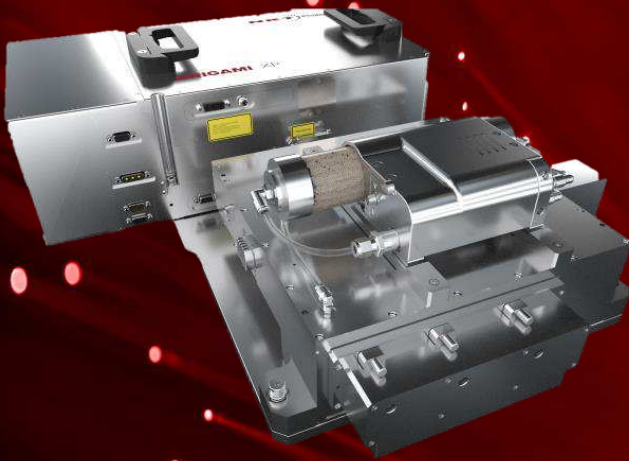


# High beam quality & Long lifetime UV/DUV Femtosecond Laser

ORIGAMI series

UV  
343 nm

DUV  
258 nm



3 port model

03XP(-S)-3P 343 / 515 / 1030 nm

02XP-S-3P 258 / 515 / 1030 nm

2 port model

03XP(-S)-2P 343 / 1030 nm

02XP-S-2P 258 / 1030 nm

## Applications

### Laser processing

High precision & Minimal heat-affected zone

$\mu$ LED, OLED, and LCD repair and lift-off

Flexible PCB processing / Photomask repair

Marking of SiC, GaN wafers / FBGs manufacturing

Biomedical device manufacturing

# High beam quality & Long lifetime UV/DUV Femtosecond Laser

## Product Overview

ORIGAMI 03XPS/02XPS is an all-in-one, microjule, femtosecond UV/DUV laser with world's premiere reliability in UV/DUV output designed for precision micromachining. High beam quality and long lifetime of UV/DUV are achieved by OXIDE's highest quality crystals used in the frequency conversion module. The fundamental laser, Origami XP of NKT Photonics, provides clean mode-locked pulses, superior beam quality and power stability, and unprecedented beam pointing stability by virtue of its monolithic system design (Optocage™). Thus, the laser system is capable of 24/7 operation in demanding industrial environment.

ORIGAMI 03XPS-3P/02XPS-3P has triple output port (1030/515/343 nm or 1030/515/258 nm) suitable for flexible laser processing of various materials. The output wavelength can be switched via GUI application or terminal command of PC. Fast wavelength switching within 1 second is possible while laser emission.

ORIGAMI 03XPS-2P/02XPS-2P is the compact model with dual output port (1030/343 nm or 1030/258 nm) with smaller footprint.

## Features & Benefits

- High beam quality ( $M^2 < 1.3$ ) and long lifetime of UV/DUV achieved by OXIDE's highest quality crystal
- Excellent beam pointing stability ( $< 5 \mu\text{rad}/^\circ\text{C}$ ) by virtue of monolithic laser design (Optocage™)
- Fast ( $< 1$  sec) & flexible wavelength switching for efficient processing of various materials
- User friendly GUI or programmable command control
- Air-cooled, single box for ease of integration

## Applications

Laser processing

- $\mu\text{LED}$ , OLED, and LCD repair and lift-off
- Flexible PCB processing
- Photomask repair
- Marking of SiC, GaN wafers
- Fiber Bragg Gratings (FBGs) manufacturing
- Biomedical device manufacturing

