

# TiC. Ti:Sapphire Continuous Wave Laser



TiC laser model designed for external pumping

- 700-1000 nm tuning range with a single set of optics
- 690...1060 nm available customized and optimized wavelengths
- >4 W at 800 nm average output power
- Down to 2 GHz linewidth (with optional etalons)
- Integrated on-board pump laser option
- Automated wavelength tuning and Windows software
- Built-in spectrometer and power meter (optional)
- Optional built-in fiber coupling

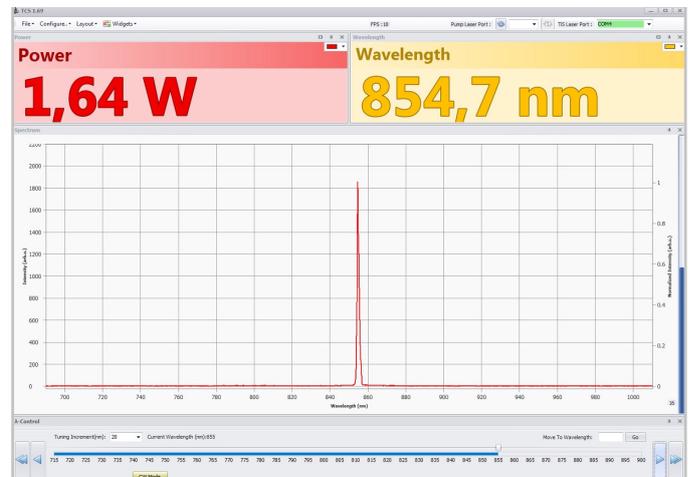
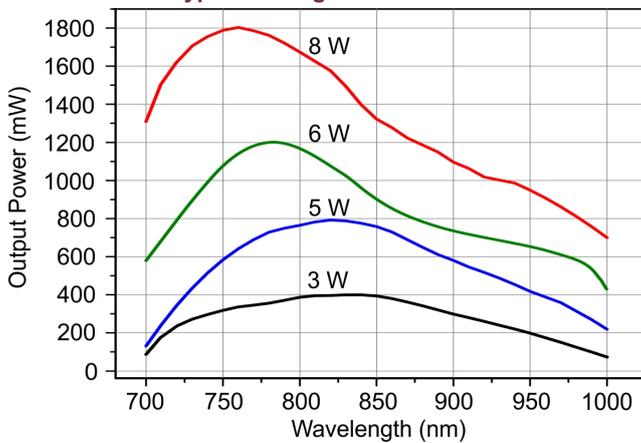
## Product overview

Continuous wave Ti:Sapphire laser features broad wavelength tuning range (700-1000 nm) and finds itself as a useful tool for many fields of fundamental research, especially various spectroscopy applications.

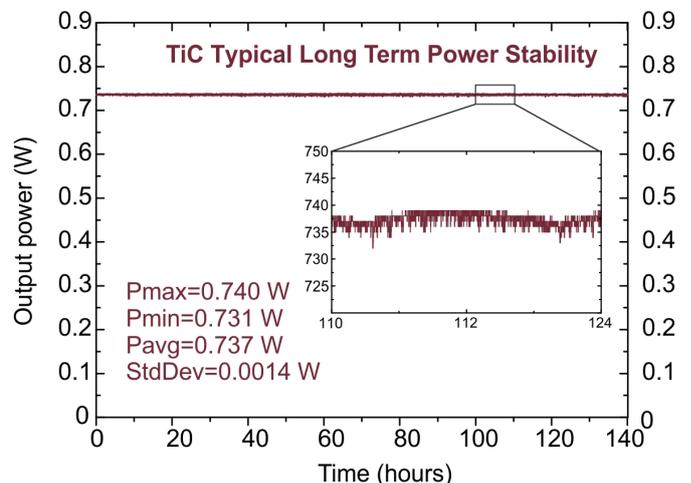
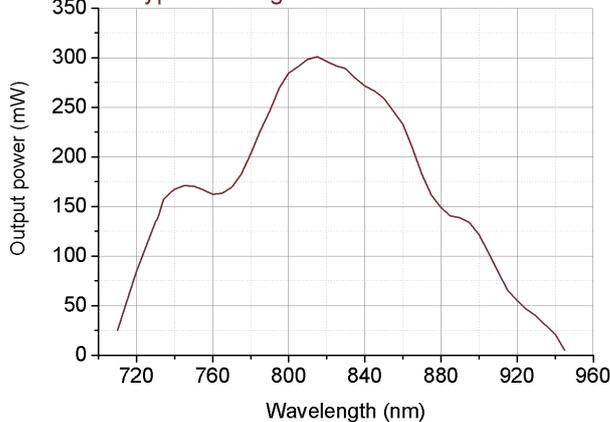
The wavelength tuning is carried out by a birefringent Lyot filter and can be either manually controlled or motorized via a step motor with USB connection to a PC. Two etalons can be optionally placed into the cavity in order to narrow the linewidth of the generated radiation down to 2 GHz. Optional fiber-coupled modification is available. The radiation is steered into a fiber with 4 um core diameter. The optical scheme allows easy switching between the free-space and the fiber outputs via a flip mount.

