



Brilliant

P u l s e d N d : Y A G l a s e r s





Applications



1/ A Brilliant laser is mounted aboard a vessel for detection of atmospheric pollution (Dr G. J. Kunz. TNO - NL).



2/ Laser induced fluorescence (Gremi-Espeo-Orléans).



3/ A standard BRILLIANT laser is mounted with a telescope on a truck (Dr G. J. Kunz. TNO - NL).



4/ Ultrasonic measurement of stainless steel tube thickness at 900°C (Dr Deppe Mannesmann).

5/ LIDAR observation at 355nm of various atmospheric layers above the city of Athens (Dr A. Papayannis, NTUA - Athènes).



Pulsed Nd : YAG

Technological evolution :

- New ergonomic Remote Control Box
- Smaller Power Supply for Brilliant B
- Active Temperature Control (Short Warm-up Time)
- New Rugged Mirror Mount
- More Precise Harmonic Generator Mounts
- Fifth Harmonic Generation

Brilliant





Quantel's Brillant has for many years set the standard for Q-Switched Nd:YAG oscillators.

Over 1000 delivered units prove the ruggedness and the ease of use of the Brillant laser system. They demonstrate reliability and flexibility in harsh industrial environments, in a mobile laboratory or on board of a helicopter, as well as in many research laboratories throughout the world.

The latest technological advances now endow the Brillant with enhanced stability, a full feature remote control unit, active temperature stabilisation and a fifth harmonic generator as a standard option.

The "Brillant" concept includes a complete range of associated products: Brillant and Brillant B, compact oscillators with their harmonic generators, Twins, double pulse system, Rainbow, tunable solid-state OPO.





No Installation:

Operating the Brilliant requires no special knowledge or specific training. Brilliant is built around a temperature controlled light alloy block; optical component alignment is therefore stable and preserved, even under difficult environmental conditions such as temperature variations, transport and vibration.

Full One Year Guarantee:

Optics are rigorously inspected by Quantel's Quality Assurance Department and protected from dust by Brilliant's hermetic structure. This allows Quantel to offer a total 12-month guarantee, including optics, for normal use. Brilliant's quality and reliability make it a product adapted for all types of use: scientific research, medical equipment, industrial applications, industrial instrumentation, OEM integration and many others.

Flexibility of Use:

An ergonomic Remote Control Box allows complete control of all major laser parameters. Four different parameter set-ups can be saved and pulse bursts and sequences are programmable. TTL synchronisation signals are available from BNC connectors for both flashlamp and Q-Switch (-500ns/+500ns time delay). The flashlamp and Q-Switch can both be externally triggered by TTL input signals.

The RS232 interface makes the Brilliant series fully computer⁽¹⁾ controlled and optional software manages all the laser functions. For customised configurations, it can be extended to control motors or an energy meter if fitted.

Long Flashlamp Lifetime:

Quantel's Quality Assurance Department controls and guarantees the flashlamp supplied. The power supply provides a

simmer current that increases lamp lifetime (typically 50 million shots) and enhances stability.

Small Footprint:

Brilliant is compact⁽²⁾ and light⁽³⁾ enough to be installed anywhere.

With its incorporated water to air cooling group, the Brilliant needs no external water supply (apart from Brilliant B 20 Hz). Active temperature control of the cooling water allows a fast start up and stabilised temperature conditions during use of the system.

To reduce the footprint the electrical power supply and the cooler are housed in the same unit.

This unit can be placed against a wall, in a corner, under a table or integrated in a OEM cabinet, since the air flow goes through the front panel.

Brilliant is fitted with a system allowing quick attachment to any optical table.

Brilliant can operate in any position including vertical and upside-down.

(The standard repetition rate is 10, 20 or 50 Hz for the Brilliant and 10 or 20 Hz for the Brilliant B.

For all other specifications please contact Quantel's Sales Department or nearest representative.)

Change the Flashlamp Without Re-alignment:

The lamp is fixed on the upper, removable, part of the ceramic pumping cavity and is easily removed by hand. Replacement is done without requiring any resonator alignment. The operation is done quickly and needs no special skills.

Very High Pumping Efficiency:

The rod and the lamp are placed in a diffusely reflecting, close-coupled ceramic cavity, ensuring the best possible energy transfer.

Excellent Beam Quality and Pointing Stability:

Brilliant uses an unstable resonator, fitted with a variable output mirror producing a near Gaussian beam profile (correlation > 0.95 in far field). With its thermo-regulated laser head and small size, Brilliant's pointing stability is less than 50 µrad.



⁽¹⁾ supplied on request

⁽²⁾ 48 x 8 cm² and 55 x 10 cm²

⁽³⁾ 5 kg and 8 kg (laser head)

Options:

• **2,3,4 and now 5 w and Wavelength Separation**
 Quantel offers a range of harmonic generators for both lasers to frequency double, triple, quadruple or quintuple Brilliant's output. They are assembled in compact modules, including the non-linear crystals and a removable set of dichroic mirrors. These mirrors are used to separate the various wavelengths in the different configurations. Phase matching for the second, third and fifth harmonics is obtained by simple mechanical adjustment (adjustment screw accessible from the top of the module); it is obtained for the fourth harmonic by crystal temperature control. Quintupling the frequency (213 nm) is obtained by mixing the fundamental and fourth harmonics in a BBO crystal.

