

# AEROTECH

## Single-Axis Direct-Drive Goniometers **ANT20G**

### Precise Pivot-Point Rotation

Our ANT20G goniometers are designed for high-speed, ultra-precise positioning applications such as the angular alignment of components. This unique design uses our best-in-class direct-drive noncontact motor technology for extremely smooth, repeatable motion and provides an industry-leading positioning speed of up to 150 degrees per second to achieve optimal throughput. Two goniometer cradles can be mounted orthogonally to achieve highly precise pitch and roll motion about a common pivot point.

### Key Applications

ANT20G stages are ideal for a variety of high-precision industrial and laboratory processes, including:

- ◆ Photonics assembly & inspection
- ◆ Fiber alignment & optimization
- ◆ Sample positioning in synchrotrons & beamlines
- ◆ Optics manufacturing, testing & inspection
- ◆ Sensor testing & qualification
- ◆ X-ray & CT inspection



### KEY FEATURES:

- ◆ Provides ample **20-DEGREE ROTATION ANGLE**
- ◆ **MAXIMIZES THROUGHPUT** with speeds to 150°/s & accelerations to 1200 rad/s<sup>2</sup>
- ◆ Offers **EXCELLENT RESOLUTION & IN-POSITION STABILITY** for high-precision processes
- ◆ **ELIMINATES MAINTENANCE** with frictionless, non-cogging direct-drive motor
- ◆ **INTEGRATES EASILY** into multi-axis assemblies for reliable rotation about a single point

## ANT20G SERIES SPECIFICATIONS

Mechanical Specifications		ANT20G-050	ANT20G-090	ANT20G-110	ANT20G-160
Rotation Angle		20°			
Accuracy <sup>1</sup>	Base Performance (-PL1)	±90 µrad (±18 arc sec)	±50 µrad (±10 arc sec)	±40 µrad (±8 arc sec)	±30 µrad (±6 arc sec)
	PLUS Performance (-PL2)	±30 µrad (±6 arc sec)	±20 µrad (±4 arc sec)	±20 µrad (±4 arc sec)	±20 µrad (±4 arc sec)
Resolution (Minimum Incremental Motion)		0.45 µrad (0.09 arc sec)	0.25 µrad (0.05 arc sec)	0.20 µrad (0.04 arc sec)	0.15 µrad (0.03 arc sec)
Bi-Directional Repeatability <sup>1</sup>		±18 µrad (±4 arc sec)	±10 µrad (±2 arc sec)		
Uni-Directional Repeatability		±5 µrad (±1 arc sec)			
Tilt Error Motion		±90 µrad (±18 arc sec)	±50 µrad (±10 arc sec)	±40 µrad (±8 arc sec)	±30 µrad (±6 arc sec)
Maximum Speed		150 degrees per second			
Maximum Acceleration		1200 rad/s <sup>2</sup>	500 rad/s <sup>2</sup>	375 rad/s <sup>2</sup>	250 rad/s <sup>2</sup>
Setting Time		See graph for typical performance			
In-Position Stability <sup>2</sup>		±0.1 µrad (±0.02 arc sec)	±0.5 µrad (±0.01 arc sec)		±0.05 µrad (±0.01 arc sec)
Nominal Radius of Rotation		50 mm	90 mm	110 mm	160 mm
Height from Tabletop to Rotation Point		19.1 mm	57.5 mm	76.2 mm	120.4 mm
Maximum Torque (Continuous)		0.40 N-m	0.85 N-m	1.00 N-m	2.40 N-m
Load Capacity	Axial	1.5 kg	2.0 kg		3.5 kg
	Moment	60 kg-mm	80 kg-mm		140 kg-mm
Stage Mass		0.68 kg	1.23 kg	1.33 kg	1.73 kg
Material		Aluminum			
MTBF (Mean Time Between Failure)		30,000 Hours			

Notes:

1. Certified with each stage.
2. In-Position Jitter listing is 3 sigma value.
3. Specifications are per axis, measured at the rotation point. Performance of multi-axis systems is payload and workpoint dependent. Consult factory for multi-axis or non-standard applications.
4. 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.

