

Gaussian-to-TopHat generator g2T[®]

Wavelength: 355 / 532 / 1064 nm



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General Description:

| **Advanced Optical Solutions** |

This compact Gaussian-to-Top Hat converter (g2T[®]) is designed for Top Hat generation for single-mode lasers (TEM₀₀-Mode). The module has a solid industrial design.

The g2T[®] converter is designed for 355 nm, 532 nm and 1064 nm. The g2T[®]-lenses are pre-aligned and compactly mounted with a focusing lens.

g2T [®] Overview - Modules	Unit	Field Size ¹ (Top Hat) ²	Working Distance WD ¹	Depth of Focus ³ DOF	Input Beam
					Diameter ⁴ (FW1/e ²)
IOS000271	mm	1.0 x 1.0	92	± 0.4	4 ± 0.1
IOS000274	mm	5.0 x 5.0	490	± 6	4 ± 0.1

¹ Tolerance of field size and working distance: ± 10%. Working distance means the distance measured from the end of the mechanical housing to where the beam has the desired shape.

² The top hat region is defined as the total field size where the uniformity specification is fulfilled.

³ The depth of focus is defined as the range in which the uniformity specification is satisfied.

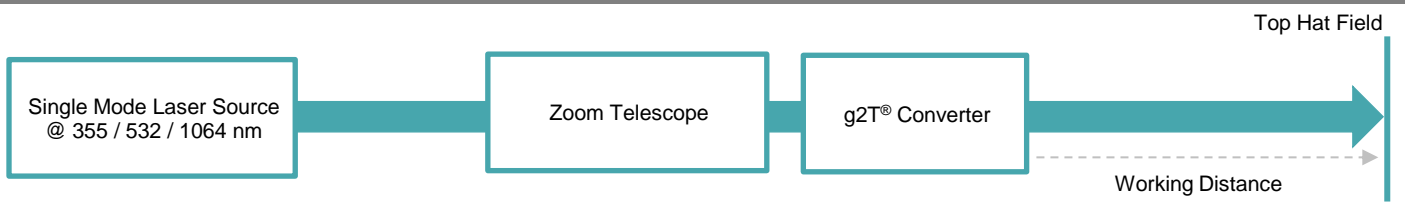
⁴ The optimum input beam diameter has to be adjusted in the range of 4 ± 0.1 mm for the best top hat profile. During operation it has to be kept stable within a tolerance of ± 0.07 mm for best performance.

All data are measured @ 532 nm.

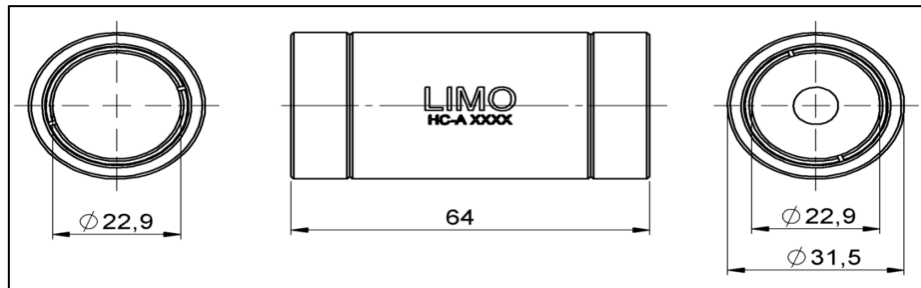
Specification Data	Unit	Value
Application wavelength	nm	355 / 532 / 1064
Input beam divergence (FW1/e ²)	mrad	≤ 1
Input beam quality		M ² < 1.4
Beam profile of laser source	%	> 95 (of Energy with Gaussian distribution)
Beam pointing	mm	< ± 0.07
Clear Aperture	mm	8
Non-Uniformity (I _{max} -I _{min})/(I _{max} +I _{min}) ⁵	%	< 10
Transmission @ 355 nm	%	> 86 (> 90 typically)
Transmission @ 532 nm	%	> 94
Transmission @ 1064 nm	%	> 94
Damage threshold	J/cm ²	> 5 @ 355 nm for 10 ns pulses, 1 Hz / suitable for picoseconds
	J/cm ²	> 10 @ 532 nm for 10 ns pulses, 1 Hz / suitable for picoseconds
	J/cm ²	> 10 @ 1064 nm for 10 ns pulses, 1 Hz / suitable for picoseconds
Dimensions of the g2T [®] -module	mm	Ø 31.5 x 64

⁵ I_{max} and I_{min} denote the maximum and minimum intensity in the homogenized field, respectively. The homogeneity is evaluated integrated across the other axis with a resolution of 6.7 μm. The homogeneity depends on the laser beam quality. Best performance is achieved with a pure Gaussian input beam profile TEM₀₀. For such beam quality the non-uniformity of the generated top hat profile is < 10%. Larger inhomogeneities may occur due to deviations from a pure Gaussian input beam and laser beam instabilities.

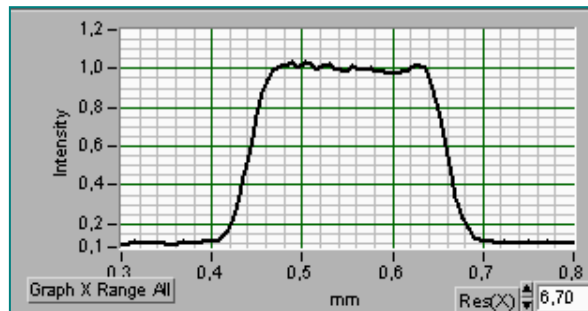
Beam Path Concept



Dimensions of the g2T[®]-Converter



Typical beam profile



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