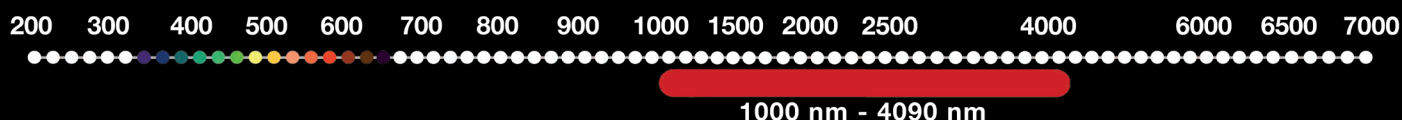


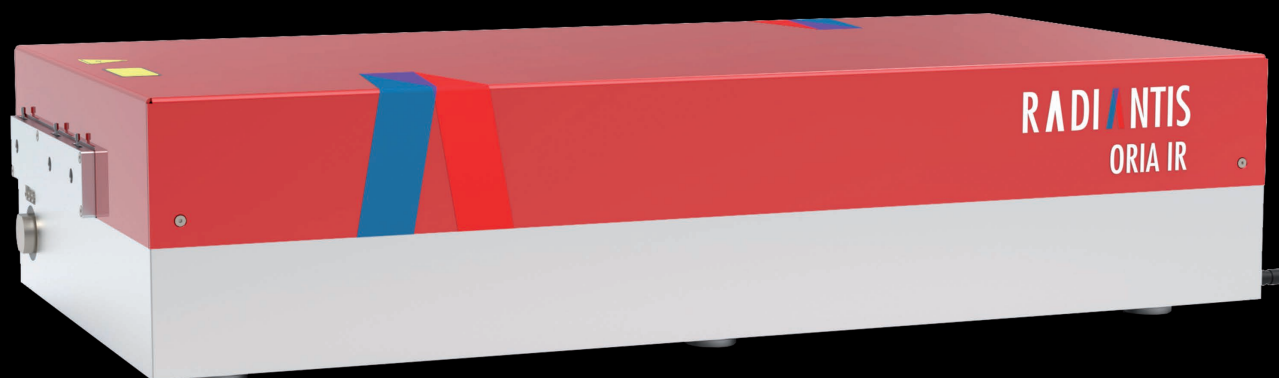
## IMPROVED PRODUCT

# Femtosecond IR OPO for Ti:Sapphire Oscillators

Hands-Free Optical Parametric Oscillator Tunable Across 1000 - 4090 nm  
(2444 - 10000  $\text{cm}^{-1}$ )



## ORIA IR



### KEY FEATURES

- Broad tuning across 1000 - 1580 nm (6329 - 10000  $\text{cm}^{-1}$ ) and 1696 - 4090 nm (2444 - 5890  $\text{cm}^{-1}$ ).
- Simultaneous Outputs: All. 3) with limited range
- Average Power: >1 W at peak of the range
- Pulse Duration: Signal 160 fs typ.
- Idler 96 fs typ.
- Repetition Rate: 80 MHz
- External SHG Extension Unit **ORIA VIS**

### APPLICATIONS

- Linear & Non-Linear Spectroscopy & Microscopy. (SHG, THG, Two-Photon, Multiphoton)
- Plasmonics.
- Pump-Probe Spectroscopy.
- Raman Spectroscopy & Microscopy. (CARS, SRS)
- Time-Resolved Spectroscopy & Microscopy. (FLIM, TR-FRET, TCSPC)



## Description

Sealed, fully automated femtosecond optical parametric oscillator (OPO) delivering broad wavelength coverage from 1000 to 4090 nm (2444 to 10000 cm<sup>-1</sup>), with unmatched average power exceeding 1 W at the peak of its range. Designed for seamless integration, it is compatible with standard femtosecond Ti:Sapphire oscillators operating at MHz repetition rates.

Engineered for effortless pick-and-place installation, the ORIA IR features integrated, easily accessible alignment tools, simplifying both installation and alignment with the Ti:Sapphire pump. Its virtually maintenance-free operation and fully automated wavelength tuning with self-calibration maximize reliability and ensure effective operation and ease of use. It also incorporates comprehensive humidity control (both passive and active), ensuring optimal performance for low-noise measurements.

To ensure shortest pulse durations across the spectral range, a dynamic dispersion compensation module is incorporated within the ORIA IR which enables independent control of the dispersion for every wavelength.

A robust mechanical design and an efficient water-cooling system ensure high peak-to-peak power stability and excellent beam pointing across the complete spectral range, making the ORIA IR an ideal tool for advanced ultrafast spectroscopy and nonlinear microscopy applications.

