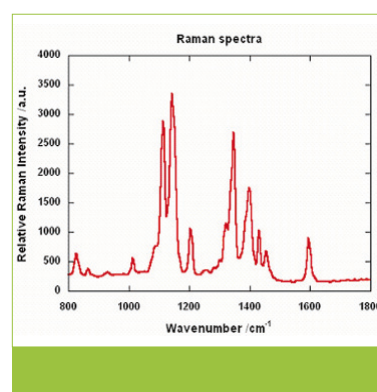


torus

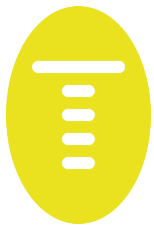
single frequency 532nm CW laser

- CW 532nm laser
- Extremely low noise
- Power from 50 - 400mW

TECHNICAL DATA SHEET

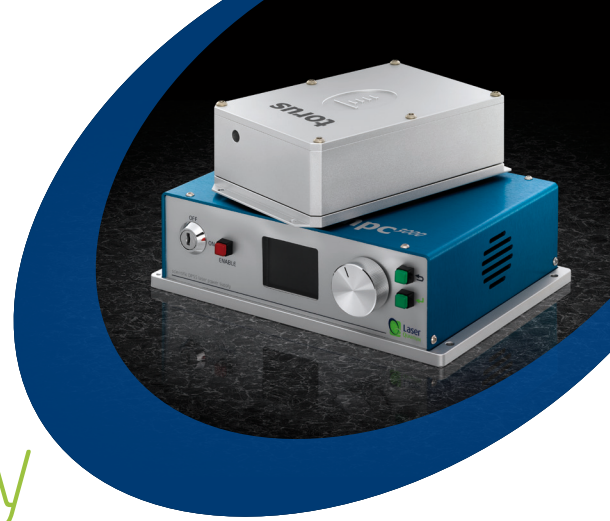


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torus

single frequency 532nm CW laser



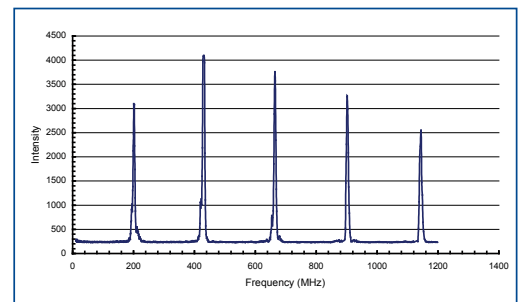
The single frequency CW 532nm laser

Overview

The torus is a high-specification, single frequency laser. Using intelligent electronics, the torus continually tracks its longitudinal mode position and ensures there is no mode-hop. The torus is available at 532nm, with powers ranging from 50 to 400mW making it ideal for applications such as holography, Brillouin scattering and Raman spectroscopy.

Single Frequency

The patented cavity of the torus ensures that it operates inherently single-frequency. The photons resonant in the cavity form a travelling wave, removing mode competition and resulting in the laser operating at just one frequency. The figure shows a single shot of a torus beam using a 200 MHz free-spectral range etalon with a finesse of 50. The five etalon peaks are clear and there are no other secondary modes visible. The resolution of the etalon is 4 MHz and the bandwidth of the torus is $\ll 1$ MHz.



Active Feedback

Despite the torus operating inherently single-mode, mode-drift and eventual mode-hop would occur if the cavity was allowed to change length. Using three PID temperature controllers, the effects of temperature change on the laser are minimised. In addition to these, the digital power supply receives a signal from the laser which tells it the exact position of the mode hundreds of times a second. The power supply feeds back a control signal which maintains the position of the mode. This active feedback removes the risk of mode-hop and leads to a stable output.

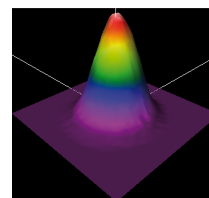
Construction

Laser Quantum builds all lasers to a high standard, and the torus is no exception.

The effects of shock impacts are minimised by the use of zero-stress mounts throughout the cavity, and the laser's feet are engineered to deform under high stress, eliminating mechanical strain within the head. The torus is capable of withstanding extreme vibrational shocks without diminishing its performance. Before shipment each torus is subjected to rigorous quality assurance, in line with our strict ISO9001 procedures. Every unit is nitrogen purged and hermetically sealed. There follows a rigorous burn-in procedure under user-realistic conditions.

Beam Quality

Due to its pure spectral quality, it follows that the spatial quality is also very pure. The typical M-squared value of the torus beam is <1.1 resulting in a near perfect and near diffraction-limited beam.



Features

Features include: single frequency travelling wave, mode-hops eliminated, diffraction limited beam, permanently aligned cavity, low noise, stable output, compact design, low M-squared, zero-stress cavity, hermetically sealed, single phase mains driven, diode >40,000 hrs MTTF and full RS232 control.

mpc3000 power supply

The mpc3000 is more than just a power supply, it is an integral part of the torus laser system. It has a full colour LCD screen, it is easy to use and the mpc3000 also monitors component temperatures in the laser head, automatically maintains laser output power and provides diagnostic analysis.

