

ns

Photoacoustic  
Imaging  
Sources

# PhotoSonus X



See list of publications  
written by employing  
**PhotoSonus** series lasers



# High Output Power DPSS Tunable Laser for Photoacoustic Imaging

## PhotoSonus X

**PhotoSonus X is a perfect solution for photoacoustic imaging in pre-clinical and clinical use and when fast sample scanning is required.**

Having high output energy of up to 90 mJ at the peak, a broad wavelength tuning range from 650 to 2600 nm, high pulse repetition rate up to 100 Hz and fast wavelength switching makes it a perfect photoacoustic imaging source for gaining high-resolution images and ensuring high data acquisition rate. Moreover, being built on a diode pumped solid-state laser platform, PhotoSonus X assures significantly quieter operation (< 60 dB) compared with flash-lamp pumped lasers, which is very beneficial for clinical use.

Diode pumped laser technology and well-engineered system design ensures high reliability and low-cost system operation. PhotoSonus X output can be coupled with almost any type of fiber bundle.

With additional options of an internal energy meter and electromechanical shutter with laser self-test capability, PhotoSonus X can be ready for certification in clinical photoacoustic applications.

## Features

Ultra-wide signal tuning range  
from **650** to **1300 nm**

Fully motorized wavelength  
tuning

Fast wavelength switching

Externally triggerable

High, up to **90 mJ** pulse energy  
from OPO

**100 Hz** or **50 Hz** pulse  
repetition rate

Certification ready

Quiet operation < **60 dB**

Integrated DPSS pump laser  
and OPO into a single housing

Fiber bundle or fiber

Signal and idler through the  
same output (optional)

Integrated energy meter  
(optional)

Electromechanical output  
shutter with laser self-test  
capability

650 –  
1300 nm / 90 mJ / < 60 dB



Learn more  
about PhotoSonus X  
[www.ekspla.com](http://www.ekspla.com)

## Specifications <sup>1)</sup>

Model	PhotoSonus X-50	PhotoSonus X-100
OPO		
Wavelength range	Signal	650 – 1300 nm
	Idler (optional)	1065 – 2600 nm
OPO output max pulse energy <sup>2)</sup>	> 90 mJ	> 50 mJ
Pulse repetition rate <sup>3)</sup>	50 Hz	100 Hz
Scanning step	Signal	0.1 nm
	Idler	1 nm
Pulse duration <sup>4)</sup>	2 – 5 ns	
Signal linewidth <sup>5)</sup>	< 15 cm <sup>-1</sup>	< 10 cm <sup>-1</sup>
Typical signal beam diameter (1/e <sup>2</sup> ) <sup>6)</sup>	6 ± 1 mm	
Control interfaces	LAN, RS232	
Physical characteristics		
Cooling	Closed loop air-water cooled <sup>7)</sup>	
Unit size (W × L × H)	551 × 400 × 162 mm	
Power supply size (W × L × H)	483 × 390 × 140 mm	
Umbilical length	0.5 m	
Operating requirements		
Room temperature	18 – 27 °C	
Relative humidity	20 – 80 % (non-condensing)	
Power requirements	100 – 240 VAC, single phase 50/60 Hz	
Power consumption	< 2 kW	

<sup>1)</sup> Due to continuous improvement, all specifications are subject to change without notice. The parameters marked typical are not specifications. They are indications of typical performance and will vary with each unit we manufacture. Unless stated otherwise all specifications are measured at 700 nm.

<sup>2)</sup> Measured at the free space output. See tuning curves for typical energy levels at different wavelengths.


<sup>3)</sup> Other fixed pulse repetiton rates are available upon request.

<sup>4)</sup> FWHM measured with photodiode featuring 1 ns rise time and 300 MHz bandwidth oscilloscope.

<sup>5)</sup> At 700 nm or higher wavelength.

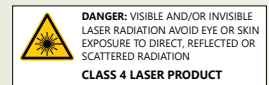
<sup>6)</sup> Measured at the free space output at 700 nm wavelength.

<sup>7)</sup> Using external chiller.