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

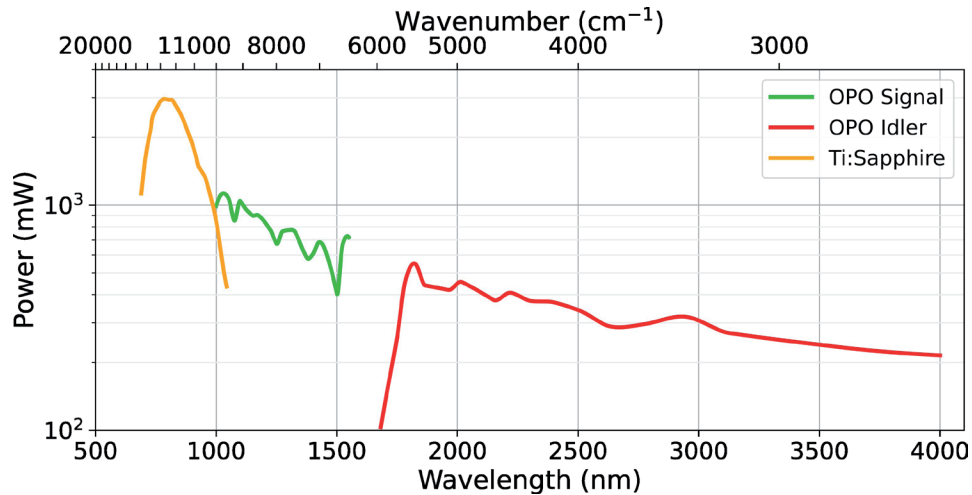
Pumped by mode-locked Ti:Sapphire laser, at 2.8 Watts, 80 MHz, 90 fs

Output Characteristics	ORIA IR S	ORIA IR I	ORIA IR XT
Signal tuning range <sup>(2)</sup>	1000 – 1580 nm (6329 - 10000 cm <sup>-1</sup> )	n/a	1000 – 1580 nm (6329 - 10000 cm <sup>-1</sup> )
Idler tuning range <sup>(2)</sup>	n/a	1696 – 4090 nm (2444 - 5890 cm <sup>-1</sup> )	1696 – 4090 nm (2444 - 5890 cm <sup>-1</sup> )
Pump tuning range <sup>(2)(3)</sup>	720 – 810 nm (12195 - 14084 cm <sup>-1</sup> )	720 – 810 nm (12195 - 14084 cm <sup>-1</sup> )	720 – 810 nm (12195 - 14084 cm <sup>-1</sup> )
Signal output power <sup>(4)</sup>	> 1 W	n/a	> 1 W
Idler output power <sup>(4)</sup>	n/a	> 350 mW	> 350 mW
Signal pulse width	160 fs typ.	n/a	160 fs typ.
Idler pulse width	n/a	96 fs typ.	96 fs typ.
Beam diameter @ 1300 nm	1.4 mm +/- 10%	n/a	1.4 mm +/- 10%
Beam divergence	< 1 mrad	< 1 mrad	< 1 mrad
Signal beam displacement with wavelength	< 600 microns at < 40cm from output	n/a	< 600 microns at < 40cm from output
Signal beam pointing with wavelength	< 300 μrad	n/a	< 300 μrad
Spatial mode	TEM <sub>00</sub> M <sup>2</sup> ≤ 1.2	TEM <sub>00</sub> M <sup>2</sup> ≤ 1.3	TEM <sub>00</sub> M <sup>2</sup> ≤ 1.2 (signal) TEM <sub>00</sub> M <sup>2</sup> ≤ 1.3 (idler)
Signal noise at 1300 nm	< 1% rms	< 1% rms	< 1% rms
Output ports	1) 100% signal and idler with no pump bypass. 2) Partial signal and idler with 20% pump bypass. 3) 100% pump bypass		
Power stability (peak to peak)	<1 %	<1 %	<1 %
Polarization	Horizontal (>100:1)	Horizontal (>100:1)	Horizontal (>100:1)
Repetition rate	80 MHz	80 MHz	80 MHz
Size (W x L x H)	725 x 365 x 170.5 mm (28.54 x 14.37 x 6.71 inch)		

Notes: (1) Specifications are subject to change without notice. (2) Extended range available upon request. (3) Pump tuning range simultaneous with signal and idler tuning range. (4) At peak of pump and OPO signal tuning range.



