

NL740 SERIES



The main feature of NL740 series is the output of ultra-stable tunable duration (2 – 10 ns) narrow bandwidth nanosecond pulses based on temporally driven CW diode laser seeder and amplification stages.

Start of the system is the single mode DFB laser with temporal output power modulator. Then light is amplified in diode pumped regenerative amplifier in order to

reach energy sufficient to amplify in double pass diode pumped amplifiers. Power amplifier is a chain of double pass amplifiers where pulse is amplified up to required energy. Before amplification spatial beam shaping is employed in order to get flat top shape at the output. The harmonic generators are based on angle tuned nonlinear crystals placed in a heater.

Tunable Pulse Duration Nd:YAG Lasers

FEATURES

- ▶ Excellent temporal and spatial output mode stability
- ▶ Up to **100 mJ** output energy
- ▶ Up to **100 Hz** repetition rate
- ▶ **2–10 ns** pulse duration
- ▶ 1064, 532 nm or 355 nm output wavelength
- ▶ Fibre front end output amplified in diode pumped regenerative amplifier

APPLICATIONS

- ▶ Metrology
- ▶ Front end for power amplifiers
- ▶ Ti: Sapphire pumping
- ▶ Laser peening – material hardening by laser-induced shock wave
- ▶ Plasma and shock physics

SPECIFICATIONS ¹⁾

Model	NL740	NL742
Pulse energy (rectangular pulse in time domain 5 ns FWHM)		
at 1064 nm	2 mJ	100 mJ
at 532 nm ²⁾	NA	50 mJ
at 355 nm ²⁾	NA	30 mJ
Pulse energy stability (StdDev) ³⁾		
at 1064 nm	< 0.5 %	
at 532 nm	< 1.0 %	
at 355 nm	< 1.5 %	
Power drift ⁴⁾	± 2 %	
Pulse duration ⁵⁾	3 – 10 ns	
Repetition rate	100 Hz	
Polarization at 1064 nm	vertical, > 98 %	
Optical pulse jitter ⁶⁾	< 150 ps	
Linewidth	<0.1 cm ⁻¹	
Beam profile	Gaussian	Hat-Top (at laser output), without diffraction rings
Typical beam diameter ⁷⁾	~2 mm	~5 mm
Beam divergence ⁸⁾	1.0 mrad	0.7 mrad
Beam pointing stability (StdDev)	± 25 µrad	

PHYSICAL CHARACTERISTICS

Laser head (W × L × H)	456 × 1031 × 249 mm	600 × 1200 × 330 mm
Power supply unit (W × L × H)	85 × 170 × 41 mm	520 × 500 × 210 mm
Umbilical length	2.5 m (other length on request)	

OPERATING REQUIREMENTS

Water consumption (max 20° C)	air-cooled	air-cooled /< 4 l/min
Ambient temperature	stabilized; from range 18–25 °C	
Relative humidity	20–80 % (non-condensing)	
Power requirements ⁹⁾	90–240 V AC, single phase 50/60 Hz	
Power consumption	< 200 W	< 1.5 kW

- ¹⁾ Due to continuous improvement, all specifications are subject to change. Parameters marked typical are illustrative; 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⁾ Harmonics outputs are not simultaneous; only single wavelength beam is present at the output at once. Manual reconfiguration is required to switch wavelength.
- ³⁾ Standard deviation value averaged from pulses, emitted during 30 sec time interval after 20 minutes of warm-up.

- ⁴⁾ Deviation from average value measured over 8 hours of operation when room temperature variation is less than ±2 °C.
- ⁵⁾ FWHM. Measured with photodiode with 100 ps rise time and oscilloscope with 600 MHz bandwidth.
- ⁶⁾ Standard deviation value, measured with respect to triggering pulse.
- ⁷⁾ Beam diameter is measured at 1064 nm at laser output at the 1/e² level.
- ⁸⁾ Full angle measured at the 1/e² level at 1064 nm.
- ⁹⁾ Mains voltage should be specified when ordering.



PERFORMANCE

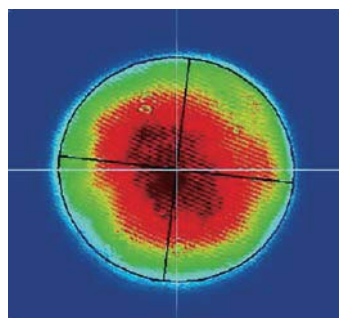


Fig 1. Typical NL740 near field beam profile at 532 nm