

foXXus-troika

lossless beam shaping for multi-kW lasers
by focusing in multiple foci



Applications:

- Welding
- LPBF
- Cutting

Features:

- High transmission
- Lossless multi-focal energy distribution
- Variable energy portions in foci
- CA 30 mm
- TEM₀₀ and multimode lasers
- Multi kW lasers
- Free of thermal focus shift
- Location between the Collimator and the Lens
- Operation with scanning optics with F- Θ lenses

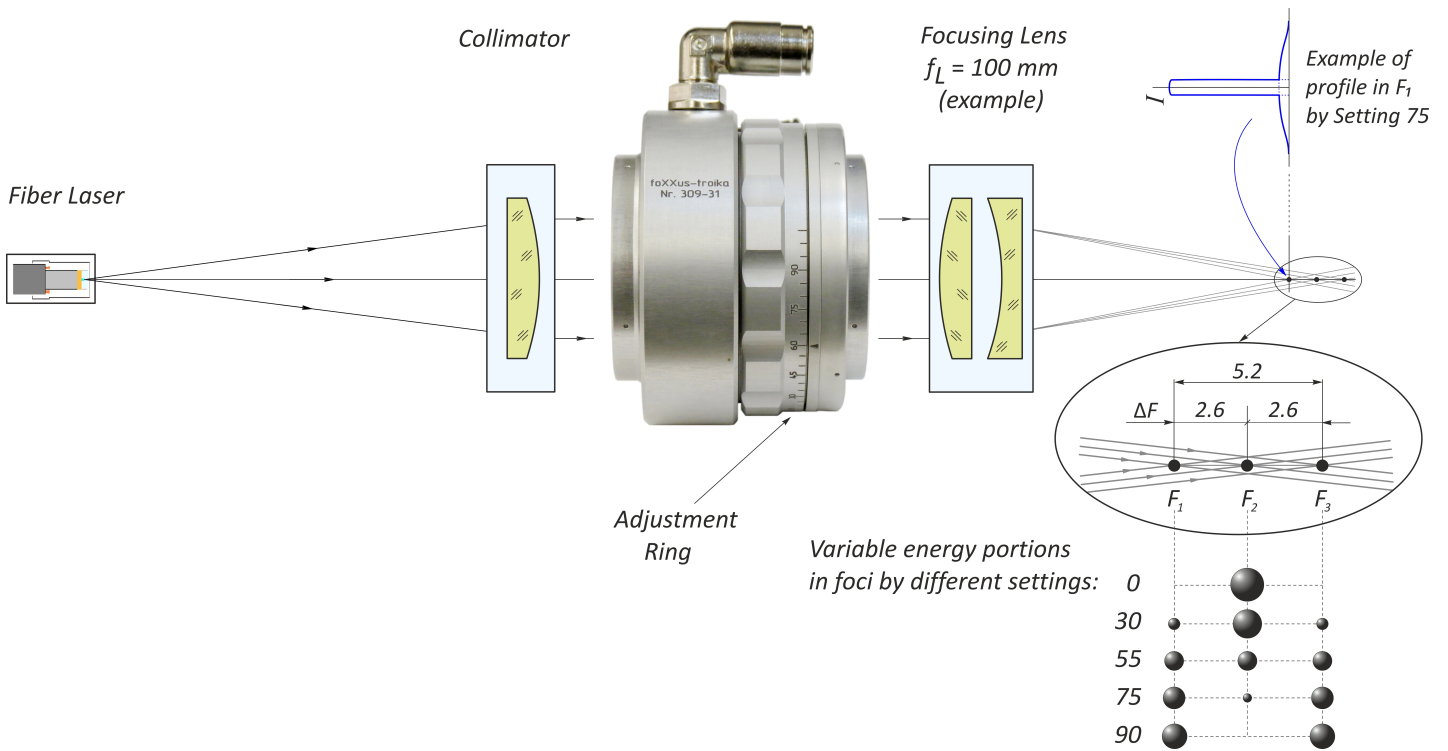


Specifications

Description	Afocal multi-focal optics: <ul style="list-style-type: none"> - providing 3 separate foci along the optical axis near focus of the focusing lens, - to be located between the collimator and the focusing lens - distances between foci depend on focal length of the focusing lens, - variable balance of energy portions in foci, - theoretically lossless beam shaping 					
Number of foci	3					
ΔF , mm	f' , mm (lens)	100	150	200	250	345
3 foci layout	ΔF , mm	2.6 - 2.6	5.8 - 5.8	10.4 - 10.4	16.3 - 16.3	31.1 - 31.1
Input	Collimated beam, divergence within ± 5 mrad					
Clear Aperture	30 mm					
Laser	<ul style="list-style-type: none"> - TEM₀₀ (single mode) and multimode, any M² - CW or pulsed - Recommended maximum average power 6 kW - Fluence up to 50 mJ/cm² by 5 ns pulses 					
Spectral band	1020 – 1100 nm, other wavelengths on request					
Transmission @ 1070 nm	>98%					
Angular field of view	$\pm 1^\circ$					
Adjustment Ring	Used to vary balance of energy portions in foci					
Working Distance	focal plane of the focusing lens, for example F- Θ lens					
Mounting	Internal threads M47x0.75 at entrance and exit					
Water cooling	by 6-1/8 fittings					
Diameter	71 mm					
Length	56 mm					
Weight	0.45 kg					

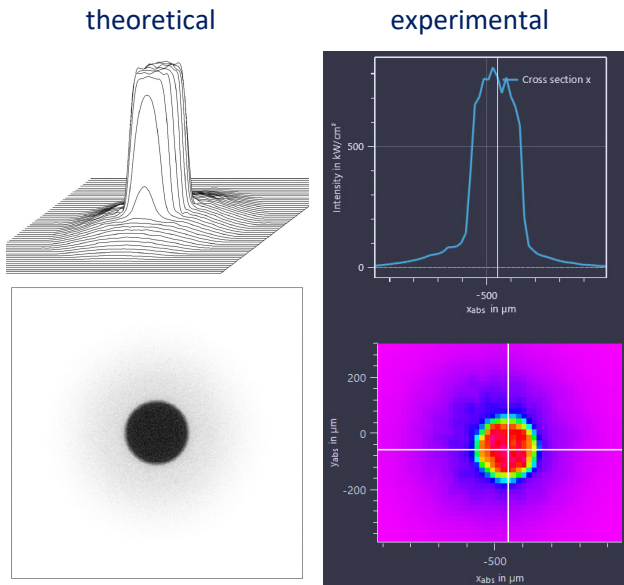
Beam Shaping of multi-kW lasers never was so easy !

Optical System with foXXus-troika



Example:

Combined profiles in F_1 by setting 75



Assembled process head with foXXus-troika mounted between the collimator Korund and the Focusing Lens



High intensity image of the Fiber End of $\varnothing 200 \mu\text{m}$ in the focal plane F_1 is surrounded by the lower intensity defocused spots corresponding to the focal planes F_2 and F_3 .

The same combined profile is achieved also in the focal plane F_3 .

(Courtesy of the Luleå University of Technology)