

ns

Industrial
Nanosecond
Lasers

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



High Energy Q-switched DPSS Nd:YAG Lasers

NL230 series

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

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 rms.

Applications

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

Features

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

At 1064 nm

190 mJ

100 Hz

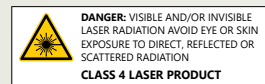
3 – 6 ns



Learn more
about NL230
www.ekspla.com

Specifications ¹⁾

Model		NL231-50	NL231-100
Pulse energy (not less than) ²⁾	at 1064 nm	190 mJ	150 mJ
	at 532 nm ³⁾	110 mJ	90 mJ
	at 355 nm ⁴⁾	55 mJ	40 mJ
Pulse energy stability (StdDev) ⁵⁾	at 1064 nm		< 1 %
	at 532 nm		< 2.5 %
	at 355 nm		< 3.5 %
Pulse repetition rate		50 Hz	100 Hz
Power drift ⁶⁾			< ±1 %
Pulse duration ⁷⁾			3 – 6 ns
Linewidth			< 1 cm ⁻¹ at 1064 nm
Beam profile ⁸⁾		"Top Hat" in near field and close to Gaussian in far field	
Beam divergence ⁹⁾			< 0.8 mrad
Beam pointing stability (StDev) ¹⁰⁾			≤ 60 μrad
Polarization			linear, > 95 % at 1064 nm
Typical beam diameter ¹¹⁾			5 mm
Optical pulse jitter (StDev)	Internal triggering mode		< 0.5 ns
	External triggering mode		< 0.5 ns
Typical warm-up time			10 min
Physical characteristics			
Laser head size (W × L × H)		251 × 291 × 167 ± 3 mm	
Power supply unit (W × L × H)	Desktop case	470 × 390 × 140 ± 3 mm	
	19" module	483 × 390 × 140 ± 3 mm	
External chiller			inquire
Umbilical length			3 m
Operating requirements			
Cooling (air cooled) ¹²⁾			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	
<p>¹⁾ 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.</p> <p>²⁾ Outputs are not simultaneous. Inquire for higher energy (up to 350 mJ at 50 Hz, 250 mJ at 100 Hz) custom models.</p> <p>³⁾ With H230SHC or H230STHC harmonic generator module.</p> <p>⁴⁾ With H230THC or H230STHC generator modules.</p> <p>⁵⁾ Averaged from pulses, emitted during 30 sec time interval.</p> <p>⁶⁾ Measured over 8 hours period after 20 min warm-up when ambient temperature variation is less than ± 2 °C and humidity < ± 5%.</p> <p>⁷⁾ FWHM.</p> <p>⁸⁾ Near field (at the output aperture) TOP HAT fit is >80%.</p> <p>⁹⁾ Full angle measured at the 1/e² level.</p> <p>¹⁰⁾ Beam pointing stability is evaluated as movement of the beam centroid in the focal plane of a focusing element.</p> <p>¹¹⁾ Beam diameter is measured at 1064 nm at the 1/e² level.</p> <p>¹²⁾ Adequate room air conditioning should be provided.</p>			



Performance

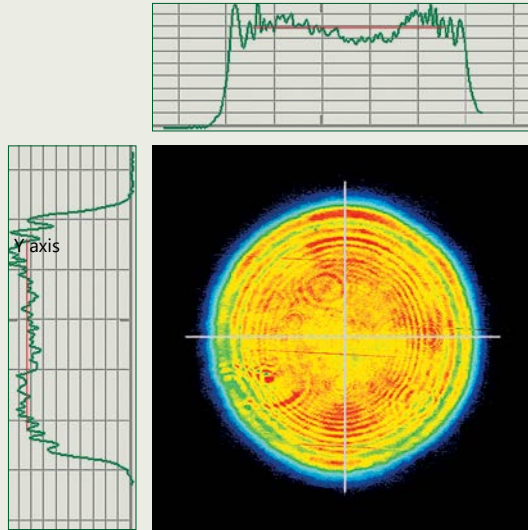


Fig 1. NL230 laser typical near field beam profile

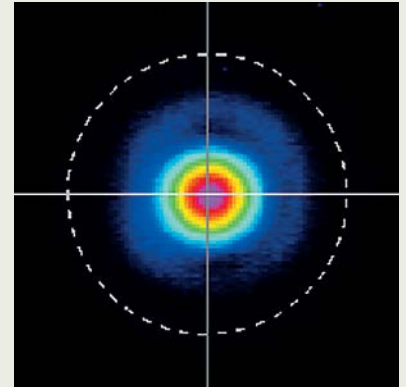


Fig 2. NL230 laser typical far field beam profile

Measure	P1.delay	P2.width	P3.area
value	72.011 ns	5.507 ns	2.358455 mVs
mean	72.044 ns	5.482 ns	2.355738 mVs
min	71.456 ns	5.167 ns	2.277066 mVs
max	72.552 ns	5.970 ns	2.409653 mVs
sdev	156.11 ps	81.27 ps	16.89196 pVs
num	4.697×10^3	4.697×10^3	4.697×10^3

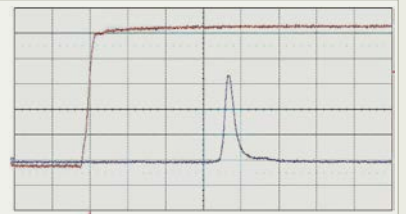


Fig 3. NL230 laser pulse waveform

Drawings

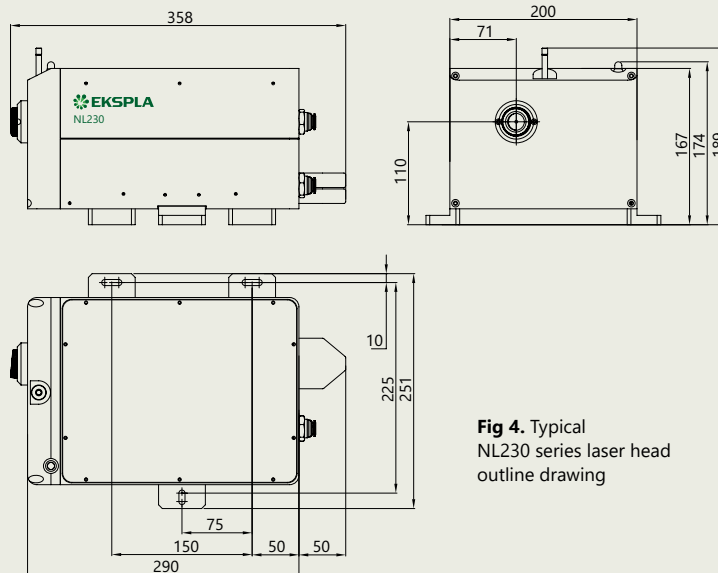


Fig 4. Typical NL230 series laser head outline drawing

Ordering information

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

NL231-H230THC

Model Optional harmonic generator modules