A CW Ti:Sapphire laser needs to be pumped by a CW DPSS pump laser at 532 nm or by a direct diode pump module from our company. Our company offers the oscillators without the pump laser, as well as a version with integrated pump laser with pump power varying from 4 W to 18 W.

Typical tuning curves for TiC laser



Typical tuning curve for TiF-CW-DP



**Standard models and available pump laser power matrix**

Pump laser power	TiC output power at 800 nm (free-space)	TiC output power at 800 nm (fiber-coupled, optional)
-DP module	>280 mW	>150 mW
4 W	>550 mW	>330 mW
5 W	>800 mW	>500 mW
6 W	>1.2 W	>900 mW
8 W	>1.8 W	>1 W (limited by fiber coupling)
10 W	>2.2 W	>1 W (limited by fiber coupling)
18 W	>4 W	>1 W (limited by fiber coupling)

**General optical specifications**

<b>Wavelength tuning range</b>	-DP direct diode pump: 720-920 nm Any DPSS pump: 700-1000 nm (customized wavelengths in the range of 690...1060 nm)
<b>Output linewidth</b>	<45 GHz (default); <20 GHz (with 1 intra-cavity etalon, optional); <2 GHz (with 2 intra-cavity etalons, optional)
<b>Pump laser</b>	integrated or stand-alone DPSS 480...550 nm low-noise pump laser (up to 18 W); the pump laser must have low amplitude noise and have a TEM00 spatial mode
<b>Fiber output (optional)</b>	switchable with free-space; SMF FC-FC patch-cord, length 1 m, core dia 4 um
<b>Spatial mode and M<sup>2</sup></b>	TEM00 (M <sup>2</sup> <1.2)
<b>Output beam diameter (at 1/e<sup>2</sup>)</b>	<2 mm
<b>Output polarization</b>	linear, horizontal, PER >100:1
<b>Beam divergence</b>	<1 mrad
<b>Long-term output power stability<sup>1)</sup></b>	<0.2% rms

**Physical dimensions (L × W × H)**

<b>Laser head</b>	427 × 300 × 129 mm (incl. integrated pump laser up to 12 W) 427 × 200 × 123 mm (for external pumping)
<b>Integrated pump laser control unit</b>	353 × 360 × 119 mm
<b>Closed-loop chiller unit</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>	<1.5 kW

