

# ORPHEUS | ONE

## Mid-IR Collinear Optical Parametric Amplifier

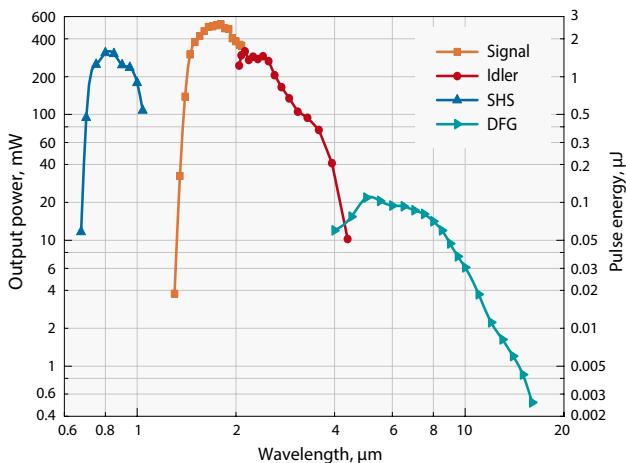
### FEATURES

- Twice the output in mid-IR
- Broad-bandwidth  $>200 \text{ cm}^{-1}$  configuration available
- 1350 – 16000 nm tunable wavelength
- Single-pulse – 1 MHz repetition rate
- Up to 40 W pump power
- Up to 2 mJ pump energy
- Computer-controlled

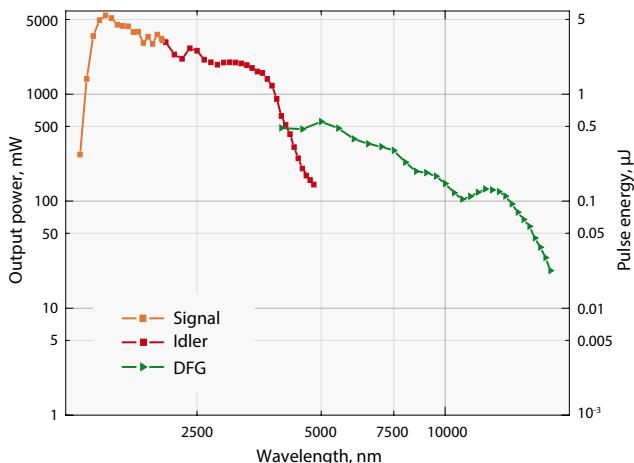


ORPHEUS-ONE is a collinear optical parametric amplifier (OPA) of white-light continuum pumped by femtosecond Ytterbium based laser amplifiers and focused on mid-infrared wavelengths generation.

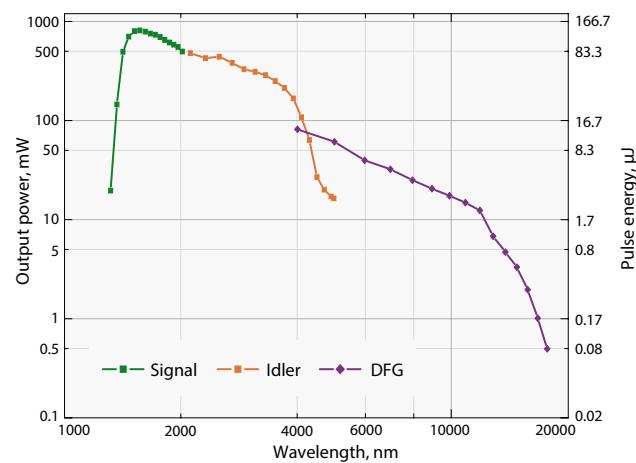
In comparison to standard ORPHEUS + DFG configuration, the ORPHEUS-ONE provides higher conversion efficiency into the infrared range. The scheme used in ORPHEUS-ONE can generate  $>150 \text{ cm}^{-1}$  bandwidth pulse when OPA is configured for broad-bandwidth amplification.



