

# NL120 SERIES



NL120 series electro-optically Q-switched nanosecond Nd:YAG lasers deliver up to 10 J per pulse with excellent stability. The innovative, diode-pumped, self-seeded master oscillator design results in Single Longitudinal Mode (SLM) output without the use of external expensive narrow linewidth seed diodes and cavity-locking electronics. Unlike more common designs that use an unstable laser cavity, the stable master oscillator cavity produces a TEM<sub>00</sub> spatial mode output that results in excellent beam properties after the amplification stages.

NL120 series Q-switched nanosecond lasers are an excellent choice for many applications, including OPO, OPCPA or dye laser pumping, holography, LIF spectroscopy, remote sensing, optics testing and other tasks.

For tasks that require a smooth and as close as possible to the Gaussian beam profile, models with improved Gaussian fit are available (see the description of the –G option on the next page).

The low jitter of the optical pulse with respect to the Q-switch triggering pulse allows the reliable synchronization between the laser and external equipment.

The optional second (SH) (for 532 nm), third (TH) (for 355 nm) and fourth (FH) (for 266 nm) harmonics generators provide access to shorter wavelengths.

The laser is controlled by a supplied netbook PC via USB port with application for Windows™ operating system.

In addition, the main settings of the laser can be controlled through an auxiliary user-friendly remote control pad. The remote pad features a backlit display that is easy to read even when wearing laser safety eyewear.

## SLM Q-switched Nd:YAG Lasers

### FEATURES

- ▶ Up to **10 J** pulse energy
- ▶ Diode-pumped, self-seeded Single Longitudinal Mode (SLM) master oscillator
- ▶ Stable master oscillator cavity producing TEM<sub>00</sub> spatial mode output
- ▶ Excellent pulse energy stability
- ▶ Up to **50 Hz** pulse repetition rate
- ▶ **2 ns** pulse duration (7 or 25 ns are optional)
- ▶ Temperature stabilized harmonics generator options
- ▶ Remote control via keypad
- ▶ Laser control from netbook PC via USB port

### APPLICATIONS

- ▶ Material processing
- ▶ OPO, OPCPA, Ti:Sapphire, dye laser pumping
- ▶ Holography
- ▶ Nonlinear laser spectroscopy
- ▶ Optics testing

SPECIFICATIONS <sup>1)</sup>

Model	NL120	NL121	NL122	NL123	NL124	NL125	NL128	NL129
Pulse energy <sup>2)</sup>								
at 1064 nm	1.9 mJ	150 mJ	300 mJ	600 mJ	1200 mJ	1600 mJ	5000 mJ	10000 mJ
at 532 nm <sup>4)</sup>	0.9 mJ	60 mJ	125 mJ	250 mJ	500 mJ	700 mJ	TBA <sup>3)</sup>	TBA <sup>3)</sup>
at 355 nm <sup>5)</sup>	0.6 mJ	40 mJ	80 mJ	160 mJ	320 mJ	450 mJ	TBA <sup>3)</sup>	TBA <sup>3)</sup>
at 266 nm <sup>6)</sup>	0.3 mJ	15 mJ	40 mJ	70 mJ	100 mJ	140 mJ	TBA <sup>3)</sup>	TBA <sup>3)</sup>
Pulse energy stability (StdDev) <sup>7)</sup>								
at 1064 nm	<0.5 %			<1 %				
at 532 nm <sup>4)</sup>	<1 %			<2 %				
at 355 nm <sup>5)</sup>	<1.5 %			<3 %				
at 266 nm <sup>6)</sup>	<2 %			<5 %				
Pulse duration at 1064 nm (FWHM) <sup>8)</sup>	2 ± 0.5 ns							
Pulse repetition rate <sup>9)</sup>	0–50 Hz	10 or 20 Hz	10 Hz					
Linewidth	≤0.02 cm <sup>-1</sup> (SLM)							
Polarization at 1064 nm <sup>10)</sup>	linear, >90 %							
Optical pulse jitter (StdDev) <sup>11)</sup>	<0.2 ns							
Beam spatial profile <sup>12)</sup>	near TEM <sub>00</sub> , >85 % fit	Hat-Top, >70 % fit						
Typical beam divergence <sup>13)</sup>	<1.5 mrad	<0.5 mrad						
Beam pointing stability <sup>14)</sup>	<25 μrad							
Typical beam diameter <sup>15)</sup>	~2 mm	~5 mm	~6 mm	~8 mm	~10 mm	~12 mm	~20 mm	~27 mm

PHYSICAL CHARACTERISTICS								
Laser head size (W × L × H)	305 × 665 × 260 mm	455 × 820 × 270 mm	455 × 1020 × 270 mm		455 × 1220 × 270 mm		600 × 1500 × 300 mm	600 × 2000 × 300 mm
Power supply size (W × L × H)	n/a	550 × 600 × 550 mm		550 × 600 × 830 mm	550 × 600 × 1030 mm		550 × 600 × 1030 mm 2 units	550 × 600 × 1650 mm 2 units
Umbilical length	2.5 m							

