

# VariFoc™ - Zoom

## Focuser/Defocuser for Lasers

A new, improved design is now available to adjust the spot size in two transverse directions independently, by changing the focal power



VariFOC™ is an optical system with independently adjustable focal lengths in two orthogonal directions, x (horizontal) and y (vertical), both transversal to the horizontal optical axis (z axis) of the laser beam. It is used to focus or defocus a laser beam, to compensate for the beam astigmatism, or to change the laser spot shape and size at a desired and adjustable distance from the laser exit aperture.

It consists of a stand-alone unit placed in proximity to the exit aperture of the laser. The unit is composed of two identical opto-mechanical systems, acting independently on x and y axes, the laser beam passing sequentially through each of them. Each system comprises a fixed base plate and a rotating drum with the openings for the beam entrance and exit. The adjustment of the focal length for each direction, x or y, is done by rotating the appropriate drum.

There is a neutral position of the drum, where no effect on the incoming beam is done; this position corresponds to a zero convergence, or infinite focal length of the corresponding optical system. By rotating the drum clockwise (counterclockwise) from this neutral position, a progressively higher convergence (divergence) is obtained. Any positive or negative focal length can be obtained, ranging between a minimum value (in absolute value) and infinity. The minimum obtainable focal length (corresponding to the maximum convergence) is specific for each model. The design is scalable to most laser wavelengths, power ranges, and operating regimes, from CW to picosecond pulses.

Pictures showing the same beam with different shapes and sizes using VariFoc-Zoom Optics.

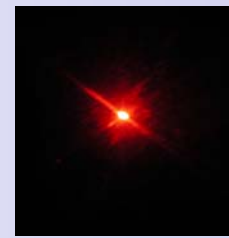
He-Ne Laser shown



Original Laser



Elongated in both axis

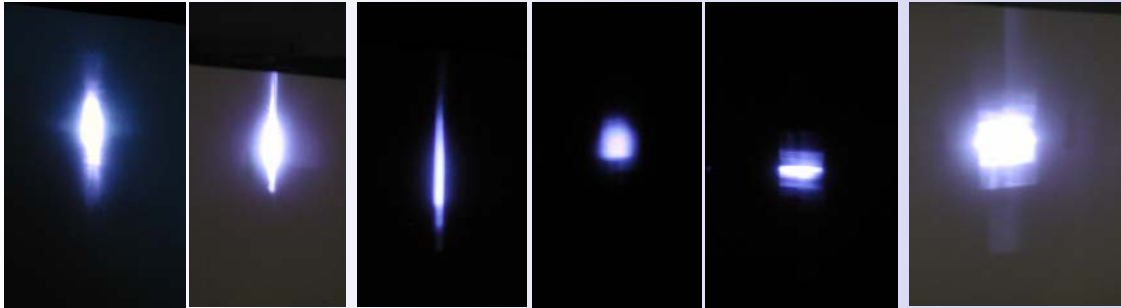


Focussed

3 feet away from the device

Pictures showing the same beam with different shapes and sizes using VariFoc-Zoom Optics.

308nm Excimer Laser shown



Original Laser

3 feet away from the device

### Technical characteristics

The following is a list of independent technical characteristics:

Minimum geometrical aperture<sup>a</sup>, GA (mm): 12; 15; 25.

Minimum (absolute value) focal length,  $|f_m|$  (mm): 100; 200; 300; 400.

Minimum working distance (from VariFoc<sup>TM</sup> exit), WD (mm):  $|f_m| - 25$ .

Maximum WD: any.

Nominal wavelengths available<sup>b</sup> for excimer lasers,  $\lambda$  (nm): 193; 248; 308; 351.

Other  $\lambda$  available<sup>c</sup> (nm): 266; 337; 355; 532; 1064;

wavelengths of diode lasers; visible range.

Nominal transmittance: Better than 93%.

Maximum size (L x W x H, mm): 200 x 100 x 150.

a - Recommended laser beam size: maximum 0.8 of the geometrical aperture.

b - Special order<sup>d</sup> for 157 nm.

c - Special order<sup>d</sup> for Yb, Ho, Er, CO, and CO<sub>2</sub> laser wavelengths.

d - Price at request for special orders.

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