The torus can also be equipped with an smd9000 power supply. The switch mode technology enables a completely silent mode of operation and no fan cooling is required. The smd9000 is streamlined for OEM integration with no screen or integral controls making it an ideal solution for integration with the torus laser.

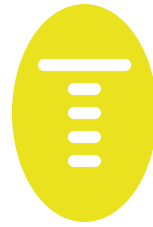
Supply voltage: 100, 120, 240 AC, frequency: 47 - 63 Hz

Technical Specifications*

	TORUS 50 - 400mW
Power	50 - 400mW
Wavelength	532 nm
Beam Size	1.7 mm
Spatial Mode	TEM ₀₀
Ellipticity	< 1:1.1
Bandwidth	1 MHz
Divergence	0.4 mrad
M-squared	< 1.1
Power stability ¹	< 1.0% rms
RMS noise ²	< 0.5%
Polarisation ratio	100:1
Polarisation direction	vertical
Coherence length	> 100m
Beam angle ³	1 mrad
Operating temperature	15 - 35°C
Head weight	1.2 kg
Umbilical length	1.5m
Warm-up time	< 30 minutes

* Subject to change without notice. ¹ Test duration 100 hrs. ² Measured up to 6MHz. ³ Tolerance relative to head orientation.

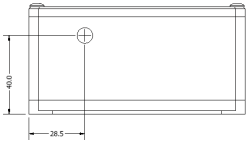
Dimensions



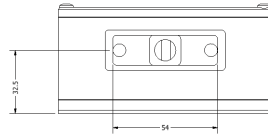
torus

single frequency 532nm CW laser

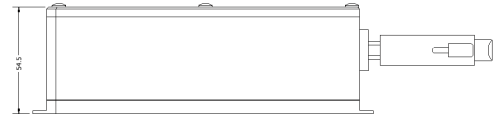
Front view



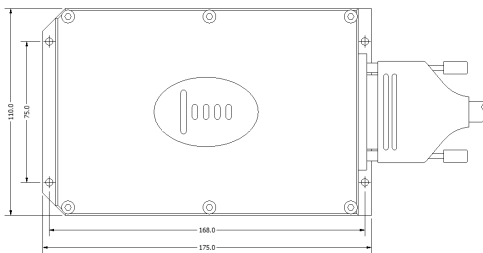
Back view



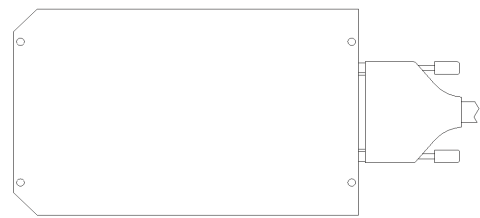
Side view



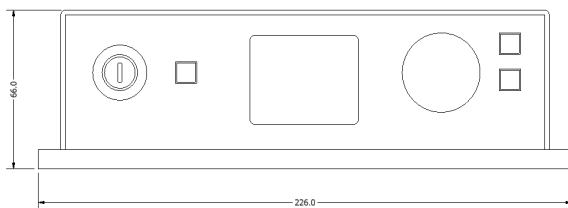
Top view



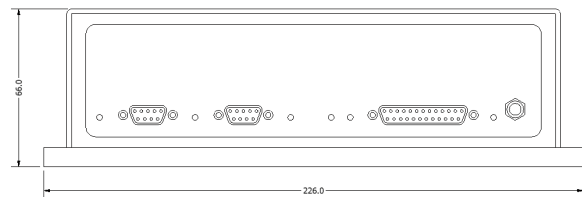
Bottom view



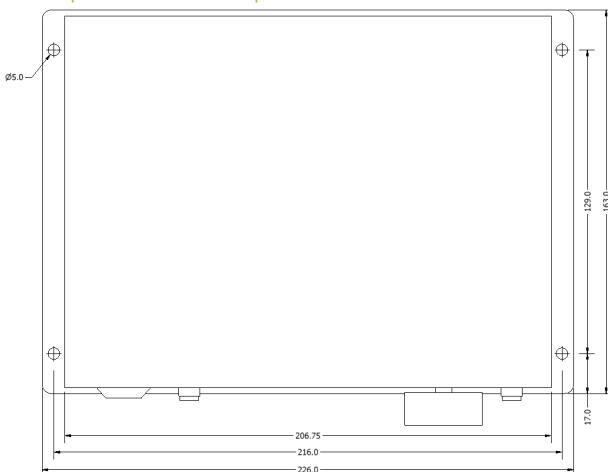
mpc3000 - front view



mpc3000 - back view



mpc3000 - top view



Typical Applications

Raman spectroscopy
Brillouin scattering
holography

PSU options

mpc3000

smd9000: 226 x 42 x 154, see below.



Drawings are for illustrative purposes only, please contact Laser Quantum for complete engineer's drawings, including smd9000.

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LASER QUANTUM LTD

EMERY COURT
VALE ROAD
STOCKPORT
SK4 3GL
UK

tel: +44 (0) 161 975 5300
fax: +44 (0) 161 975 5309
email: info@laserquantum.com
web: www.laserquantum.com



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