

# 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

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## 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.

<b>Model</b>	10XP	10XP-S
<b>Center wavelength</b>	1030 nm	1030 nm
<b>Pulse duration</b>	< 370 fs	< 370 fs
<b>Average power</b>	> 4 W	> 5 W
<b>Pulse energy</b>	40 μJ	70 μJ
<b>Peak power</b>	> 80 MW	> 150 MW
<b>Spectral bandwidth</b>	< 7.5 nm	< 7.5 nm

### Dual wavelength SHG

<b>Model</b>	05XP	05XP-S
<b>Center wavelength</b>	515 nm	515 nm
<b>Pulse duration</b>	< 370 fs	< 370 fs
<b>Average power</b>	> 2 W	> 2.5 W
<b>Pulse energy</b>	20 μJ	35 μJ
<b>Peak power</b>	> 40 MW	> 75 MW
<b>Spectral bandwidth</b>	< 3.5 nm	< 3.5 nm

# Typical Performance

**Origami**  
XP

## 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**

**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  $\mu$ J 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

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## Optical

Model	10XP	10XP-S
Center wavelength [nm]	1030	1030
Average Power [W]	> 4	> 5
Pulse duration [fs]	< 370	< 370
Pulse energy [ $\mu$ J] <sup>1</sup>	40	70
Peak power [MW]	> 80	> 150
Spectral bandwidth [nm]	< 7.5	< 7.5
Pulse selection options	Single-shot to 1 MHz	Single-shot to 1 MHz
Beam quality (TEM <sub>00</sub> )	$M^2 \leq 1.2$	$M^2 \leq 1.2$
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 $\mu$ rad rms (12h), constant temperature < 15 $\mu$ rad / °C 18 – 28 °C	< 30 $\mu$ rad rms (12h), constant temperature < 15 $\mu$ rad / °C 18 – 28 °C

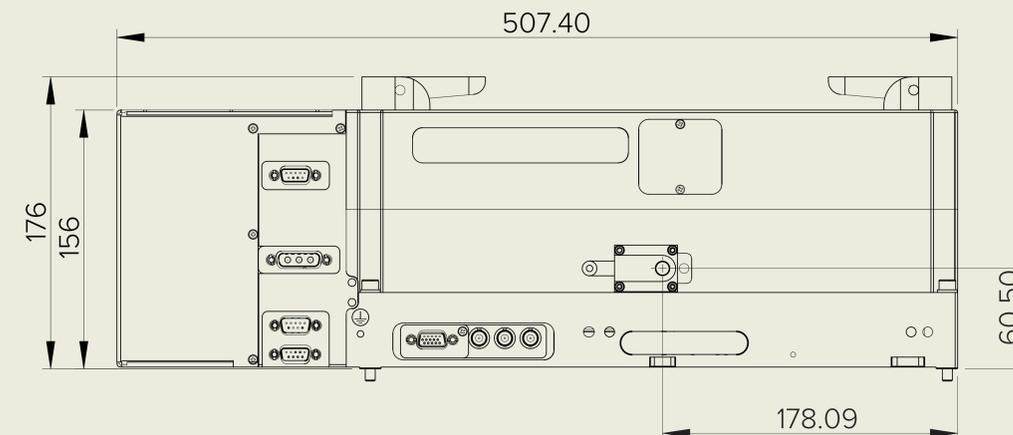
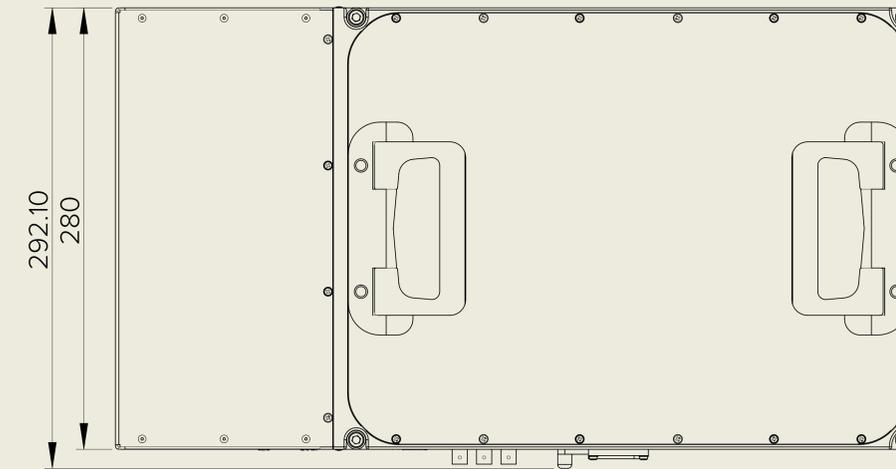
1) At 50 kHz

