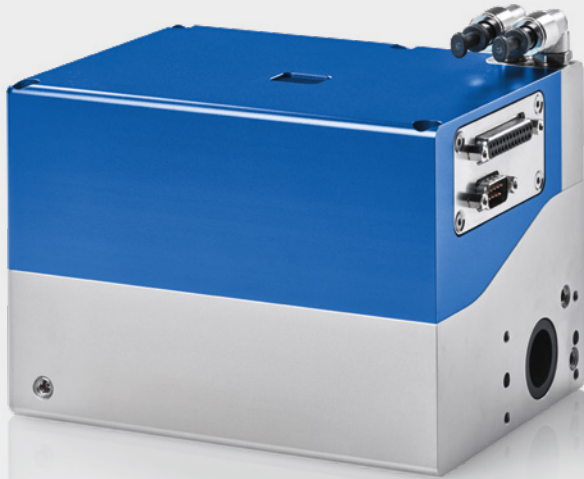


# SUPERSCAN IIE



2-AXIS DEFLECTION UNITS

FOR CHALLENGING INDUSTRIAL APPLICATIONS



- Lowest drift values through twin-shell design
- Suitable for high power applications
- Water temperature control and air cooling options
- "enhanced" option for 50 % improved long-term drift
- Available input apertures: 7, 10, 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 temperature control.

### 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-3.

### TYPICAL APPLICATIONS

Material processing such as engraving, marking, ablation, cutting, welding, perforating, or high speed processing on the fly. The water temperature control 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.

# SUPERSCAN IIE

## GENERAL SPECIFICATIONS

Power supply <sup>1</sup>	Voltage	± 15 V to ± 18 V	Temperature Drift	Max. Gaindrift <sup>2</sup>	< 15 ppm/K
	Current	3 A, RMS, max. 10 A		Max. Offsetdrift <sup>2</sup>	< 10 µrad/K
	Ripple/ Noise	Max. 200 mVpp, @ 20 MHz bandwidth	Typical deflection (optical)	± 0.393 rad	
Interface signals	Digital	XY2-100 protocol	Resolution optically	12 µrad	
Ambient temperature	+15°C to +35°C		Repeatability (RMS)	2 µrad	
Storage temperature	-10°C to +60°C		Long-term Drift 8 h <sup>2,3</sup>	< 150 µrad	
Humidity	≤ 80 % non-condensing		Long-term Drift 8 h water tempering <sup>2,4</sup>	< 100 µrad	
			Position noise (RMS)	< 10 µrad	

<sup>1</sup> 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.

<sup>2</sup> Drift per axis. <sup>3</sup> After 30 min warm-up, at constant ambient temperature and process stress. <sup>4</sup> 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-15	SS-IIE-20	SS-IIE-20 L	SS-IIE-30
Input aperture [mm]	7	10	15	20	20	30
Beam displacement [mm]	9.0	12.4	18.55 / 18.05 <sup>1</sup>	26.28 / 25.63 <sup>1</sup>	26.28 / 25.63 <sup>1</sup>	35.98 / 35.38 <sup>1</sup>
Weight (without objective) [kg]	approx. 1.6	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	203.0 x 159.0 x 150.0/160.5 <sup>2</sup>	203.0 x 159.0 x 150.0/160.5 <sup>2</sup>
Water Tempering Option		✓	✓	✓	✓	✓
Air Flushing Option					✓	✓

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

## APERTURE DEPENDENT SPECIFICATIONS – MIRROR VARIATIONS

Deflection unit	SS-IIE-7	SS-IIE-10	SS-IIE-15	SS-IIE-20	SS-IIE-30
AG	SI				
343 nm			QU		
405 nm			QU		
355 nm	SI	SI	QU, SI	QU	
532 nm	SI	SI	QU, SI	SI	
180 – 780 nm + AL			QU		
780 – 980 nm			QU	QU	
780 – 980 nm + AL					QU
1,064 nm	SI	SI	QU, SI	SI	QU, SI
1,064 nm + 850 – 870 nm				QU	
900 – 1,100 nm + AL					QU
1,020 – 1,040 nm					QU
1,060 – 1,080 nm				QU	QU
10,600 nm	SI	SI	SI	SI	SI

QU = Quartz (Fused Silica), SI = Silicon <sup>1</sup> 850 – 870 nm (YIL) for illumination purposes only

## TYPE DEPENDENT SPECIFICATIONS – DYNAMIC DATA

Deflection unit	SS-IIE-7	SS-IIE-10	SS-IIE-15	
Mirror type	SI	SI	QU	SI
Acceleration time [ms]	0.19	0.22	0.36	0.30
Writing speed [cps] <sup>1,2</sup>	900	800	450	500
Processing speed [rad/s] <sup>1</sup>	90	60	35	40
Positioning speed [rad/s] <sup>1</sup>	90	60	35	40

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

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

## OPTIONS

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

## AIR COOLING

Specifications	
Compressed air <sup>1</sup>	Clean air free of water and oil

<sup>1</sup> ISO 8573-1:2010 [1:0(0.05):0(0.005)]

Flow rate	Pressure drop
50 – 100 l/min	1.0 bar – 1.5 bar

## WATER TEMPERATURE CONTROL

Specifications	
Water <sup>1</sup>	Clean tap water with additives
Temperature	22°C – 28°C
Max. water pressure	< 3 bar

Flow rate	Pressure loss
2 l/min	0.4 bar
4 l/min	0.8 bar
6 l/min	1.2 bar

<sup>1</sup> **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



2-AXIS DEFLECTION UNITS

FOR CHALLENGING INDUSTRIAL APPLICATIONS

All trademarks are registered trademarks of their owner.

**Headquarters:**

**RAYLASE GmbH**

Wessling, Germany

+49 8153 9999 699

info@raylase.de

**Subsidiary China:**

**RAYLASE Laser Technology (Shenzhen) Co.**

Shenzhen, China

+86 755 28 24 85333

info@raylase.cn

**Subsidiary USA:**

**RAYLASE Laser Technology Inc.**

Newburyport, MA, USA

+1 978 255 1672

info@raylase.com

