

Q-SHIFT

DIODE PUMPED AIR-COOLED Q-SWITCHED LASER

FEATURES

Up to **40 mJ** pulse energy, up to **1 W** average power

Up to **100 Hz** pulse repetition rate

Air cooled (water-free)

2-5 ns pulse duration

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

Sync pulses for triggering of user equipment

Remote monitoring and control via built-in **Ethernet interface**

Optional attachable attenuator for fundamental wavelength

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

Optional stand-alone pulse generator for variable pulse repetition rate

APPLICATIONS

Laser micro-machining (LCD repair)

Laser Dermatology (facial renewal, hair removal, acne treatment etc.)

Eye-safe Light Detection And Ranging (LiDAR)

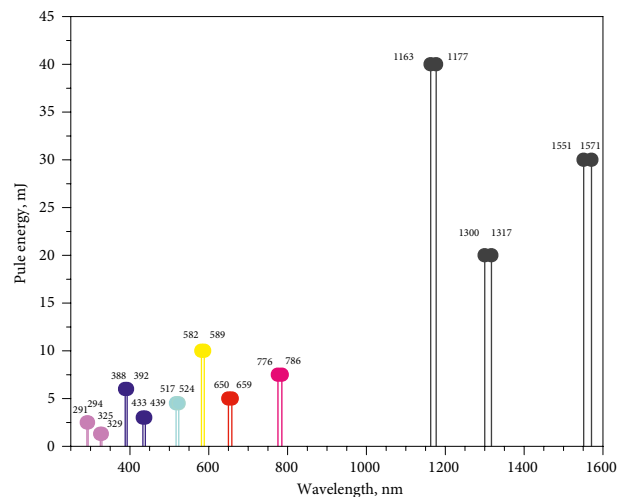
Laser ablation/cleaning

Time-resolved laser spectroscopy

Light Induced Breakdown Spectroscopy (LIBS)



Q-SHIFT is family of Q-switched lasers with build-in nonlinear wavelength conversion stage that allows to produce wavelengths that are not accessible with conventional solid-state laser sources. As pump sources our Nd:YAG or Nd:YLF lasers of Q2 or Q2HE series are used.



High peak intensity pulses at visible wavelengths (blue, yellow and red) are provided when Q-SHIFT laser is combined with our attachable SHG or stand-alone H-SMART harmonic generator.

Laser functionality can be further extended by auxiliary equipment.



Quantum
Light
Instruments

WWW.QLINSTRUMENTS.COM

SPECIFICATIONS AT 1163 OR 1177 NM WAVELENGTH ¹⁾

| MODEL ²⁾ | Q-SHIFT-W1163, Q-SHIFT-W1177 | | | | | |
|--------------------------------------|------------------------------|------|-------------|-------------|-------------|-------|
| | -Bxx | -Cxx | -Dxx | -Exx | -F20 | -F10 |
| Wavelength, nm ³⁾ | 1163 or 1177 nm | | | | | |
| Pulse repetition rate ⁴⁾ | up to 100 Hz | | up to 50 Hz | up to 33 Hz | up to 20 Hz | 10 Hz |
| Pulse energy | 4 mJ | 8 mJ | 16 mJ | 24 mJ | 32 mJ | 40 mJ |
| Typical pulse duration ⁵⁾ | 2 – 5 ns | | | | | |
| Pulse energy stability ⁶⁾ | < 1.5 % RMS | | | | | |
| Power drift ⁷⁾ | ± 3.0 % | | | | | |
| Beam profile | Bell shaped | | | | | |
| Beam divergence ⁸⁾ | < 3.0 mrad | | | | | |
| Polarization | linear, > 95 % | | | | | |
| Typical beam diameter ⁹⁾ | 3 – 4 mm typical | | | | | |
| Jitter ¹⁰⁾ | < 0.5 ns RMS | | | | | |

OPTIONAL HARMONICS GENERATOR ¹¹⁾

| | | | | | | |
|---------------------------|---------|--------|--------|--------|--------|--------|
| Pulse energy @ wavelength | | | | | | |
| 581.5 / 588.5 nm | 1 mJ | 2 mJ | 4 mJ | 6 mJ | 8 mJ | 10 mJ |
| 388 / 392 nm | 0.6 mJ | 1.2 mJ | 2.4 mJ | 3.6 mJ | 4.8 mJ | 6 mJ |
| 291 / 294 nm | 0.25 mJ | 0.5 mJ | 1 mJ | 4.5 mJ | 2 mJ | 2.5 mJ |

