifications. Other options are available.

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 Application Engineering for more information.

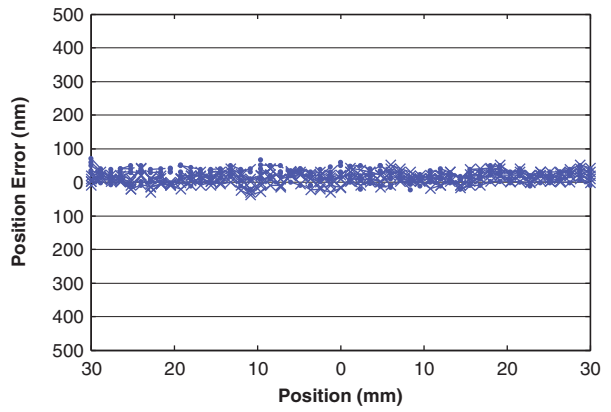
ANT130-L/ANT130-L-PLUS Series PERFORMANCE



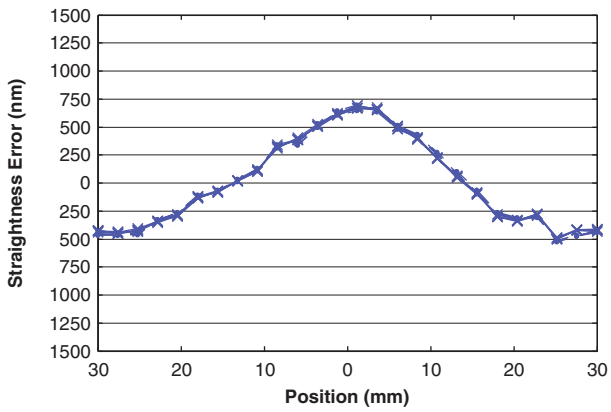
ANT130-060-L-PLUS velocity performance at 100 mm/s and 1 kg payload. Excellent speed stability is another feature of the ANT series stages.



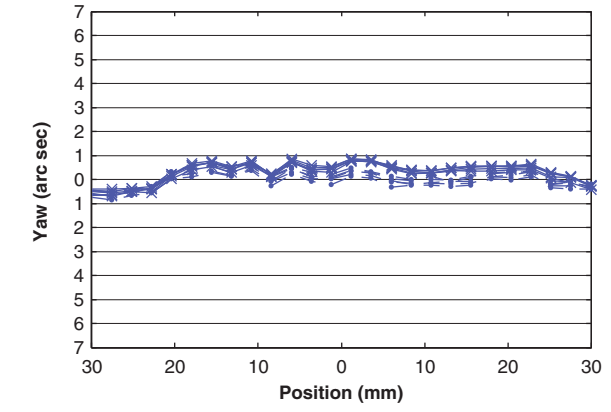
ANT130-060-L-PLUS step and settle performance with 1 kg payload. Outstanding settling time enhances throughput of most applications.



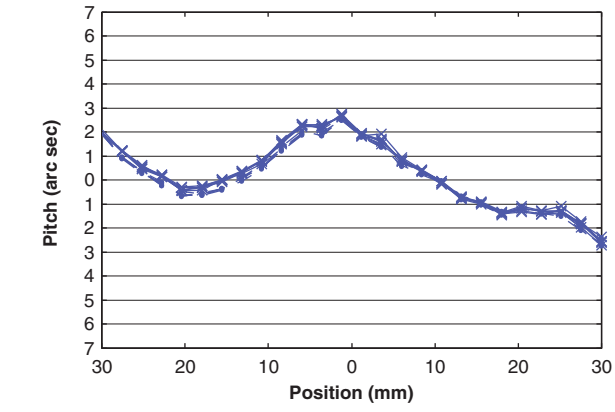
ANT130-060-L-PLUS accuracy and repeatability, five runs, bi-directional over an extended period of time shows the high level of system accuracy and repeatability.



ANT130-060-L-PLUS straightness error, bi-directional. Exceptional and highly repeatable performance is assured with minimal straightness error.

