



Two-Axis XY Nanopositioning Stages

ANT130XY



Integrated XY Design for Optimized Performance

Our ultra-precise ANT130XY stages deliver superior planar performance with excellent geometric characteristics, thanks to an integrated two-axis design. Equipped with stiff, anti-creep crossed-roller bearings, high-resolution position feedback and ironless linear motors to achieve the smoothest, most precise motion possible, ANT130XY stages can be further enhanced with ultra high-accuracy 2D calibration to optimize even the most demanding inspection and manufacturing processes. Plus, the dynamically optimized design results in impressive speed and process throughput.

Key Applications

ANT130XY is ideal for multi-axis applications that require high precision and dynamic positioning performance, including:

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

KEY FEATURES:

- ◆ Enhanced second-generation design
- ◆ Achieves **MINIMUM INCREMENTAL MOTION TO 0.5 nm - NEW**
- ◆ **OPTIMIZES ORTHOGONALITY, STRAIGHTNESS & FLATNESS** with integrated XY design
- ◆ Guarantees **TWO-DIMENSIONAL ACCURACY TO ± 200 nm** or better with ULTRA calibration option
- ◆ Features high-precision crossed-roller bearings for **EXCELLENT DYNAMIC PERFORMANCE & AMPLE LOAD CAPACITY**
- ◆ **MAXIMIZES PROCESS THROUGHPUT & RELIABILITY** with ironless direct-drive linear motor
- ◆ **ABSOLUTE** and **ULTRA-HIGH RESOLUTION** incremental encoder options are available

ANT130XY SERIES SPECIFICATIONS

Mechanical Specifications		ANT130XY-060	ANT130XY-110	ANT130XY-160
Travel		60 mm x 60 mm	110 mm x 110 mm	160 mm x 160 mm
Accuracy ^(1,2)	Base Performance (-PL1)	± 2.5 µm	± 4.0 µm	± 5.0 µm
	Plus Performance (-PL3)	± 250 nm (-E1, -E2, -E3) ± 200 nm (-E4)	± 300 nm (-E1, -E2, -E3) ± 225 nm (-E4)	
	Ultra Performance (-PL4)	± 250 nm (-E1, -E2, -E3) ± 200 nm (-E4)	± 300 nm (-E1, -E2, -E3) ± 225 nm (-E4)	
Repeatability (Bidirectional) ⁽²⁾		±75 nm		
Resolution (Minimum Incremental Motion)		1 nm (-E1) 5 nm (-E3) 0.5 nm (-E4)		
Straightness ⁽²⁾	Base Performance (-PL1)	± 1.5 µm		± 2.0 µm
	Plus Performance (-PL3)	± 1.5 µm		± 2.0 µm
	Ultra Performance (-PL4)	± 250 nm	± 300 nm	
Flatness ⁽²⁾	Base Performance (-PL1)	± 1.5 µm		± 2.0 µm
	Plus Performance (-PL3)	± 1.5 µm		± 2.0 µm
	Ultra Performance (-PL4)	± 1.0 µm		
Pitch		10 arc sec	12 arc sec	15 arc sec
Roll		10 arc sec	12 arc sec	15 arc sec
Yaw		5 arc sec	6 arc sec	8 arc sec
Orthogonality ⁽³⁾	Base Performance (-PL1)	10 arc sec		
	Plus Performance (-PL3)	3 arc sec		
	Ultra Performance (-PL4)	1 arc sec	0.5 arc sec	
Maximum Speed ⁽⁴⁾		350 mm/s (Upper Axis: -E1, -E3, -E4) 145 mm/s (Upper Axis: -E2)		
Maximum Acceleration (No Load) ⁽⁴⁾		1 g (Upper Axis)		
Speed Stability		See graph for typical performance		
Settling Time		See graph for typical performance		
In-Position Stability ⁽⁵⁾		<1 nm (-E1) <5 nm (-E3) <0.5 nm (-E4)		
Load Capacity ⁽⁶⁾	Horizontal	12 kg		
Moving Mass	Upper Axis	1.4 kg	1.9 kg	2.3 kg
	Lower Axis	4.2 kg	5.6 kg	6.9 kg
Stage Mass		5.7 kg	7.5 kg	9.2 kg
Material		Anodized Aluminum		
MTBF (Mean Time Between Failure)		30,000 Hours		

Notes:

- Specifications for BASE and PLUS options are per-axis, measured 25 mm above the tabletop. Specifications for ULTRA option are XY, measured 25 mm above the tabletop. PLUS and ULTRA performance options require the use of an Aerotech controller.
- Certified with each stage.
- Requires the use of an Aerotech controller.
- Requires the selection of an appropriate amplifier with sufficient voltage and current.
- In-position stability is reported as 3-sigma value. Requires a 1 Vpp encoder.
- Payload specifications assume payload is centered on-axis.
- 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	ANT130XY-060	ANT130XY-110	ANT130XY-160
Drive System	Brushless Linear Servomotor		
Feedback	Noncontact Linear Encoders 1 Vpp with 20 µm signal period (-E1) Digital RS422 (-E2) BiSS-C absolute + incremental 1 Vpp linear dual-track encoder (-E3) 1 Vpp with 4 µm signal period (-E4)		
Maximum Bus Voltage	-CN1: 80 VDC -CN2: 160 VDC		
Limit Switches	5 V, Normally Closed		
Home Switch	Near Center		

ANT130XY SERIES ORDERING INFORMATION

Travel (Required)

-060	60 mm x 60 mm travel
-110	110 mm x 110 mm travel
-160	160 mm x 160 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

Connectors (Required)

-CN1	Single 25-pin D connector per axis, 25DU
-CN2	Two connectors per axis, 4-pin HPD and 25-pin D, 4DU-25DU

Note: The -CN1 option is limited to a maximum bus voltage of 80 V. The -CN2 option is required for higher bus voltages.

Cable Management (Required)

-CMS2	Post for two-axis cable support
-CMS3	Post for three-axis cable support

Mounting Plate (Optional)

-MP	Mounting plate
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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

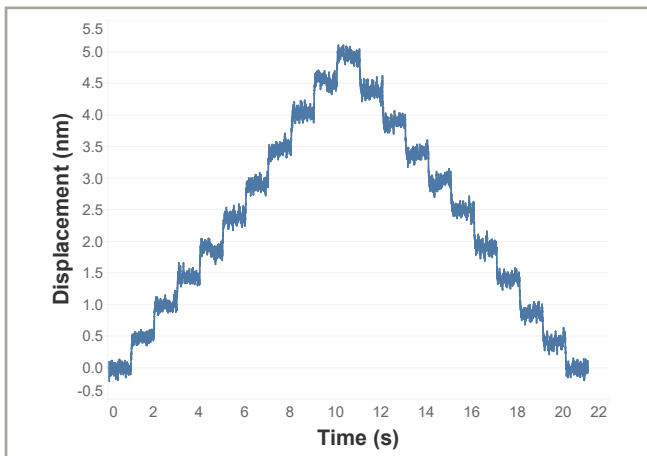
Testing, integration, and documentation of a group of components as a complete system that will be used together (ex: drive, controller, and stage). This includes parameter file generation, system tuning, and documentation of the system configuration.

-TAC Integration - Test as components

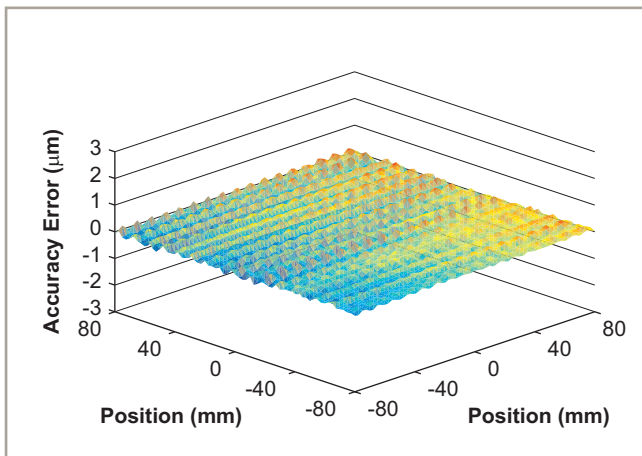
Testing and integration of individual items as discrete components that ship together. This is typically used for spare parts, replacement parts, or items that will not be used together. These components may or may not be part of a larger system.

