

AOM360D Series

Motorized Optical Mounts

Continuous 360° rotation of both axes

High axis-positioning accuracy and repeatability

Low axis wobble and orthogonality

Direct-drive brushless servomotors

High accuracy induction feedback

Cog-free design for outstanding velocity stability

Thermal stability better than 0.4 arc seconds/°C

Accommodates loads up to 500 mm (20 in) diameter

Vacuum-compatible versions available

Aerotech's AOM360D series of positioning gimbal mounts provides ultra-precise elevation-over-azimuth positioning. The finest quality motors, bearings, and transducers are incorporated into precision-machined housings to assure peak performance.

The AOM360D series positioning gimbal mounts are ideal for automatic testing of components that must be precisely positioned in azimuth and elevation, such as sensors and optics. Other applications include calibration, laser beam steering, target acquisition and tracking, camera and telescope scanning and pointing.

Accurate 360° Positioning

Direct-drive brushless torque motors, incorporating rare-earth magnets and high-accuracy 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 inductosyn position transducers assure highly accurate and repeatable positioning with gimbal accuracy down to $\pm 5 \mu\text{rad}$ (± 1 arc sec).



Superior Mechanical Design Features

Large diameter, matched-set ABEC-7 bearings maximize performance with respect to wobble, moment stiffness, and rotating friction. A thick-walled, precision-ground shaft further minimizes wobble. The large diameter bearing permits large payloads without compromising performance. Three tapped holes with leveling screws provide a convenient means to align the gimbal axes with the optical axis.

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.

Direct-Drive Motors for Outstanding Control

To maximize positioning performance, AOM360D optical mounts utilize Aerotech's S-series brushless, slotless servomotors. This motor has 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.

AOM360D Series SPECIFICATIONS

Basic Model		AOM360D-20	AOM360D-30	AOM360D-40	AOM360D-50
Travel		360° continuous, both azimuth and elevation			
Clear Aperture Diameter ⁽¹⁾		193.5 mm	292.1 mm	393.7 mm	489.0 mm
Mechanical Drive System		Direct-Drive Brushless Servomotor			
Accuracy ⁽³⁾		±10 μrad (±2 arc sec)	±10 μrad (±2 arc sec)	±5 μrad (±1 arc sec)	±5 μrad (±1 arc sec)
Repeatability		±2.5 μrad (±0.5 arc sec)	±2.5 μrad (±0.5 arc sec)	±2.5 μrad (±0.5 arc sec)	±2.5 μrad (±0.5 arc sec)
Resolution		0.27 μrad (0.055 arc-sec)			
Feedback		Inductosyn (7 in diameter; 720 poles)		Inductosyn (12 in diameter; 720 poles)	
Maximum Rotary Speed ⁽²⁾		100 rpm	100 rpm	50 rpm	50 rpm
Maximum Load Parameters	Diameter	203.2 mm (8.0 in)	304.8 mm (12.0 in)	406.6 mm (16.0 in)	508.0 mm (20.0 in)
	Thickness	40.6 mm (1.5 in)	53.3 mm (2.1 in)	63.5 mm (2.5 in)	88.9 mm (3.5 in)
	Weight	20.0 kg (44 lb)	20.0 kg (44 lb)	50.0 kg (110.2 lb)	50.0 kg (110.2 lb)
Axis Wobble	Azimuth	14.6 μrad (3 arc sec; 0.00083°)			
	Elevation	24.3 μrad (5 arc sec; 0.0014°)			
Orthogonality		48.5 μrad (10 arc sec; 0.0028°); 12 μrad (2 arc sec; 0.0014°) optional			
AZ Motor Type		S-180-69-A	S-180-69-A	S-240-63-A	S-240-63-A
EL Motor Type		S-180-44-A	S-180-44-A	S-240-63-A	S-240-63-A
Mass		84 kg	91 kg	208 kg	234 kg
AZ Inertia		1.21 kg-m ²	2.07 kg-m ²	7.48 kg-m ²	11.71 kg-m ²
EL Inertia		0.033 kg-m ²	0.033 kg-m ²	0.24 kg-m ²	0.70 kg-m ²
Material		Steel AZ housing and yoke; Aluminum EL housing and mirror cell			
Standard Finish		Paint: Textured Epoxy (Polane-T), Pebble Grey Color			

