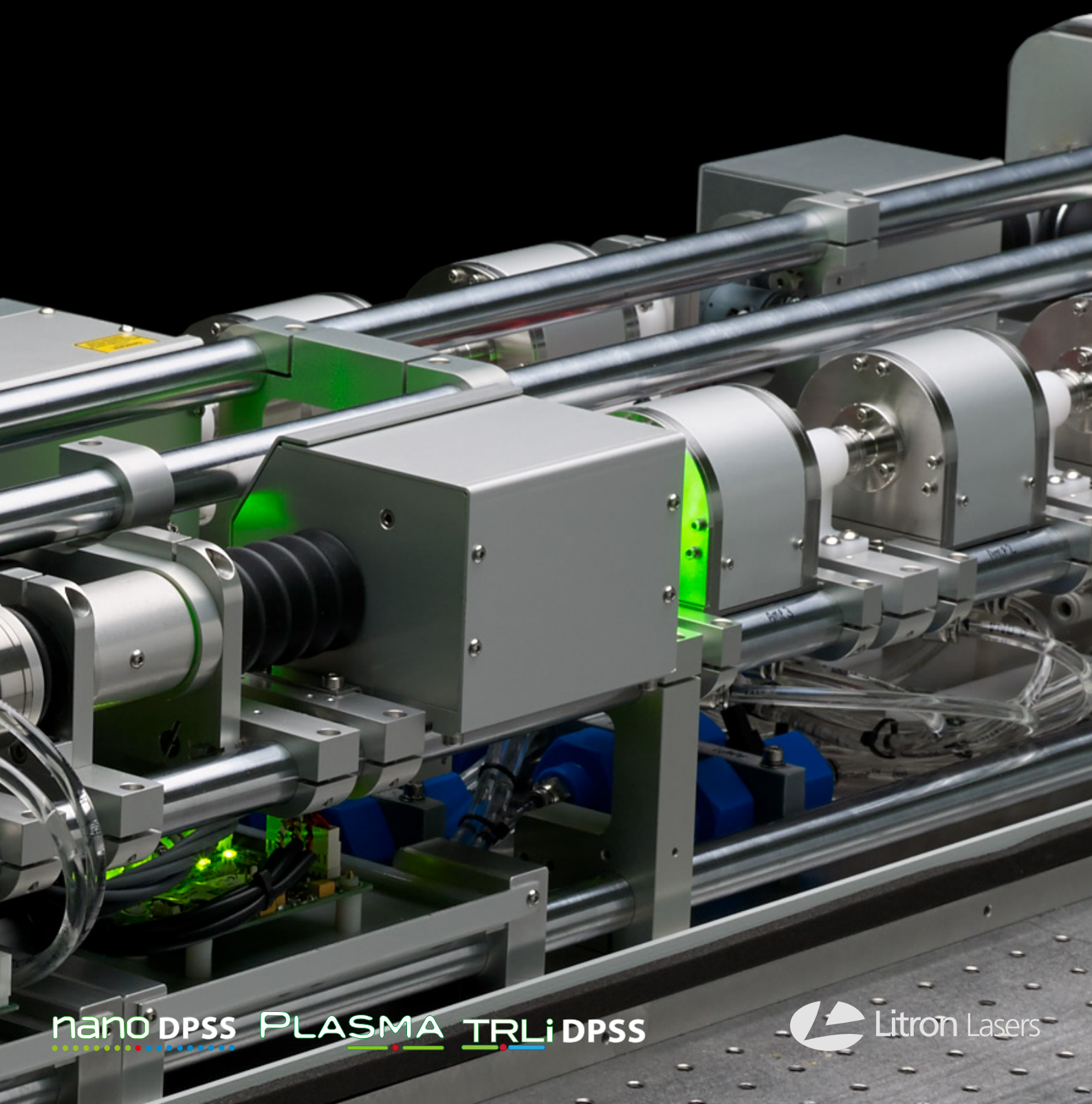
PULSED DIODE PUMPED SOLID STATE LASERS

2023



nano DPSS PLASMA TRLi DPSS

Litron Lasers

Nano DPSS Series

Ultra-compact DPSS Q-switched pulsed Nd:YAG lasers

The Nano DPSS is an ultra-compact pulsed Q-switched Nd:YAG laser with output energies up to 130mJ and repetition rates of up to 300Hz. A fully sealed head provides protection from external contamination and a free-standing PSU with separate chiller completes this ultra-compact, high-performance and reliable laser system. With typical pump diode lifetime of greater than 4 billion pulses and field replaceable diode modules, the Nano DPSS offers excellent performance with the lowest cost of ownership.

