LUXINAR
Industrial lasers that last

Aionis | Femtosecond lasers

The ultrafast laser for next generation material processing



Outstanding performance
Highest quality and outstanding performance for high precision laser manufacturing

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

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

Part of Pulsecore® - Every pulse predictable.
With Pulsecore®, you get absolute process stability for short- and ultrashort-pulse laser manufacturing.

Excellent performance
Reliable performance for your laser processing systems
The Aionis ultrafast laser is engineered for demanding 24/7 applications that require outstanding performance. Laser head, control unit 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 nm, 1030 nm and 1950 nm models are the optimum choice for high-quality and precision laser manufacturing. Thanks to the ultrashort pulses the Aionis femtosecond lasers reduce heat-affected zones to a minimum and avoid micro-cracking in brittle materials.

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 laser provides unparalleled processing results for the following applications:

- Semiconductor wafer & substrate processing
- Brittle material processing
- Diamond processing
- Thin foil cutting
- Photovoltaics
- Medical

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
- Ultrashort pulse width typically < 350 fs
- Tunable pulse duration from femtosecond to picosecond
- Excellent pulse-to-pulse and power stability
- Laser power up to 100 W
- Fast laser warm-up

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Specifications

Aionis	515	1030	
Laser			
Model	515-50-Yb	1030-100-Yb	1030-25-Yb
Laser medium	Ytterbium	Ytterbium	Ytterbium
Central wavelength	515 nm	1030 nm	1030 nm
Laser performance			
Nominal power	50 W @ 1 MHz	100 W @ 1 MHz	25 W @ 2.5 MHz
Repetition rate	single shot to 30 MHz*	single shot to 30 MHz* burst mode: 30 MHz, 2 – 15 pulses	single shot to 2.5 MHz*
Pulse picker / modulator	integrated	integrated	integrated
Pulse width	< 350 fs	350 fs – 10 ps (software tunable)	600 fs – 4 ps (software tunable)
Pulse energy	100 µJ @ 400 kHz 60 µJ @ 750 kHz	200 µJ @ 400 kHz 120 µJ @ 750 kHz	25 µJ @ 1000 kHz
Peak power	> 275 MW	> 550 MW	> 60 MW
Pulse-to-pulse stability (rms)	< 2.5 %	< 2.5 %	< 3.0 %
Power stability (rms, 8 h)	< 1.0 %	< 1.0 %	< 3.0 %
Laser beam propagation			
Spatial mode	M^2 < 1.2	M^2 < 1.3	M^2 < 1.3
Beam divergence (full angle)	≤ 1.0 mrad	≤ 2.0 mrad	≤ 2.0 mrad
Nom. beam diameter (at output)	2.5 mm ± 0.5 mm	3.0 mm ± 0.5 mm	1.2 mm ± 0.2 mm
Polarization	vertical, > 100:1	vertical, > 100:1	linear, - 45°, > 100:1
Circularity	> 90 % (focal point)	> 90 % (focal point)	> 90 % (focal point)
Operating specifications			
Warm-up time	< 15 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	< 1000 W	< 1000 W	< 700 W
External control	RS232, USB, TTL, analog modulation		
Cooling and ambient			
Cooling	water**	water**	water
Ambient temperature	15 – 35 °C, non-condensing	15 – 35 °C, non-condensing	15 – 30 °C, non-condensing
Dimensions and weights			
Dimensions laser head (L × W × H)	995 × 375 × 202 mm^3	995 × 375 × 202 mm^3	725 × 415 × 229 mm^3
Weight laser head	75 kg	75 kg	70 kg