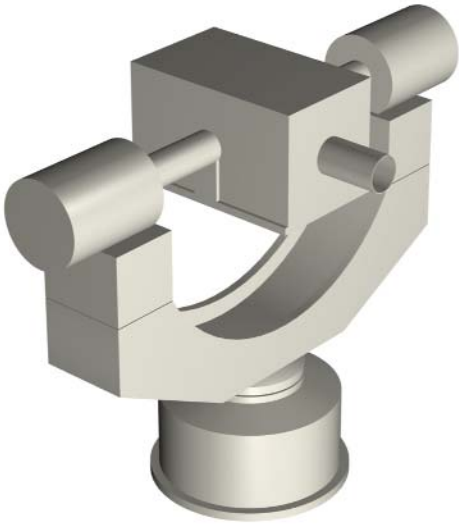
Notes:

1. Special cell adapters and slip ring assemblies available by special order.
2. Maximum speed based on stage capability. Maximum application velocity may be limited by system data rate and system resolution.
3. Requires Aerotech controls and axis calibration.



Custom systems including non-standard cells, fixturing, and mounting are readily available.

AOM 360D Series APPLICATION EXAMPLES



Video Tracking — Elevation over azimuth video tracking mount for missile testing.

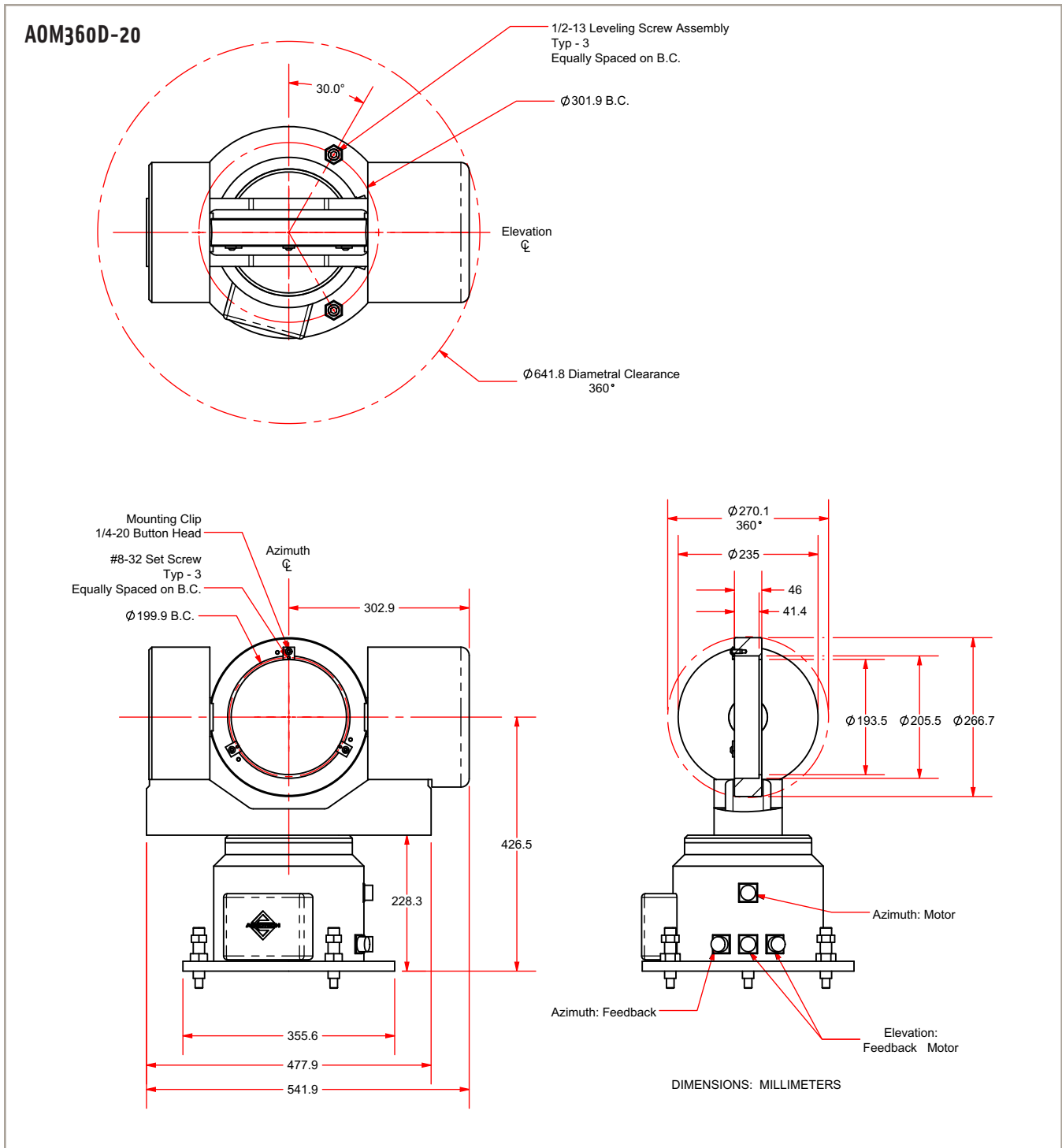


Telescope Positioning — Telescope alignment and tracking of celestial bodies.



