

# Nano Series Ultra Compact Pulsed Nd:YAG Lasers

*Product Range Specification*



# Nano Range Specification Stable & Stable Telescopic Resonators

Model	Nano S 130-10	Nano S 120-20	Nano S 60-30	Nano S 30-50	Nano L 320-10	Nano L 200-10	Nano L 290-20	Nano L 200-20	Nano L 200-30	Nano L 150-50	Nano L 90-100
<b>Max. Repetition Rate (Hz)</b>	10	20	30	50	10	10	20	20	30	50	100
<b>Output Energy (mJ) <sup>(1)</sup></b>											
1064nm	130	120	60	30	320	200	290	200	200	150	90
532nm	65	60	30	15	200	110	145	110	110	75	50
355nm	25	15	10	6	45	40	50	40	40	30	15
266nm	16	12	6	3	30	25	30	25	25	15	10
213nm	3	3	2	1	5	4	5	3	3	3	2
<b>Parameter</b>											
Pulse - pulse Stability (±%) <sup>(2)</sup>	3	2	2	2	2	2	2	2	2	2	2
Beam diameter (mm)	4	4	3	3	6.5	5	6.5	5	5	4	4
Beam divergence (mrad) <sup>(3)</sup>	<2.5	<2.5	<2.0	<2.0	<2.0	<2.0	<1.5	<2.0	<2.0	<1.5	<1.5
Pulse length @ 1064nm (ns)	6-8	6-8	6-8	6-8	7-9	7-9	7-9	7-9	6-9	7-9	7-9
Pointing stability (µrad)	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70
Resonator type <sup>(5)</sup>	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable
TEM <sub>00</sub> (mJ) @ 1064nm <sup>(6)</sup>	15	15	10	10	40	40	30	40	40	20	20
Lamp life (pulses)	5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>
Timing jitter (ns) <sup>(7)</sup>	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
<b>Services</b>											
Voltage (VAC)	110-250	110-250	110-250	110-250	220-250	110-250	220-250	110-250	220-250	220-250	200-250
Frequency (Hz)	47-63	47-63	47-63	47-63	47-63	47-63	47-63	47-63	47-63	47-63	47-63
Power	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase
Ambient <sup>(8)</sup> (°C)	5-35	5-35	5-35	5-35	5-35	5-35	5-35	5-35	5-35	5-35	5-35
Consumption (W)	<300	<300	<300	<300	<350	<350	<450	<650	<650	<850	<850
<b>PSU Type</b>	LPU250 <sup>(9)</sup>	LPU250 <sup>(9)</sup>	LPU250 <sup>(9)</sup>	LPU250 <sup>(9)</sup>	LPU1000	LPU250 <sup>(9)</sup>	LPU1000	LPU350	LPU1000	LPU1000	LPU1000

Model	Nano T 290-10	Nano T 250-10	Nano T 270-20	Nano T 250-20	Nano T 100-50
<b>Max. Repetition Rate (Hz)</b>	10	10	20	20	50
<b>Output Energy (mJ) <sup>(1)</sup></b>					
1064nm	290	250	270	250	100
532nm	145	125	135	125	50
355nm	50	45	45	45	20
266nm	27	30	25	30	15
213nm	4	4	3	4	2
<b>Parameter</b>					
Pulse - pulse stability (±%) <sup>(2)</sup>	2	2	2	2	2
Beam diameter (mm)	6.35	5	5	5	5
Beam divergence (mrad) <sup>(3)</sup>	<0.8	<0.8	<0.8	<0.8	<0.8
Pulse length @ 1064nm (ns)	7-11	7-11	7-11	7-11	7-11
Pointing stability (µrad)	<70	<70	<70	<70	<70
Resonator type <sup>(5)</sup>	Telescopic	Telescopic	Telescopic	Telescopic	Telescopic
TEM <sub>00</sub> (mJ) @ 1064nm <sup>(6)</sup>	45	45	45	45	30
Lamp life (pulses)	5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>
Timing jitter (ns) <sup>(7)</sup>	<0.5	<0.5	<0.5	<0.5	<0.5
<b>Services</b>					
Voltage (VAC)	110-250	110-250	110-250	110-250	220-250
Frequency (Hz)	47-63	47-63	47-63	47-63	47-63
Power	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase
Ambient <sup>(8)</sup> (°C)	5-35	5-35	5-35	5-35	5-35
Consumption (W)	<650	<350	<650	<650	<650
<b>PSU Type</b>	LPU250 <sup>(9)</sup>	LPU250 <sup>(9)</sup>	LPU350	LPU350	LPU1000

