

AOM130M Series

Motorized Optical Mounts

Standard models 152.4 mm (6 inches) through 609.6 mm (24 inches) optic diameters

Exhibits excellent thermal stability of better than $2 \mu\text{rad}/^\circ\text{C}$

Precise positioning is assured by sub-arc second resolution capability

Choose from a selection of stepping and servo drive motors

Mounting holes are slotted to accommodate English or metric hole pattern

Can be supplied prepared for use in vacuum to 10^{-6} mbar

Custom precision mounting designs are available for centering non-circular payloads on the gimbal



The AOM130M series of gimbal mounts position optical components as large as 600 mm (24 inches) in diameter in both azimuth and elevation. The AOM130M mounts provide outstanding stability and sub-arc-second resolution for use in optics and laser experimentation in research or industrial laboratory settings.

Precision Bearings Assure Accuracy

The AOM130M's precision gimbal pivot ball bearings minimize backlash and reduce stiction. The mirror cell and azimuth bearing systems utilize high-quality preloaded angular contact bearings, which permit fully-loaded operation in any orientation, including upside-down.

Excellent Positioning Capability

The AOM130M mounts possess desirable positioning characteristics including: 0.75 arc sec unidirectional repeatability; negligible backlash; and hysteresis that is typically better than 5 arc sec.

The mechanical and thermal stabilities of the AOM130M series are excellent. The rigid castings employed help push resonant frequencies beyond 200 Hz, and thermal stability is better than $2 \mu\text{rad}/^\circ\text{C}$.

Highly Accurate Limits and Homing System

All AOM130M mounts are equipped with high accuracy limit switches. Combining the output of these switches and the motor's marker signal, Aerotech's motion controllers can position the AOM130M mounts to highly accurate home reference points, typically to within 0.001° .

Standard Sizes to 600 mm (24 in)

AOM130M series motor-driven gimbal mounts are available in six standard sizes that accommodate 152.4, 228.6, 304.8, 406.4, 508.0, and 609.6 mm (6, 9, 12, 16, 20 and 24 inch) diameter optical components.

In addition, adapters for 127.0, 203.2, and 254.0 mm (5, 8, and 10 inch) diameter optics are available as accessories,

AOM130M Series SPECIFICATIONS

providing mounting capability for virtually all standard optic elements between 127.0 and 609.6 mm (5 to 24 inches) in diameter.

Full 360° AZ and EL Positioning

High resolution positioning in the range of $\pm 4^\circ$ is achieved under motor control. Rotational freedom is further extended to a full 360 degrees by unclamping the mirror cell and/or azimuth assembly (a tool is included), and manually rotating each axis anywhere in a 360° range, and reclamping. Neither of the manual adjustments disturbs the precision motorized drive assembly.

Wide Range of Resolutions and Drive Choices

Depending upon the motor selected (microstepping or servo) and the controller resolution setting, resolution to 0.008 arc second is achievable with the AOM130M. Some commonly specified resolutions and corresponding mount resolutions are listed in the specifications table. For mount resolutions other than those listed in the specifications table, please contact us.

A home marker encoder and positioning knob are options for microstepping versions. The DC servomotor is equipped with a rotary encoder with marker-to-enable closed-loop positioning feedback.

