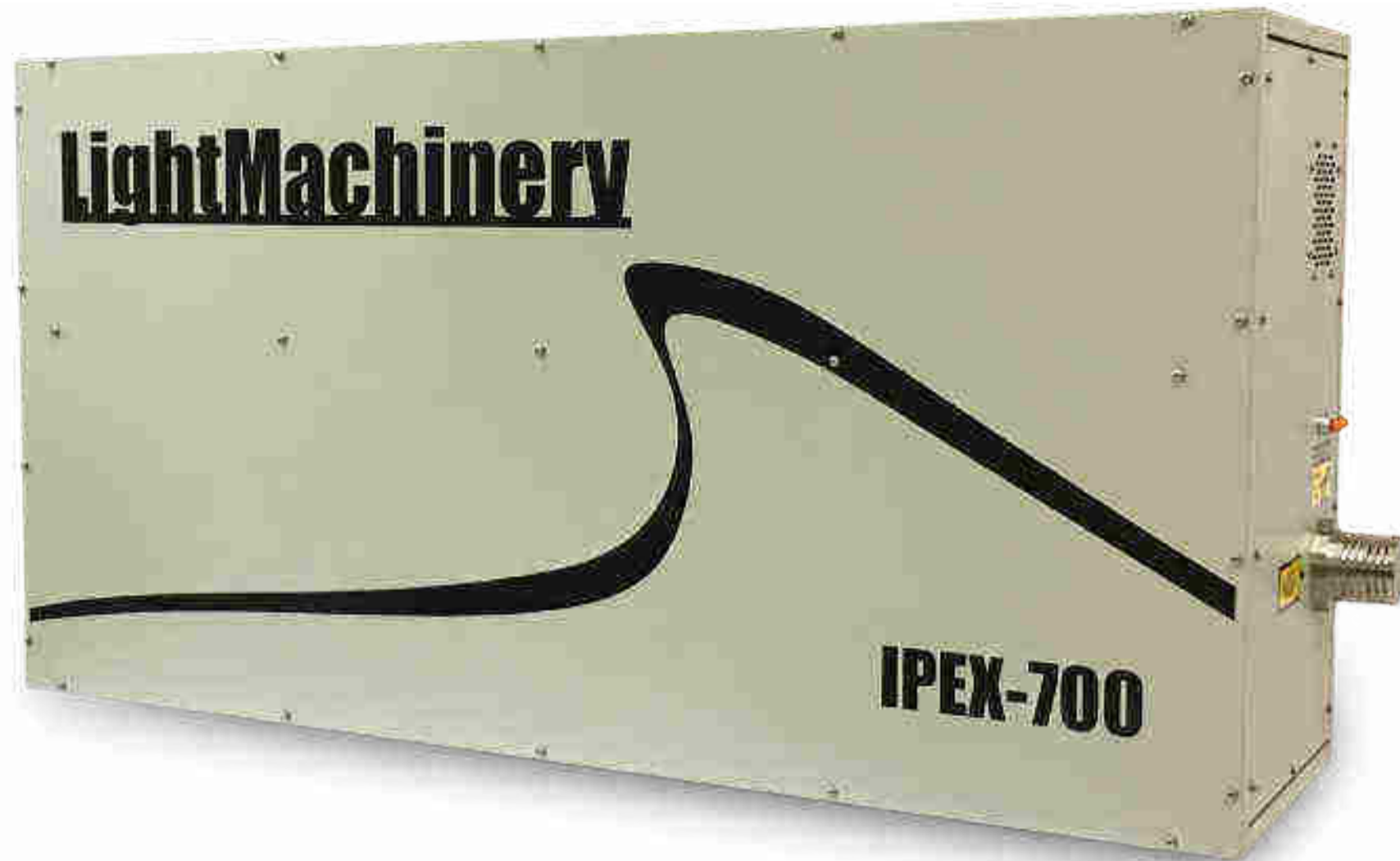


LASER PRODUCTS



Specialise Instruments Marketing Company,
1201,DS Buisness Galleria,L.B.S. Road,
Kanjurmarg (W).Mumbai – 400 078.
Tel: 91-022-68551200 -Extn - 213.
Web: www.simc.co.in



IPEX-700

A better excimer laser

- **Medium-power excimer lasers** for Industrial, R&D and Scientific applications (including Pulsed Laser Deposition), based on LightMachinery's best-selling high-power IpeX-800 Series industrial excimer lasers
- Now with **exciPure™** technology for ultimate gas lifetimes and lowest cost of operation
- Simple, direct control from a new-generation tablet-based user interface
- User-convenient features, optional air-cooling to 25 Hz, single-phase electrical power, small footprint, single-sided service access, **EasyClean™** automated optics seals to retain gas fill and reduce downtime during optics maintenance
- Excellent beam uniformity, pulse-to-pulse energy stability and short pulse duration
- High-stability optics mounts for ultimate beam pointing accuracy & optional high-brightness optics for applications requiring low beam divergence

IPEX™-740 / 760 Series Excimer Lasers for Industrial & Scientific Applications

IPEX-700 Series lasers are designed for medium-power industrial processing and scientific applications. They deliver versatile performance combined with state-of-the-art industrial reliability.

exciPure™ technology, introduced in 2016, combines improved materials, a new dual-stage filter that removes both particulate and gaseous contaminants, and an improved stabilization algorithm. It represents the greatest improvement in excimer gas lifetime and reduction in operating costs in a generation.

EasyClean™ automated valves filled to the optics ports allow the laser chamber to be sealed and the gas fill to be retained while resonator optics are removed for cleaning and maintenance.

Simple to use

- Advanced tablet-based operator interface
- Optional air cooled operation to 25 Hz
- Premix or individual gas cylinders
- Single phase electrical power
- Integral oil-free vacuum pump
- Single-sided service access and economical to operate

IPEX-700 lasers combine the benefits of high performance with the lowest total cost of ownership and best uptime in the market today.