# Specifications - Single Output

**Origami**  
XP

## Electrical/Mechanical

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



# Specifications - Dual Wavelength SHG

**Origami**  
XP

## Optical

<b>Model</b>	05XP	05XP-S
<b>Center wavelength [nm]</b>	515	515
<b>Average Power [W]</b>	> 2	> 2.5
<b>Pulse duration [fs]</b>	< 370	< 370
<b>Pulse energy [<math>\mu</math>J] <sup>1</sup></b>	20	35
<b>Peak power [MW]</b>	> 40	> 75
<b>Spectral bandwidth [nm]</b>	< 3.5	< 3.5
<b>Pulse selection options</b>	Single-shot to 1 MHz	Single-shot to 1 MHz
<b>Beam quality (TEM<sub>00</sub>)</b>	$M^2 \leq 1.3$	$M^2 \leq 1.3$
<b>Polarization / PER (vertical) [dB]</b>	> 17	> 17
<b>Power stability (RMS, 12h, constant temp) [%]</b>	< 1	< 1
<b>Ellipticity</b>	< 1.2	< 1.2
<b>Pulse-to-pulse stability (RMS) [%]</b>	< 1	< 1
<b>Pointing stability</b>	< 30 $\mu$ rad rms (12h), constant temperature < 15 $\mu$ rad / °C 18 – 28 °C	< 30 $\mu$ rad rms (12h), constant temperature < 15 $\mu$ rad / °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  $\mu$ J/35  $\mu$ J at 1030 nm/515 nm