ANT130XY SERIES SPECIFICATIONS

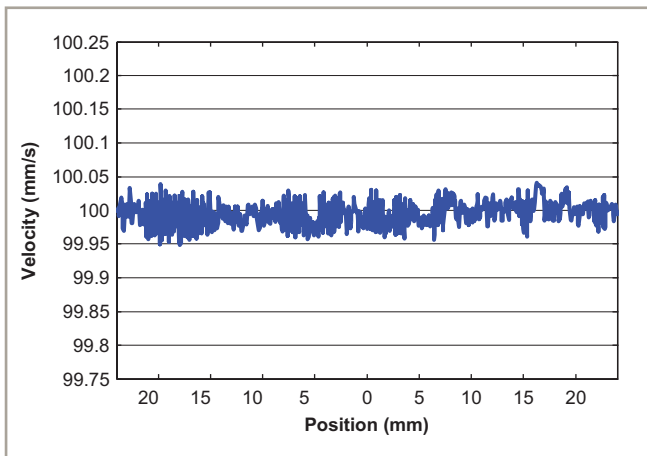
ANT130XY SERIES PERFORMANCE



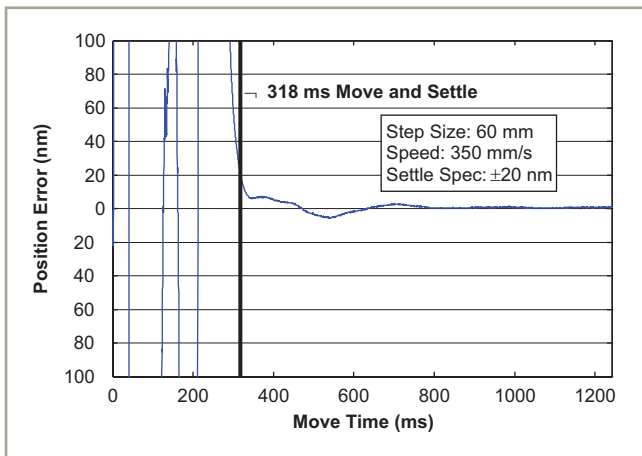
ANT130XY-160-E4-PL3 step plot showing 0.5 nm minimum incremental motion of the lower axis. Best-in-class resolution and exceptional in-position stability for large travel stages.



ANT130XY-160-E1-PL4 – exceptional 2D system accuracy with Aerotech's ULTRA performance grade.



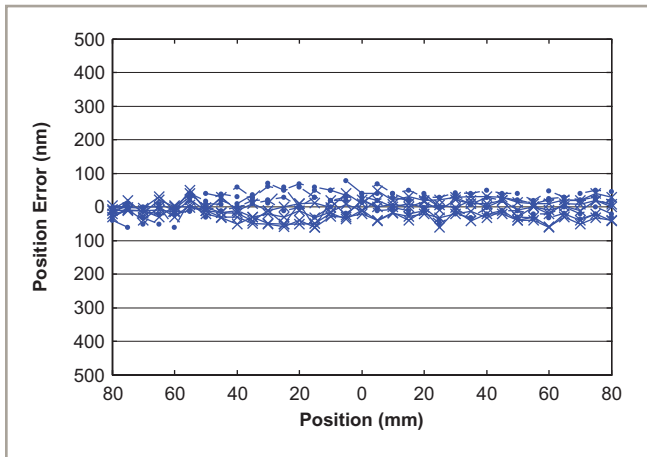
ANT130XY-060-E1-PL3 velocity performance at 100 mm/s and 1 kg payload for the X (lower) axis. This outstanding speed stability enhances most scanning or laser machining applications.



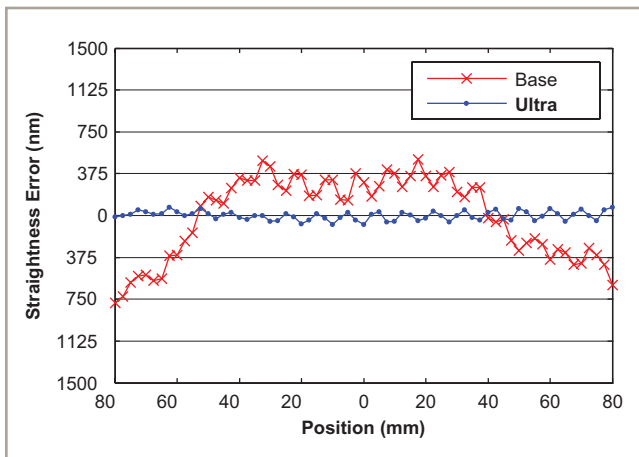
ANT130XY-060-E1-PL3 step and settle performance at full travel and 1 kg payload for the X (lower) axis. Industry-best settling times significantly improve throughput for most applications

