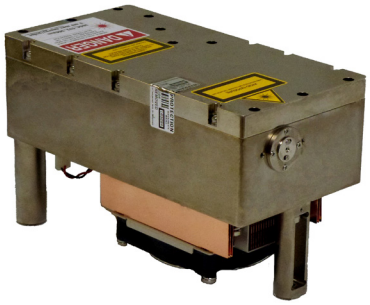
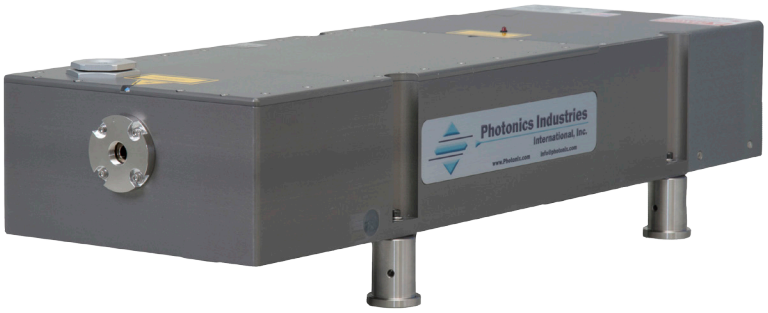
OPO Series

High Repetition Rate OPO Diode Pumped Lasers





Photonics 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 bewtween 1um and 750nm or 666nm to 255nm.

Features

- Diode Pumped Technology
- Patented OPO Generation Technology
- TEM_{00} 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

Photonics Industries
International, Inc.

1800 Ocean Ave, Ronkonkoma, NY, 11779 Phone: 631-218-2240 Fax: 631-218-2275
E-Mail: info@photonix.com Website: www.Photonix.com

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:YVO_4 lasers. Nd:YLF is ideal for low kHz repetition rates, Nd:YVO_4 is for high repetition rates such as 20kHz or higher, and Nd:YAG up to approximately 10kHz. Photonics Industries technology gives a single mode TEM_{00} (M^2~1.3) 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 TEM_{00} 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)

[2] 4.1" includes height of desiccant

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DS-OPO Series

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

Model	**DS10-OPO**		**DS20-OPO**	
Wavelength	1.5 to 2um	2.2 to 3.4um	1.5 to 2um	2.2 to 3.4um
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† 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 1.5µm to 3.4µm wavelength range.

Model	**DC150-OPO**	
Wavelength	1.5 to 2um	2.2 to 3.4um
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)

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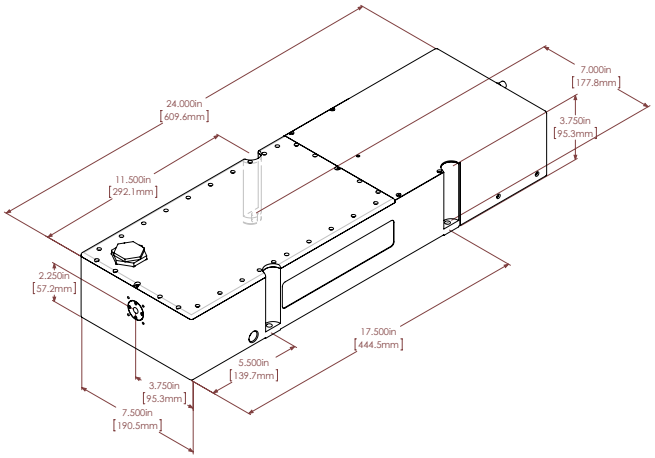
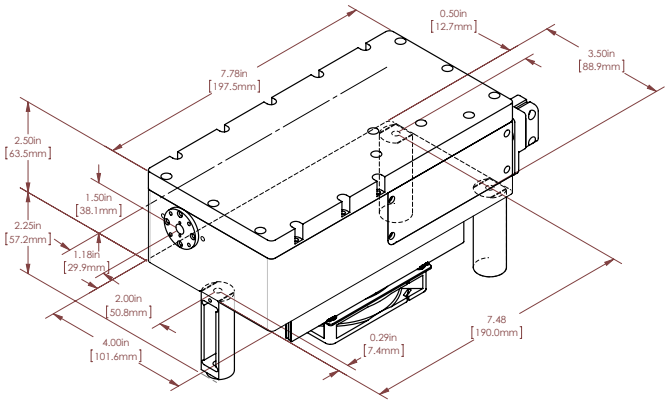
Dimensional Drawings

