

# Quantas

## Q1-1053

## DIODE PUMPED AIR-COOLED Q-SWITCHED Nd:YLF LASER

### FEATURES

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Up to **40 mJ** pulse energy at **1053 nm**

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**Air cooled** – no liquids inside

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Short pulse duration **< 8 ns**

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Weight **< 5 kg** incl. power supply

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Variable pulse repetition rate

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Build-in sync pulse generator for triggering of user equipment

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Remote control via build-in **Ethernet** interface

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Optional 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> or 5<sup>th</sup> harmonic generators

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Optional attenuator for fundamental wavelength

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Optional fiber coupled output

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**OEM** version is available

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Guaranteed **>1 Gshot** lifetime

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### APPLICATIONS

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Light Induced Breakdown Spectroscopy (LIBS)

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Laser ablation

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Time-of-Flight Spectroscopy (TOFS)

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Light Induced Fluorescence (LIF) spectroscopy

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Flash photolysis

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Matrix Assisted Laser Desorption/Ionization (MALDI)

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Pulsed Light Deposition (PLD)

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Remote sensing

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TFT-LCD repair

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Particle Image Velocimetry (PIV)

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Quantas is diode pumped, air-cooled, Q-switched laser designed for wide range of applications that require low pulse repetition rate and high peak power pulses (Q1D model produces ~6 MW peak power).

Typical applications are Light Induced Breakdown Spectroscopy (LIBS), Light Induced Fluorescence Spectroscopy (LIF), laser ablation and remote sensing.

Less than 8 ns pulse duration allows efficient fundamental wavelength conversion to higher harmonics with shortest wavelength available of 211 nm. Wavelength extensions into infrared range are available by request.

Quantas is completely air cooled laser due its excellent wall-plug efficiency. Liquids are not used for heat transfer, as result, maintenance associated with regular replacements of cooling liquid and/or cleaning of cooling system is not required.

Low jitter triggering pulses for user equipment are available with up to 450  $\mu$ s lead in internal triggering mode. If required, laser pulsing can be externally triggered from delay generator, allowing operation in single-shot or variable pulse repetition modes.

Laser controller has Ethernet interface for convenient monitoring and control from personal computer.



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

MODEL	Quantas-1053 Q1B	Quantas-1053 Q1C	Quantas-1053 Q1D
Wavelength	1053 nm <sup>2)</sup>		
Pulse energy	10 mJ	20 mJ	40 mJ
Typical pulse duration	< 8 ns <sup>3)</sup>		
Pulse to pulse energy stability <sup>4)</sup>	< 0.5 % RMS		
Power drift	± 3.0 % <sup>5)</sup>		
Pulse repetition rate	single shot – 10 Hz <sup>6)</sup>		
Beam profile	nearly TEM <sub>00</sub>	bell-shaped, >75 % fit to Gaussian	
Beam divergence <sup>7)</sup>	< 2 mrad	< 1.5 mrad	
Polarization	linear, horizontal		
Typical beam diameter, <sup>8)</sup>	1.5 mm	2 mm	2.5 mm
Jitter	< 1 ns RMS <sup>9)</sup>		

### OPTIONAL HARMONICS GENERATOR MODULE <sup>10)</sup>

Pulse energy	5 mJ	10 mJ	20 mJ
527 nm	5 mJ	10 mJ	20 mJ
351 nm	3 mJ	6 mJ	12 mJ
263 nm	1.5 mJ	3 mJ	6 mJ
211 nm	0.5 mJ	1 mJ	2 mJ

### OPTIONAL ATTENUATOR <sup>11)</sup>

Wavelength, nm	1053 nm, 527 nm, 351 nm
Attenuation range	5 – 95 %

### OPTIONAL FIBER COUPLED OUTPUT <sup>12)</sup>

Wavelength	1053 or 527 nm
Max output pulse energy	up to 7 mJ <sup>13)</sup>

### DIMENSIONS

Laser head (W×L×H)	113 × 230 × 112 mm <sup>3</sup>
Harmonics generator module (W×L×H)	113 × 242 × 112 mm <sup>3</sup>
Controller unit (W×L×H)	85 × 165 × 50 mm <sup>3</sup>
Power adapter, typical (W×L×H)	50 × 125 × 32 mm <sup>3</sup>

