

AMG Series

Motorized Position and Rate Gimbals

Continuous 360° rotation of azimuth and elevation including built-in slip ring

High accuracy angular position and rate capability

Direct-drive brushless servomotors result in zero backlash

Cog-free design for outstanding velocity stability

Accommodate loads up to 600 mm diameter

Low maintenance and high reliability provide the lowest cost of ownership

Aerotech's AMG position and rate gimbal mounts provide ultra-precise angular position, rate, and acceleration for development and production testing of a wide range of systems. The AMG series is ideal for directing optics, lasers, antennas, and sensors at high speed to very precise pointing angles. Typical applications include missile seeker test and calibration, LIDAR, electro-optical sensor and FLIR testing, airborne targets tracking, optical testing of space-based sensors in a vacuum, and angular testing of inertial sensors such as gyros, MEMS, accelerometers, and inertial reference units. The AMG gimbal design incorporates recent Aerotech rotary stage design improvements to provide high performance at an affordable price. The finest quality motors, bearings, and encoders are integrated into precision-machined housings to ensure peak performance. The AMG position and rate gimbals provide precise angular motion with the high performance customers expect from Aerotech products.

Accurate 360° Positioning and Rate Generation

Direct-drive brushless torque motors, with rare-earth magnets and high-accuracy angular transducers, are coupled directly to precision shafts for accurate and smooth 360° continuous motion. The absence of gear trains and other drive mechanisms eliminates position error contributions due to mechanical hysteresis and backlash. Directly-coupled high-resolution position transducers ensure highly accurate and repeatable positioning.



A wide-range of performance feedback grades is available. Typical line gimbal resolution ranges from 1.0 to 0.13 μ rad with Aerotech controls. The built-in azimuth slip ring provides for continuous rotation with no cable wrap up.

Direct-Drive Motors for Outstanding Control

To maximize positioning and velocity performance, AMG gimbal mounts utilize Aerotech's high torque S-series brushless, slotless servomotors. These motors have all of the advantages of a brushless direct-drive motor — no brushes to wear, no gear trains to maintain, and high acceleration and high speeds. Since it is a slotless, ironless design, there is zero cogging, meaning that there is absolutely no torque ripple. This results in smoother motion throughout travel and more precise positioning. These motors are available in different winding configurations to work with high or low voltage power supplies.

Superior Mechanical Design Features

Large diameter, matched-set ABEC-7 bearings maximize performance with respect to wobble, moment stiffness, and rotating friction. The large diameter bearing permits large payload capacity without compromising performance. Casting gimbal yokes provide high stiffness to maintain gimbal accuracy under dynamic conditions. Travel limits, hardstops, and brakes are available as standard options.

AMG Series DESCRIPTION

Mirror and Alternate Payload Accommodation

A variety of mirror cell diameters are available for standard optic applications. We also provide for custom payload attachment solutions to accommodate various device interfaces. Each gimbal mirror cell can be modified or replaced with different shaped cells to accommodate sensors or other odd shaped payloads. We understand customer payloads vary and our engineers have a variety of solutions to implement offset CG payloads.