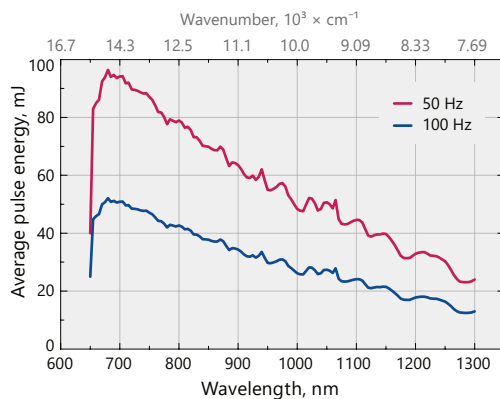


**DANGER: VISIBLE AND/OR INVISIBLE LASER RADIATION AVOID EYE OR SKIN EXPOSURE TO DIRECT, REFLECTED OR SCATTERED RADIATION**

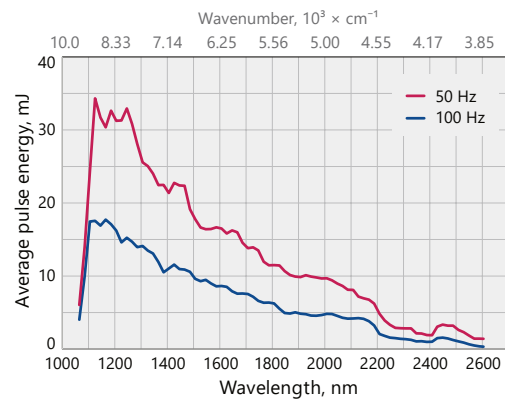
**CLASS 4 LASER PRODUCT**



## Performance

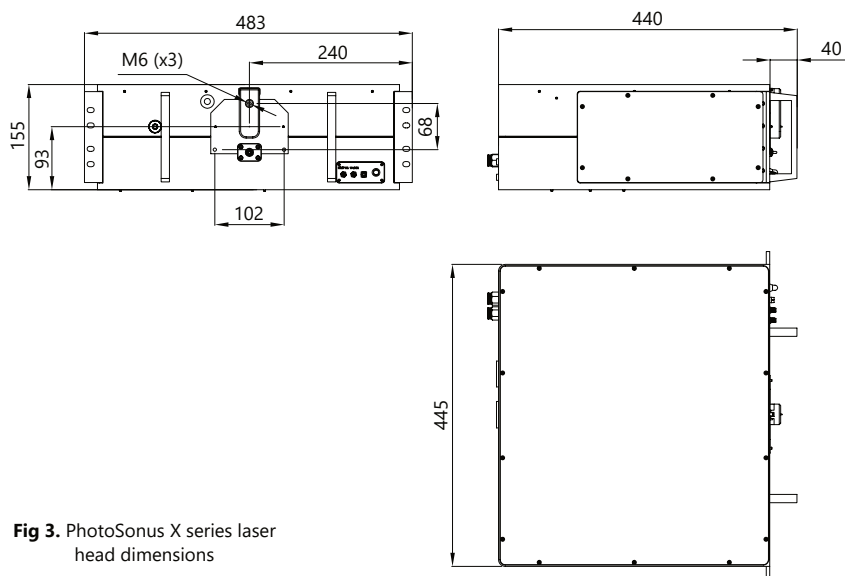


**Fig 1.** Typical PhotoSonus X free space extended range signal output energy vs. wavelength

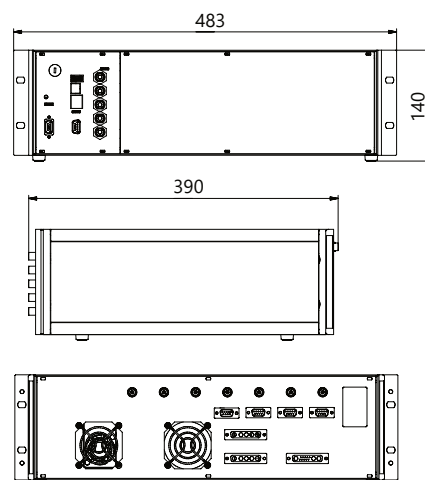


**Fig 2.** Typical PhotoSonus X free space idler output energy vs. wavelength

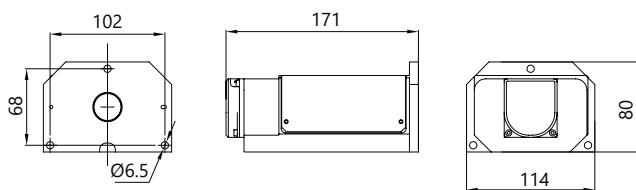
## Drawings



**Fig 3.** PhotoSonus X series laser head dimensions



**Fig 4.** Outline drawing of PhotoSonus X power supply unit



**Fig 5.** Outline drawing and dimensions of 3 mm fiber bundle

**Fig 6.** PhotoSonus X laser head with power supply units and cooling chiller installed in one rack



## Ordering information

**Note:** Laser must be connected to the mains electricity all the time. If there will be no mains electricity for longer than 1 hour then laser (system) needs warm up for a few hours before switching on.

### PhotoSonus X-50-IDL-EM-EFBC

Model

X → diode-pumped version

Repetition rate:

50 → 50 Hz

100 → 100 Hz

EFBC → exchangeable fiber coupling module

EM → OPO energy meter

IDL → idler option