ANT130XY SERIES SPECIFICATIONS

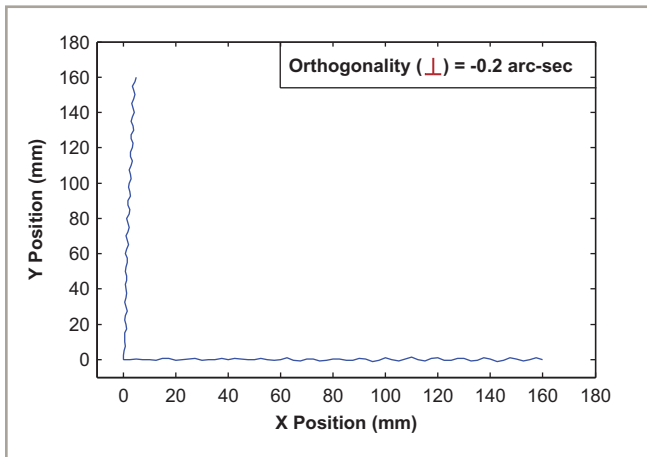
ANT130XY SERIES PERFORMANCE



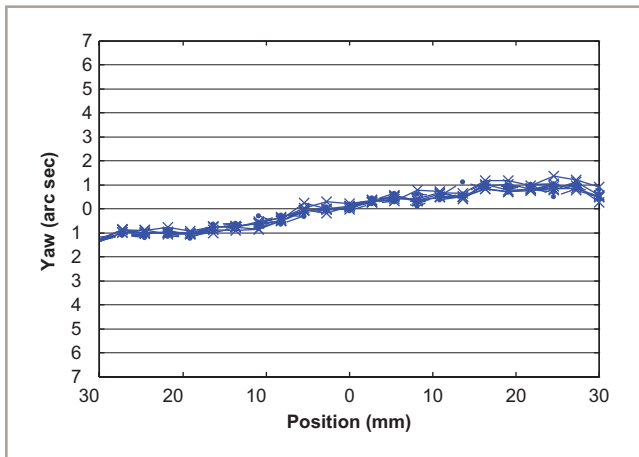
ANT130XY-160-E1-PL3 accuracy and repeatability, five runs, bi-directional for the Y (upper) axis. The total repeatability of ± 75 nm over 160 mm travel is significantly better than other offerings.



ANT130XY-160 straightness error comparison between the BASE and ULTRA performance grades shows a dramatic improvement in this specification.



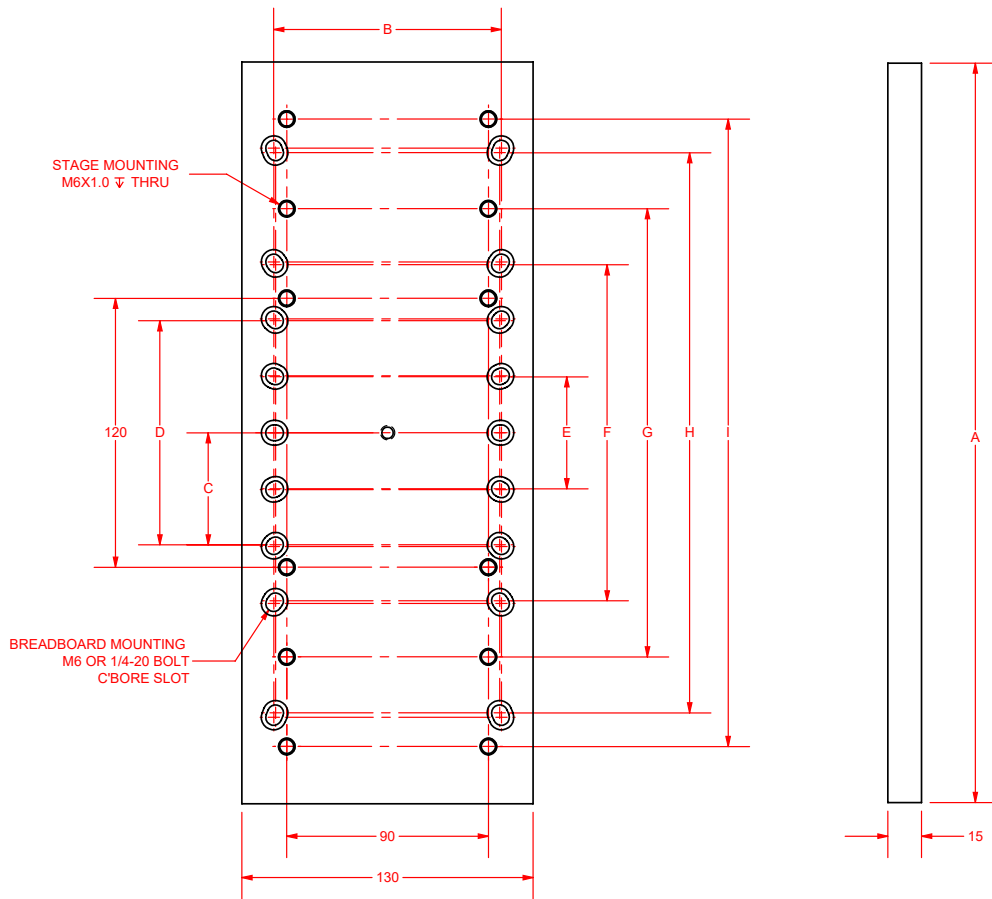
ANT130XY-060-E1-PL4 orthogonality. The plot is exaggerated 10,000x for clarity. The ULTRA performance grade orthogonality is a twenty-fold improvement over the BASE performance grade.



