

F-Theta Lenses

Standard lens catalog



F-Theta Lenses for galvo systems

- EFL 100 mm, 160 mm, 254 mm
- Accurate beam positioning
- Design wavelength 1064 nm and 532 nm

Opto5 F-Theta lenses are engineered to meet the more demanding requirements for the laser marking industry, offering a combination of the popular focal length range and mount selection with uniform beam quality over the engraving field and precise spot positioning. Lens design, optical glass selection, and coating are optimal for high-power Nd:YAG lasers.

M39 Mount Series

	F-THETA 1064 100/3E/M39	F-THETA 1064 160/2E/M39	F-THETA 1064 254/2E/M39
Nominal Focal Length [mm]	100	160	254
Focal Length [mm]	99.9	159.6	254.9
Design Wavelength [nm]	1064	1064	1064
Mount	M39x1	M39x1	M39x1
Flange Focal Distance ¹ [mm]	129.6	195.42	301.2
Scan Field [mm]	62×62	100×100	161×161
Overall Scan Angle [°]	+/- 25	+/- 25	+/- 25
Entrance Beam Diameter ² [mm]	8	8	8
1/e ² Spot Diameter [μm] ³	22.2	35.2	56.4
Mirror Distances m1/m1+m2 ⁴ [mm]	18.6/32.1	18.6/32.2	18.6/32.2
F-Theta Distortion	<0.1%	<1%	<1%
Total Transmittance ⁵	>96.0%	>97.0%	>97.0%
	F-THETA 532 100/3E/M39	F-THETA 532 160/3E/M39	F-THETA 532 254/3E/M39
Nominal Focal Length [mm]	100	160	254
Focal Length [mm]	101.0	159.7	255.0
Design Wavelength [nm]	532	532	532
Mount	M39x1	M39x1	M39x1
Flange Focal Distance ¹ [mm]	133.0	195.1	306.2
Scan Field [mm]	44×44	71×71	112×112
Overall Scan Angle [°]	+/- 17	+/- 17	+/- 17
Entrance Beam Diameter [mm]	8	8	8
1/e ² Spot Diameter [μm] ³	11.1	17.6	28.2
Mirror Distances m1/m1+m2 ⁴ [mm]	19.7/33.2	20.8/34.3	20.9/34.4
F-Theta Distortion	<0.05%	<0.5%	<0.8%
Total Transmittance ⁵	>96.0%	>96.0%	>96.0%

¹: From mechanical flange to focal plane.