OPERATING REQUIREMENTS								
Water consumption (max. 20 °C)	air cooled	<10 l/min			<20 l/min			
Ambient temperature	18–27 °C							
Relative humidity	10–80 % (non-condensing)							
Power requirements <sup>16)</sup>	90–240 V AC, 50/60 Hz	208 or 240 V AC, single phase 50/60 Hz			208 or 380 V AC, three-phase 50/60 Hz			
Power consumption <sup>17)</sup>	<0.5 kVA	<1.5 kVA	<2.5 kVA	<4 kVA	<4 kVA	<5 kVA	<8 kVA	<10kVA

<sup>1)</sup> Due to continuous improvement, all specifications are subject to change without notice. Parameters marked typical are not specifications. They are indications of typical performance and will vary with each unit we manufacture. Unless stated otherwise, all specifications are measured at 1064 nm.  
<sup>2)</sup> Outputs are not simultaneous.  
<sup>3)</sup> Contact EKSPILA for more information.  
<sup>4)</sup> For NL12x-SH and NL12x-SH/FH options.  
<sup>5)</sup> For NL12x-TH option.  
<sup>6)</sup> For NL12x-SH/FH option.  
<sup>7)</sup> Averaged from 300 pulses.  
<sup>8)</sup> Optional 7 or 25 ns pulse duration. Inquire for pulse energy specifications.

<sup>9)</sup> Pulse repetition rates up to 50 Hz are optional. Inquire for pulse energy specifications.  
<sup>10)</sup> For models without harmonics generators.  
<sup>11)</sup> With respect to Q-switch triggering pulse.  
<sup>12)</sup> Measured at 1 m distance from the laser output. Improved fit beam profile is available (see –G option description).  
<sup>13)</sup> Full angle measured at the 1/e<sup>2</sup> point at 1064 nm.  
<sup>14)</sup> Full angle, 300 shots, RMS.  
<sup>15)</sup> Beam diameter is measured at 1064 nm at the 1/e<sup>2</sup> level.  
<sup>16)</sup> Mains should be specified when ordering.  
<sup>17)</sup> For 10 Hz pulse repetition rate.



Picosecond Lasers

Picosecond Tunable Systems

Nanosecond Lasers

Nanosecond Tunable Lasers

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OPTIONS

► **-G option — >85 % Gaussian fit beam profile in near field**

Pulse energies are presented in the table below. Beam profile has lower beam intensity modulation when propagated over long distance. Recommended when application require homogenous, without hot spots, light intensity distribution.

Model	NL121G	NL122G	NL123G	NL124G
Max. pulse energy				
at 1064 nm	60 mJ	140 mJ	280 mJ	550 mJ
at 532 nm	20 mJ	40 mJ	80 mJ	165 mJ
at 355 nm	12 mJ	30 mJ	55 mJ	110 mJ
at 266 nm	3 mJ	7 mJ	14 mJ	30 mJ
Typical beam diameter	~3 mm	~5 mm	~7 mm	~9 mm
Beam profile at 1064 nm	Gaussian fit >85 %			

<sup>1)</sup> Other specifications of the lasers remain the same.

► **-P7 and -P25 options — 7 or 25 ns pulse duration**

For applications requiring longer pulse duration the laser master oscillator cavity can be modified to produce 7 or 25 ns pulses. Note: some of other specifications can be changed. Please contact Ekspla for detailed datasheets.

OUTLINE DRAWINGS

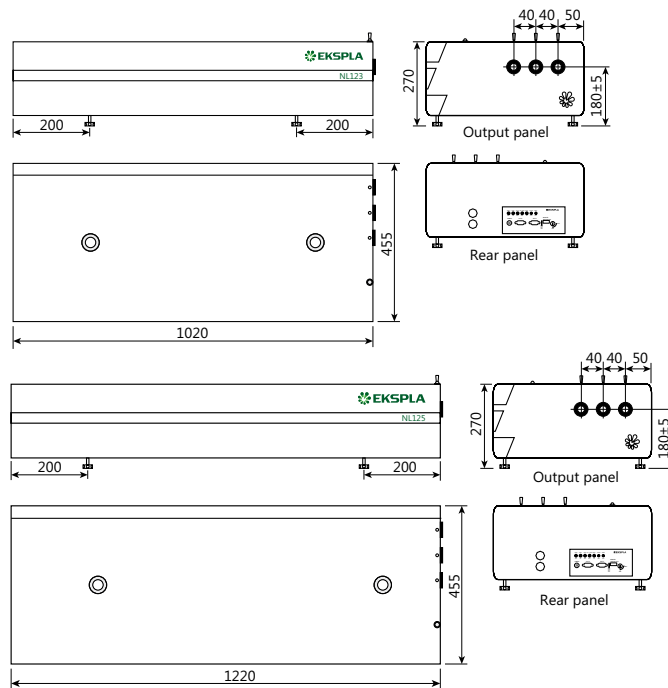


Fig 1. Typical external dimensions of NL122 and NL123 lasers

Fig 2. Typical external dimensions of NL124 and NL125 lasers

ORDERING INFORMATION

NL121G-10-P8-AW-SH/TH

