

ANT95R

Single-Axis Rotary Direct-Drive Nanopositioning Stages

- High resolution (0.01 arc sec)
- High performance
- Unlimited rotation
- Outstanding error motion specifications
- Excellent in-position stability
- Multi-axis configurations
- High dynamic performance



Introduction

The ANT95R direct-drive rotary stages are designed as part of Aerotech's nano Motion Technology product family. Our rotary stages offer unprecedented in-position stability (0.005 arc sec) and sub 0.01 arc-sec incremental motion performance, and are offered in two grades of accuracy.

Multi-Axis Capabilities

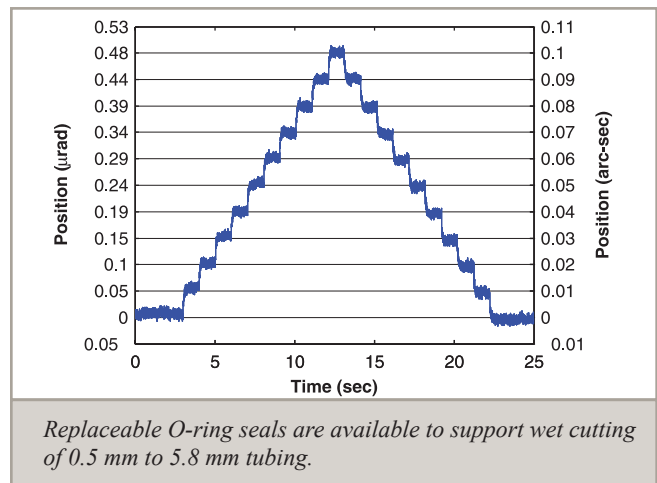
The ANT95R series is designed for compatibility and easy integration with Aerotech's ANT linear stage product offerings. Together these stages provide accuracy, stability, and small-size performance capability for almost any nano-manufacturing or inspection application.

Dynamic Performance

In addition to the high precision levels, these systems offer high dynamic performance and throughput ideal for processes that require speed and precision.

Durability

The ANT95R stage series was designed to operate in a 24/7 manufacturing environment. Unlike other rotary devices, the ANT95R requires no periodic maintenance, assuring years of trouble-free operation.



ANT95R Series SPECIFICATIONS

Mechanical Specifications		ANT95R-020	ANT95R-180	ANT95R-360
Rotation Angle		20°	180°	±360° Continuous
Accuracy ⁽¹⁾	BASE	10 arc sec	10 arc sec	10 arc sec
	PLUS	3 arc sec	3 arc sec	3 arc sec
Resolution (Minimum Incremental Motion)		0.01 arc sec	0.01 arc sec	0.01 arc sec
Repeatability (Bi-Directional) ⁽¹⁾		1.5 arc sec	1.5 arc sec	1.5 arc sec
Repeatability (Uni-Directional)		0.5 arc sec	0.5 arc sec	0.5 arc sec
Tilt Error Motion	Synchronous	NA	NA	10 arc sec
	Asynchronous	NA	NA	3 arc sec
Axial Error Motion ⁽¹⁾	Synchronous	NA	NA	2 µm
	Asynchronous	NA	NA	0.5 µm
Radial Error Motion ⁽¹⁾	Synchronous	NA	NA	3 µm
	Asynchronous	NA	NA	1 µm
Maximum Speed		20 rpm	20 rpm	200 rpm
Maximum Acceleration		400 rad/s ²	400 rad/s ²	400 rad/s ²
In-Position Stability ⁽²⁾		0.005 arc sec	0.005 arc sec	0.005 arc sec
Aperture		11 mm (0.433 in)	11 mm (0.433 in)	11 mm (0.433 in)
Maximum Torque (Continuous)		0.2 Nm	0.2 Nm	0.2 Nm
Load Capacity ⁽³⁾	Axial	2.0 kg (4.4 lb)	2.0 kg (4.4 lb)	2.0 kg (4.4 lb)
	Radial	1.5 kg (3.3 lb)	1.5 kg (3.3 lb)	1.5 kg (3.3 lb)
	Moment	2 Nm	2 Nm	2 Nm
Rotor Inertia (Unloaded)		0.00065 kg-m ²	0.00066 kg-m ²	0.00069 kg-m ²
Stage Mass		1.2 kg (2.6 lb)	1.2 kg (2.6 lb)	1.2 kg (2.6 lb)
Material		Aluminum Body/Black Hardcoat Finish		
MTBF (Mean Time Between Failure)		30,000 Hours		

