

# Q-TUNE

## AIR COOLED, DIODE PUMPED, TUNABLE WAVELENGTH Q-SWITCHED LASER

### FEATURES

Seamless laser and Optical Parametric Oscillator (OPO) integration

Turnkey performance due water-free pump laser design

Microprocessor controlled operation with self-optimisation, self-calibration capability

> **2 G shot** pump diode lifetime

Hands-free, automated tuning  
from **210 to 2300 nm**

Up to **8 mJ** pulse energy in visible range

< **6 cm<sup>-1</sup>** linewidth

Up to **100 Hz** pulse repetition rate

Internal or external triggering modes

Separate output ports for access to pump laser wavelengths

Low power consumption –  
from **50 to 150 W** depending on model

Air purging for long lifetime of UV optics

### APPLICATIONS

Temporally resolved laser spectroscopy  
(for example, Light Induced Fluorescence Spectroscopy (LIFS))

Non-linear laser spectroscopy

Confocal microscopy

Metrology

Photoacoustic imaging



Q-TUNE is using Optical Parametric Oscillator (OPO) to produce tunable wavelength in 410 – 2300 nm range with linewidth narrower than 6 cm<sup>-1</sup>. Optional second harmonic generator extends tuning range to 210 – 410 nm with linewidth narrower than 12 cm<sup>-1</sup>. Combined with shorter than 5 ns pulse duration and up to 100 Hz pulse repetition rate Q-TUNE is perfect coherent light source for temporally resolved spectroscopy, metrology, photoacoustic imaging.

QLI breakthrough water-free laser crystal pumping technology allows to produce high quality laser beam with up to 100 mJ pulse energy. Advanced laser design resulted in very compact, user-friendly turnkey system that requires little maintenance. There is no chillers or bulky power supplies that one needs to fit under the table. All laser electronics are integrated into housing of the Q-TUNE and the only external module is mains adapter that provides 12 or 28 VDC, 50 – 150 W power (depending on model).

Both pump laser and OPO are controlled through single Ethernet port via build-in web-server. There is no need to install control software – any computer or even cell phone with modern web-browser will be able to control Q-TUNE. API is also provided for integration with user devices.

In addition to tunable wavelength output, the Q-TUNE provides two extra ports for access to pump laser beams.

Optional extensions available by request:

- > Air purging for long lifetime of UV optics.
- > Compact spectrometer for monitoring of OPO wavelength and linewidth.
- > Fiber coupled OPO output.



Quantum  
Light  
Instruments

[WWW.QLINSTRUMENTS.COM](http://WWW.QLINSTRUMENTS.COM)

# SPECIFICATIONS <sup>1)</sup>

MODEL	Q-TUNE				
	-C10	-C100	-E10	-E33	-F10
Wavelength range <sup>2)</sup>	410 – 2300 nm				
OPO	210 – 410 nm				
SH extension	210 – 410 nm				
Pulse repetition rate <sup>3)</sup>	10 Hz	100 Hz	10 Hz	33 Hz	10 Hz
Pulse energy <sup>4)</sup>	> 1 mJ		> 5 mJ		> 8 mJ
Linewidth	< 6 cm <sup>-1</sup>				
Pulse duration <sup>5)</sup>	< 5 ns				
Pulse-to-pulse stability <sup>6)</sup>	< 4.5 % RMS				
Power drift <sup>7)</sup>	± 3.0 %				
Polarization	vertical				
Typical beam diameter <sup>8)</sup>	3 mm		5 mm		6 mm
Typical beam divergence <sup>9)</sup>	< 3 mrad		< 5 mrad		
Jitter <sup>10)</sup>	< 0.5 ns RMS				

## PUMP LASER OUTPUTS <sup>11)</sup>

Max pulse energy at <sup>12)</sup>				
Fundamental	15 mJ		50 mJ	80 mJ
2 <sup>nd</sup> harmonic	7 mJ		20 mJ	30 mJ
3 <sup>rd</sup> harmonic	5 mJ		20 mJ	30 mJ

## DIMENSIONS

Laser head (W×L×H)	390 × 620 × 135 mm <sup>3</sup>	390 × 620 × 153 mm <sup>3</sup>
Power adapter (W×L×H) <sup>13)</sup>	50 × 125 × 33 mm <sup>3</sup>	192 × 178 × 46 mm <sup>3</sup>

