

# ORIGAMI 10XP

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.

### 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

# ORIGAMI 10XP

## 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  $\mu$ J at 515 nm and 40  $\mu$ J at 1030 nm with the ORIGAMI XP, or between 35  $\mu$ J at 515 nm and 70  $\mu$ J 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.

## 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.

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 $\mu$ J	70 $\mu$ J
Peak power	> 80 MW	> 150 MW
Spectral bandwidth	< 7.5 nm	< 7.5 nm

Model	Dual wavelength SHG	
	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 $\mu$ J	35 $\mu$ J
Peak power	> 40 MW	> 75 MW
Spectral bandwidth	< 3.5 nm	< 3.5 nm

# SPECIFICATIONS - SINGLE OUTPUT

## Optical

Model	10XP	10XP-S
Center wavelength [nm]	1030	1030
Pulse duration [fs]	< 370	< 370
Average power [W]	> 4	> 5
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, Pulse-on-demand	Single-shot to 1 MHz, Pulse-on-demand
Beam quality ( $TEM_{00}$ )	$M^2 \leq 1.2$	$M^2 \leq 1.2$
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

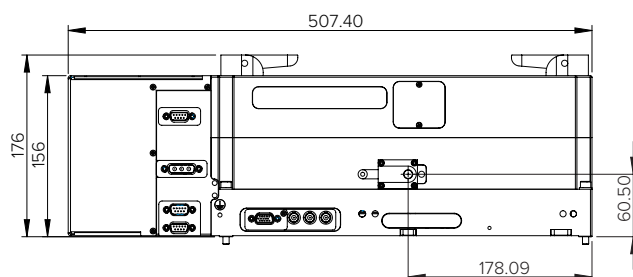
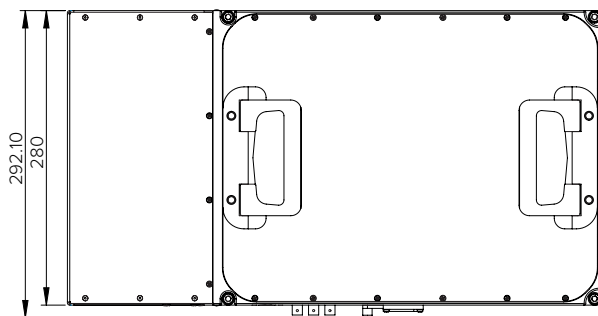
## Features

- 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  $\mu$ 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

## Mechanical/Electrical

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

## Optical

Model	05XP	05XP-S
Center wavelength [nm]	515	515
Pulse duration [fs]	< 370	< 370
Average power [W]	> 2	> 2.5
Pulse energy [ $\mu$ J] <sup>1)</sup>	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 ( $TEM_{00}$ )	$M^2 \leq 1.3$	$M^2 \leq 1.3$
Polarization / PER (horizontal) [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 $\mu$ 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

## 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

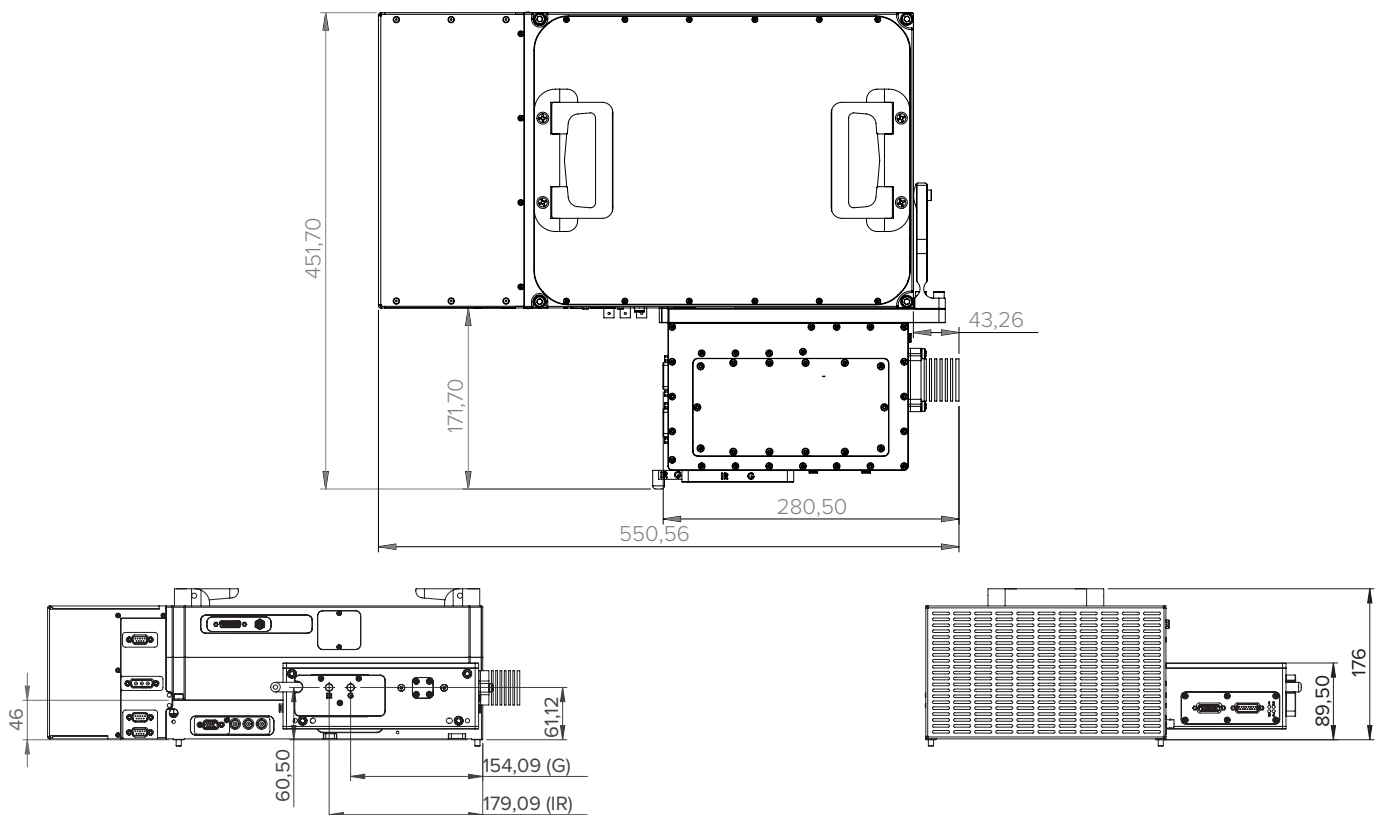
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Cooling	Water or air

### Also available

- 03XP(-S)-2P Dual UV/IR output
  - 03XP(-S)-3P Triple UV/Green/IR output
- See separate datasheet for details



All ORIGAMI products are produced under our quality management system certified in accordance with the ISO 9001:2015 and ISO 13485:2016 standard.