### OPERATING REQUIREMENTS

Cooling requirements	air cooled
Ambient temperature	15 – 30 °C
Relative humidity	10 – 80 % (non-condensing)
Mains voltage	90 – 230 V AC, single phase, 47 – 63 Hz <sup>14)</sup>
Power consumption	< 30 W

<sup>1)</sup> Due to continuous improvements all specifications are subject to change. Unless stated otherwise all specifications are measured at 1053 nm and 10 Hz pulse repetition rate.

<sup>2)</sup> 1064 nm output wavelength models are available. See Q1-1064 model leaflet.

<sup>3)</sup> FWHM level at 1053 nm. Shorter pulse duration is available by request. Please inquire for specifications.

<sup>4)</sup> Averaged from 500 pulses.

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

<sup>6)</sup> Factory-set pulse repetition rate is fixed at 10 Hz. Single shot or variable pulse repetition rate is possible when laser is externally triggered. Higher repetition rates are available, please inquire for details.

<sup>7)</sup> Full angle measured at 1/e<sup>2</sup> level.

<sup>8)</sup> Beam diameter is measured 20 cm from laser output at 1/e<sup>2</sup> level.

<sup>9)</sup> In respect to Q-switch triggering edge of pulse.

<sup>10)</sup> Harmonics generator module is stand-alone unit optimized for specified output wavelength. Inquire for details if multiple wavelength output is needed.

<sup>11)</sup> External Motorized Variable Attenuator. Please inquire for attenuator build-in into harmonics generator module.

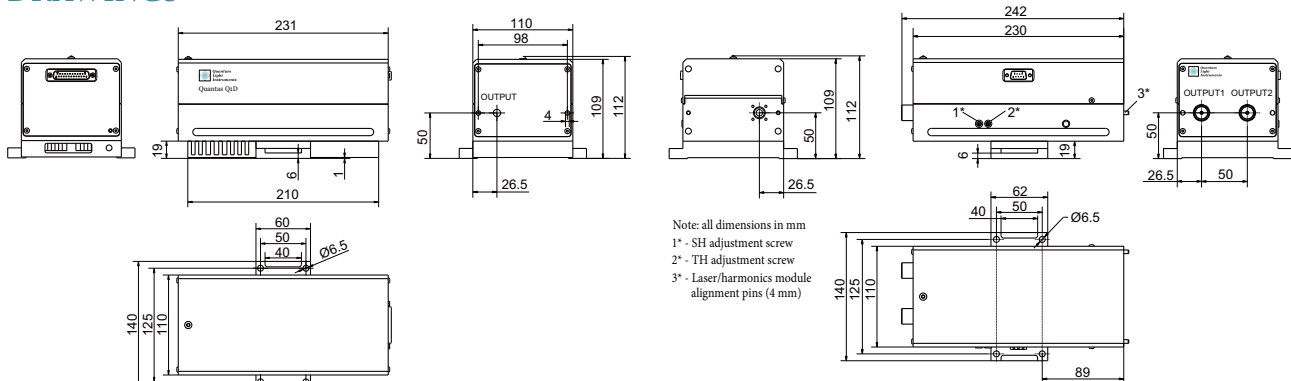
<sup>12)</sup> Fiber coupler is build-in into harmonics generator module. Please inquire for details.

<sup>13)</sup> For fiber core diameter of 550 μm. Smaller or larger core fibers are available, please inquire for specifications.

<sup>14)</sup> Laser can be powered from appropriate 12 V DC power source. Please inquire for details.



## DRAWINGS



Laser head dimensions

Harmonic generator module dimensions