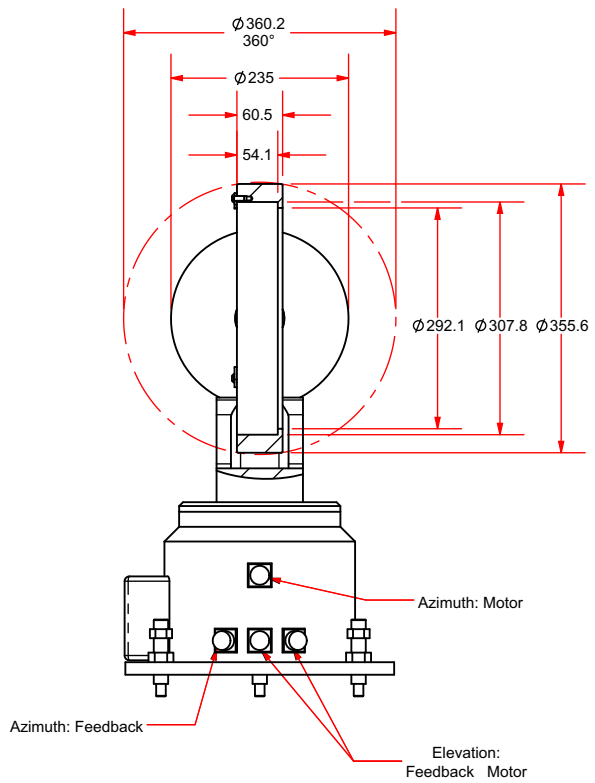
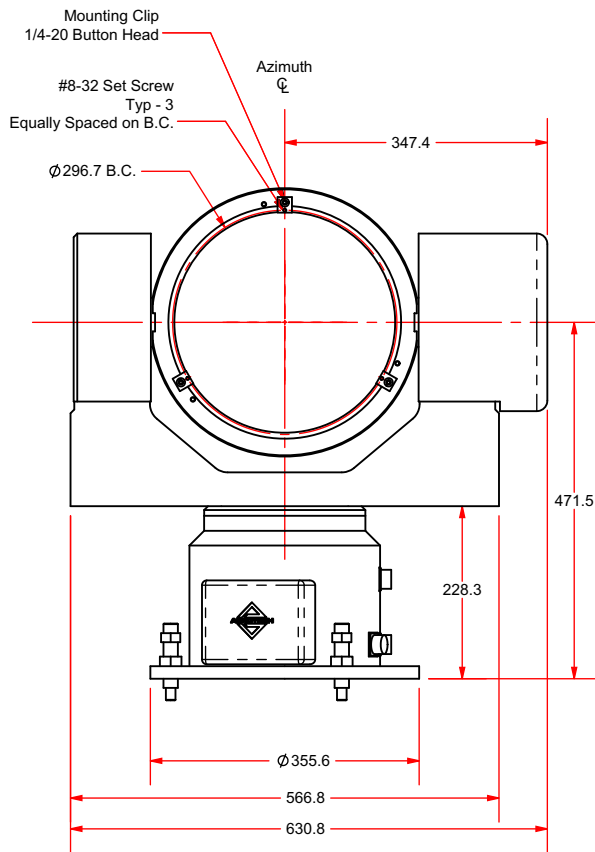
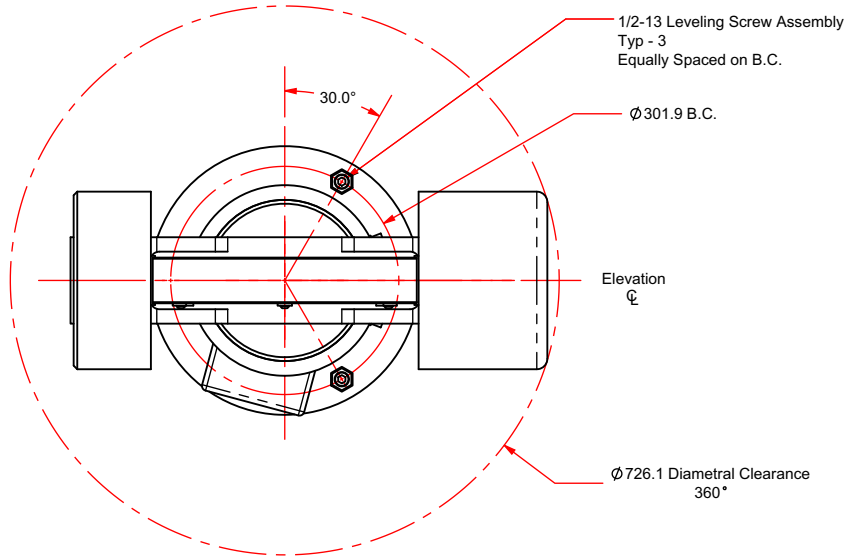
Laser Scanning, Aiming, or Tracking — CO2 laser scanning for atmospheric and environmental LIDAR measurements.

