

SUPERSCAN IIE



2-AXIS DEFLECTION UNITS

FOR CHALLENGING INDUSTRIAL APPLICATIONS



- Lowest drift values through twin-shell design
- Suitable for high power applications
- Water tempering and air flushing options
- "enhanced" option for 50 % improved long-term drift
- Available input apertures: 7, 10, 12, 15, 20, 30 mm

HIGHEST PRECISION WITH EXTREME PERFORMANCE

YOUR BENEFITS

The innovative thermal management and modular design make the SUPERSCAN IIE the perfect deflection unit for demanding laser applications. The "enhanced" option offers a 50 % better long-term drift performance. Long-term drift can even be further minimized by an additional water tempering.

MIRRORS AND OBJECTIVES

Scan mirrors and objectives with optimized mounts are available for all typical laser types, wavelengths, power densities, focal lengths and working fields. Customer specific configurations are also possible.

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.

TYPICAL APPLICATIONS

Material processing such as engraving, marking, ablation, cutting, welding, perforating, or high speed processing on the fly. The water tempered option is extremely suitable for very precise application requirements with low tolerance such as micro machining, drilling, ITO structuring or Ag-patterning.

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.



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SUPERSCAN IIE

GENERAL SPECIFICATIONS

Power supply ¹	Voltage	± 15 V to ± 18 V
	Current	3 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	

Temperature Drift	Max. Gaindrift ²	< 15 ppm/K
	Max. Offsetdrift ²	< 10 μrad/K
Typical deflection (optical)		± 0.393 rad
Resolution optically		12 μrad
Repeatability (RMS)		2 μrad
Long-term Drift 8 h ^{2,3}		< 150 μrad
Long-term Drift 8 h water tempering ^{2,4}		< 100 μrad
Position noise (RMS)		< 10 μrad

¹ **NOTE:** It must be ensured at all times that at least ± 15 V is supplied to the deflection unit, even during peak current requirements due to the laser process. Since less robust power supply units may experience voltage drops during peak current requirements, it is recommended to set the voltage to ± 16.5 V.

² Drift per axis. ³ After 30 min warm-up, at constant ambient temperature and process stress. ⁴ After 30 min warm-up, under varying process loads, with water temperature control set for ≥ 2 l/min and 22°C water temperature.

APERTURE DEPENDENT SPECIFICATIONS – MECHANICAL DATA

Deflection unit	SS-IIE-7	SS-IIE-10	SS-IIE-12	SS-IIE-15	SS-IIE-20	SS-IIE-20 L	SS-IIE-30
Input aperture [mm]	7	10	12	15	20	20	30
Beam displacement [mm]	9.0	12.4	14.0	18.55 / 18.05 ¹	26.28 / 25.63 ¹	26.28 / 25.63 ¹	35.98 / 35.38 ¹
Weight (without objective) [kg]	approx. 1.6	approx. 3.3	approx. 3.3	approx. 3.3	approx. 3.3	approx. 5.9	approx. 5.9
Dimension (L x W x H) [mm]	135.0 x 97.0 x 102.0	170.0 x 125.0 x 117.5	170.0 x 125.0 x 117.5	170.0 x 125.0 x 117.5	170.0 x 125.0 x 117.5	203.0 x 159.0 x 150.0/160.5 ²	203.0 x 159.0 x 150.0/160.5 ²
Water Tempering Option		✓	✓	✓	✓	✓	✓
Air Flushing Option						✓	✓

¹ Specification for fused silica mirrors. ² AXIALSCAN variation only, additional output plate for protection window.

APERTURE DEPENDENT SPECIFICATIONS – MIRROR VARIATIONS

Deflection unit	SS-IIE-7	SS-IIE-10	SS-IIE-12	SS-IIE-15	SS-IIE-20	SS-IIE-30
355 nm	SI	SI	SI	QU, SI	QU	
532 nm	SI	SI	SI	QU, SI	QU, SI	QU
780 – 980 nm + AL				QU	QU	QU
1,064 nm	SI	SI	SI	QU, SI	QU, SI	QU, SI, SC
900 – 1,100 nm + AL						SC
1,020 – 1,040 nm						QU
1,060 – 1,080 nm						QU, SC
10,600 nm	SI	SI	SI	SI, SC	SI	SI, SC

Standard: QU = Quartz (Fused Silica), SI = Silicon, High Speed: SC = Silicon carbide

TYPE DEPENDENT SPECIFICATIONS – DYNAMIC DATA

Deflection unit	SS-IIE-7	SS-IIE-10	SS-IIE-12	SS-IIE-15		
Mirror type	SI	SI	SI	QU	SI	SC
Acceleration time [ms]	0.19	0.22	0.25	0.36	0.30	0.24
Writing speed [cps] ^{1,2}	900	800	650	450	500	650
Processing speed [rad/s] ¹	90	60	50	35	40	50
Positioning speed [rad/s] ¹	90	60	50	35	40	50

Deflection unit	SS-IIE-20 / SS-IIE-20 L		SS-IIE-30		
Mirror type	QU	SI	QU	SI	SC
Acceleration time [ms]	0.70	0.61	0.90	0.84	0.52
Writing speed [cps] ^{1,2}	350	350	-	-	-
Processing speed [rad/s] ¹	35	35	25	30	35
Positioning speed [rad/s] ¹	35	35	25	30	35

¹ With f-theta lens f = 160 mm / field size 110 mm x 110 mm. ² Single-stroke font with 1 mm height.