- (1) Variable by mean of lamp voltage control. Energy stability remains within specification from 20% to 100% of output energy. The maximum energy is quoted for a system having a 15 minute warm-up period.
- (2) At 1064nm.
- (3) Full angle for 90% of the output energy.
- (4) Full angle.
- (5) With the addition of optional intra-cavity aperture.
- (6) Factory fitted option on the Nano S range, this is not customer removable. On the Nano L and Nano T ranges the TEM<sub>00</sub> aperture can be added or removed as required.
- (7) Jitter is measured with respect to the Q-switch trigger input.
- (8) 0-80% non condensing atmosphere.
- (9) LPU250R option available as 4U 19" Rackmounted PSU.

### Nano stable resonators and stable telescopic resonators

This Nano range allow a great deal of flexibility both in scientific and industrial applications. The output of these systems is multimode, however the telescopic resonators offer high energy beams with low divergences - comparable to those from unstable Gaussian coupled resonators but with a more uniform spatial profile, and a smoother temporal profile. Such features lend these systems to the pumping of narrow band dye lasers and optical parametric oscillators. All Nano L and Nano T models can be fitted with intra-cavity apertures to give a true TEM<sub>00</sub> output.

# Nano Range Specification Gaussian Coupled Resonators

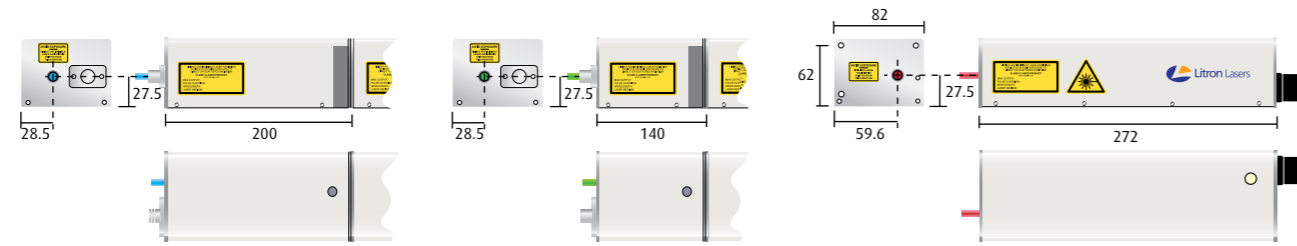
Model	Nano SG 150-10	Nano SG 120-20	Nano SG 60-30	Nano LG 300-10	Nano LG 225-10	Nano LG 250-20	Nano LG 200-20	Nano LG 150-30	Nano LG 130-50
<b>Max. Repetition Rate (Hz)</b>	<b>10</b>	<b>20</b>	<b>30</b>	<b>10</b>	<b>10</b>	<b>20</b>	<b>20</b>	<b>30</b>	<b>50</b>
<b>Output Energy (mJ)</b>									
1064nm	150	120	60	300	225	250	200	150	130
532nm	75	65	35	150	120	125	110	75	65
355nm	30	15	10	60	50	45	40	25	20
266nm	15	12	6	35/45 <sup>(4)</sup>	30	30	25	18	15
213nm	3	2	1	6	5	4	4	2	2
<b>Parameter</b>									
Pulse - pulse Stability (±%)	2	2	2	2	2	2	2	2	2
Beam diameter (mm)	5	4	4	5	5	5	5	5	5
Beam divergence (mrad) <sup>(1)</sup>	<0.7	<0.5	<0.5	<0.7	<0.5	<0.7	<0.5	<0.5	<0.5
Fit to Gaussian N/F field (%)	70/95	70/95	70/95	70/95	70/95	70/95	70/95	70/95	70/95
M <sup>2</sup>	<2	<2	<2	<2	<2	<2	<2	<2	<2
Pulse length @ 1064nm (ns)	4-6	6-8	6-8	4-6	4-6	4-6	4-6	4-6	4-6
Pointing stability (µrad) <sup>(2)</sup>	<100	<70	<70	<100	<70	<100	<70	<100	<100
Lamp life (pulses)	>5x10 <sup>7</sup>	>5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>	5x10 <sup>7</sup>
Timing jitter (ns) <sup>(3)</sup>	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
<b>Services</b>									
Voltage (VAC)	110-250	110-250	110-250	220-250	220-250	220-250	220-250	220-250	220-250
Frequency (Hz)	47-63	47-63	47-63	47-63	47-63	47-63	47-63	47-63	47-63
Power	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase
Ambient <sup>(5)</sup> (°C)	5-35	5-35	5-35	5-35	5-35	5-35	5-35	5-35	5-35
Consumption (W)	<350	<350	<350	<400	<650	<650	<650	<650	<650
<b>PSU Type</b>	LPU250 <sup>(6)</sup>	LPU350 <sup>(6)</sup>	LPU350 <sup>(6)</sup>	LPU1000	LPU1000	LPU1000	LPU1000	LPU1000	LPU1000

