AXIALSCAN-20/-30

PRE-FOCUSING-UNIT

FOR CHALLENGING INDUSTRIAL APPLICATIONS

- For wide working fields with small spot size and 3D-applications
- For laser power of up to 4 kW
- High speed Z-axis with double motor option
- Available options: Motorized, high power, high speed
- Variable field sizes (mm x mm): 100 x 100 up to 1,800 x 1,800

FLEXIBLE WIDE FIELD PROCESSING WITH SMALLEST SPOT

YOUR BENEFITS

The AXIALSCAN deflection units offer very small spot diameters at large field sizes, flexibility, high scanning speeds, long term stability and low drift values for superior quality standards. This combination results in high power density in the spot, enabling new applications and reduced system costs. Deflection units are designed for field sizes from 100 mm x 100 mm up to 1,800 mm x 1,800 mm.

INNOVATION AND QUALITY

Innovation and maintaining high product quality standards are our priorities at RAYLASE. All our products are developed, built and tested in our own laboratories and production facilities. Through our world-wide support network we can offer best maintenance and rapid service for our customers.

MIRRORS AND OBJECTIVES

Scan mirrors and objectives with optimized mounts are available for all typical laser types.

OPTIONS

AXIALSCAN Motorized: This option of the AXIALSCAN enables motorized adjustment of the operating field steered by the stepper motor interface

AXIALSCAN-HP – High Power: with optimized Nd: YAG and CO_2 optics for up to 4 kW

AXIALSCAN-HS – High Speed: with double motor driven Z-axis and extremely light and stiff high performance mirrors

INTERFACES

The deflection units are compatible to the XY2-100 standard. They can be digitally controlled by a control card, such as the SP-ICE-1 PCIe PRO or SP-ICE-3.

TYPICAL APPLICATIONS

Material processing such as scribing, cutting, perforating, welding, drilling, micro machining, processing-on-the-fly, 3D-applications, additive manufacturing.

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GENERAL SPECIFICATIONS

Power supply	Voltage	± 15 V to ± 18 V
	Current	7.5 A, RMS, max. 10 A
	Ripple/ Noise	Max. 200 mVpp, @ 20 MHz bandwidth
Interface signals	Digital	XY2-100 protocol

Ambient temperature	+15°C to +35°C
Storage temperature	-10°C to +60°C
Humidity	≤ 80 % non-condensing
Weight	approx. 12.0 kg to 16.5 kg
Max. input aperture	15 mm / 20 mm (high power)
Acceleration time LTM	2.5 ms to 3.0 ms

CONFIGURATION EXAMPLES FOR CO_2 (λ = 10,600 NM) AXIALSCAN-20-C AND AXIALSCAN-30-C/BO

Field size [mm x mm]	100 x 100	250 x 250	500 x 500	750 x 750	1,000 x 1,000	1,250 x 1,250	1,500 x 1,500
Spot diameter 1/e² [µm] [1]							
AXIALSCAN-20-C BO100 / BO250	172 / -	312 / 337	737 / 600	- / 900	- / 1,200	- / 1,500	- / 1,800
AXIALSCAN-30-C/BO BO100 / BO250	108 / -	214 / 237	452 / 471	- / 706	- / 941	- / 1,176	- / 1,411
Working distance [mm] [2]							
AXIALSCAN-20-C	79	301	573	883	1,192	1,502	1,811
AXIALSCAN-30-C/BO	74	259	569	878	1,188	1,497	1,806
Resolution [µm]	< 4	< 8	< 16	< 24	< 32	< 40	< 48

CONFIGURATION EXAMPLES FOR ND:YAG (λ = 1.064 NM) AXIALSCAN-20-Y AND AXIALSCAN-30-Y

Field size [mm x mm]	200 x 200	400 x 400	600 x 600	800 x 800	1,000 x 1,000	1,200 x 1,200
Spot diameter 1/e² [µm] [1]						
AXIALSCAN-20-Y	34	66	99	126	160	194
AXIALSCAN-30-Y	-	40	60	79	98	117
Working distance [mm] [2]						
AXIALSCAN-20-Y	202	450	697	945	1,192	1,440
AXIALSCAN-30-Y	-	445	693	940	1,188	1,435
Resolution [µm]	< 7	< 13	< 19	< 25	< 31	< 37

CONFIGURATION EXAMPLES FOR ND:YAG DOUBLED (λ = 532 NM) AXIALSCAN-20-DY WITH LTM-15 DY [200] V2

Field size [mm x mm]	200 x 200	500 x 500	800 x 800	1,000 x 1,000	1,200 x 1,200
Spot diameter 1/e² [µm] [1]	18	40	64	80	96
Working distance [mm] [2]	229	573	945	1,192	1,440
Resolution [µm]	< 7	< 17	< 26	< 35	< 42

CONFIGURATION EXAMPLES FOR ND:YAG TRIPLED (λ = 355 NM) AXIALSCAN-20-TY WITH LTM-15 TY [200] V2 D2

Field size [mm x mm]	200 x 200	500 x 500	700 x 700	1,000 x 1,000	1,200 x 1,200
Spot diameter 1/e² [µm] [1]	12	27	37	53	63
Working distance [mm] [2]	202	573	821	1,193	1,440
Resolution [µm]	< 7	< 17	< 24	< 35	< 42

[1] Input beam quality: $M^2 = 1.0$. [2] From the bottom edge of deflection unit or the output plate (SS-IIE & SS-III) to the processing field. Note: Actual spot size and writing speeds are material- and application-dependent, and therefore may vary according to application significantly.
Free Z-range: The free Z-range for 3D-applications under consideration of the Z-range for flat field settings are on request available.

SPECIFICATIONS FOR ASSOCIATED DEFLECTION UNITS

Deflection unit	SUPERSCAN IIE-20L	SUPERSCAN III-30
Mechanical data:		
Input aperture [mm]	20	30
Beam displacement [mm]	25.63 [3] / 26.28	35.4 [3] / 36.0
Weight (without objective) [kg]	approx. 3.3	approx. 5.9
Dynamic data:		
Typical deflection (optical) [rad]	± 0.393	± 0.393
Repeatability (RMS) [µrad]	2	2
Max. Gaindrift [ppm/K] [1]	15	15
Max. Offsetdrift [µrad/K] [1]	10	10
Long-term drift 8 h [µrad] [1, 2]	< 100	< 60
Acceleration time (10 %–90 %) [ms] [3]	≤ 0.58	≤ 0.85

[1] Drift per axis, after 30 min warm-up, at constant ambient temperature and process stress.
[2] After 30 min warm-up, under varying process loads, with water temperature control set for ≥ 2 l/min and 22°C water temperature. [3] Specification for fused Silica mirrors.

SPECIFICATIONS FOR OPTICS

Laser		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]	AS-20	200 [1]	100 [1]	100 [1]	500 [2]
	AS-30	4,000 [1]	-	-	2.500 [2]

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