Notes:

1. Certified with each stage. Requires the use of an Aerotech controller.
2. In-Position Jitter listing is 3 sigma value.
3. Axis orientation for on-axis loading is listed.
 - Specifications are per axis, measured 25 mm above the tabletop. Consult factory for multi-axis or non-standard applications.
 - All error motion specifications are measured at 60 rpm.
 - For high speed operation, customer payload must be balanced to G1.0 per ISO 1940.

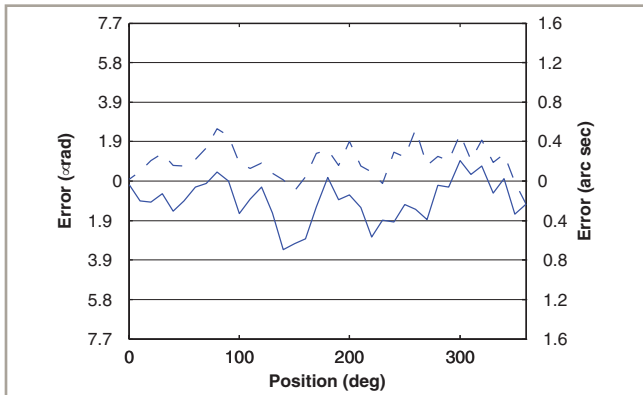
Electrical Specifications	ANT95R
Drive System	Slotless, Brushless, Direct-Drive Rotary Motor
Feedback	Noncontact Rotary Encoder
Maximum Bus Voltage	±40 VDC
Limit Switches	5 V, Normally Closed
Home Switch	Near Center

Recommended Controller	ANT95R
Multi-Axis	A3200 Npaq MXR Npaq MR-MXH Ndrive ML-MXH
	Ensemble Epaq MXR Epaq MR-MXH Ensemble ML-MXH
Single Axis	Soloist Soloist ML-MXH

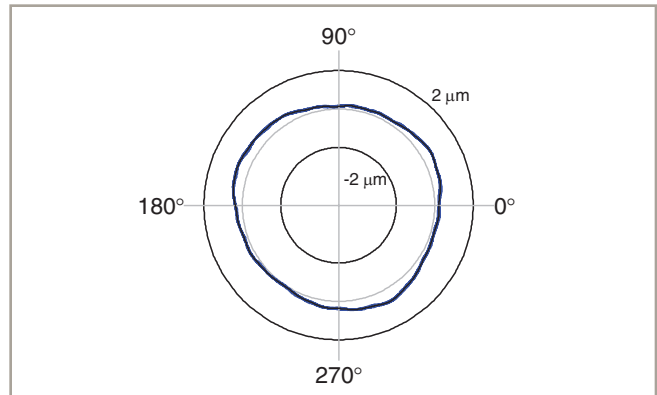
Notes:

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

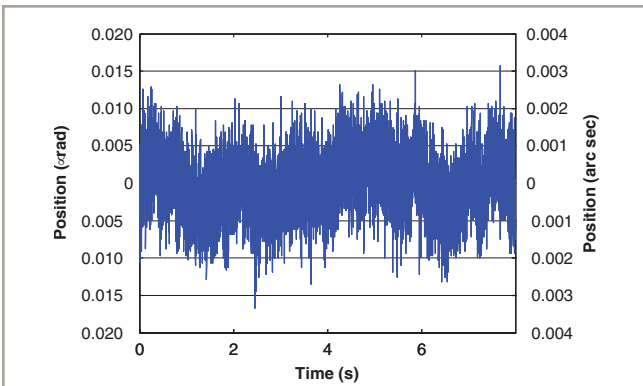
ANT95R Series PERFORMANCE



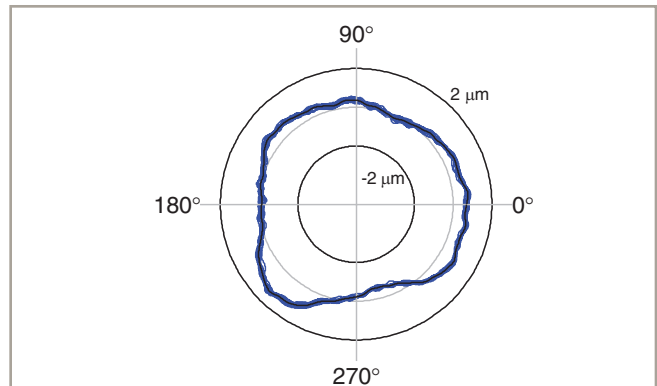
ANT95R accuracy plot showing excellent accuracy and bi-directional positioning capability.



ANT95R axial error plot illustrating outstanding synchronous and asynchronous error motion performance.

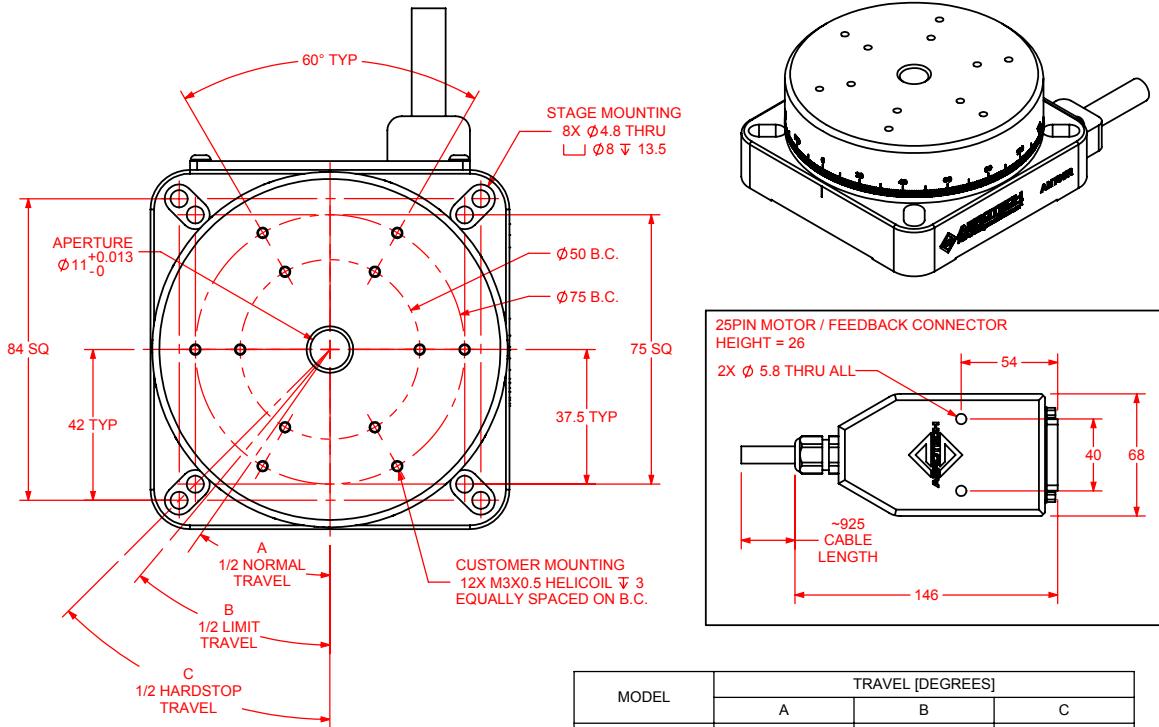


ANT95R plot showing best-in-class in-position stability.