# DUV (258 nm) femtosecond laser ORIGAMI 02XP-S-2P, 02XP-S-3P

**DUV  
258 nm**

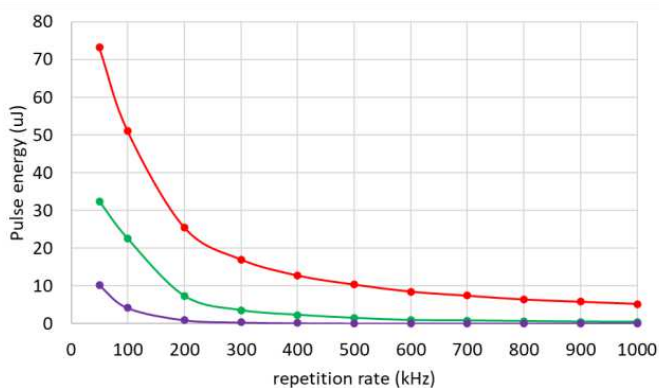
**High pulse energy**

## Optical Specification

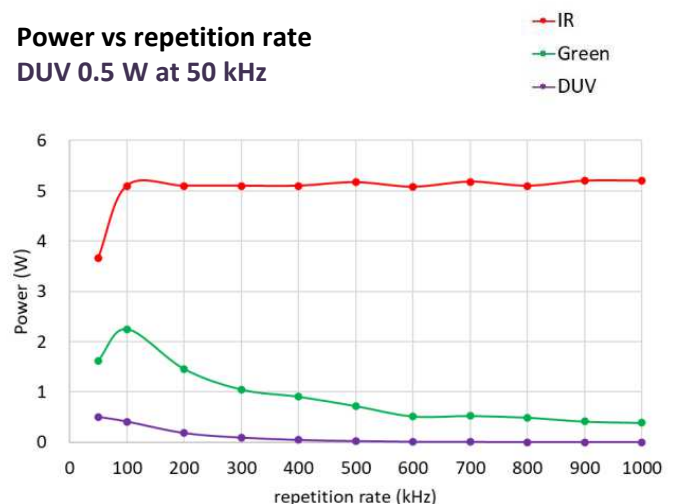
Model	02XP-S-2P		02XP-S-3P		
	IR	DUV	IR	GR	DUV
Port	IR	DUV	IR	GR	DUV
Center wavelength [nm]	1030	258	1030	515	258
Spectral bandwidth [nm]	< 5	< 1	< 5	< 2	< 1
Nominal repetition rate [kHz]	50				
Pulse selection options	Single-shot to 1MHz, Pulse-on-Demand				
Pulse duration [fs]	< 400				
Average power [W]	> 3.3	> 0.45	> 3.3	> 1.5	> 0.45
Pulse energy [ $\mu$ J]	> 66	> 9	> 66	> 30	> 9
Peak power [MW]	> 165	> 22.5	> 165	> 75	> 22.5
Beam quality ( $TEM_{00}$ )	$\leq 1.2$	$\leq 1.3$	$\leq 1.2$	$\leq 1.3$	$\leq 1.3$
Beam divergence ( $2\sigma$ ) [mrad]	< 1.0				
Beam diameter [mm]	1.8	2.0	2.0	2.0	2.0
Beam circularity (measured at 300 mm from aperture)	> 0.9	> 0.8	> 0.9	> 0.85	> 0.8
Polarization orientation	Horizontal	Vertical	Horizontal	Horizontal	Vertical
PER [dB]	> 23				
Power stability (12h, constant temp) [%] rms	< 1.0	< 2.0	< 1.0	< 1.5	< 2.0
Pulse-to-pulse stability (over 2000 pulses) [%] rms	< 1.0	< 2.0	< 1.0	< 1.5	< 2.0
Pointing stability (12h constant temp) [urad] rms	< 30				
Pointing stability (18-28 °C) [ $\mu$ rad/°C] rms	< 5				
Laser output	Collimated free-space				
Wavelength switching time [s]	< 1				
Notes	All parameters are specified at Nominal repetition rate				

## Typical performance of DUV (optimized at 50kHz)

**Pulse energy vs repetition rate**  
DUV 10  $\mu$ J at 50 kHz



**Power vs repetition rate**  
DUV 0.5 W at 50 kHz



\* These typical performances are not guaranteed values but representative ones.