Electrical Specifications	ANT20G-050	ANT20G-090	ANT20G-110	ANT20G-160
Drive System	Slotless, Brushless, Direct-Drive			
Feedback	Noncontact Encoder			
Maximum Bus Voltage	±40 VDC			
Limit Switches	5 V, Normally Closed			
Home Switch	Near Center			

## ANT20G SERIES ORDERING INFORMATION

### Radius of Rotation (Required)

-050	50 mm radius of rotation
-090	90 mm radius of rotation
-110	110 mm radius of rotation
-160	160 mm radius of rotation

### 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

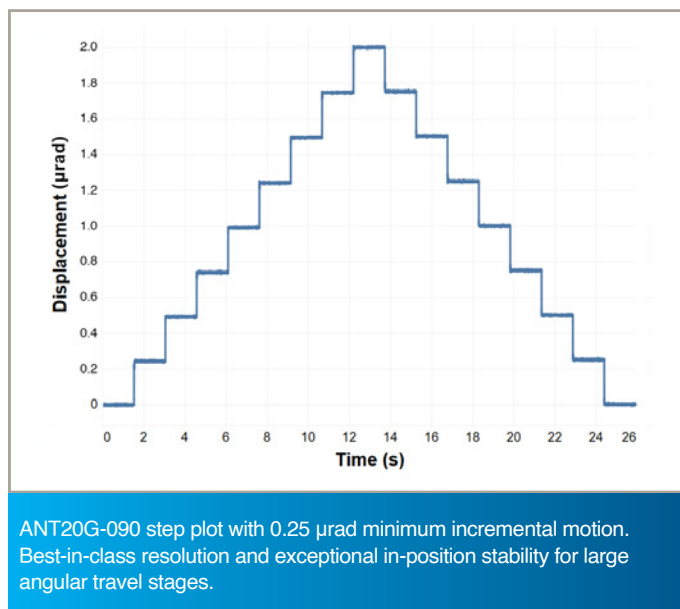
Testing, integration, and documentation of a group of components as a complete system that will be used together (ex: drive, controller, and stage). This includes parameter file generation, system tuning, and documentation of the system configuration.

#### -TAC Integration - Test as components

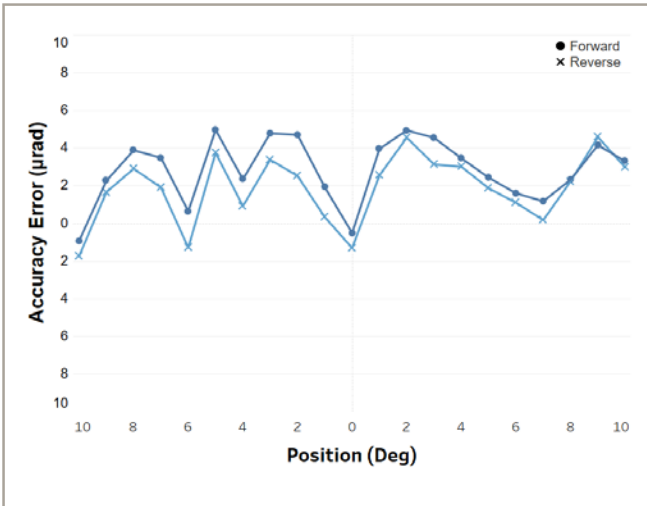
Testing and integration of individual items as discrete components that ship together. This is typically used for spare parts, replacement parts, or items that will not be used together. These components may or may not be part of a larger system.

### Accessories (to be ordered as separate line item)

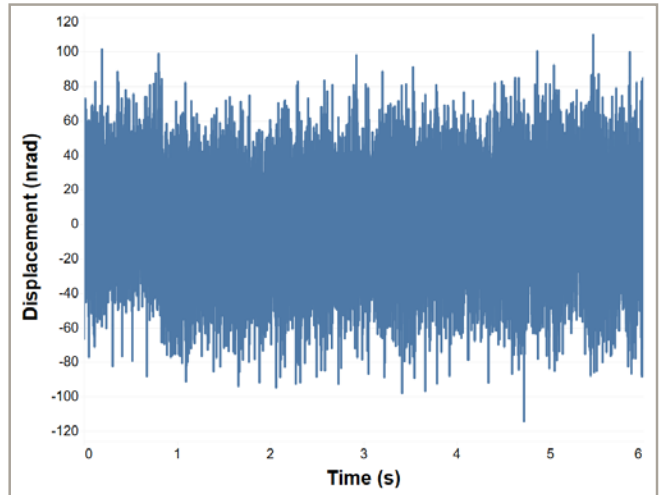
ALIGN-PA10	XY assembly; 10 arc sec orthogonality
ALIGN-PA5	XY assembly; 5 arc sec orthogonality