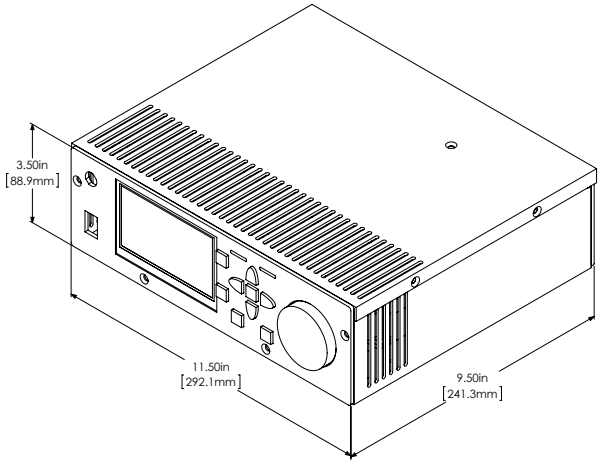
DS and DP OPO Laser Head



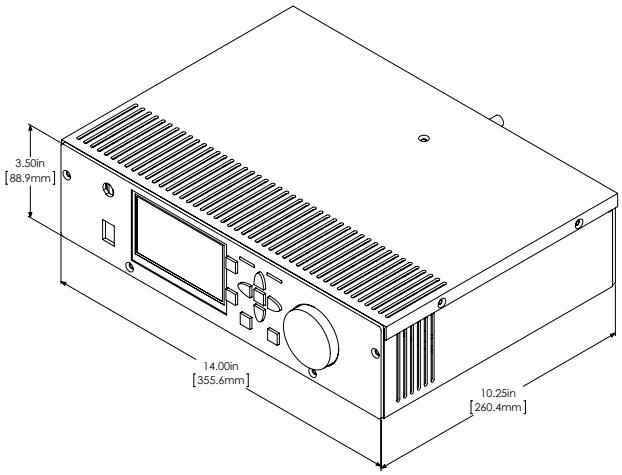
DC OPO Laser Head



DC Controller



DS and DP OPO Controller



US Main Office
1800 Ocean Ave, Ronkonkoma, NY, 11779
Phone: 631-218-2240
Fax: 631-218-2275
E-Mail: info@photonix.com
Website: www.Photonix.com

Korea Office
703 Sogong Bldg, 352-5 Gugal-Dong
Giheung-gu, Yongin City
Gyeonggi-Do, 446-569 Korea
Tel: +82-31-284-9520
Fax: +82-31-284-9521
Contact: Sang-Moon Kim
Email: kimsm@photonix.com

Japan Office
Rokusan Bldg. 9F, Funamachi 7
Shinjuku-ku, Tokyo 160-0006, Japan
Tel: +81 03 -6423-1805
Fax: +81 03-6423-1806
Email: kseita@photonix.co.jp

China Office
No 2 Rui'en Lane, Xingpu Rd.
Suzhou Industrial Park
Suzhou 215021, P. R. China
Tel: +86-512-6763 5761
Fax: +86-512-6763 5762
Email: china@photonix.com
Website: http://www.photonix.com.cn

Taiwan Office
18F-3, No.77,Sec.1,Xintai 5th Rd.
Xizhi Dist., New Taipei City 221, Taiwan
Tel:886-2-26983620
Fax: 886-2-26983630
Contact: Brett Chiang
Email: bchiang@photonix.com

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

Photonics Industries International, Inc.

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Rayture Systems

レイチャーシステムズ株式会社
〒160-0006 東京都新宿区舟町７ ロクサンビル７Ｆ
TEL：03-3351-0717 FAX：03-3351-6771
URL：http://www.rayture-sys.co.jp
E-mail : laser@rayture-sys.co.jp