

PT277-XIR SERIES

Single Housing
MIR (mid infrared
range) Tunable
Picosecond Laser



PT277 series laser systems integrate a picosecond optical parametric oscillator and DPSS pump laser into a single compact housing. Mounting the components into one frame provides a cost-effective and robust solution. It makes laser installation shorter and improves long-term stability, reduces maintenance costs. The tuning range for the model PT277-XIR 1400 – 2000, 2280 – 4450, 4800 – 16000 nm (7000 – 5000, 4385 – 2245, 2080 – 625 cm^{-1}) with linewidth $<5 \text{ cm}^{-1}$ in the full tuning range.

The fast wavelength tuning is based on the microprocessor-control and wavelength tuning is fully automatic. The wavelength tuning elements are mounted on precise closed loop micro stepping motors. The temperatures of the non linear crystals is controlled by a precise thermocontrollers. For customer convenience the system can be controlled via keypad and/or any controller running on any OS using REST API commands. Variety of interfaces USB, RS232, LAN, WLAN (optionally) ensures easy control and integration with other equipment.

FEATURES

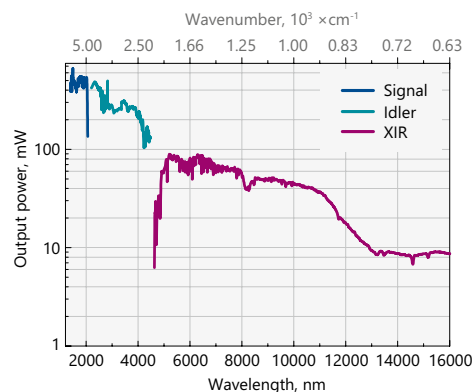
- ▶ **1400 – 16000 nm (7000 – 625 cm^{-1}) tuning range**
- ▶ **Linewidth $<5 \text{ cm}^{-1}$ in the full tuning range**
- ▶ **Nearly diffraction limited divergence**
- ▶ **Remote control via keypad and/or any controller running on any OS using REST API commands**
- ▶ **PC control via USB (virtual com port), RS232, LAN**

APPLICATIONS

- ▶ *Infrared spectroscopy*

TUNING CURVES

Fig 1. Typical output PT277-XIR tuning curve.
The actual tuning curve might differ from presented here.



SPECIFICATIONS

Model	PT277 - XIR
SYNCHRONOUSLY PUMPED OPO SPECIFICATIONS ¹⁾	
Tuning range	
Signal	1400 – 2000 nm (7000 – 5000 cm ⁻¹)
Idler	2280 – 4450 nm (4385 – 2245 cm ⁻¹)
XIR	4800 – 16000 nm (2080 – 625 cm ⁻¹)
Linewidth	< 5 cm ⁻¹
Output power ²⁾	
OPO @4000 nm (2500 cm ⁻¹)	> 150 mW
OPO @ 12500 nm (800 cm ⁻¹)	> 10 mW
Pulse repetition rate	87 MHz
Pulse duration (pump laser)	~8 ps
Scanning step	
Signal	0.1 nm
Idler, XIR	1 nm
Polarization	vertical
Typical beam diameter ^{3) 4)}	~3 mm
Typical beam divergence ⁵⁾	< 2 mrad (for signal)
Beam pointing stability	< 50 μrad rms @ 1596 nm
AOM modulation	70 kHz – 2 MHz
Fast spectral scan, scan speed (for spectral range)	
Idler	< 2 s
XIR	< 1 s
PHYSICAL CHARACTERISTICS	
Unit size (W×L×H)	320 × 766 × 241 mm
Power supply size (W×L×H)	483 × 140 × 390 mm
Umbilical length	2.5 m
OPERATING REQUIREMENTS	
Cooling	water-air (by provided chiller)
Room temperature	22 ± 2 °C
Room temperature stability	± 1 °C
Relative humidity	20 – 80 % (noncondensing)
Power requirements	100 – 240 VAC (-10% / +5%), single phase, 50/60 Hz
Power consumption	< 1 kVA
Cleanness of the room	not worse than ISO Class 9

- ¹⁾ 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 1596 nm.
- ²⁾ Output powers are specified at selected wavelengths. See typical tuning curves for power at other wavelengths.
- ³⁾ Measured at 3000 nm.
- ⁴⁾ Beam diameter at the 1/e² level and can vary depending on the pump pulse energy.
- ⁵⁾ Full angle measured at the FWHM level.

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. The laser and auxiliary units must be settled in such a place void of dust and aerosols. It is advisable to operate the laser in air conditioned room, provided that the laser is placed at a distance from air conditioning outlets. The laser should be positioned on a solid worktable. Access from both sides should be ensured. Intensive sources of vibration should be avoided, like railways station etc nearby laboratory.



OUTLINE DRAWINGS

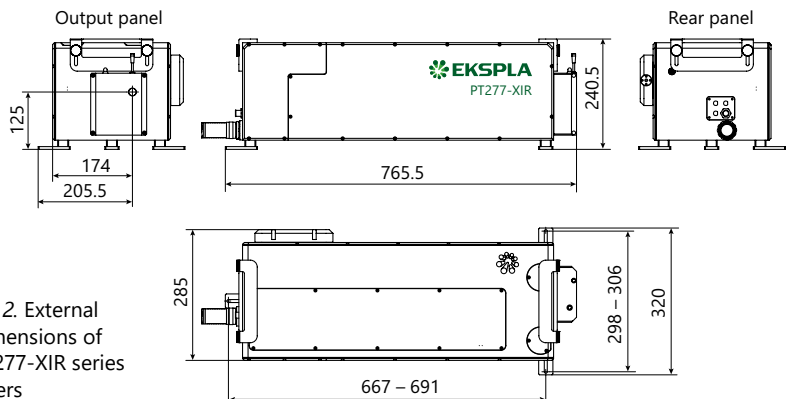


Fig 2. External dimensions of PT277-XIR series lasers