

# I-OPA

## Industrial-Grade Optical Parametric Amplifier



I-OPA-TW on air-cooled CARBIDE-CB5

Wavelength tunability  
in an industrial design

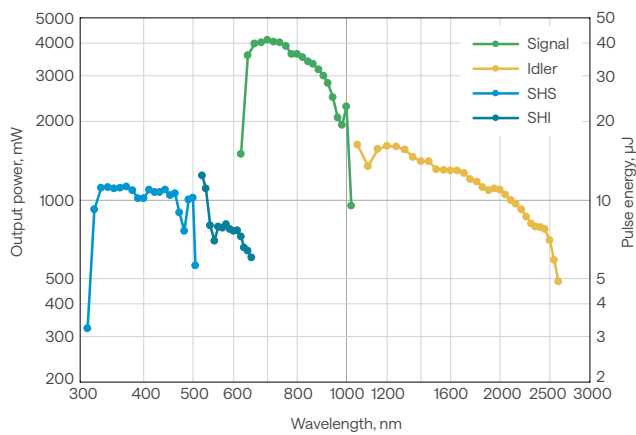
Single-box solution

Tunable or fixed-wavelength  
models

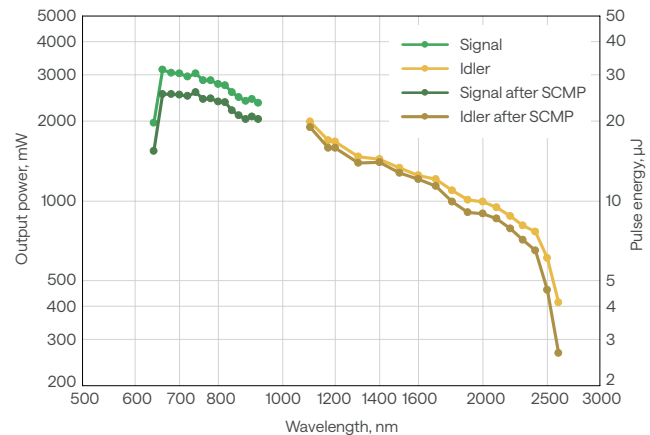
Plug-and-play installation and  
robust performance

The most compact OPA  
in the market

I-OPA-HP typical tuning curves  
Pump: 40 W, 400  $\mu$ J, 100 kHz



I-OPA-F typical tuning curves  
Pump: 40 W, 400  $\mu$ J, 100 kHz



# Specifications

Model	I-OPA-HP	I-OPA-F	I-OPA-ONE
Configuration	ORPHEUS	ORPHEUS-F	ORPHEUS-ONE
Pump power	Up to 40 W		
Pump pulse energy	20 – 400 $\mu$ J		
Repetition rate	Up to 2 MHz		
Tuning range <sup>1)</sup>	640 – 1010 nm (signal) 1050 – 2600 nm (idler)	650 – 920 nm (signal) 1200 – 2500 nm (idler)	1350 – 2000 nm (signal) 2100 – 4500 nm (idler)
Conversion efficiency	> 7% @ 700 nm (40 – 400 $\mu$ J pump; up to 1 MHz)		> 9% @ 1550 nm (40 – 400 $\mu$ J pump; up to 1 MHz)
	> 3.5% @ 700 nm (20 – 40 $\mu$ J pump; up to 2 MHz)		> 6% @ 1550 nm (20 – 40 $\mu$ J pump; up to 2 MHz)
Spectral bandwidth <sup>2)</sup>	80 – 220 $\text{cm}^{-1}$ @ 700 – 960 nm	200 – 1000 $\text{cm}^{-1}$ @ 650 – 920 nm 150 – 1000 $\text{cm}^{-1}$ @ 1200 – 2000 nm	60 – 150 $\text{cm}^{-1}$ @ 1450 – 2000 nm
Pulse duration <sup>2)3)</sup>	120 – 250 fs	< 55 fs @ 800 – 920 nm < 70 fs @ 650 – 800 nm < 100 fs @ 1200 – 2000 nm	100 – 300 fs
Long-term power stability, 8 h <sup>4)</sup>	< 1% @ 800 nm		< 1% @ 1550 nm
Pulse-to-pulse energy stability, 1 min <sup>4)</sup>	< 1% @ 800 nm		< 1% @ 1550 nm
Wavelength extension options	320 – 505 nm (SHS) <sup>5)</sup> 525 – 640 nm (SHI) <sup>5)</sup>	Contact sales@lightcon.com	4500 – 10000 nm (DFG)
Pulse compression options <sup>2)</sup>	n/a	SCMP (signal pulse compressor) ICMP (idler pulse compressor) GDD-CMP (compressor with GDD control)	n/a

## PUMP LASER REQUIREMENTS

Pump laser	PHAROS or CARBIDE
Center wavelength	1030 $\pm$ 10 nm
Maximum pump power	40 W
Maximum repetition rate	Up to 2 MHz
Pump pulse energy	20 – 400 $\mu$ J
Pulse duration	180 – 300 fs

## ENVIRONMENTAL & UTILITY REQUIREMENTS

Operating temperature <sup>6)</sup>	19 – 25 $^{\circ}$ C (air conditioning recommended)
Relative humidity <sup>6)</sup>	20 – 70% (non-condensing)
Electrical requirements	n/a <sup>7)</sup>

<sup>1)</sup> In case of fixed wavelength (FW), a single wavelength can be selected from the signal or idler range. The signal may have an accessible idler pair, and vice versa.

