

OPO Series

High Repetition Rate OPO Diode Pumped Lasers



Photonic Industries' OPO Series of novel diode-pumped, intra-cavity frequency conversion, Q-switched Optical Parametric Oscillator (OPO) represents the FIRST commercially available OPOs to produce high pulse energy pulses at a high repetition rates of up to 50 kHz. The DS OPO produce stable peak power output of up to 300 kWatts with milli-Joule levels of energy per pulse, at kHz repetition rates in a compact, industry rugged design. It can also produce 10 Watts of average power at a repetition rate of approximately 10 kHz. These lasers are produced with either a fixed wavelength, or continuously tunable wavelength in the region of 1.5 μm to 3.4 μm . Lower power air-cooled versions are also available.

Harmonic versions available to provide any fixed wavelength selectable between 1 μm and 750nm or 666nm to 255nm.

Features

- Diode Pumped Technology
- Patented OPO Generation Technology
- TEM₀₀ Beam
- Pulse Rates from Single Shot to 50 kHz
- mJ Pulse Energy at kHz Repetition Rates
- RS232 Computer Control

Applications

- Chemical Detection
- Eye-Safe Illumination
- NIR Spectroscopy
- MID-IR Spectroscopy
- LIDAR
- IR-MALDI
- Rangefinder, Designator
- Material Processing Research & Production
- Biophotonic Research



Photonic Industries
International, Inc.

Photonics Industries OPO

The unique features of Photonics Industries' OPOs come from the patented and patent pending intra-cavity frequency conversion technology. Conventional OPO systems use low repetition rate lasers, typically limited to 100Hz, to pump the OPO. Photonics Industries integrates our OPOs within the Q-switched based oscillator. This design produces kilohertz repetition rates, nominal 10ns pulse durations and milli-Joule levels of pulse energy in a single, compact, industry reliable package. Depending on the requirement of the repetition rate, the OPO can be based on Nd:YLF, Nd:YAG or Nd:YVO₄ lasers. Nd:YLF is ideal for low kHz repetition rates, Nd:YVO₄ is for high repetition rates such as 20kHz or higher, and Nd:YAG up to approximately 10kHz. Photonics Industries technology gives a single mode TEM₀₀ (M²~1.3) laser output that is more efficient than other eye safe wavelength laser technologies (such as Er based and Raman Shifting).

DP-OPO Series

Photonics Industries' DP Series OPOs allows you to choose a fixed wavelength in the eye safe wavelength range of ~1.516μ up to 2μm. Pulse energies at this eye safe wavelength up to 4mJ in a TEM₀₀ mode. Other wavelengths in the 1.5 to 2um and 2.2 to 3.4um range are also available.

Model	DP10-OPO	
wavelength	1.5 to 2μm	2.2 to 3.4μm
Pulse Energy* @ 100Hz	4mJ	1mJ
Pulse Width @ 100Hz (nominal)	6 to 10ns	
Beam Mode	TEM ₀₀ for 1.5-2μm	
Beam Diameter @ exit (nominal)	0.7 to 1mm	
Pulse to Pulse Stability	±3% rms	
Repetition Rate	100Hz	

Model	DP10H-OPO		DP20H-OPO	
wavelength	1.5 to 2μm	2.2 to 3.4μm	1.5 to 2μm	2.2 to 3.4μm
Pulse Energy *@ 1kHz	2mJ	0.5mJ	4mJ	1mJ
Pulse Width @ 1kHz (nominal)	6 to 10ns			
Beam Mode	TEM ₀₀ for 1.5-2μm			
Beam Diameter @ exit (nominal)	0.7 to 1mm			
Pulse to Pulse Stability	± 3% rms			
Repetition Rate	1kHz			

* Pulse energy specified at peak wavelength. For higher pulse energy please contact the factory.