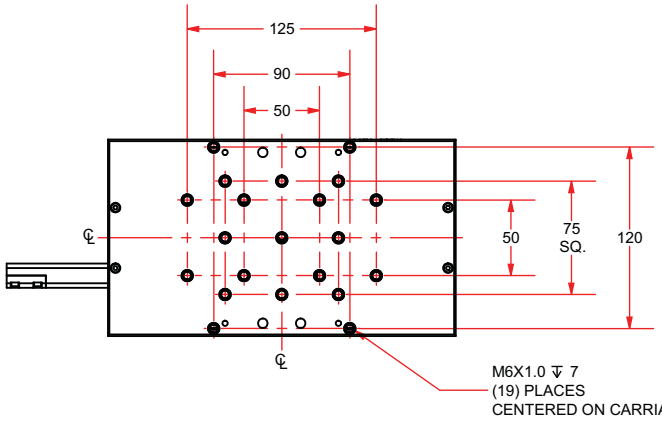


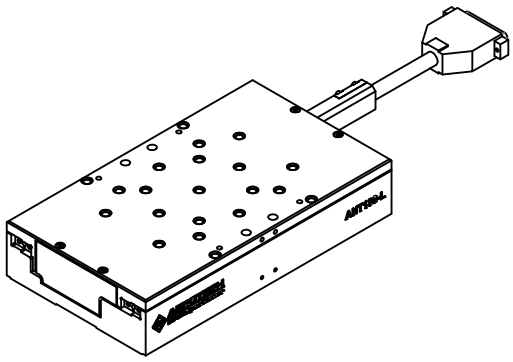
ANT130-060-L-PLUS yaw, five runs, bi-directional. Highly repeatable, minimal yaw error enhances system positioning accuracy.

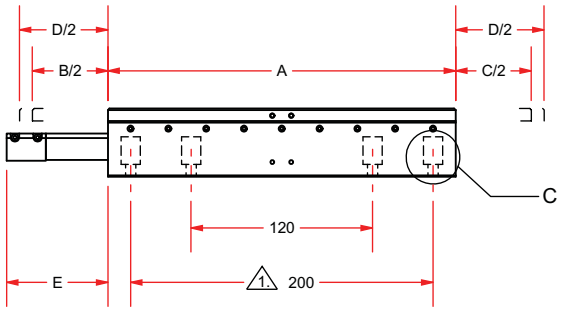


ANT130-060-L-PLUS pitch, five runs, bi-directional. Excellent repeatability/accuracy contribute to improved processing.