## OPERATING REQUIREMENTS

Cooling requirements	air cooled (water-free)				
Ambient temperature	15 – 25 °C				
Relative humidity	10 – 80 % (non-condensing)				
Mains voltage	90 – 230 VAC, single phase, 47 – 63 Hz <sup>14)</sup>				
Average power consumption	< 50 W	< 150 W	< 100 W	< 150 W	< 120 W

<sup>1)</sup> Due to continuous improvements all specifications are subject to change. Unless stated otherwise all specifications are measured at 450 nm and max pulse repetition rate. The parameters marked typical are not specifications. They are indications of typical performance and will vary with each unit we manufacture.

<sup>2)</sup> Optional extension down to 210 nm is available with second harmonic generator.

<sup>3)</sup> Factory-set pulse repetition rate in internal triggering mode. Pulse repetition rate can be divided-down to 1 Hz.

<sup>4)</sup> Measured at 450 nm output. See tuning curves for pulse energies at other wavelengths.

<sup>5)</sup> FWHM level at 1064 nm, measured with 350 ps rise time photodiode.

<sup>6)</sup> Measured during 30 seconds operation after warm-up.

<sup>7)</sup> Over 8 hour period after 20 minutes of warm-up, when ambient temperature variation is less than ±2 °C. Power value is calculated every 1 second.

<sup>8)</sup> Beam diameter is measured 20 cm from laser output at the 4σ level.

<sup>9)</sup> Full angle measured at the 4σ level.

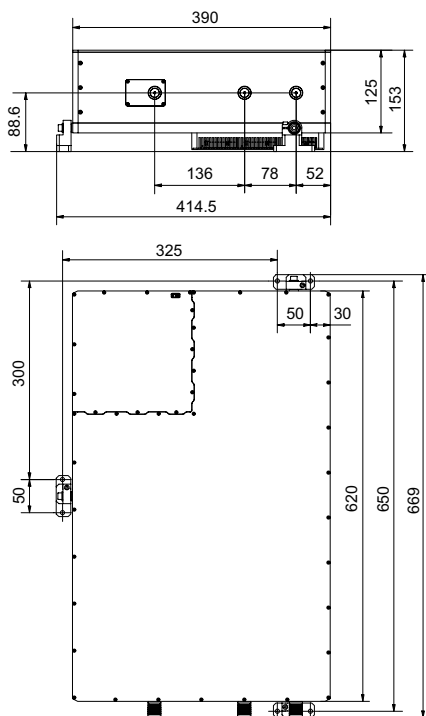
<sup>10)</sup> In respect to falling edge of pump diode triggering pulse.

<sup>11)</sup> Laser pulse energy is optimized for OPO pumping and may differ from stand-alone laser specifications.

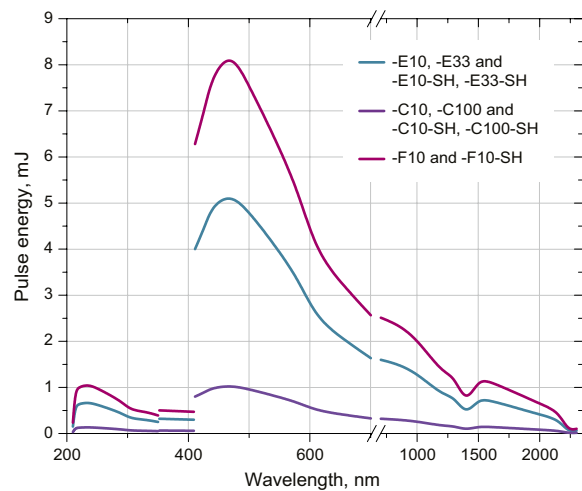
<sup>12)</sup> Outputs can be configured for simultaneous or non-simultaneous with OPO operation. Values indicated here are for non-simultaneous operation.

<sup>13)</sup> Power adapter size depends of model.

<sup>14)</sup> Laser can be powered from appropriate 12 or 28 VDC power source, depending on model. Please inquire for details.



Dimensional drawing of Q-TUNE-C100/E10/E33/F10 (in mm)



Q-TUNE tuning curves