* Pulse-on-demand mode up to 750 kHz
** Distilled water + additives

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Specifications

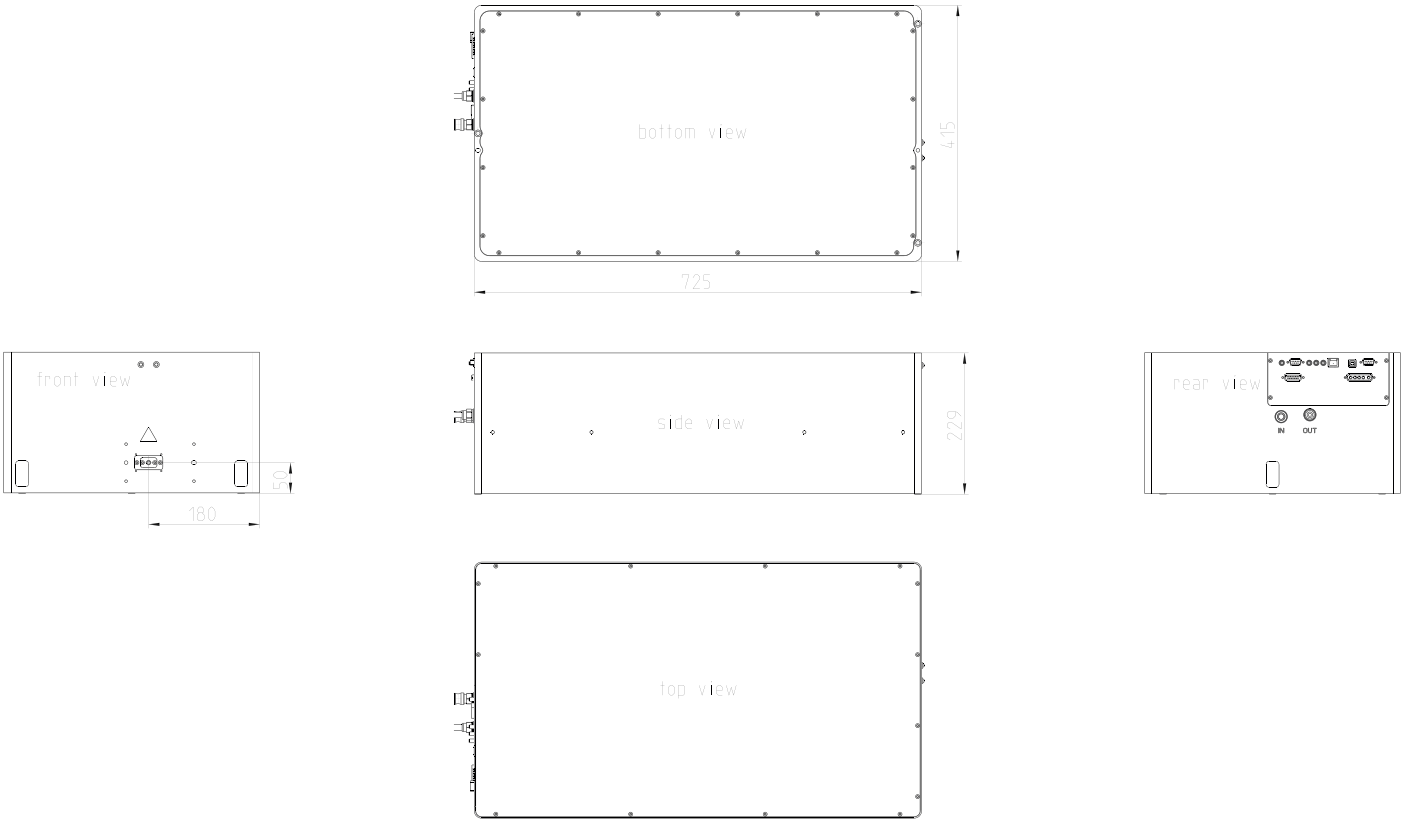
Aionis	1950		
Laser			
Model	1950-8-Tm	1950-8-Tm-LP	1950-4-Tm-HE
Laser medium	Thulium	Thulium	Thulium
Central wavelength	1950 nm	1950 nm	1950 nm
Laser performance			
Nominal power	≥ 7.5 W @ 2.5 MHz	≥ 8 W @ 2.5 MHz	≥ 2.5 W @ 250 kHz ≥ 3.8 W @ 2.5 MHz
Repetition rate	single shot to 2.5 MHz*	single shot to 2.5 MHz*	single shot to 2.5 MHz*
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, 8 h)	< 3.0 %	< 3.0 %	< 3.0 %
Laser beam propagation			
Spatial mode	$M^2 \leq 1.5$	$M^2 \leq 1.5$	$M^2 \leq 1.5$
Beam divergence (full angle)	≤ 6 mrad	≤ 6 mrad	≤ 6 mrad
Nom. 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)
Operating specifications			
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
External control	RS232, USB, TTL, analog modulation		
Cooling and ambient			
Cooling	water	water	water
Ambient temperature	15 – 30 °C, non-condensing	15 – 30 °C, non-condensing	15 – 30 °C, non-condensing
Dimensions and weights			
Dimensions laser head (L × W × H)	512 × 360 × 185 mm³	512 × 360 × 185 mm³	512 × 360 × 185 mm³
Weight laser head	50 kg	50 kg	50 kg