Basic Model		AOM130M-6	AOM130M-9	AOM130M-12
Resolution ⁽¹⁾	at 4000 steps/rev	0.06 μ rad (0.013 arc sec)	0.04 μ rad (0.009 arc sec)	
	at 1000 steps/rev	0.24 μ rad (0.050 arc sec)	0.18 μ rad (0.037 arc sec)	
Clear Aperture		144.27 mm (5.68 in)	218.95 mm (8.62 in)	292.1 mm (11.50 in)
Range ⁽²⁾ (Mechanical)		360° AZ/EL		
Range (Motor-Driven)		$\pm 4^\circ$ AZ/EL		
Repeatability (Unidirectional)		3.64 μ rad (0.75 arc sec)		
Component Diameter (Max)		152.4 mm (6 in)	228.6 mm (9 in)	304.8 mm (12 in)
Component Thickness (Max)		26.92 mm (1.06 in)	41.4 mm (1.63 in)	53.85 mm (2.12 in)
Component Weight (Max)		4.4 kg (9.6 lb)	15 kg (33 lb)	35 kg (77 lb)
Maximum Slew Rate ⁽³⁾		8.3°/min	6.2°/min	
Mount Weight Using Brushless Motors		12.2 kg (26.8 lb)	20.2 kg (44.4 lb)	24.7 kg (54.4 lb)
Vacuum Capability (Optional)		10 ⁻³ or 10 ⁻⁶ mbar		
Material		Aluminum		
Finish		Black Epoxy Paint		

Notes:

1. Mount resolution depends upon controller resolution setting. Consult Controllers section for how to specify resolution.
2. Clamp screw release required for 360° rotational freedom.
3. Maximum motor speed is 600 rpm.

Basic Model		AOM130M-16	AOM130M-20	AOM130M-24
Resolution ⁽¹⁾	at 4000 steps/rev	0.04 μ rad (0.009 arc sec)	0.04 μ rad (0.009 arc sec)	
	at 1000 steps/rev	0.18 μ rad (0.037 arc sec)	0.16 μ rad (0.032 arc sec)	
Clear Aperture		393.7 mm (15.50 in)	488.95 mm (19.25 in)	590.55 mm (23.25 in)
Range ⁽²⁾ (Mechanical)		360° AZ/EL		
Range (Motor-Driven)		$\pm 4^\circ$ AZ/EL		
Repeatability (Unidirectional)		3.64 μ rad (0.75 arc sec)		
Component Diameter (Max)		406.4 mm (16 in)	508.0 mm (20 in)	609.6 mm (24 in)
Component Thickness (Max)		63.5 mm (2.5 in)	88.9 mm (3.5 in)	101.6 mm (4.0 in)
Component Weight (Max)		73 kg (161 lb)	114 kg (250 lb)	264 kg (580 lb)
Maximum Slew Rate ⁽³⁾		5.2°/min		
Mount Weight Using Brushless Motors		32.9 kg (72.4 lb)	67 kg (147.4 lb)	79.7 kg (175.4 lb)
Vacuum Capability (Optional)		10 ⁻³ or 10 ⁻⁶ mbar		
Material		Aluminum		
Finish		Black Epoxy Paint		

Notes:

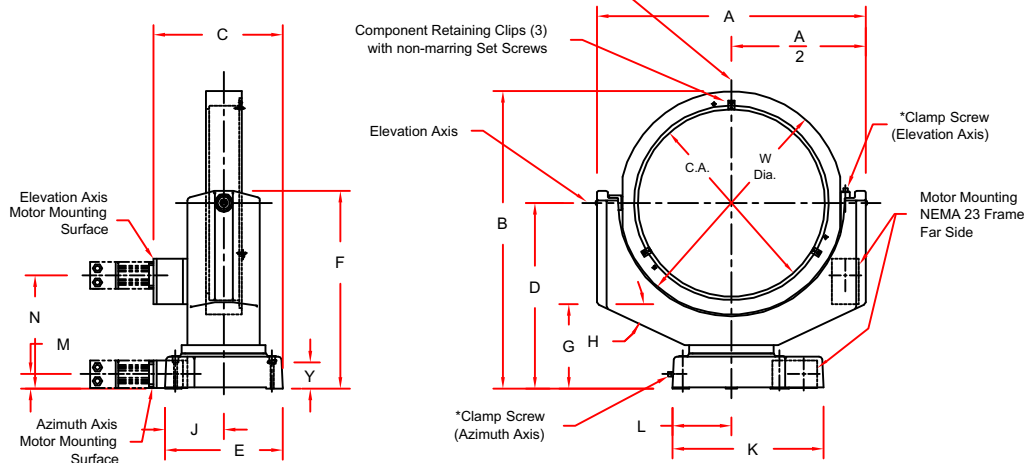
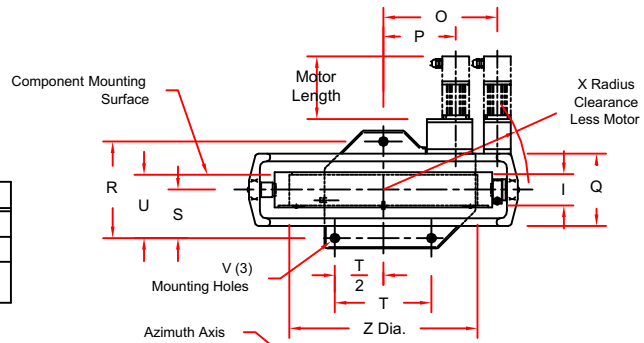
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AOM130M Series DIMENSIONS