Typical tuning curve of **ORPHEUS-ONE**.  
Pump: 6 W, 30  $\mu\text{J}$ , 200 kHz



Typical tuning curve of **ORPHEUS-ONE-HP**.  
Pump: 40 W, 40  $\mu\text{J}$ , 1000 kHz



Typical tuning curve of **ORPHEUS-ONE-HE**.  
Pump: 6 W, 1 mJ, 6 kHz

For custom tuning curve value visit <http://toolbox.lightcon.com/tools/tuningcurves/>

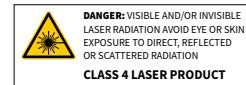
## SPECIFICATIONS

Model	ORPHEUS-ONE	ORPHEUS-ONE-HP	ORPHEUS-ONE-HP (BB)	ORPHEUS-ONE-HE
<b>OUTPUT FROM ORPHEUS-ONE (1350 – 4500 nm)</b>				
Tuning range		1350 – 2060 nm (Signal) 2060 – 4500 nm (Idler)		
Maximum pump power	8 W	40 W		10 W
Pump energy	12 – 400 µJ	12 – 400 µJ		400 – 2000 µJ
Conversion efficiency at peak of tuning curve, signal and idler combined <sup>1)</sup>		> 14 %, pump 30 – 2000 µJ > 10 %, pump 12 – 30 µJ		
Pulse bandwidth	60 – 120 cm <sup>-1</sup> @ 1450 – 2000 nm	60 – 150 cm <sup>-1</sup> @ 1450 – 2000 nm	> 300 cm <sup>-1</sup> @ 1400 nm 60 – 140 cm <sup>-1</sup> @ 1550 – 2000 nm	60 – 150 cm <sup>-1</sup> @ 1450 – 2000 nm
Long term power stability (8 h)		< 2 % @ 1550 nm		
Pulse energy stability (1 min)		< 2 % @ 1550 nm		
Features	Cost-effective	High power		High energy

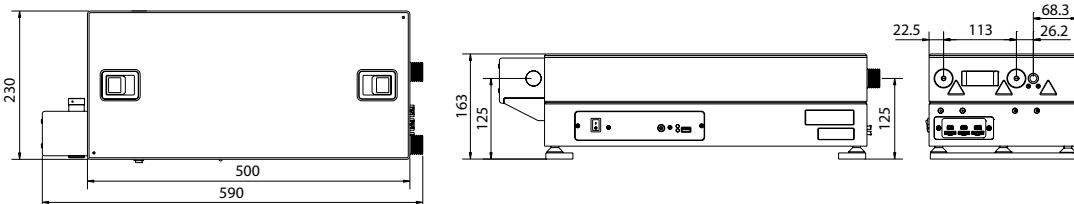
## WAVELENGTH EXTENSIONS

Tuning range (SHS)	720 – 970 nm	n/a	720 – 970 nm	
Pulse energy conversion efficiency <sup>1)</sup>	> 2 % at peak		> 2 % at peak	
Pulse bandwidth	70 – 150 cm <sup>-1</sup> @ 800 – 970 nm		70 – 150 cm <sup>-1</sup> @ 800 – 970 nm	
Tuning range (DFG2)	4500 – 16000 nm (based on signal and idler calibration)			
Pulse energy conversion efficiency <sup>1)</sup>	> 0.3 % @ 10000 nm, when pump energy 30 – 2000 µJ > 0.2 % @ 10000 nm, when pump energy 12 – 30 µJ			
Pulse bandwidth	60 – 150 cm <sup>-1</sup> @ 5000 – 8000 nm	60 – 120 cm <sup>-1</sup> @ 5000 – 8000 nm		

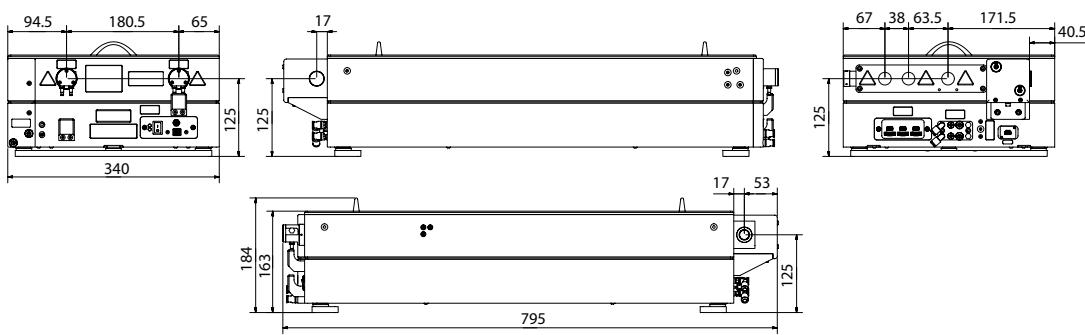
<sup>1)</sup> Conversion efficiency specified as the percentage of input power to ORPHEUS-ONE.



## OUTLINE DRAWINGS



ORPHEUS-ONE outline drawings



ORPHEUS-ONE-HP and ORPHEUS-HP outline drawings