

# NL230 SERIES



## BENEFITS

- ▶ Short duration 3 – 6 ns pulses ensures strong interaction with material, are highly suitable for LIBS
- ▶ User selectable wavelength single axis output is superior for experiments, where alternating wavelengths are required, like material ablation, LIBS
- ▶ Rugged, monolithic design enables laser usage in harsh environment
- ▶ Diode pumped design provides quiet operation, eliminates the irritation of flash light
- ▶ Variety of interfaces USB, RS232, LAN, WLAN ensures easy control and integration with other equipment

The NL230 series diode-pumped short nanosecond lasers are designed to produce high-intensity, high-brightness pulses and are targeted for applications such as material ablation, Light Detection And Ranging (LIDAR), remote sensing, mass spectroscopy, OPO, Ti:Sapphire or dye laser pumping and many more. Diode pumping allows maintenance-free laser operation for an extended period of time - more than 3 years for an estimated eight working hours per day.

Because laser head components are placed in a robust, sealed and precisely machined monolithic aluminium block, this laser can

reliably work in a harsh industrial environment with applications such as laser-induced breakdown spectroscopy (LIBS).

Second and third harmonic options allows for an expanded range of applications, where high pulse energy and high pulse to pulse stability are required.

For easy and seamless control and integration with other industrial equipment, the NL230 series laser is equipped with USB/RS232 interfaces and can be externally triggered with a jitter as low as < 0.5 ns StDev.

NL230 series lasers are designed to work reliably 24/7 in an industrial environment.

## High Energy Q-switched DPSS Nd:YAG Lasers

### FEATURES

- ▶ Customers recognized reliability
- ▶ Two years warranty
- ▶ Diode-pumped
- ▶ Rugged sealed laser cavity
- ▶ Up to **190 mJ** at **1064 nm** pulse energy
- ▶ Up to **100 Hz** pulse repetition rate
- ▶ Short pulse duration in the **3–6 ns** range
- ▶ Variable reflectivity output coupler for low-divergence beam
- ▶ Quiet operation: no more flashlamp firing sound
- ▶ Remote control via keypad and/or any controller running on any OS using REST API commands
- ▶ Optional temperature-stabilized second and third harmonic generators
- ▶ Electromechanical shutter (optional)
- ▶ Easy replaceable output window

### APPLICATIONS

- ▶ LIBS (Light Induced Breakdown Spectroscopy)
- ▶ Material ablation
- ▶ OPO pumping
- ▶ Remote Sensing
- ▶ LIDAR (Light Detection And Ranging)
- ▶ Mass Spectroscopy
- ▶ LIF (Light Induced Fluorescence)

SPECIFICATIONS <sup>1)</sup>

Model	NL231-50	NL231-100
Pulse energy (not less than) <sup>2)</sup>		
at 1064 nm	190 mJ	150 mJ
at 532 nm	110 mJ	90 mJ
at 355 nm	55 mJ	40 mJ
at 266 nm	3 mJ	1.2 mJ
Pulse energy stability (StdDev) <sup>3)</sup>		
at 1064 nm	< 1 %	
at 532 nm	< 2.5 %	
at 355 nm	< 3.5 %	
at 266 nm	< 5 %	
Pulse repetition rate	50 Hz	100 Hz
Power drift <sup>4)</sup>	< ±3 %	
Pulse duration <sup>5)</sup>	3 – 6 ns	
Linewidth	< 1 cm <sup>-1</sup> at 1064 nm	
Beam profile <sup>6)</sup>	"Top Hat" in near field and close to Gaussian in far field	
Beam divergence <sup>7)</sup>	< 0.8 mrad	
Beam pointing stability (RMS) <sup>8)</sup>	≤ 60 μrad	
Polarization	linear, > 90 % at 1064 nm	
Typical beam diameter <sup>9)</sup>	5 mm	
Optical pulse jitter (StDev)		
Internal triggering regime	< 0.5 ns	
External triggering regime	< 0.5 ns	
Typical warm-up time	10 min	

PHYSICAL CHARACTERISTICS

Laser head size (W × L × H)	251 × 290 × 167 ± 3 mm
Power supply unit (W × L × H)	
Desktop case	449 × 390 × 140 ± 3 mm
19" module	483 × 390 × 140 ± 3 mm
External chiller	inquire
Umbilical length	3 m

OPERATING REQUIREMENTS

Cooling (air cooled) <sup>10)</sup>	external chiller
Ambient temperature	18–30 °C
Relative humidity (non-condensing)	20–80 %
Power requirements	100–240 V AC, single phase, 50/60 Hz
Power consumption	< 1.0 kW
Cleanliness of the room	not worse than ISO Class 9

<sup>1)</sup> Due to continuous improvement, all specifications are subject to change. The parameters marked typical may vary with each unit we manufacture. Unless stated otherwise all specifications are measured at 1064 nm and for basic system without options.  
<sup>2)</sup> Outputs are not simultaneous. Inquire for higher energy (up to 350 mJ at 50 Hz, 250 mJ at 100 Hz) custom models.  
<sup>3)</sup> Averaged from pulses, emitted during 30 sec time interval.  
<sup>4)</sup> Measured over 8 hours period after 20 min warm-up when ambient temperature variation is less than ± 2 °C and humidity < ± 5%.

