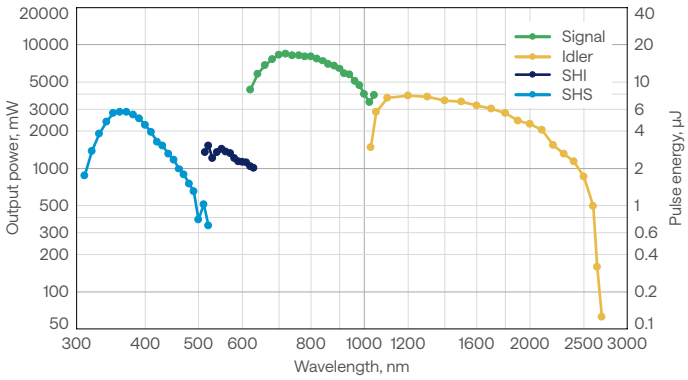
ORPHEUS

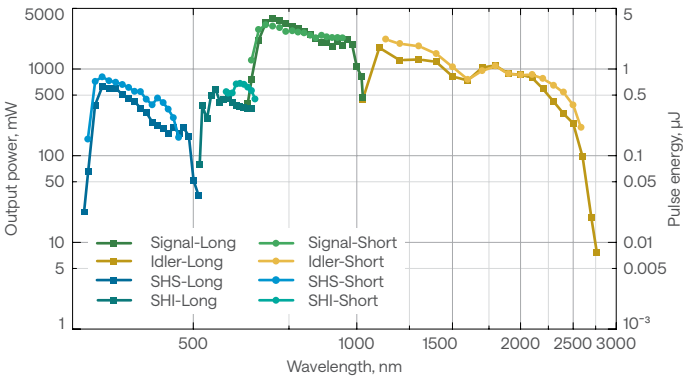
Optical Parametric Amplifier

- Continuous tunability from UV to MIR, 190 – 16 000 nm
- Single-shot – 2 MHz repetition rate
- Up to 80 W pump power
- Up to 0.4 mJ pump pulse energy

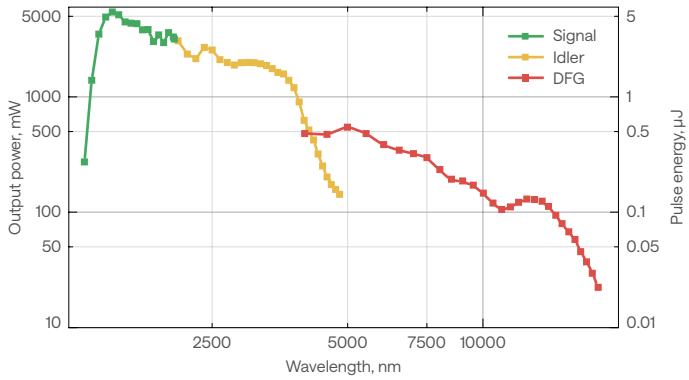
ORPHEUS typical tuning curves
Pump: 80 W, 160 µJ, 500 kHz



ORPHEUS-F typical tuning curves
Pump: 40 W, 40 µJ, 1000 kHz



ORPHEUS-ONE typical tuning curves
Pump: 40 W, 40 µJ, 1000 kHz



Optics Toolbox

Specifications

Model	ORPHEUS		ORPHEUS-F	ORPHEUS-ONE
Tuning range [1]	630 – 1030 nm (signal) 1030 – 2600 nm (idler)		650 – 900 nm (signal) 1200 – 2500 nm (idler) [2]	1400 – 2000 nm (signal) 2100 – 4200 nm (idler)
Pump power	Up to 80 W			
Repetition rate	Up to 2 MHz			
Pump pulse energy [3]	8 – 20 µJ	20 – 400 µJ	10 – 400 µJ	12 – 400 µJ
Conversion efficiency	> 4.5% @ peak (signal) > 2% @ peak (idler)	> 9% @ peak (signal) > 4% @ peak (idler)	> 7% @ 700 nm [4]	> 9%, 30 – 40 µJ pump @ 1550 nm > 6%, 12 – 30 µJ pump @ 1550 nm
Pulse duration	120 – 400 fs		< 55 fs @ 800 – 900 nm [5] < 70 fs @ 650 – 800 nm [5] < 100 fs @ 1200 – 2000 nm [5]	100 – 300 fs
Spectral bandwidth	60 – 220 cm^{-1}		200 – 750 cm^{-1} @ 650 – 900 nm	50 – 150 cm^{-1} @ 1450 – 2000 nm
Long-term power stability, 8 h [6]	< 2% @ 800 nm			< 2% @ 1550 nm
Pulse-to-pulse energy stability, 1 min [6]	< 2% @ 800 nm			< 2% @ 1550 nm
Compressor transmission	n/a		65% @ 650 – 900 nm 80% @ 1200 – 2000 nm	n/a