Laser Head Dimensions	7.5 in x 4.1 [†] in x 24 in
Controller Dimensions	19 in x 3.5 (2U) in x 10.25 in
Electrical Requirement	110 VAC 20 Amps or 220 VAC 10 Amps @ 50/60 Hz
Ambient Temperature	15 to 30°C(59 to 86°F) Operating Range
Umbilical Length	3 meter (10 feet)

[†]4.1" includes height of desiccant



DS-OPO Series

Photonics Industries' DS Series OPOs are produced with either a fixed wavelength, or a narrowly tunable range around that fixed wavelength in the region of 1.5 to 2.0 μ m in the signal or 2.2 to 3.4 μ m.

Model	DS10-OPO		DS20-OPO	
Wavelength	1.5 to 2 μ m	2.2 to 3.4 μ m	1.5 to 2 μ m	2.2 to 3.4 μ m
Average Power* @ 1kHz	1W	300mW	4W	1W
Pulse Width @ 1kHz (nominal)	10-15ns			
Beam Mode	TEM ₀₀			
Beam Diameter @ exit (nominal)	0.7 to 1mm			
Pulse to Pulse Stability	+/- 3% rms			
Repetition Rate	range depending on gain medium (1-5kHz, 4-10kHz, 10-20kHz)			
* Power specified at peak wavelength. For higher power please contact the factory.				
Laser Head Dimensions	7.5 in x 4.1 \dagger in x 24 in			
Laser Controller	19 in x 3.5 (2U) in x 10.25 in			
Electrical Requirement	110 VAC 20 Amps or 220 VAC 10 Amps @ 50/60 Hz			
Ambient Temperature	15 to 30°C(59 to 86°F) Operating Range			
Umbilical Length	3 meter (10 feet)			

DC-OPO Series

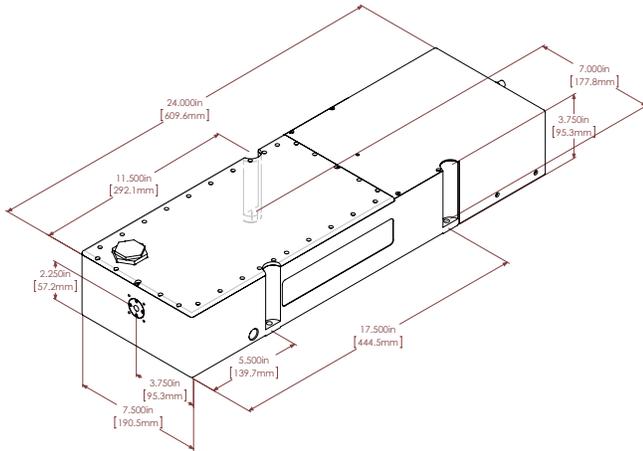
Photonics Industries' DC Series OPO is an air-cooled version of Photonics Industries' Optical Parametric Oscillator which can produce pulse rates at a high repetition of up to 50kHz. The DC OPOs produce peak power output of up to 30kWatts, with milli-Joule levels of energy-per-pulse, at low repetition rates, or up to 0.5Watts average power. These lasers are produced with a fixed wavelength selected in the 1.5 μ m to 3.4 μ m wavelength range.

Model	DC150-OPO	
Wavelength	1.5 to 2 μ m	2.2 to 3.4 μ m
Average Power* @ 1kHz	300mW	75mW
Pulse Width @ 1kHz (nominal)	10 to 15ns	
Beam Mode	TEM ₀₀	
Beam Diameter @ exit (nominal)	0.7 to 1mm	
Pulse to Pulse Stability	+/- 3% rms	
Repetition Rate	range depending on gain medium (1-5kHz, 4-10kHz, 10-20kHz)	
cooling	air-cooled	
* Power specified at peak wavelength. For higher power please contact the factory.		
Laser Head Dimensions	4 in x 4.75 in x 7.8 in	
Laser Controller Dimensions	11.5 in x 3.5 in x 9.5 in	
Electrical Requirement	110 VAC 20 Amps or 220 VAC 10 Amps @ 50/60 Hz	
Ambient Temperature	15 to 30°C (59 to 86°F) Operating Range	
Umbilical Length	3 meter (10 feet)	

