

AIONIS | FEMTOSECOND LASERS

The Ultrafast Laser for Next Generation Material Processing



Outstanding Performance

Highest quality and outstanding performance for high precision laser manufacturing



Durable Laser Source

Aionis femtosecond lasers are designed for 24/7 operation in the most demanding applications.



Easy Integration

The compact all-in-one design simplifies integration and makes the Aionis a rugged laser processing tool.



Excellent Performance

Reliable Performance for Your Laser Processing Systems

The all-fiber based Aionis ultrafast laser is engineered for demanding 24/7 applications that require outstanding performance. Laser head, power supply and control electronics are integrated into a rugged, compact all-in-one laser head made of strengthened aluminum for highest stability. The new design significantly reduces system costs without sacrificing quality or laser lifetime.

Benefits

New Ways of Laser Material Processing

The Aionis ultrafast lasers provide outstanding performance for high efficiency laser processes. Our 515, 1030 and 1950 nm models are the optimum choice for high-quality and precision laser manufacturing. Thanks to the short femtosecond pulses. The Aionis lasers do not generate heat affected zones (HAZ).

The 48 VDC operating voltage and the field proven laser control interface enable a simple and easy integration of the system. An integrated pulse picker/modulator is included for fast pulse and fast power control commands. Experience contactless and wear-free manufacturing on any type of material.

Applications

Aionis Lasers for High-Precision Manufacturing

The Aionis femtosecond lasers provides the unparalleled laser processing results the following applications:

- Semiconductor
- Brittle Material Processing
- Diamond Processing
- Thin Foil Cutting
- Photovoltaics
- Medical / BioTech

Advantages

Femtoseconds Engineered for 24 / 7 Industrial Applications

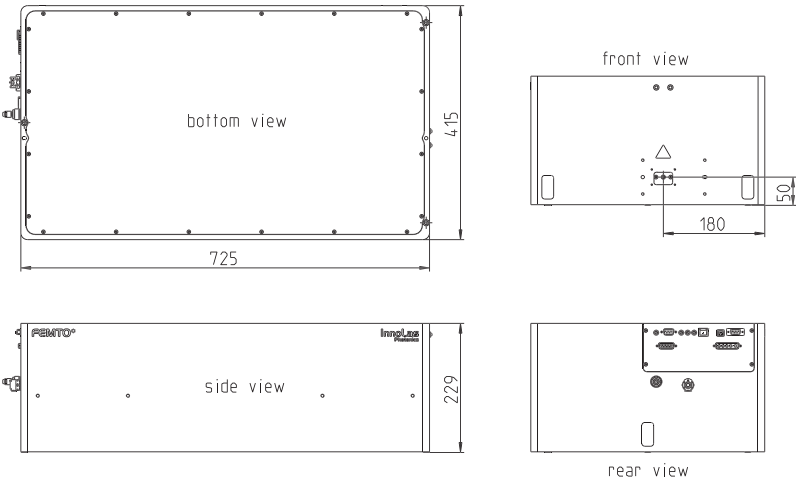
The Aionis ultrafast laser comes with an integrated pulse picker, pulse-on-demand and burst mode options. Combined with wavelengths of either 1950 nm, 1030 nm or 515 nm this builds a unique line-up in the laser industry.

It is designed for applications that require:

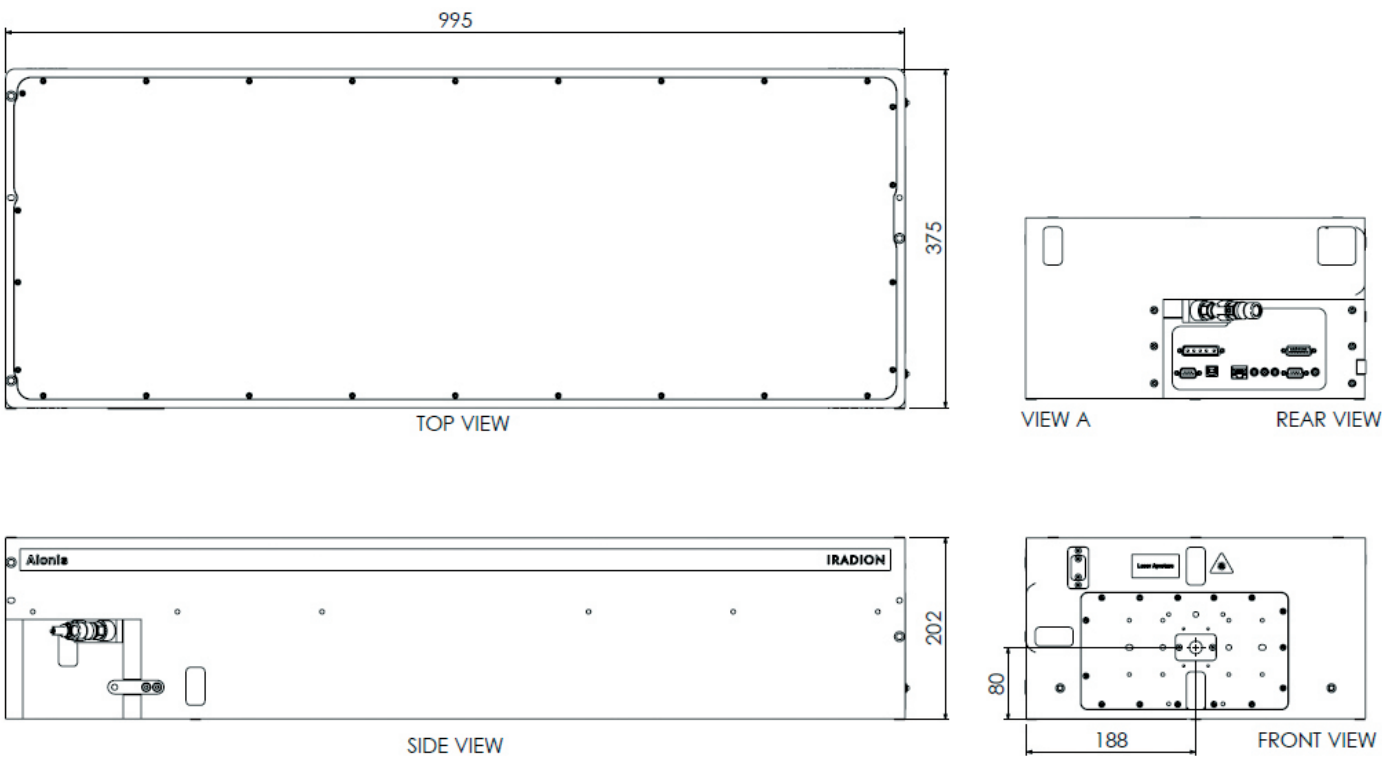
- Reliable 24/7 operation in industrial environments
- Short pulse width typically < 350 fs
- Tunable pulse duration from femtosecond to picosecond
- Excellent pulse-to-pulse and power stability
- Laser power up to 90 W
- Fast laser warm-up

Technical Drawings

Aionis 515-10-Yb, Aionis 1030-25-Yb

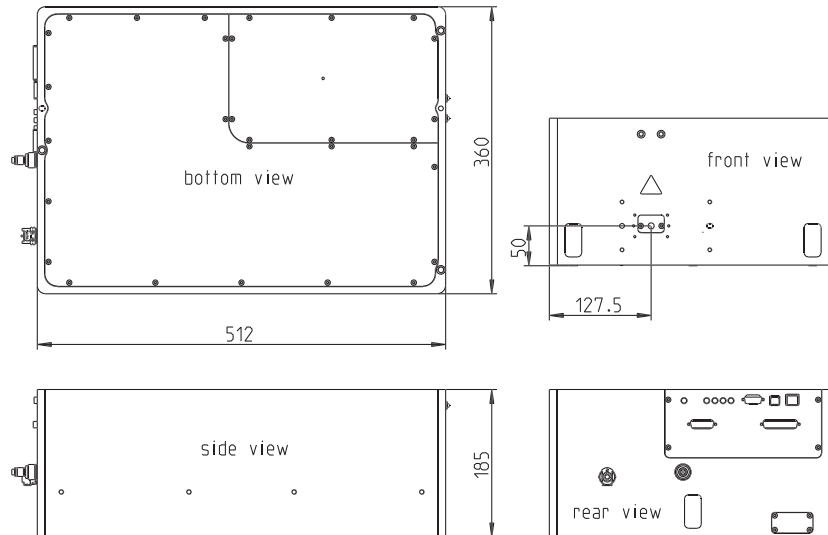


Aionis 1030-90-Yb



Technical Drawings

Aionis 1950-8-Tm



Add-Ons

Customization Options for Individual Applications

Choose from the following options for Aionis ultrafast lasers:

- Customized pulse-on-demand mode
- Beam expander box
- Scan head adapter flanges
- Water-to-water or water-to-air chiller