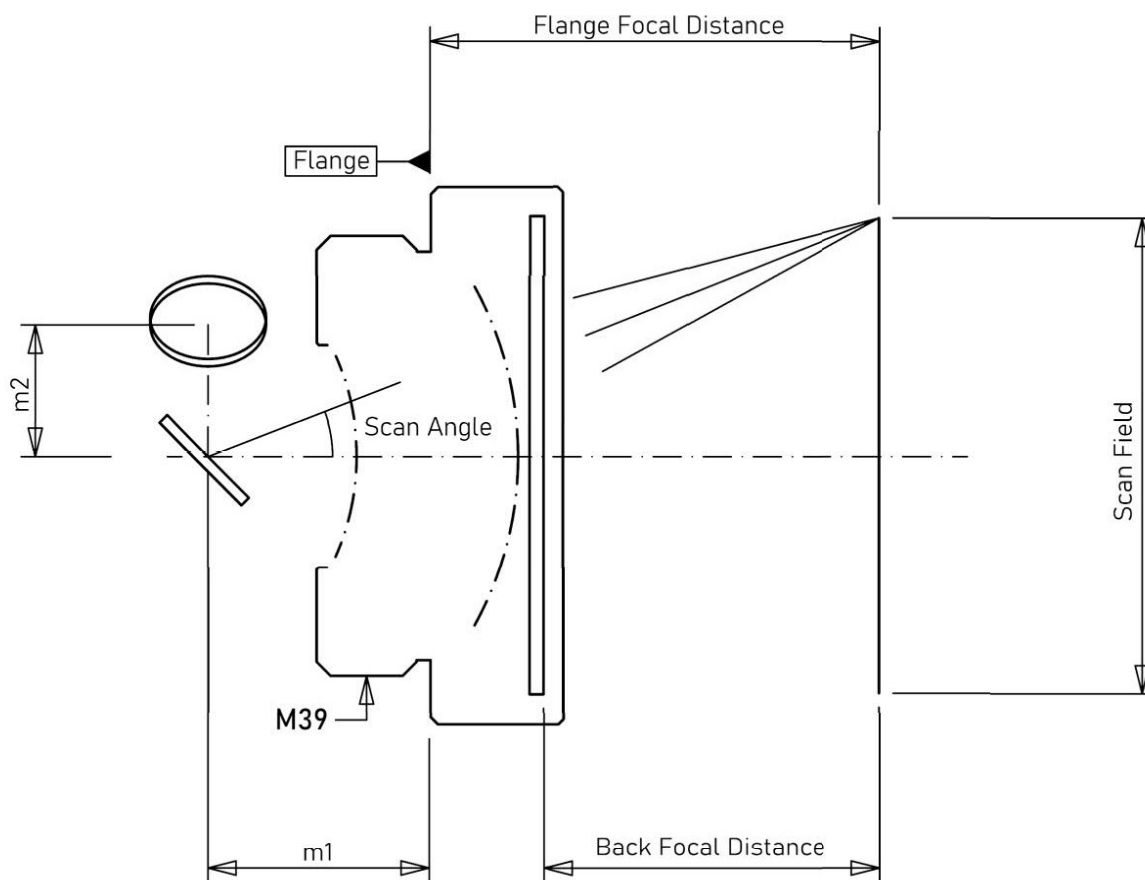
²: Maximum value for optimal performances

³: Value corresponding to uniform pupil illumination

⁴: Design distance between lens flange and mirrors central points, measured along optical axis, with nominal entrance beam diameter.

⁵: Protective glass included.

M39 Mount Series diagram



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M85 Mount Series

	F-THETA 1064 100/4E/M85	F-THETA 1064 160/3E/M85
Nominal Focal Length [mm]	100	160
Focal Length [mm]	100.0	160.8
Design Wavelength [nm]	1064	1064
Mount	M85x1	M85x1
Flange Focal Distance ¹ [mm]	106.6	185.0
Scan Field [mm]	72x72	102×102
Overall Scan Angle [°]	+/- 28	+/- 28
Entrance Beam Diameter ² [mm]	12	12
1/e ² Spot Diameter [μm] ³	15.2	23.4
Mirror Distances m1/m1+m2 ⁴ [mm]	49.0/65.0	51.2/67.2
F-Theta Distortion	<0.05%	<0.05%
Total Transmittance ⁵	>95.1%	>96.0%

¹: From mechanical flange to focal plane.

²: Maximum value for optimal performances

³: Value corresponding to uniform pupil illumination

⁴: Design distance between lens flange and mirrors central points, measured along optical axis, with nominal entrance beam diameter.

