

# PT403 SERIES



PT403 series laser systems integrate a picosecond 1 KHz repetition rate DPSS pump laser and optical parametric generator into a single housing. New picosecond tunable wavelength laser system provide from 210 to 2300 nm from the one box.

Unlike other solutions in the market, offering laser and OPO in different units, new approach features pump laser and OPO integrated into one unit. That delivers almost twice smaller footprint, shorter installation, better stability and other substantial benefits for user.

All-in one-box solution features all components placed into one compact housing. It means better overall stability because all potential causes for misalignment between separate units of pump laser and optical parametric generator are eliminated.

To ensure reliability industry and market tested solutions were employed during the build-up of PT403.

Pump laser is based on industry "gold standard" diode pumped Ekspla PL2210 series picosecond mode-locked laser. Improved output

parameters and reduced maintenance costs are achieved by employing diode-pumped-only technology.

Optical parametric generator is based on PGX03 picosecond optical parametric amplifier systems. Fully automatized and microprocessor based control system ensures hands free precise wavelength tuning.

PT403 was built without sacrificing any parameters or reliability. The optical design is optimized to produce low divergence beams with moderate linewidth (typically  $<8 \text{ cm}^{-1}$ ) at approximately 15 – 20 ps pulse duration. Featuring 1 KHz repetition rate PT403 tuneable laser is versatile cost-efficient tool for scientists researching various kind of disciplines like time resolved fluorescence, pump-probe spectroscopy, laser-induced fluorescence, Infrared spectroscopy and other applications.

For customer convenience the system can be controlled through its USB type PC interface (RS232 is optional) with LabView™ drivers or a remote control pad. Both options allow easy control of system settings.

## Tunable Wavelength Picosecond Laser

### FEATURES

- ▶ High pulse energy at kHz rates
- ▶ Diode pumped solid state design
- ▶ Air cooled – external water supply is not required
- ▶ Turn-key operation
- ▶ Low maintenance costs
- ▶ Optional streak camera triggering pulse with  $<10 \text{ ps}$  rms jitter
- ▶ Hands-free wavelength tuning
- ▶ Tuning range **from 210 nm to 2300 nm**
- ▶ Narrow linewidth  $<8 \text{ cm}^{-1}$
- ▶ Low divergence  $<2 \text{ mrad}$
- ▶ PC control

### APPLICATIONS

- ▶ Time resolved fluorescence, pump-probe spectroscopy
- ▶ Laser-induced fluorescence
- ▶ Infrared spectroscopy
- ▶ Nonlinear spectroscopy: surface-SH, Z-scan
- ▶ Other spectroscopic and nonlinear optics applications

### BENEFITS

- ▶ Better long term stability (compared with layout where laser and OPO are in different units)
- ▶ Higher safety – all beams are in the box
- ▶ Shorter installation time
- ▶ Almost twice smaller footprint

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

Model	PT403	PT403-SH
<b>OPA SPECIFICATIONS</b>		
Output wavelength tuning range		
SH	-	210 – 410 nm
Signal	410 – 709 nm	
Idler	710 – 2300 nm	
Output pulse energy <sup>2)</sup>		
SH <sup>3)</sup>	-	10 μJ
Signal <sup>3)</sup>	70 μJ	
Idler <sup>4)</sup>	15 μJ	
Pulse repetition rate	1000 Hz	
Linewidth	<8 cm <sup>-1</sup>	
Typical pulse duration <sup>5)</sup>	15 ps	
Scanning step		
SH	-	0.05 nm
Signal	0.1 nm	
Idler	1 nm	
Typical beam size <sup>6)</sup>	~ 3 mm	
Beam divergence <sup>7)</sup>	< 2 mrad	
Beam polarization		
SH	-	horizontal
Signal	horizontal	
Idler	vertical	
<b>OPERATING REQUIREMENTS</b>		
Room temperature	22 ± 2 °C	
Power requirements	100 – 240 V single phase, 47 – 63 Hz	
Power consumption	<120 W	
Water service	not required, air cooled	

<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 450 nm for PT403 units for basic system without options.

<sup>2)</sup> Pulse energies are specified at selected wavelengths. See typical tuning curves for pulse energies at other wavelengths.  
<sup>3)</sup> Measured at 250 nm.  
<sup>4)</sup> Measured at 1000 nm.  
<sup>5)</sup> Estimated assuming 30 ps at 1064 nm pump pulse. Pulse duration varies depending on wavelength and pump energy.  
<sup>6)</sup> Beam diameter at the 1/e<sup>2</sup> level. Can vary depending on the pump pulse energy.  
<sup>7)</sup> Beam divergence measured at 450 nm.



**OUTLINE DRAWINGS**

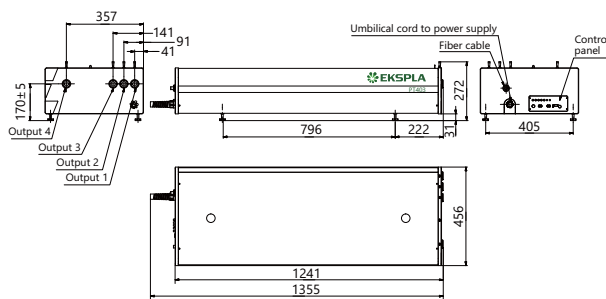


Fig 1. PT403 series laser head typical outline drawing

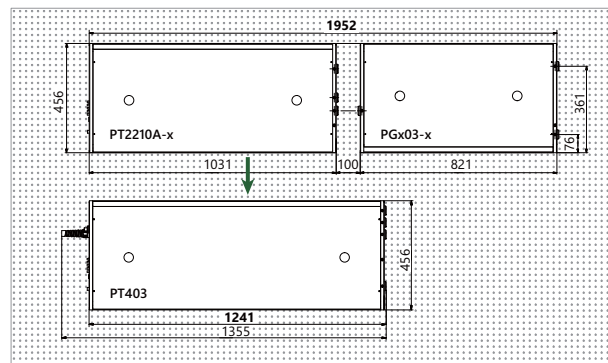


Fig 2. Compared with layout where laser and OPO are in different units, PT403 features almost twice smaller footprint

**Note:** Laser must be connected to the mains electricity all the time. If there will be no mains electricity for longer that 1 hour then laser (system) needs warm up for a few hours before switching on.