- (1) Irreducible beam divergence measured full angle for cone containing 90% of energy.
- (2) Full angle.
- (3) With respect to Q-switch trigger input/sync output.
- (4) Higher 266nm output option available.
- (5) 0-80% non condensing atmosphere.
- (6) LPU250R option available as 4U 19" Rackmounted PSU.

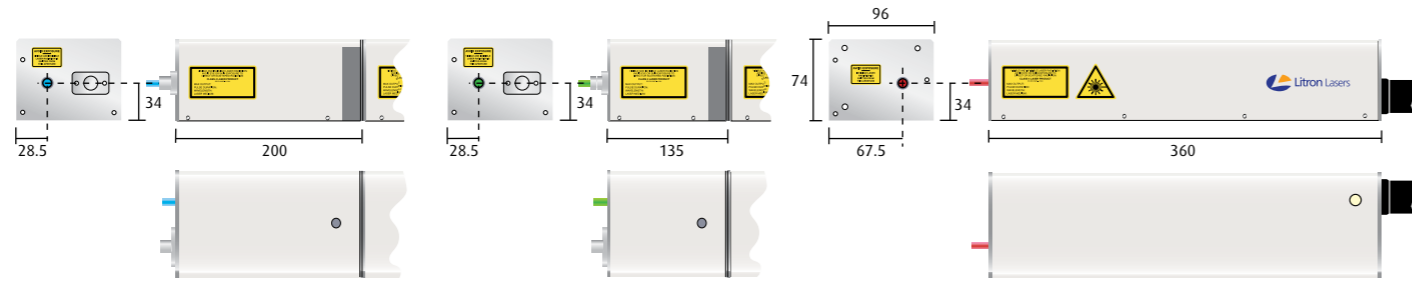
## Nano geometrically unstable Gaussian coupled resonators

This Nano series is available with unstable Gaussian coupled resonators giving very low divergence single transverse mode output beams.