Specifications

Aionis	515	1030	
Model	Aionis 515-10-Yb	Aionis 1030-90-Yb	Aionis 1030-25-Yb
Laser Medium	Ytterbium	Ytterbium	Ytterbium
Central Wavelength	515 nm	1030 nm	1030 nm
Nominal Power	10 W @ 2500 kHz	90 W	25 W @ 2500 kHz
Repetition Rate	100 Hz to 2500 kHz (Internal Mode) Single shot to 750 kHz (Pulse-on-Demand Mode)	100 Hz to 2500 kHz (Internal Mode) Single shot to 750 kHz (Pulse-on-Demand Mode)*	100 Hz to 2500 kHz (Internal Mode) Single shot to 750 kHz (Pulse-on-Demand Mode)
Pulse Picker/Modulator	Integrated	Integrated	Integrated
Pulse Width	600 fs	400 fs–10 ps (typ. < 350 fs), software tunable	600 fs–4 ps, software tuneable
Pulse Energy	10 µJ @ 1000 kHz	120 µJ @ 500 kHz	25 µJ @ 1000 kHz
Peak Power	> 20 MW	> 300 MW	> 60 MW
Pulse-to-Pulse Stability (RMS)	< 5.0%	< 2.5%	< 3.0%
Power Stability (RMS, 8h)	< 5.0%	< 1.0%	< 3.0%
Spatial Mode	M ² < 1.5	M ² < 1.3	M ² < 1.3
Beam Divergence (full angle)	≤ 1.6 mrad	≤ 2.0 mrad	≤ 2.0 mrad
Beam Diameter (at output)	1.2 mm ± 0.2 mm	3.0 mm ± 0.5 mm	1.2 mm ± 0.2 mm
Polarization	Linear, -45°, > 100:1	Vertical, > 100:1	Linear, -45°, > 100:1
Circularity	> 90% (focal point)	> 90% (focal point)	> 90% (focal point)
Warm-up Time	< 20 min (warm start), < 30 min (cold start)	< 10 min (warm start), < 30 min (cold start)	< 20 min (warm start), < 30 min (cold start)
Operating Voltage Laser	48 VDC	48 VDC	48 VDC
Laser Power Consumption	< 700 W	< 1000 W	< 700 W
Cooling	Water	Water**	Water
Ambient Temperature	15-30 °C, non condensing	15-35°C, non-condensing	15-30 °C, non condensing
External Control	RS232, USB, TTL, Analog Modulation	RS232, USB, TTL, Analog Modulation	RS232, USB, TTL, Analog Modulation
Dimensions Laser Head (L x W x H)	725 x 415 x 229 mm ³	995 x 375 x 200 mm ³	725 x 415 x 229 mm ³
Weight Laser Head	70 kg	85 kg	70 kg

* Higher repetition rates available on request (up to 30 MHz in burst mode)

** distilled water + additives

Specifications

Aionis	1950		
Model	Aionis 1950-8-Tm	Aionis 1950-8-Tm-LP	Aionis 1950-4-Tm-HE
Laser Medium	Thulium	Thulium	Thulium
Central Wavelength	1950 nm	1950 nm	1950 nm
Nominal Power	≥ 7.5 W @ 2500 kHz	≥ 8 W @ 2500 kHz	≥ 2.5 W @ 250 kHz ≥ 3.8 W @ 2500 kHz
Repetition Rate	100 Hz to 2500 kHz (Internal Mode) Single shot to 750 kHz (Pulse-on-Demand Mode)	100 Hz to 2500 kHz (Internal Mode) Single shot to 750 kHz (Pulse-on-Demand Mode)	100 Hz to 2500 kHz (Internal Mode) Single shot to 750 kHz (Pulse-on-Demand Mode)
Pulse Picker / Modulator	Integrated	Integrated	Integrated
Pulse Width	< 800 fs	< 4 ps	< 4 ps
Pulse Energy	≥ 3 µJ @ 2500 kHz	≥ 3.2 µJ @ 2500 kHz	≥ 10 µJ @ 250 kHz
Peak Power	> 5 MW	> 1 MW	> 2.5 MW
Pulse-to-Pulse Stability (RMS)	< 3.0%	< 3.0%	< 3.0%
Power Stability (RMS, 8h)	< 3.0%	< 3.0%	< 3.0%
Spatial Mode	M ² ≤ 1.5	M ² ≤ 1.5	M ² ≤ 1.5
Beam Divergence (full angle)	≤ 6 mrad	≤ 6 mrad	≤ 6 mrad
Beam Diameter (at output)	2.0 mm ± 0.5 mm	2.0 mm ± 0.5 mm	2.0 mm ± 0.5 mm
Polarization	Linear, -45°, > 100:1	Linear, -45°, > 100:1	Linear, -45°, > 100:1
Circularity	> 90% (focal point)	> 90% (focal point)	> 90% (focal point)
Warm-up Time	< 20 min (warm start), < 30 min (cold start)	< 20 min (warm start), < 30 min (cold start)	< 20 min (warm start), < 30 min (cold start)
Operating Voltage Laser	48 VDC	48 VDC	48 VDC
Laser Power Consumption	< 500 W	< 500 W	< 500 W
Cooling	Water	Water	Water
Ambient Temperature	15-30 °C, non condensing	15-30 °C, non condensing	15-30°C, non condensing
External Control	RS232, USB, TTL, Analog Modulation	RS232, USB, TTL, Analog Modulation	RS232, USB, TTL, Analog Modulation
Dimensions Laser Head (L x W x H)	512 x 360 x 185 mm ³	512 x 360 x 185 mm ³	512 x 360 x 185 mm ³
Weight Laser Head	50 kg	50 kg	50 kg

All values measured after laser warm-up.

Iradion follows a policy of continuous product improvement. All specifications are subject to change without notice. Rev. 4.0, 02 / 2026.
Iradion Laser GmbH is DIN EN ISO 9001 certified.

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