These modules are consistent with Brilliant's concept:
 - Just plug and run and easy to use. They fit directly onto the laser head (including the electrical connections) and require no optical re-alignment. The same module adapts to both Brilliant and Brilliant B.

- They are dust tight.
- They are thermally regulated to ensure good conversion stability.

• **Intra-cavity Etalon**

This option, available on Brilliant B, reduces the laser's spectral bandwidth to < 0.1cm⁻¹

• **Eye-safe OPO**

A fixed wavelength OPO converts the 1.06µm infrared output to the more eye-safe wavelength of 1.57µm.

• **Rainbow**

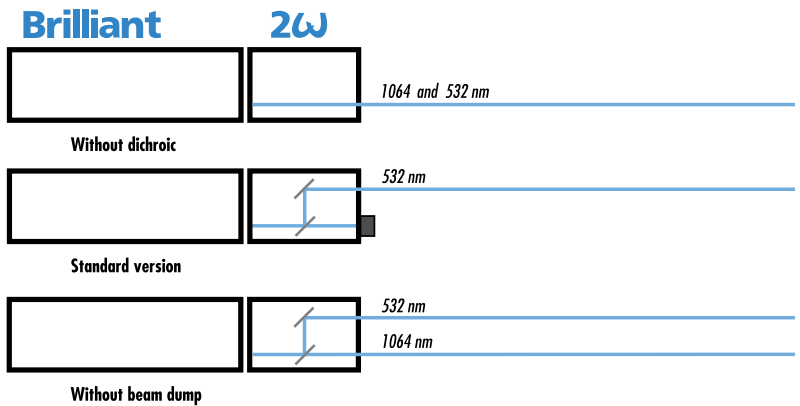
A tunable broadband OPO pumped at 1.06µm, 532, 355 or 266 nm.

• **Multimode Resonator**

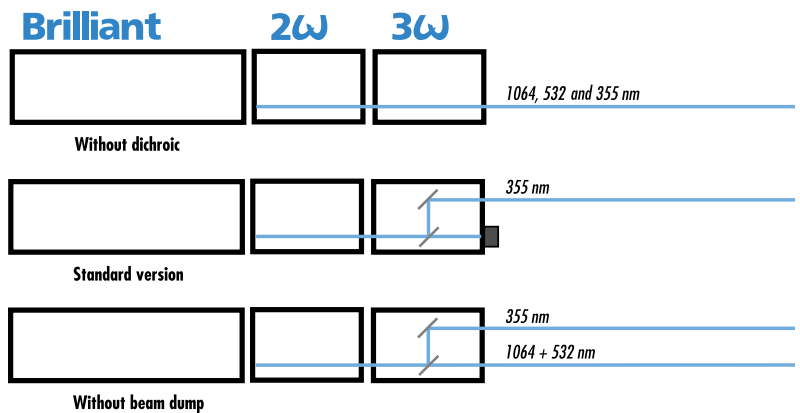
Accessories:

1. Laser intensity beam attenuator module (made of half-wave plate and two polarisers), which fits into the same mechanical module as the harmonic generators.
2. Power meter with single pulse energy or average power measurement
3. Protective eyewear
4. Focusing system and CCD camera for micro-machining
5. Fast photodiode

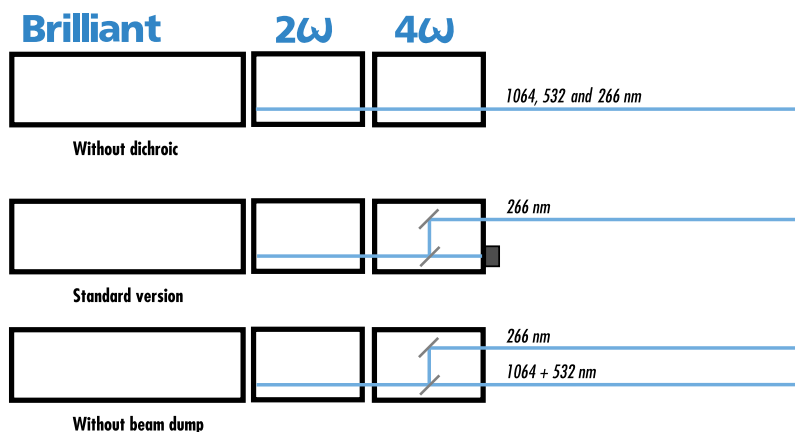
W For frequency doubling :



W For frequency tripling :



W For frequency quadrupling :



W For frequency quintupling :



Brilliant

P u l s e d N d : Y A G l a s e r s



**VISIBLE AND INVISIBLE LASER RADIATION
AVOID EYE OR SKIN TO DIRECT
OR SCATTERED RADIATION.**

CLASS 4 LASER RADIATION PRODUCT

Max Average Power	: 10 W
Max Energy/pulse	: 1J
Pulse duration	: <10ns
Emitted Wavelength	: 213/1064nm

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