# UV (343 nm) femtosecond laser ORIGAMI 03XP-2P, 03XP-3P

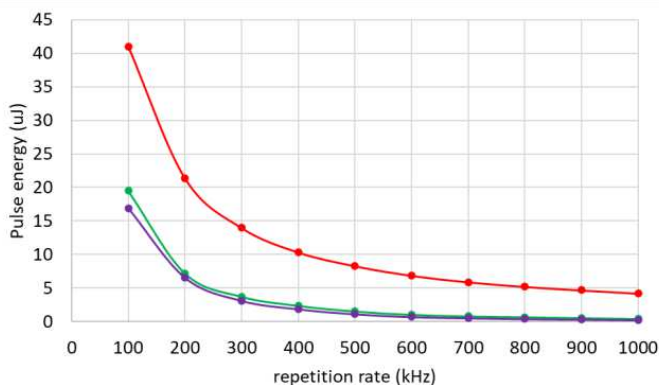
UV  
343 nm

## Optical Specification

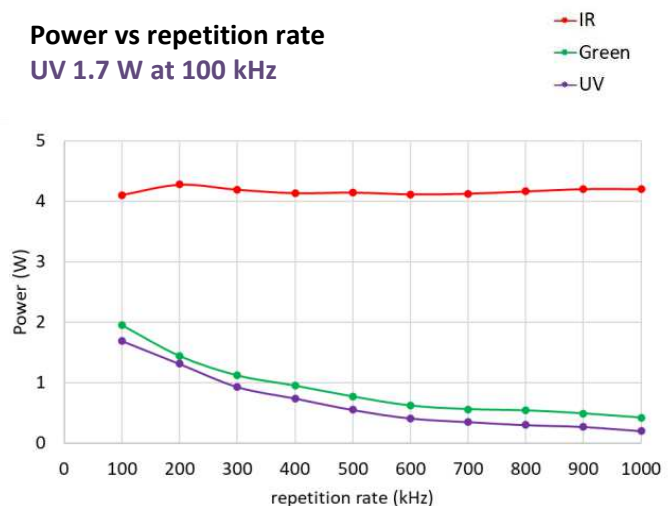
Model	03XP-2P		03XP-3P		
	IR	UV	IR	GR	UV
Port	IR	UV	IR	GR	UV
Center wavelength [nm]	1030	343	1030	515	343
Spectral bandwidth [nm]	< 5	< 1	< 5	< 2	< 1
Nominal repetition rate [kHz]	100				
Pulse selection options	Single-shot to 1MHz, Pulse-on-Demand				
Pulse duration [fs]	< 400		< 400	< 350	< 300
Average power [W]	> 3.8	> 1.2	> 3.8	> 1.5	> 1.2
Pulse energy [uJ]	> 38	> 12	> 38	> 15	> 12
Peak power [MW]	> 95	> 30	> 95	> 42	> 40
Beam quality (TEM <sub>00</sub> )	≤ 1.2	≤ 1.3	≤ 1.2	≤ 1.3	≤ 1.3
Beam divergence (2σ) [mrad]			< 1.0		
Beam diameter [mm]	1.8	2.0	2.0	2.0	2.0
Beam circularity (measured at 300 mm from aperture)	> 0.9	> 0.8	> 0.85	> 0.85	> 0.8
Polarization orientation	Horizontal	Vertical	Horizontal	Horizontal	Vertical
PER [dB]			> 23		
Power stability (12h, constant temp) [%] rms	< 1.0	< 2.0	< 1.0	< 1.5	< 2.0
Pulse-to-pulse stability (over 2000 pulses) [%] rms	< 1.0	< 2.0	< 1.0	< 1.5	< 2.0
Pointing stability (12h constant temp) [μrad] rms	< 30				
Pointing stability (18-28 °C) [μrad/°C] rms	< 5				
Laser output	Collimated free-space				
Wavelength switching time [s]	< 1				
Notes	All parameters are specified at Nominal repetition rate				

## Typical performance of UV (optimized at 100kHz)

**Pulse energy vs repetition rate**  
UV 17 uJ at 100 kHz



**Power vs repetition rate**  
UV 1.7 W at 100 kHz



\* These typical performances are not guaranteed values but representative ones.

# UV (343 nm) femtosecond laser ORIGAMI 03XP-S-2P, 03XP-S-3P

UV  
343 nm

High pulse energy

## Optical Specification

Model	03XP-S-2P		03XP-S-3P		
	IR	UV	IR	GR	UV
Port					
Center wavelength [nm]	1030	343	1030	515	343
Spectral bandwidth [nm]	< 5	< 1	< 5	< 2	< 1
Nominal repetition rate [kHz]			50		
Pulse selection options	Single-shot to 1MHz, Pulse-on-Demand				
Pulse duration [fs]	< 400		< 400	< 350	< 300
Average power [W]	> 3.3	> 1.0	> 3.3	> 1.5	> 1.0
Pulse energy [ $\mu$ J]	> 66	> 20	> 66	> 30	> 20
Peak power [MW]	> 165	> 50	> 165	> 85	> 66
Beam quality (TEM <sub>00</sub> )	$\leq$ 1.2	$\leq$ 1.3	$\leq$ 1.2	$\leq$ 1.3	$\leq$ 1.3
Beam divergence (2 $\sigma$ ) [mrad]			< 1.0		
Beam diameter [mm]	1.8	2.0	2.0	2.0	2.0
Beam circularity (measured at 300 mm from aperture)	> 0.9	> 0.8	> 0.85	> 0.85	> 0.8
Polarization orientation	Horizontal	Vertical	Horizontal	Horizontal	Vertical
PER [dB]			> 23		
Power stability (12h, constant temp) [%] rms	< 1.0	< 2.0	< 1.0	< 1.5	< 2.0
Pulse-to-pulse stability (over 2000 pulses) [%] rms	< 1.0	< 2.0	< 1.0	< 1.5	< 2.0
Pointing stability (12h constant temp) [ $\mu$ rad] rms	< 30				
Pointing stability (18-28 °C) [ $\mu$ rad/°C] rms	< 5				
Laser output	Collimated free-space				
Wavelength switching time [s]	< 1				
Notes	All parameters are specified at Nominal repetition rate				

03XP-S is a model with higher pulse energy compared to 03XP.  
Max IR pulse energy of 03XP-S and 03XP are > 66  $\mu$ J and > 38  $\mu$ J respectively.