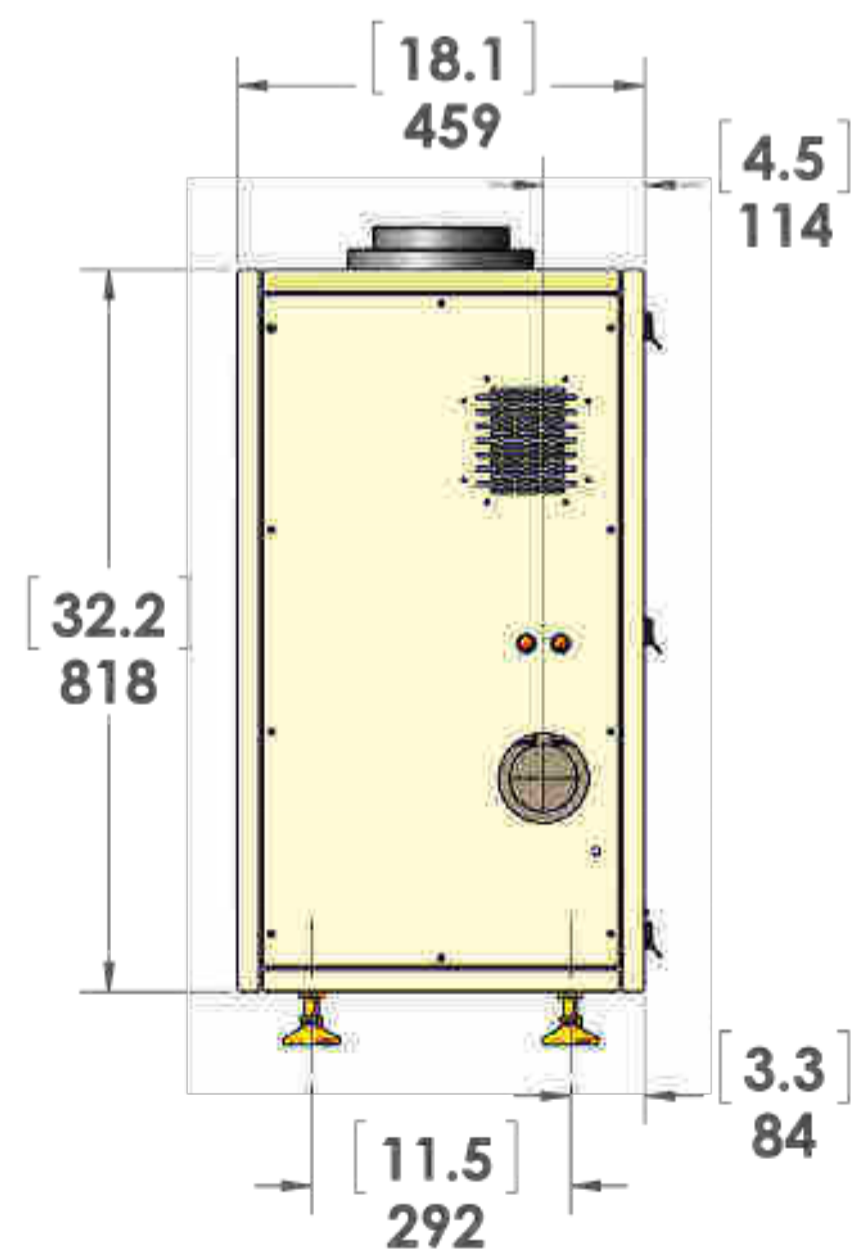
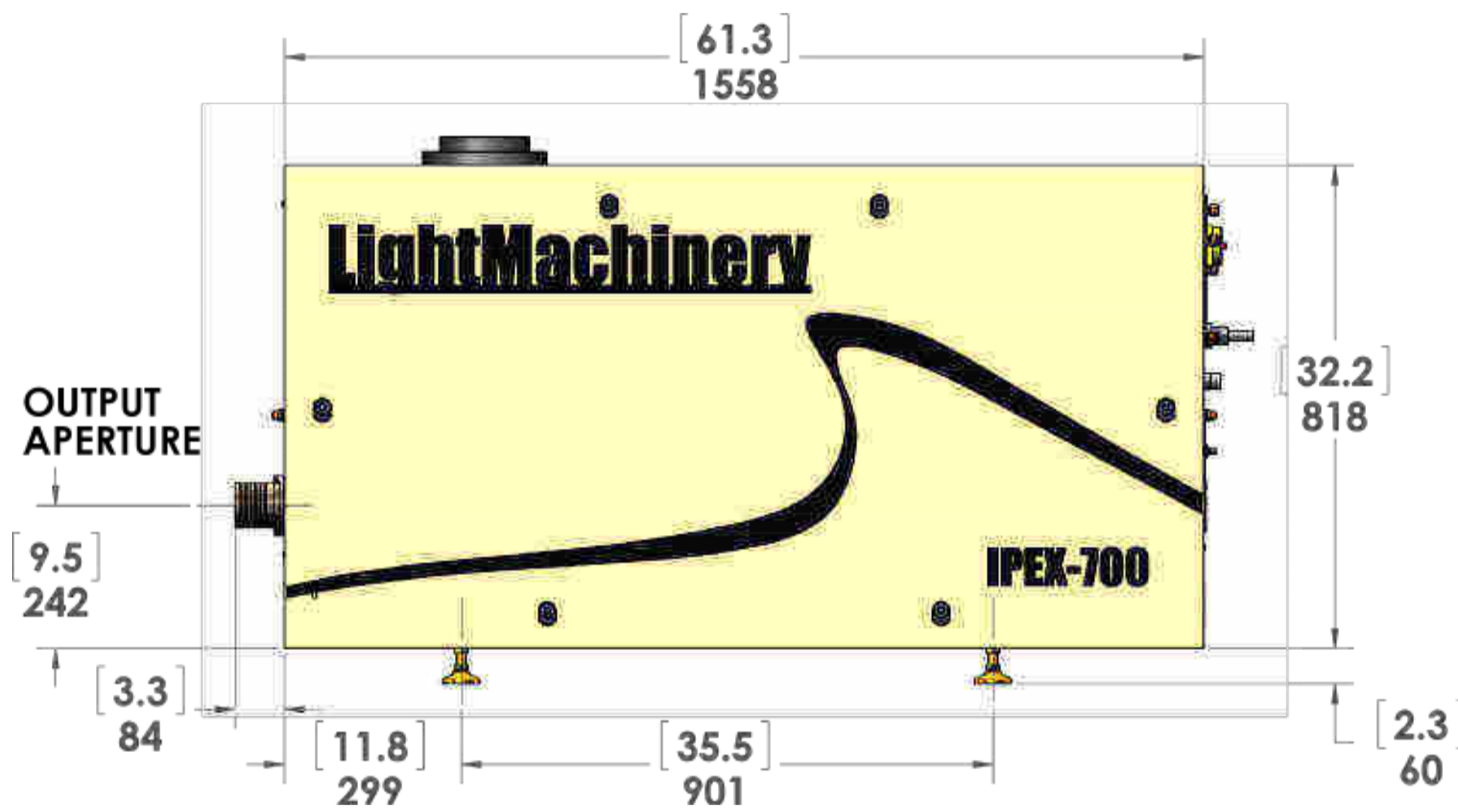
Optical Beam Delivery Systems

LightMachinery is more than just a laser supplier. With our optical design expertise and together with our integration partners, we can offer complete laser / beam delivery / processing systems for many requirements, including those of PLD customers.

Facilities

<p>Electrical Power Single-phase, 200 – 240 V 50 / 60 Hz</p>	<p>Cooling Optional air cooling up to 25 Hz repetition rates Water cooling at higher repetition rates</p>
<p>Laser Gas Premix or individual gas cylinders Consult LightMachinery for details</p>	<p>Weight (net) 295 kg / 650 lbs.</p>

Dimensions



Specifications

	Series	ArF	KrF	XeCl	XeF
Wavelength (nm)		193	248	308	351
Maximum Pulse Energy (mJ) at low repetition rates	IPEX- 740	230	475	300	275
	IPEX- 760	250	700	600	350
Stabilised Pulse Energy (mJ) at maximum repetition rates	IPEX- 740	150	400	250	225
	IPEX- 760	200	600	500	300
Stabilised Average Power (W)	IPEX- 746	15	40	25	22
	IPEX- 744	7.5	20	12	11
	IPEX- 742	3.7	10	6.0	5.5
	IPEX- 766	10	30	25	15
	IPEX- 764	6.0	18	10	9.0
	IPEX- 762	3.0	9.0	5.0	4.5
Maximum Repetition Rate (pps)	IPEX- 746	100	100	100	100
	IPEX- 744	50	50	50	50
	IPEX- 742	25	25	25	25
	IPEX- 766	50	50	50	50
	IPEX- 764	30	30	20	30
	IPEX- 762	15	15	10	15
Pulse Duration (ns) (FWHM)		12-20			
Energy Stability, 1 Sigma (%) (KrF)		1			
Beam Dimensions (mm) (V x H) (nominal)	IPEX- 740	12 x 26			
	IPEX- 760	12 x 28			
Beam Divergence (mrad) (V x H) (nominal) *	IPEX- 740	1 x 3			
	IPEX- 760	1 x 3			

*With standard resonator optics. Can be reduced to ~250 μ rad with High Brightness Unstable Resonator Optics

Specifications are subject to change. Please consult LightMachinery for latest information

For further technical and sales information, please visit our website or contact:

LightMachinery Inc.

80 Colonnade Road

Ottawa, Ontario, Canada, K2E 7L2

lasers@lightmachinery.com

(613) 749-4895



HyperFine HF Series Spectrometers

compact, sub picometer resolution

The HyperFine HF series of spectrometers are based on LightMachinery's patented fluid jet polishing technology. Designed for measuring hyperfine spectra and subtle spectral shifts, the HyperFine spectrometer from LightMachinery is a compact spectrometer capable of **1 picometer resolution**.

It is ideal for measuring fine features in plasmas, pulsed laser characterization and for measuring the small spectral shifts from Brillouin or Raman scattering. Simple PC based software allows the user to review spectra in real time and save or export for more analysis. LabView drivers enable the HF series to be integrated into automated experimental setups.