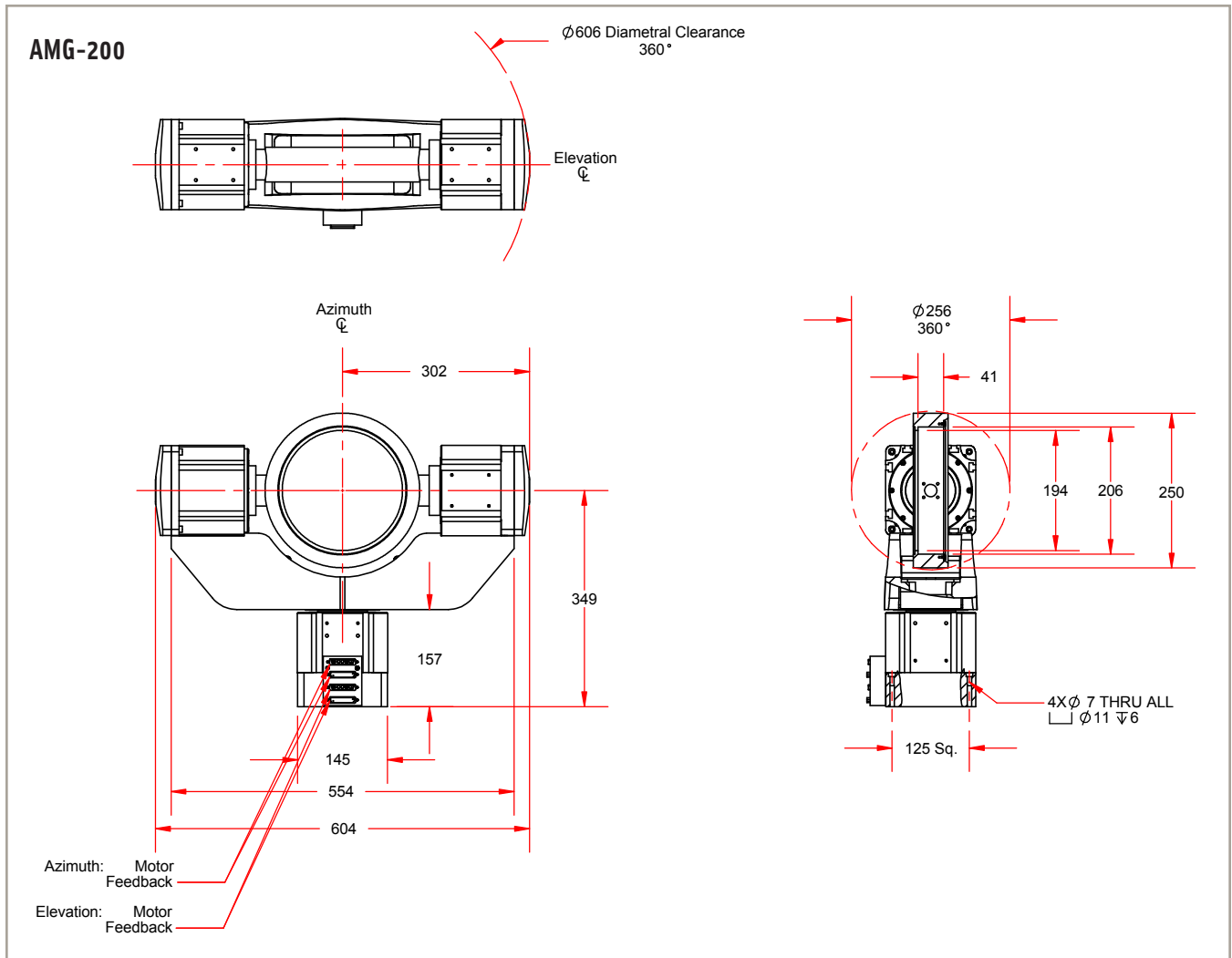
AMG Series SPECIFICATIONS

Basic Model		AMG-200	AMG-300	AMG-400	AMG-500	AMG-600
Travel		360° continuous, AZ/EL				
Maximum Bus Voltage		340 VDC				
Maximum Torque (Continuous)	Azimuth	2.36 N·m	11.12 N·m	11.12 N·m	19.71 N·m	19.71 N·m
	Elevation	2.36 N·m	2.36 N·m	2.36 N·m	11.12 N·m	11.12 N·m
Clear Aperture Diameter ⁽¹⁾		194 mm	292 mm	394 mm	489 mm	591 mm
Accuracy		±24 to ±144 μrad ⁽²⁾ (±5 to ±30 arc sec)				
Repeatability		±2.4 μrad (±0.5 arc sec)				
Maximum Rotary Speed ⁽³⁾		100 rpm	100 rpm	100 rpm	50 rpm	50 rpm
Maximum Load Capability		20 kg	40 kg	40 kg	70 kg	70 kg
Axis Wobble		48 μrad (10 arc sec)				
Orthogonality		24 μrad (5 arc sec)				
Standard Finish		Black Anodize with Hard-Coated Cell				
Max Component Diameter ⁽⁴⁾		206 mm	306 mm	407 mm	509 mm	610 mm
Nominal Component Thickness		41 mm	54 mm	64 mm	95 mm	102 mm
Mass (Without Mirror)		29 kg	47 kg	54 kg	116 kg	137 kg
Inertia AZ ⁽⁵⁾		0.97 kg·m ²	1.877 kg·m ²	2.71 kg·m ²	10.4 kg·m ²	14.94 kg·m ²
Inertia EL ⁽⁵⁾		0.019 kg·m ²	0.105 kg·m ²	0.27 kg·m ²	0.974 kg·m ²	2.33 kg·m ²
AZ Aperture When Slip Ring is Removed (AZ Travel Must be Limited)		50 mm	75 mm	75 mm	100 mm	100 mm
Aperture with Slip Ring		12.7 mm	12.7 mm	12.7 mm	38.1 mm	38.1 mm

