

FEMTOPOWER™ V PRO

| sub-25 fs |

| 5 mJ |

| 1 kHz |

| high contrast |

Applications

High Harmonics Generation
incl. x-ray generation

Time-resolved ultrafast spectroscopy

Frontend for TW and PW ultrafast
amplifier systems

Femtochemistry

Coherent THz generation

Materials processing

OPA pumping

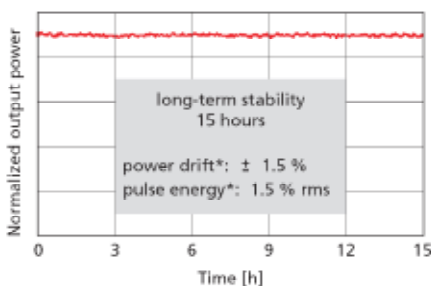
OPCPA seeding | pumping



The **FEMTOPOWER™ V PRO** is an ultrafast 2-stage Ti:Sapphire multi-millijoule (mJ) amplifier system including a FEMTOSOURCE™ ultrafast oscillator. FEMTOPOWER™ systems combine those key technologies for the generation of amplified pulses of unprecedented quality, stability, and reproducibility required for a wide range of demanding applications in science and technology.

The combination of FEMTOLASERS™ key technologies results in:

- **Shortest pulses** are ensured by the multipass technology for both amplifier stages, supporting maximum bandwidth and minimizing pulse distortion during stretching, amplification and compression.
- Unprecedented **pulse quality** is ensured by Dispersive Mirror (DM) technology for precise dispersion management.
- Perfect **reproducibility** and stability is ensured by the use of FEMTOSOURCE™ oscillators guaranteeing clean pulses and highest contrast.



* Measured with a FEMTOPOWER™ compact PRO after 3 hours warm up and environmental conditions of $20^\circ \pm 0.5^\circ\text{C}$ and a relative humidity of $50\% \pm 5\%$

FEMTOPOWER™ V

PRO

Extraordinary Features

- Ultrashort pulses
- Highest pulse quality and stability
- Excellent pulse contrast
- Broad spectrum
- Compact footprint
- Ultra high peak power
- Ultrafast oscillator output

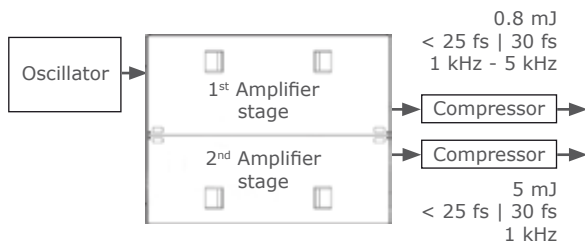
Contrast & Peak Power

The pulse-to-background contrast is the highest in commercial amplifier systems. The main pulse contains the entire energy without any pre-pulses or pedestals. This is ensured by the combination of our FEMTOSOURCE™ oscillators and the use of DM technology for precise dispersion management. Together with the unsurpassed short pulse duration, highest possible peak power is available for demanding experiments.

Reliability & User friendliness

The amplifier crystals are cooled in vacuum chambers preventing dust mediated damage. The closed loop cooling system ensures reduced thermal lensing, highest reliability and lowest noise, as well as the reach of operational temperature within minutes. Excellent long term stability is guaranteed by the integration of the compact multipass-setup onto a monolithic, temperature stabilized base plate.

Schematic overview



Ultrafast pulses | Dispersion Management | PRO-Version

FEMTOPOWER™ systems deliver clean pulses with residual unbalanced high order dispersion reduced to a minimum. Pulse stretching is performed by means of an alignment-free glass-block, compression by high throughput transmission gratings where heat- and nonlinear phenomena are avoided. DMs manage the all over system-dispersion for optimum compensation of all its orders. For the PRO Version clean sub-25 fs pulses are guaranteed at the multi-mJ output energy level. Easy integration of a DAZZLER™ AOPDF allows shaping and generation of the shortest possible pulses. The KALEIDOSCOPE™ hollow fiber compressor transforms the amplifier output to pulses of sub-7 fs with unprecedented efficiency.

Custom design with higher pulse energy available upon request.

FEMTOPOWER™ V PRO	1 st Amplifier stage (optional)		2 nd Amplifier stage		Oscillator (optional exit)
Pulse duration	< 30 fs	< 25 fs	< 30 fs	< 25 fs	< 12 fs < 10 fs
Spectral width (FWHM) @ 800 nm	> 40 nm	> 60 nm	> 40 nm	> 60 nm	> 75 nm > 100 nm
Repetition rate	1 kHz		1 kHz		75 MHz
Output energy	> 800 μJ		> 5 mJ		2.3 - 9 nJ
Peak power	> 27 GW	> 32 GW	> 0.14 TW	> 0.2 TW	220 kW - 900 kW
Beam diameter (1/e ²) Beam divergence	15 mm (nom.) < 2 mrad		~ 40 mm (nom.) < 2 mrad		< 2 mm < 2 mrad
Beam pointing stability (optional active stab.)	< 10 μrad rms @ Ø 15 mm		< 10 μrad rms @ Ø 40 mm		-
Spatial mode	TEM ₀₀ (M ² < 1.5)		TEM ₀₀ (M ² < 1.5)		TEM ₀₀ (M ² < 1.3)
Polarization	linear, horizontal		linear		linear, horizontal
Pulse to pulse energy stability	< 1.5 % rms		< 2 % rms		< 0.1 % rms

*All specifications are subject to change without notice
DAZZLER™ is a trademark of Fastlite, France*



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FEMTOLASERS' laser products are certified to comply with the Federal Regulations (21 CFR Subchapter J) as administered by Center of Devices and Radiological Health on all systems ordered for shipment after October 1, 2003.