Features

- FAST, No moving parts (single shot spectrum analysis)
- Sub picometer resolution
- Fiber optic input
- Quick data acquisition and export
- Simple USB interface
- LabView Drivers

Benefits

- Fast acquisition (>10Hz)
- Compact
- Can resolve hyper fine spectra below 1 picometer
- Ultra-reliable
- Large range-over-resolution ratio (>10000)
- LightMachinery's legendary customer support

Light source characterization

- Lasers of all types
- Single shot pulsed laser spectrum
- Super luminescent diodes
- Gas discharge lamps, etc

Passive components characterization

- Notch filters
- Etalons
- Fiber Bragg gratings, etc

Spectroscopy

- Plasma spectroscopy
- High-precision gas spectroscopy
- Brillouin spectroscopy
- Femtosecond comb fingerprinting spectroscopy
- Spectral-domain optical coherence tomography
- Solar spectroscopy



Form Factors:

- A: 10 x 24 x 6 inches
- B: 22 x 13 x 6 inches
- C: 8 x 8 x 5 inches
- D: 28 x 15 x 6 inches

Part Number	Form Factor	Total Range (nm) with manual grating rotation	Simultaneous Range (nm) without grating rotation	Resolution (pm)	Resolution (1/cm)
HF-8993-1	A	270 - 330	12	<2.5	0.3
HF-8993-2	A	270 - 330	25	<5	0.6
HF-11457	C	250 - 320	50	<15	1.7
HF-11458	C	280 - 360	80	<15	1.7
HF-9340	C	fixed grating	350 - 450	<25	1.5
HF-9332	C	fixed grating	450 - 650	<30	0.9
HF-8989-1	A	400 - 500	15	1.0	0.05
HF-8989-2	B	500 - 600	15	1.0	0.03
HF-8989-2e	B	525 - 640	15	1.0	0.03
HF-8988*	A	500 - 550	15	15	0.55
HF-8989-3	A	600 - 700	15	1.0	0.02
HF-9353	C	fixed grating	700 - 1050	<30	0.4
HF-8995-1	B	700 - 900	25	2.0	0.03
HF-8995-1-0.5	D	700 - 900	6	<1	0.01
HF-8991-3	A	800 - 1000	20	2.0	0.02
HF-8995-2	A	900 - 1100	20	2.0	0.02

RADIANT X

TUNABLE LASER SYSTEM

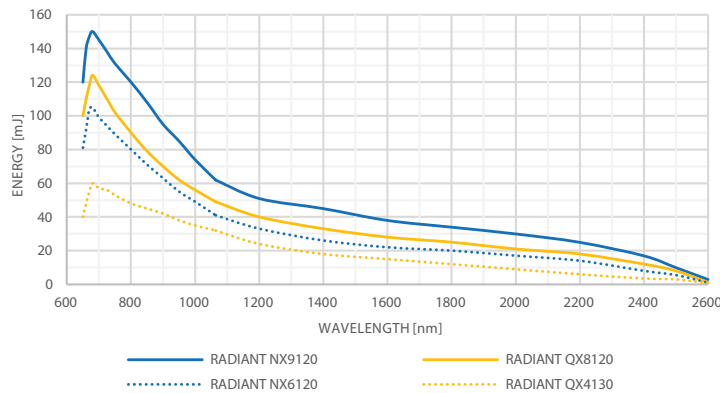


The next generation of RADIANT tunable laser systems has arrived! With the assistance of our loyal customers, OPOTEK has redesigned the versatile RADIANT tunable laser system with an increase of up to 50% output energy per pulse in a 12% smaller package. The RADIANT X is light-sealed and fully motorized so that all tunable wavelengths are accessible from a single port.

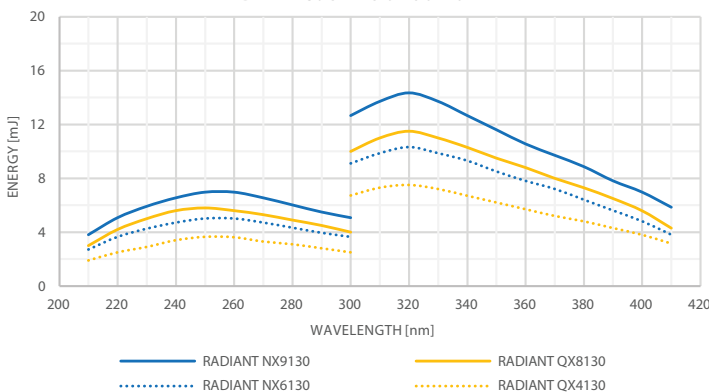
Required installations are now a thing of the past. The RADIANT X is designed to withstand the rigors of shipping. With an external alignment verification that takes minutes for any user to perform, the RADIANT X can be operational the same day it is received.

New to the list of features for the RADIANT X tunable laser system is an easy mount solution for users looking to integrate the RADIANT X into a larger OEM system.

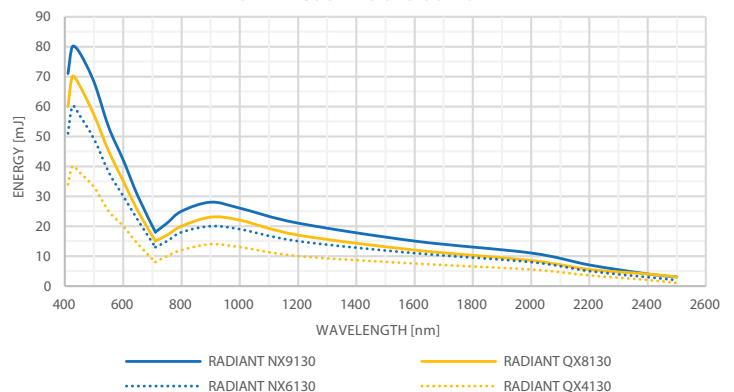
RADIANT X20 SERIES OPO OUTPUT



RADIANT X30 SERIES UV OUTPUT



RADIANT X30 SERIES OPO OUTPUT

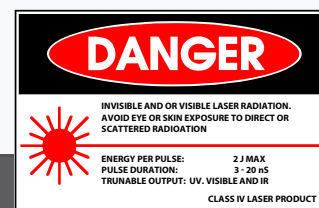


RADIANT X SERIES SPECIFICATIONS

	RADIANT QX4120	RADIANT QX8120	RADIANT NX6120	RADIANT NX9120	RADIANT QX4130	RADIANT QX8130	RADIANT NX6130	RADIANT NX9130
WAVELENGTH RANGE (nm)								
SIGNAL	650-1064				410-710			
IDLER	1064-2600				710-2500			
UV (optional)	---				210-410			
OPO CHARACTERISTICS								
PEAK OPO ENERGY [mJ]	60	120	100	150	40	70	60	80
PULSE TO PULSE STABILITY (RMS % @ PEAK OPO WL)	2				2			
PUMP LASER RESIDUAL ENERGY [mJ]	40 - 50 at 532 nm	80 - 100 at 532 nm	70 - 80 at 532 nm	100 - 120 at 532 nm	30 - 60 at 355 nm	40 - 80 at 355 nm	50 - 70 at 355 nm	60 - 100 at 355 nm
LINEWIDTH (cm ⁻¹)	4-7				4-7			
TUNING RESOLUTION (cm ⁻¹)	<1				<1			
PULSE DURATION (ns)	6	6	8	8	6	6	7	7
BEAM DIAMETER (mm)	6.5	9	7	8	6.5	9	7	8
BEAM DIVERGENCE (mrad)	<2				<1.5			
SIGNAL POLARIZATION	Horizontal				Horizontal			
IDLER POLARIZATION	Vertical				Vertical			
PUMP LASER								
PUMP WAVELENGTH (nm)	532				355			
PUMP ENERGY (mJ)	150	400	270	420	110	200	140	210
PULSE DURATION (ns)	6	6	8	8	6	6	7	7
BEAM DIVERGENCE (mrad)	<1				<1			
PULSE TO PULSE STABILITY (%)	<4				<6			
PULSE REPETITION RATE (Hz)	20	10	10	10	20	10	10	10
DIMENSIONS (L x W x H) [inches (cm)]								
LASER HEAD	29.0x16.0x10.0 (73.7x40.7x25.4)				29.0x16.0x10.0 (73.7x40.7x25.4)			
CONTROL ELECTRONICS BOX	11.5x10.3x3.8 (29.2x26.2x9.7)				11.5x10.3x3.8 (29.2x26.2x9.7)			
UMBILICAL LENGTH (m)	2.5				2.5			
PUMP LASER POWER SUPPLY	11.1x19.9x20.2 (28.3x50.7x51.3)	11.1x19.9x20.2 (28.3x50.7x51.3)	22.3x23.2x11.6 (56.8x59.0x29.6)	22.3x23.2x11.6 (56.8x59.0x29.6)	11.1x19.9x20.2 (28.3x50.7x51.3)	11.1x19.9x20.2 (28.3x50.7x51.3)	22.3x23.2x11.6 (56.8x59.0x29.6)	22.3x23.2x11.6 (56.8x59.0x29.6)
LASER HEAD WEIGHT [lbs (kg)]	100 (45.4)				100 (45.4)			
PUMP LASER POWER SUPPLY WEIGHT [lbs (kg)]	59.5 (27)	59.5 (27)	65 (29.5)	65 (29.5)	59.5 (27)	59.5 (27)	65 (29.5)	65 (29.5)
OPERATING REQUIREMENTS								
COOLANT SYSTEM	Distilled water				Distilled water			
ROOM TEMPERATURE (°C)	18-28				18-28			
ENVIRONMENT CONDITIONS	Pollution degree 2 or better				Pollution degree 2 or better			
POWER REQUIREMENTS	100-240 VAC, 50Hz/60Hz				100-240 VAC, 50Hz/60Hz			



All specifications are subject to change due to ongoing product improvements.
All tuning curves represent nominal values.
All dimensions approximate in inches (centimeters)



2233 Faraday Avenue Suite E | Carlsbad California CA USA 92008
760.929.0770 | www.opotek.com | sales@opotek.com

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OPOTEK

OPOLETTE SERIES



World's smallest OPO tunable laser system

UV • VIS • NIR • MIR

The Opotelette tunable laser series utilizes optical parametric oscillator (OPO) technology to generate wavelengths over a broad range in the UV, VIS, NIR and MIR. Designed for portability, the entire laserhead fits into a compact footprint and ships hermetically sealed to protect from the environment.

