

# Q-TUNE-G

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

### FEATURES

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Seamless laser and Optical Parametric Oscillator (OPO) integration

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Turnkey performance due water-free pump laser design

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

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Guaranteed > 2 Gshot pump diode lifetime

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Hands-free, automated tuning from **680 to 2300 nm**

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Up to **100 Hz** pulse repetition rate

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Up to **11 mJ** pulse energy in near-IR range

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**10 – 15 cm<sup>-1</sup>** typical linewidth (broadband version available by request)

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Internal or external triggering modes

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Separate output ports for access to pump laser wavelengths

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

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Optional air purging for long lifetime of optics

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### APPLICATIONS

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Photo-acoustics imaging

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Photo-acoustics microscopy

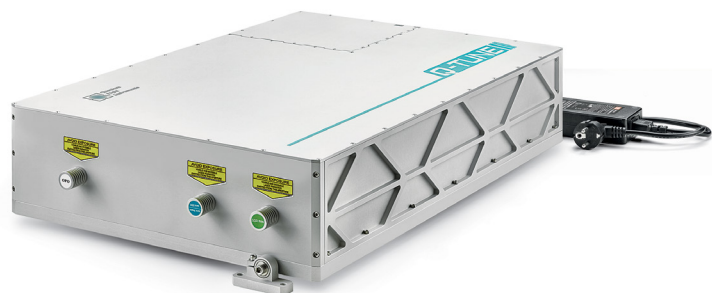
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Non-linear laser spectroscopy

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Metrology

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Q-TUNE-G is an air-cooled, tunable wavelength laser, integrating Optical Parametric Oscillator (OPO) and its pump source. Pump source is Q-switched DPSS laser of Q2 series. Less than 4 ns pulse duration and up to 100 Hz pulse repetition rate make Q-TUNE perfect coherent light source for photoacoustic imaging, non-linear and temporally resolved spectroscopy, metrology.

Q2 series lasers feature water-free laser crystal pumping technology that 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 are 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-G 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 built-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-G. API is also provided for integration with user devices.

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

Optional extensions available by request:

- Air purging for long lifetime of optics.
- Compact spectrometer for monitoring of OPO wavelength and linewidth.
- Motorized attenuator for VIS or NIR range.
- OPO pulse energy monitor.
- Fiber coupled OPO output.
- Air purging unit for long lifetime of optics.

## SPECIFICATIONS <sup>1)</sup>

MODEL	Q-TUNE-G				
	-C10	-C100	-E10	-E33	-F10
Wavelength range	680 – 2300 nm				
Pulse repetition rate <sup>2)</sup>	10 Hz	100 Hz	10 Hz	33 Hz	10 Hz
Pulse energy <sup>3)</sup>	> 2 mJ		> 7 mJ		> 11 mJ
Linewidth <sup>4)</sup>	< 10 cm <sup>-1</sup>		< 15 cm <sup>-1</sup>		
Pulse duration <sup>5)</sup>	< 4 ns				
Pulse-to-pulse stability <sup>6)</sup>	< 3 % RMS				
Power drift <sup>7)</sup>	± 3.0 %				
Polarization					
signal	horizontal				
idler	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>

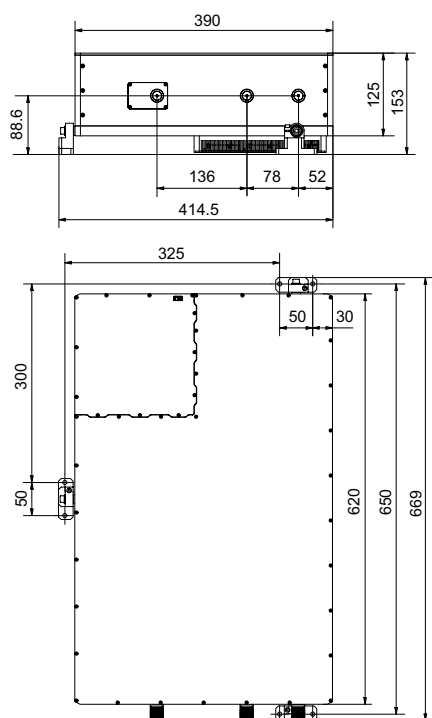
Fundamental	15 mJ	60 mJ	80 mJ
2nd harmonic	7 mJ	30 mJ	40 mJ

### DIMENSIONS

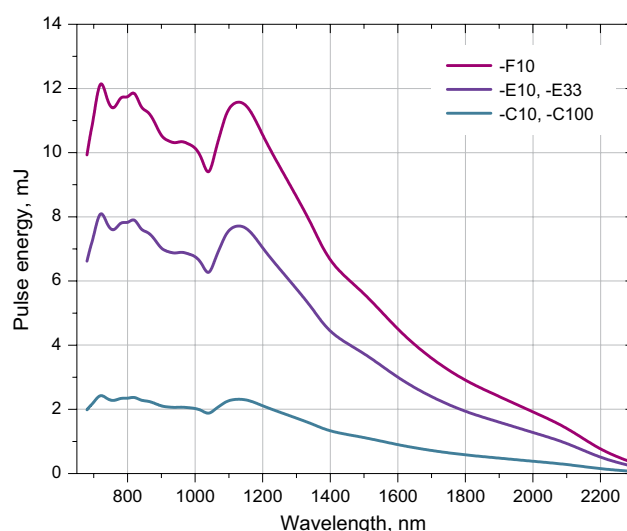
Laser head (W×L×H)	390 × 620 × 135 mm <sup>3</sup>	390 × 620 × 153 mm <sup>3</sup>
Power adapter (W×L×H) <sup>13)</sup>	50 × 125 × 33 mm <sup>3</sup>	192 × 178 × 46 mm <sup>3</sup>
Air purging unit (APU) <sup>14)</sup>	89 × 422 × 330 mm <sup>3</sup>	

### OPERATING REQUIREMENTS

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



Dimensional drawing of Q-TUNE-G (in mm)



Q-TUNE-G tuning curves

<sup>1)</sup> Due to continuous improvements all specifications are subject to change. Unless stated otherwise all specifications are measured at 800 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> Factory-set pulse repetition rate in internal triggering mode. In internal triggering mode repetition rate can be divided by integer number down to f/2, f/3, f/4... 1 Hz.

<sup>3)</sup> Measured at 800 nm output. See tuning curves for pulse energies at other wavelengths.

<sup>4)</sup> Broadband version is available by request. Linewidth is in 20 – 200 cm<sup>-1</sup> range.

<sup>5)</sup> FWHM level at 800 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> APU is optional. APU provides power for Q-TUNE-G, additional power adapter is not required.

<sup>15)</sup> Laser can be powered from appropriate 12 or 28 VDC power source, depending on model. Please inquire for details.