

Origami XP

High-energy industrial femtosecond laser



Built for industrial performance

The most compact femtosecond laser in its class

The ORIGAMI 10XP is a single box, turn-key, air-cooled femtosecond laser. The latest upgrade has made it even more attractive for femtosecond laser applications, allowing easier and flexible deployment.

With its signature small footprint, the ORIGAMI 10XP is now equipped with additional functionalities and internal sensing capabilities to give users further flexibility in laser micromachining.



Origami XP

Applications

- Ophthalmic applications
- Medical device fabrication
- Femtosecond micromachining
- Thin film patterning
- Sapphire drilling and cutting
- Glass cutting and drilling
- Ceramics drilling and scribing
- Polyimide drilling and cutting
- Multiphoton microscopy
- FPD pixel repair

Reliable



Ultra-short pulses and excellent beam quality

As with all versions of the ORIGAMI 10XP, the laser delivers superior beam quality and unprecedented beam pointing stability due to the monolithic system design. In addition, the excellent pulse quality and duration of <370 fs makes the ORIGAMI 10XP an ideal choice for medical device manufacturing and ultra-high precision micromachining applications.

Green and UV flexibility

515 nm and 343 nm wavelengths are now available with the ORIGAMI XP platform. The ORIGAMI 05XP switches between 20 µJ at 515 nm and 40 µJ at 1030 nm with the ORIGAMI XP, or between 35 µJ at 515 nm and 70 µJ at 1030 nm with the 05XP-S. The wavelength is selected via software.

The ORIGAMI 03XP series allows effortless switching between IR, green, or UV. Please see datasheets for 03XP(-S)-2P and 03XP(-S)-3P for more information.

Model	10XP	10XP-S
Center wavelength	1030 nm	1030 nm
Pulse duration	< 370 fs	< 370 fs
Average power	> 4 W	> 5 W
Pulse energy	40 µJ	70 µJ
Peak power	> 80 MW	> 150 MW

Spectral bandwidth	< 7.5 nm	< 7.5 nm
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Dual wavelength SHG		
Model	05XP	05XP-S
Center wavelength	515 nm	515 nm
Pulse duration	< 370 fs	< 370 fs
Average power	> 2 W	> 2.5 W
Pulse energy	20 µJ	35 µJ
Peak power	> 40 MW	> 75 MW

Spectral bandwidth	< 3.5 nm	< 3.5 nm
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Typical Performance



Flexible control and OEM-ready

The ORIGAMI 10XP has been designed for easy integration and extra flexibility. Closed-loop power control ensures stable laser power performance and additional sensors to monitor relative peak power in real-time. Pulse width tuning from 370 fs - 5 ps is available as an optional extra for applications needing peak power flexibility. Laser communication is facilitated via our standard bus interface, common to all NKT Photonics lasers. Together with the CONTROL graphical user interface, it has become simpler and more intuitive to control the laser. Ethernet protocol is supported as a standard, which is particularly relevant for OEM applications.

Internal sensors allow the continuous monitoring and logging of the ORIGAMI 10XP parameters during operation, giving the user a full overview of the status of the laser. View the parameters easily via the GUI for pro-active servicing and laser health monitoring.

Features

- Air-cooled, single-box for ease of integration
- Proprietary Optocage mechanical design
- Single-shot and Pulse-on-Demand
- Outstanding energy and pointing stability
- Water cooling available
- Standard pulse width below 370 fs
- Average power up to 5 W at 1030 nm
- Pulse energy up to 70 µJ at 1030 nm
- Closed loop power control
- Variable IR pulse width (370 fs - 5 ps)
- Peak power measurement (TPA)
- State-of-the-art monitoring & logging
- Ethernet communication

Specifications - Single Output



Optical

Model	10XP	10XP-S
Center wavelength [nm]	1030	1030
Average Power [W]	> 4	> 5
Pulse duration [ps]	< 370	< 370
Pulse energy [μJ] ¹	40	70
Peak power [MW]	> 80	> 150
Spectral bandwidth [nm]	< 7.5	< 7.5
Pulse selection options	Single-shot to 1 MHz, Pulse-on-demand	Single-shot to 1 MHz, Pulse-on-demand
Beam quality (TEM ₀₀)	M ² ≤ 1.2	M ² ≤ 1.2
Polarization / PER (vertical) [dB]	> 22	> 22
Power stability (RMS, 12h, constant temp) [%]	< 1	< 1
Ellipticity	< 1.1	< 1.1
Pulse-to-pulse stability (RMS) [%]	< 1	< 1
Pointing stability	< 30 μrad rms (12h), constant temperature < 15 μrad / °C 18 – 28 °C	< 30 μrad rms (12h), constant temperature < 15 μrad / °C 18 – 28 °C