Requiring no installation, the system includes verification hardware to check alignment after shipping or relocation. All tunable beams exit the system from the same port resulting in one beam path to the end-user's application. Wavelength tuning is motorized and computer controlled.

OPOTEK.COM • 760.929.0770

OPOLETTE HE 355 LD

Tuning Range Output: UV, VIS, NIR

Application: Spectroscopy

FEATURES

- Hermetically sealed, light-weight, compact tunable laser system
- Integrated pump laser with quick connect cables
- End-user replaceable flashlamp (50 million shot lifetime) and DI cartridge
- All tunable wavelengths output from a single port
- Alignment verification
- Computer controlled tuning via control software/software development kit (SDK)
- Flashlamp and/or Q-Switch external triggering
- Temperature controlled, motorized Harmonic(s) (MH)
- Real-time wavelength monitoring (WM)
- Harmonic Auto-Optimization (HAO)
- Access to residual beams
- Warranty: One year on pump laser, all optics and crystals, mechanics, and electronics. Includes all options except fibers.

OPTIONS

Protective Hard Shell Cases (PHSC)

Includes two protective hard cases with custom foam padding.

Extended UV Tuning Range (UV)

Extends tuning range to 210 – 410 nm. Decreases OPO by about 20%

External Motorized Variable Attenuator (eMVA)

End-user installable/removable. Reduces max OPO by 10-15% when installed. Computer controlled. Can only be used with visible and near-infrared wavelengths.

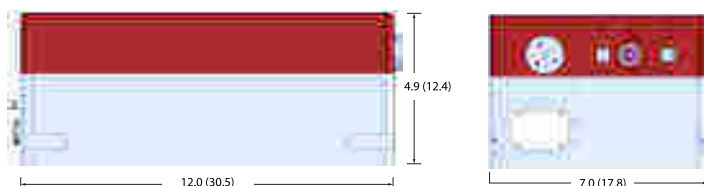
Fiber Delivery Kit (FD)

Can be optimized for either ultra-violet (UV), visible (VIS), or near-infrared (NIR) tuning ranges. Externally mounted fiber delivery kit includes mounts, coupling lens and fiber. Fiber specifications: 2.5 m long, 1 mm diameter core, NA = 0.22

Extended Warranty (EXW)

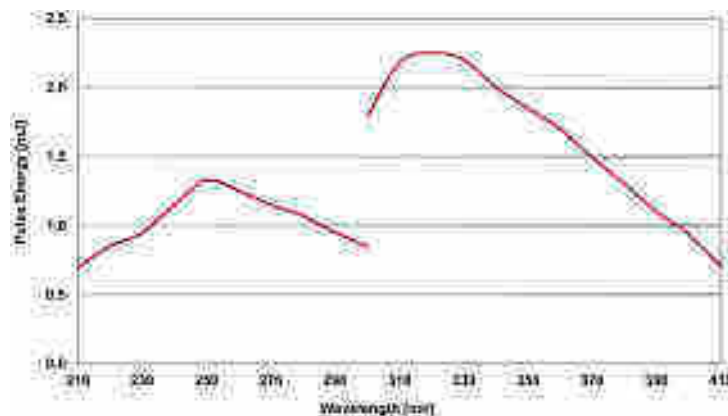
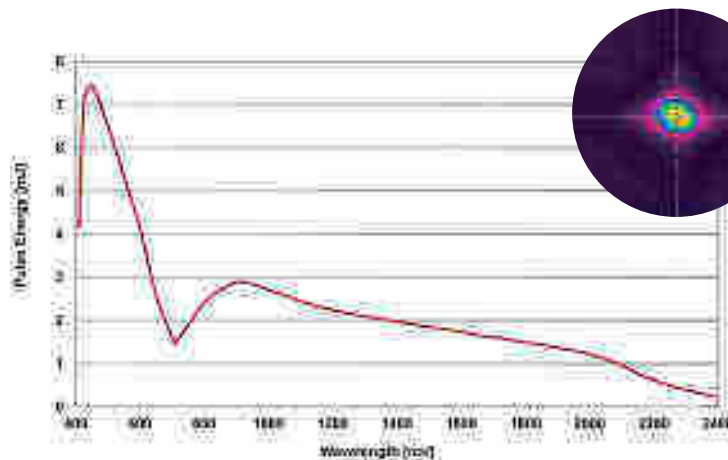
Extends full system warranty for one additional year, for a total of two years. Includes all options except for fibers.

DIMENSIONS (532 LD, 355 LD, 2731, 3034)



All dimensions approximate in inches (centimeters)

Typical far field beam profile at 450 nm shown in insert.



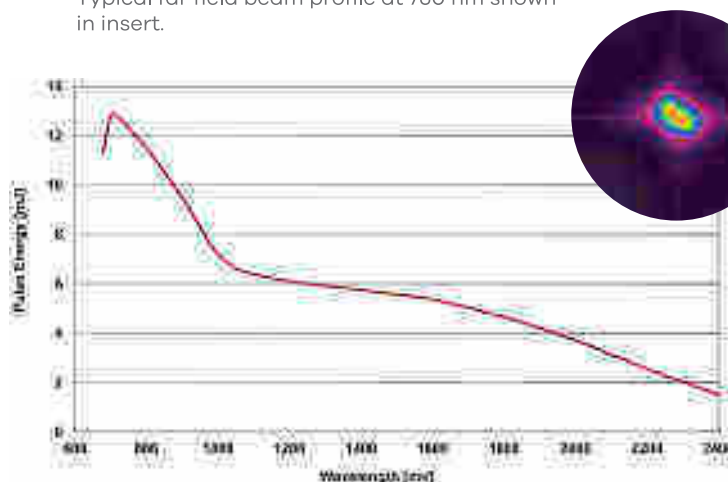
Extend the tuning range with UV tuning (210-410nm).

OPOLETTE HE 532 LD

Tuning Range Output: NIR

Application: Photoacoustic Imaging

Typical far field beam profile at 750 nm shown in insert.



OPOLETTE HE 2731/3034

Tuning Range Output: MIR
Application: Mass Spectrometry

FEATURES

- Hermetically sealed, light-weight, compact tunable laser system
- Integrated pump laser with quick connect cables
- End-user replaceable flashlamp (50 million shot lifetime) and DI cartridge
- All tunable wavelengths output from a single port
- Alignment verification
- Integrated alignment diode laser for OPO beam path identification
- Computer controlled tuning via control software/software development kit (SDK)
- Flashlamp and/or Q-Switch external triggering
- Access to residual beams
- Warranty: One year on pump laser, all optics and crystals, mechanics, and electronics. Includes all options except fibers.

OPTIONS

Protective Hard Shell Cases (PHSC)

Includes two protective hard cases with custom foam padding.

External Motorized Variable Attenuator (eMVA)

End-user installable/removable. Reduces max OPO by 10-15% when installed. Computer controlled. Can only be used with visible and near-infrared wavelengths.

Fiber Delivery Kit (FD)

Can be optimized for either ultra-violet (UV), visible (VIS), or near-infrared (NIR) tuning ranges. Externally mounted fiber delivery kit includes mounts, coupling lens, and fiber. Fiber specifications: 2.5 m long, 1 mm diameter core, NA = 0.22

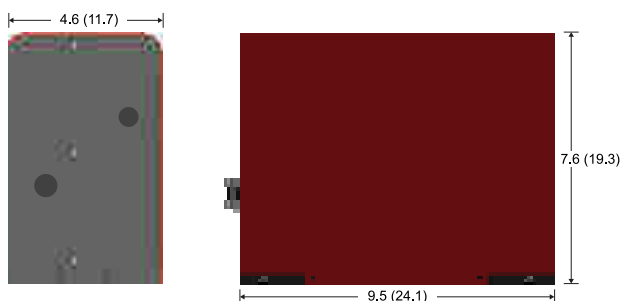
Harmonic Generation (HG)

355 nm generated from residual 1064 nm.