<sup>2)</sup> I-OPA-F broad-bandwidth pulses are compressed externally. Typical pulse duration before compression: 120 – 250 fs, after compression: 25 – 70 fs @ 650 – 900 nm, 40 – 100 fs @ 1200 – 2000 nm.

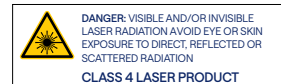
<sup>3)</sup> Output pulse duration depends on selected wavelength and pump laser pulse duration.

<sup>4)</sup> Expressed as normalized root mean squared deviation (NRMSD).

<sup>5)</sup> Conversion efficiency is 1.2% at peak; specified as a percentage of pump power.

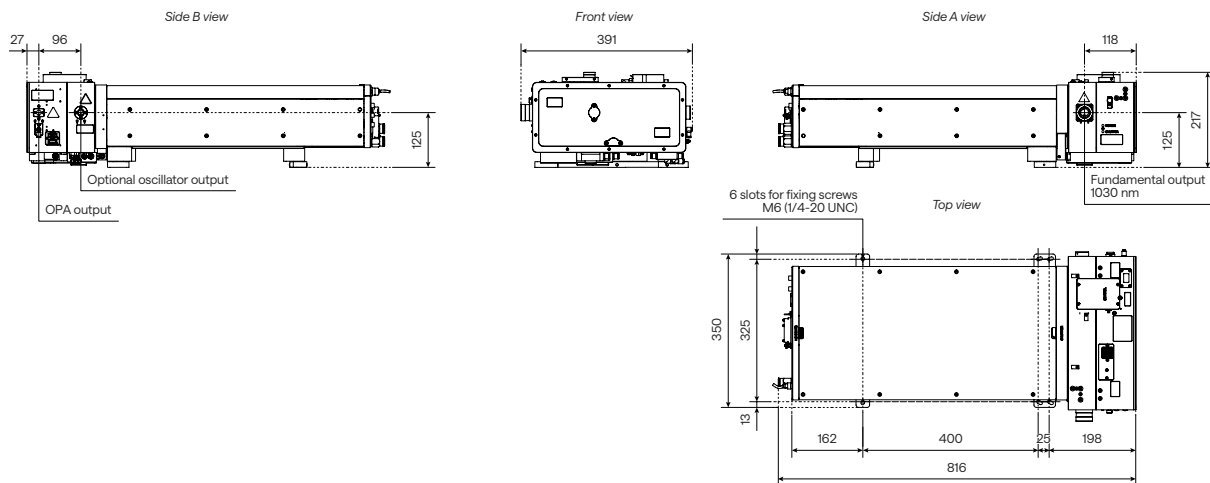
<sup>6)</sup> Specifications are guaranteed for a maximum temperature variation of  $\pm$  1  $^{\circ}$ C and humidity variation of  $\pm$  10%.

<sup>7)</sup> I-OPA is powered by the same electrical source as the pump laser. Thus, refer to the pump laser electrical requirements.

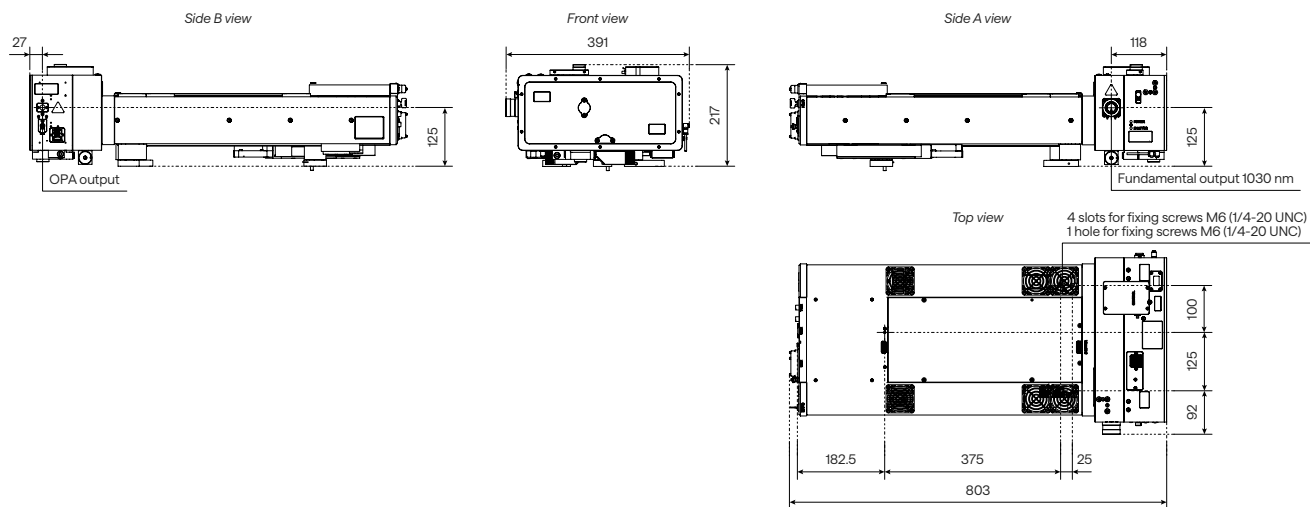


# Drawings

## CARBIDE-CB3 with I-OPA-HP drawing and output ports



## CARBIDE-CB5 with I-OPA-HP drawing and output ports



## PHAROS-PH2 with I-OPA-HP drawing and output ports

