

# Picosecond Nd:YLF Lasers



Nd:YLF mode-locked picosecond lasers produces high energy pulses with as short as 10 ps pulse duration.

## Rugged and reliable design

Diode pumped mode-locked quasi-CW master oscillator produces the train of the pulses that is guided to the regenerative amplifier for further amplification. The single pulse is cavity-dumped from regenerative amplifier and then amplified by linear amplifiers to up to 80 mJ pulse energy. The output pulse energy can be adjusted in approximately 1 % steps from 1 mJ to nominal output, at the same time pulse-to-pulse energy stability remains less than 1.5 % rms at 1053 nm.

Angle-tuned KD\*P and KDP crystals mounted in thermostabilised ovens are used for second, third and fourth harmonic generation. Harmonic separators ensure high spectral purity of each harmonic directed to different output port.

Build in energy monitors continuously monitors output pulse energy. Data from the energy monitor can be seen on the remote keypad or on PC monitor.

The laser provides triggering pulse for synchronization of customer's equipment with lead up to 500 ns. The lead of triggering pulse can be adjusted in ~0.25 ns steps from control pad or PC.

PRETRIG is standard feature for streak camera triggering and can provide pulse with up to 1000  $\mu$ s lead that can be adjusted from PC with approx. 33 ns step.

## Simple and convenient laser control

For customer convenience the laser can be operated from master device or personal computer through USB (VCP, ASCII commands), RS232 (ASCII commands) or LAN (REST API) interfaces or from remote control pad with backlit display that is easy to read even while wearing laser safety glasses.

Custom product, tailored for specific applications

## FEATURES

- ▶ **10 ps** pulse duration
- ▶ Fiber master oscillator
- ▶ Diode pumped regenerative amplifier
- ▶ Flashlamp pumped power amplifier producing up to **70 mJ** per pulse at 1053 nm
- ▶ Excellent pulse duration stability
- ▶ Up to **10 Hz** repetition rate
- ▶ PC control via USB (RS232 is optional) and LabView™ drivers
- ▶ Remote control pad
- ▶ Optional streak camera triggering pulse with <10 ps rms jitter
- ▶ Optional thermostabilized second, third or fourth harmonic generators
- ▶ Optical parametric generators for tunable wavelength output in 210–2600 nm range are available

## APPLICATIONS

- ▶ Time resolved spectroscopy
- ▶ Nonlinear spectroscopy
- ▶ OPG pumping
- ▶ Other spectroscopic and nonlinear optics experiments

SPECIFICATIONS <sup>1)</sup>

Model	PL3143	PL3143A
Pulse energy		
at 1053 nm	40 mJ	70 mJ
at 526.5 nm <sup>2)</sup>	20 mJ	35 mJ
at 351 nm <sup>3)</sup>	10 mJ	17 mJ
at 263 nm <sup>3)</sup>	Contact Ekspla	
Pulse duration (FWHM) <sup>4)</sup>	10±2 ps	
Repetition rate	10 Hz	5 Hz
Triggering mode	internal / external	
SYNC OUT pulse jitter <sup>5)</sup>	< 100 ps	
SYNC OUT pulse lead/delay <sup>6)</sup>	-500...50 ns	

PHYSICAL CHARACTERISTICS

Laser head size (W × L × H)	462 × 1245 × 255 mm
Electric cabinet size (W × L × H)	550 × 600 × 835 mm
Umbilical length	2.5 m

OPERATING REQUIREMENTS

Water consumption (max 20 °C)	< 5 l/min
Room temperature	22±2 °C
Relative humidity	20–80 % (non-condensing)
Power requirements <sup>7)</sup>	three phase, 208 or 380 V AC, 20 A, 50/60 Hz
Power consumption	< 2.5 kVA

- <sup>1)</sup> Due to continuous improvement, all specifications are 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 1053 nm and for basic system without options.
- <sup>2)</sup> For -SH option. Outputs are not simultaneous. Please inquiry for pulse energies at other wavelengths.
- <sup>3)</sup> With auxiliary H400 harmonic generator unit. Outputs are not simultaneous. Please inquiry for pulse energies at other wavelengths.

- <sup>4)</sup> Inquiry for optional pulse durations in 20–80 ps range.
- <sup>5)</sup> With respect to optical pulse. <10 ps jitter is provided with PRETRIG standard feature.
- <sup>6)</sup> SYNC OUT lead or delay can be adjusted with ~0.25 ns steps in specified range. PRETRIG standard feature provide -1000..5000 µs lead/delay time adjustment range.
- <sup>7)</sup> Mains voltage should be specified when ordering.



PRETRIG FEATURE

- **PRETRIG** standard feature provides low jitter pulse for streak camera triggering with delay in -1000...5100 µs range and <10 ps rms jitter.

BEAM PROFILE

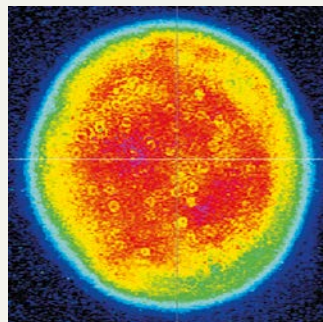


Fig 1. Typical beam profile at 1053 nm at 20 cm from PL3143B laser output at 80 mJ pulse energy

OUTLINE DRAWINGS

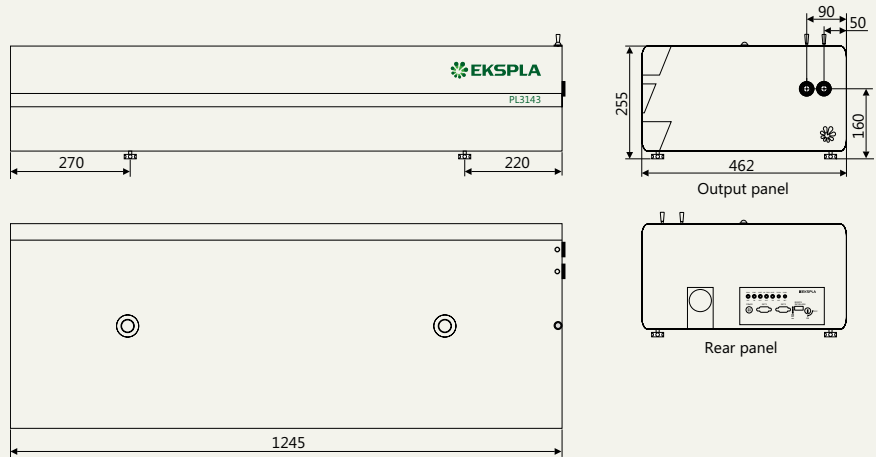


Fig 2. Dimensions of PL3143 and PL3143A lasers

ORDERING INFORMATION

**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.

