

NL310 SERIES



High pulse energy NL310 series lasers are targeted for applications like OPO or Ti:S pumping, material processing and plasma diagnostics.

These lasers can produce pulse energies up to 10 J in fundamental wavelength at 10 Hz pulse repetition rate.

For the convenience of customers the NL310 series nanosecond Q-switched laser can be controlled either through a user-friendly remote keypad or USB-CAN port. The remote keypad allows easy control of all parameters and features a backlit display that is easy to read even wearing laser safety eyewear.

Software for Windows™ operating system is provided to control the laser from PC. LabView™ drivers are supplied as well, allowing laser control integration into existing Labview™ programs.

The optional second (SH, 532 nm), third (TH, 355 nm), fourth (FH, 266 nm) and fifth (FiH, 213 nm) harmonic generators can be integrated into laser head or placed outside laser head into auxiliary harmonics generator module. Output wavelength switching is done manually. Motorized wavelength switching is available by request.

Triggering of the laser is possible from built-in internal or external pulse generator. Pulses with TTL levels are required for external triggering. Laser pulses have less than 0.5 ns rms jitter in respect to Q-switch triggering pulse in both cases.

The simple and field proven design ensures easy maintenance and reliable long-term operation of the NL310 series laser.

High Energy Q-switched Nd:YAG Lasers

FEATURES

- ▶ Up to **10 J** output energy
- ▶ Better than **0.5% rms** pulse energy stability
- ▶ **4–6 ns** pulse duration
- ▶ **10 or 20 Hz** repetition rate
- ▶ Thermo stabilized second, third, fourth and fifth harmonics generators
- ▶ Remote control via keypad or USB-CAN port
- ▶ Low jitter internal/external synchronization
- ▶ Robust and stable laser head

APPLICATIONS

- ▶ OPO, Ti:S, dye laser pumping
- ▶ Material processing
- ▶ Plasma generation and diagnostics
- ▶ Nonlinear spectroscopy
- ▶ Remote sensing
- ▶ Your application is welcome!

SPECIFICATIONS ¹⁾

Model	NL311	NL313	NL315	NL317	NL319
Pulse energy:					
at 1064 nm	1300 / 1000 mJ	1600 mJ	3500 mJ	5000 mJ	10000 mJ
at 532 nm ²⁾	600 / 440 mJ	800 mJ	1700 mJ	2500 mJ	5000 mJ
at 355 nm ³⁾	390 / 290 mJ	490 mJ	1000 mJ	1300 mJ	TBA ⁴⁾
at 266 nm ⁵⁾	130 / 120 mJ	180 mJ	210 mJ	250 mJ	TBA ⁴⁾
Pulse energy stability (StdDev): ⁶⁾					
at 1064 nm	0.5 %				
at 532 nm	1.0 %				
at 355 nm	1.8 %				
at 266 nm	3.6 %				
Power drift ⁷⁾	±2 %				
Pulse duration ⁸⁾	4–6 ns				
Repetition rate	10 / 20 Hz ⁹⁾	10 Hz ⁹⁾	10 Hz		
Polarization ¹⁰⁾	vertical, >90 %				
Optical pulse jitter ¹¹⁾	<0.5 ns				
Linewidth	<1 cm ⁻¹				
Beam profile	"Hat-Top" (near field), near Gaussian (far field)				
Typical beam diameter ¹²⁾	~10 mm	~12 mm	~18 mm	~21 mm	~27 mm
Beam divergence ¹³⁾	<0.5 mrad				
Beam pointing stability	±50 µrad				

PHYSICAL CHARACTERISTICS

Laser head (W × L × H) ¹⁴⁾	310 × 800 × 230 mm		460 × 1250 × 260 mm		6000 × 2000 × 300 mm
Power supply unit (W × L × H) ¹⁴⁾	550 × 600 × 530 mm		550 × 600 × 1235 mm	550 × 600 × 1630 mm	550 × 600 × 1620 mm 2 units
Umbilical length	2.5 m				

OPERATING REQUIREMENTS

Water consumption (max 20 °C) ¹⁴⁾	<6 l/min		10 l/min	12 l/min	15 l/min
Ambient temperature	stabilized; from range 18–30°C				
Relative humidity	20–80% (non-condensing)				
Power requirements ^{15) 16)}	208 or 240 V AC, single phase 50/60 Hz		208 or 380 V AC, three phases, 50/60 Hz		
Power consumption ¹⁴⁾	20 A	25 A	50/25 A ¹⁷⁾		60/30 A

¹⁾ Due to continuous improvement, all specifications 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.

