

Q-TUNE-HR

HIGH PULSE REPETITION RATE TUNABLE WAVELENGTH OPO

FEATURES

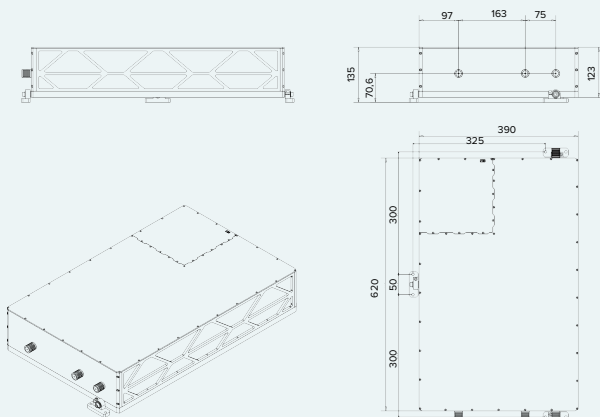
- **Up to 100 kHz** pulse repetition rate.
- Hands-free, automated wavelength tuning from **680 to 2100 nm**.
- **Up to 4 W** output power in near IR range.
- Can be adapted for user-supplied laser with 532 nm or 1064 nm pump wavelength and up to **35 W @ 532 nm** input power.
- Microprocessor controlled operation with self-optimization, self-calibration capability.
- Powered from +12 VDC source or AC/DC adapter.

OPTIONAL EXTENSIONS

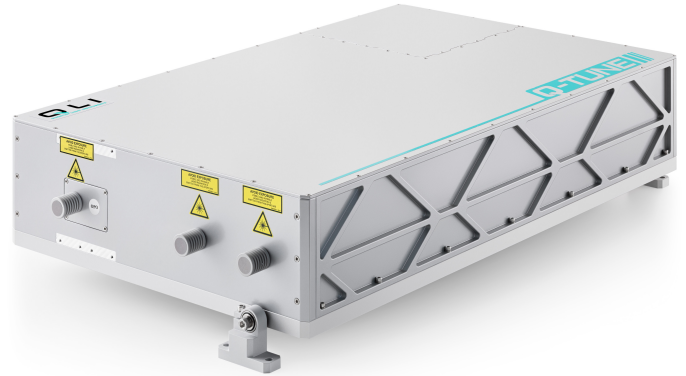
- **Air Purging** for long lifetime of OPO optics.
- **Compact spectrometer** for monitoring of OPO wavelength and linewidth.
- **Fiber coupled** OPO output

APPLICATIONS

- Photo-acoustic microscopy.
- Micromachining.
- Raman spectroscopy & microscopy.
- Infrared spectroscopy.



Laser head (WxLxH): 390 x 620 x 135 mm^{3/}



Q-TUNE-HR is an Optical Parametric Oscillator (OPO) producing tunable wavelength in 680-2200 nm range with up to 100 kHz pulse repetition rate. High pulse repetition rate make Q-TUNE-HR perfect coherent light source for photoacoustic microscopy, micromaching, imaging applications. There are several models optimized for pump sources with different pump laser wavelengths and pulse energy levels. G100 and G1K models are pumped by 1064 nm laser with pulse energies in starting from 5 mJ @ 1064 nm. G10K and G100k are pumped by 532 nm lasers with minimum pump pulse energy of 350 μ J.

By default OPO is optimized to produce maximum output in 800 nm range. As option, unit can be optimized for 1300 nm range. OPO is 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.

