

NL310 SERIES



High pulse energy NL310 series lasers are targeted for applications like OPO or Ti: Sapphire 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 with 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
- ▶ Temperature 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: Sapphire, dye laser pumping
- ▶ Material processing
- ▶ Plasma generation and diagnostics
- ▶ Nonlinear spectroscopy
- ▶ Remote sensing
- ▶ Your application is welcome!

SPECIFICATIONS ¹⁾

| Model | NL311 | NL313 | NL314 | NL315 | NL317 | NL319 |
|--|---|--------------|----------------|---------|---------|----------|
| Pulse energy: | | | | | | |
| at 1064 nm | 1300 mJ | 1600 mJ | 2000 / 1800 mJ | 3500 mJ | 5000 mJ | 10000 mJ |
| at 532 nm ^{2) 6)} | 600 mJ | 800 mJ | 1000 / 900 mJ | 1700 mJ | 2500 mJ | 5000 mJ |
| at 355 nm ^{3) 6)} | 390 mJ | 490 mJ | 610 / 600 mJ | 1000 mJ | 1300 mJ | 2000 mJ |
| at 266 nm ^{4) 6)} | 130 mJ | 180 / 150 mJ | 190 / 160 mJ | 270 mJ | 400 mJ | 700 mJ |
| at 213 nm ^{5) 6)} | 25 / 20 mJ | 30 / 25 mJ | 40 / 30 mJ | - | - | - |
| Pulse energy stability (StdDev): ⁷⁾ | | | | | | |
| at 1064 nm | | | | | | 0.5 % |
| at 532 nm | | | | | | 1.5 % |
| at 355 nm | | | | | | 2.5 % |
| at 266 nm | | | | | | 4.0 % |
| at 213 nm | | | | | | 6.0 % |
| Power drift ⁸⁾ | | | | | | ±2 % |
| Pulse duration ⁹⁾ | 4–6 ns | | | 4–7 ns | | |
| Repetition rate | 10 / 20 Hz | | | 10 Hz | | |
| Polarization | vertical, >90 % | | | | | |
| Optical pulse jitter ¹⁰⁾ | <0.5 ns | | | | | |
| Linewidth | <1 cm ⁻¹ | | | | | |
| Beam profile ¹¹⁾ | "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 ¹⁴⁾ | ±50 μrad | | | | | |

PHYSICAL CHARACTERISTICS

| | | | | | |
|-------------------------------|---|--|--|---------------------|---------------------|
| Laser head (W × L × H) | 460 × 1250 × 260 mm | 310 × 800 × 230 mm / 460 × 1250 × 260 mm | 460 × 1250 × 260 mm | | 600 × 1800 × 300 mm |
| Power supply unit (W × L × H) | 553 × 600 × 653 mm / 553 × 600 × 832 mm | | 553 × 600 × 832 mm / 553 × 600 × 1020 mm | 550 × 600 × 1250 mm | 550 × 600 × 1640 mm |
| Umbilical length | 2.5 m | | | | |

OPERATING REQUIREMENTS

| | | | | | | |
|--|---|---------------|-----------------|---|--------|--------|
| Water consumption (max 20 °C) ¹⁵⁾ | <8 / <12 l/min | | <12 / <16 l/min | <12 l/min | | |
| Ambient temperature | stabilized; from range 18–27°C | | | | | |
| Relative humidity | 20–80% (non-condensing) | | | | | |
| Power requirements ¹⁶⁾ | 208–240 V AC, single phase 50/60 Hz / 208 or 380 V AC, three phases, 50/60 Hz | | | 208 or 380 V AC, three phases, 50/60 Hz | | |
| Power consumption | <2 / <3.5 kVA | <2.5 / <4 kVA | <4 / <5 kVA | <5 kVA | <6 kVA | <8 kVA |

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 -SH harmonics generator option.

³⁾ For -SH/TH harmonics generator option.

⁴⁾ For -SH/FH, -SH/TH/FH or -SH/FH/FiH harmonics generator option.

⁵⁾ For -SH/FH/FiH harmonics generator option.

⁶⁾ Harmonics outputs are not simultaneous; only single wavelength beam is present at the output at once. Manual reconfiguration is required to switch wavelength.

⁷⁾ Averaged from pulses, emitted during 30 sec time interval after 5–15 minutes of warm-up.

⁸⁾ Measured over 8 hours period after 20 min warm-up when ambient temperature variation is less than ±2 °C.

⁹⁾ FWHM.

¹⁰⁾ Standard deviation value, measured with respect to Q-switch triggering pulse.

¹¹⁾ Near field (at the output aperture) TOP HAT fit is >70%.

¹²⁾ Beam diameter is measured at 1064 nm at the 1/e² level.

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

¹⁴⁾ Beam pointing stability is evaluated as movement of the beam centroid in the focal plane of a focusing element.

¹⁵⁾ Water air cooling chiller is possible. Inquire for details.

¹⁶⁾ Mains voltage should be specified when ordering.



OPTIONS

- **-G option.** For models NL311, NL313. 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

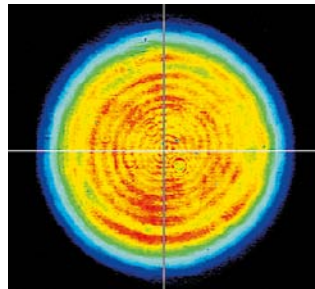


Fig 1. Typical beam profile of the NL310 series lasers. Near field

OUTLINE DRAWINGS

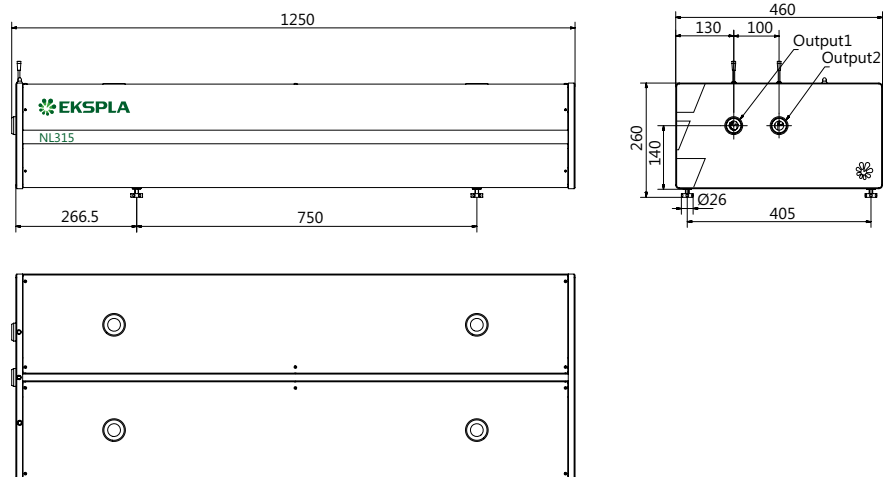


Fig 2. NL315 and NL317 lasers head outline drawing

ORDERING INFORMATION

