

Q-TUNE series

The **Q-TUNE series** is a family of fully-integrated, air-cooled, tunable nanosecond laser systems based on optical parametric oscillator (OPO) technology. Designed for applications that demand high pulse energy and wavelength flexibility, all models offer hands-free tuning, excellent beam quality, and robust, compact design.

- **Q-TUNE**: Tunable from 410 to 2300 nm, ideal for general-purpose spectroscopy, LIDAR, and material analysis.
 - **Q-TUNE-G**: Tunable from 680 to 2300 nm, optimized for high pulse energy in the red to near-infrared range—ideal for remote sensing and nonlinear optics.
 - **Q-TUNE-IR**: Covers 1380 to 4500 nm, extending deep into the mid-infrared for molecular spectroscopy and environmental monitoring.
 - **Q-TUNE-HR**: Offers high repetition rate (up to 100 kHz) and tunable wavelengths in the 750 to 3200 nm range, tailored for spectroscopy and spectral analysis.
- Each Q-TUNE laser is fully self-contained and easy to install, making the series a versatile solution for both scientific and industrial applications.

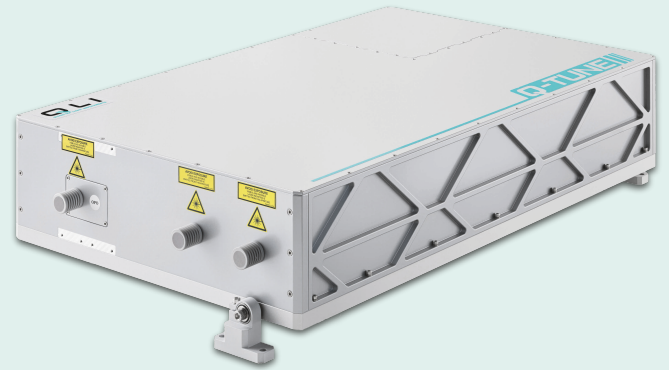
FEATURES

- Seamless laser and Optical Parametric Oscillator (OPO) integration.
- Turnkey performance due **water-free** pump laser designed.
- Microprocessor controlled operation with **self-optimisation, self-calibration** capability.
- Guaranteed **> 2 G shots** pump diode lifetime.
- Hands-free, **automated tuning from 210 to 4500 nm**.
- **Up to 100 Hz** pulse repetition rate.
- **Up to 8 mJ** pulse energy in visible range.
- **<6 cm⁻¹** linewidth.
- **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.

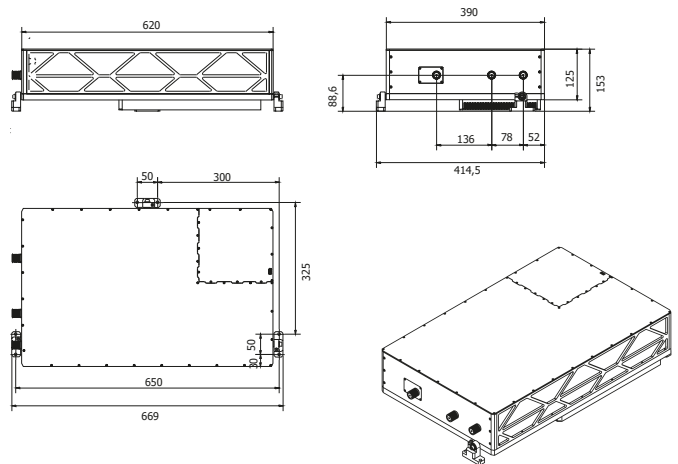
APPLICATIONS

- Light Detection And Ranging (LIDAR) (Metrology, Military, Astronomy ant etc.),
- Spectroscopy (Laser Induced Breakdown (LIBS), Light Induced Fluorescence (LIFS), Flash photolysis and etc.)
- Laser ablation (marking, LCD repair, trimming, scribing and etc.),
- Medical (Ophthalmology, Dermatology, Photoacoustic Imaging (PAI) and etc.),
- Pulsed Laser Deposition (PLD).