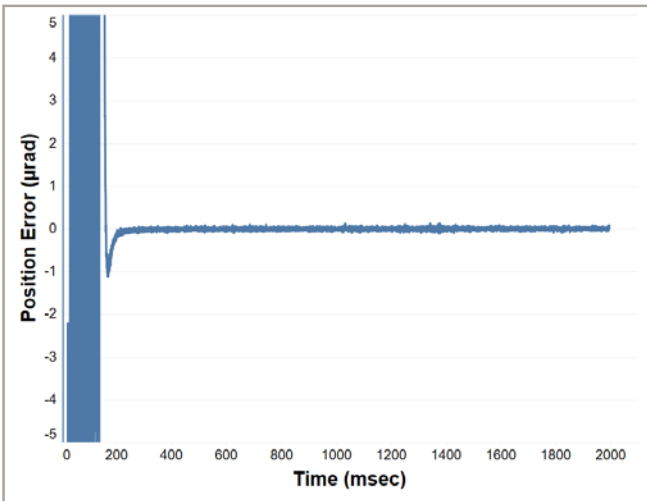
**ANT20G SERIES SPECIFICATIONS**  
**ANT20G SERIES PERFORMANCE**



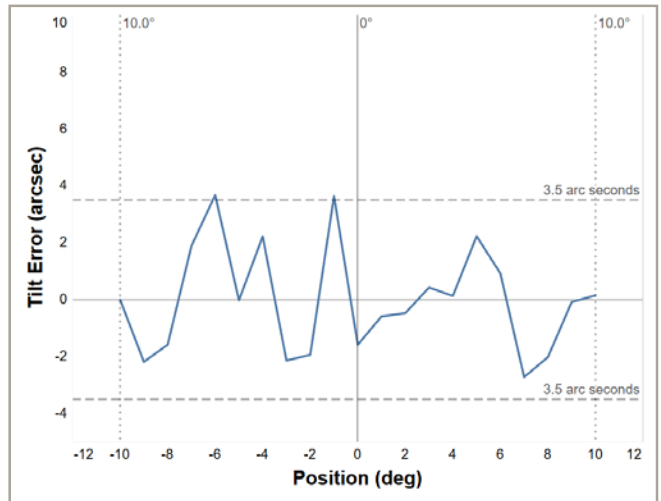
ANT20G-090 calibrated accuracy performance.



ANT20G-090 in-position stability. Excellent in-position stability is another feature of the ANT Series goniometers.



ANT95L-025-PL2 accuracy and repeatability. This multiple test run over an extended period of time shows the high level of system accuracy and repeatability.



ANT20G-090 tilt error motion performance.