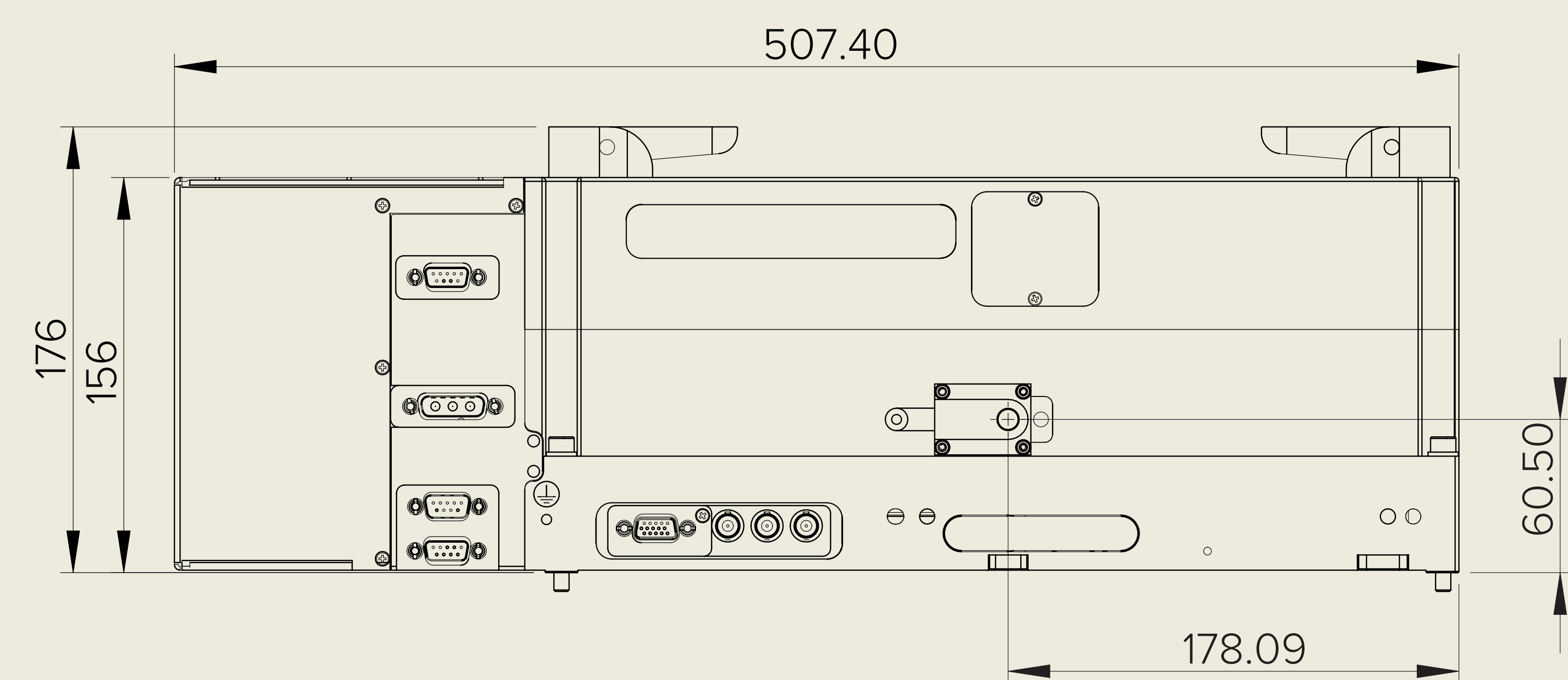
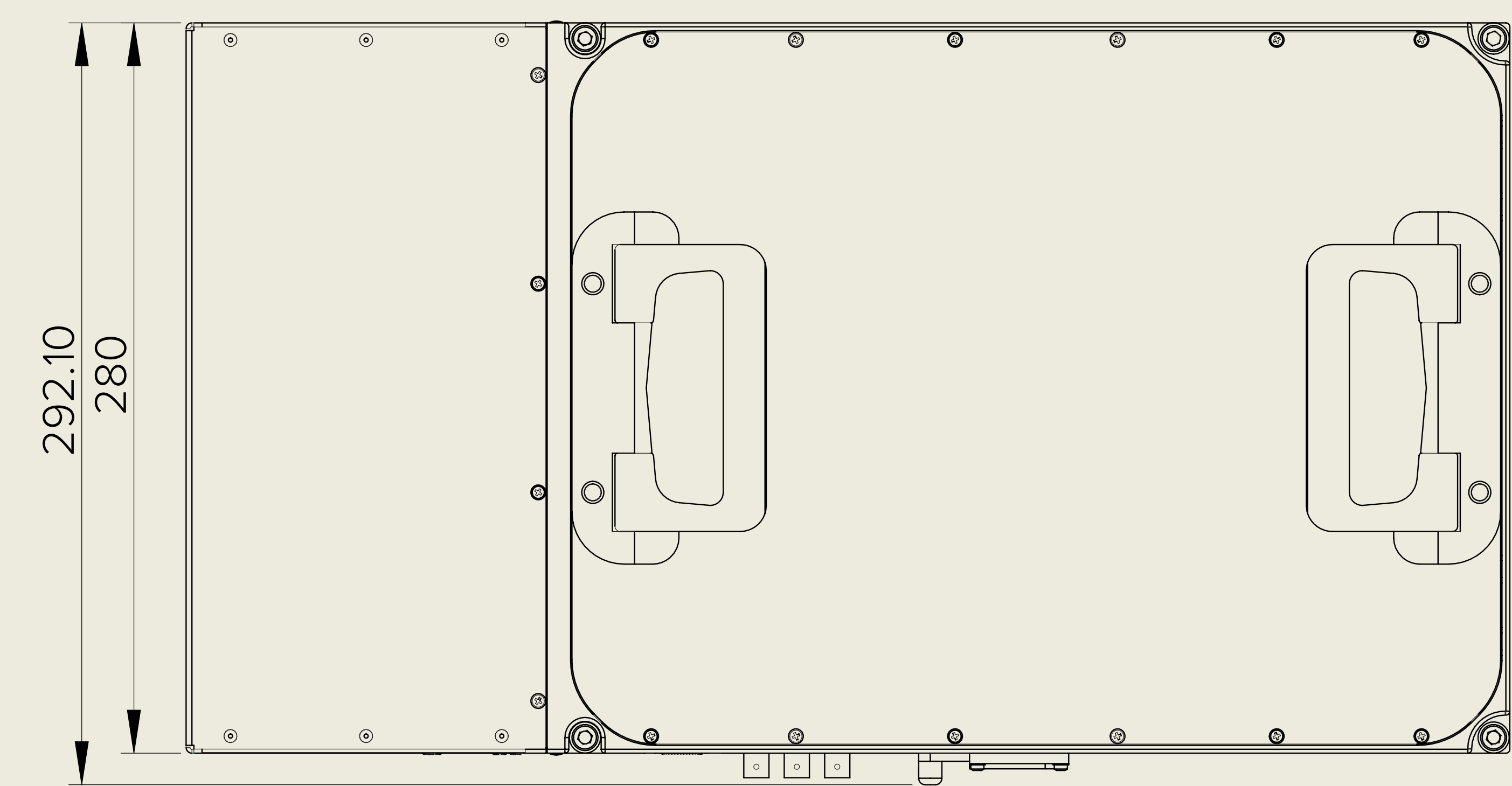
1) At 50 kHz
NKT PHOTONICS