Motor Options	Length
BMS(BMS60)	132.3 [5.21]
SM(50SMB2-HM)	84.3 [3.32]

*See motor section for alternate motors and more details.

* To Have 360° Rotational Freedom, Release Clamp Screw.



Dimensions - Millimeters [Inches]

Basic Model	A	B	C	D	E	F	G	H	I
AOM130M-6	269.7 [10.62]	294.4 [11.59]	262.9 [10.35]	206.3 [8.12]	209.6 [8.25]	231.7 [9.12]	63.5 [2.50]	No Angle	27.0 [1.06]
AOM130M-9	368.3 [14.50]	412.8 [16.25]	272.3 [10.72]	279.4 [11.00]	247.7 [9.75]	304.8 [12.00]	95.3 [3.75]	No Angle	41.4 [1.63]
AOM130M-12	457.2 [18.00]	500.1 [19.69]	272.3 [10.72]	322.3 [12.69]	247.7 [9.75]	347.7 [13.69]	106.4 [4.19]	5°	53.9 [2.12]
AOM130M-16	565.2 [22.25]	625.6 [24.63]	272.3 [10.72]	390.6 [15.38]	247.7 [9.75]	416.0 [16.38]	177.8 [7.00]	25°	63.5 [2.50]
AOM130M-20	704.9 [27.75]	787.4 [31.00]	386.5 [15.22]	495.3 [19.50]	340.0 [13.38]	530.3 [20.88]	231.6 [9.12]	30°	88.9 [3.50]
AOM130M-24	806.5 [31.75]	906.5 [35.69]	386.5 [15.22]	558.8 [22.00]	340.0 [13.38]	593.8 [23.38]	261.1 [10.28]	30°	101.6 [4.00]

Basic Model	J	K	L	M	N	O	P	Q	R
AOM130M-6	95.3 [3.75]	247.7 [9.75]	95.3 [3.75]	31.8 [1.25]	92.0 [3.62]	96.8 [3.81]	114.3 [4.50]	95.3 [3.75]	176.1 [6.94]
AOM130M-9	124.0 [4.88]	317.5 [12.50]	124.0 [4.88]	30.7 [1.21]	127.0 [5.00]	141.2 [5.56]	152.4 [6.00]	114.3 [4.50]	201.7 [7.94]
AOM130M-12	124.0 [4.88]	317.5 [12.50]	124.0 [4.88]	30.7 [1.21]	169.9 [6.69]	185.7 [7.31]	152.4 [6.00]	114.3 [4.50]	201.7 [7.94]
AOM130M-16	124.0 [4.88]	317.5 [12.50]	124.0 [4.88]	30.7 [1.21]	238.2 [9.38]	239.0 [9.41]	152.4 [6.00]	152.4 [6.00]	201.7 [7.94]
AOM130M-20	119.1 [4.69]	422.3 [16.63]	193.8 [7.63]	41.2 [1.62]	314.4 [12.38]	301.7 [11.88]	181.4 [7.14]	190.5 [7.50]	302.2 [11.9]
AOM130M-24	119.1 [4.69]	422.3 [16.63]	193.7 [7.63]	41.3 [1.62]	377.4 [14.86]	352.5 [13.88]	181.4 [7.14]	203.2 [8.00]	302.2 [11.9]

