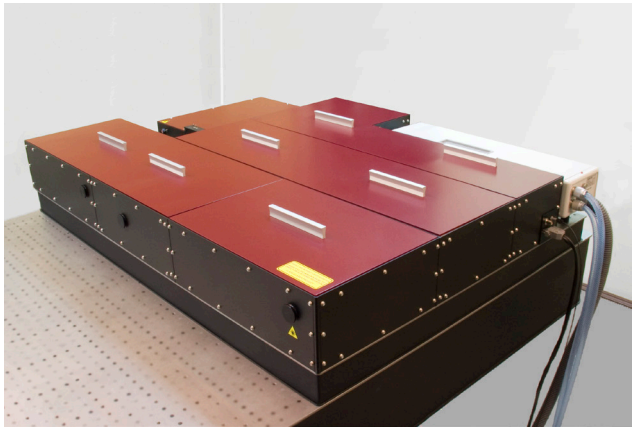
REUS. Ti:Sapphire Femtosecond Amplifiers

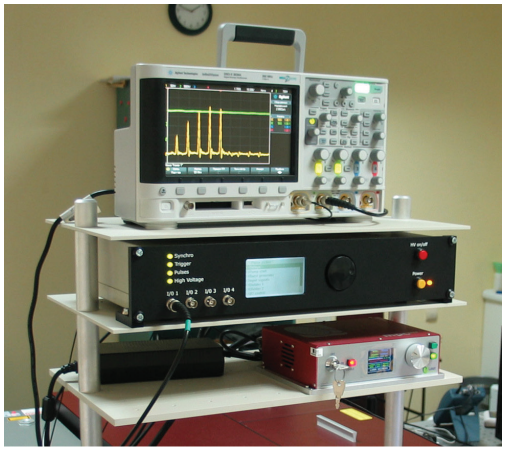
- Up to >40 mJ pulse energy
- Pulse duration down to <35 fs (down to 30 fs customized)
- High nanosecond contrast ratio 10^4:1
- User-adjustable output repetition rate (standard package)
- Upgrade to TW-level
- One-box solution
- High beam quality and long-term stability



Ti:Sapphire regenerative amplifier REUS-5m20 (5 mJ, 20 Hz)

Product overview

The REUS femtosecond amplifier family comprises regenerative, multipass and combined (RA+MPA) systems with Ti:S as active amplification medium. The systems are based on chirped pulse amplification approach (CPA) when femtosecond pulses being formed in a seed oscillator are stretched in a pulse stretcher, then amplified to required energy and then compressed back to femtosecond pulse duration. Almost all REUS amplifiers are equipped with a built-in pulse slicer (output pulse picker) based on a Pockels cell that significantly increases the systems contrast ratio and provides total control over the output pulse repetition rate including programmable bursts and "pulse-on-demand" functionality. The systems may be manufactured as a single one-box unit with integrated seed oscillator and pump lasers or as a separate modules with various configuration and adaptation possibilities with a customer-provided seed oscillator or amplifier pump laser(s).



REUS control rack

We offer two basic seed oscillator modules: a solid-state Ti:S femtosecond oscillator with a wider spectrum resulting in ~30-40 fs amplified pulse duration or a fiber laser seed oscillator unit with a narrower spectrum but smaller footprint and likely more budget-friendly resulting in 90-120 fs amplified pulse duration. The systems may be adapted to accept a third-party seed oscillator or customized for a different set of seed and output parameters.

The system's output may be increased step by step by gradually adding additional amplification stages up to TW-level with 500 mJ pulse energy (10 Hz repetition rate).