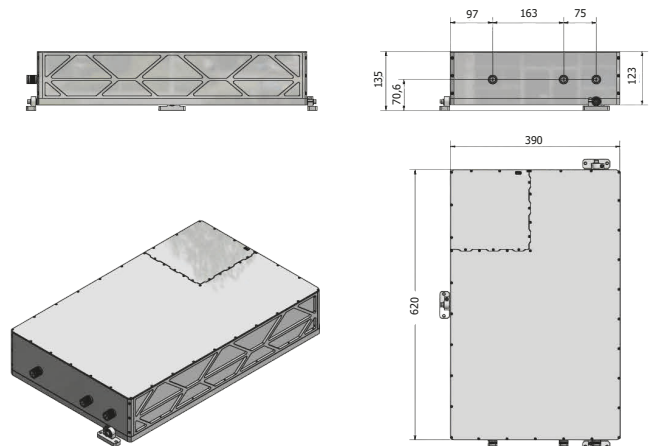
AIR-COOLED DIODE PUMPED TUNABLE WAVELENGTH OPTIC PARAMETRIC OSCILLATORS



Laser head (WxLxH): 390 x 620 x 153 mm³



Laser head (WxLxH): 390 x 620 x 135 mm³



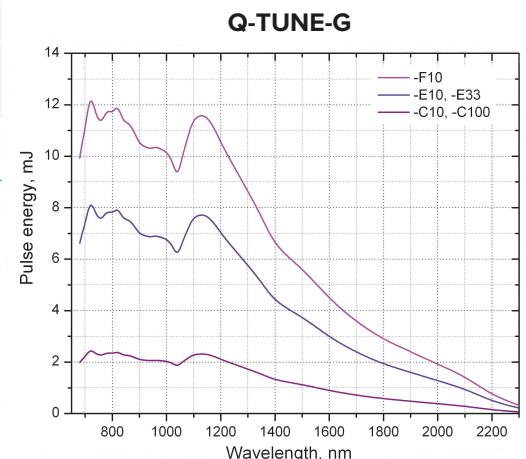
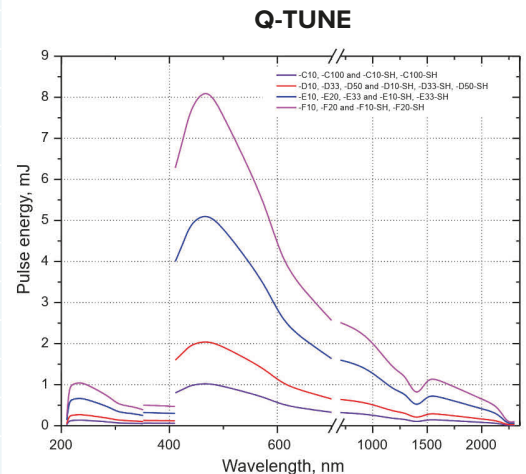
SPECIFICATIONS for Q-TUNE ¹⁾

Model	Q-TUNE									
	-C10	-C100	-D10	-D20	-D50	-E10	-E20	-E33	-F10	-F20
Wavelength range, nm	410 - 2300 nm									
OPO	410 - 2300 nm									
SH extension ³⁾	210 - 410 nm									
Pump laser wavelength	1053 nm	1064 nm	1053 nm	1064 nm	1064 nm	1053 nm	1064 nm	1053 nm		
Pulse repetition rate ⁴⁾	10 Hz	100 Hz	10 Hz	20 Hz	50 Hz	10 Hz	20 Hz	33 Hz	10 Hz	20 Hz
Pulse energy ⁵⁾	> 1 mJ		> 2 mJ			> 5 mJ		> 8 mJ		
Linewidth	< 6 cm ⁻¹									
Pulse duration ⁷⁾	< 5 ns									
Pulse-to-pulse stability ¹⁰⁾	< 4.5 % RMS									
Polarization:										
Signal	Vertical									
Idler	Vertical									
Typical beam diameter ¹²⁾	3 mm		4 mm			5 mm		6 mm		
Typical beam divergence ¹³⁾	< 3 mrad		< 4 mrad			< 5 mrad				
Pump laser outputs ¹⁵⁾										
Max pulse energy at ¹⁶⁾										
Fundamental	15 mJ		30 mJ			50 mJ		70 mJ		70 mJ
2nd harmonic	7 mJ		15 mJ			20 mJ		30 mJ		25 mJ
3rd harmonic	5 mJ		9 mJ			20 mJ		30 mJ		25 mJ
Average power consumption	< 50 W	< 150 W	< 100 W	< 150 W		100 W	< 150 W			