The Nano DPSS offers the greatest flexibility to match each customer application without compromising performance. A full suite of accessories is available: harmonic modules, a fully motorised attenuator and an intra-cavity aperture for true TEM_{00} output.

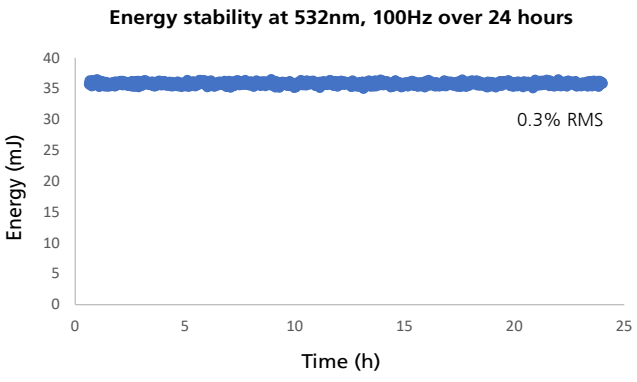
By miniaturising Litron's proven motorised harmonics, the Nano DPSS can be specified to the 5th harmonic with automated control. As standard, the harmonic module contains an integrated attenuator operated via the software to allow fast and precise control over the pulse energy. All harmonic generation crystals are automatically angled-tuned with high-precision linear actuators and a diode-based energy monitor feedback loop, making Litron's unique mechanical angle-tuning much faster than traditional thermal tuning. This feature has the option of single, on-demand tuning or continuous automatic tracking of the crystals for guaranteed long-term stability.

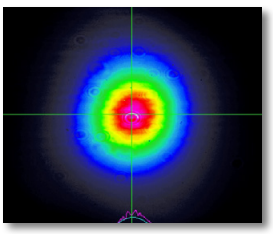
FEATURES

- ***Repetition rates up to 300Hz***
- ***Fully motorised attenuator and harmonics***
- ***Choice of resonator***
- ***Ultra high stability***
- ***Exceptional diode life***
- ***Field replaceable diodes***
- ***Excellent beam quality***
- ***Compact PSU***
- ***Detachable, compact chiller***
- ***Diode pointer option***
- ***TEM_{00} – upon request***

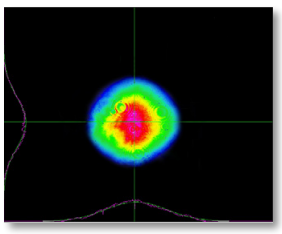
APPLICATIONS

- ***LIBS & Spectroscopy***
- ***LIDAR & Remote sensing***
- ***Dye, OPO and Ti:Sa pumping***
- ***Laser flash photolysis***
- ***MALDI***
- ***Laser ultrasonics***
- ***Microscopy***
- ***Sample testing***
- ***Ablation***
- ***LCD repair***
- ***Thomson Scattering***
- ***PLD***