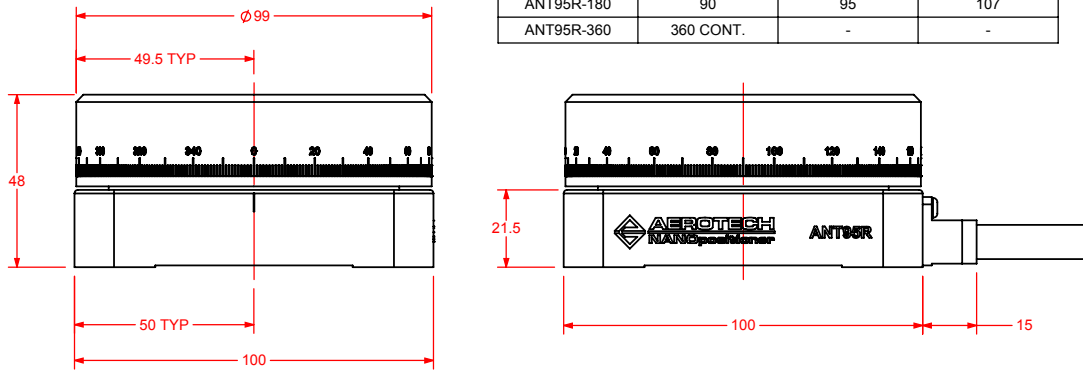


ANT95R radial error plot illustrating outstanding synchronous and asynchronous error motion performance.

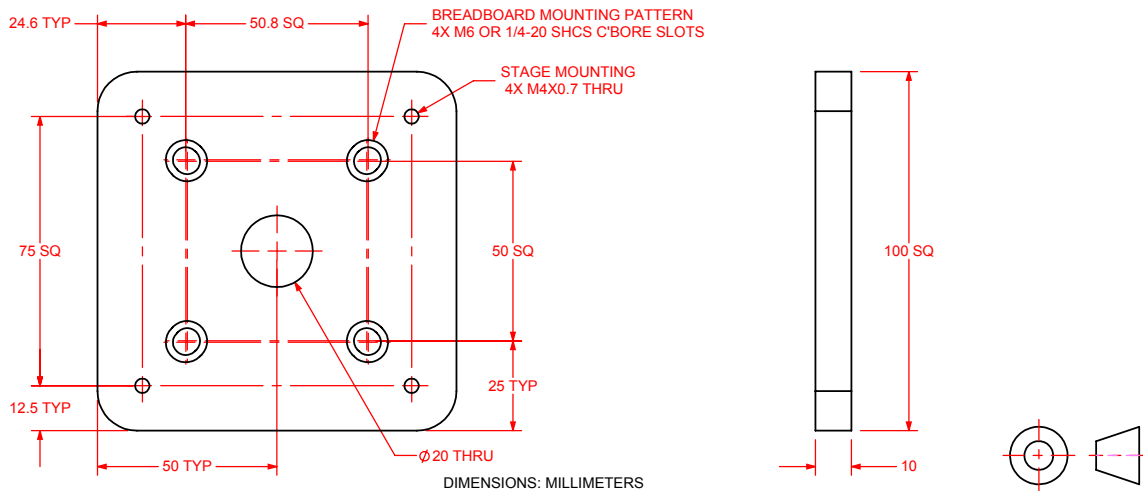
ANT95R Series DIMENSIONS



MODEL	TRAVEL [DEGREES]		
	A	B	C
ANT95R-020	10	15	27
ANT95R-180	90	95	107
ANT95R-360	360 CONT.	-	-



-MP (MOUNTING PLATE BREADBOARD)



ANT95R Series ORDERING INFORMATION

Travel (Required)

-360	Continuous travel
-20	Limited travel, ±10 degrees
-180	Limited travel, ±90 degrees

Mounting Plate (Optional)

-MP	Mounting plate
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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	<p>Integration - Test as system</p> <p>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.</p>
-TAC	<p>Integration - Test as components</p> <p>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.</p>