Q-DOUBLE

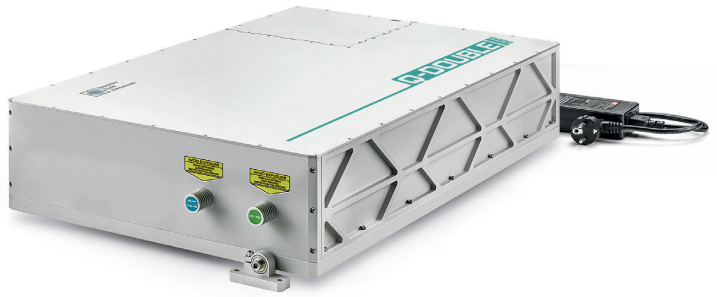
DOUBLE PULSE DIODE PUMPED AIR-COOLED Q-SWITCHED LASER

FEATURES

- Up to **80 mJ** pulse energy and/or up to **2 W** average power (for each channel)
- Up to **100 Hz** pulse repetition rate
- Air cooled (**water-free**)
- **5 – 10 ns** pulse duration
- **10 ns – 100 ms** temporal separation
- Stand-alone delay generator for timing adjustment
- Guaranteed **> 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 build-in **2nd, 3rd or 4th harmonic** generator
- Optional build-in attenuators for fundamental wavelength
- Optional pulse energy monitor for each channel
- Optional **< 3 ns** pulse duration at up to **40 mJ** pulse energy (short cavity version)

APPLICATIONS

- Particle Image Velocimetry (PIV)
- Light Induced Breakdown Spectroscopy (LIBS)
- Laser-induced fluorescence (LIF)
- Planar laser-induced fluorescence (PLIF)
- Laser ablation/cleaning
- Holography
- Electronic Speckle Interferometry (ESPI)
- Laser ablation/cleaning
- Light Induced Fluorescence (LIF)



Q-DOUBLE is diode pumped, fully air-cooled (water free), Q-switched laser designed to produce two pulses with variable temporal separation. Its target applications are PIV (Particle Image Velocimetry), LIBS (Laser Induced Breakdown Spectroscopy) and many others.

The laser can be configured for up to 160 mJ pulse energy at 10 Hz pulse repetition rate. In high repetition rate configuration laser can produce up to 40 mJ total pulse energy at 100 Hz repetition rate.

The laser can be configured to emit 1053 nm or 1064 nm wavelength from Nd:YLF or Nd:YAG laser crystals respectively. When configured for 1053 nm, the laser can operate from single shot to maximum pulse repetition rate without significant changes in beam divergence or profile.

Our innovative laser design resulted in compact, user-friendly turnkey system that requires little maintenance. There are no chillers or bulky power supplies that one needs fit under the table. All laser electronics are integrated into Q-DOUBLE housing and the only external module is mains adapter that provides 12 or 28 VDC, 50-200 W powering (depending on model).

Laser is controlled trough 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-DOUBLE.

Low jitter triggering pulses for user equipment are available with up to 450 µs lead in internal triggering mode. In external triggering mode, laser pulsing can be externally triggered from pulse generator.

Quantum Light Instruments

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SPECIFICATIONS [1)]

MODEL	Q-DOUBLE				
	-F10	-E20	-E33	-D50	-C100
Wavelength, nm	1053 nm	1053 or 1064 nm	1064 nm		
Pulse repetition rate [2)]	10 Hz	20 Hz	33 Hz	50 Hz	100 Hz
Pulse energy	80 mJ	60 mJ		40 mJ	20 mJ
Typical pulse duration [3)]	< 5 ns				< 7 ns
Pulse energy stability [4)]	< 0.5 % RMS				
Power drift [5)]	± 3.0 %				
Beam profile	Bell-shaped, > 80% fit to Gaussian				
Beam divergence [6)]	< 1 mrad				
Polarization	Linear, horizontal				
Typical beam diameter [7)]	4.0 mm				3.5 mm
Jitter [8)]	< 0.5 ns RMS				
OPTIONAL HARMONICS GENERATOR [9)]					
Pulse energy					
526.5 / 532 nm	40 mJ	35 mJ	30 mJ	20 mJ	10 mJ
351 / 355 nm	24 mJ	20 mJ	18 mJ	12 mJ	6 mJ
263 / 266 nm	12 mJ	10 mJ	10 mJ	6 mJ	3 mJ
OPTIONAL ATTENUATOR [10)]					
Transmission range	0.5 – 95 %				1 – 95 %
DIMENSIONS					
Laser head (W×L×H)	390 × 620 × 153 mm³				
Power adapter (W×L×H) [11)]	192 × 178 × 46 mm³ typical				
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	120 W	160 W	200 W		

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.*

3) *At FWHM level at fundamental wavelength, measured with 350 ps rise time photodiode. Short pulse duration version is available, with pulse duration shorter by approx 50%. Inquire for detailed specifications.*

4) *Measured during 30 seconds operation after laser warm-up.*

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

6) *Full angle measured at the 4σ level.*

7) *Beam diameter is measured 20 cm from laser output at the 4σ level.*

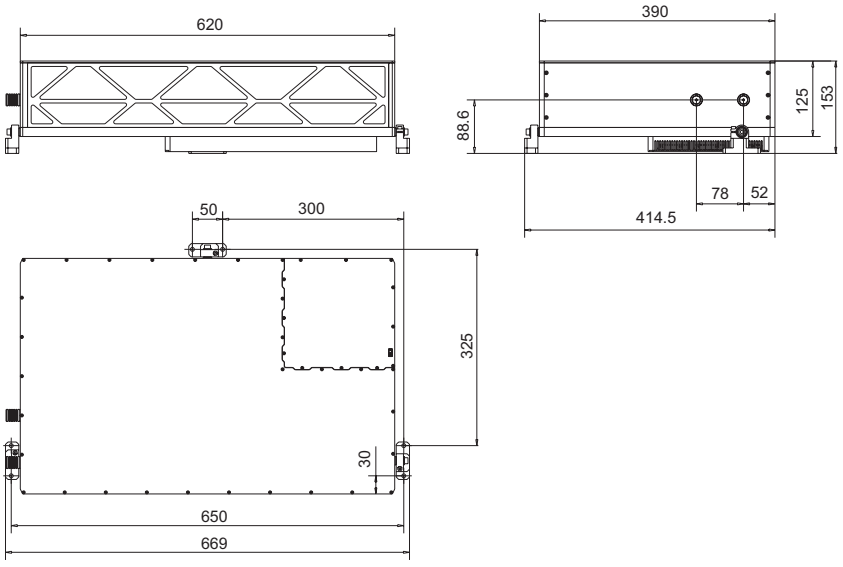
8) *In respect to falling edge of pump diode triggering pulse.*

9) *Q-DOUBLE is compatible with all models of stand-alone H-SMART harmonics generator. Pulse energies presented here are maximum values. Please refer to H-SMART harmonic generator datasheets for detailed specifications.*

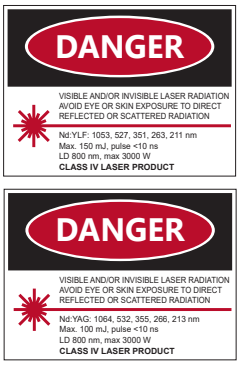
10) *Motorized attenuator is build into the laser housing. Transmission can be changed remotely trough laser web-server control interface.*

11) *Power adapter dimensions might differ from indicated here, depending on model.*

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



Q-DOUBLE laser head dimensions



AUXILIARY EQUIPMENT

Stand-alone air-purging unit

Optional beam guiding module