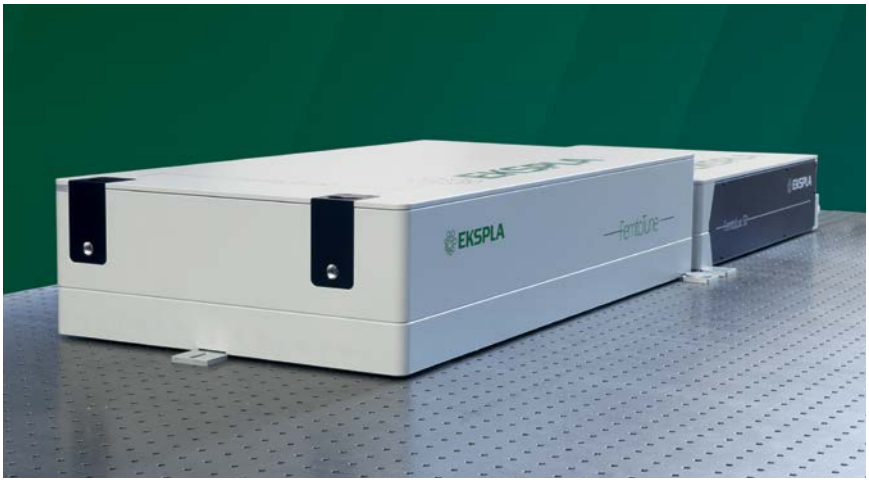
FemtoTune SERIES

Tunable Femtosecond System for Ultrafast Applications



FemtoTune femtosecond optical parametric amplifier is designed to meet the demanding specifications of modern ultrafast science, while introducing valuable features that enhance measurement efficiency, convenience, flexibility, and reliability.

FemtoTune is based on Ekspla's extensive experience in developing picosecond and nanosecond tunable systems, as well as optical parametric chirped pulse amplifiers (OPCPAs) with pulse energies up to 1 joule and durations as short as 10 fs. *FemtoTune* delivers a compact, high-repetition-rate (up to 100 kHz) solution with sub-50 fs pulse duration across the broad wavelength tuning range, tailored for modern ultrafast spectroscopy and imaging.

The time-synchronised motor positioning enables fast and smooth wavelength tuning, allowing users to scan the full range in just a few seconds or access specific wavelengths within several tenths of a second. Continuous, gapless tuning in the mid-IR (2.5–10 µm) with a single polarisation eliminates the need to switch between signal and idler waves. This results in faster, more stable measurements ensuring excellent beam pointing stability.

For applications requiring narrow spectral bandwidths, such as SFG or CARS, *FemtoTune* offers an additional narrowband channel at 1030 nm or 515 nm, providing <8 cm^{-1} bandwidth without the need for complex spectral narrowing techniques. Optical synchronisation with most of our picosecond lasers and wavelength tunable systems allows achieving even narrower bandwidth (<3 cm^{-1}) enabling simultaneous high temporal and spectral resolution measurements.

Pumped by robust award-winning industrial-grade FemtoLux series laser, *FemtoTune* offers long-term stability, hands-free operation, and minimal maintenance.

FemtoTune delivers ultrashort pulses at high repetition rate, enhanced by advanced functionality, all in a compact system.

FEATURES

- ***650–950 nm & 1100–2000 nm*** *tuning range*
- *Extension to* ***UV - VIS*** *(330–470 nm & 550–650 nm)*
- *Extension to* ***Mid-IR*** *(2300–10 000 nm) gapless tuning*
- ***< 50 fs*** *pulse duration featuring integrated dispersion compensation*
- ***Single shot–100 kHz*** *repetition rate*
- *Scan of full wavelength range in a few seconds and* ***fast wavelength sweep***
- *Pumped by reliable* ***Femtolux*** *series lasers featuring dry or water cooling*
- *Additional* ***narrow spectral bandwidth*** *optically synchronised output at 1030 or at 515 nm less than 8 cm^{-1}*
- *Optical synchronisation with picosecond Ekspla laser sources: e.g. PL2231, PT501 (bandwidth below 3 cm^{-1})*