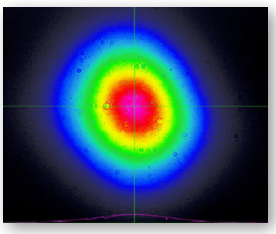




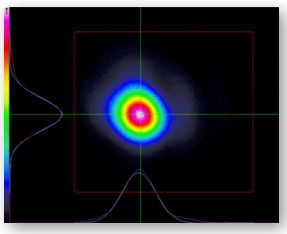
Stable beam profile, 1064nm near field



Stable telescopic beam profile, 532nm near field



Stable telescopic beam profile, 532nm far field



TEM_{00} beam profile, 1064nm far field

TECHNICAL DATA

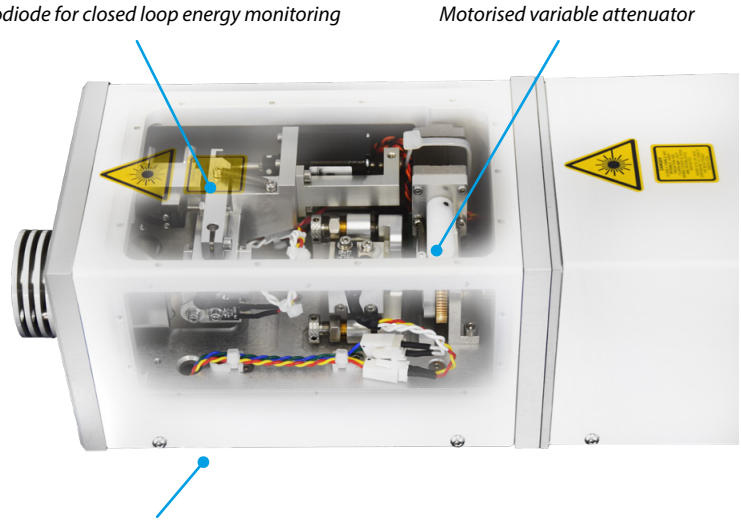
Model	Nano DPSS 80-100	Nano DPSS 130-100	Nano DPSS 70-200	Nano DPSS 90-200	Nano DPSS 55-300	Nano DPSS ST 70-100	Nano DPSS G 60-100
Type of Resonator	Stable	Stable	Stable	Stable	Stable	Stable Telescopic	Super-Gaussian
Repetition Rate (Hz)	100	100	200	200	300	100	100
Output Energy (mJ)							
1064nm	80	130	70	90	55	70	60
532nm	40	65	35	45	25	35	25
355nm	20	25	15	20	10		15
266nm	10	15	8	10	5		6
213nm (1)							
Pulse Stability (%RMS) (2)							
1064nm	0.2	0.2	0.2	0.2	0.2	0.4	≤0.9
532nm	0.3	0.3	0.3	0.3	0.3	0.5	≤1.2
355nm	1.0	1.0	1.0	1.0	1.0		≤2.8
266nm	1.5	1.5	1.5	1.5	1.5		≤3.0
Pulse Width (ns) (3)							
1064nm	<12	<12	<12	<12	<12	<11	<12
532nm	<11	<11	<11	<11	<11	<10	<11
355nm	<11	<11	<11	<11	<11		<11
266nm	<10	<10	<10	<10	<10		<10
Beam Parameter							
Beam Diameter (mm) (4)	5	5	5	6	5	5	5
Beam Divergence (mrad)	≤2	≤2	≤2	≤2	≤2	≤0.8	≤0.5
M^2							≤2
Pointing Stability (µrad) (5)	<15	<15	<15	<15	<15	<15	<15
Timing Jitter (ns) (6)	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5
Polarisation	Linear	Linear	Linear	Linear	Linear	Linear	Linear

All Models	
Operation	
Control (7)	RS232
Q-switch Trigger and Sync	TTL
Services	
Voltage (VAC) (8)	200-250
Frequency (Hz)	50 or 60
Power	Single Phase
Ambient (°C) (9)	5-35
External Cooling (10)	Air
Diode Warranty (shots)	4×10^9

All specifications at maximum repetition rate unless otherwise stated.

(1) Contact Litron for more information.
(2) 99% of pulses.
(3) FWHM – measured with a fast diode.
(4) 100% beam diameter at laser exit port.
(5) Half angle.
(6) RMS with respect to Q-switch trigger input.
(7) Full software suite and programming tools supplied.
(8) 100-200VAC operation – contact Litron.
(9) 0 to 80% non-condensing atmosphere.
(10) Standard air-cooled chiller or optional water-cooled chiller.

Free standing PSU and chiller (separate units)



Intelligent harmonic units: 532nm, 355nm, 266nm and 213nm available

TRLi DPSS Series

Fully modular system designed for flexibility and enhanced performance

The **TRLi DPSS** series lasers are compact high energy, diode pumped, Q-switched Nd:YAG lasers with output energies of up to 360mJ and repetition rates of up to 200Hz. Based around Litron's birefringence compensating twin-rod resonator design gives highly homogeneous output beams. The laser resonator is housed in a body machined from solid aluminum to ensure high mechanical and optical integrity.

State-of-the-art diode pump modules and electronics give rise to outputs with industry leading stabilities of better than 0.2% RMS at 1064nm over a six-hour period. A choice of stable, stable telescopic or super-Gausian resonator ensures the best configuration available to match each application. All accessories such as harmonics, beam expanding telescope or OPO are bolt-and-play and can be added and removed as required. The intelligent system controller automatically adapts to the pre-set configuration and allows seamless control in any application.

Auto-tracking

Continuous auto-tracking is possible due to the fast response of the motorised mechanical angle tuning, as opposed to conventional thermal tuning. This feature maintains the set energy over long periods of continuous operation; effectively removing any long-term drift.

Motorised automatic harmonic tuning

Stepper motor driven angular adjustment mechanics are used to tune the harmonic crystal relative to the incoming beam. Combined with the temperature-stabilised diode-based energy monitor, a complete scan is carried out in under 20 seconds. Auto-tuning is a start up or on demand function using a simple software command.