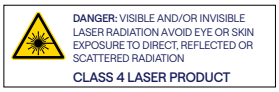
WAVELENGTH EXTENSIONS

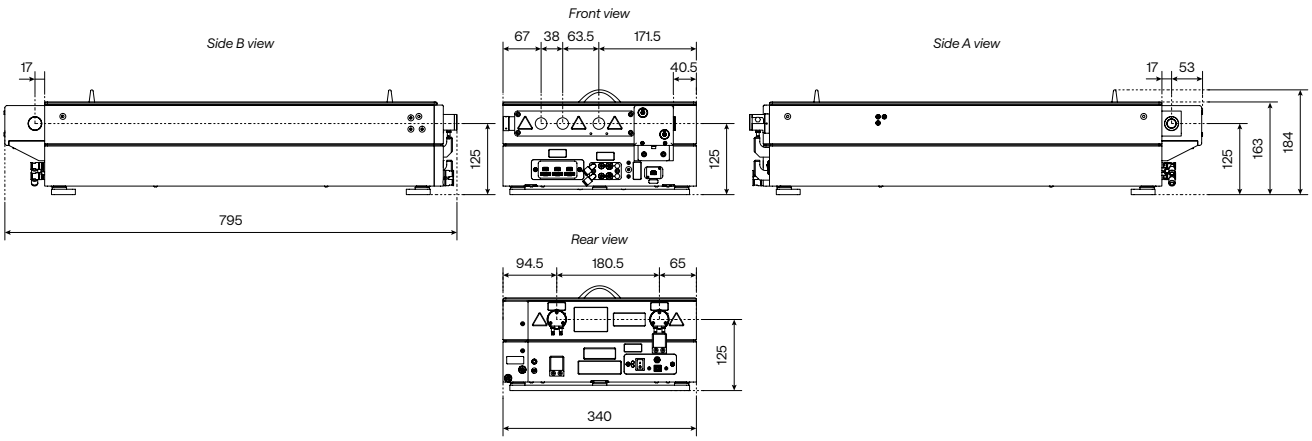
DUV	n/a	190 – 215 nm: > 0.3% @ 200 nm [7]	n/a	n/a
THS	210 – 315 nm: > 0.4% @ 250 nm [8]	210 – 315 nm: > 0.8% @ 250 nm [8]	n/a	n/a
SHS, SHI	315 – 630 nm: > 1.2% @ 350 nm	315 – 630 nm: > 2.4% @ 350 nm	325 – 450 nm: [9] > 1% @ peak 600 – 650 nm: [9] 0.5% @ peak	n/a
DFG	2200 – 4200 nm: > 1.5% @ 3000 nm	2200 – 4200 nm: > 3% @ 3000 nm	n/a	4000 – 16 000 nm: > 0.3% @ 10 000 nm, 30 – 2000 µJ pump > 0.2% @ 10 000 nm, 12 – 30 µJ pump
	4000 – 16 000 nm: > 0.1% @ 10 000 nm	4000 – 16 000 nm: > 0.2% @ 10 000 nm	n/a	

PUPM LASER, ENVIRONMENTAL & UTILITY REQUIREMENTS

Refer to www.lightcon.com

[1] *Dual output model (-TWINS) available, providing optically synchronized and simultaneous outputs.*
[2] *Long pulse mode is optional, providing 650 – 1010 nm (signal) and 1050 – 2500 nm (idler) range at < 290 fs.*
[3] *Pump pulse energy up to 5 mJ applicable, refer to ORPHEUS-HE.*
[4] *Specified before pulse compressor. Conversion efficiency at peak is 10% for signal and idler combined.*
[5] *After pulse compression. Typical pulse duration before compression: 120 – 250 fs, after compression: 25 – 70 fs @ 650 – 920 nm, 40 – 100 fs @ 1200 – 2000 nm.*
[6] *Expressed as normalized root mean squared deviation (NRMSD).*
[7] *DUV conversion efficiency is specified for pump power up to 10 W and frequencies up to 200 kHz. In the case of higher pump power, conversion efficiency decreases. The maximum output power is 40 mW at 200 nm.*
[8] *For > 15 µJ pump pulse energy.*
[9] *Maximum output power of 400 mW.*



Drawings

ORPHEUS