APPLICATIONS

- *Ultrafast non-linear spectroscopy:*
  - *Pump-probe*
  - *SFG*
  - *CARS*
- *Multiphoton imaging*

SAVANORIU AV. 237, LT-02300 VILNIUS, LITHUANIA PH +370 5 2649629 E-MAIL SALES@EKSPLA.COM WWW.EKSPLA.COM

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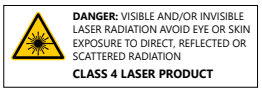
SPECIFICATIONS [1]

Model		FemtoTune
MAIN SPECIFICATIONS		
Tuning range		650–950 nm & 1100–2000 nm
Pulse energy [2]	800 nm	> 30 µJ
	1500 nm	> 10 µJ
Pulse duration at 700 – 900, 1100 – 1900 nm		< 50 fs
Long-term power stability, 9 hours		< 1 %
Pulse-to-pulse stability, 10 sec		< 1 %
Repetition rate		Single shot–100 kHz [3]
PUMP LASER		
Model		FemtoLux series
OPERATING REQUIREMENTS		
Mains requirements		100 – 240 V AC, single phase, 50/60 Hz
Operating ambient temperature		18 – 27 °C
Relative humidity		10–80 % (non-condensing)
Air contamination level		ISO 9 (room air) or better

[1] 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.

[2] Please see picture Fig. 1. Pulse energy at 10 kHz repetition rate.

[3] Max repetition rate is fixed.



OPTIONS AND ACCESSORIES

Option	Value
Extension to UV–VIS	330–470 nm & 550–650 nm
Extension to Mid-IR	2300–10 000 nm gapless tuning
Additional output (simultaneously)	1030 or 515 nm