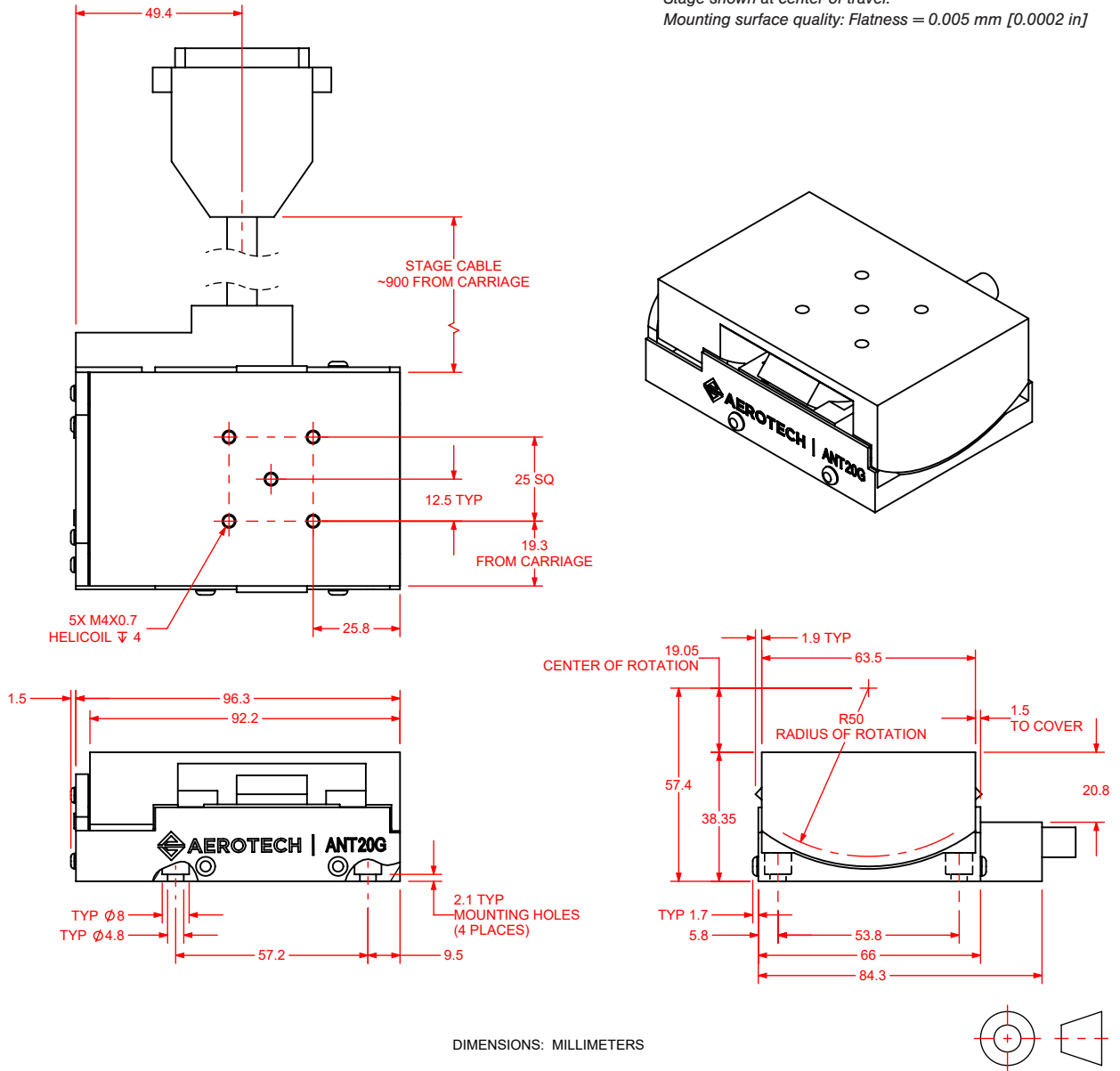
# ANT20G SERIES DIMENSIONS

## ANT20G-050

U.S. Patent No. 6,442,851

Stage shown at center of travel.

Mounting surface quality: Flatness = 0.005 mm [0.0002 in]