## ORIA IR Typical Tuning Curves



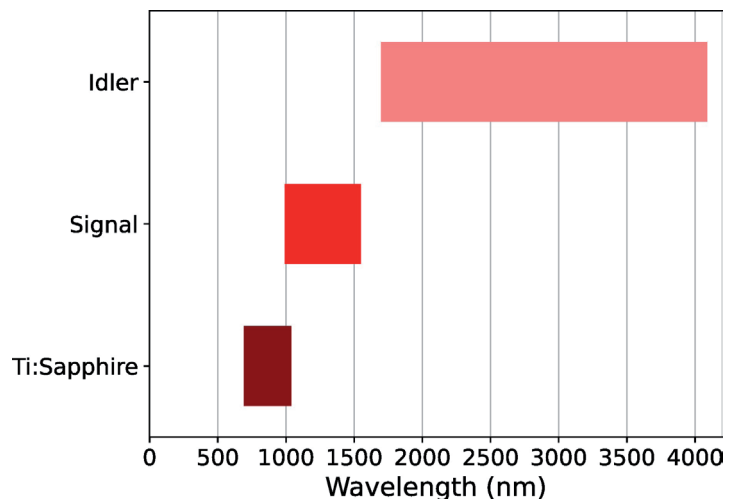
## ORIA IR XT Wavelength Coverage

### Output Ports

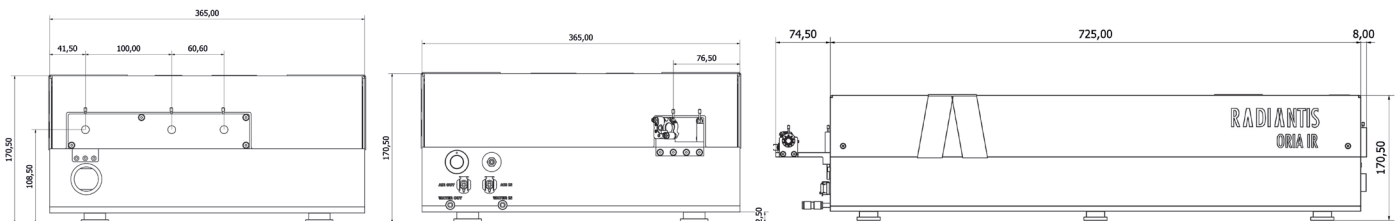
The ORIA IR XT includes three output ports which deliver

- 1) The Signal 1000 - 1580 nm ( $6329 - 10000 \text{ cm}^{-1}$ )
- 2) The Pump (typically) 680 - 1080 nm ( $9259 - 14705 \text{ cm}^{-1}$ )
- 3) The Idler 1696 - 4090 nm ( $2444 - 5890 \text{ cm}^{-1}$ )

An important feature of the ORIA IR XT is the incorporated Ti:Sapphire pump bypass which enables the selection of 100% of the pump (with no signal and idler power), a percentage of the pump (simultaneously with partial signal and idler power) or 0% of the pump (with full signal and idler power).



## Dimensions

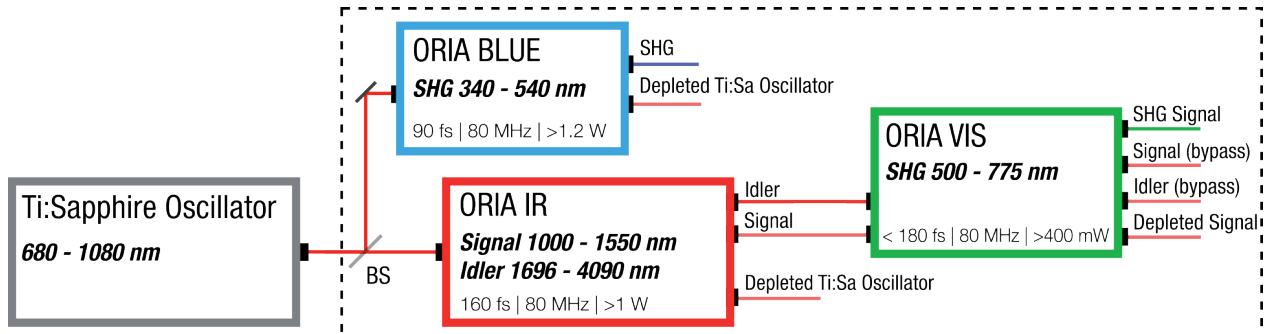


Notes: Dimensions in mm



## ORIA Series

Ti:Sapphire Wavelength Extensions



- Broad wavelength tuning across 340 - 4090 nm
- (2444 - 29411 cm<sup>-1</sup>)
- Fully automated, hands-free tuning for simplified use
- Simultaneous pump, signal and idler outputs

## Related Products

### ORIA BLUE

Femtosecond & Picosecond Second Harmonic Generator



Key Features:

- Output Ports:
  - 1) SHG: 340 - 540 nm (18518 - 29411 cm<sup>-1</sup>)
  - 2) Undepleted Pump: 680 - 1080 nm (9259 - 14705 cm<sup>-1</sup>)
- Simultaneous Outputs: All
- Average Power: >1.2 W
- Pulse Duration Models:
  - - Femtosecond <180 fs - Picosecond <5 ps
- Repetition Rate: 80 MHz

### ORIA VIS

Femtosecond Second Harmonic Generator



Key Features:

- Output Ports:
  - 1) SHG: 495 - 775 nm (12903 - 20202 cm<sup>-1</sup>)
  - 2) Pump (OPO) Bypass Signal: 1000 - 1580 nm (6329 - 10000 cm<sup>-1</sup>)
  - 3) Pump (OPO) Bypass Idler: 1696 - 4090 nm (2444 - 5890 cm<sup>-1</sup>)
  - 4) Undepleted Pump (OPO): 1000 - 1580 nm (6329 - 10000 cm<sup>-1</sup>)
- Simultaneous Outputs: 1), 3) and 4)
- Average Power: >400 mW
- Pulse Duration: <180 fs
- Repetition Rate: 80 MHz