Extended Warranty (EXW)

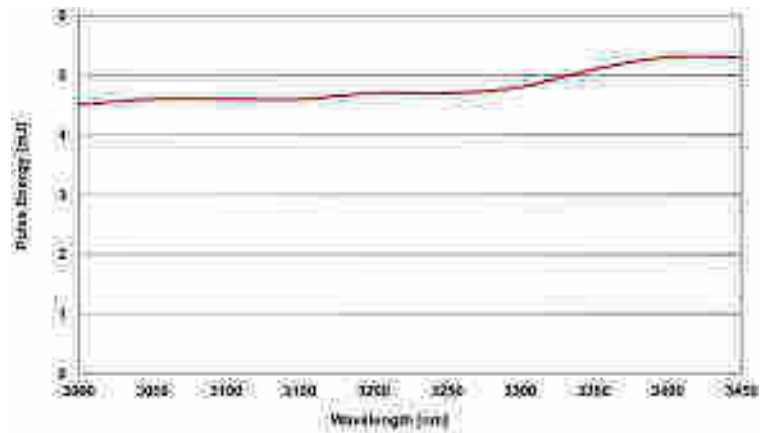
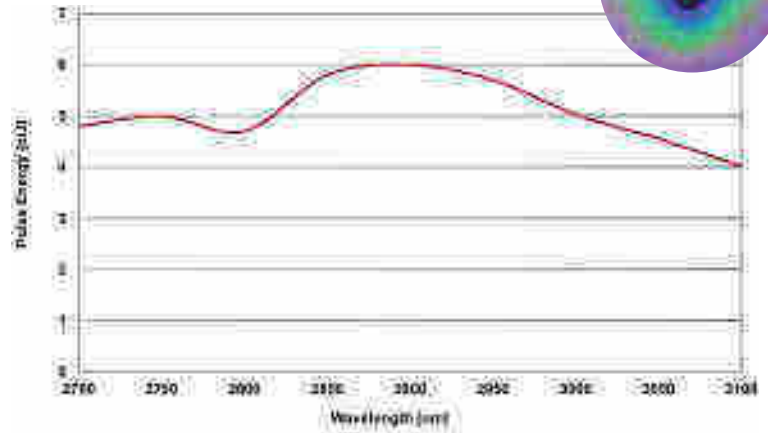
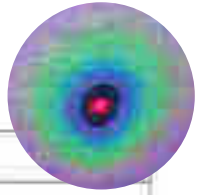
Extends full system warranty for one additional year, for a total of two years. Includes all options except for fibers.

DIMENSIONS (2940)



All dimensions approximate in inches (centimeters)

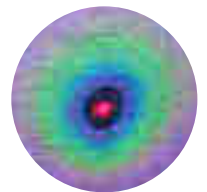
Picture shows MIR OPO beam heating a liquid crystal sheet with built-in guidance laser overlapping the center area.



OPOLETTE HE 2940

Application: Mass Spectrometry

Fixed Wavelength: 2940 nm
and Peak OPO Energy: 6 mJ



Picture shows MIR OPO beam heating a liquid crystal sheet with built-in guidance laser overlapping the center area.

OPOLETTE SERIES SPECIFICATIONS

Product	HE 532 LD	HE 355 LD	HE 2940	HE 2731	HE 3034
Wavelength range (nm)	650 - 2400	410 - 2400	2940	2700 - 3100	3000 - 3450
Signal	650 - 1064	410 - 710	---	---	---
Idler	1064 - 2400	710 - 2400	2940	2700 - 3100	3000 - 3450
Output pulse energy					
Peak OPO Energy (mJ)	12.5	9	6	6	5
Pulse to Pulse Stability (RMS % at Peak OPO WL)	2	2	2	2	2
Pump laser residual energy (mJ)	20 - 25 at 532 nm	15 - 20 at 355 nm	40 at 1064 nm	40 - 45 at 1064 nm	40 - 45 at 1064 nm
Linewidth (cm ⁻¹)	4 - 7	4 - 7	3 - 4	3 - 4	3 - 4
Tuning Resolution (cm⁻¹)					
Signal	< 1	< 1	< 1	< 1	< 1
Idler	< 1	< 1	< 1	< 1	< 1
Pulse Duration (ns)	7	7	7	7	7
Beam Diameter (mm)	4	4	4	4	4
Beam Divergence (mrad)	< 2	< 2	<10 on x-axis, <5 on y-axis	<10 on x-axis, <5 on y-axis	<10 on x-axis, <5 on y-axis
Polarization					
Signal Beam	Horizontal	Horizontal	---	---	---
Idler Beam	Vertical	Vertical	Vertical	Vertical	Vertical
Pump Laser					
Pump Wavelength (nm)	532	355	1064	1064	1064
Max pump pulse energy (mJ)	55	35	100	100	100
Pulse Duration (ns)	7	7	7	7	7
Beam Divergence (mrad)	< 3	< 3	< 3	< 3	< 3
Pulse to Pulse Stability (RMS %)	< 2	< 2	< 2	< 2	< 2
Pulse Repetition Rate (Hz)	20	20	20	20	20
Physical Characteristics:					
LxWxH - inches (cm)					
Laser Head	12 x 7 x 4.9 (30.5 x 17.8 x 12.4)	12 x 7 x 4.9 (30.5 x 17.8 x 12.4)	9.5 x 4.6 x 7.6 (24.1 x 11.7 x 19.3)	12 x 7 x 4.9 (30.5 x 17.8 x 12.4)	12 x 7 x 4.9 (30.5 x 17.8 x 12.4)
Control Electric Box	11.5 x 10.3 x 3.8 (29.2 x 26.2 x 9.7)	11.5 x 10.3 x 3.8 (29.2 x 26.2 x 9.7)	---	11.5 x 10.3 x 3.8 (29.2 x 26.2 x 9.7)	11.5 x 10.3 x 3.8 (29.2 x 26.2 x 9.7)
Umbilical Length: (m)	2.5	2.5	2.5	2.5	2.5
Pump laser power supply size	17.2 x 5.3 x 14.2 (43.5 x 13.3 x 36)	17.2 x 5.3 x 14.2 (43.5 x 13.3 x 36)	17.2 x 5.3 x 14.2 (43.5 x 13.3 x 36)	17.2 x 5.3 x 14.2 (43.5 x 13.3 x 36)	17.2 x 5.3 x 14.2 (43.5 x 13.3 x 36)
Laser Head weight: lbs (kg)	25 (11)	25 (11)	10 (4.5)	25 (11)	25 (11)
Control Electric Box weight: lbs (kg)	5 (2.3)	5 (2.3)	---	5 (2.3)	5 (2.3)
Pump laser power supply weight: lbs (kg)	31 (14)	31 (14)	31 (14)	31 (14)	31 (14)
Operating Requirements					
Coolant system	Distilled water	Distilled water	Distilled water	Distilled water	Distilled water
Room Temperature (°C)	18 - 28	18 - 28	18 - 28	18 - 28	18 - 28
Environment Conditions	Pollution degree 2 or better	Pollution degree 2 or better	Pollution degree 2 or better	Pollution degree 2 or better	Pollution degree 2 or better
Power Requirements	100 - 240 VAC, 50Hz/60Hz	100 - 240 VAC, 50Hz/60Hz	100 - 240 VAC, 50Hz/60Hz	100 - 240 VAC, 50Hz/60Hz	100 - 240 VAC, 50Hz/60Hz



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All specifications are subject to change due to ongoing product improvements.
All tuning curves represent nominal values.
All dimensions approximate in inches (centimeters)

2233 Faraday Avenue Suite E | Carlsbad California CA USA 92008
760.929.0770 | www.opotek.com | opo@opotek.com

DANGER

INVISIBLE AND OR VISIBLE LASER RADIATION.
AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION

ENERGY PER PULSE: 2 J MAX
PULSE DURATION: 3 - 20 nS
TUNABLE OUTPUT: UV, VISIBLE AND IR

CLASS IV LASER PRODUCT



OPOTEK

PHOCUS SERIES



Tunable Laser System for Photoacoustic Imaging

Based on the Ring-Cavity optical parametric oscillator (OPO) technology, the Phocus series represents the optimal light source for photoacoustic imaging applications that require high pulse energies and NIR wavelengths for

deep penetration of biological tissue. A customizable, safety-interlocked fiber bundle delivers light from the system to the instrumentation and prevents system operation without fiber attachment.

FEATURES

- Fully integrated tunable laser system with quick connect cables
- Motorized, hermetically sealed, harmonic/OPO modules
- End-user replaceable flashlamp (100 million shot lifetime) and DI cartridge
- All tunable wavelengths output from a single port
- Computer controlled tuning via control software/software development kit (SDK)
- Flashlamp and/or Q-Switch external triggering
- Temperature controlled, motorized Harmonic(s) (MH)
- Real-time pulse energy monitoring and logging for data normalization (EM)
- Harmonic Auto-Optimization (HAO)
- Flashlamp and/or Q-Switch external triggering
- Warranty: Two years on pump laser, one year on all optics and crystals, mechanics, and electronics. Includes all options except fibers.