FEATURES

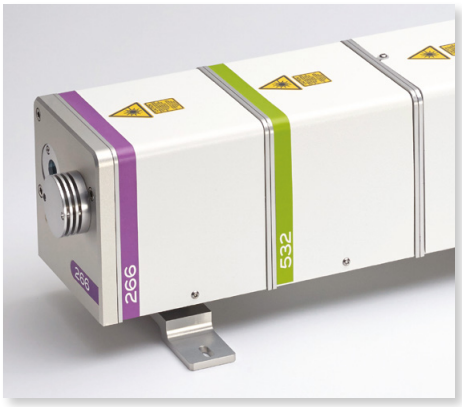
- ***Choice of resonator options***
- ***Ultra high stability***
- ***Exceptional diode life***
- ***Field replaceable diodes***
- ***Homogeneous beam profile***
- ***Compact PSU***
- ***Detachable, compact chiller***
- ***RS232 control***

APPLICATIONS

- ***LIDAR***
- ***Remote Sensing***
- ***Si wafer inspection***
- ***LIBS & LIF***
- ***Laser cleaning***
- ***LCD repair***
- ***Dye, OPO and Ti:Sa pumping***
- ***Laser Lift-Off***
- ***MALDI***
- ***Thomson Scattering***
- ***PLD***

Integrated motorised optical attenuator

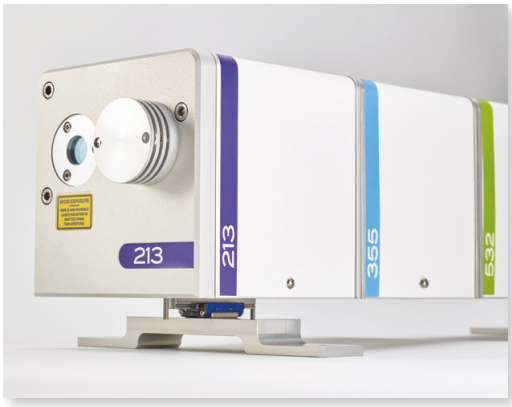
The second harmonic module contains a motorised half waveplate for precise control of the generation of 532nm and all subsequent harmonics. Attenuation of harmonic output does not cause the beam properties to be altered when the pulse energy is varied.



Intelligent bolt-on harmonic unit

IP54 Sealed output window

Motorised variable attenuator



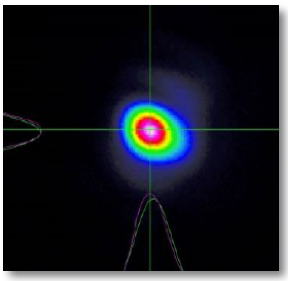
TECHNICAL DATA

Model	TRLi DPSS 360-10	TRLi DPSS 170-100	TRLi DPSS 230-100	TRLi DPSS 130-200	TRLi DPSS 180-200	TRLi DPSS 100-300	TRLi DPSS G170-100	TRLi DPSS G130-200
Type of Resonator	Stable	Stable	Stable	Stable	Stable	Stable	Super-Gaussian	Super-Gaussian
Repetition Rate (Hz)	10	100	100	200	200	300	100	200
Output Energy (mJ)								
1064nm	360	170	230	130	180	100	170	130
532nm	180	85	115	65	90	50	85	65
355nm (1)	95	45	60	25	45	23	45	25
266nm	30	15	20	10	15	5	15	10
213nm (2)								
Pulse Stability (%RMS) (3)								
1064nm	0.2	0.2	0.2	0.2	0.2	0.2	≤0.8	≤0.8
532nm	0.3	0.3	0.3	0.3	0.3	0.3	≤1.0	≤1.0
355nm	0.8	0.8	0.8	0.8	0.8	0.8	≤1.5	≤1.5
266nm	1.5	1.5	1.5	1.5	1.5	1.5	≤2.0	≤2.0
Pulse Width (ns) (4)								
1064nm	10-12	8-10	10-12	9-11	9-11	10-12	8-10	9-11
532nm	9-11	7-9	9-11	9-11	9-11	9-11	7-9	9-11
355nm	8-10	6-9	8-10	8-10	8-10	8-10	6-9	8-10
266nm	8-10	6-9	8-10	8-10	8-10	8-10	6-9	8-10
Beam Parameter								
Beam Diameter (mm) (5)	6	5	6	5	6	5	5	5
Beam Divergence (mrad)	≤2	≤2	≤2	≤2	≤2	≤2	≤0.5	≤0.5
M^2 @ 1064nm	≤8	≤8	≤8	≤8	≤8	≤8	≤2	≤2
Pointing Stability (µrad) (6)	≤15	≤15	≤15	≤15	≤15	≤15	≤20	≤20
Timing Jitter (ns) (7)	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5
Polarisation	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear

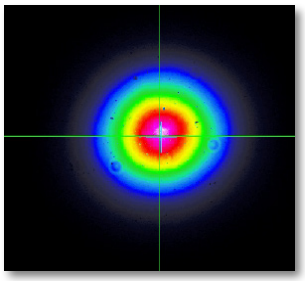
All Models	
Operation	
Control (8)	RS232
Q-switch Trigger and Sync	TTL
Services	
Voltage (VAC) (9)	200-250
Frequency (Hz)	50 or 60
Power	Single Phase
Ambient (°C) (10)	5-35
External Cooling (11)	Air
Diode Warranty (shots)	4×10^9

All specifications at maximum repetition rate unless otherwise stated.