PERFORMANCE

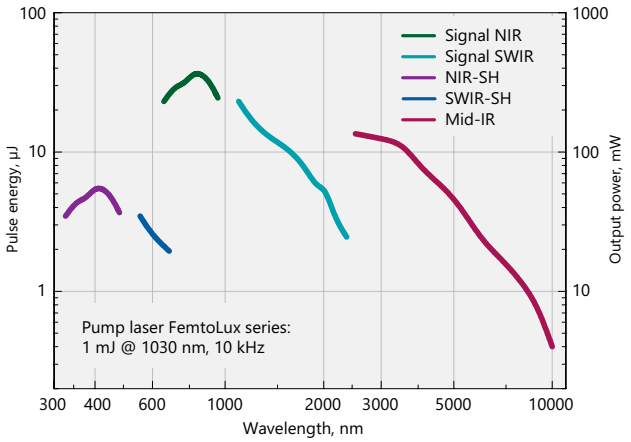


Fig 1. Spectral range and pulse energy with extensions

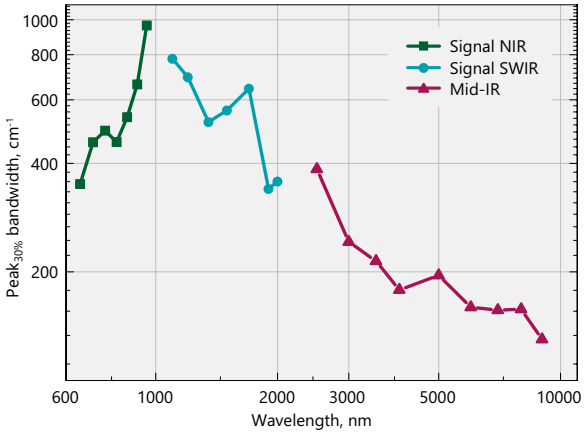


Fig 2. Pulse bandwidth in NIR, SWIR and Mid-IR wavelength ranges

STABILITY

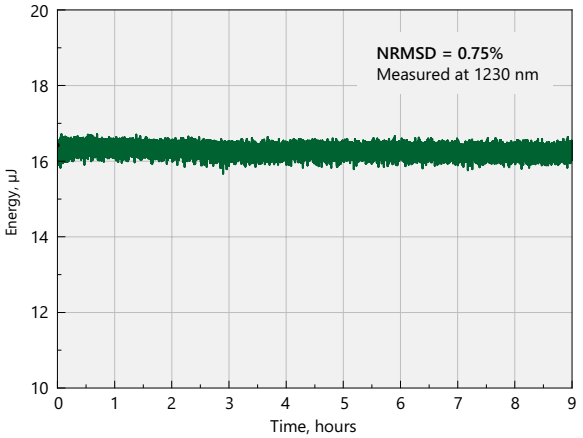


Fig 3. Pulse energy stability

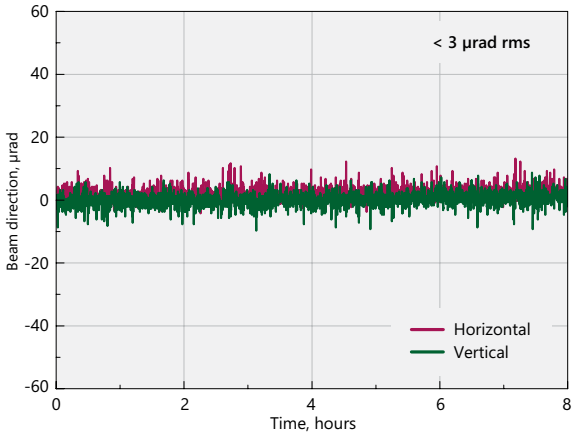


Fig 4. Beam pointing stability

DRAWINGS

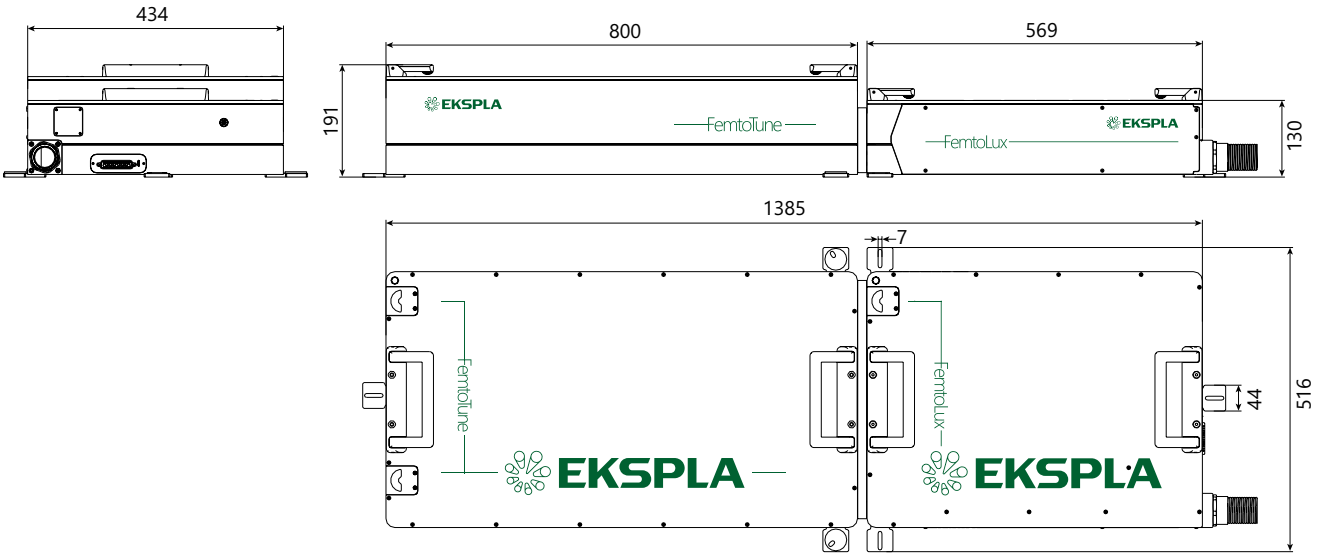


Fig 5. External dimensions of FemtoTune femtosecond tunable wavelength laser system

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本　社：〒134-0088 東京都江戸川区西葛西6-18-14 T. ビル　Tel. 03-3686-4711
営業所：〒532-0003 大阪府大阪市淀川区宮原4-1-46 新大阪北ビル　Tel. 06-6393-7411
URL：https://www.tokyoinst.co.jp　Mail：sales@tokyoinst.co.jp