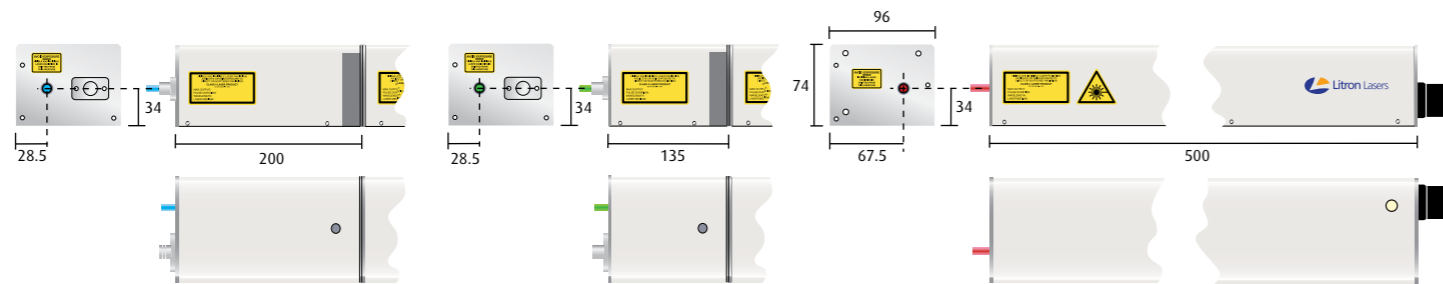
# Nano Range Dimensions



**Nano S** Laser Head with Doubler & Tripler/Quadrupler Units. (Quintupler/5th HG Unit length is 265mm.)

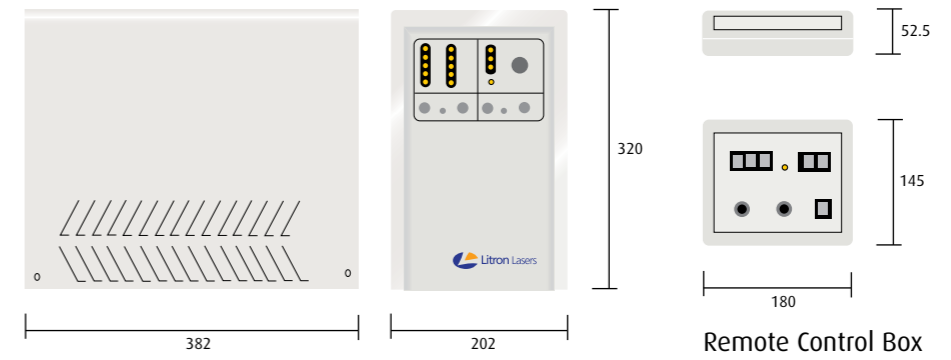


**Nano L** Laser Head with Doubler & Tripler/Quadrupler Units. (Quintupler/5th HG Unit length is 260mm.)

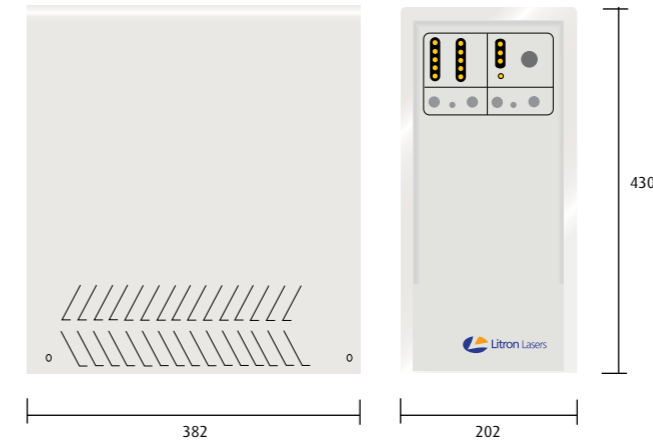


**Nano T** Laser Head with Doubler & Tripler/Quadrupler Units. (Quintupler/5th HG Unit length is 260mm.)

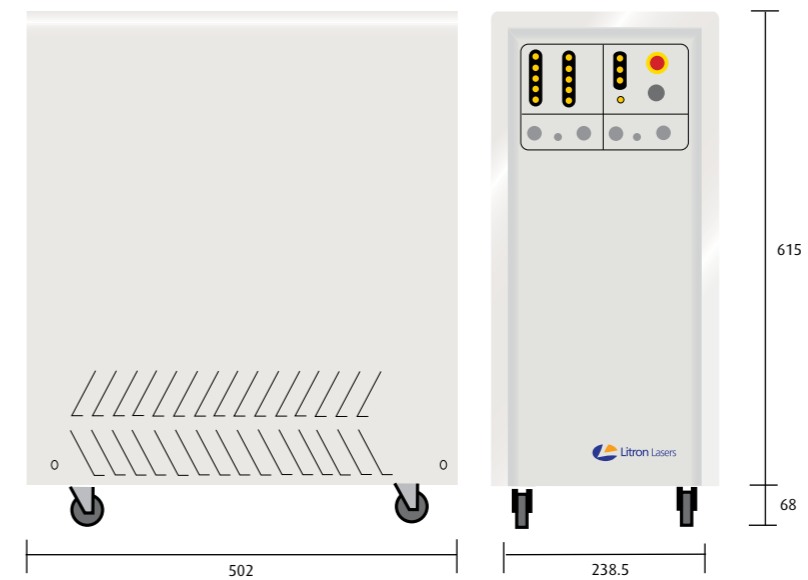
All dimensions shown in mm



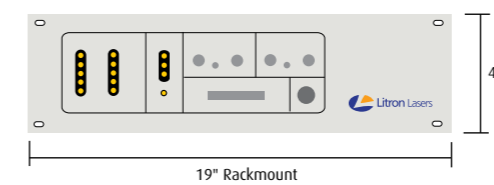
LPU250 PSU



LPU350 PSU



LPU1000 PSU



LPU 250R PSU



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