<sup>5)</sup> FWHM.  
<sup>6)</sup> Near field (at the output aperture) TOP HAT fit is >80%.  
<sup>7)</sup> Full angle measured at the 1/e<sup>2</sup> level.  
<sup>8)</sup> Beam pointing stability is evaluated as movement of the beam centroid in the focal plane of a focusing element.  
<sup>9)</sup> Beam diameter is measured at 1064 nm at the 1/e<sup>2</sup> level.  
<sup>10)</sup> Adequate room air conditioning should be provided.



PERFORMANCE

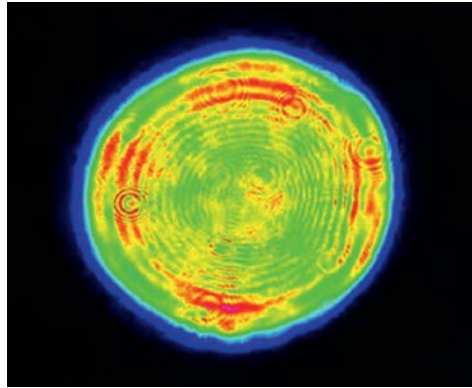


Fig 1. NL230 series laser typical near field beam profile

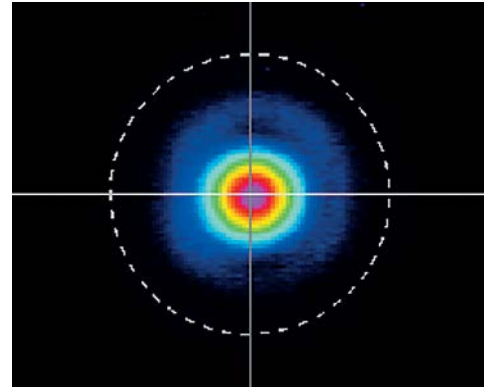


Fig 2. NL230 series laser typical far field beam profile

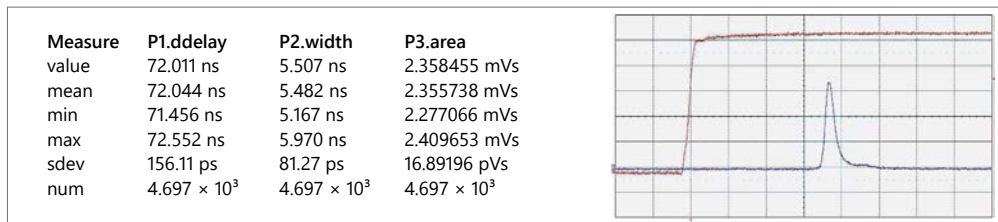


Fig 3. NL230 laser pulse waveform

OUTLINE DRAWINGS

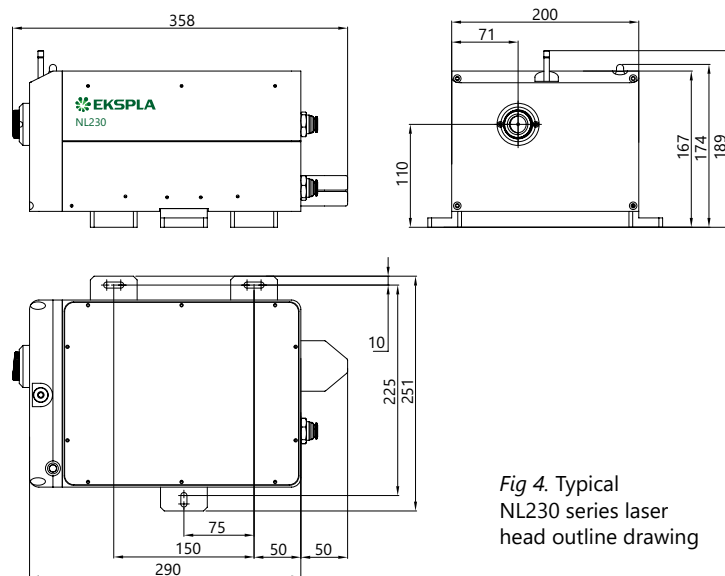


Fig 4. Typical NL230 series laser head outline drawing

ORDERING INFORMATION

<b>NL231-H230THC</b>	
Model	Optional harmonic generator modules

**Note:** Laser must be connected to the mains electricity all the time. If there will be no mains electricity for longer than 1 hour then laser (system) needs warm up for a few hours before switching on.