DualPower lasers for imaging applications

The ideal choice for PIV, visualisation and particle sizing

Features

- Output energies up to 200 mJ
- Custom lasers up to 1 J
- Repetition rates up to 200 Hz
- Quick and easy lamp change
- Dedicated PIV laser
- Wavelength 532 nm with 355 nm and 266 nm options

Applications

- Visualisation and PIV in water and air
- Vortex shedding
- Spray analysis
- Mixing analysis
- Turbulence research
- Dynamic fluid and structure interaction

A DualPower laser, comprising the laser head (with light sheet optics), power supply and remote control panel

Introduction

With decades of experience in experimental fluid mechanics applications, Dantec Dynamics introduces the DualPower laser series.

DualPower lasers are compact, lightweight and extremely stable. The lasers are suitable for traversing and applications in confined spaces.

Combined with the Dantec SpeedSense 1000 cameras (up to 520 Hz frame rate), DualPower lasers are the best fit for time-resolved PIV in water.

Description

The state-of-the-art DualPower Lasers give the best performance for your application with an extensive range of output energies of up to 1 J per pulse and repetition rates up to 200 Hz.

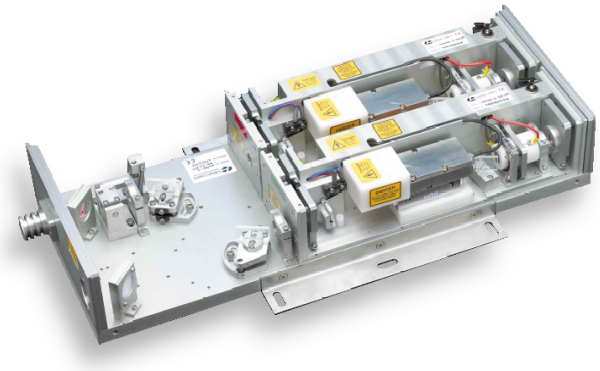
Our flexible laser systems supply 266 nm or 355 nm output options suitable for LIF applications.

The screw-pump cooling system supports elevation differences and extra-long umbilical options are available on request. Flash lamps are easily exchanged without the need for optical realignment.

DANTEC DYNAMICS

Overview

DualPower lasers use aluminium head structures cut from a single solid block to assure the highest mechanical stability and homogeneity, and good uniformity in the formation of any light sheet.



Mono-block aluminium head structure.

The most important requirement for high beam quality, both in terms of spatial profile and pointing stability, is that the pumping chamber is designed properly. The pumping chambers of DualPower lasers are machined from solid 316-grade stainless steel. They contain two extremely close-coupled diffuse ceramic reflectors, which give rise to a highly uniform pumping of the laser rod, something not achieved with elliptical specular reflectors.

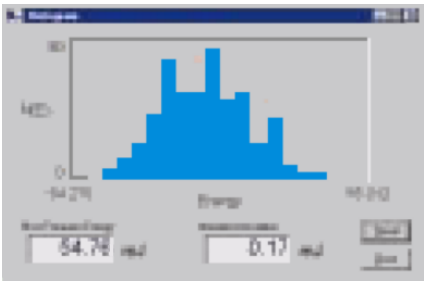
Stainless steel pumping chamber.

The laser rod and the flashlamp are separated by a tough ionic glass filter that totally absorbs all of the UV radiation emitted by the flashlamp. Such radiation is of no use in pumping the laser rod, but can damage the rod over a period of time.

The result of such a design is a system that will work reliably for many years with no problems.

The flashlamp can be removed and replaced by the user in 5 minutes, with no need for optical realignment.

The DualPower range of stable resonators and stable telescopic resonators allows a great deal of flexibility in your applications and gives you the best illumination of the sample area.



Distribution of the output energy per pulse for 500 consecutive shots. Range of histogram, ± 1% of mean value. Standard deviation ~0.3%.

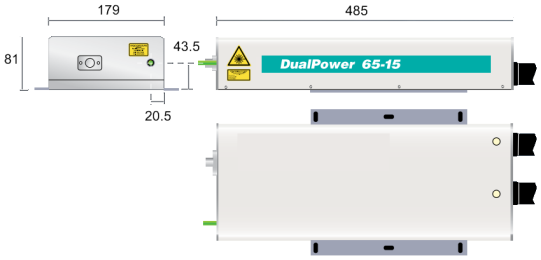
The robust design with remote controllers and TTL compatible trigger and synchronisation signals results in turnkey systems suitable for both laboratory and industry applications.

The output beams are combined by dielectric polarisers and then frequency doubled, and if desired can be frequency tripled, quadrupled or quintupled.