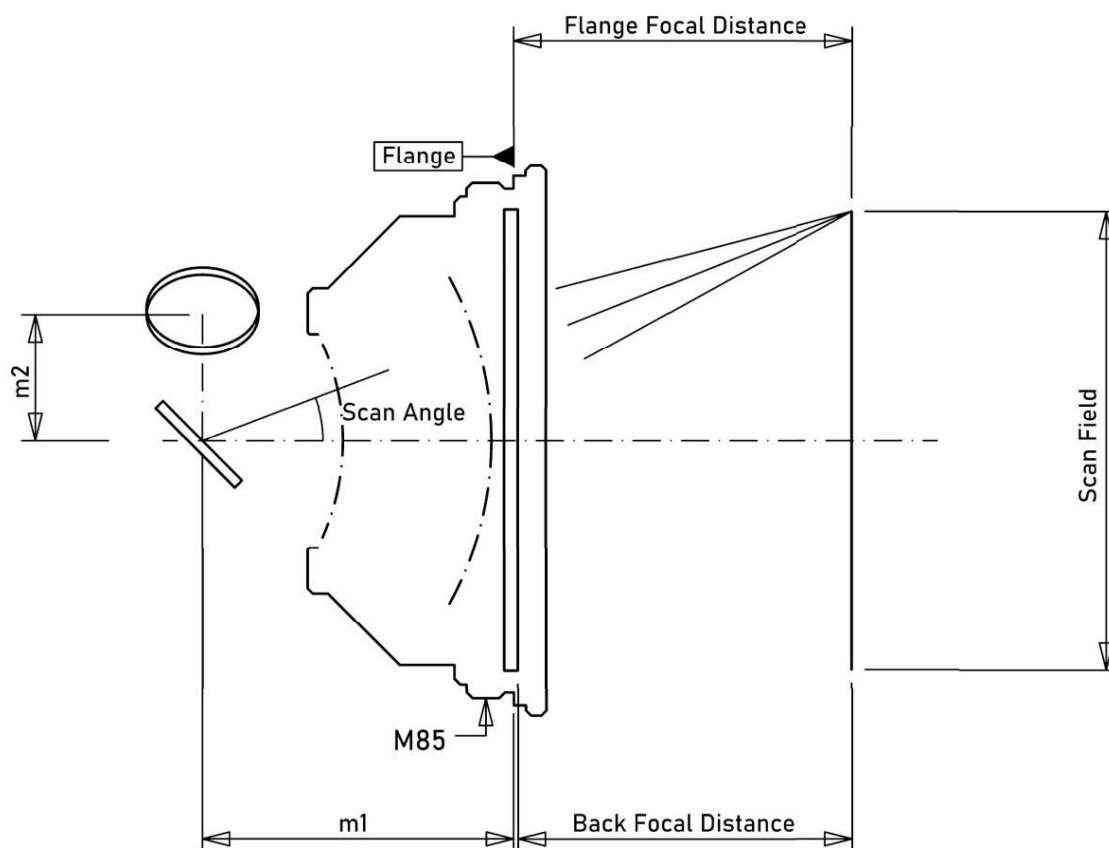
⁵: Protective glass included.

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M85 Mount Series diagram



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M85-M55 Mount Flat Field / Double Flange Series

- Scan Lenses with enhanced field flatness and double flange

	FF1064 100/3E/M85	FF1064 160/3E/M85	FF1064 254/3E/M85
Nominal Focal Length [mm]	100	160	254
Focal Length [mm]	100.1	160.3	253.6
Design Wavelength [nm]	1064	1064	1064
Mount	M85x1 M55x1	M85x1 M55x1	M85x1 M55x1
M85 Flange Focal Distance ¹ [mm]	125.3	187.7	277.4
M55 Flange Focal Distance ¹ [mm]	147.0	209.4	299.1
Scan Field [mm]	72x72	114x114	182x182
Overall Scan Angle [°]	+/- 28	+/- 28	+/-28
Entrance Beam Diameter ³ [mm]	12	12	12
1/e ² Spot Diameter [μm]	15.2	23.4	37.2
M85 Mirror Distances m1/m1+m2 ⁴ [mm]	39.2/53.2	39.2/53.2	39.2/53.2
M55 Mirror Distances m1/m1+m2 ⁴ [mm]	17.5/31.5	17.5/31.5	17.5/31.5
Field Curvature [mm]	< 0.12	<0.19	<0.30
Total Transmittance ⁵	>96%	>96%	>96%

¹: From mechanical flange to focal plane.

²: Maximum value for optimal performances

³: Value corresponding to uniform pupil illumination

⁴: Design distance between lens flange and mirrors central points, measured along optical axis, with nominal entrance beam diameter.

⁵: Protective glass included.

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M85-M55 Mount Flat Field / Double Flange Series diagram

