SUPERSCAN V-30

2-AXIS DEFLECTION UNITS

FOR CHALLENGING INDUSTRIAL APPLICATIONS

- Positioning of the laser with 20 bit resolution with the SL2-100 protocol
- Minimal drift and extremely low noise thanks to digital encoder technology
- Extreme acceleration and precise laser guidance for sharp corners and edges
- Recording and diagnosis of all properties
- Input aperture: 30 mm

FULLY DIGITAL FEEDBACK CONTROL, FAST AND PRECISE

YOUR BENEFITS

A fully digital feedback control electronics inside the SUPERSCAN V-30 provides excellent dynamics and continuous monitoring of e.g. the position of the mirrors and their speed. Depending on the applied protocol (SL2-100 or XY2-100), the mirrors can be positioned with a resolution of up to 20 bits. Thanks to the enormous acceleration and maximum speed of the digital galvanometers, the SUPERSCAN V-30 performs also laser jobs with sharp edges extremely fast and precise.

CONFIGURABLE IN AND OUT

The lenses and lightweight SC- scan mirrors are suited for all common laser types, wavelengths, power densities, focal distances and working fields. The control electronics can also support additional sets of control parameters (tuning options). We would also be happy to help you put together the perfect configuration for your application.

TYPICAL APPLICATIONS

SUPERSCAN V-30 is the right choice for various high-end applications in laser processing, where highest accuracy is required. This is ensured at all times by the digital control of the mirror positions. Especially applications in micromachining and structuring in electronics and IT-technology benefit from the dynamic and precision of the SUPERSCAN V-30 scan head. In combination with the digital RAYLASE linear translator module LT-II as an AXIALSCAN-30 the SUPERSCAN V-30 is emerged for the hatching in the additive manufacturing industry.

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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GENERAL SPECIFICATIONS

Power supply	**Voltage**	30 V or 48 V
	Current	2 A RMS, Max. 5 A
	Ripple/ Noise	Max. 200 mVpp, @ 20 MHz bandwidth
Ambient temperature		+15 °C to +35 °C
Humidity		≤ 80 % non-condensing
IP-Code		65
Interface signals	**Digital**	XY2-100-Enhanced protocol SL2-100 protocol

Typical deflection		± 0.393 rad
Resolution XY2-100-E 16-Bit		12 µrad
Resolution SL2-100 20-Bit		0.76 µrad
Repeatability (RMS)		< 0.4 µrad
Position noise (RMS)		< 2.0 µrad
Temperature drift	**Max. Gaindrift [1]**	8 ppm/K
	Max. Offsetdrift [1]	15 µrad/K
Long-term drift 8 h without water temperature control [1]		< 50 µrad
Long-term drift 8 h with water temperature control [1, 2]		< 30 µrad

[1] Angles optical. 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.

APERTURE DEPENDENT SPECIFICATIONS – MECHANICAL DATA

Deflection unit	**SUPERSCAN V**
Input aperture [mm]	30
Beam displacement [mm]	35.7
Weight (without objective) [kg]	approx. 5.5
Dimension (L x W x H) [mm]	203.0 x 159.0 x 150.0

MIRROR VARIATIONS

Wavelengths	**Substrate**
1,064 nm	SC
10,600 nm	SC

TYPE DEPENDENT SPECIFICATIONS – TUNING

Tuning	**Description**
Microstructuring tuning	Optimized tuning for high precision beam deflection with sharp corners and minimized tracking error.

TYPE DEPENDENT SPECIFICATIONS – DYNAMIC DATA

Deflection unit	**SUPERSCAN V-30-SC**
Mirror type	SC
Tuning	Microstructuring
Processing speed [rad/s] [1]	25 @ 30 V 30 @ 48 V
Positioning speed [rad/s] [1]	25 @ 30 V 30 @ 48 V
Tracking error [ms] [2]	0.25
Step response time 1 % of full scale [ms] [3]	0.66

[1] See "Calculation of speed". [2] Calculation acceleration time approx. 1.7 × tracking error. [3] Settling to 1/5,000 of full scale.

Calculation of speed

Speed in working field = focal length f-theta lens x positioning speed:
Example: SUPERSCAN V-30-SC with f-theta lens f = 163 mm, positioning speed 30 rad/s, v = 163/1,000 x 30 = 4.8 m/s

Mirrors & Lenses

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. Please contact the RAYLASE support team for specific information and possible combinations on +49 8153 9999 699 or email support@raylase.de.

Options

The SUPERSCAN V-30 deflection units provide water temperature control (W) for the electronic components and galvanometer scanners in combination with air flushing for the scan mirrors. This ensures constant working conditions and excellent long-term stability, thus guaranteeing reliable operation even in high power laser applications. The SUPERSCAN V deflection units can also be operated without temperature control. In consequence the drift values may increase.

AIR FLUSHING

Specifications	
Compressed air [1]	Clean air free of water and oil

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

[1] ISO 8573-1:2010 [1:0(0.05):0(0.005)]

WATER TEMPERATURE CONTROL

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

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

[1] **Caution:** When using cooling water including deionised 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

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