



## TiF-15. Ti:Sapphire Femtosecond Solid-State Oscillator

- Pulse duration down to <math><12\text{ fs}</math>
- Output power up to 500 mW
- Tuning range: 750-860 nm (@50 fs)
- Thermostabilized monolithic body
- Motorized USB wavelength tuning (option)
- Automatic mode-lock starter (option)
- Integrated spectrometer and power meter (optional)



*The TiF-15SP-TU Ti:Sapphire femtosecond laser with an integrated pump source*

### Product overview

The TiF-15 laser system offers the shortest available pulse duration in the TiF family of Ti:S femtosecond laser oscillators. It is a robust tool for cutting-edge ultrafast research.

The system can be supplied in two basic versions: the TiF-15, being a stand-alone version for pumping with an external pump laser; or the TiF-15F system which may be integrated with an industry-standard pump laser on site or at our factory. However, the dimensions of the Ti:S laser head are the same for either version, the stand-alone version may later be fitted with an integrated pump laser at minimum additional cost. The acceptable pump laser power for the TiF-15/TiF-15F is up to 4 W.

The system is designed to operate 24/7 as a seed oscillator for our larger amplifier systems and thus inherits all the stability-enhancing design features. The system may be supplied pre-tuned to one of the two available pulse duration configurations, with all the components inside the box being the same.

An external prism pair or tunable pulse compressor (model APC) for output pulse chirp compensation and pre-compensation are also available.



*Widget-based software screenshot for the TiF family of lasers with integrated spectrometer ("Auto" package)*

### Applications:

- Seed oscillator for amplifier systems
- Terahertz generation
- "Pump-probe" spectroscopy
- Optical coherent tomography
- Metrology
- Multiphoton microscopy



	TiF-15SP-12	TiF-15SP-15	TiF-15SP-30	TiF-15SP-50	TiF-15SP-TU
<b>Compressed pulse duration with external compressor<sup>1),5)</sup></b>	<12 fs	<15 fs	<30 fs	<50 fs	15-50 fs (tunable)
<b>Spectrum width (FWHM)<sup>1)</sup></b>	>80 nm	>60 nm	>30 nm	>18 nm	18-65 nm
<b>Central wavelength tuning</b>	800±15 nm (fixed)	790-820 nm	770-840 nm	750-860 nm	790-820 nm (FWHM >65 nm) 750-860 nm (FWHM >18 nm)
<b>Output power<sup>2)</sup></b>	>230 mW (3W pump)	>280 mW (3W pump)	>350 mW (3W pump) >470 mW (4W pump)	>400 mW (3W pump) >530 mW (4W pump)	>300 mW@65 nm (3W pump) >530 mW@18 nm (4W pump)

#### General optical specifications

<b>Pulse repetition rate (fixed)</b>	80±10 MHz
<b>Pump laser</b>	integrated or stand-alone DPSS 532 nm low-noise laser (up to 4 W)
<b>Beam mode</b>	TEM <sub>00</sub>
<b>Beam diameter (at 1/e<sup>2</sup>)</b>	<2 mm
<b>Output polarization</b>	linear, horizontal, PER >20 dB
<b>Beam divergence</b>	<1 mrad
<b>Long-term stability<sup>2)</sup></b>	<0.2% rms
<b>Noise<sup>4)</sup></b>	<0.1% rms

#### Physical dimensions (L × W × H)

<b>Laser head dimensions</b>	513 × 268 × 120 mm (including integrated pump laser)
<b>Pump laser control unit dimensions</b>	353 × 360 × 119 mm
<b>Closed-loop chiller dimensions</b>	430 × 340 × 190 mm

#### Environmental and utility specifications

<b>Operating temperature</b>	15-30 °C
<b>Relative humidity</b>	<60%, non-condensing
<b>Voltage</b>	single-phase; 100-240 VAC; 50/60 Hz
<b>Power consumption</b>	<2 kW

#### Available configuration packages<sup>3)</sup>

<b>Thermally stabilized monolithic body</b>	included in any package
<b>Pulse train SMA output with mode-lock LED</b>	included in any package
<b>"Auto" factory package</b>	- built-in spectrometer - single-touch wavelength tuning w. presets - built-in power meter - active output power stability locking - Windows software with configurable widgets - automatic mode-lock start and monitoring PC requirements: USB 2.0 port, Windows 10
<b>"Basic" factory package (default)</b>	- mode-lock LED and push-button starter - USB 2.0 wavelength tuning via step-motor slit (via step number information and calibration) PC requirements: USB 2.0 port, Windows 10
<b>"Manual" factory package</b>	- push-button starter - manual wavelength tuning slit