OPTIONS

High Energy Fiber Bundle (FBHE): Benchtop.

Can be optimized for either visible (VIS) or near-infrared (NIR) tuning ranges. Externally mounted fiber bundle delivery kit includes, mounts, coupling lens, and fiber bundle. Fiber bundle specifications: 2.0 m long, 3.5 or 5 mm input and output diameter, NA = 0.37.

Energy Meter (EM): Inline and Benchtop.

Real-time pulse energy monitoring, logging for data normalization. Reduces OPO energy by 8%.

IDLER Access (ID): Benchtop.

Extends tuning range to include 740 – 1200 nm
Decreases SIGNAL performance by 10%

Fast Tuning OPO (FT): Inline and Benchtop.

Tunes the OPO to any SIGNAL (or IDLER) wavelength per shot fired.

Fiber Bundle Access to Residual 1064nm Output (1B): Benchtop.

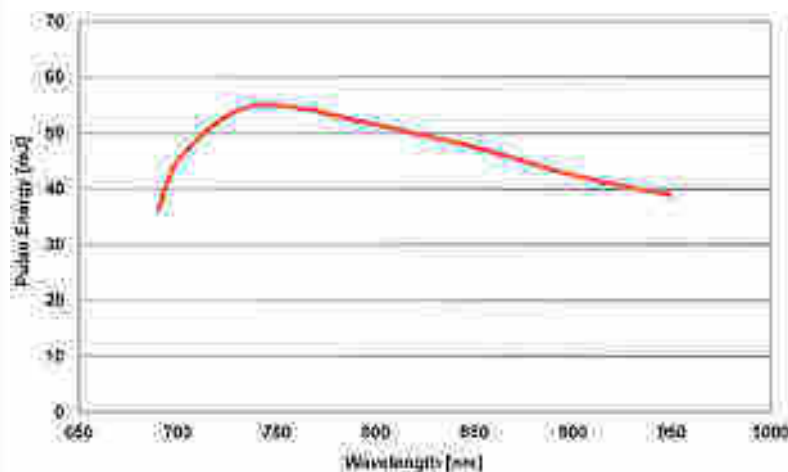
Fiber Bundle Access to Residual 532nm Output (2B): Benchtop.

Wavemeter (WM): Inline and Benchtop.

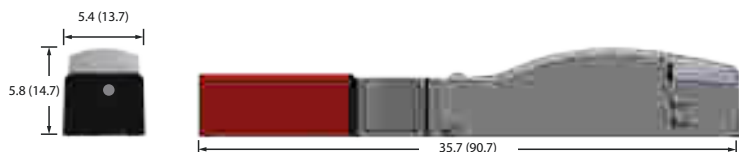
Integrated wavemeter for real-time wavelength monitoring

Extended Warranty (EXW): Inline and Benchtop.

Extends full system warranty for one additional year, for a total of two years. Includes all options except for fibers.



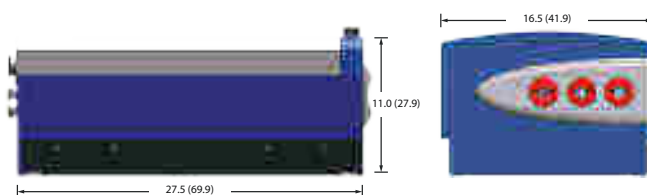
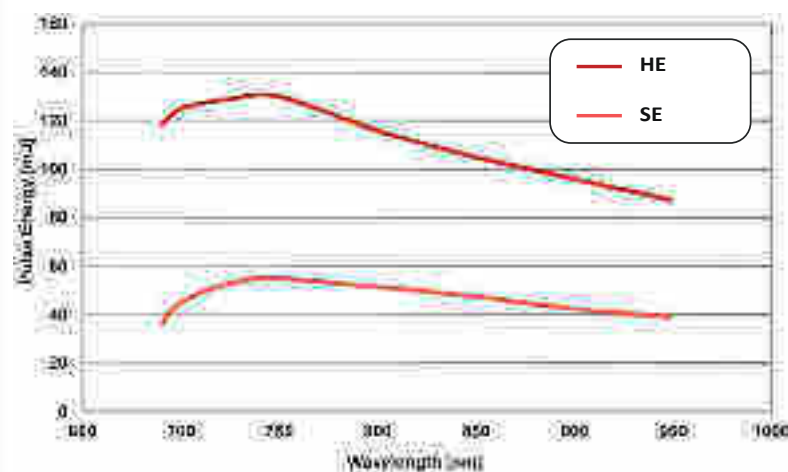
DIMENSIONS



All dimensions approximate in inches (centimeters)

BENCHTOP SE/HE

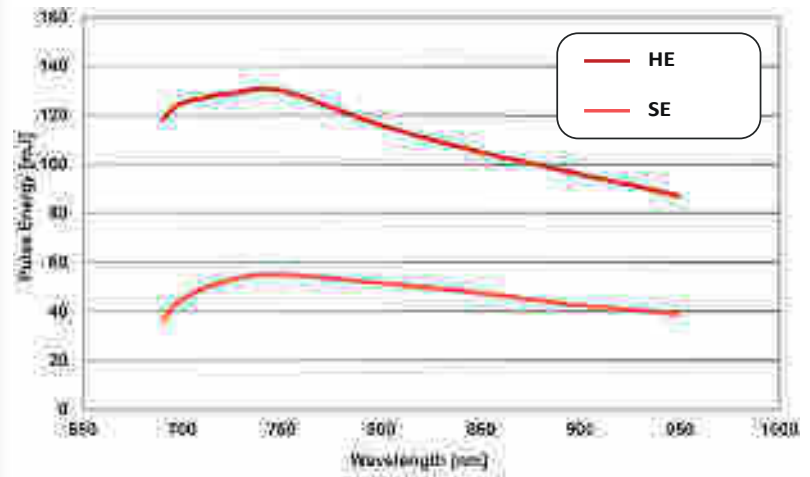
Tuning Range Output: VIS, NIR
Application: Photoacoustic Imaging



All dimensions approximate in inches (centimeters)

FEATURES

- Vibration isolated, fully integrated, light sealed transportable cart with shock-absorbing casters
- Motorized, hermetically sealed, harmonic/OPO modules
- End-user replaceable flashlamp (100 million shot lifetime) and DI cartridge
- All tunable wavelengths output from a single port
- Interlocked fiber bundle output, includes fiber bundle (FB)
- Computer controlled tuning via control software/software development kit (SDK)
- Flashlamp and/or Q-Switch external triggering
- Temperature controlled, motorized Harmonic(s) (MH)
- Harmonic Auto-Optimization (HAO)
- Warranty: Two years on pump laser, one year on all optics and crystals, mechanics, and electronics. Includes all options except fibers.



OPTIONS

Motorized Variable Attenuator (MVA)

End-user installable/removable. Reduces max OPO by 10-15% when installed. Computer controlled. Can only be used with visible and near-infrared wavelengths

High Energy Fiber Bundle (FBHE)

Can be optimized for either visible (VIS) or near-infrared (NIR) tuning ranges.

Externally mounted fiber bundle delivery kit includes, mounts, coupling lens, and fiber bundle. Fiber bundle specifications: 2.0 m long, 3.5 or 5 mm input and output diameter, NA = 0.37.

Fast Tuning OPO (FT)

Tunes the OPO to any SIGNAL (or IDLER) wavelength per shot fired.

Fiber Bundle Access to Residual 1064nm Output (1B)

Fiber Bundle Access to Residual 532nm Output (2B).

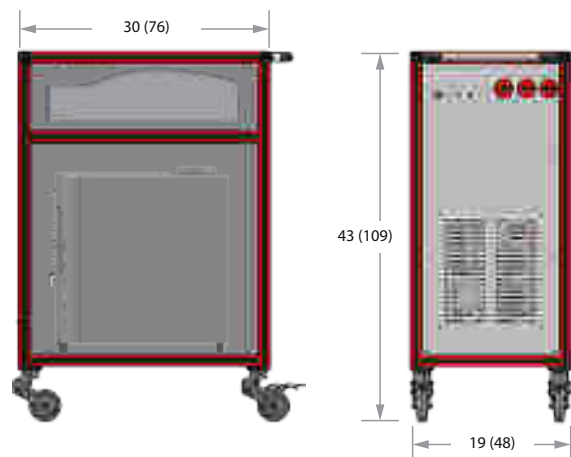
Wavemeter (WM)

Integrated wavemeter for real-time wavelength monitoring

Extended Warranty (EXW)

Extends full system warranty for one additional year, for a total of two years. Includes all options except for fibers.