REUS technical specifications

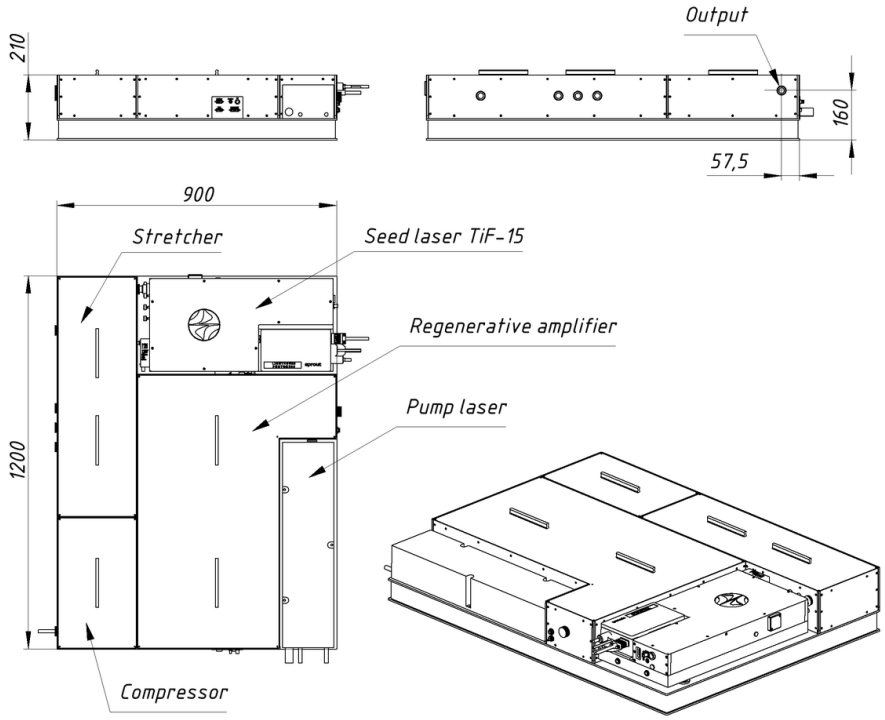
	REUS-0.5m1k	REUS-1.5m100	REUS-3m1k	REUS-5m1k	REUS-5m20	REUS-10m15	REUS-25m15	REUS-C*
Pulse energy	>500 uJ	>1.5 mJ	>3 mJ	>5 mJ	>5 mJ	>10 mJ	>25** mJ	up to 40** mJ
Pulse repetition rate	1 kHz	100 Hz	1 kHz	1 kHz	20 Hz	15 Hz	15 Hz	1 Hz…10 kHz
	the output pulse repetition rate is adjustable via a built-in pulse slicer from single-shot to nominal rep. rate of a given amplifier							
Pulse duration (FWHM)	<35 fs with solid-state seed oscillator; <100 fs with fiber seed oscillator							30…120 fs
Central wavelength	800 ± 20 nm (fixed)							740…950 nm
Beam diameter	<3 mm	<3 mm	8 mm	10 mm	8 mm	10 mm	<20 mm	-
M²	<1.3	<1.3	<1.3	<1.5	<1.3	<1.5	<2	-
Output polarization	linear, horizontal							
Long-term stability	<2.5% rms	<2% rms	<1% rms	<1% rms	<2.5% rms	<2.5% rms	<2.5% rms	-
Pulse contrast	10^4:1 @ >10 ns (to replica pulse); >10^3:1 @ 1 ps, >10^6:1 @ 5 ps, >5x10^7:1 @ 10-20 ps, >5x10^7:1 @ ASE							

** - the ranges of parameters in this column are given for possible customized development of an amplifier system or its adaptation to a customer-provided pump laser and/or seed oscillator;*
*** - please refer to "TW systems" section for systems with pulse energy up to 500 mJ.*

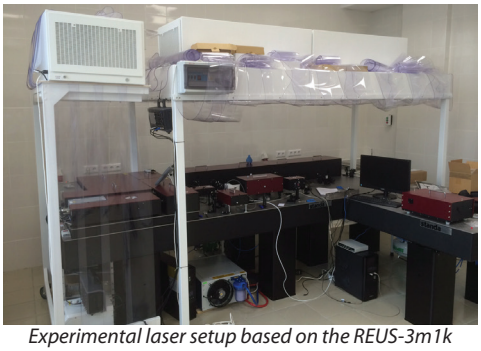
AVESTA
LASERS AND OPTICAL SYSTEMS

Avesta Ltd., 11 Fizicheskaya Street
Troitsk, 108840, Moscow, Russia
Tel.: +7 (495) 967-94-73
Fax: +7 (495) 646-04-95