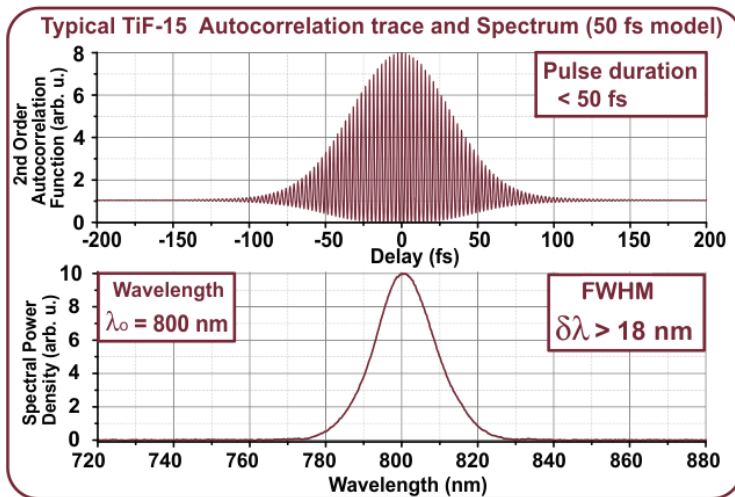
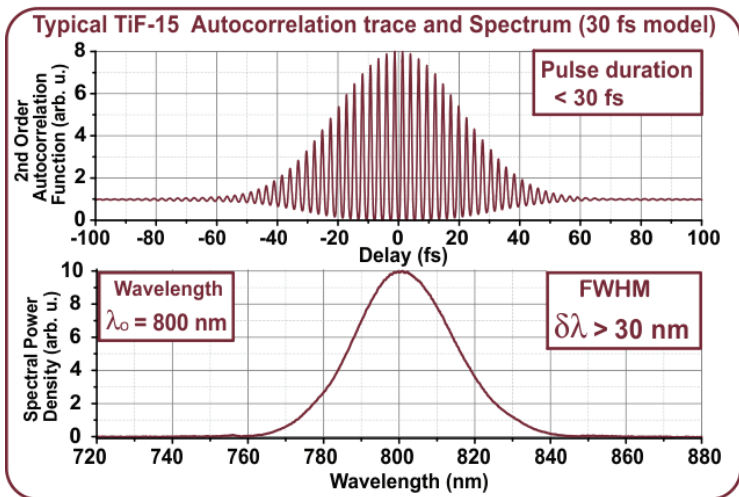
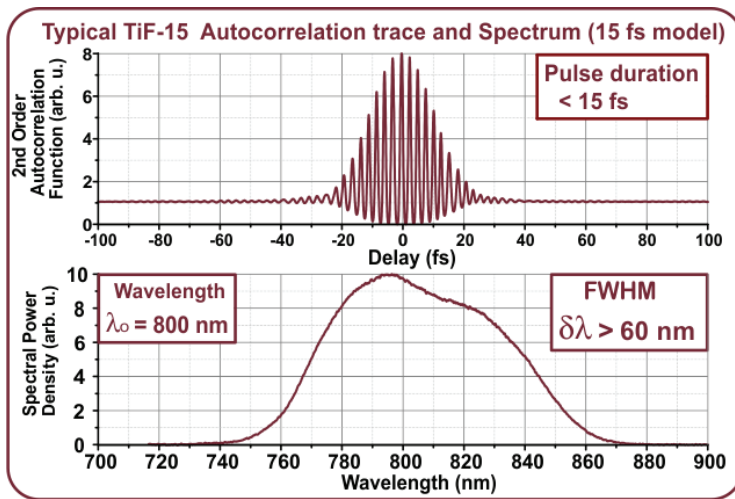
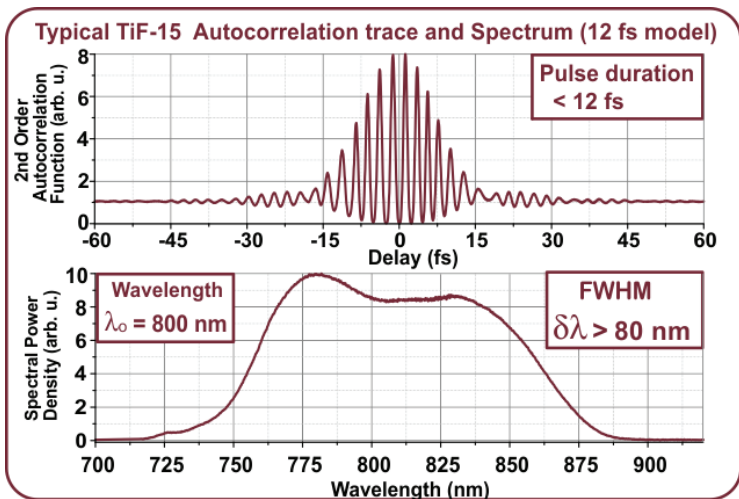
1) - when tuned to 800 nm central wavelength;