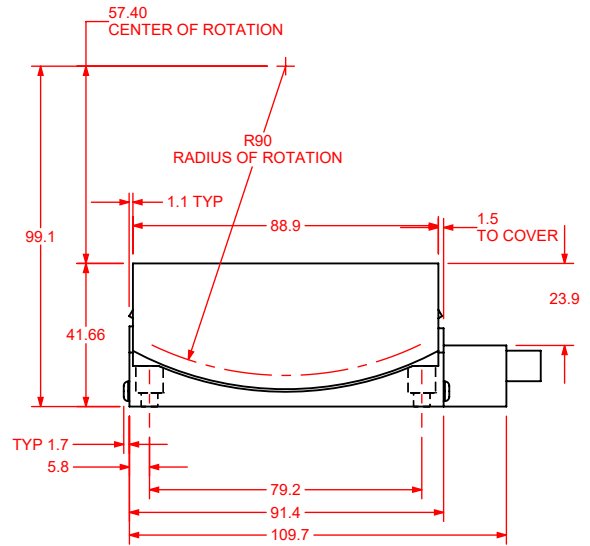
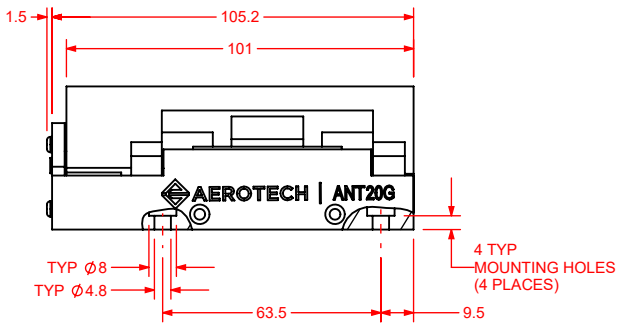
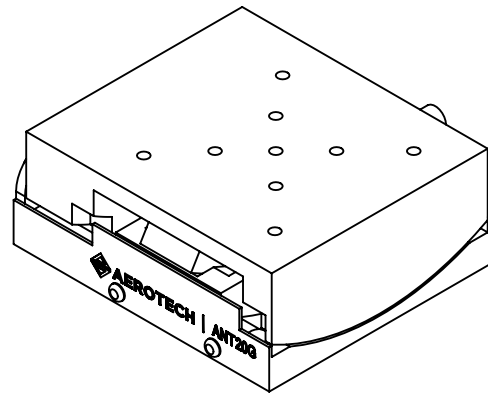
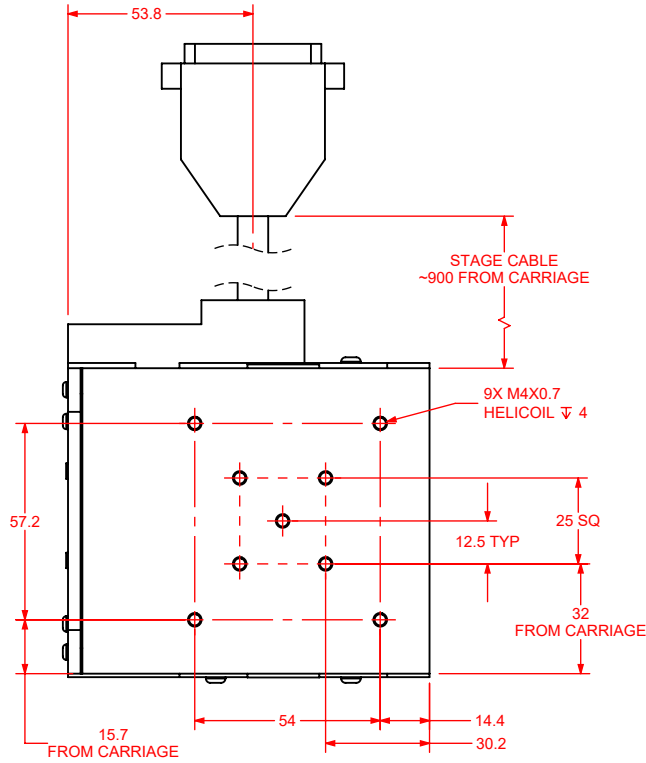
# ANT20G SERIES DIMENSIONS

ANT20G-090

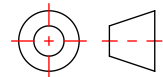
U.S. Patent No. 6,442,851

Stage shown at center of travel.

Mounting surface quality: Flatness = 0.005 mm [0.0002 in]

