

FEATURES

- High Optical Quality Continuous Surface
- Capable of Receiving Any High Reflectivity Coating
- Diameters: 1" – 8" (25mm-200mm)
- Customizable Mirror Substrate
- Circular and Elliptical Mirror Shapes
- Integrated Sensors
- All Digital Tunable Controller with Ethernet Interface
- Microradian Accuracy with Milliradian Stroke
- Compatible with AOS AO Controllers

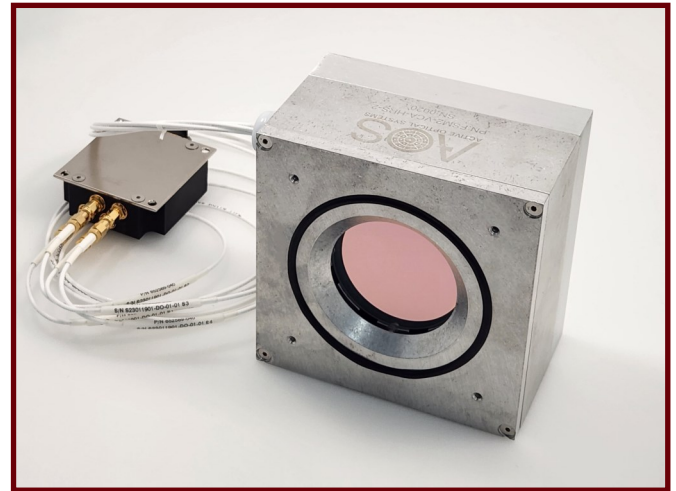
Elliptical VCA FSM

(No Package Option)



APPLICATIONS

- **Defense Systems:** Used in high-powered directed energy systems to stabilize the beam inside the beam control system and on target
- **Imaging Systems:** Used to stabilize information/images
- **Laser communications:** Can modulate light to carry information



DESCRIPTION

AOS primarily manufactures FSMs to address the laser pointing control market, although our FSMs can be employed in communication or image stabilization systems. Our FSMs can address a wide variety of tilt needs from atmosphere aberration compensation to mechanical jitter rejection.

AOS FSMs are scalable with 1"-8" diameter mirrors (25mm-200mm) and can be produced in circular or elliptical shapes to accommodate extreme angles of incidence and varied beam size. FSM mirror coatings are customizable and capable of receiving any high reflectivity coating. AOS FSMs are digitally controlled, eliminating the traditional drawbacks of analog adjustment. FSMs are available with or without exterior packaging, and in either anodized or uncoated finishes, to accommodate physical space or vacuum requirements.

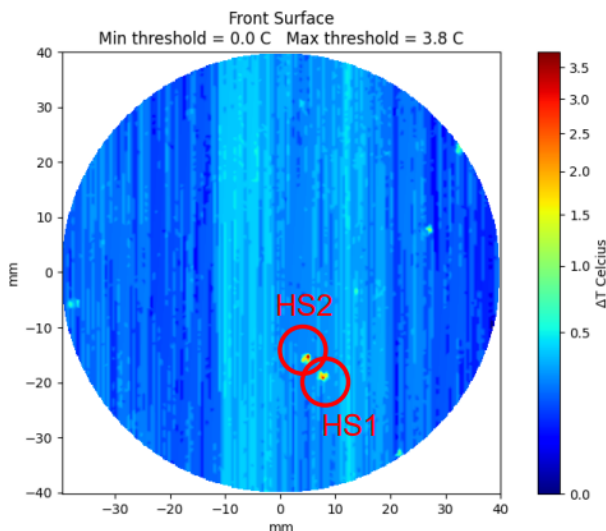
AOS produces FSMs in two distinct architectures contingent upon intended application. The VCA Production Line employs voice coils and features larger diameter mirrors and has been used effectively within HEL Directed Energy Systems. Due to their architecture, VCA FSMs allow for increased tilt. The PZT line is designed to address small size and high speed requirements.



SPECIFICATIONS

Parameter	Value	Units	Notes
Clear Aperture / Diameter	1" - 8"	in	25 - 200 mm
Coating Type	Any	-	Coated with the same coatings as the rest of the optics in the system
Substrate	Silicon, Glass (Fused Silica)	-	Can be Customized and/or Customer Provided
Mirror Shape	Circle, Ellipse	-	
Angular Stroke	5 - 34	mrad	(2" $\pm$ 34mrad; 3" $\pm$ 22mrad; 4" $\pm$ 17mrad;)
Angular Accuracy	<5	μ rad	
Bandwidth*	50-300	Hz	Adjustable through digital Ethernet interface
Angle of Incidence	0 - 45	degrees	Typically 10-degrees for High Power Coatings
Laser Power Handling	Tested up to 240kW and 1MW/cm2	-	120kW (20kW/cm2) for 5s resulted in <1oC heating
Thermal Stress Test	-50 - 90	° Celsius	No performance loss
Vacuum Bake	10	μ torr	Low Outgassing Materials

*Note: Specifications scale with aperture diameter and other design specifications



Laser damage testing directly on a completed AOS FSM. The FSM was 100% raster scanned over the full aperture at 100kW/cm2. The FSM successfully passed and demonstrated only two small hot spots with a temperature rise that peaked at 25C. Zero damage occurred to the FSM under test.