AOM360D Series DIMENSIONS



AOM360D Series DIMENSIONS

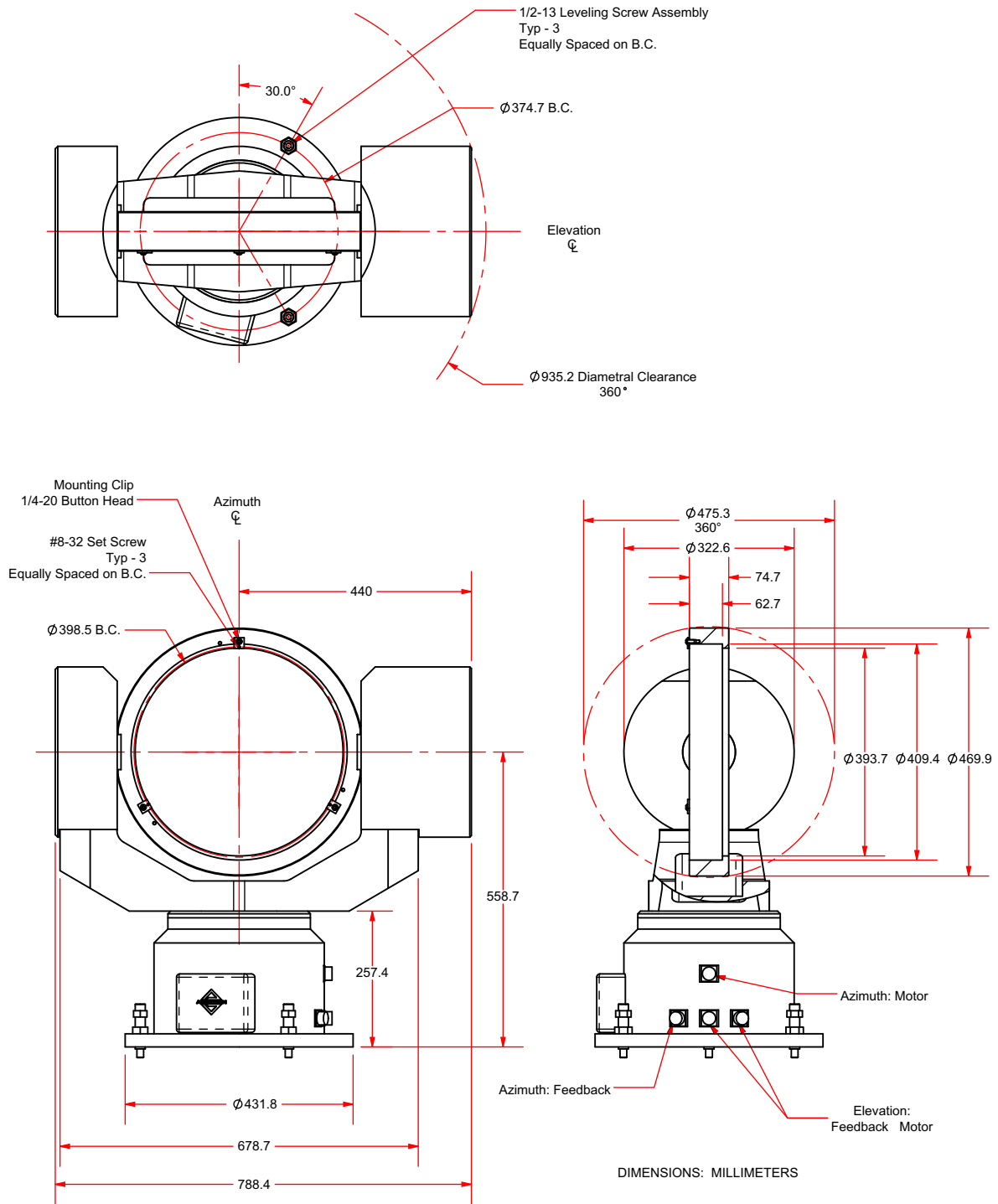
AOM360D-30



DIMENSIONS: MILLIMETERS

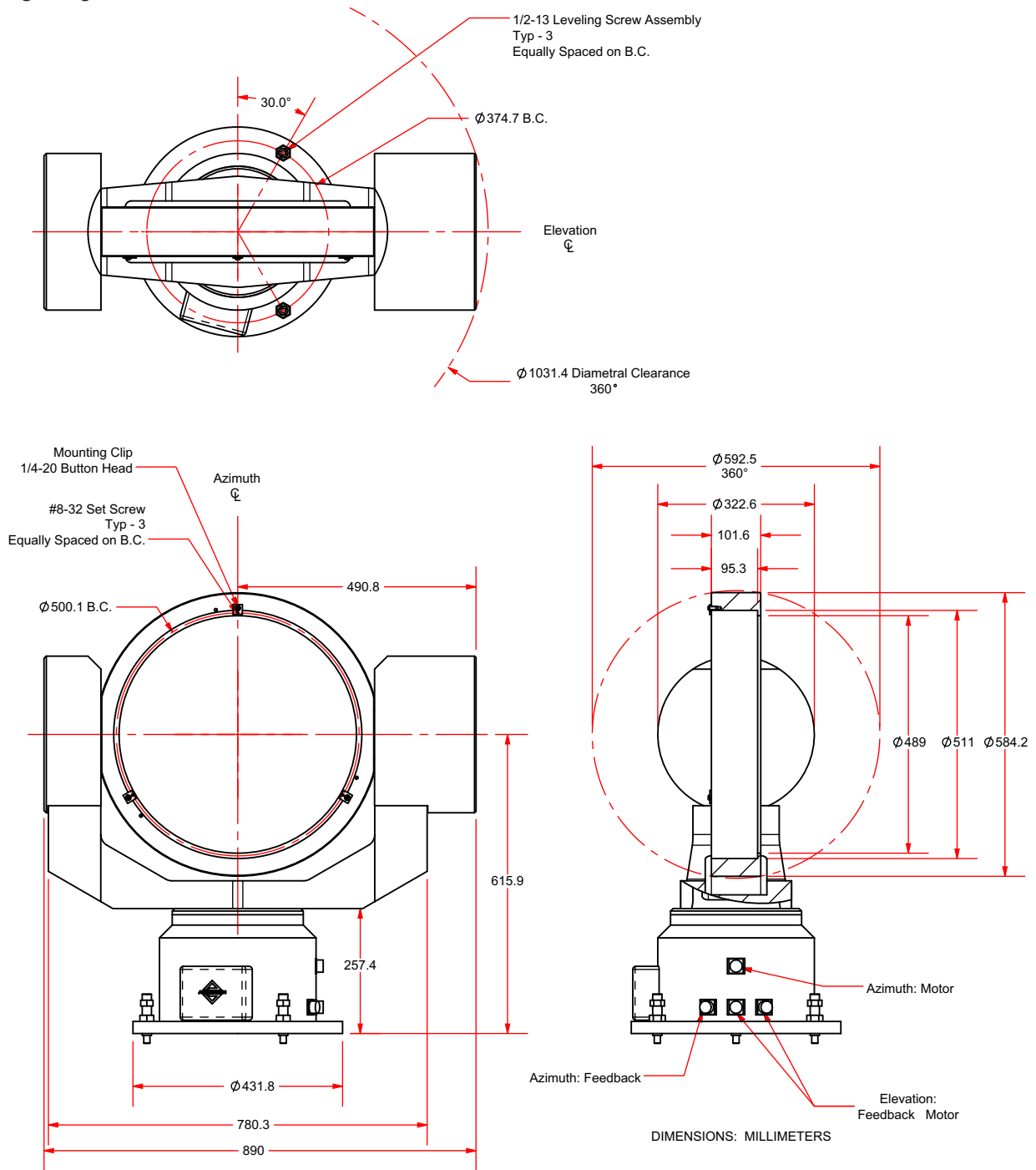
AOM360D Series DIMENSIONS

AOM360D-40



AOM360D Series DIMENSIONS

AOM360D-50



AOM360D Series ORDERING INFORMATION

Ordering Example

AOM360D	-20	(Opt.)/
	Cell Diameter	Stage & Assembly Options
	20	-VAC3
	30	-VAC6
	40	
	50	

AOM360D Series Optical Mount

AOM360D-20	AZ-EL, 360° continuous positioning mount for 200mm diameter (8 in) load. Includes direct drive, slotless motors and ND50 inductosyn for both axes.
AOM360D-30	AZ-EL, 360° continuous positioning mount for 300mm diameter (12 in) load. Includes direct drive, slotless motors and ND50 inductosyn for both axes.
AOM360D-40	AZ-EL, 360° continuous positioning mount for 400mm diameter (16 in) load. Includes direct drive, slotless motors and ND50 inductosyn for both axes.
AOM360D-50	AZ-EL, 360° continuous positioning mount for 500mm diameter (20 in) load. Includes direct drive, slotless motors and ND50 inductosyn for both axes.

Options

VAC3*	Vacuum preparation of stage to 10 ⁻³ torr.
VAC6*	Vacuum preparation of stage to 10 ⁻⁶ torr.

Note: See "Vacuum Preparation" in the stage application section.