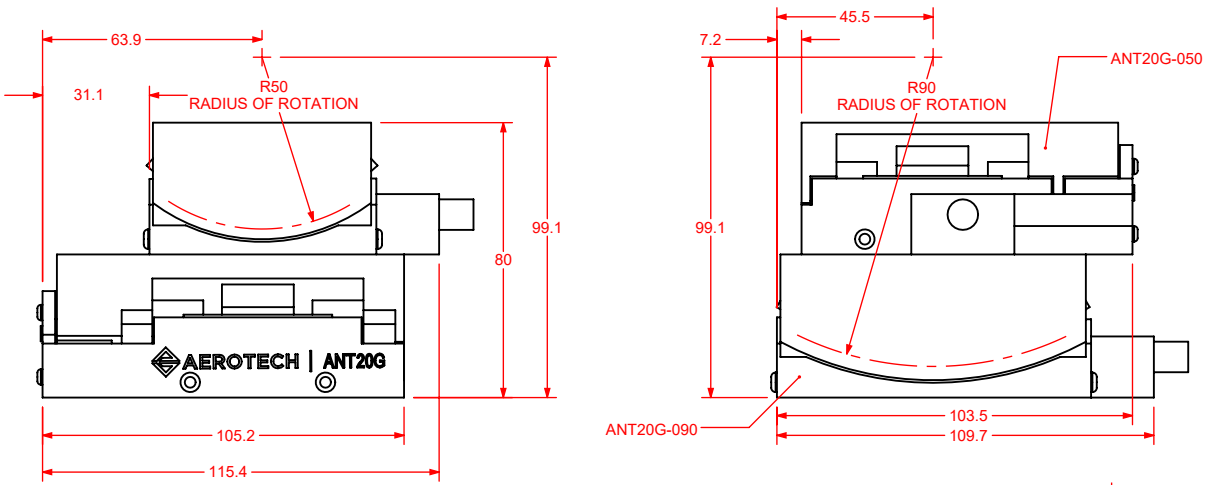


DIMENSIONS: MILLIMETERS

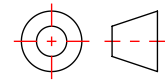


# ANT20G SERIES DIMENSIONS

ANT20G-050-090



DIMENSIONS: MILLIMETERS



U.S. Patent No. 6,442,851

All stages shown at center of travel. Mounting surface quality: Flatness = 5  $\mu\text{m}$  [0.0002 in.]

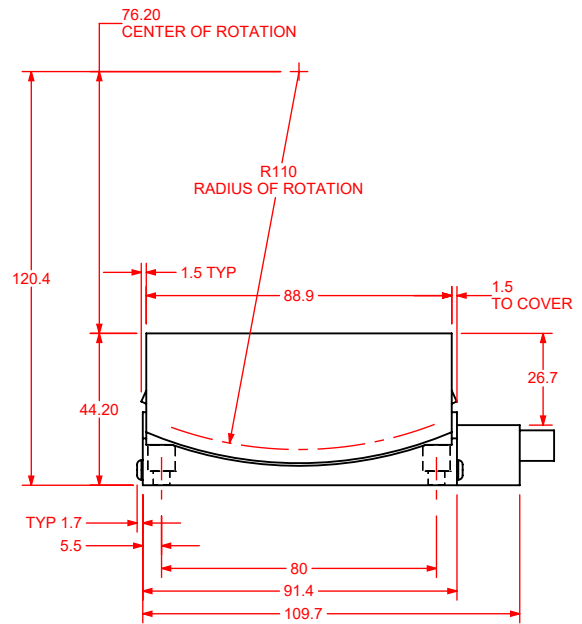
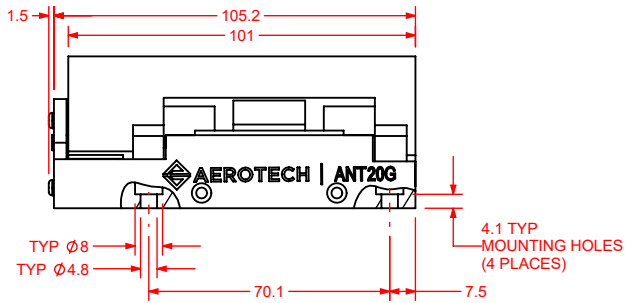
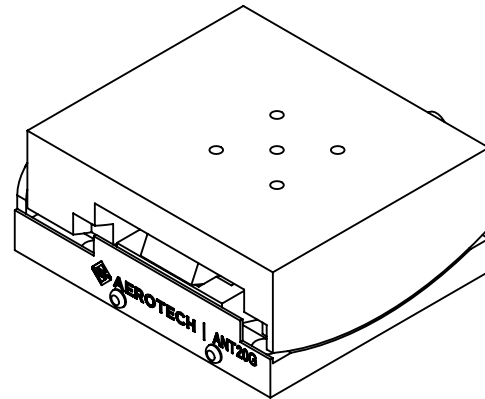
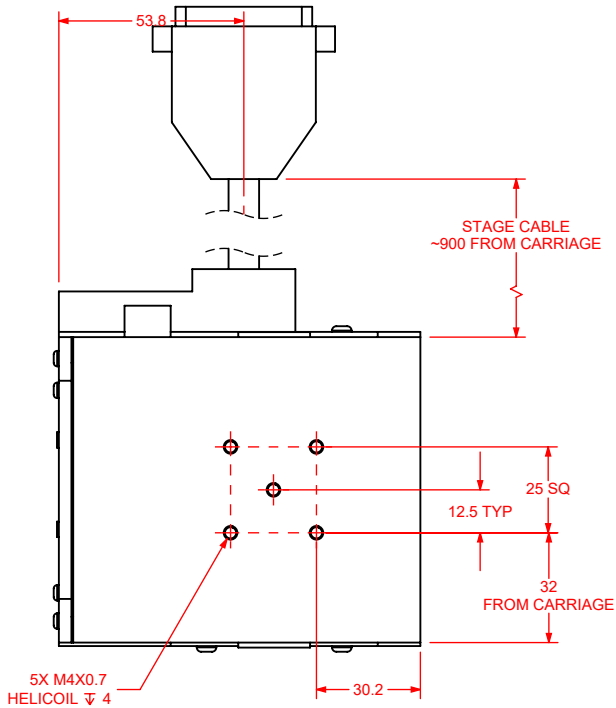
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ANT20G-110