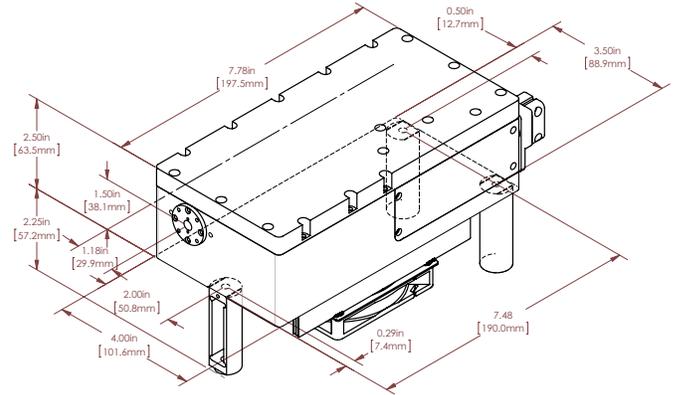


Dimensional Drawings

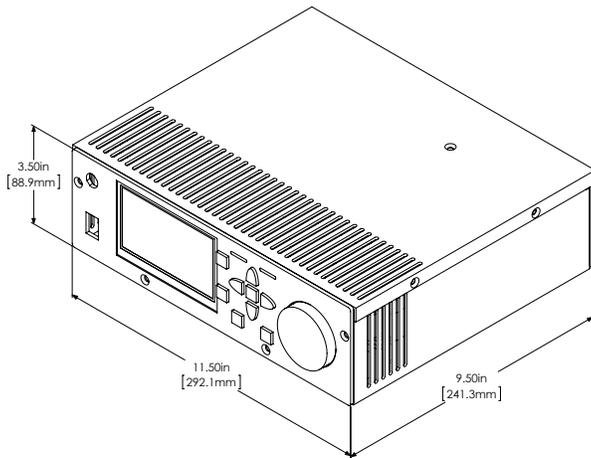
DS and DP OPO Laser Head



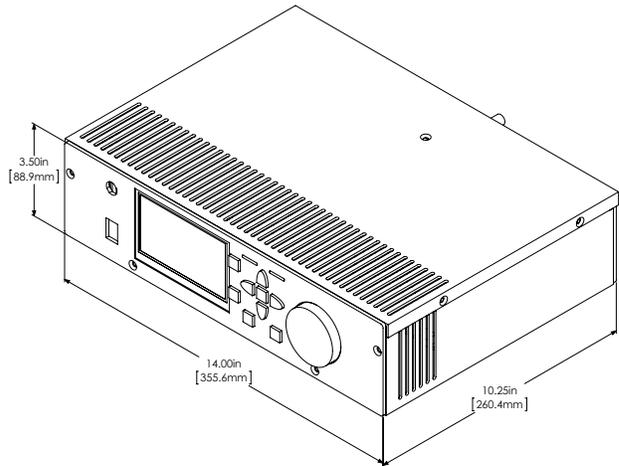
DC OPO Laser Head



DC Controller



DS and DP OPO Controller



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Due to Photonics Industries' commitment to continuous product improvement, specifications and drawings are subject to change without notice.

Photonics Industries conforms to provisions of US 21 CFR 1040.10 & 1040.11 and is made under one or more US patents listed below:
7,346,092; 7,082,149; 7,079,557; 6,999,483; 6,980,574; 6,961,355; 6,842,293; 6,762,405; 6,690,692; 6,587,487; 6,584,487; 6,366,596;
6,327,281; 6,356,578; 6,246,707; 6,229,839; 6,108,356; 6,061,370; 6,028,620; 5,936,938; 5,898,717 and Pending Patents

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