# Specifications - Dual Wavelength SHG

**Origami**  
XP

## Electrical/Mechanical

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

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### Also available

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

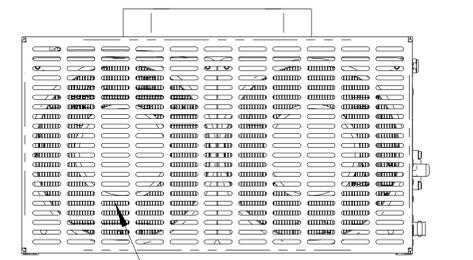
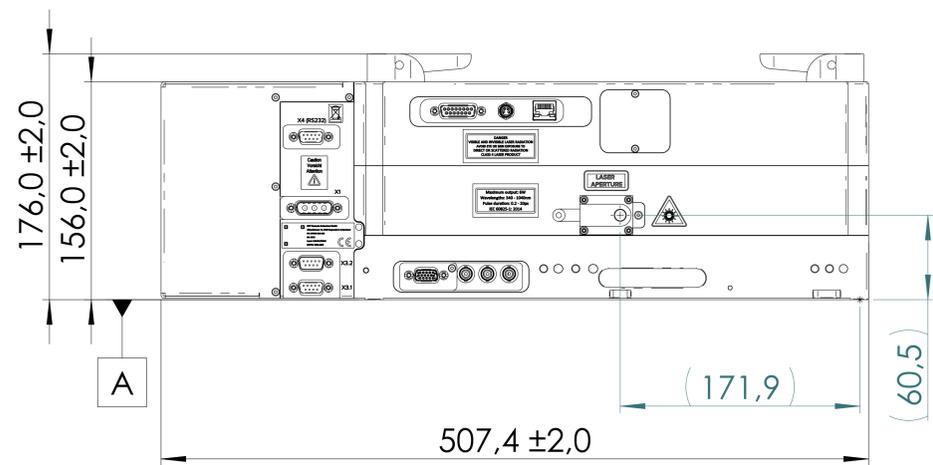
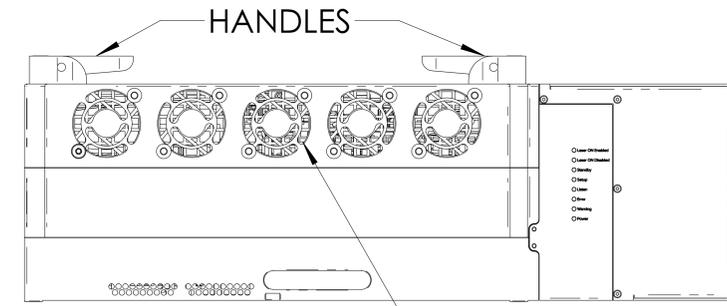
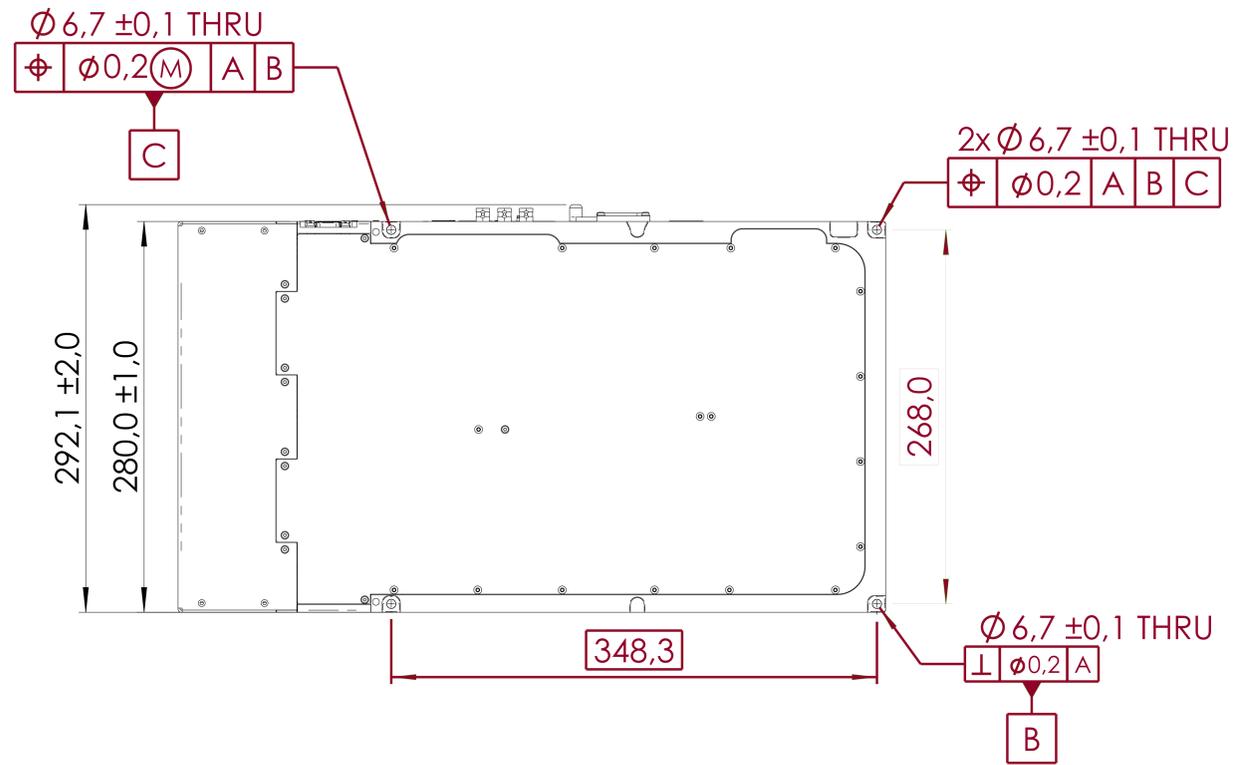
03XP(-S)-3P Triple UV/Green/IR output

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.



BLACK: OUTLINE DIMENSIONS  
 PETROL: OUTPUT BEAM LOCATION  
 RED: MOUNTING HOLES

# SOLUTIONS FOR INNOVATORS