Notes:

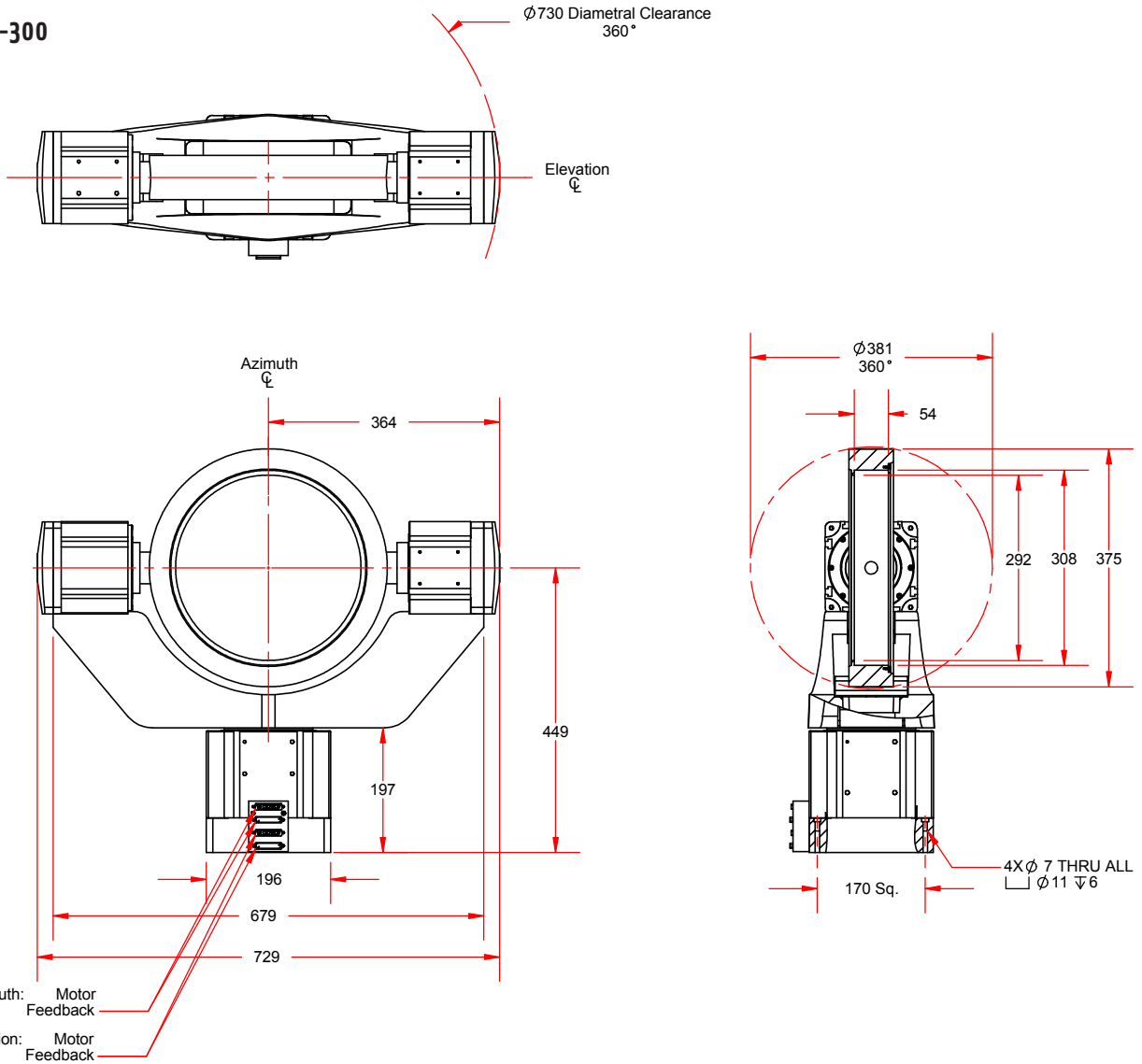
1. Special cell adapters and slip ring assemblies by special order.
2. ±24 μrad calibrated; ±144 μrad uncalibrated.
3. Maximum speed based on stage capability; maximum application velocity may be limited by system data rate and system resolution.
4. Tolerance equals +0/-0.25.
5. Unloaded inertia.

