

PL2230 SERIES



Ekspla is proud to introduce the first commercial fully diode pumped high pulse energy mode-locked laser, producing 28 ps pulses with up to 15 mJ pulse energy at a 100 Hz or up to 40 mJ at 50 Hz pulse repetition rate.

Innovative design

The heart of the system is a diode pumped solid state (DPSS) master oscillator placed in a sealed monolithic block, producing high repetition rate pulse trains (88 MHz) with a low single pulse energy of several nJ. Diode pumped amplifiers are used for amplification of the pulse to 40 mJ output. The high-gain regenerative amplifier has an amplification factor in the proximity of 10^6 . After the regenerative amplifier, the pulse is directed to a multipass power amplifier that is optimized for efficient stored energy extraction from the Nd:YAG rod, while maintaining a near Gaussian beam profile and low wavefront distortion. The output pulse energy can be adjusted in approximately 1% steps, while pulse-to-pulse energy stability remains at less than 0.5% rms at 1064 nm.

Angle-tuned KD*P and KDP crystals mounted in thermostabilised ovens

are used for second, third, and fourth harmonic generation. Harmonics separators ensure the high spectral purity of each harmonic guided to different output ports.

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

The laser provides triggering pulses for the synchronisation of your equipment. The lead of the triggering pulse can be up to 500 ns and is user adjustable in ~ 0.25 ns steps from a personal computer. If required, up to 1000 μ s lead of triggering pulse is available when a PRETRIG option is installed.

Precise pulse energy control, excellent short-term and long-term stability, and a 100 Hz repetition rate makes PL2230 series lasers an excellent choice for many demanding scientific applications.

Simple and convenient laser control

For customer convenience the laser can be controlled through a user-friendly remote control pad or USB interface.

The remote pad allows easy control of all parameters and features a

Fully Diode Pumped Mode-locked Nd:YAG Lasers

FEATURES

- ▶ Hermetically sealed DPSS master oscillator
- ▶ Diode pumped regenerative amplifier
- ▶ Diode pumped power amplifier producing up to **40 mJ** per pulse at 1064 nm
- ▶ Air-cooled
- ▶ **<30 ps** pulse duration
- ▶ Excellent pulse duration stability
- ▶ Up to **100 Hz** repetition rate
- ▶ Streak camera triggering pulse with **<10 ps** jitter
- ▶ Excellent beam pointing stability
- ▶ Thermo stabilized second, third or fourth harmonic generator options
- ▶ PC control through USB and with supplied LabView™ drivers
- ▶ Remote control via keypad

APPLICATIONS

- ▶ Time resolved spectroscopy
- ▶ SFG/SHG spectroscopy
- ▶ Nonlinear spectroscopy
- ▶ OPG pumping
- ▶ Remote laser sensing
- ▶ Satellite ranging
- ▶ Other spectroscopic and nonlinear optics applications

back-lit display that is easy to read even with laser safety eye-wear.

Alternatively, the laser can be controlled from a personal computer with supplied software for a Windows™ operating system. LabView™ drivers are supplied as well.

SPECIFICATIONS ¹⁾

MODEL	PL2231-50	PL2231-100
Pulse energy		
at 1064 nm	40 mJ	15 mJ
at 532 nm ²⁾	18 mJ	7 mJ
at 355 nm ³⁾	12 mJ	5 mJ
at 266 nm ⁴⁾	5 mJ	1.5 mJ
at 213 nm ⁵⁾	2 mJ	0.4 mJ
Pulse energy stability (Std. Dev) ⁶⁾		
at 1064 nm	<0.5 %	
at 532 nm	<0.8 %	
at 355 nm	<1.1 %	
at 266 nm	<1.2 %	
at 213 nm	<2.5 %	
Pulse duration (FWHM) ⁷⁾	28±3 ps	
Pulse duration stability ⁸⁾	±1.0 ps	
Max pulse repetition rate ⁹⁾	50 Hz	100 Hz
Polarization	linear, vertical, >100:1	
Pre-pulse contrast	>200:1	
Triggering mode	internal / external	
SYNC OUT pulse jitter ¹⁰⁾	<0.1 ns	
SYNC OUT pulse delay ¹¹⁾	-500...50 ns	
Beam divergence ¹²⁾	<0.7 mrad	
Beam pointing stability ¹³⁾	<25 µrad	
Beam diameter ¹⁴⁾	~6 mm	~5 mm
Typical warm-up time	10 min	