* Pulse-on-demand mode up to 750 kHz

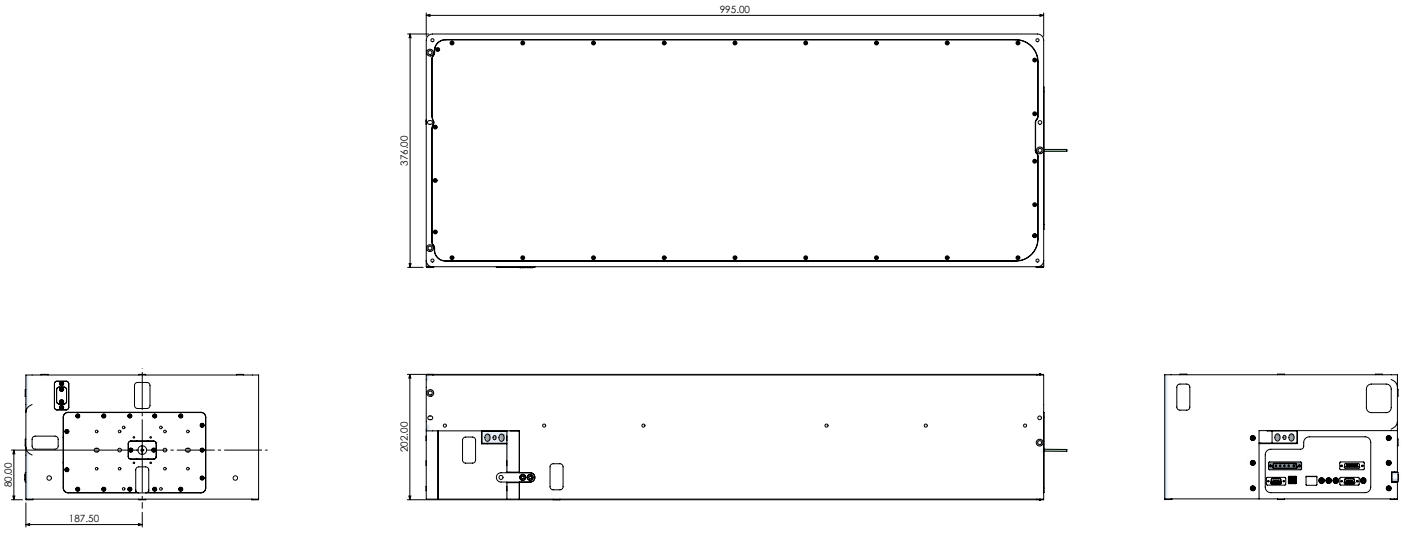
All values measured after laser warm-up. Luxinar follows a policy of continuous product improvement. All specifications are subject to change without notice. Luxinar Holding GmbH is DIN EN ISO 9001 certified. Rev. 1.0, 09 / 2026 | 903-0328-00

