AOM360D Series

Direct-Drive Gimbal

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 ±5 µrad (±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

<table>
<thead>
<tr>
<th>Basic Model</th>
<th>AOM360D-200</th>
<th>AOM360D-300</th>
<th>AOM360D-400</th>
<th>AOM360D-500</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Travel</strong></td>
<td>360° continuous, both azimuth and elevation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Clear Aperture Diameter</strong></td>
<td>193.5 mm</td>
<td>292.1 mm</td>
<td>393.7 mm</td>
<td>489.0 mm</td>
</tr>
<tr>
<td><strong>Mechanical Drive System</strong></td>
<td>Direct-Drive Brushless Servomotor</td>
<td></td>
<td></td>
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<tr>
<td><strong>Accuracy</strong></td>
<td>±10 μrad (±2 arc sec)</td>
<td>±10 μrad (±2 arc sec)</td>
<td>±5 μrad (±1 arc sec)</td>
<td>±5 μrad (±1 arc sec)</td>
</tr>
<tr>
<td><strong>Repeatability</strong></td>
<td>±2.5 μrad (±0.5 arc sec)</td>
<td>±2.5 μrad (±0.5 arc sec)</td>
<td>±2.5 μrad (±0.5 arc sec)</td>
<td>±2.5 μrad (±0.5 arc sec)</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>0.27 μrad (0.055 arc-sec)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Feedback</strong></td>
<td>Inductosyn (7 in diameter; 720 poles)</td>
<td>Inductosyn (12 in diameter; 720 poles)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum Rotary Speed</strong></td>
<td>100 rpm</td>
<td>100 rpm</td>
<td>50 rpm</td>
<td>50 rpm</td>
</tr>
<tr>
<td><strong>Maximum Load Parameters</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Diameter</strong></td>
<td>203.2 mm (8.0 in)</td>
<td>304.8 mm (12.0 in)</td>
<td>406.6 mm (16.0 in)</td>
<td>508.0 mm (20.0 in)</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>40.6 mm (1.5 in)</td>
<td>53.3 mm (2.1 in)</td>
<td>63.5 mm (2.5 in)</td>
<td>88.9 mm (3.5 in)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>20.0 kg (44 lb)</td>
<td>20.0 kg (44 lb)</td>
<td>50.0 kg (110.2 lb)</td>
<td>50.0 kg (110.2 lb)</td>
</tr>
<tr>
<td><strong>Axis Wobble</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Azimuth</strong></td>
<td>14.6 μrad (3 arc sec; 0.00083°)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Elevation</strong></td>
<td>24.3 μrad (5 arc sec; 0.0014°)</td>
<td></td>
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<tr>
<td><strong>Orthogonality</strong></td>
<td>48.5 μrad (10 arc sec; 0.0028°); 12 μrad (2 arc sec; 0.0014°) optional</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Mass</strong></td>
<td>84 kg</td>
<td>91 kg</td>
<td>208 kg</td>
<td>234 kg</td>
</tr>
<tr>
<td><strong>AZ Inertia</strong></td>
<td>1.62 kg-m²</td>
<td>2.5 kg-m²</td>
<td>9 kg-m²</td>
<td>12.53 kg-m²</td>
</tr>
<tr>
<td><strong>EL Inertia</strong></td>
<td>0.019 kg-m²</td>
<td>0.105 kg-m²</td>
<td>0.27 kg-m²</td>
<td>0.974 kg-m²</td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Steel AZ housing and yoke; Aluminum EL housing and mirror cell</td>
<td></td>
<td></td>
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<tr>
<td><strong>Standard Finish</strong></td>
<td>Paint; Textured Epoxy (Polane-T), Pebble Grey Color</td>
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</tbody>
</table>

**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-200

DIMENSIONS: MILLIMETERS

1/2-13 Leveling Screw Assembly
Typ - 3
Equally Spaced on B.C.

Φ301.9 B.C.

Φ641.8 Diametral Clearance
360*

Mounting Clip
1/4-20 Button Head

#8-32 Set Screw
Typ - 3
Equally Spaced on B.C.

Φ199.9 B.C.

Azimuth

Elevation

Azimuth: Motor

Azimuth: Feedback

Elevation: Feedback

Motor

DIMENSIONS: MILLIMETERS
AOM360D Series DIMENSIONS

AOM360D-300

DIMENSIONS: MILLIMETERS

1/2-13 Levelling Screw Assembly
Typ - 3
Equally Spaced on B.C.

Ø301.9 B.C.

30.0°

Elevation

Ø726.1 Diametral Clearance
360°

Mounting Clip
1/4-20 Button Head

Azimuth

#8-32 Set Screw
Typ - 3
Equally Spaced on B.C.

Ø296.7 B.C.

347.4

228.3

Azimuth: Motor

Azimuth: Feedback

Elevation: Feedback

Motor

DIMENSIONS: MILLIMETERS

Ø360.2

360°

Ø235

60.5

54.1

Ø292.1 Ø307.8 Ø355.6

Elevation:

Feedback

Motor

DIMENSIONS: MILLIMETERS

MCN REV. DESCRIPTION DATE APPROVED
eglaser MODEL BY:
MODEL FILENAME:
AOM360D-CAT
Aerotech AOM360D
PART CODE:
PART NAME:
DWG. NO. REV
SHEET 1 OF 1
DATE
ENG APPR. 04/08
RFIELD
NAME
CHECKED
RFIELD
DRAWN

04/08
04/08
04/08

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AOM360D Series DIMENSIONS

AOM360D-500

DIMENSIONS: MILLIMETERS

1/2-13 Leveling Screw Assembly Typ - 3 Equally Spaced on B.C.

Elevation

Azimuth

Mounting Clip 1/4-20 Button Head

#8-32 Set Screw Typ - 3 Equally Spaced on B.C.

500.1 B.C.

Azimuth

Feedback

Motor

Azimuth: Feedback

Elevation: Feedback Motor

Elevation:

Motor

Azimuth:

Feedback

DIMENSIONS: MILLIMETERS

562.5

360°

322.6

101.6

95.3

489

511

534.2

584.2

592.5

360°
**AOM360D Series ORDERING INFORMATION**

### Cell Size (Required)

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>-200</td>
<td>200 mm diameter cell</td>
</tr>
<tr>
<td>-300</td>
<td>300 mm diameter cell</td>
</tr>
<tr>
<td>-400</td>
<td>400 mm diameter cell</td>
</tr>
<tr>
<td>-500</td>
<td>500 mm diameter cell</td>
</tr>
</tbody>
</table>

### 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.