ANT130XY-060-E1-PL3 Y (upper) axis yaw, five runs, bi-directional. Highly repeatable, lowest angular error over full travel.

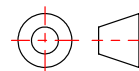
ANT130XY DIMENSIONS

ANT130XY MOUNTING PLATE



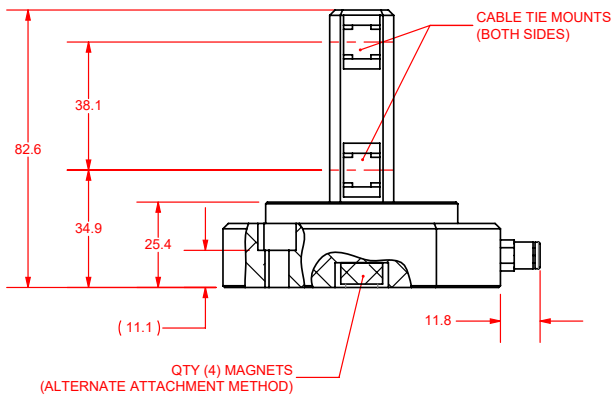
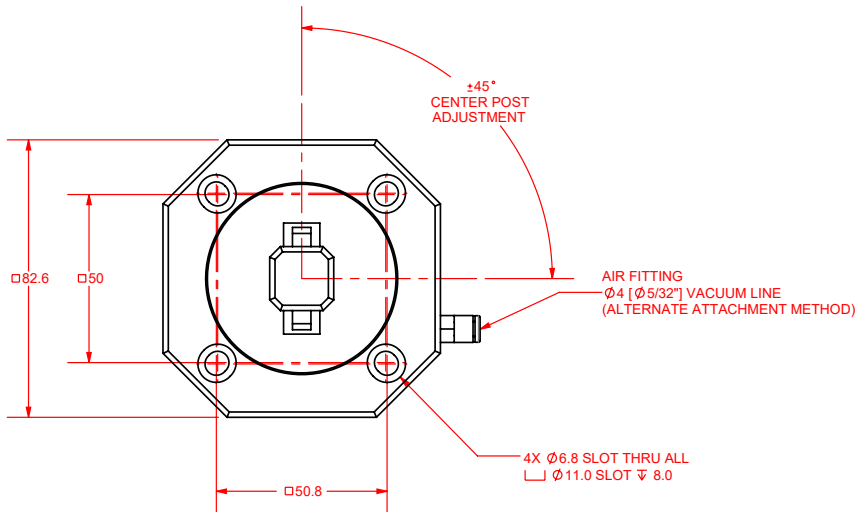
TRAVEL OPTION	LENGTH		MOUNTING						
	A	B	C	D	E	F	G	H	I
-060	180	100 [4.0]	--	--	50 [2.0]	150 [6.0]	--	--	--
-110	230	100 [4.0]	--	--	50 [2.0]	150 [6.0]	200	--	--
-160	280	100 [4.0]	--	--	50 [2.0]	150 [6.0]	200	250 [10.0]	--

DIMENSIONS: MILLIMETERS

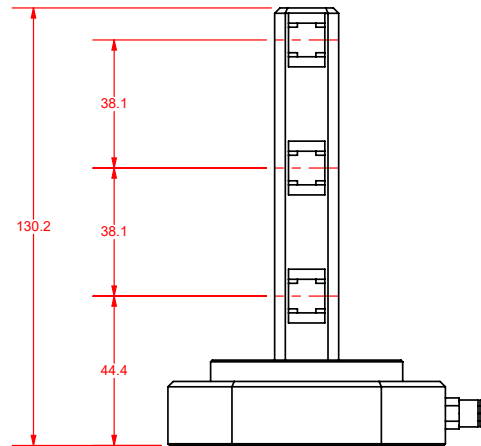


ANT130XY DIMENSIONS

ANT130XY POST



ACP2: INCLUDED WITH
"-CMS2" OPTION



ACP3: INCLUDED WITH
"-CMS3" OPTION

NOTE: DIMENSIONS NOT SHOWN
ARE THE SAME AS ACP2

DIMENSIONS: MILLIMETERS