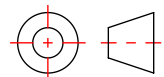
U.S. Patent No. 6,442,851

Stage shown at center of travel.

Mounting surface quality: Flatness = 0.005 mm [0.0002 in]



DIMENSIONS: MILLIMETERS





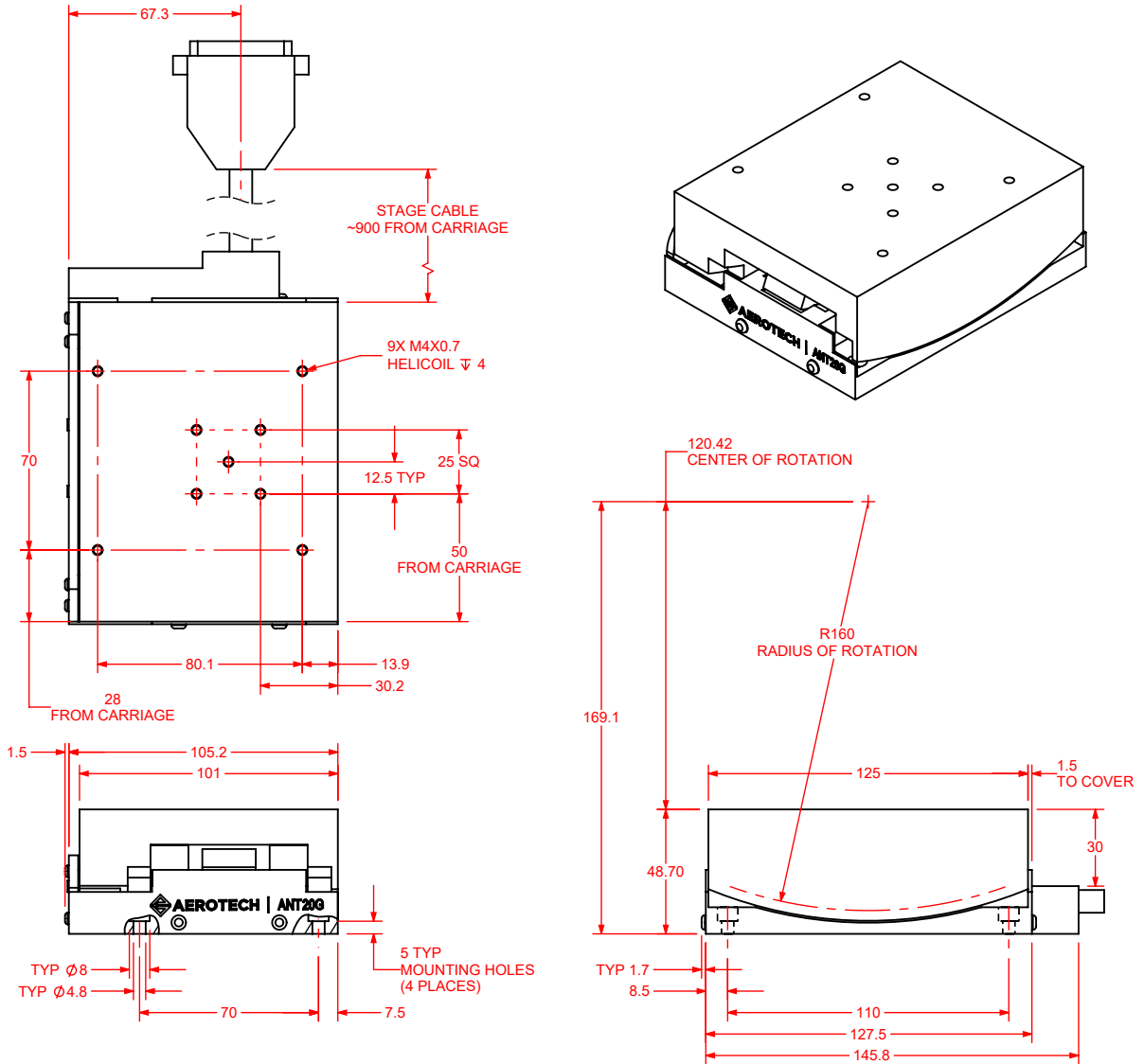
# ANT20G SERIES DIMENSIONS

## ANT20G-160

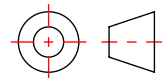
U.S. Patent No. 6,442,851

