

MFC Series

High-Speed Adjustable Focus Mirrors

Features

Fast, precise focus control

Variable focal length: $\infty < f < 67\text{mm}$

2mm - 4mm diameter aperture
(other diameters by request)

Fast settling time $< 150\mu\text{s}$

Reflective metal coatings = no chromatic aberrations

Aberration correction capability

Applications

- Confocal microscopy
- 2-photon microscopy
- Machine vision
- Maskless lithography
- High speed imaging
- Laser focus control



A Complete Focus Control Solution

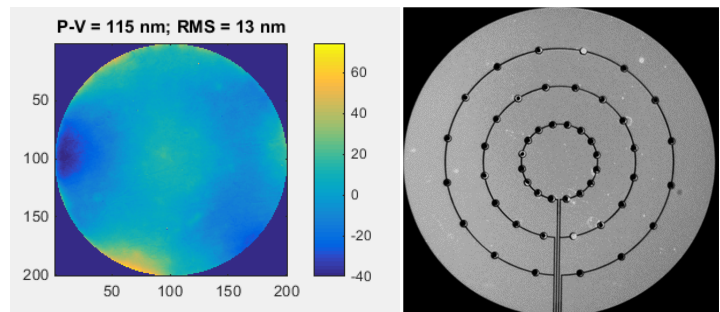
Our MFC Series variable focus mirrors are reflective optical elements with an electrically tunable radius of curvature. The technology uses an electrostatically actuated membrane mirror to provide rapid, repeatable focal length adjustment from infinity (flat) to less than 67mm.

Our 1" diameter prototype package mates easily with standard optic mounts for quick and easy setup. If a custom mounting option is preferred, our optomechanical design experience can help incorporate the MFC Series mirrors into any OEM design.

Control of the MFC Series mirrors is accomplished by the AHV400 amplifier. The user supplies an analog input signal (0-10V), and the AHV400 provides the high-voltage output required for mirror operation. For real-time aberration tuning the AHV400 can control up to 4 mirror zones with a standard 0-10V input signal per zone.

Spherical Aberration Correction in Real Time

Our variable focus mirror technology utilizes a series of concentric electrodes for actuation, allowing the surface shape of the mirror to be adjusted to correct aberrations. With settling times less than $100\mu\text{s}$ for aberration changes, spherical aberration control can be performed in real time.



Flatness map of Revibro Optic's deformable mirror for an unactuated device showing mirror flatness (left).

Concentric electrodes enable surface shape changes for aberration correction (right).

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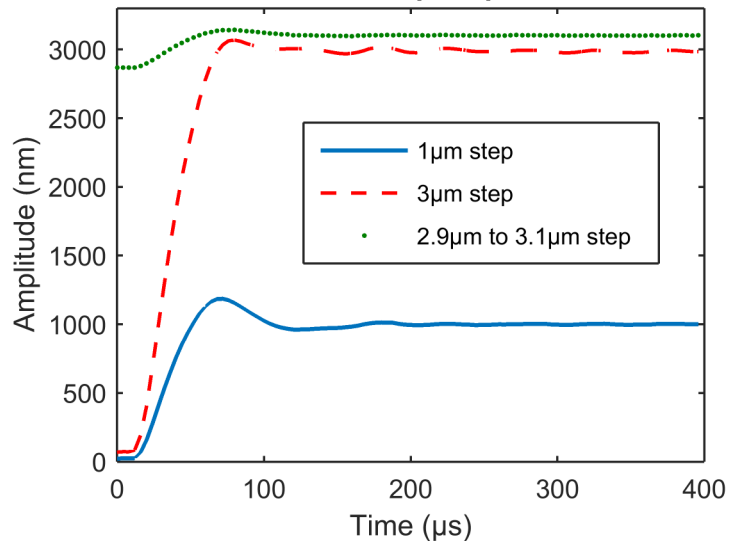
406-624-9068

Bozeman, MT 59717

Mirror Specifications

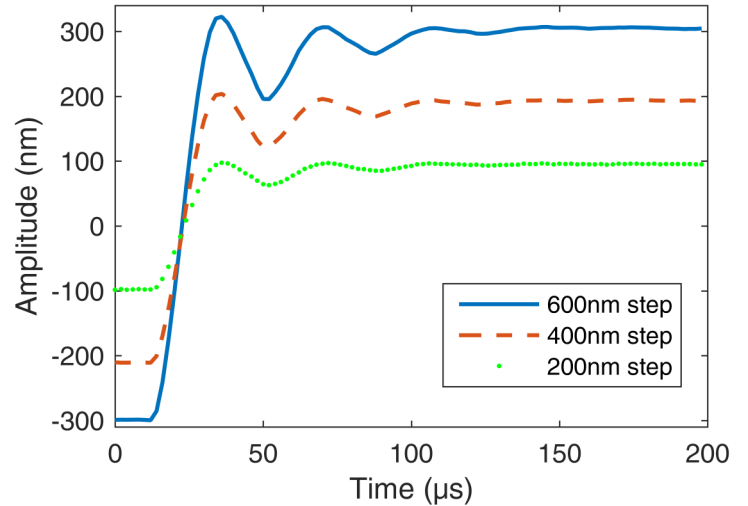
Mirror diameter	2 - 4 mm (others possible)
Maximum stroke	18 μm
Minimum focal length	<67 mm
Settling Time	<150 μs
Mirror flatness	<30nm RMS
Mirror material	Aluminum, Gold, Silver
Standard Housing dimensions (custom packaging available)	Diameter: 25.4 mm Length: 19 mm

Defocus step response



Primary spherical step response

$$\text{Zernike } 6r^2 - 6r^4 + 1$$



AHV 400 Amplifier Specifications

Interface	Analog input only
Input voltage	0-10 V
Output voltage	0-400 V
# Channels/mirror zones	1-4
Small signal bandwidth, no load	25 kHz
Full scale bandwidth, no load	2 kHz, slew rate limited
Slew rate, no load	2.75 V/ μs
Inputs	DSUB



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