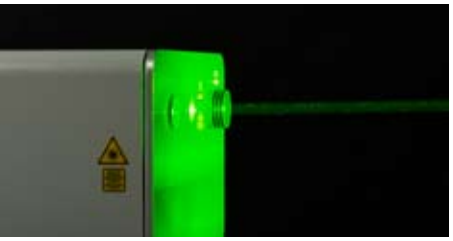
LPY742 HR Series

High Frequency Pulsed Nd:YAG Lasers



The LPY742 series of high repetition pulsed Q-switched Nd:YAG lasers offer high pulse energies at repetition rates from 50Hz to 200Hz. Constructed on an industrially proven self-supporting invar frame, the laser is thermally and mechanically stabilised. The optical rail and microprocessor control systems are enclosed in a rugged industrially sealed case.

50Hz to 200Hz – Stable Resonator

The stable resonator configuration provides a homogeneous and consistent spatial profile even at 200Hz. The beam is ideally suited to surface interaction applications such as annealing or ablation and for point processing applications such as shot peening and drilling.

Motorised harmonic module

Twin Rod Birefringence Compensation

The twin rod configuration compensates for thermally induced birefringence associated with the high average pump powers needed for high frequency operation. By maintaining a high degree of polarisation fidelity in the 1064nm beam, the conversion efficiency, overall system pulse stability and spatial homogeneity are maintained even at high pulse frequencies.

Motorised attenuator

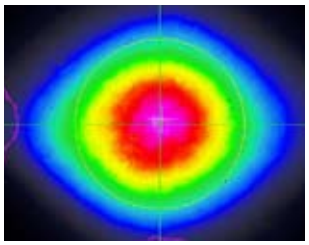
Motorised Harmonics with Auto-tuning

Dedicated thermally stabilised harmonic mounts with automated tuning are standard for this series. Diode based auto-tuning is included in the final harmonic module with selectable continuous tune and stop-and-tune functions. A beam dump process shutter is also included as standard to allow the laser system to warm up and stabilise internally with no external output.

In-line energy monitor

LUCi and MOBIUS – Microprocessor Laser Control

The laser is controlled via RS232. The MOBIUS microprocessor system continuously monitors the whole laser to ensure fast and detailed feedback of the laser status. The system measures temperatures and water flow rates along with other key system parameters and displays them via the PC interface. The optional LUCi controller allows full remote control of the laser (independent of a PC) with touch screen controls and displays all the MOBIUS data available.



Optional Enhancements

Motorised 1064nm attenuator - mounted after the oscillator to allow for fine control of the laser system output energy without adjusting the primary drive parameters of the laser.
In-line energy monitor - with calibrated energy output and closed loop auto peak energy function.
Wavelength switching unit - allows the automated selection between two primary wavelengths such as 532nm and 355nm.

Features

- *Proven industrial configuration*
- *Invar optical rail and sealed laser head*
- *50Hz to 200Hz models*
- *Twin rod – birefringence compensation*
- *Homogeneous beam profile*
- *Motorised harmonic modules*
- *Automated tuning and energy peaking*
- *532nm, 355nm and 266nm options*
- *MOBIUS – Microprocessor control*
- *Customisation options*
- *Long lamp lifetimes*

Scientific Applications

OPO pumping
Dye Laser pumping
Ti:Sa Pumping

Industrial Applications

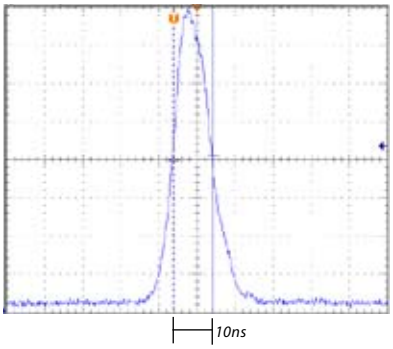
Laser ablation, annealing, shot peening, selective doping, lift-off and microprocessing of metals, semiconductors, displays, microelectronics, polymers and plastics.

TECHNICAL DATA

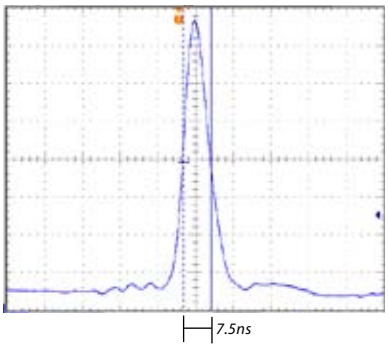
Model	LPY742-50	LPY742-100	LPY742-150	LPY742-200
Repetition Rate (Hz)	**50**	**100**	**150**	**200**
Output Energy (mJ) (1a)				
1064nm	450	400	280	200
532nm	225	200	140	100
355nm (1b)	110	90	60	50
266nm	35	20	18	10
Pulse Stability (±%) (2)				
1064nm	2	2	2	2
532nm	3	3	3	3
355nm	4	4	4	4
266nm	6	6	6	6
Pulse Length (ns) (3)				
1064nm	8-10	8-10	9-11	9-11
532nm	7-9	7-9	9-11	9-11
355nm	6-9	6-9	8-10	8-10
266nm	6-9	6-9	8-10	8-10
Parameter				
System configuration	Osc/Amp	Osc/Amp	Osc/Amp	Osc/Amp
Oscillator configuration	Stable	Stable	Stable	Stable
Beam diameter (mm)	6.5	6.5	6.5	6.5
Beam divergence (mrad) (4)	2	2	2	2.5
Pointing stability (µrad) (5)	<70	<100	<100	<100
Lamp life (pulses) (6)	$1.5x10^8$	$1.5x10^8$	$1.5x10^8$	$1.5x10^8$
Timing jitter (ns) (7)	<0.5	<0.5	<0.5	<0.5
Services				
Voltage (VAC) (8)	220-250	220-250	220-250	220-250
Frequency (Hz) (9)	50/60	50/60	50/60	50/60
Power phase	Single	Single	Single	Single
Operating ambient temp (°C) (10)	5-35	5-35	5-35	5-35
Laser cooling (10)	Water	Water	Water	Water
PSU type (19" Rackmount)	16U	16U	16U	16U