**Available factory configuration packages<sup>2)</sup>**

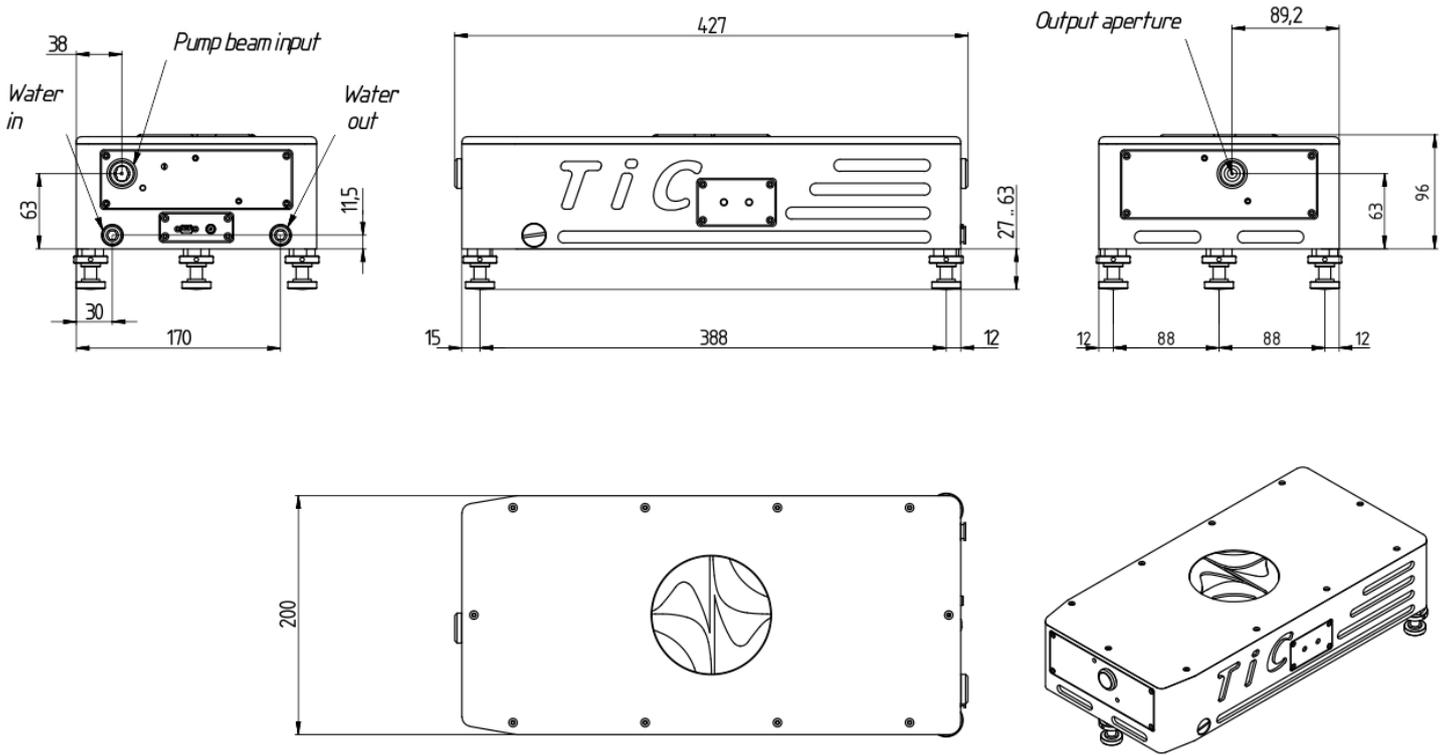
<b>Thermally stabilized monolithic body</b>	included in any package
<b>"Manual" factory package</b>	- birefringent Lyot filter with manual micrometer screw adjustment - (optional) one or two intracavity etalons with manual adjustment
<b>"Basic" factory package (default)</b>	- birefringent Lyot filter with step-motor adjustment - (optional) one or two intracavity etalons with manual or step-motor adjustment - motorized wavelength tuning with remote control - basic Windows software with wavelength tuning remote control capability
<b>"Auto" factory package</b>	- birefringent Lyot filter with step-motor adjustment - (optional) one or two intracavity etalons with manual or step-motor adjustment - built-in spectrometer - built-in power meter - active output power stability locking <sup>3)</sup> - BRF control and etalons (optional) control via single Windows software application - extended Windows software version, incorporating monitoring of operational parameters and single-click wavelength tuning

1) – after 30 min warm-up with cold start, during 12-hour continuous operation under equal room temperature conditions using factory-supplied/recommended stabilized closed-loop chiller with proper capacity and factory-supplied/recommended low-noise on-board integrated highly stable pump laser with active power locking turned ON; "Auto" package only;

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

3) – available only with certain manufacturer-certified pump laser models, please enquire.

## TiC laser head for use with external pump



## TiC laser head with integrated pump