²⁾ For NL31x-SH harmonics generator option. Harmonics outputs are not simultaneous; only single wavelength beam is present at the output at once. Manual reconfiguration is required to switch wavelength.

³⁾ For NL311-SH/TH or NL313-SH/TH harmonics generator option. Harmonics outputs are not simultaneous; only single wavelength beam is present at the output at once. Manual reconfiguration is required to switch wavelength. External harmonics generator module is used in NL315, NL317, NL319 lasers for 355 nm generation (unit dimensions 460×260×460 mm).

⁴⁾ Contact EKSPALA for more information.

⁵⁾ For NL311-SH/FH or NL313-SH/FH harmonics generator option. Harmonics outputs are not simultaneous; only single wavelength beam is present at the output at once. Manual reconfiguration is required to switch wavelength. External harmonics generator module is used in NL315, NL317, NL319 lasers for 266 nm generation (unit dimensions 460×260×460 mm).

⁶⁾ Standard deviation value averaged from 1000 shots after 5 minutes of warm-up.

⁷⁾ Deviation from average value measured over 8 hours of operation when room temperature variation is less than ±2 °C.

⁸⁾ Measured with photodiode with 500 ps rise time and oscilloscope with 600 MHz bandwidth.

⁹⁾ Inquire for models with up to 30 Hz pulse repetition rate.

¹⁰⁾ Measured at 10 Hz pulse repetition rate.

¹¹⁾ Standard deviation value, measured in respect to Q-switch triggering pulse.

¹²⁾ Beam diameter is measured at 1064 nm at laser output at the 1/e² level and can vary with each unit we manufacture.

¹³⁾ Full angle measured at the 1/e² level at 1064 nm.

¹⁴⁾ At 10 Hz pulse repetition rate.

¹⁵⁾ Mains voltage should be specified when ordering.

¹⁶⁾ For pulse repetition rates higher than 10 Hz three-phase mains are required.

¹⁷⁾ First number is for 208 V AC, second – for 380 V AC mains.



OPTIONS

- **-G option.** Provides beam profile optimized for OPO pumping or other applications requiring smooth, without hot spots beam profile in the near and medium field. Pulse energies typically are lower by 30% in comparison to standard lasers without -G option.

BEAM PROFILE

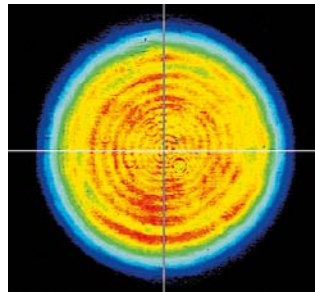


Fig 1. Typical beam profile of the NL310 series lasers. Near field

OUTLINE DRAWINGS

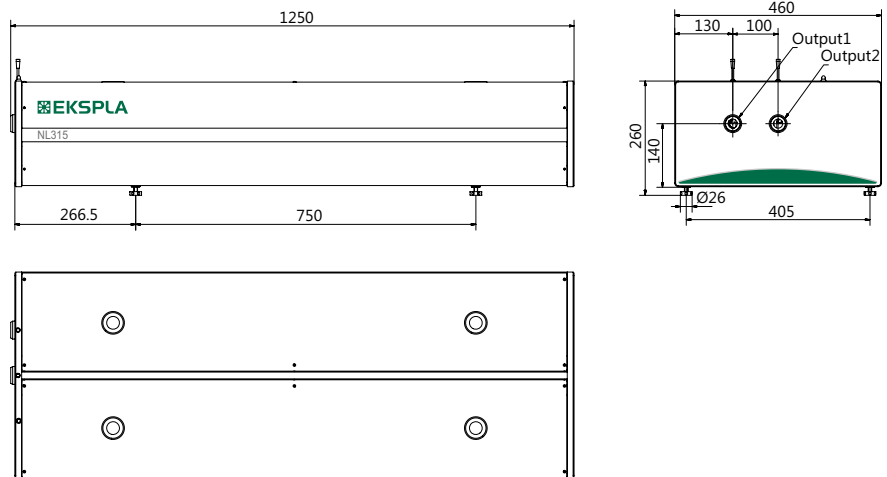


Fig 2. NL315 and NL317 lasers head outline drawing

ORDERING INFORMATION