DIMENSIONS



All dimensions approximate in inches (centimeters)

PHOCUS SERIES SPECIFICATIONS

Product Name	Inline	SE Benchtop	HE Benchtop	SE Mobile	HE Mobile
Beam Delivery	free space	fiber delivery	fiber delivery	fiber delivery	fiber delivery
Wavelength range (nm)	690 - 950	690 - 950, 1200 - 2400	690 - 950, 1200 - 2400	690 - 950, 1200 - 2400	690 - 950, 1200 - 2400
Signal	690 - 950	690 - 950	690 - 950	690 - 950	690 - 950
Idler	1200 - 2600	1200 - 2600	1200 - 2600	1200 - 2600	1200 - 2600
Output pulse energy					
Peak OPO energy (mJ)	55	60	150	60	150
Pump laser residual energy (mJ)		20 - 40	70 - 100	20 - 40	70 - 100
Pulse Duration (ns)	5	5	5	5	5
Beam Diameter (mm)	6.5	6.5	9	6.5	9
Beam Divergence (mrad)	< 10	< 10	< 10	< 10	< 10
Polarization					
Signal Beam	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Idler Beam	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Pump Laser					
Pump Wavelength (nm)	532	532	532	532	532
Max pump pulse energy (mJ)	150	150	360 - 400	150	360 - 400
Pulse Duration (ns)	6	6	6	6	6
Beam Divergence (mrad)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pulse Pulse Stability (%)	< 3	< 2	< 2	< 2	< 2
Pulse Repetition Rate (Hz)	20	20	10	20	10
Physical Characteristics					
Unit Size (WxLxH) (mm)	137 x 907 x 147	419 x 699 x 279	483 x 762 x 1092	483 x 762 x 1092	483 x 762 x 1092
Power Supply Size (mm)	262 x 292 x 97	integrated	integrated	integrated	integrated
Umbilical Length (m)	2.5	2.5	2.5	integrated	integrated
Pump laser power supply size (mm)	283 x 507 x 513	283 x 507 x 513	283 x 507 x 513	integrated	integrated
Operating Requirements					
Coolant system	Distilled water	Distilled water	Distilled water	Distilled water	Distilled water
Room Temperature (°C)	18 - 28	18 - 28	18 - 28	18 - 28	18 - 28
Environment Conditions	Pollution degree 2 or better	Pollution degree 2 or better	Pollution degree 2 or better	Pollution degree 2 or better	Pollution degree 2 or better
Power Requirements	100 - 240 VAC, 50Hz/60Hz	100 - 240 VAC, 50Hz/60Hz	100 - 240 VAC, 50Hz/60Hz	100 - 240 VAC, 50Hz/60Hz	100 - 240 VAC, 50Hz/60Hz



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 All specifications are subject to change due to ongoing product improvements.
 All tuning curves represent nominal values.
 All dimensions approximate in inches (centimeters)

2233 Faraday Avenue Suite E | Carlsbad California CA USA 92008
 760.929.0770 | www.opotek.com | opo@opotek.com

DANGER

INVISIBLE AND OR VISIBLE LASER RADIATION.
 AVOID EYE OR SKIN EXPOSURE TO DIRECT OR
 SCATTERED RADIATION

ENERGY PER PULSE:
 PULSE DURATION:
 TUNABLE OUTPUT: UV, VISIBLE AND IR

2 J MAX
 3 - 20 ns
 CLASS IV LASER PRODUCT



High Power CW 532 nm DPSS Lasers Sprout-H Series



Features

- Compact laser head with Seal™ enclosure for long lifetime
- LockT™ optics mounting for permanent laser head alignment
- Long lifetime pump diode pack integrated inside laser head
- Low noise option <math><0.02\%</math> rms with Noise Elimination Technology
- Excellent long-term power stability <math><0.5\%</math> rms over 24 hours
- Closed-loop, purpose-built TEC chiller integrated in power supply
- Disconnectable, 3 meter long control cable
- 5, 6, 8, 10, 12, 15, 18 and 20 W versions

Applications

- Pumping Ti:Sapphire lasers:
ultrafast & continuous-wave
- Pumping dye lasers
- Flow visualization, PIV
- Flow cytometry
- Spectroscopy

Patented



Sprout™ is a compact, diode-pumped solid-state (DPSS) laser providing high-power, continuous-wave (CW) power at 532nm in a near- perfect TEM₀₀ mode with extremely low optical noise and excellent long-term stability. Sprout™ is truly a next-generation laser designed and manufactured using many years of experience to provide a sealed, turn-key source of collimated green light with high spectral purity.

A number of key technologies enable Sprout™ to guarantee this performance. Seal™ technology keeps all dirt, dust and moisture out of the laser head to provide years of uninterrupted usage without need for cleaning or maintenance. LockT™ technology locks all laser head optics permanently in perfect alignment. Finally, for those applications requiring near-zero optical noise, Noise Elimination Technology (NET™) is the solution.

The laser head is a monolithic 3-dimensional design for ruggedness and compactness to minimize the space consumed in your lab or instrument. The pump diode package, integrated inside the laser head, has a typical mean time to failure (MTTF) of more than 50,000 hours to minimize cost-of-ownership. Locating the pump diode in the laser head rather than the power supply eliminates the fiber optic delivery cable.

A 3 meter long, flexible, disconnectable control cable connects the laser head to the power supply. The power supply, with touch-screen control, also contains an integrated TEC-based chiller purpose-built for this application to provide increased reliability and reduced overall system footprint. Additional features include automatic laser power control and USB, RS-232 and Ethernet interfaces for external monitoring, control and remote service.

Sprout™ is a state-of-the-art laser designed for today's integrated solutions. It combines superb performance and tremendous value for today's market.

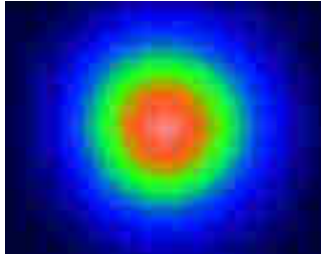


Laser Output Characteristics ^{1,8}	H-5W	H-6W	H-8W	H-10W	H-12W	H-15W	H-18W	H-20W
Average Output Power	> 5 W	> 6 W	> 8 W	> 10 W	> 12 W	> 15 W	> 18 W	> 20 W
Wavelength	532 nm							
Spectral Purity ²	> 99.9 %							
Spatial Mode	TEM ₀₀							
Beam Quality (M ²)	1.0 - 1.1							
Beam Ellipticity	< 1.0 : 1.1							
Beam Diameter ³	2.3 mm ± 10%							
Beam Divergence ⁴	< 0.5 mrad							
Pointing Stability ⁵	< 2 μrad/°C							
Power Stability ⁶	< ± 0.25 % rms							
Noise ⁷	Standard version: < 0.1 % rms Low noise (NET) version: < 0.02 % rms							
Polarization	> 100:1 vertical Horizontal polarization option available							
Power Requirements								
Operating Voltage	100-240 VAC, 50 Hz / 60 Hz							
Power Consumption	5W-12W versions: 600 W max, 350 W typical 15W-20W versions: 1000 W max, 600 W typical							
Cooling Requirements								
Laser Head	Closed-loop TEC chiller built into separate compartment in power supply chassis							
Power Supply	Air-cooled							
Environmental Specifications								
Operating Temperature	64-90°F (18-32°C)							
Relative Humidity	8-85%, non-condensing							
Laser Head - Physical								
Dimensions (Height x Width x Length)	5W-12W versions: 2.7 x 5.3 x 9.4 inches (69 x 135 x 240 mm) 15W-20W versions: 2.7 x 5.3 x 16.8 inches (69 x 135 x 425 mm)							
Weight	5W-12W versions: 9.2 lbs (4.2 kg) 15W-20W versions: 16.7 lbs (7.6 kg)							
Cable Length	10 ft (3 m) 16 ft (5 m) option available for 5W-12W versions							
Power Supply-Cooler - Physical								
Dimensions (Height x Width x Depth)	13.6 x 15.7 x 18.9 inches (345 x 398 x 480 mm)							
Weight	5W-12W versions: approx. 70 lbs (32 kg), including cable 15W-20W versions: approx. 77 lbs (35 kg), including cable							

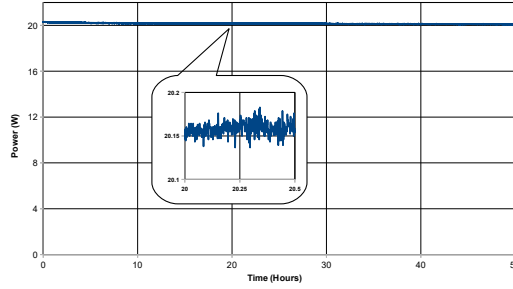
Notes:

1. All performance specifications are guaranteed at specified power
2. Output power at 532 nm compared to output power at 1064 nm
3. 1/e², measured at the output port of the laser head
4. Full angle (1/e²), measured at the output port of the laser head
5. Measured at far-field x and y positions after a 30 minute warm-up and over a 20°C to 30°C temperature range
6. Measured over a 24 hour period after a 15 minute warm-up
7. Measured from 10 Hz to 10 MHz
8. Lighthouse Photonics is continually improving the performance of its products. Specifications subject to change without notice.