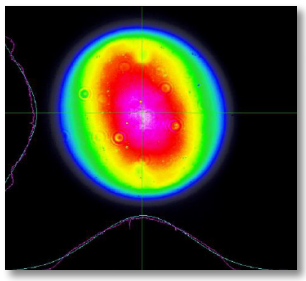
(1) Higher energies available on request using alternative harmonic generation crystals.
(2) Contact Litron for more information.
(3) 99% of pulses.
(4) FWHM – measured with a fast photodiode.
(5) 100% beam diameter at laser exit port.
(6) Half angle.
(7) RMS with respect to Q-switch trigger input.
(8) Full software suite and programming tools supplied.
(9) 200V to be specified at order.
(10) 0 to 80% non-condensing atmosphere.
(11) Standard air-cooled chiller or optional water-cooled chiller.



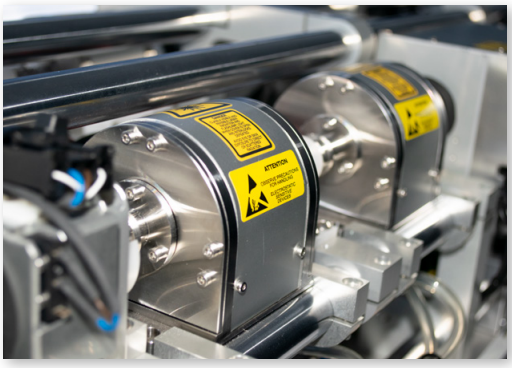
Stable resonator beam profile, 1064nm far field



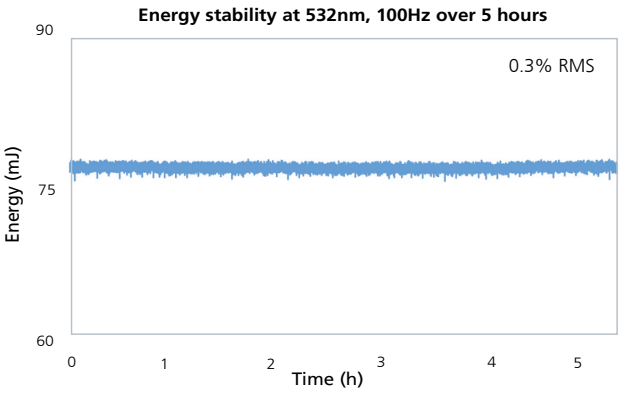
Stable resonator beam profile, 532nm far field



