



high power meets high dynamics

The welDYNA scan head enables innovative high power applications by a unique set of properties:

- Suitable for multi-kW lasers
- Designed for highest beam quality (single mode)
- High oscillation frequencies > 2 kHz
- Modular integration with standard collimation and focussing units
- Low long-term and temperature drift
- Fully digital servo circuitry
- Integrated sensor system with real-time monitoring
- Software-independent interlock interface
- Water and air cooling in a robust housing

The welDYNA scan head joins high power with high dynamics. The high power suitability is supported by ultra-low absorption coatings, air cooling of the mirrors, strict separation of electronics and optical path and in addition a set of built-in sensors. Empowered by the fully digital electronics, the integrated sensors provide extensive possibilities for real-time monitoring of the system's operational state. Light-weight SiC mirrors and highly dynamic galvanometer scanners of the dynAXIS 3 series enable beam oscillation frequencies that are unprecedented in high-power scan heads.

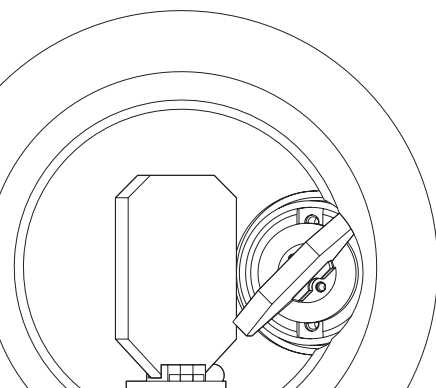
An innovative optical configuration leads to opposing beam-entrance and exit apertures, thus facilitating the integration in gantry- or robot-based machines, e.g. in the automotive or metalworking industry.

Typical Applications:

- Welding of dissimilar materials, e.g. aluminum and copper
- Joining of materials with low weldability, e.g. for power train or body-in-white components
- Cutting of thick metal sheets or fiber-reinforced plastics (FRP)

Typical Industries:

- Automotive
- Mechanical engineering and metalworking
- Aerospace industry



Specifications

Aperture	20.8 mm
Mirrors	
Working wavelength	1030-1090 nm
Reflectivity	
at 1030-1090 nm	>99.5% per mirror
at 633 nm	>50% per mirror
Max. laser power (with air cooling)	3000 W
at 50% duty cycle	6000 W
Max. XY oscillation amplitude	
at 2000 Hz	±3.1 mrad
at 4000 Hz	±0.6 mrad
Tuning	Vector
Tracking error	<0.16 ms
Step response time ⁽¹⁾	
1% of full scale	0.4 ms
10% of full scale	2.3 ms
Positioning speeds	
typical	40 rad/s
(with f=245 mm focusing)	(10 m/s)
maximal	55 rad/s
(with f=245 mm focusing)	(13 m/s)

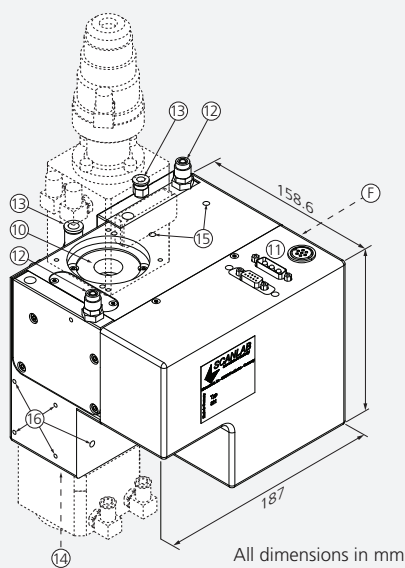
(1) settling to 1/1000 of full scale

(2) dependent on collimation and focusing module

(3) with f=245 mm focusing

Long-term drift (8h)	
Offset	<150 µrad
Gain	<150 ppm
Temperature drift	
Offset	<30 µrad/K
Gain	<20 ppm/K
Repeatability (RMS)	<2 µrad
Positioning resolution	18 Bit
Optical performance	
Typical scan angle ⁽²⁾	±25 mrad
Typical field size ⁽³⁾	10x10 mm ²
Gain error	<5 mrad
Zero offset	<5 mrad
Nonlinearity	<0.9 mrad/44°
Power requirements	
30 V DC, max. 7 A	
or ±15 V DC, max. 7 A	
Interface	SL2-100
Operating temperature	25 °C ±10 °C
Weight	7.5 kg
Cooling specifications	
Air cooling	20 l/min (Δp < 1 bar)
Water cooling	3 l/min (p < 4 bar)

(all angles are in optical degrees)



Legend

- 1 Fiber*
- 2 Laser beam
- 3 Collimation optics*
- 4 Two IR photo diodes
- 5 Temperature sensor galvo mount
- 6 Two scan mirrors
- 7 Two mirror temperature sensors
- 8 Focusing optics*
- 9 Image field
- 10 Beam entrance, mounting option for collimation module*
- 11 Electrical connectors for data, power, interlock
- 12 Connections for cooling water
- 13 Connections for cooling air
- 14 Beam exit, mounting option for focusing module*
- 15 Bore holes at free disposal, e.g. for cable relief
- 16 Bore holes at free disposal, e.g. for illumination, camera, crossjet
- F Flange surface

(*not included)