AMG Series DIMENSIONS



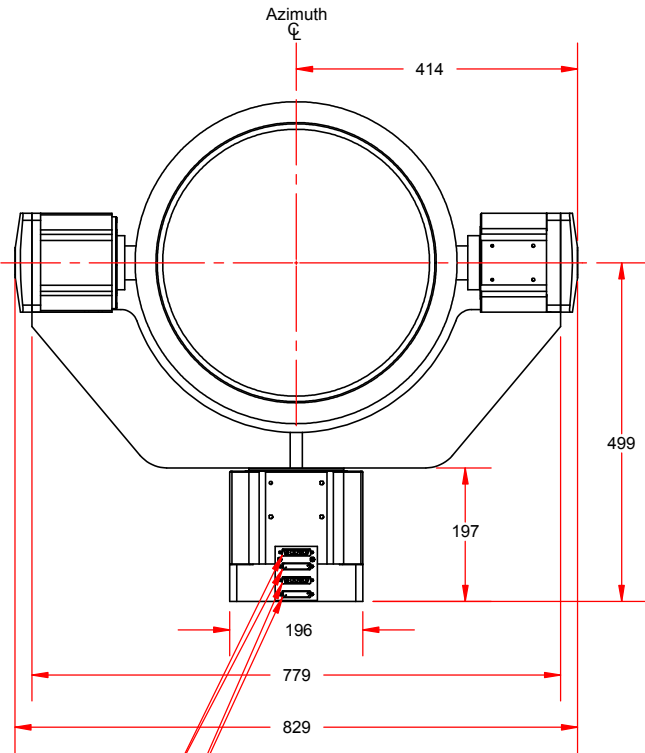
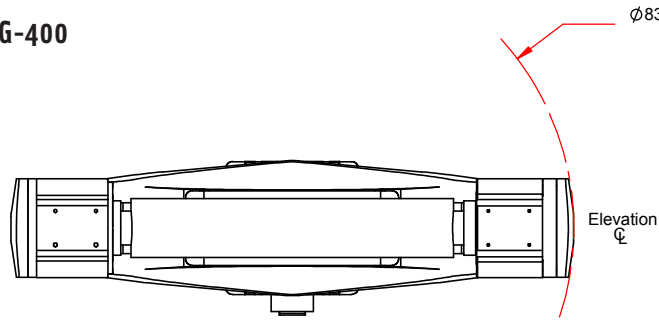
AMG Series DIMENSIONS