Stable resonator beam profile, 532nm near field

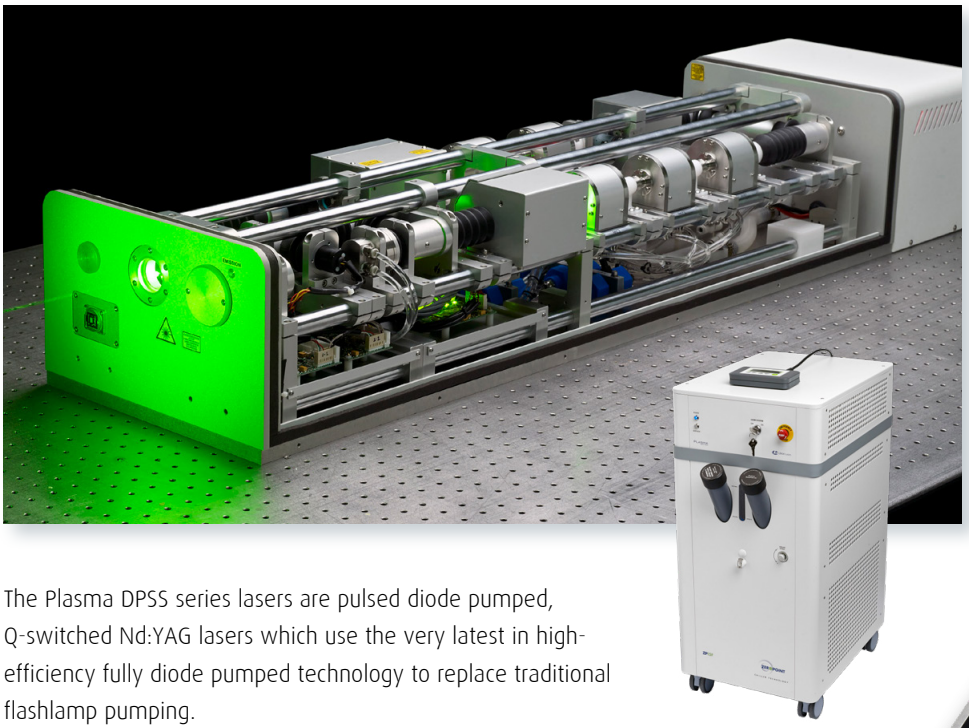


Diode pump modules



Plasma Series

High Energy Pulsed DPSS Nd:YAG Lasers at up to 250Hz



FEATURES

- ***Output energies up to 1J***
- ***Repetition rates up to 250Hz***
- ***Fully diode pumped lasers***
- ***Super-Gaussian resonator M^2 ≤2***
- ***Stable resonator M^2 ≤8***
- ***Ultra high stability***
- ***Exceptional diode life***
- ***Homogeneous beam profile***
- ***Compact PSU***
- ***Detachable chiller***
- ***Field replaceable diodes***
- ***RS232 control***
- ***Optional injection seeding***

The Plasma DPSS series lasers are pulsed diode pumped, Q-switched Nd:YAG lasers which use the very latest in high-efficiency fully diode pumped technology to replace traditional flashlamp pumping.

The Plasma series DPSS lasers use Litron's sealed, mechanically robust diode pump module to ensure stable output, high reliability, easy diode replacement and diode warranty of 4 billion pulses.

LUCi Controller

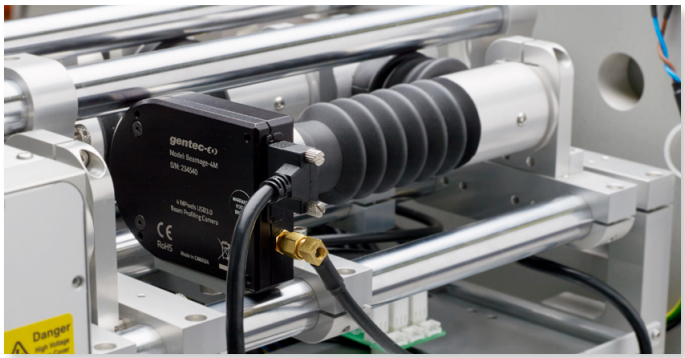
APPLICATIONS

- ***Semiconductor annealing***
- ***LIDAR & Remote Sensing***
- ***Thomson Scattering***
- ***Laser Shock Peening***
- ***Si wafer inspection***
- ***Dye, OPO and Ti:Sa pumping***
- ***Laser cleaning***
- ***Laser Lift-Off***
- ***LCD repair***
- ***LIBS & LIF***
- ***LIDT***

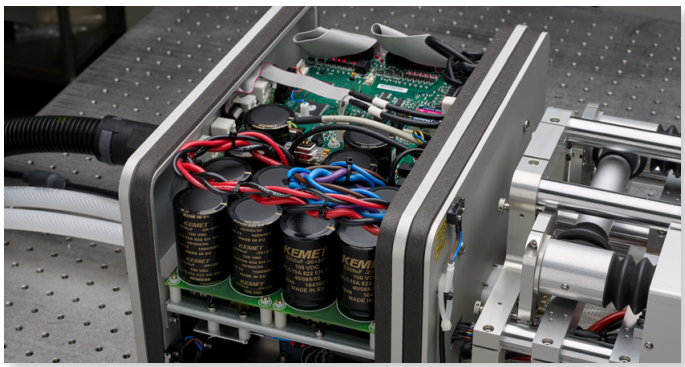
All Plasma models employ a true birefringence-compensating twin-rod resonator that gives a circular and highly homogeneous beam profile with a low M^2.

A super-Gaussian coupled twin-rod birefringence compensating resonator is also available (M^2 ≤2) for applications requiring a highly focusable beam.

The Plasma series options include motorised auto-tuning and auto-tracking of the harmonics modules. Litron has developed industrially proven, hands-free tuning to obtain the maximum energy output from a given harmonic module in <20 seconds. The additional auto-tracking function significantly reduces long term energy drift, often prevalent at UV wavelengths.