- 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.
- 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.
- Optional extension down to 210 nm is available with 2nd harmonic generator.
- Factory-set pulse repetition rate in internal triggering mode. Pulse repetition rate can be divided-down to 1 Hz.
- Measured at 450 nm output. See tuning curves for pulse energies at other wavelengths.
- Measured at 800 nm output. See tuning curves for pulse energies at other wavelengths.
- FWHM level at 450 nm, measured with 350 ps rise time photodiode.
- Broadband version is available by request. Linewidth is in 20-200 cm⁻¹ range.
- FWHM level at 800 nm, measured with 350 ps rise time photodiode.
- Measured during 30 seconds 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 4th level.
- Full angle measured at the 4th level.
- In respect to falling edge of pump diode triggering pulse.
- Laser pulse energy is optimized for OPO pumping and may differ from stand-alone laser specifications.
- Outputs can be configured for simultaneous or non-simultaneous with OPO operation. Values indicated here are for non-simultaneous operation.
- APU is optional for Q-TUNE-G. APU provides power for Q-TUNE-G and for Q-TUNE, additional power adapter is not required.
- Laser can be powered from appropriate 12 or 28 VDC power source, depending on model. Please inquire for details.
- For model Q-TUNE-C10 housing dimensions - 390 × 620 × 135 mm³.
- Power adapter is integrated with air purging unit.

SPECIFICATIONS for Q-TUNE-G ²⁾

Model	Q-TUNE-G						
	-C10	-C100	-D10	-E10	-E20	-E33	-F10
Wavelength range, nm	680 - 2300 nm						
Pump laser wavelength	1053 nm	1064 nm	1053 nm		1064 nm	1053 nm	
Pulse repetition rate ⁴⁾	10 Hz	100 Hz	10 Hz	10 Hz	20 Hz	33 Hz	10 Hz
Pulse energy ⁶⁾	> 2 mJ		> 4 mJ		> 7 mJ		> 11 mJ
Linewidth ⁸⁾	< 10 cm ⁻¹		< 13 cm ⁻¹		< 15 cm ⁻¹		
Pulse duration ⁹⁾	< 4 ns						
Pulse-to-pulse stability ¹⁰⁾	< 3 % RMS						
Polarization							
Signal	Horizontal						
Idler	Vertical						
Typical beam diameter ¹²⁾	3 mm		4 mm		5 mm		6 mm
Typical beam divergence ¹³⁾	< 3 mrad		< 4 mrad		< 5 mrad		
Pump laser outputs ¹⁵⁾							
Max pulse energy at ¹⁶⁾							
Fundamental	15 mJ		30 mJ		60 mJ		80 mJ
2nd harmonic	7 mJ		15 mJ		30 mJ		30 mJ
Average power consumption	< 50 W	< 150 W	< 100 W			< 150 W	



For all Q-TUNE and Q-TUNE-G series

Dimensions		Cooling requirements	Air cooled (water-free)
Laser head (WxLxH) ¹⁹⁾	390 × 620 × 153 mm ³	Jitter ¹⁴⁾	< 0.5 ns RMS
Air Purging Unit · APU (WxLxH) ²⁰⁾	482 × 460 × 106.1 (91.4 – without feet) mm ³	Power drift ¹¹⁾	± 3.0 %
		Ambient temperature	15 – 25 °C
		Relative humidity (non-condensing)	10 – 80 %
		Mains voltage:	90-230 VAC, single phase, 47-63 Hz ¹⁸⁾