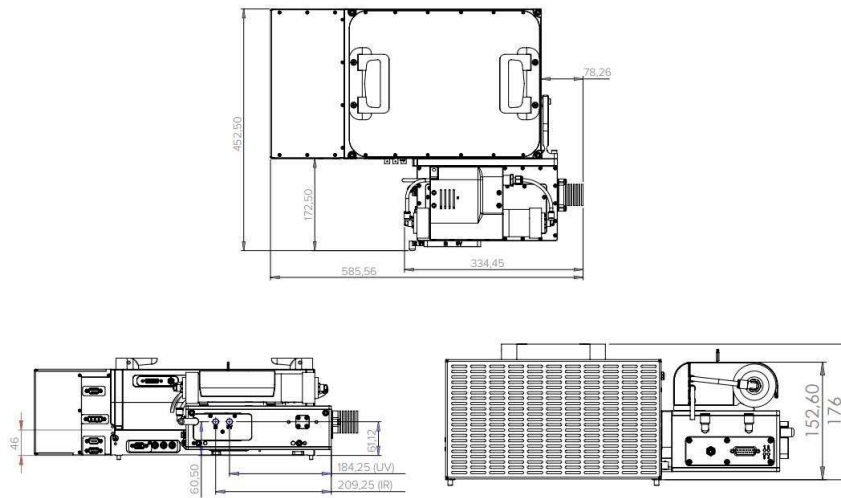
## Mechanical/Electrical Specification

	2 port model	3 port model
Warm-up time [min]	< 15 (warm start), < 30 (cold start)	
Operation temperature [°C]	18 ~ 28	
Storage temperature [°C]	-20 ~ 55	
Laser head dimensions (WxHxD) [mm]	585.6 x 176.0 x 438.5	675.2 x 222.6 x 585.4
Laser head weight [kg]	33	52
Power supply dimensions (WxHxD) [mm]	165 x 85 x 314	
Power supply requirements	24 VDC/20A or 90-264 VAC, 47-63 Hz	
Power consumption [W]	< 500	
Cooling	Air or water	

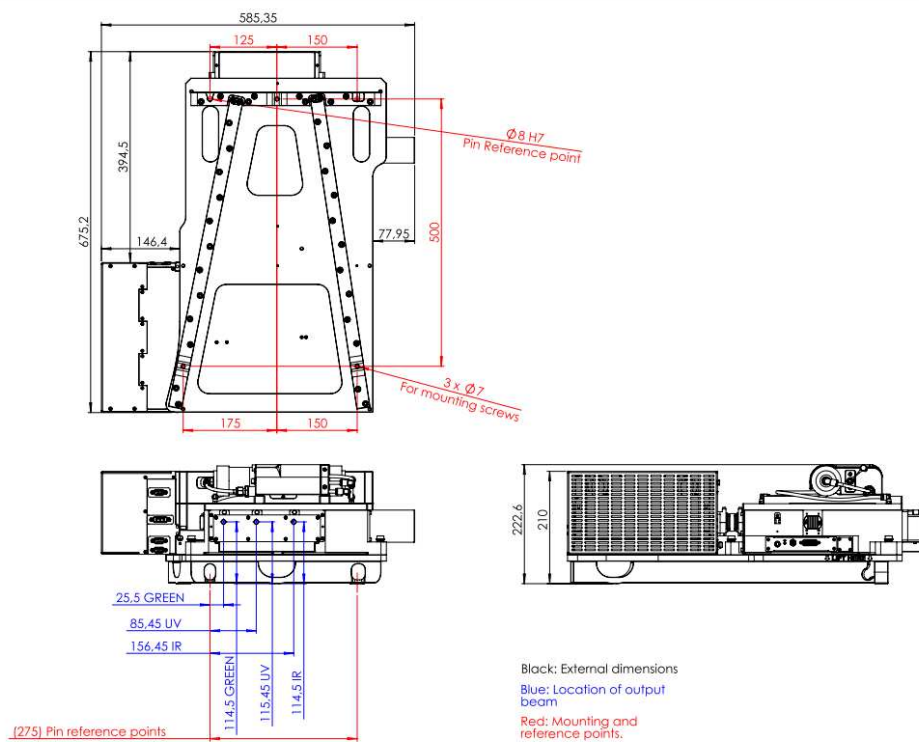


# Drawings

## 2 port model



## 3 port model



# OXIDE

OXIDE Corporation Yokohama Office  
4th floor, Yokohama Business Park South Tower,  
134 Godo-cho, Hodogaya-ku, Yokohama, Kanagawa, 240-0005, Japan  
TEL : +81-45-444-9511  
E-mail : [laser.sales@opt-oxide.com](mailto:laser.sales@opt-oxide.com)  
URL : <https://www.opt-oxide.com/>

