

# APL4206 SERIES

## High Energy Picosecond Amplifiers



APL4200 series amplifiers are designed to produce multiple outputs of up to 130 mJ picosecond pulses at up to 1 kHz pulse repetition rate. Short pulse duration, excellent pulse-to-pulse stability, superior beam quality makes APL4200 series diode pumped picosecond amplifiers well suited for applications like multiple stage OPCPA pumping, non-linear optics and others.

### Regenerative amplifier/Power amplifier design

APL4200 series amplifiers consist of regenerative and power amplifiers. System could be seeded by built-in picosecond oscillator or other ultrafast laser system. Pulses from regenerative amplifier are spatially shaped and amplified in double-pass amplifiers with thermally induced birefringence compensation. Advanced optical design ensures smooth, without hot spots beam spatial profile at the laser output. Low light depolarization level allows high efficiency generation of up to

4th harmonic with build-in harmonic generators. Repetition rate and timing of the pulses can be locked to the external RF source (with –PLL option) or other ultrafast laser system (with –FS option).

### Simple and convenient laser control

For customer convenience the amplifier can be controlled through Laser Control software via USB interface (control PC included). Alternatively, the amplifier can be controlled from personal computer with supplied software for Windows™ operating system. LabVIEW™ drivers are supplied as well.

### Build-in harmonic generators

Angle-tuned LBO and/or BBO crystals mounted in temperature stabilized heaters are used for second, third and fourth harmonic generation. Harmonic separation system is designed to ensure high spectral purity of radiation and direct it to the output ports.

### FEATURES

- ▶ High pulse energy up to **1 kHz** rate
- ▶ Diode pumped solid state design
- ▶ Cooled by supplied water-to-water chiller
- ▶ Low maintenance costs
- ▶ PC control via USB with supplied, LabVIEW™ drivers
- ▶ Optional temperature stabilized second, third and fourth harmonic generators

### APPLICATIONS

- ▶ Multiple stage OPCPA pumping
- ▶ Non-linear optics
- ▶ Other spectroscopic and nonlinear optics applications

**SPECIFICATIONS** <sup>1)</sup>

Model	APL4206
<b>MAIN SPECIFICATIONS</b>	
Central wavelength	1064 nm
Output energy	up to 8 channels × ≥130 mJ
Pulse energy stability <sup>2)</sup>	≤ 1 %
Pulse duration (FWHM)	90 ± 10 ps
Pulse repetition rate	1 kHz
Spectral bandwidth	≤ 1 cm <sup>-1</sup>
Triggering mode	external
Spatial mode	Top-Hat
Beam divergence	< 0.7 mrad
Beam diameter <sup>3)</sup>	~ 8 mm
Beam pointing stability <sup>2)</sup>	< 30 μrad
Beam local intensity fluctuation <sup>4)</sup>	< ±15 %
Deviation of spatial parameters between beams	±10 %
Pre-pulse contrast <sup>5)</sup>	> 200:1
Polarization contrast	> 100:1
Polarization	linear, horizontal
<b>PHYSICAL CHARACTERISTICS</b>	
Laser head size (W×L×H)	1500 × 3000 × 400 mm (preliminary)
Power supply size (W×L×H)	553 × 600 × 1200 mm – 1 unit 553 × 600 × 500 mm – 1 unit
<b>OPERATING REQUIREMENTS</b>	
Warm up time	< 30 min
Total water consumption	< 20 l/min, 2 bar, 20 °C
Relative humidity	20–80 % (non condensing)
Operating ambient temperature	22 ± 2 °C
Mains voltage	208, 380 or 400 V AC, three phases, 50/60 Hz
Power rating	< 22 kVA
Cleanness of the room	ISO Class 7 or 10000 as per U.S. Fed Std. 209 (5 VDI 2083, C GMP)

<sup>1)</sup> With “-internal oscillator” and “-PLL” options.

<sup>2)</sup> Rms, measured over 30 s.

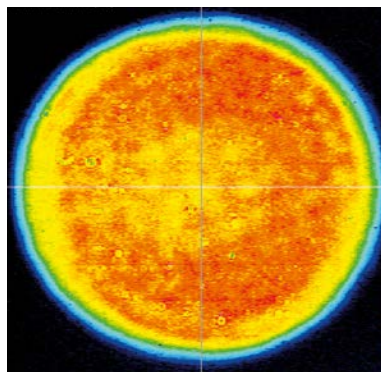
<sup>3)</sup> Beam diameter is measured at the 1/e<sup>2</sup> level.

<sup>4)</sup> From the average intensity across 80 % of beam cross-section (or beam diameter measured at 1/e<sup>2</sup> level).

<sup>5)</sup> Peak-to-peak in respect to residual pulses.



**BEAM PROFILE**



*Fig 1.* Typical beam profile of APL4206 series laser (measured at the relay image plane)