DIMENSIONS

| | |
|--------------------------------------|--|
| Laser head (W×L×H) ¹²⁾ | 160 × 230 × 141 mm ³ or 190 × 408 × 155 mm ³ |
| Controller unit (W×L×H) | 108 × 191 × 59 mm ³ |
| Power adapter (W×L×H) ¹³⁾ | 192 × 178 × 46 mm ³ or 89 × 422 × 330 mm ³ |

OPERATING REQUIREMENTS

| | |
|------------------------------|--|
| Cooling requirements | air cooled |
| Ambient temperature | 15 – 30 °C |
| Relative humidity | 10 – 80 % (non-condensing) |
| Mains voltage ¹⁴⁾ | 90 – 230 VAC, single phase, 47 – 63 Hz |
| Average power consumption | 30 – 100 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⁾ xx in the model name sets laser repetition rate, for example Q-SHIFT-W1177-B100 laser will have factory-set 100 Hz pulse repetition rate.

³⁾ Depend on pump laser wavelength.

⁴⁾ Standard factory-set repetition rates are 10 Hz, 20 Hz, 33 Hz, 50 Hz and 100 Hz. Specify required pulse repetition rate when ordering, for example -D50 would mean laser with 50 Hz pulse repetition rate.

⁵⁾ At FWHM level at fundamental wavelength, measured with 350 ps rise time photodiode

⁶⁾ Measured during 30 seconds operation after warm-up.

⁷⁾ Over 8 hour period after 20 minutes of warm-up when ambient temperature variation is less than ±2 °C.

⁸⁾ Full angle measured at the 4σ level.

⁹⁾ Beam diameter is measured 20 cm from laser output at the 4σ level.

¹⁰⁾ In respect to falling edge of pump diode triggering pulse.

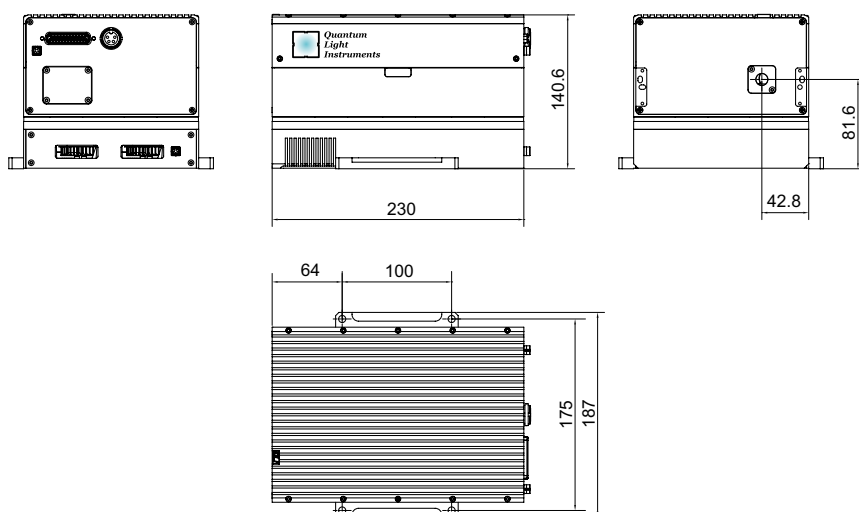
¹¹⁾ Q-SHIFT is compatible with our attachable second harmonic generator (model SHG) and stand-alone H-SMART harmonics generator. Pulse energies presented here are maximum values. Please refer to harmonic generator datasheet for detailed specifications.

¹²⁾ Laser housing size depends on average power at output wavelength.

¹³⁾ Power adapter dimensions depends on model.

¹⁴⁾ Laser can be powered from appropriate 12 or 28 VDC power source. Please inquire for details.