2) - after 30 min warm-up with cold start, during 12-hour continuous operation under equal room temperature conditions using recommended stabilized closed-loop chiller with proper capacity and recommended low-noise on-board integrated highly stable pump laser with active power locking;

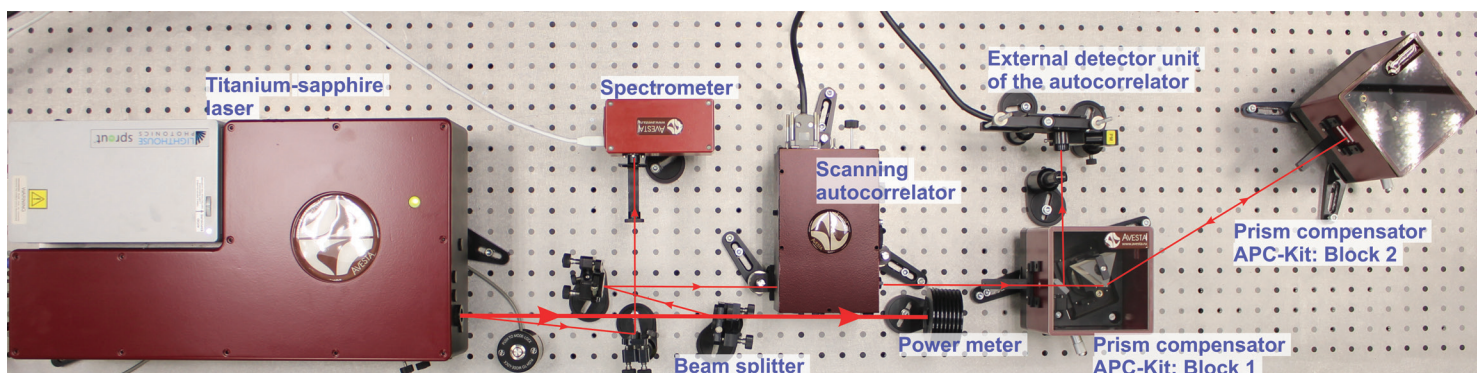
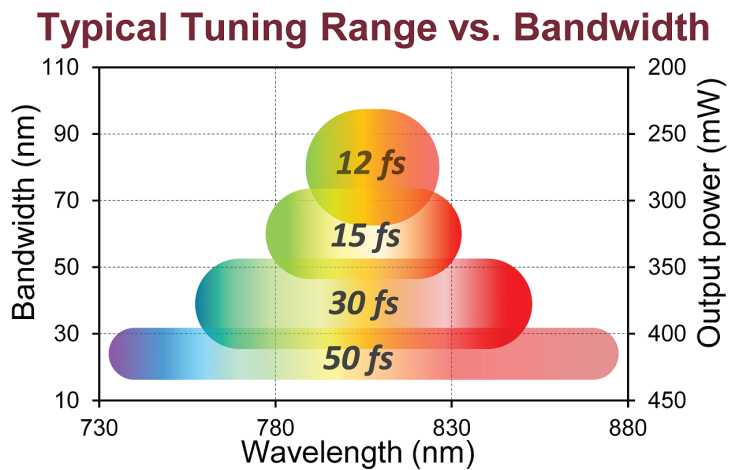
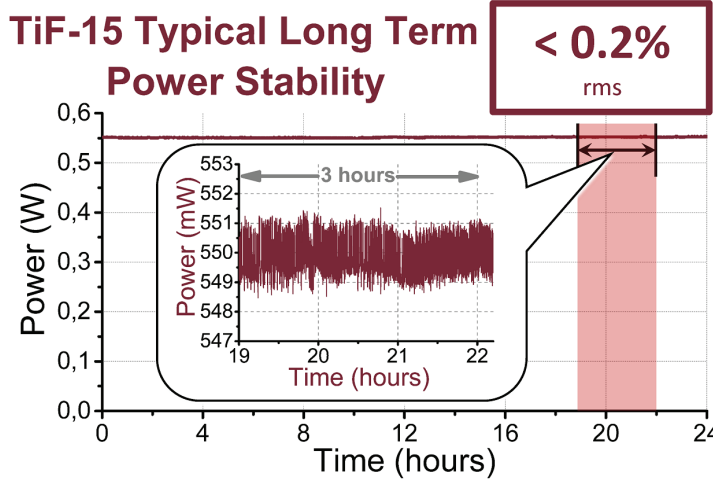
3) - please select one of the packages for your system; certain features may be tailored or combined differently according to specific customer requirements;