(1a) Single wavelength output only.
(1b) Dedicated 355nm only laser model.
(2) Peak to peak energy - 100% of pulses.
(3) FWHM.
(4) Full angle for 90% of the output energy.
(5) Full angle.
(6) Typical lifetime.
(7) RMS jitter, measured with respect to the Q-switch trigger input.
(8) 208VAC option requires autotransformer to be specified on order.
(9) 50 or 60Hz to be specified on order.
(10) Refer to cooling requirements table.

Water Cooling Requirements	
Max water temp (°C)	20
Nominal flow rate (lpm)	6-8
Min water pressure (Bar [psi])	2 [30]
Max water pressure (Bar [psi])	4.5 [65]
External water filtration (Micron)	10
Ext. chiller high pressure bypass (Bar [psi])	5 [73]
Osc/Amp systems thermal load (kW)	~6



Typical pulse profile @ 532nm, 200Hz



Typical pulse profile @ 532nm, 100Hz

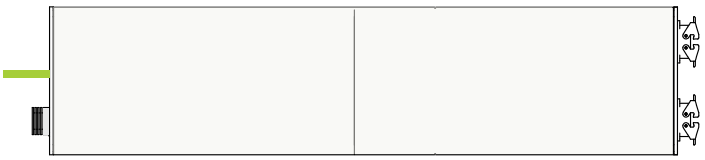
MECHANICAL DATA

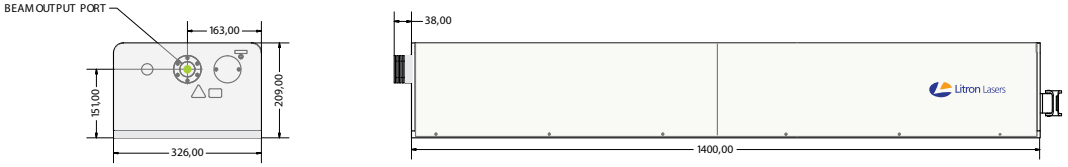
System Dimensions	
Laser Head (mm)	
1064 & 532nm output	326 (W) x 209 (H) x 1200 (L)
355nm & 266nm output	326 (W) x 209 (H) x 1400 (L)
Laser Head (Inches)	
1064 & 532nm output	12.8 (W) x 8.2 (H) x 55 (L)
355nm & 266nm output	12.8 (W) x 8.2 (H) x 67 (L)
PSU	
16U mm	605 (W) x 700 (D) x 793 (H)
16U Inches	23.8 (W) x 27.5 (D) x 31.2 (H)

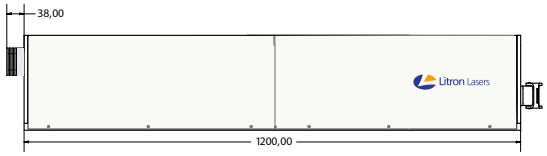
System Weights	
Laser Head	
1064 & 532nm output	50kg
355nm & 266nm output	60kg
PSU	130kg

Laser Head

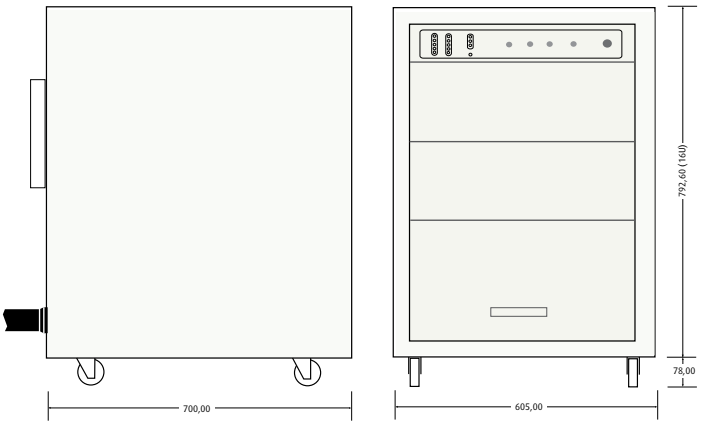
All dimensions shown in mm unless stated.







Power Supply Unit



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Our policy is to improve the design and specification of our products. The details given in this document are not to be regarded as binding.

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