SPECIFICATIONS for Q-TUNE-IR ¹⁾ and Q-TUNE-HR models ²⁾

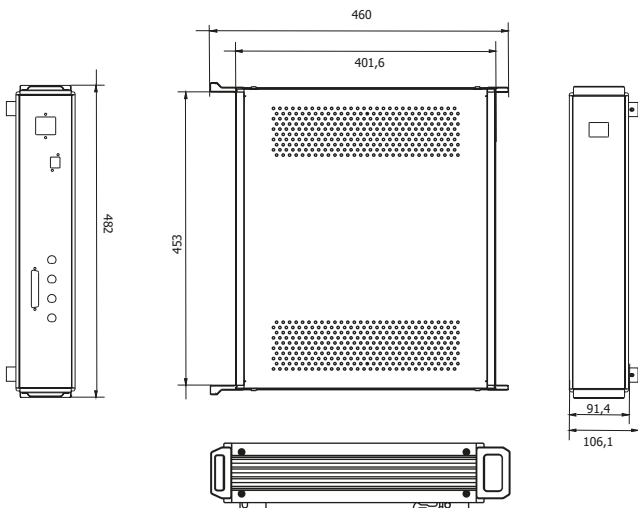
Model	Q-TUNE-IR					Q-TUNE-HR		
	-C10	-C100	-E33	-F10	-F20	-G10	-G100K	-I10K
Wavelength range, nm	1380-4500 nm ³⁾					750-1800 nm		1600-3200 nm
Pump laser wavelength	1053 nm	1064 nm	1064 nm	1053 nm	1053 nm	532 nm	532 nm	1064 nm
Pulse repetition rate ⁴⁾	10 Hz	100 Hz	33 Hz	10 Hz	20 Hz	1-10 kHz	10-100 kHz	1-10 kHz
Pulse energy	-					>50 µJ @ 1200 nm ⁶⁾		100 µJ @1650 nm ⁷⁾
-TC1 ⁵⁾	≥1.5 mJ	≥1 mJ	≥3 mJ	≥5 mJ	≥4 mJ	-		
-TC2 ⁵⁾	≥2 mJ	≥1.3 mJ	≥4 mJ	≥6 mJ	≥5 mJ	-		
Linewidth ⁸⁾	< 10 cm ⁻¹					20-100 cm ⁻¹		
Pulse duration	3-4 ns typical ⁹⁾					5-7 ns ¹⁰⁾		
Pulse-to-pulse stability ¹¹⁾	< 4.5 % RMS					2 × pump laser		
Power drift ¹²⁾	± 3.0 %					2 × pump laser		
Polarization	horizontal, linear					horizontal		
Typical beam diameter ¹²⁾	3 mm ¹³⁾		5 mm ¹³⁾		6 mm ¹³⁾	3 mm ¹⁴⁾		
Typical beam divergence	< 3 mrad ¹⁵⁾		< 5 mrad ¹⁵⁾		< 3 mrad ¹⁶⁾			< 5 mrad ¹⁶⁾
Power	-					< 40 W		
M ² factor	-					< 1.5		
Jitter ¹⁷⁾	< 0.5 ns RMS					-		
Pump laser outputs								
Max pulse energy at ¹⁸⁾								
Fundamental	20 mJ	14 mJ	50 mJ	80 mJ	60 mJ	-	-	>1mJ
2nd harmonic	-	-	-	-	-	> 350 µJ	> 350 µJ	-
Average power consumption	< 50 W	< 150 W	< 80 W	<120 W			< 50 W	

1. Due to continuous improvements all specifications are subject to change. Unless stated otherwise all specifications are measured at 3300 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.
2. Due to continuous improvements all specifications are subject to change. Unless stated otherwise all specifications are measured at 1200 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.
3. There are two wavelengths at the exit port in 1800 – 2500 nm range corresponding to signal and idler of OPO. Configurations for single wavelength output and/or no gap in 2800-2900 nm range are available. Please inquire for details.
4. Factory-set pulse repetition rate in internal triggering mode. Pulse repetition rate can be divided-down to 1 Hz. Determined by pulse repetition rate of pump source.
5. Pulse energy @3300 nm. See tuning curves for typical pulse energies at other wavelengths.
6. When pumped by 4 W @532 nm @ 10 kHz pulse repetition rate source. See tuning curves for pulse energies at other wavelengths.
7. When pumped by 10 W @1064 nm @10 kHz pulse repetition rate source.
8. Broadband version is available, with linewidth up to 200 cm⁻¹. Please inquire for details.
9. FWHM level at 1550 nm, measured with 350 ps rise time photodiode.
10. When pumped by 10 W @1064 nm @10 kHz pulse repetition rate source.
11. Measured during 30 seconds of operation after warm-up.
12. 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.
13. Beam diameter is measured 20 cm from laser output at the 1/e² level at 1550 nm.
14. Beam diameter is measured 20 cm from laser output at the 4σ level.
15. Full angle measured at 1550 nm at the 1/e² level.
16. Full angle measured at the 4σ level.
17. In respect to falling edge of pump diode triggering pulse.
18. Laser pulse energy is optimized for OPO pumping may differ from stand-alone laser specifications indicated here.
19. For models Q-TUNE-HR housing dimensions - 390 × 620 × 135 mm³.
20. Air Purging Unit is supplied with integrated power adapter.
21. Laser can be powered from appropriate 12 or 28 VDC power source, depending on model. Please inquire for details.

