

Q2HE

HIGH ENERGY AIR-COOLED Q-SWITCHED LASER

FEATURES

Up to **160 mJ** pulse energy,
up to **5 W** average power

1053 or **1064 nm** output wavelength

Air cooled (water-free)

Up to **100 Hz** repetition rate

Smoothly variable pulse repetition rate
for 1053 nm output wavelength models

> **2 G shot** lifetime of pump diodes

Built-in sync pulse generator for triggering of
user equipment

Remote monitoring and control via built-in
Ethernet interface

Optional attachable 2nd harmonic generator

Optional 2nd, 3rd, 4th or 5th stand-alone harmonic
generator

Optional stand-alone air purging unit for
operation in harsh environments

Optional attachable attenuator for fundamental
wavelength

Optional attachable pulse energy monitor

Optional seeder for SLM operation

APPLICATIONS

Laser Induced Breakdown Spectroscopy (LIBS)

Light Detection And Ranging (LIDAR)

Remote sensing/designation

Laser ablation (marking, LCD repair etc.)

Laser shock wave generation

Pulsed light deposition (PLD)



Quantum Light Instruments Ltd. innovative water-free laser crystal cooling technology enables generation of high quality laser beam with up to 160 mJ pulse energy and/or up to 5 W average output power.

Q2HE series sets new standard in Q-switched laser market. Advanced laser design resulted in compact, user-friendly turnkey system that requires little maintenance. There is no chillers or bulky power supplies that one needs fit under the table. Most of laser electronics is integrated into housing of the Q2HE and the only external modules are compact controller box and mains adapter that provides 28 VDC, 50 – 150 W power (depending on model).

Less than 7 ns pulse duration and low divergence of the beam enables efficient fundamental wavelength conversion to higher harmonics with shortest wavelength available of 211 nm.

Low jitter triggering pulses for user equipment are available in internal triggering mode. If required, laser pulsing can be externally triggered from delay generator.

Laser is controlled through 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 installed will be able to control Q2HE. API is provided for integration with user devices.

Laser performance can be enhanced by optional extensions listed in chapter “Auxiliary equipment” on other side of page.



*Quantum
Light
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SPECIFICATIONS ¹⁾

MODEL	Q2HE					
	-D50	-D100	-E50	-F10	-F20	-G10
Wavelength	1053 or 1064 nm	1064 nm	1064 nm	1053/1064 nm		1053 nm
Pulse repetition rate ²⁾	50 Hz	100 Hz	50Hz	10 Hz	20 Hz	10 Hz
Pulse energy ³⁾	40 mJ		70 mJ	120/100 mJ	100/80 mJ	160 mJ
Typical pulse duration ⁴⁾	< 7 ns			< 6 ns		
Pulse to pulse energy stability	< 0.5 % RMS ⁵⁾					
Power drift	± 3.0 % ⁶⁾					
Beam profile	bell-shaped, > 75 % fit to Gaussian					
Beam divergence ⁷⁾	< 1 mrad					
Polarization	linear, horizontal					
Typical beam diameter ⁸⁾	3.0 mm	3.5 mm	4.5 mm		5.5 mm	
Jitter	< 0.5 ns RMS ⁹⁾					

OPTIONAL HARMONICS GENERATOR ¹⁰⁾

Pulse energy :					
526.5 / 532 nm	20 mJ	35 mJ	60/50 mJ	50/40 mJ	80 mJ
351 / 355 nm	12 mJ	20 mJ	35/30 mJ	30/25 mJ	50 mJ
263 / 266 nm	5 mJ	10 mJ	18/15 mJ	15/12 mJ	27 mJ
211 / 213 nm	1.5 mJ	3 mJ	5/4 mJ	4/3.5 mJ	7 mJ

OPTIONAL ATTENUATOR ¹¹⁾

Transmission range	1 – 95 %
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DIMENSIONS

Laser head (W×L×H)	190 × 408 × 155 mm ³	
Controller unit (W×L×H)	108 × 191 × 59 mm ³	
AC/DC power adapter, typical (W×L×H)	89 × 422 × 330 mm ³	192 × 178 × 46 mm ³

OPERATING REQUIREMENTS

Cooling requirements	air cooled			
Ambient temperature	15 – 30 °C			
Relative humidity	10 – 80 % (non-condensing)			
Mains voltage	90 – 230 VAC, single phase, 47 – 63 Hz ¹²⁾			
Average power consumption	100 W	150 W	70W	120W

¹⁾ Due to continuous improvements all specifications are subject to change. Unless stated otherwise all specifications are measured at fundamental wavelength and maximum 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⁾ Factory-set pulse repetition rate is fixed at max repetition rate shown in the table. In internal triggering mode repetition rate can be divided by integer number down to f/2, f/3, f/4... 1 Hz. Pulse repetition rate up to 200 Hz are available by request.

³⁾ When pulse energy is presented in xx/yy format, first number is for 1053 nm wavelength version, second – for 1064 nm version.

⁴⁾ At FWHM level at 1064 nm, measured with 350 ps rise time photodiode.

⁵⁾ Measured during 30 seconds operation after warm-up.

⁶⁾ Over 8 hour period after 20 minutes of warm-up when ambient temperature variation is less than ±2 °C.

⁷⁾ Full angle measured at the 4th level.

⁸⁾ Beam diameter is measured 20 cm from laser output at the 4th level.

⁹⁾ In respect to falling edge of pump diode triggering pulse.

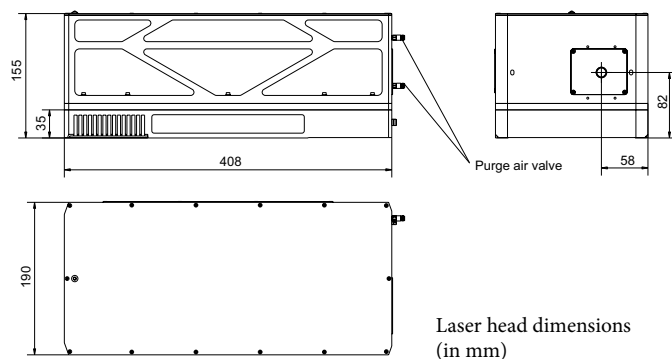
¹⁰⁾ Q2HE is compatible with our attachable SHG and stand-alone H-SMART harmonic generators. Pulse energies presented here are maximum values. Please refer to harmonic generator datasheets for detailed specifications.

¹¹⁾ Motorized attenuator intended to be attached to the laser housing. Transmission can be changed remotely through laser web-server control interface.

¹²⁾ Laser can be powered from appropriate 28 VDC power source. Please inquire for details.



DRAWINGS



AUXILIARY EQUIPMENT

H-SMART series stand-alone up 5th harmonic generator

Attachable 2nd harmonic generator, model SHG

Attachable motorized attenuator for fundamental wavelength beam

Attachable pulse energy monitor with analog and/or digital output

Attachable beam guiding module

Stand-alone two-channel pulse generator for variable pulse repetition rate

Stand-alone seeder for SLM operation

Optional stand-alone air purging unit for operation in harsh environments