

3-AXIS LASER BEAM SUBSYSTEMS

FOCUSSHIFTER



Flexible Deep Processing with Smallest Spot Diameter

- Variable, easy to adjust focus range in Z direction
- Modular and compact design for easy integration
- Robust and dust proof (CE) for industrial conditions
- Customized solutions
- Outstanding price/performance ratio

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FOCUSHIFTER



● DESIGN

The FOCUSHIFTER subsystems set new standards. They provide tiny spot diameters with flexible focusing range in Z direction, high scanning speeds, long-term stability and low drift values to meet superior quality standards. This combination enables new applications and reduced system costs.

The modular, compact, robust and pre-aligned design (CE) makes integration easy.

RAYLASE products combine optimised optics, precision tolerance mechanics, superior electronics and galvanometer scanners.

● **FIELD SIZES** Subsystems for Nd:YAG and CO₂ lasers are designed for field sizes from 100 mm x 100 mm to 300 mm x 300 mm. The field sizes are determined by the f-theta objective type. Field sizes for subsystems of other wavelengths upon request.

● GENERAL SPECIFICATIONS

Power Supply	Voltage	±15 to ±18 V
	Current	7.5 A, RMS, max. 10 A
	Noise	≤ 0.5 % DC to 30 MHz
Ambient Temperature	+15 to +35 °C	

● QUALITY

Maintaining high product quality standards is a priority at RAYLASE. Subsystems are shipped to customers only after passing extensive tests.

● OPTICS

Objectives and mirrors are available for Nd:YAG and CO₂ laser types.

● INTERFACES

The subsystems are electrically and mechanically compatible with the XY2-100 standard. They can be controlled via high-speed data link, with a suitable control card, or by using an analogue current or voltage interface.

● TYPICAL APPLICATIONS

Deep engraving, deep processing of materials and creating 3D images in glass blocks.

Storage Temperature	-10 to +60 °C	
Humidity	≤ 80 % non condensing	
Interface Signals	Analog	±5 V, ±10 V, 0-10 V, ±20 mA, 0-40 mA
	Digital	XY2-100 Protocol

● SPECIFICATIONS FOR LINEAR TRANSLATOR MODULES

Laser	Nd:YAG	Nd:YAG doubled	Nd:YAG Tripled	CO ₂	
Input Aperture (mm)	5.0	5.0	5.0	10.0	10.0
Beam Expansion Factor	3.0	3.0	2.0	1.5	2.0
Focus Range in Z-Direction (mm)	± 15.0 ⁽¹⁾	± 15.0 ⁽¹⁾	± 25.0 ⁽¹⁾	± 10.0 ⁽²⁾	± 15.0 ⁽²⁾
Weight (kg)	approx. 7.5	approx. 7.5	approx. 7.5	approx. 7.5	approx. 7.5

(1) With F-Theta objective f = 160 mm. (2) With F-Theta objective f = 250 mm.

● SPECIFICATIONS FOR ASSOCIATED DEFLECTION UNITS

	TURBOSCAN-15	SUPERSCAN-15	SUPERSCAN-20
Mechanical Data:			
Input Aperture (mm)	15.0	15.0	20.0
Beam Displacement (mm)	16.4	16.4	26.0
Max. Immersion Depth for Objectives (mm) ⁽¹⁾	17.5	17.5	12.5
Weight (kg) (without objective)	approx. 2.9	approx. 2.9	approx. 3.6
Dynamic Data:			
Typical Deflection (rad)	±0.393	±0.393	±0.393
Repeatability (μrad)	20	20	20
Max. Gaindrift (%/K) ⁽²⁾	0.007	0.005	0.005
Max. Offsetdrift (μrad/K) ⁽²⁾	35	30	30
Long-term Drift over 8 hours (μrad) ^(2,3)	< 400	< 300	< 300
Acceleration Time (ms) (10-90%)	0.50	0.32	0.60

(1) From bearing surface of lens ring, incl. 1 mm safety clearance. (2) Drift per axis. (3) After warming-up, variations of ambient temperature < 1K.

● SPECIFICATIONS FOR OPTICS

	Nd:YAG	Nd:YAG doubled	Nd:YAG Tripled	CO ₂
Wavelength (nm)	1,064	532	355	10,600
Coating	AR Coating	AR Coating	AR Coating	AR Coating
Max. Laser Power, cw (W/cm ²)	500	500	500	500

● SPECIFICATIONS FOR F-THETA LENSES

	Nd:YAG	Nd:YAG doubled	Nd:YAG Tripled	CO ₂
Wavelength (nm)	1,064	532	355	10,600
Objective (mm)	f = 160	f = 160	f = 160	f = 250
Typical Field Size (mm x mm)	95 x 95	95 x 95	95 x 95	150 x 150
Spotdiameter 1/e ² , TEM00				
Aperture 15 mm / 20 mm (μm)	30 / -	15 / -	10 / -	270 / 220
Working Distance (mm)	209 +/- Focus Range	208 +/- Focus Range	248 +/- Focus Range	193 +/- Focus Range

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