4) - measured from 10 Hz to 10 MHz;

5) - external compressor is not included.

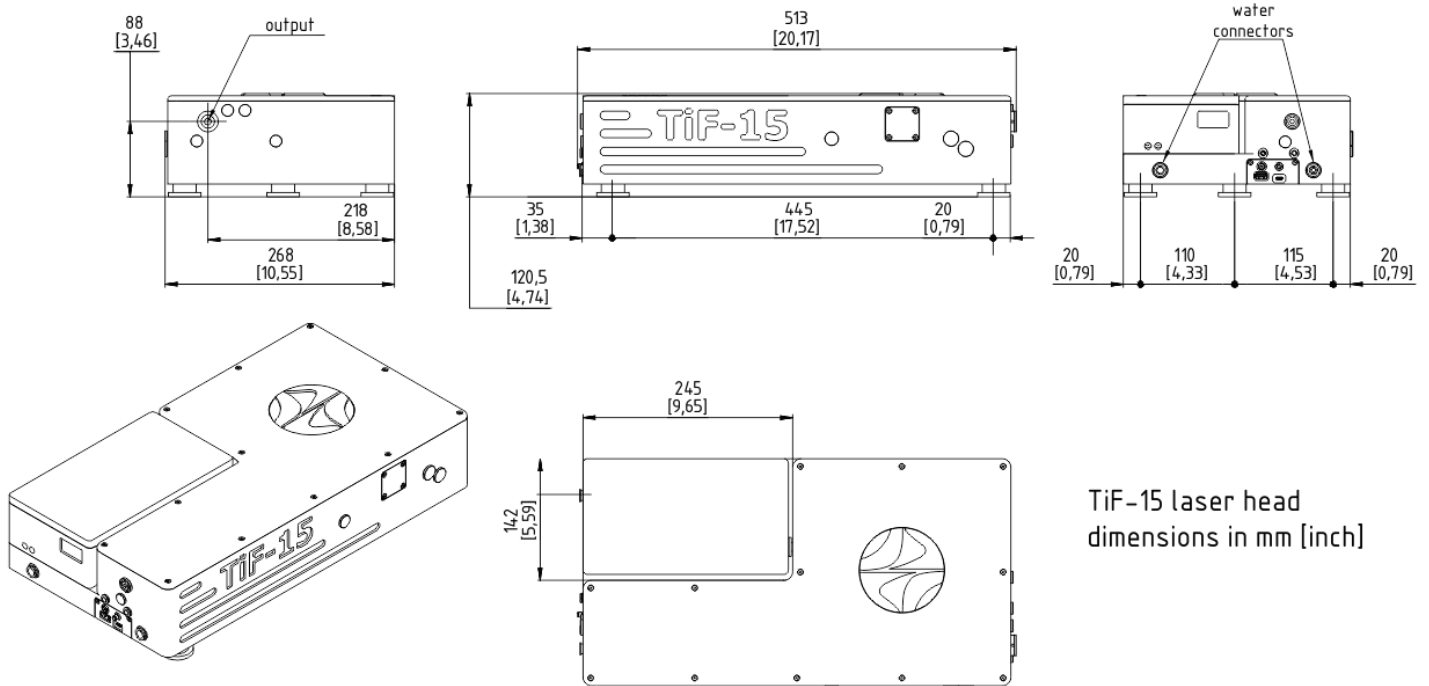


Possible factory configurations of the TiF-15SP system for various output pulse durations



Possible dispersion total control setup for multi-photon microscopy applications with APC Kit dispersion compensator and AA-M scanning autocorrelator with an external detector unit

# TiF-15 laser head dimensions



TiF-15 laser head dimensions in mm [inch]

*Dimensions of the TiF-15SP system including the pump laser head (pump laser compartment is left empty for stand-alone versions)*