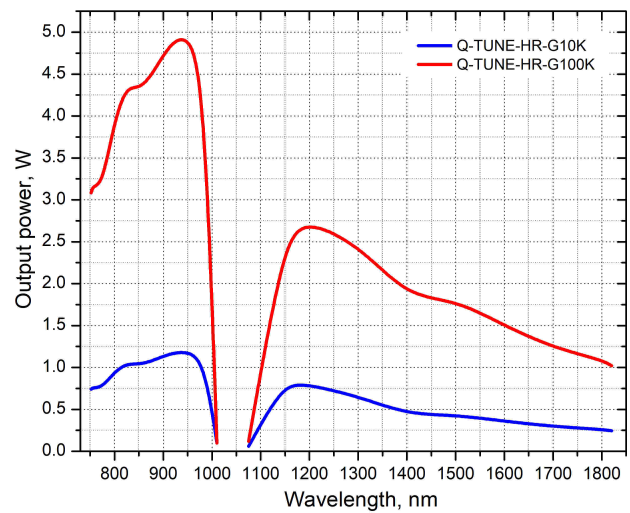
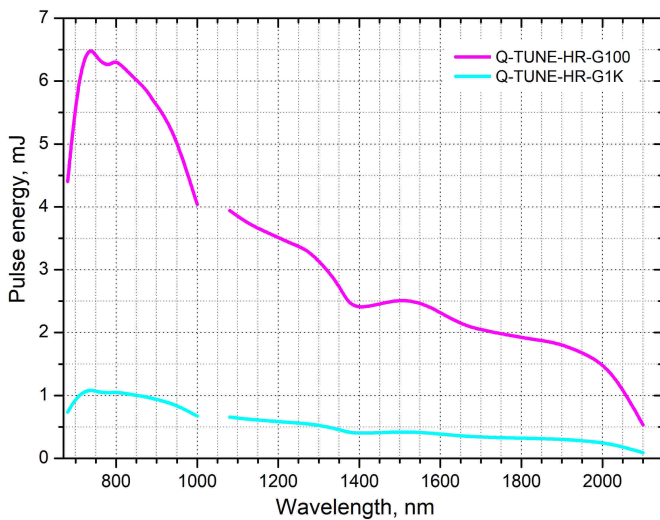
In addition to tunable wavelength output, the Q-TUNE provides bypass port for access to pump laser beam.

SPECIFICATIONS¹⁾

Model	Q-TUNE-HR			
	-G100	-G1K	-G10K	-G100K
Wavelength range, nm ²⁾	680-2100 nm		750-1800 nm	
Pulse repetition rate ³⁾	100 Hz	1 kHz	1-10 kHz	10-100 kHz
Typical conversion efficiency	>20 % (signal + idler)			
Output pulse energy	>6 mJ ⁴⁾	>1 mJ ⁵⁾	>100 μJ ⁶⁾	>40 μJ ⁷⁾
Linewidth	20-100 cm ⁻¹			
Pulse duration ⁸⁾	5-7 ns ¹⁰⁾			
Pulse-to-pulse stability ⁹⁾	2 × pump laser			
Power drift ¹⁰⁾	2 × pump laser			
Polarization	linear, horizontal			
Typical beam diameter ¹¹⁾	4 mm	3 mm ¹⁴⁾		
Typical beam divergence ¹²⁾	< 5 mrad	< 3 mrad		
Pump laser requirements				
Pump laser wavelength	1064 nm	1064 nm	532 nm	532 nm
Pulse duration	5-8 ns FWHM			
Pulse energy	>20 mJ	>5 mJ	>700 μJ	>350 μJ
Max pump power	<5 W	<10 W		< 35 W
M ² factor	< 2	< 1.5		
Dimensions				
Laser head (WxLxH)	390 x 620 x 135 mm ³			
Power adapter (WxLxH)	50 x 125 x 33 mm ³			
Operating requirements				
Ambient temperature	15 - 30 °C			
Relative humidity (non-condensing)	10 - 80%			
Mains voltage	90-230 VAC, single phase, 47-63 Hz ¹³⁾			
Average power consumption	< 50 W			

- 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.
- Custom build devices with wavelength range of 210 - 4000 nm are available by request. Please inquire for details.
- Determined by pulse repetition rate of pump source. Q-TUNE-G100 can be configured for 200 Hz rep rate if minimum pump energy requirements are satisfied.
- When pumped by 40 mJ @1064 nm @100 Hz pulse repetition rate source. See tuning curves for pulse energies at other wavelengths.
- When pumped by 10 mJ @1064 nm @1 kHz pulse repetition rate source. See tuning curves for pulse energies at other wavelengths.
- When pumped by 8 W @532 nm @10 kHz pulse repetition rate source. See tuning curves for pulse energies at other wavelengths.
- When pumped by 30 W @532 nm @100 kHz pulse repetition rate source. See tuning curves for pulse energies at other wavelengths.
- FWHM level at 800 nm, measured with 350 ps rise time photodiode.
- Measured during 30 seconds of operation after warm-up.
- 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.
- Beam diameter is measured 20 cm from laser output at the 4σ level.
- Full angle measured at the 4σ level.
- Laser can be powered from appropriate 12 or 28 VDC power source, depending on model. Please inquire for details.

TUNING CURVES



Front panel of Q-TUNE-HR



Rear panel of Q-TUNE-HR



Front panel of Air Purging Unit



Rear panel of Air Purging Unit