Specifications - Single Output



Electrical/Mechanical

Laser output	Collimated free-space
Warm-up time [min.]	< 10 (warm start)
	< 30 (cold start)
Operation temperature [°C]	18 – 28
Storage temperature [°C]	-20 – 55
Power supply requirements	24 VDC/20A or 90-264 VAC, 47-63 Hz
Power consumption [W]	< 500
Laser head dimensions (WxHxD) [mm]	508 x 176 x 292
Power supply dimensions (WxHxD) [mm]	165 x 85 x 314
Laser head weight [kg]	28 kg (water-cooled)
	28 kg (air-cooled)
Cooling	Water or Air



Specifications - Dual Wavelength SHG

Origami
XP

Optical

Model	05XP	05XP-S
Center wavelength [nm]	515	515
Average Power [W]	> 2	> 2.5
Pulse duration [fs]	< 370	< 370
Pulse energy [μJ] ¹	20	35
Peak power [MW]	> 40	> 75
Spectral bandwidth [nm]	< 3.5	< 3.5
Pulse selection options	Single-shot to 1 MHz, Pulse-on-demand	Single-shot to 1 MHz, Pulse-on-demand
Beam quality (TEM ₀₀)	M ² ≤ 1.3	M ² ≤ 1.3
Polarization / PER (vertical) [dB]	> 17	> 17
Power stability (RMS, 12h, constant temp) [%]	< 1	< 1
Ellipticity	< 1.2	< 1.2
Pulse-to-pulse stability (RMS) [%]	< 1	< 1
Pointing stability	< 30 μrad rms (12h), constant temperature < 15 μrad / °C 18 – 28 °C	< 30 μrad rms (12h), constant temperature < 15 μrad / °C 18 – 28 °C