Basic Model	S	T	U	V	W	X	Y	Z	C.A.
AOM130M-6	75.6 [2.98]	151.1 [5.95]	87.1 [3.43]	9.5 [0.38]	176.3 [6.94]	198.9 [7.83]	47.6 [1.88]	153.9 [6.06]	144.3 [5.68]
AOM130M-9	100.8 [3.97]	201.7 [7.94]	119.9 [4.72]	9.5 [0.38]	266.7 [10.50]	228.6 [9.00]	54.0 [2.13]	230.9 [9.09]	218.9 [8.62]
AOM130M-12	100.8 [3.97]	201.7 [7.94]	125.2 [4.93]	9.5 [0.38]	355.6 [14.00]	286.5 [11.28]	54.0 [2.13]	307.9 [12.12]	292.1 [11.50]
AOM130M-16	100.8 [3.97]	201.7 [7.94]	132.6 [5.22]	9.5 [0.38]	469.9 [18.50]	306.1 [12.05]	54.0 [2.13]	409.5 [16.12]	393.7 [15.50]
AOM130M-20	100.7 [3.96]	352.8 [13.89]	146.1 [5.75]	14.3 [0.56]	584.2 [23.00]	369.1 [14.53]	74.6 [2.94]	571.1 [20.12]	489.0 [19.25]
AOM130M-24	100.7 [3.96]	352.8 [13.89]	152.4 [6.00]	14.3 [0.56]	695.5 [27.38]	415.0 [16.34]	74.6 [2.94]	612.7 [24.12]	590.6 [23.25]

AOM130M Series ORDERING INFORMATION

Ordering Example

AOM130-M	-9	-BMS	-NC	-9DU		
	Optic Diameter (in)	Motor Options	Limits	Limit Wiring	Options	Accessories
	-6	-NM	-NC	-9DU	-VAC3	AOM6T5
	-9	-BMS	-NO	-FLY	-VAC6	AOM9T8
	-12	-SM				AOM12T10
	-16					
	-20					
	-24					

Notes:

1. Servomotors require encoder (resolution) option.
2. Resolutions 11, 41 and 42 specify line driver-type encoders; option 42 includes Hall effect sensors.

AOM130M Series Optical Mount

AOM130M-6	Motorized gimbal mount for 6 in (152.4 mm) diameter optic
AOM130M-9	Motorized gimbal mount for 9 in (228.6 mm) diameter optic
AOM130M-12	Motorized gimbal mount for 12 in (304.8 mm) diameter optic
AOM130M-16	Motorized gimbal mount for 16 in (406.4 mm) diameter optic
AOM130M-20	Motorized gimbal mount for 20 in (508.0 mm) diameter optic
AOM130M-24	Motorized gimbal mount for 24 in (609.6 mm) diameter optic

Motor Options

-NM	No motor or encoder
-BMS	Two brushless servomotors with connectors and 1000-line encoder (BMS60-A-D25-E1000H); motor power and feedback cable required
-SM	Two stepping motors with connector and home marker pulse (50 SMB2-HM); motor power cable required

Limits

-NC	Normally closed
-NO	Normally open

Limit Wiring

-9DU	9-pin D (BMS standard, or NM)
-FLY	Flying leads (SM or NM)

Options

VAC3	Vacuum preparation for use to 10 ⁻³ mbar
VAC6	Vacuum preparation for use to 10 ⁻⁶ mbar

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

Accessories

AOM6T5	Adapter for 5 in (127.0 mm) diameter optic
AOM9T8	Adapter for 8 in (203.2 mm) diameter optic
AOM12T10	Adapter for 10 in (254.0 mm) diameter optic