Real time beam profile monitoring option



Power supply for pump diodes located inside laser head

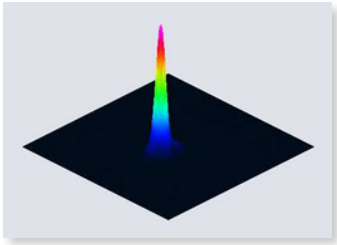
TECHNICAL DATA

Model	Plasma 450-100	Plasma 400-200	Plasma 1000-100	Plasma G 400-100	Plasma 100-100
Type of Resonator	Stable	Stable	Stable	Super-Gaussian	TEM_{00}
Repetition Rate (Hz)	100	200	100	100	100
Output Energy (mJ)					
1064nm	450	400	1000	400	100
532nm	225	200	500	200	50
355nm	100	90	200	100	20
266nm	45	30	70	45	9
213nm (1)					
Pulse Stability (%RMS) (2)					
1064nm	0.2	0.2	0.2	≤0.8	≤0.3
532nm	0.3	0.3	0.3	≤1.0	≤0.4
355nm	1.0	1.0	1.0	≤1.5	≤1.0
266nm	1.5	1.5	1.5	≤2.0	≤1.5
Pulse Width (ns) (3)					
1064nm	11-14	9-11	11-14	8-10	8-10
532nm	10-13	9-11	10-13	8-10	8-10
355nm	9-12	8-10	9-12	7-9	7-9
266nm	9-12	8-10	9-12	7-9	7-9
Beam Parameter					
Beam Diameter (mm) (4)	9.5	9.5	9.5	9.5	5.0
Beam Divergence (mrad) (5)	≤2	≤2	≤2	≤0.5	≤1
M^2 @ 1064nm	≤8	≤8	≤8	≤2	≤1.3
Pointing Stability (µrad) (6)	≤15	≤15	≤15	≤20	≤20
Timing Jitter (ns) (7)	≤0.5	≤0.5	≤0.5	≤0.5	≤0.5
Polarisation	Linear	Linear	Linear	Linear	Linear

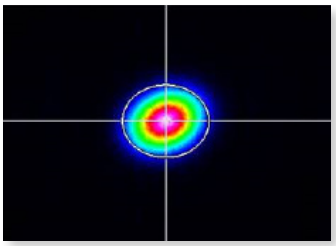
All Models	
Operation	
Control (8)	RS232
Q-switch Trigger and Sync	TTL
Services	
Voltage (VAC) (9)	200-250
Frequency (Hz)	50 or 60
Power	Single Phase
Ambient (°C) (10)	5-35
External Cooling (11)	Air
Diode Warranty (shots)	4×10^9

All specifications at maximum repetition rate unless otherwise stated.

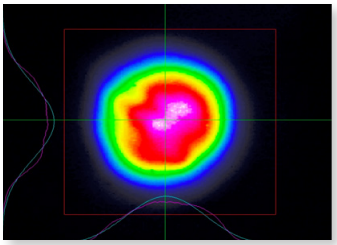
(1) Contact Litron for more information.
(2) 99% of pulses.
(3) FWHM – measured with a fast photodiode.
(4) 100% beam diameter at laser exit port.
(5) Full angle at specified beam diameter.
(6) Half angle.
(7) RMS with respect to Q-switch trigger input.
(8) Full software suite and programming tools supplied.
(9) 200V to be specified at order.
(10) 0 to 80% non-condensing atmosphere.
(11) Standard air-cooled chiller or optional water-cooled chiller.



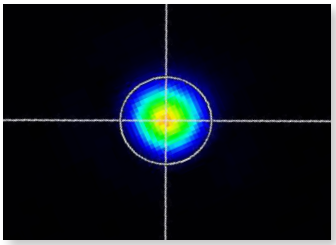
Stable resonator beam profile, 1064nm near field



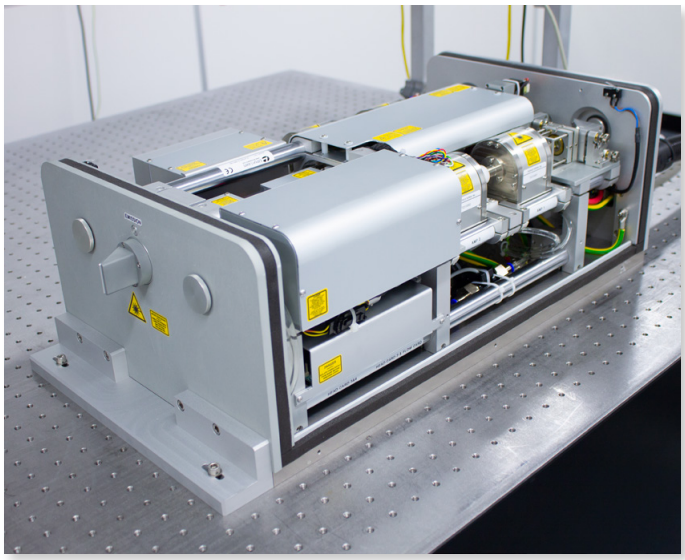
Stable resonator beam profile, 1064nm far field