AMG-300

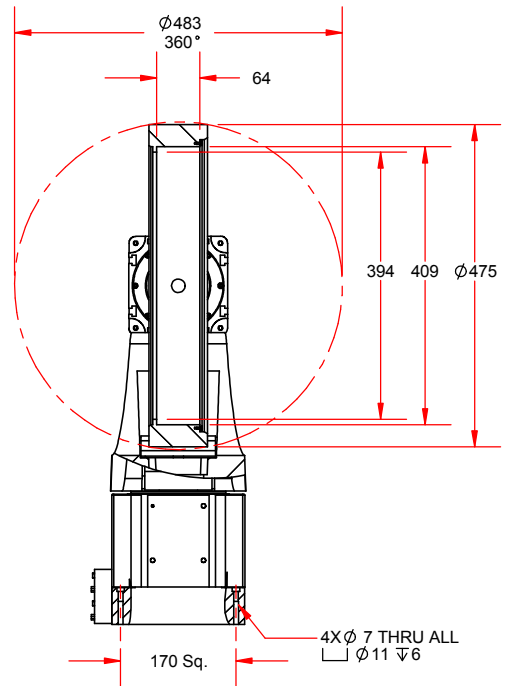


AMG Series DIMENSIONS

AMG-400

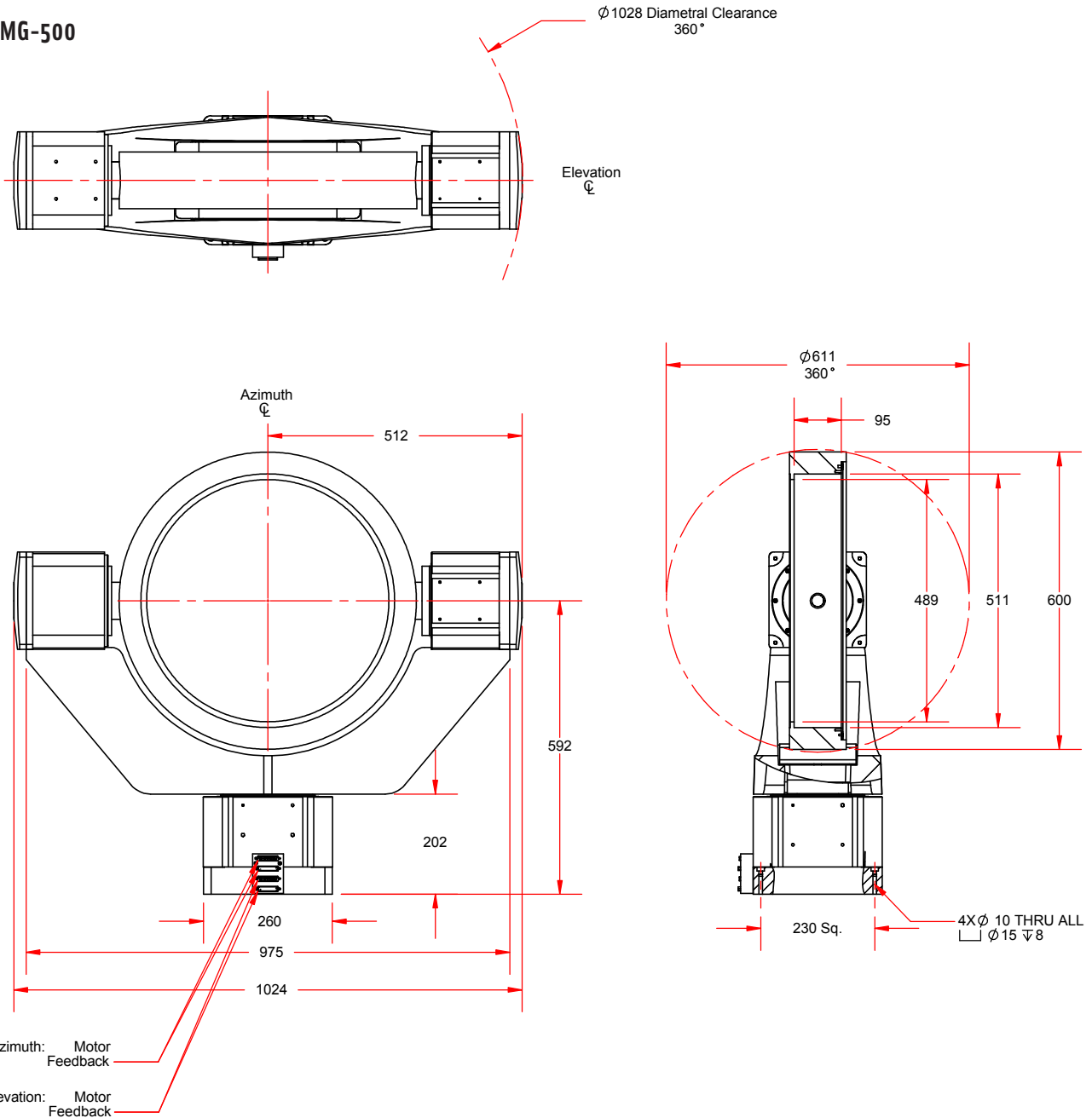


Azimuth: Motor Feedback
Elevation: Motor Feedback



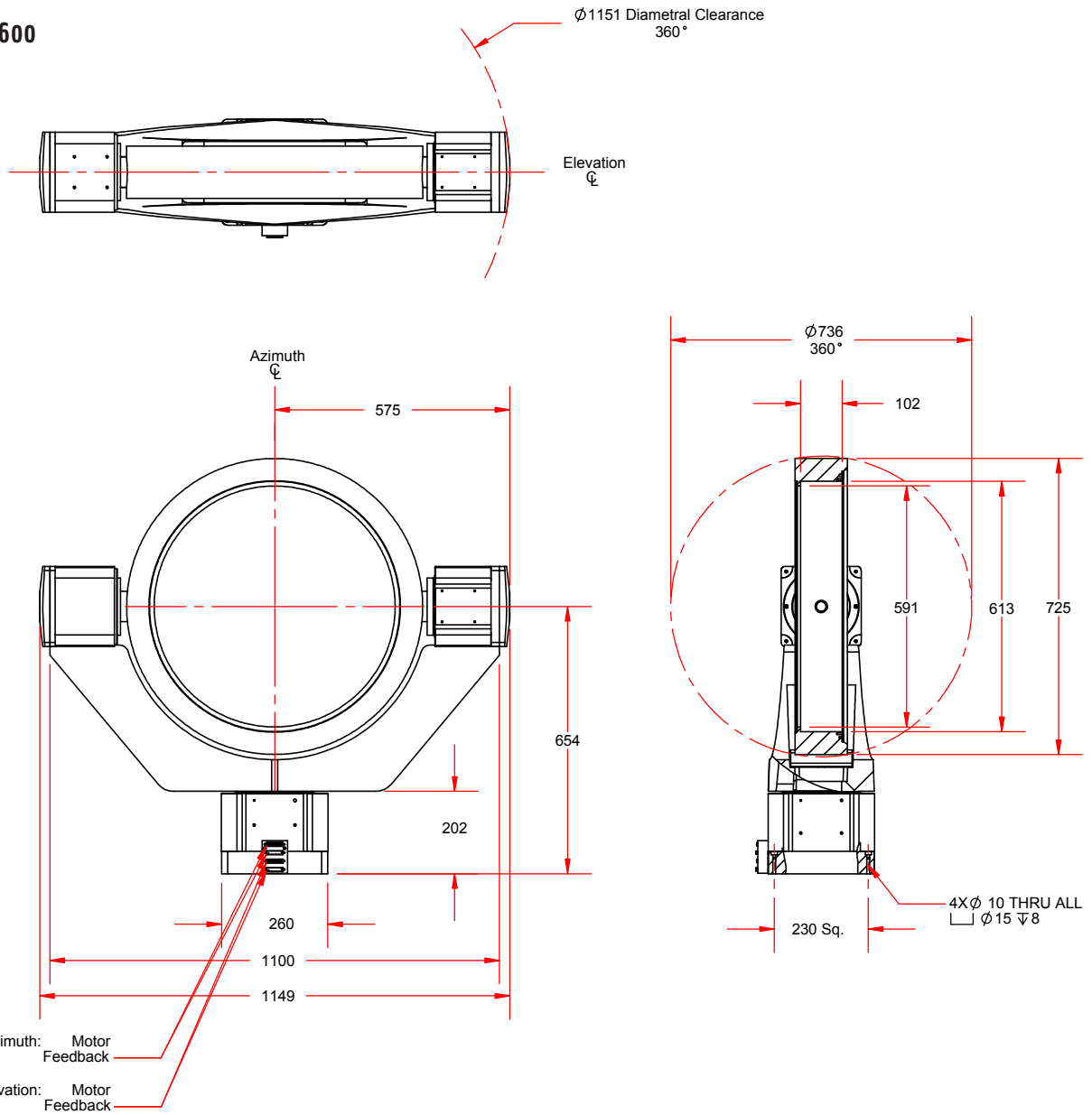
AMG Series DIMENSIONS

AMG-500



AMG Series DIMENSIONS

AMG-600



AMG Series ORDERING INFORMATION

AMG Series Direct-Drive Gimbals

AMG200	AMG200 direct-drive gimbal, 200 mm nominal aperture
AMG300	AMG300 direct-drive gimbal, 300 mm nominal aperture
AMG400	AMG400 direct-drive gimbal, 400 mm nominal aperture
AMG500	AMG500 direct-drive gimbal, 500 mm nominal aperture
AMG600	AMG600 direct-drive gimbal, 600 mm nominal aperture

Feedback (Required)

-E1	Incremental encoder, 1 Vpp
-E2	Incremental encoder, TTL, x5 interpolation
-E3	Incremental encoder, TTL, x50 interpolation

Metrology (Required)

-PL1	Metrology, uncalibrated with performance plots
-PL2	Metrology, calibrated (HALAR) with performance plots

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>