DRAWINGS



Low average power version.
Q-SHIFT laser head dimensions (in mm)



SPECIFICATIONS AT 1300 OR 1317 NM WAVELENGTH ¹⁾

| MODEL ²⁾ | Q-SHIFT-W1300, Q-SHIFT-W1317 | | | | | |
|--------------------------------------|------------------------------|------|-------------|-------------|-------------|-------|
| | -Bxx | -Cxx | -Dxx | -Exx | -F20 | -F10 |
| Wavelength, nm ³⁾ | 1300 or 1317 nm | | | | | |
| Pulse repetition rate ⁴⁾ | up to 100 Hz | | up to 50 Hz | up to 33 Hz | up to 20 Hz | 10 Hz |
| Pulse energy | 2 mJ | 4 mJ | 8 mJ | 12 mJ | 16 mJ | 20 mJ |
| Typical pulse duration ⁵⁾ | 2 – 5 ns | | | | | |
| Pulse energy stability ⁶⁾ | < 2.0 % RMS | | | | | |
| Power drift ⁷⁾ | ± 3.0 % | | | | | |
| Beam profile | Bell shaped | | | | | |
| Beam divergence ⁸⁾ | < 3.0 mrad | | | | | |
| Polarization | linear, > 95 % | | | | | |
| Typical beam diameter ⁹⁾ | 3 – 4 mm typical | | | | | |
| Jitter ¹⁰⁾ | < 0.5 ns RMS | | | | | |

OPTIONAL HARMONICS GENERATOR ¹¹⁾

| | | | | | | |
|---------------------------|---------|---------|--------|---------|--------|--------|
| Pulse energy @ wavelength | | | | | | |
| 650 / 658.5 nm | 0.5 mJ | 1 mJ | 2 mJ | 3 mJ | 4 mJ | 5 mJ |
| 433 / 439 nm | 0.3 mJ | 0.6 mJ | 1.2 mJ | 1.8 mJ | 2.4 mJ | 3 mJ |
| 325 / 329 nm | 0.12 mJ | 0.25 mJ | 0.5 mJ | 0.75 mJ | 1 mJ | 1.3 mJ |

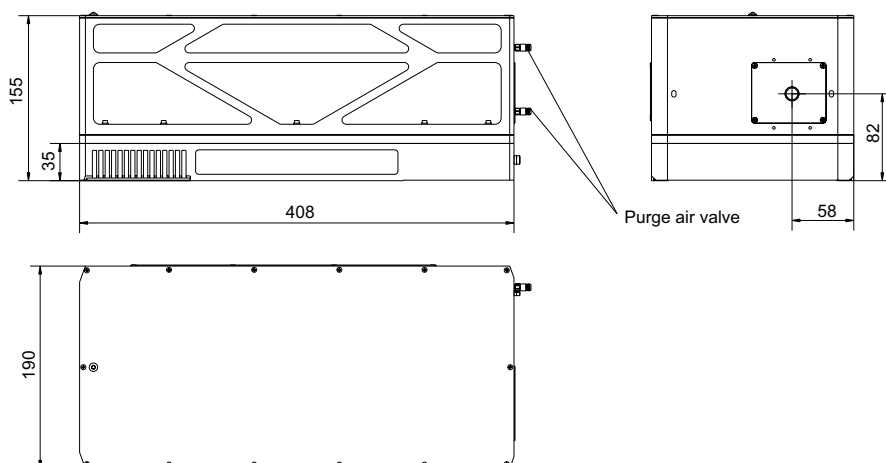
DIMENSIONS

| | | | | | | |
|--------------------------------------|--|--|--|--|--|--|
| Laser head (W×L×H) ¹²⁾ | 160 × 230 × 141 mm ³ or 190 × 408 × 155 mm ³ | | | | | |
| Controller unit (W×L×H) | 108 × 191 × 59 mm ³ | | | | | |
| Power adapter (W×L×H) ¹³⁾ | 192 × 178 × 46 mm ³ or 89 × 422 × 330 mm ³ | | | | | |

OPERATING REQUIREMENTS

| | | | | | | |
|------------------------------|--|--|--|--|--|--|
| Cooling requirements | air cooled | | | | | |
| Ambient temperature | 15 – 30 °C | | | | | |
| Relative humidity | 10 – 80 % (non-condensing) | | | | | |
| Mains voltage ¹⁴⁾ | 90 – 230 VAC, single phase, 47 – 63 Hz | | | | | |
| Average power consumption | 30 – 100 W | | | | | |

DRAWINGS



High average power version.
Q-SHIFT laser head dimensions (in mm)

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⁾ xx in the model name sets laser repetition rate, for example Q-SHIFT-W1177-B100 laser will have factory-set 100 Hz pulse repetition rate.

³⁾ Depend on pump laser wavelength.