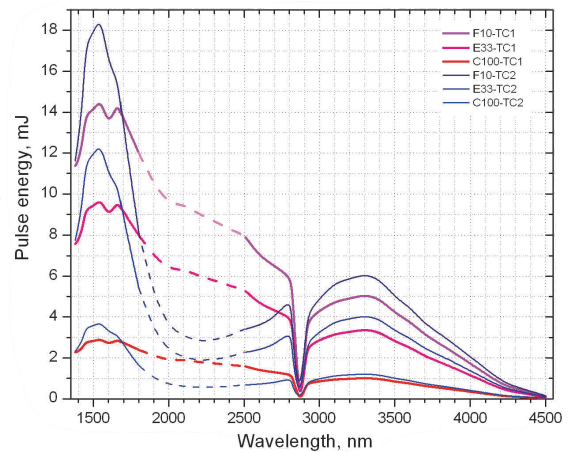
For all Q-TUNE-IR and Q-TUNE-HR series

Dimensions		Cooling requirements	Air cooled (water-free)
Laser head (WxLxH) ¹⁹⁾	390 × 620 × 153 mm ³	Ambient temperature	15 – 25 °C
Air Purging Unit APU (WxLxH) ²⁰⁾	482 × 460 × 106.1 (91.4 – without feet) mm ³	Relative humidity (non-condensing)	10 – 80 %
		Mains voltage:	90-230 VAC, single phase, 47-63 Hz ²¹⁾

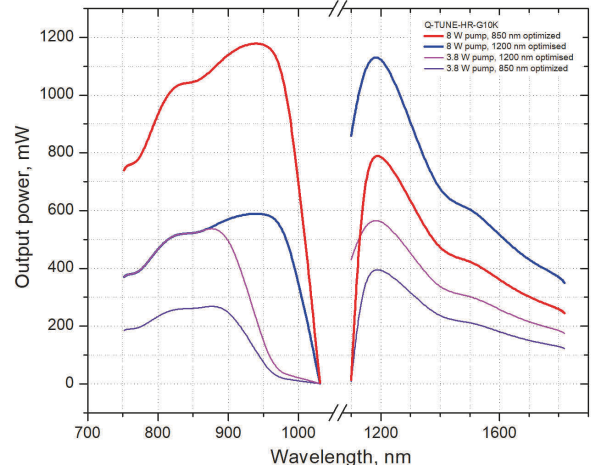
Air Purging Unit



Q-TUNE-IR



Q-TUNE-HR



Air Purging Units

Air-Purging Unit (model APU2) is designed to remove water vapor and dust particles by recirculating air from the laser or harmonic generator cavity. Maintaining a clean environment helps extend the lifetime of UV optical components and eliminates water vapor absorption lines present in the near- and mid-IR ranges.

In addition, the APU2 includes an integrated AC/DC converter for powering the laser electronics. Several versions of the air-purging unit are available with additional functionality. The unit can integrate an AC/DC mains adapter and/or a laser controller.

The **laser controller** provides interfaces for operating the laser from a personal computer (PC) or directly from a triggering pulse generator. Standard features include an Ethernet port for PC control, BNC sockets for applying trigger pulses to the pump diodes and Q-switch, a safety key switch, and an emergency stop connector.

Our high average power lasers (typically above 2 W) may require a **19" rack-mount AC/DC adapter**, model PS19. On request, the PS19 can be upgraded with a built-in controller (**CT19**) and an air-purging unit (**CTA19**).

By default, most QLI lasers are supplied with a **compact CT-type controller**, which is not a 19" rack unit. Due to its small size, the CT controller can be placed close to the laser head for convenient access. For more information about the default controller, please refer to the datasheet of each laser.

FEATURES

- Designed to remove moisture and particles from the air.
- 19" rack form-factor. (by customer request)
- Operates in a closed loop configuration.
- Cleanroom-grade conditions for several months without service.
- Optionally can be configured with AC/DC mains adapter and/or laser controller for powering and remote control.

MODEL	Controller	AC/DC adapter	Air-Purging	19' from-factor
CT	+	-	-	-
CT19	+	+	-	+
PS19	-	+	-	+
APU2	-	+	+	+
CTA19	+	+	+	+

AIR PURGING UNITS AND CONTROLLERS FOR Q-TUNE SERIES



CTA19 front and rear panel

SPECIFICATIONS ¹⁾

Model	PS19	CT19	APU2	CTA19
Laser head powering	12 or 28 VDC, depends on laser model			
Air flow	N / A		0.6 to 1 L/min	
Air filters ²⁾	N / A		Desiccant & Molecular Sieve	
Operating requirements				
Ambient temperature	15 – 40 °C			
Relative humidity	0 – 95 % (non-condensing)			
Mains voltage	90-230 VAC, single phase, 47-63 Hz			
Power consumption	30-200 W, depending on laser model			
External Tube Fittings	N/A		FESTO for 1/4" OD tubing	
Dimensions				
Housing	482 × 460 × 106.1 (91.4 – without feet) mm ³ (W × L × H). ³⁾			
Weight	7.5 - 10.5 kg			

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2. Moisture Trap Capacity: 15 g.

3. 19" rack standard compatible, 2U height.