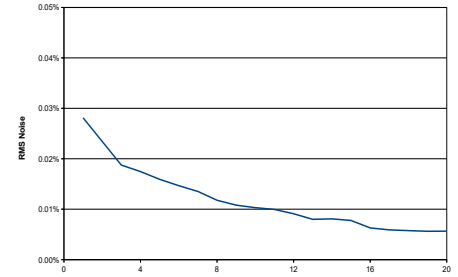




Typical Far-field beam profile



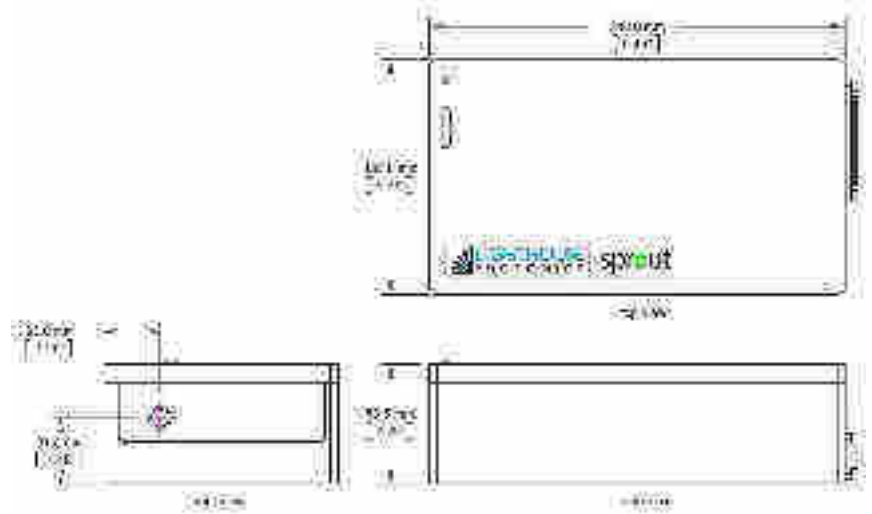
Power stability <math><0.1\%</math> rms over >24 hours



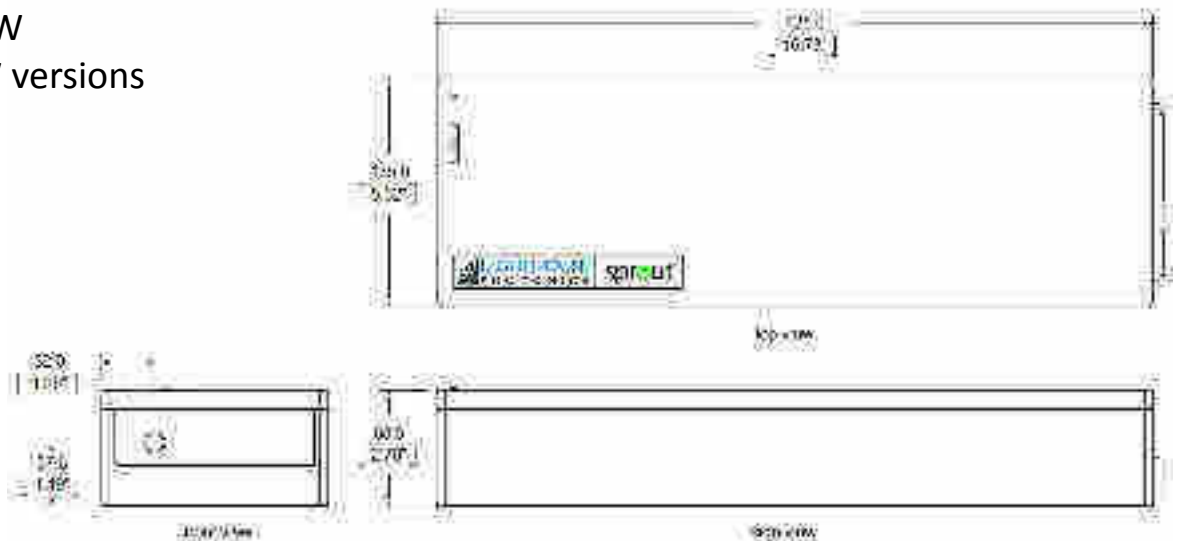
Optical noise <math><0.02\%</math> rms for NET™ version

Laser Head Dimensions

5W, 6W, 8W, 10W,
and 12W versions

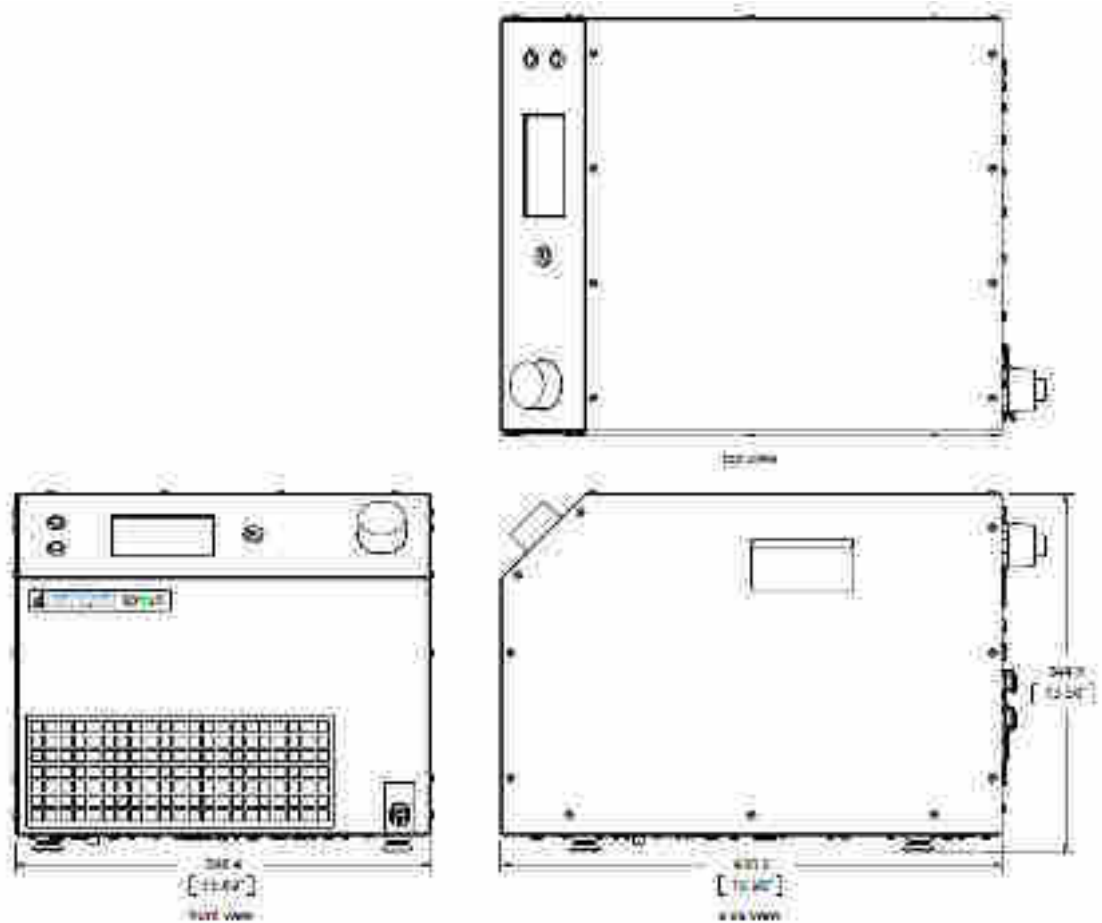


15W, 18W
and 20W versions





Power Supply - Cooler Dimensions



For more information go to: www.lighthousephotonics.com

Lighthouse Photonics Inc.
780 Montague Expy, Suite 304
San Jose, CA 95131 USA
phone: 408-708-7967
efax: 408-773-6240
e-mail: info@lighthousephotonics.com



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