Features

Standard pulse width below 370 fs

Average power up to 5 W/2.5 W at 1030 nm/515 nm

Pulse energy up to 70 μJ/35 μJ at 1030 nm/515 nm

Specifications - Dual Wavelength SHG

Electrical/Mechanical

Laser output	Collimated free-space
Warm-up time [min.]	< 10 (warm start)
	< 30 (cold start)
Operation temperature [°C]	18 – 28
Storage temperature [°C]	-20 – 55
Power supply requirements	24 VDC/20A or 90-264 VAC, 47-63 Hz
Power consumption [W]	< 500
Laser head dimensions (WxHxD) [mm]	551 x 176 x 438
Power supply dimensions (WxHxD) [mm]	165 x 85 x 314
Laser head weight [kg]	32 kg (water-cooled)
	32 kg (air-cooled)
Cooling	Water or Air

Origami XP

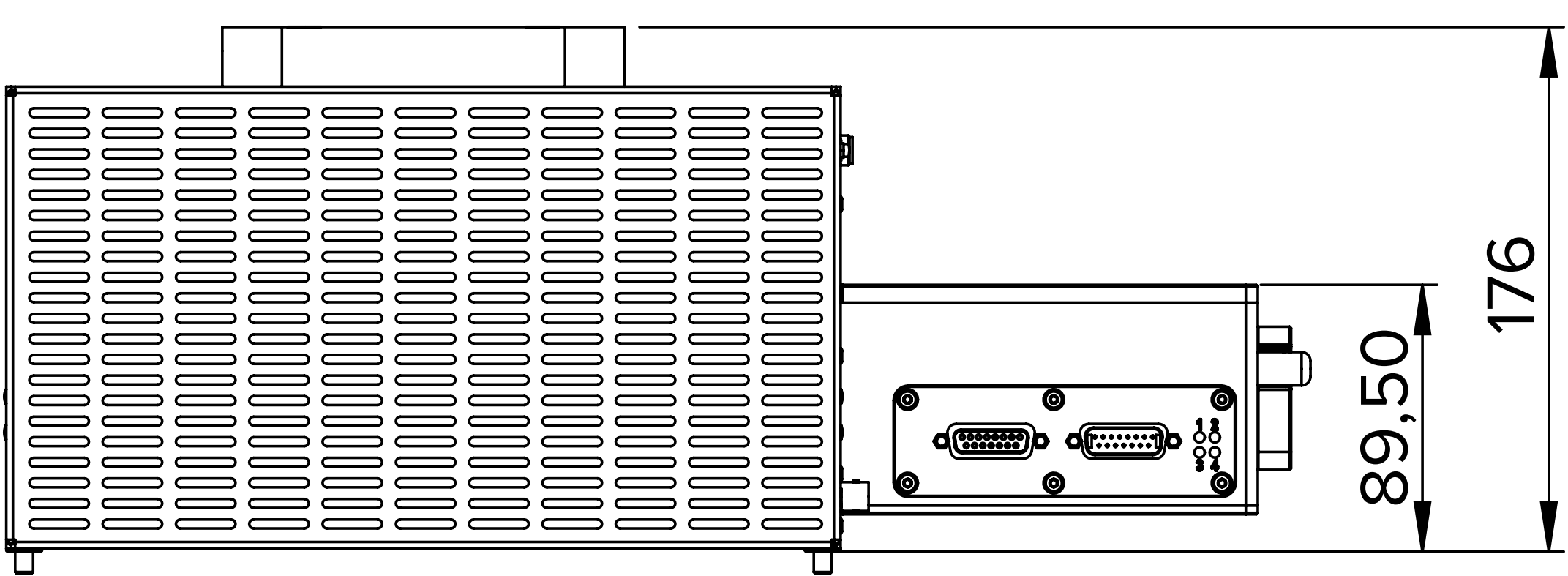
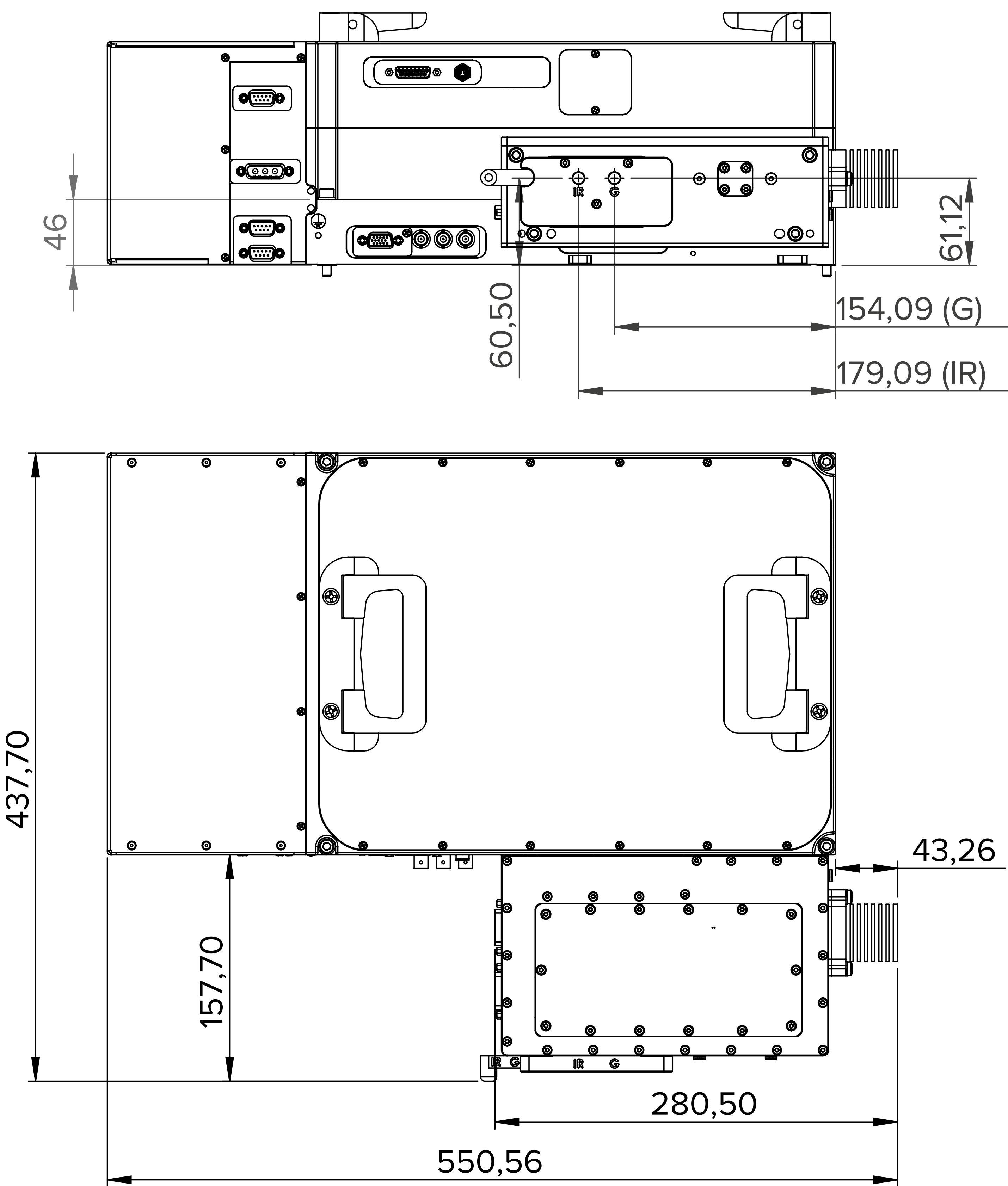
Also available

03XP(-S)-2P Dual UV/IR out-put

03XP(-S)-3P Triple UV/Green/IR output

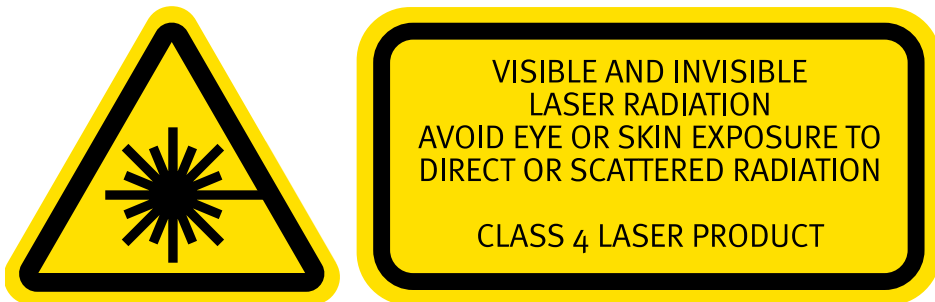
See separate datasheet for details

Technical Drawings



Origami XP

All NKT Photonics products are produced under our quality management system certified in accordance with the ISO 9001:2015 standard.



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