

AGC Series

Gear-Drive Goniometers

±45° rotary positioning with unobstructed 360° view of customer load

Stackable design with common rotation point

Precision worm gear drive for outstanding accuracy and repeatability

Direct encoder option

Horizontal or vertical mounting orientation

High load capacity



AGC motorized mechanical goniometers are used in applications where 90 degrees of angular travel is needed with the payload at the center of rotation, or where two axes of rotation are needed about a common point. AGC goniometers are designed to be mounted to standard optical tables, as well as standard Aerotech rotary stages, to provide roll, pitch, and yaw about a common 3-axis intersection. This flexible stage series is ideal for optical alignment, payload tip/tilt, beam steering, sensor calibration, laser applications, automated manufacturing and/or testing, and multi-axis diffractometer systems.

Construction Features

The sizes within the AGC family are designed to be mounted on one another to form a three-axis rotary system with all three axes of rotation sharing a common intersection point. This allows compact pitch/roll/yaw systems to be created easily from a standard stage platform and without special adapter plates or mating fixtures. The drive mechanism for AGC stages is a precision gear and matched worm that are preloaded to reduce backlash. All AGC stages include optical limit switches and hard stops to define a ±45 degree range of travel.

Innovative feedback technology yields stable performance and negligible performance drift over the life of the stage. This is in stark contrast to inferior designs that must be continually adjusted to compensate for worm wear. All stage tabletops feature hardcoated aluminum, with stainless-steel Heli-Coil® inserts to prevent thread wear.

Flexible Options

Options include flexible motor selections as well as a direct encoder mounted along the stage travel to offer outstanding repeatability and to minimize hysteresis and backlash. Vacuum-compatible versions, for use in pressures as low as 10^{-6} torr, are also available.

Motor and Drives

Standard AGC stage configurations feature Aerotech's brushless servomotors. However, all AGC goniometers can be outfitted with stepper or brushed motors, as well. A full range of matching drives and controls are available for a complete single-source solution.

AGC SPECIFICATIONS

Mechanical Specifications	AGC-85	AGC-160	AGC-245	
Travel Range	±45°			
Accuracy ⁽¹⁾	±12 arc sec			
Resolution	3 arc sec			
Repeatability (Bi-Directional) ⁽¹⁾	±10 arc sec			
Repeatability (Uni-Directional) ⁽¹⁾	±5 arc sec			
Tilt Error Motion	±40 arc sec			
Gear Ratio	152:1	192:1	288:1	
Maximum Speed	30°/s			
Nominal Radius of Rotation	125 mm	200 mm	300 mm	
Distance from Tabletop to Rotation Point	85 mm	160 mm	245 mm	
Maximum Torque (Continuous)	18 N-m	20 N-m	30 N-m	
Load Capacity ⁽²⁾	Axial	20 kg	30 kg	50 kg
	Moment	20 N-m	30 N-m	50 N-m
Stage Mass	5.6 kg	12.5 kg	24.3 kg	
Material	Aluminum Body/Clear Anodize Finish			
MTBF (Mean Time Between Failure)	5000 Hours			

Notes:

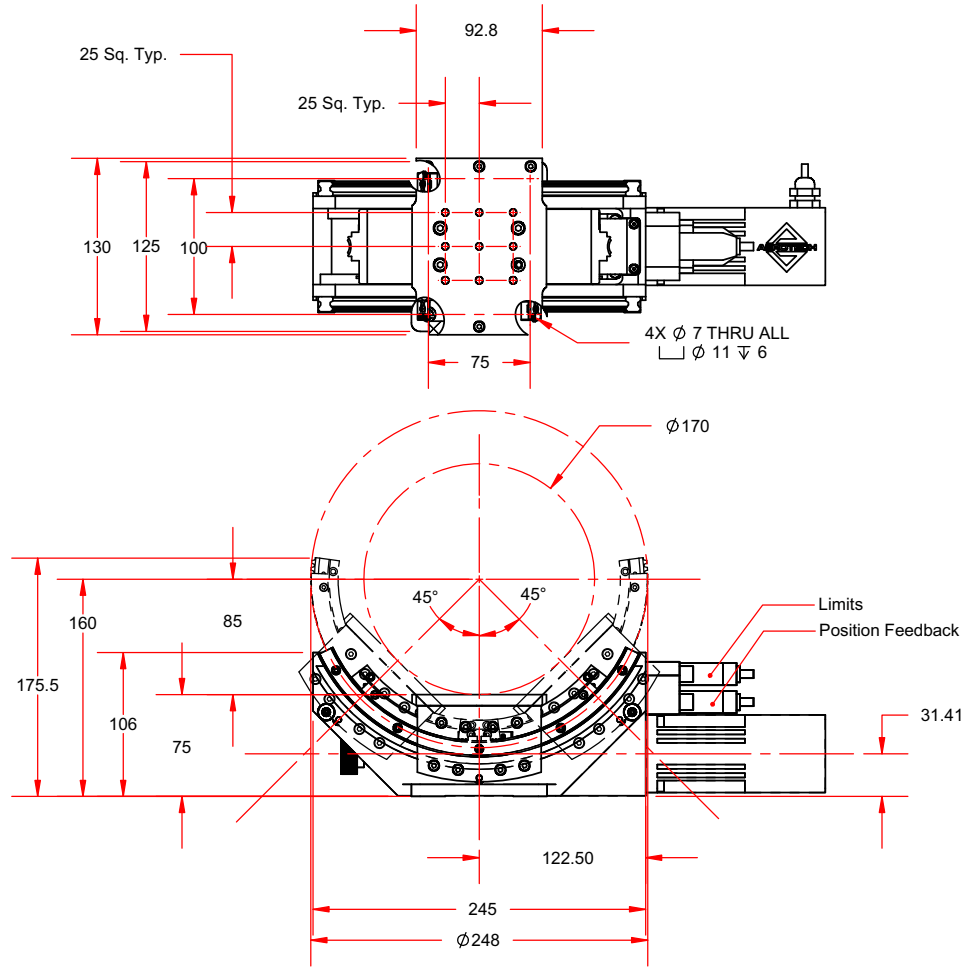
1. Certified with each stage. Requires direct encoder feedback with HALAR option and is tested with Aerotech controller.
2. On-axis loading is listed.
3. Specifications are for single-axis systems measured at the center of rotation. Performance of multi-axis systems is payload and workpoint dependent. Consult factory for multi-axis or non-standard applications.
4. Load Center of Mass not to exceed bounding volume of 160 mm in diameter by 80 mm above pivot point.

Electrical Specifications	AGC-85	AGC-160	AGC-245
Drive System	Worm-Gear Assembly		
Feedback	Rotary Encoder on Drive Motor and Noncontact Direct Encoder		
Maximum Bus Voltage	320 VDC		
Limit Switches	5 V, Normally Closed		
Home Switch	Near Limit		

Recommended Controller	AGC-85	AGC-160	AGC-245
Multi-Axis	A3200/Npaq	Ndrive CP10	Ndrive CP10
	Ensemble	Ensemble CP10	Ensemble CP10
Single Axis	Soloist	Soloist CP10	Soloist CP10