⁴⁾ Standard factory-set repetition rates are 10 Hz, 20 Hz, 33 Hz, 50 Hz and 100 Hz. Specify required pulse repetition rate when ordering, for example -D50 would mean laser with 50 Hz pulse repetition rate.

⁵⁾ At FWHM level at fundamental wavelength, measured with 350 ps rise time photodiode

⁶⁾ Measured during 30 seconds operation after warm-up.

⁷⁾ Over 8 hour period after 20 minutes of warm-up when ambient temperature variation is less than ±2 °C.

⁸⁾ Full angle measured at the 4σ level.

⁹⁾ Beam diameter is measured 20 cm from laser output at the 4σ level.

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¹¹⁾ Q-SHIFT is compatible with our attachable second harmonic generator (model SHG) and stand-alone H-SMART harmonics generator. Pulse energies presented here are maximum values. Please refer to harmonic generator datasheet for detailed specifications.

¹²⁾ Laser housing size depends on average power at output wavelength.

¹³⁾ Power adapter dimensions depends on model.

¹⁴⁾ Laser can be powered from appropriate 12 or 28 VDC power source. Please inquire for details.



SPECIFICATIONS AT 1551 OR 1571 NM WAVELENGTH ¹⁾

| MODEL ²⁾ | Q-SHIFT-W1571, Q-SHIFT-W1551 | | | | | |
|--------------------------------------|------------------------------|------|-------------|-------------|-------------|-------|
| | -Bxx | -Cxx | -Dxx | -Exx | -F20 | -F10 |
| Wavelength, nm ³⁾ | 1551±1 nm or 1571±1 nm | | | | | |
| Pulse repetition rate ⁴⁾ | up to 100 Hz | | up to 50 Hz | up to 33 Hz | up to 20 Hz | 10 Hz |
| Pulse energy | 3 mJ | 6 mJ | 12 mJ | 20 mJ | 24 mJ | 30 mJ |
| Typical pulse duration ⁵⁾ | 2 – 5 ns | | | | | |
| Pulse energy stability ⁶⁾ | < 3.5 % RMS | | | | | |
| Power drift ⁷⁾ | ± 3.0 % | | | | | |
| Beam profile | Bell shaped | | | | | |
| Beam divergence ⁸⁾ | 5.0 mrad typical | | | | | |
| Polarization | linear, > 95 % | | | | | |
| Typical beam diameter ⁹⁾ | 3 – 6 mm typical | | | | | |
| Jitter ¹⁰⁾ | < 0.5 ns RMS | | | | | |

OPTIONAL HARMONICS GENERATOR ¹¹⁾

| | | | | | | |
|---------------------------|---------|---------|---------|---------|--------|--------|
| Pulse energy @ wavelength | | | | | | |
| 775.5 / 785.5 nm | 0.75 mJ | 1.5 mJ | 3 mJ | 5 mJ | 6 mJ | 7.5 mJ |
| 517 / 524 nm | 0.45 mJ | 0.9 mJ | 1.8 mJ | 3 mJ | 3.6 mJ | 4.5 mJ |
| 388 / 393 nm | 0.18 mJ | 0.36 mJ | 0.75 mJ | 1.25 mJ | 1.5 mJ | 1.8 mJ |

DIMENSIONS

| | |
|--------------------------------------|--|
| Laser head (W×L×H) ¹²⁾ | 160 × 230 × 141 mm ³ or 190 × 408 × 155 mm ³ |
| Controller unit (W×L×H) | 108 × 191 × 59 mm ³ |
| Power adapter (W×L×H) ¹³⁾ | 192 × 178 × 46 mm ³ or 89 × 422 × 330 mm ³ |

OPERATING REQUIREMENTS

| | |
|------------------------------|--|
| Cooling requirements | air cooled |
| Ambient temperature | 15 – 30 °C |
| Relative humidity | 10 – 80 % (non-condensing) |
| Mains voltage ¹⁴⁾ | 90 – 230 VAC, single phase, 47 – 63 Hz |
| Average power consumption | 30 – 100 W |

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AUXILIARY EQUIPMENT

Attachable motorized attenuator for fundamental wavelength

Attachable pulse energy monitor with analog and/or digital output

Stand-alone two-channel pulse generator for smoothly variable pulse repetition rate, burst, double-pulse and other user-configurable modes of operation