fs@avesta.ru
www.avesta.ru

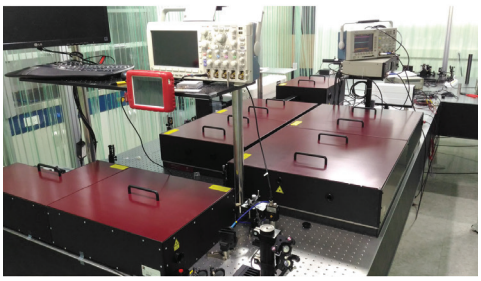


REUS-3m1k dimensions in mm



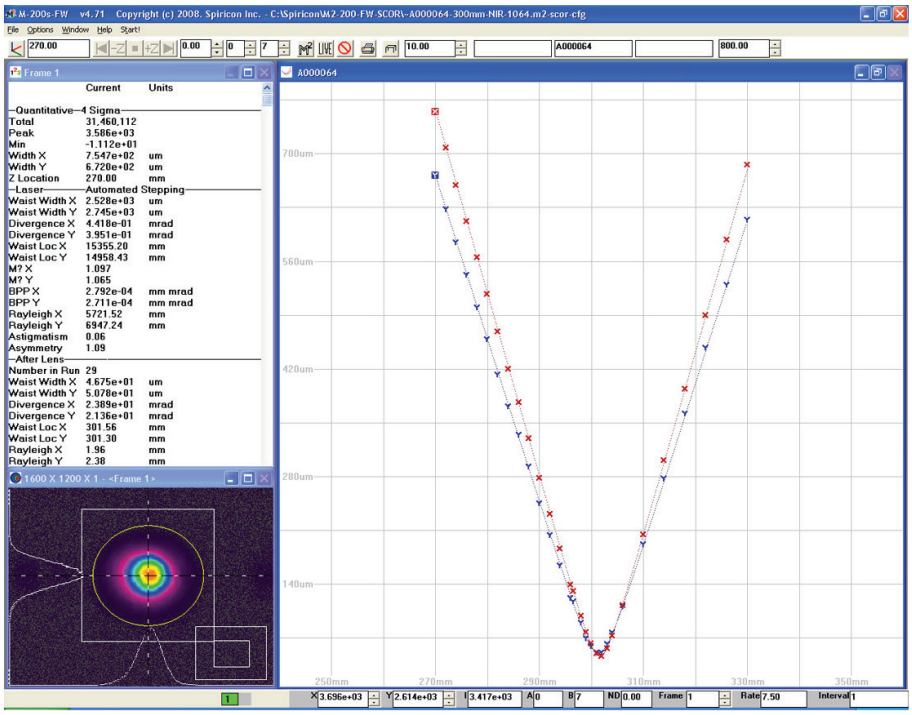
Experimental laser setup based on the REUS-3m1k (3 mJ, 1 kHz, 35 fs) with the Compulse hollow-fiber compressor and complete diagnostics set

The REUS-3m1k (3 mJ, 1 kHz, 35 fs) as a part of a laser experiment

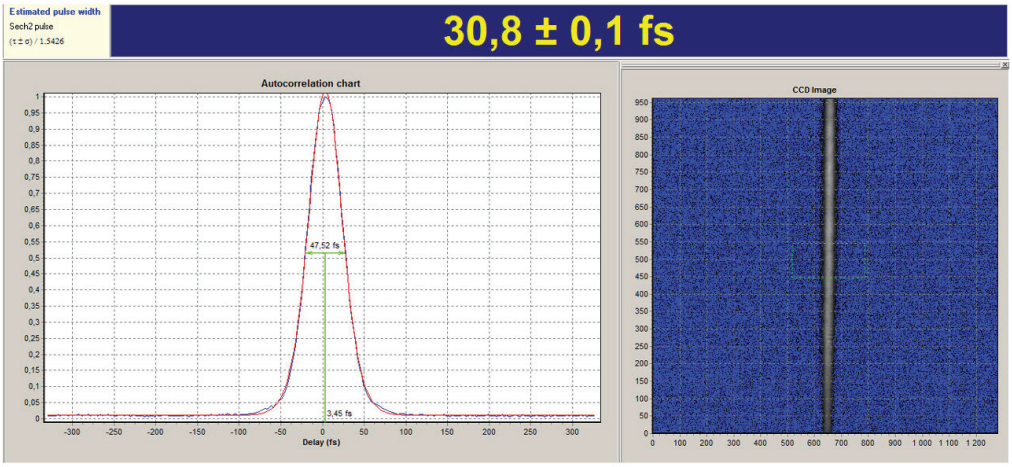


The customized REUS-C: two amplifier stages (2 and 20 mJ, 10 Hz, 40 fs) and two independent compressor units

M^2 data for the REUS-3m1k



Autocorrelation trace of the REUS-3m1k output pulse



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Tel.: +7 (495) 967-94-73

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