Technical drawings

Aionis 1030-25-Yb

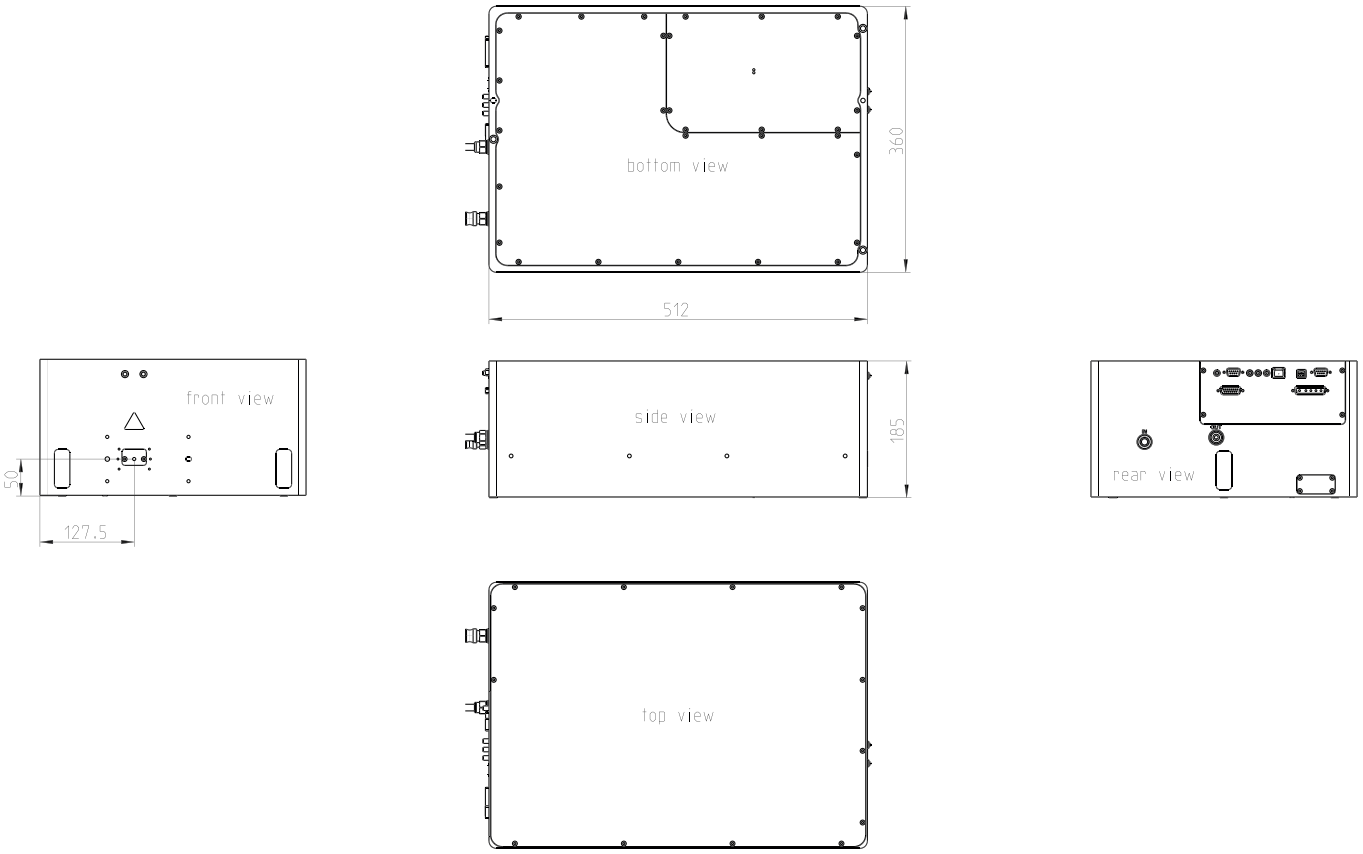


Aionis 1030-100-Yb, Aionis 515-50-Yb



Technical drawings

Aionis 1950-8-Tm(-LP), Aionis 1950-4-Tm-HE





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