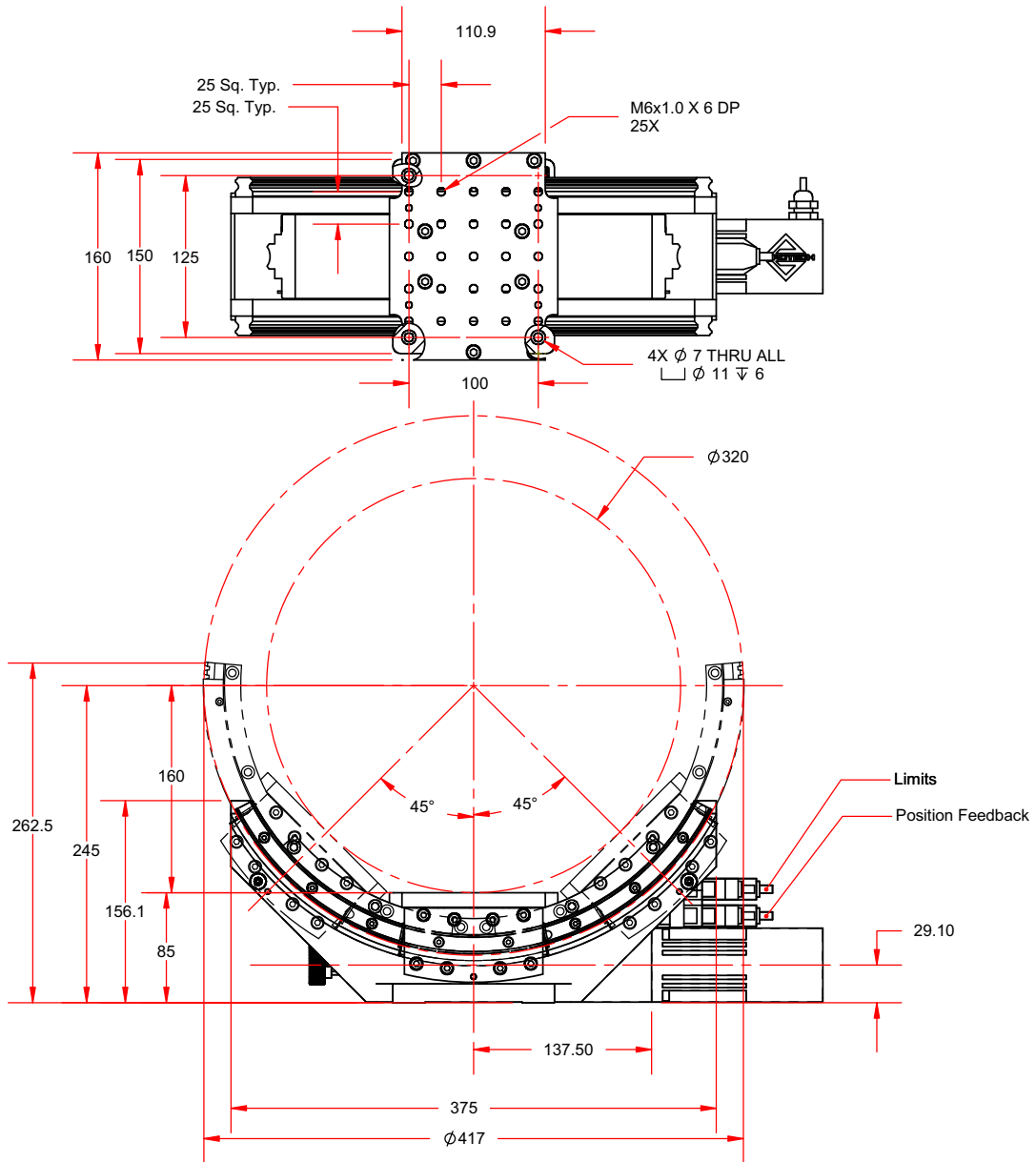
AGC DIMENSIONS

AGC-85



Feedback Option Shown

AGC-160



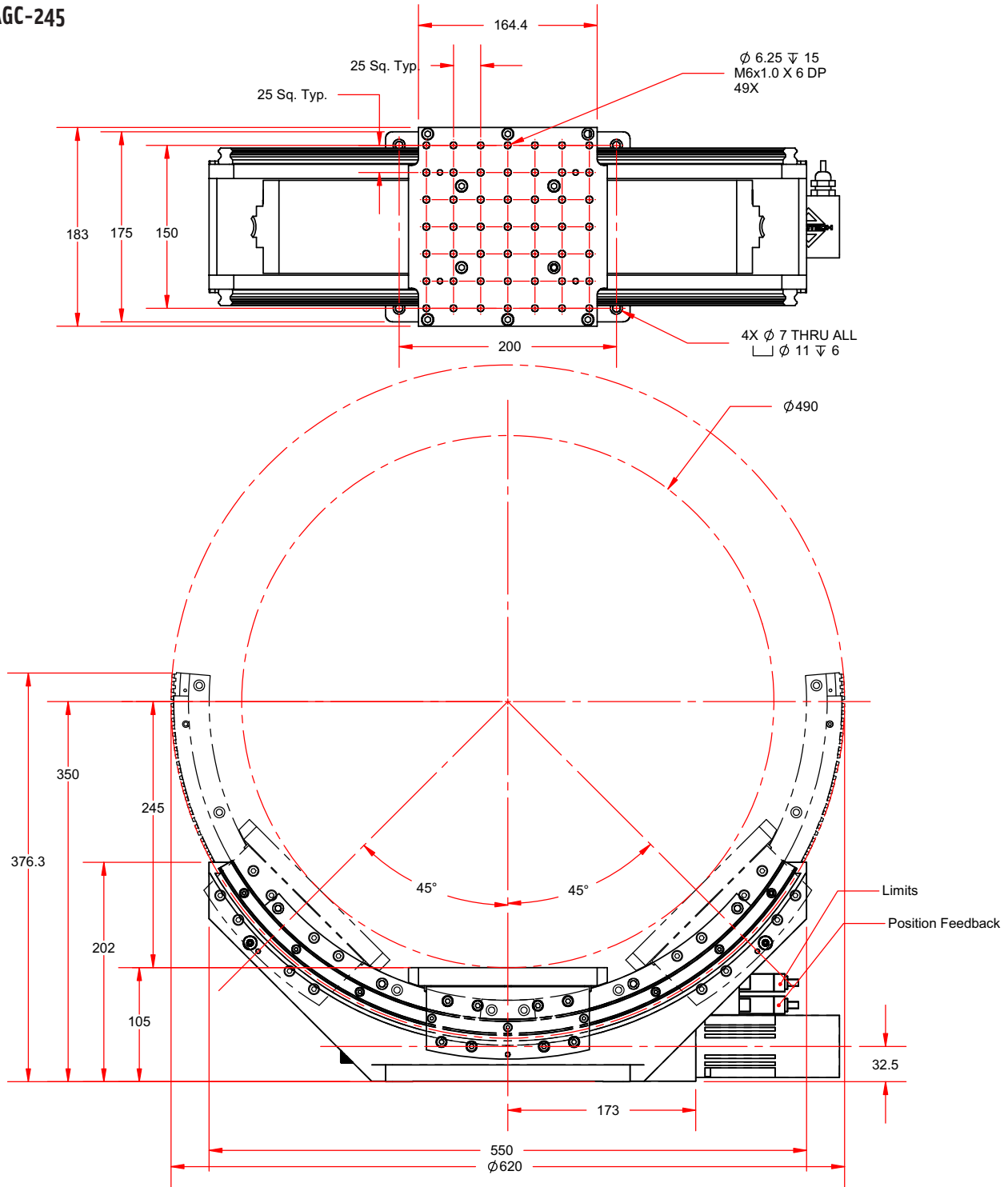
Feedback Option Shown

AGC DIMENSIONS

Goniometers

AGC Series

AGC-245



Feedback Option Shown

AGC Series ORDERING INFORMATION

Ordering Example

AGC	-85	-BMS	-AS
Series	Effective Radius of Curvature (mm)	Motor	Optional Position Transducer
	-85	-BMS	-AS
	-160	-SM	-X50
	-245	-NM	

AGC Series Gear-Driven Goniometric Cradles

AGC-85	Gear-driven goniometric cradle with ± 45 degrees travel and 85 mm radius of curvature
AGC-160	Gear-driven goniometric cradle with ± 45 degrees travel and 160 mm radius of curvature
AGC-245	Gear-driven goniometric cradle with ± 45 degrees travel and 245 mm radius of curvature

Motor

-BMS	Brushless servomotor with connectors and 1000-line encoder; requires motor-to-controller cable; AGC-85 (BMS60-A-D25-E1000H); AGC-160 and AGC-245 (BMS100-A-D25-E1000H)
-SM	Stepping motor with 4.6 m (15 ft) integral cable and home marker pulse (one per rev); AGC-85 (50SMB2-HM), AGC-160 and AGC-245 (55SMB2-HM)
-NM	No motor

Optional Position Transducer

-AS	Direct encoder option, sine wave output; resolution (before encoder multiplication) of 6.6 arc seconds for AGC-85; 4.0 arc seconds for AGC-160; 2.8 arc seconds for AGC-245
-X50	Direct encoder option, square wave output; resolution of 0.033 arc seconds for AGC-85; 0.020 arc seconds for AGC-160; and 0.014 arc seconds for AGC-245

Note that using AGC stages with dual feedback loops will necessitate that the drive motor is outfitted with an amplified sine encoder and appropriate encoder interpolation (MXH, MXU, or MXR).