Stage shown at center of travel.

Mounting surface quality: Flatness = 0.005 mm [0.0002 in]

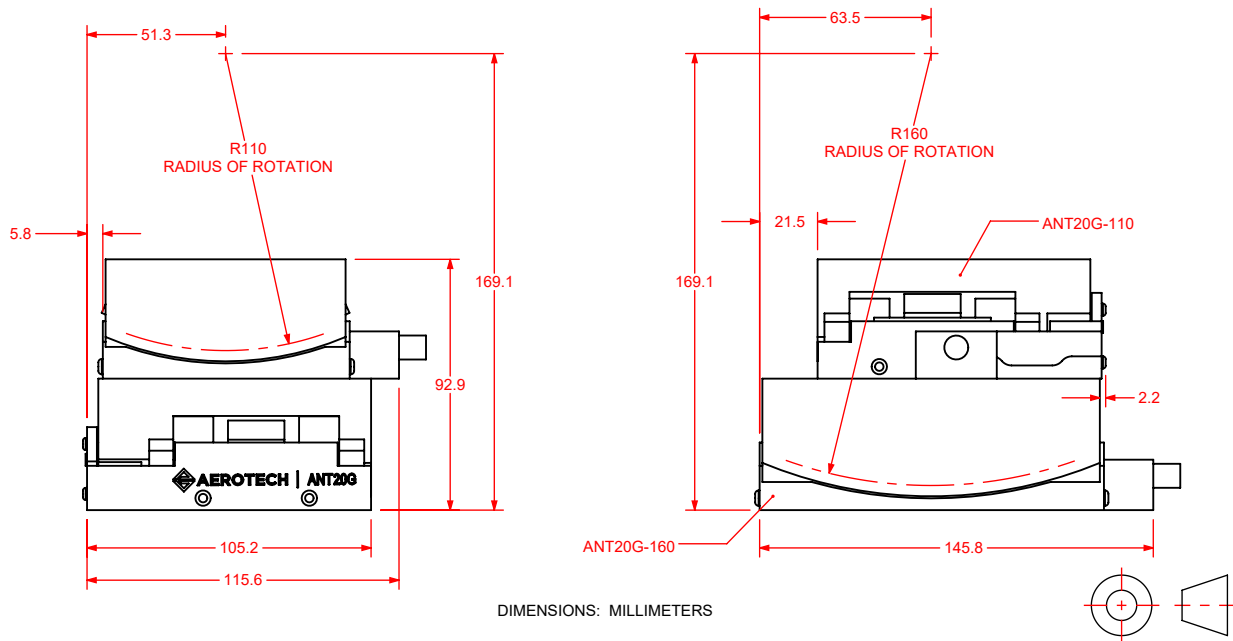


DIMENSIONS: MILLIMETERS



# ANT20G SERIES DIMENSIONS

## ANT20G-110-160



U.S. Patent No. 6,442,851

All stages shown at center of travel. Mounting surface quality: Flatness = 5  $\mu\text{m}$  [0.0002 in.]