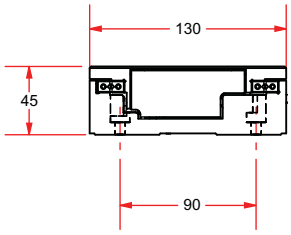
ANT130-L/ANT130-L-PLUS DIMENSIONS

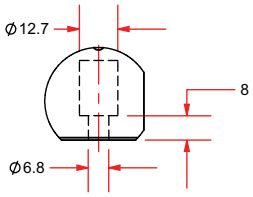






1. ANT130-110-L AND ANT130-160-L ONLY



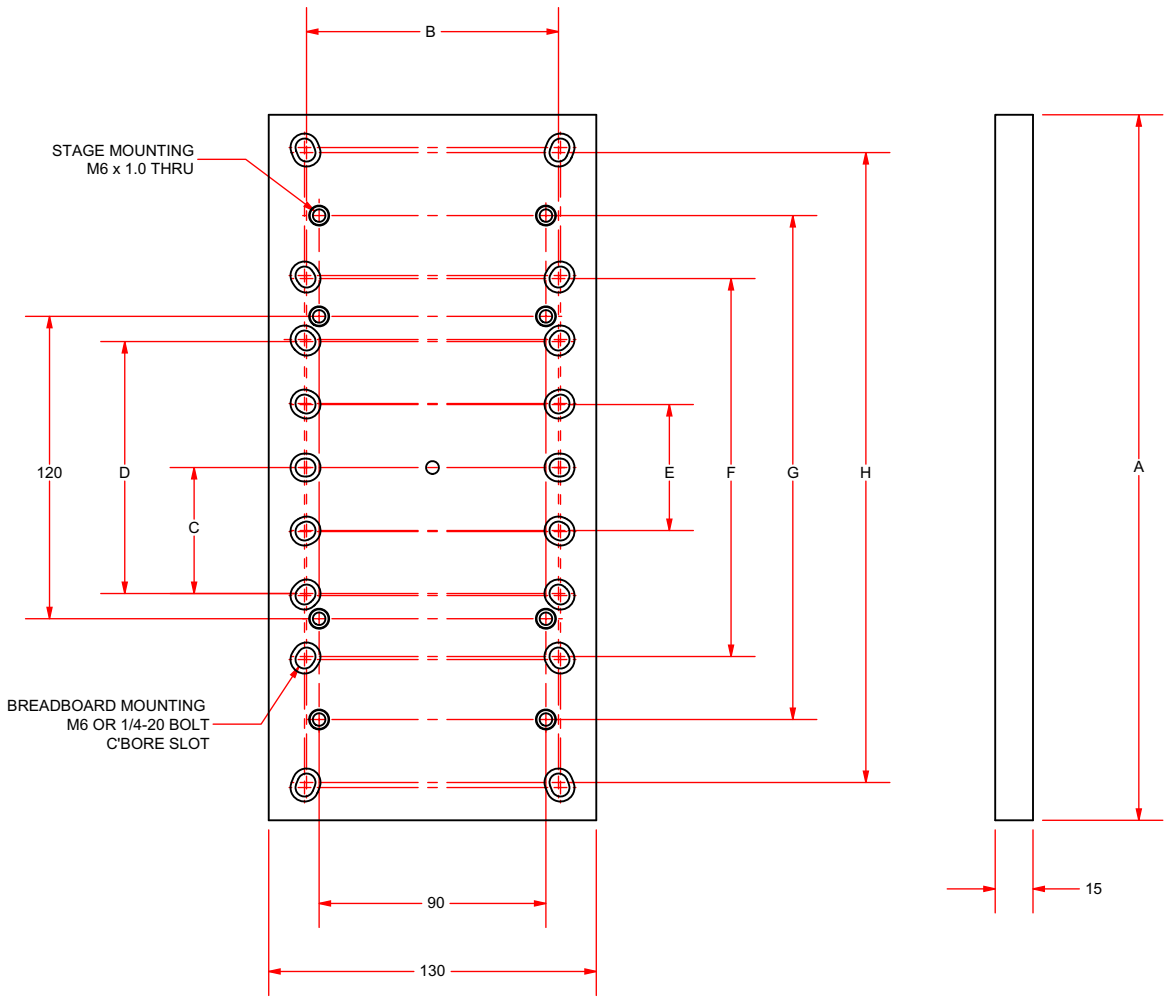


DETAIL C
SCALE 2 : 5
MOUNTING HOLES TYP.

MODEL	A = STAGE LENGTH	B = NOMINAL TRAVEL	C = LIMIT TRAVEL	D = HARDSTOP TRAVEL	E
ANT130-035-L	155	35	41	50	27
ANT130-060-L	180	60	66	75	42
ANT130-110-L	230	110	116	125	67
ANT130-160-L	280	160	166	175	92

DIMENSIONS: MILLIMETERS

ANT130-L/ANT130-L-PLUS Mounting Plate DIMENSIONS



	LENGTH	MOUNTING						
OPTION	A	B	C	D	E	F	G	H
MP-ANT130-035	155	100[4.0]	50[2.0]	100[4.0]	--	--	--	--
MP-ANT130-060	180	100[4.0]	--	--	50[2.0]	150[6.0]	--	--
MP-ANT130-110	230	100[4.0]	--	--	50[2.0]	150[6.0]	200	--
MP-ANT130-160	280	100[4.0]	--	--	50[2.0]	150[6.0]	200	250[10.0]

DIMENSIONS: MILLIMETERS

ANT130-L/ANT130-L-PLUS Series ORDERING INFORMATION

ANT130-L Series Linear Stage

ANT130-L/ANT130-L-PLUS	Aerotech nanotranslation crossed-roller linear positioner

Linear Stage Travel

ANT130-035-L	35 mm travel stage with linear motor and limits
ANT130-035-L-PLUS	35 mm travel stage with linear motor and limits (high accuracy version)
ANT130-060-L	60 mm travel stage with linear motor and limits
ANT130-060-L-PLUS	60 mm travel stage with linear motor and limits (high accuracy version)
ANT130-110-L	110 mm travel stage with linear motor and limits
ANT130-110-L-PLUS	110 mm travel stage with linear motor and limits (high accuracy version)
ANT130-160-L	160 mm travel stage with linear motor and limits
ANT130-160-L-PLUS	160 mm travel stage with linear motor and limits (high accuracy version)

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

Options

-MP	Breadboard mounting plate