OPTIONS

The SUPERSCAN IIE scan heads provide two types of water-tempering connections for the electronics and galvanometer scanners: straight [W] connectors and 90° [W2] connectors along with air-cooling [A] of the deflection mirrors. This ensures constant working conditions and excellent long-term stability, thus guaranteeing reliable operation even in high-laser-power applications.

SC mirrors allow for higher speed performance due to the lightweight mirror substrates and optimized mirror mounts.

AIR FLUSHING

Specifications	
Air	Clean air free of water and oil

Flow rate	Air pressure
100 l/min	1.0 bar – 1.5 bar

WATER TEMPERING

Specifications	
Water ¹	Clean tap water with additives
Temperature	22°C – 28°C
Pressure	2 bar – 3 bar

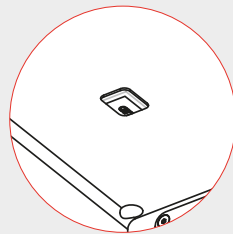
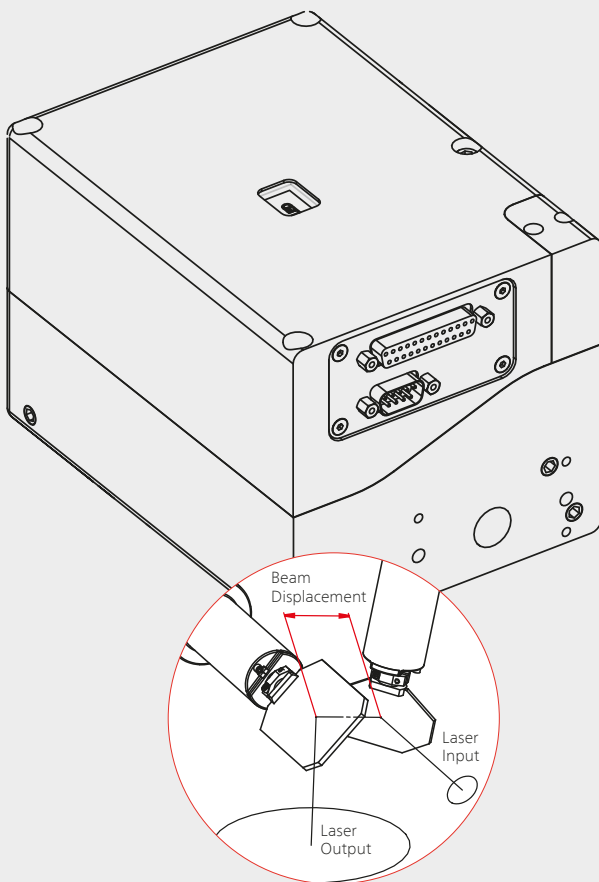
Flow rate	Pressure loss
2 l/min	0.3 bar
4 l/min	0.4 bar
6 l/min	0.7 bar

¹ **Caution:** When using cooling water including deionized water, suitable additives must be used to prevent the growth of algae and protect the aluminium parts against corrosion.

Additive recommendations (Please consult your additive supplier for dosage information):

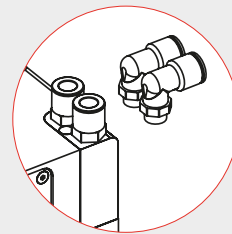
Standard industrial applications: Products of company NALCO, e.g. CCL105 (Premix) or TRAC105A_B (Additive)

Food & beverage, packaging applications: Polypropylene glycol of company Dow Chemical, e.g. DOWCAL N



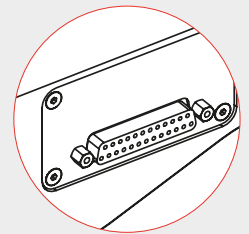
LEDs

The status LEDs allows you to check important functions on the deflection unit. They are located on the front or the top of the deflection unit (depends on type).



WATER TEMPERING CONNECTORS

The SUPERSCAN IIE is available with 2 types of connectors, straight [W] and 90° [W2].



INTERFACE SIGNAL CONNECTORS

D1: 25 pin D-Sub connector for power and control.
D2: 25 pin D-Sub connector for control and 9 pin D-Sub connector for power.

Distributor



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