PHYSICAL CHARACTERISTICS		
Laser head size (W × L × H)	456 × 1031 × 249 mm	
Electric cabinet size (W × L × H)	470 × 390 × 140 mm	470 × 390 × 286 mm
Umbilical length	2.5 m	

OPERATING REQUIREMENTS		
Cooling ¹⁵⁾	built-in chiller	
Room temperature	22±2 °C	
Relative humidity	20–80 % (non-condensing)	
Power requirements	110–240 V AC, 50/60 Hz	
Power consumption	<0.5 kVA	<0.7 kVA

¹⁾ Due to continuous improvement, all specifications are subject to change without notice. The 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 option. Outputs are not simultaneous. Please inquire for pulse energies at other wavelengths.

³⁾ For -TH option. Outputs are not simultaneous. Please inquire for pulse energies at other wavelengths.

⁴⁾ For -FH option. Outputs are not simultaneous. Please inquire for pulse energies at other wavelengths.

⁵⁾ For -FiH option. Outputs are not simultaneous. please inquiry for pulse energies at other wavelengths. FiH option is supplied in separate harmonics unit.

⁶⁾ Averaged from 300 pulses.

⁷⁾ Inquire for optional pulse durations in 20–100 ps range.

⁸⁾ Measured over 1 hour period when ambient temperature variation is less than ±1 °C.

⁹⁾ Fixed pulse repetition rate should be specified when ordering. Inquire for variable pulse repetition rates.

¹⁰⁾ <10 ps jitter is provided with PRETRIG option.

¹¹⁾ SYNC OUT lead or delay can be adjusted with ~0.25 ns steps in specified range.

¹²⁾ Average of X- and Y-plane full angle divergence values measured at the 1/e² level at 1064 nm.

¹³⁾ RMS value measured from 300 shots.

¹⁴⁾ Beam diameter is measured at 1064 nm at the 1/e² level.

¹⁵⁾ Adequate room air conditioning should be provided.



OPTIONS

- ▶ **Option PRETRIG** provides low jitter pulse for streak camera triggering with delay in -1000 ... 5100 μ s range and <10 ps rms jitter.
- ▶ **Option P20** provides 20 ± 2 ps output pulse duration. Pulse energies are 30 % lower in comparison to the 30 ps pulse duration version.
- ▶ **Option P80** provides less than 80 ps output pulse duration.
- ▶ **Option PLL** allows locking the master oscillator pulse train repetition rate to an external RF generator, enabling precise external triggering with <500 fs low jitter.

BEAM PROFILE

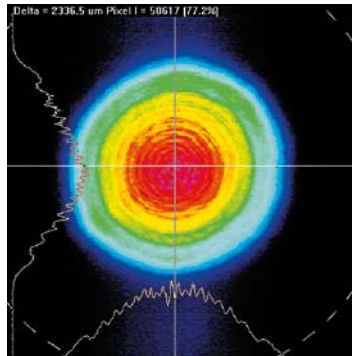


Fig 1. Typical near field output beam profile of PL2231 model laser

OUTLINE DRAWINGS

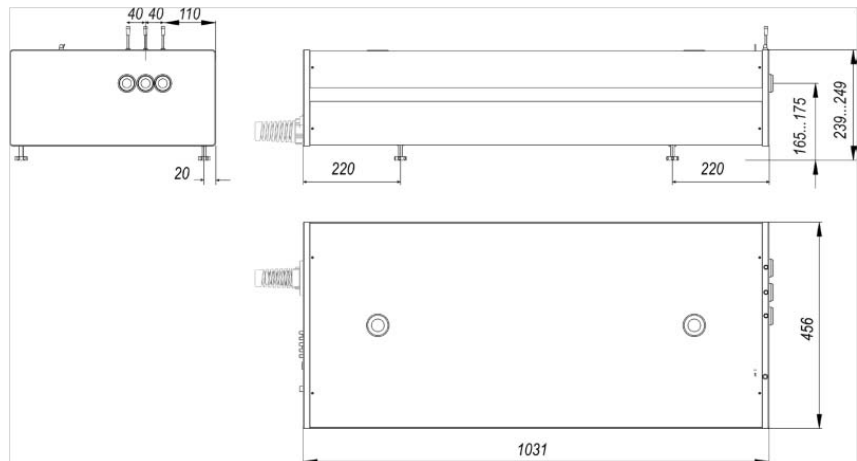


Fig 2. Dimensions of PL2230 series laser head

ORDERING INFORMATION