Stable resonator beam profile, 532nm far field



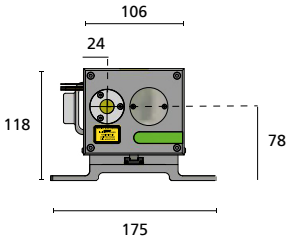
TEM_{00} beam profile, 1064nm far field

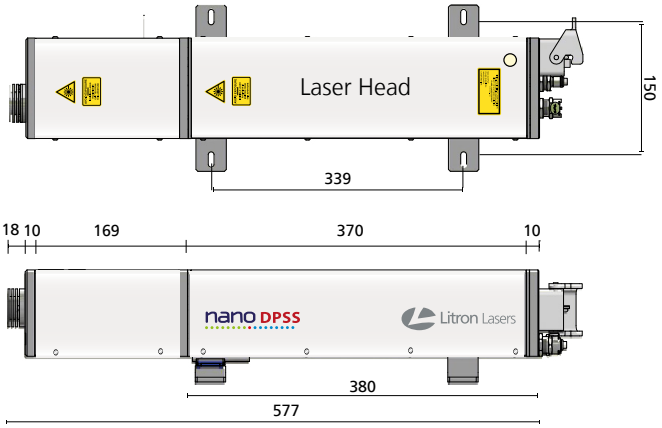


Compact Plasma G 400-100, 30mJ 266nm

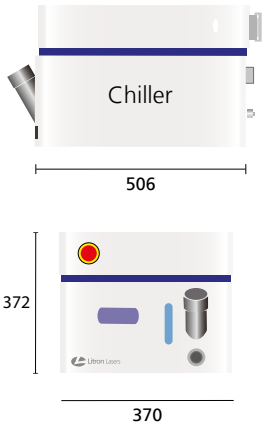
MECHANICAL DATA

All dimensions shown in mm



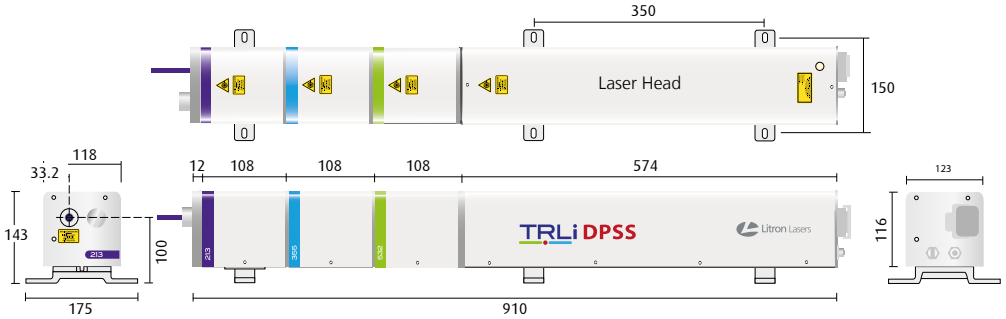


Free standing PSU and chiller

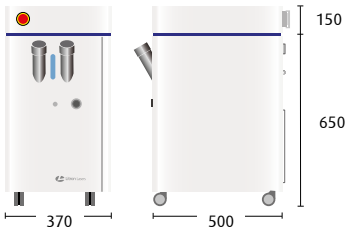


MECHANICAL DATA

All dimensions shown in mm

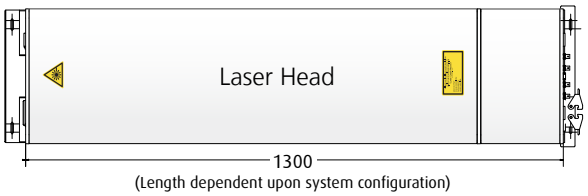


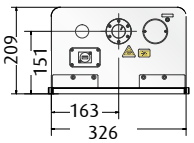
Free standing PSU and chiller



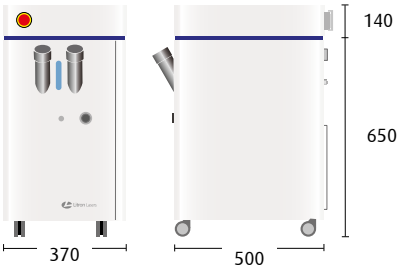
MECHANICAL DATA

All dimensions shown in mm





Free standing PSU and chiller



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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