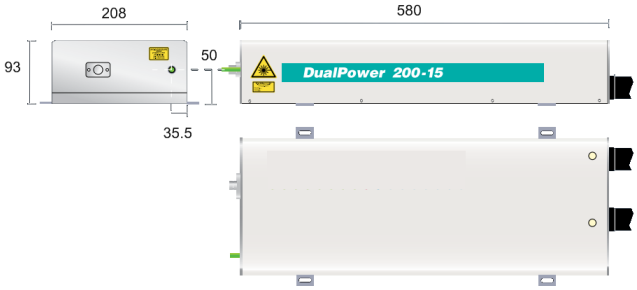
To ensure the highest safety, each laser head contains a verified electronic intra-cavity safety shutter as standard and the laser systems cannot be started with the shutter open.

Dimensions

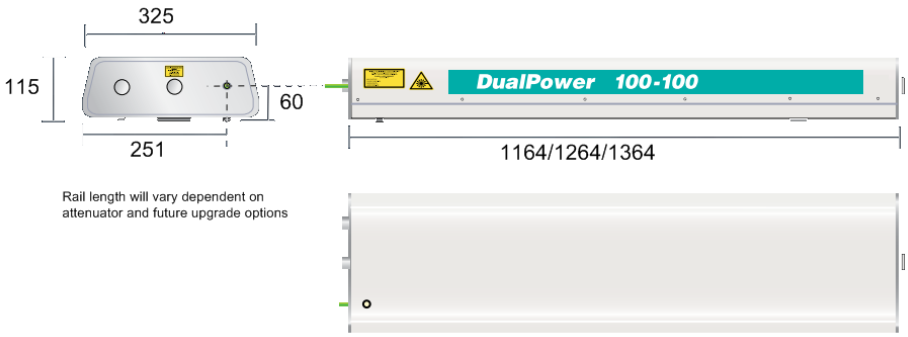
Laser head configuration A



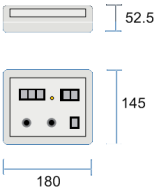
Laser head configuration B



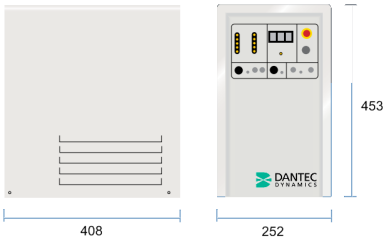
Laser head configuration C



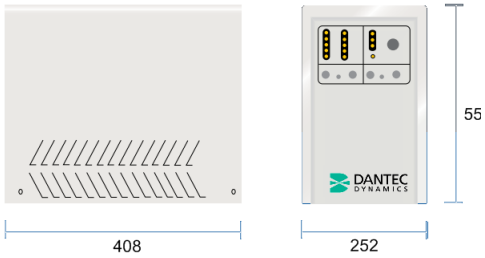
Remote Control Box



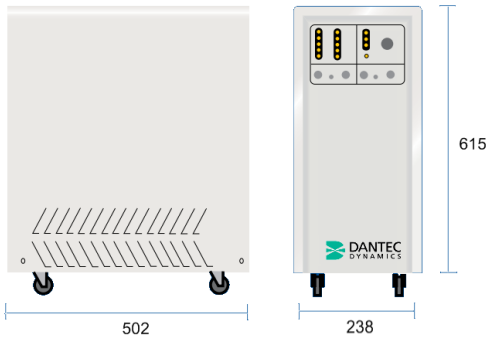
LPU 450



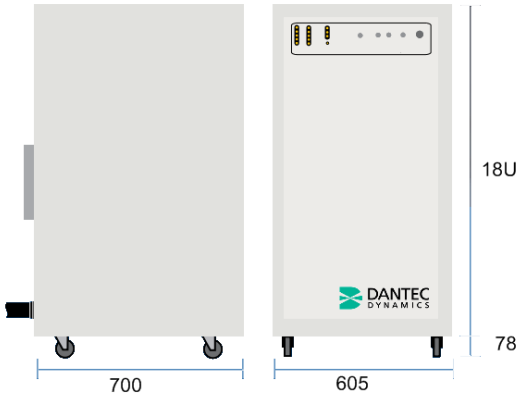
LPU 550



LPU 1000



Rack mount PSU



Specifications

	DualPower 65-15	DualPower 135-15	DualPower 200-15	DualPower 50-100	DualPower 50-200	DualPower 100-100
Laser head structure	Mono-block aluminium	Mono-block aluminium	Mono-block aluminium	Mono-block aluminium	Invar Rails	Invar Rails
Configuration	A	B	B	B	C	C
Pulse Energy at 532 nm	2 x 65 mJ	2 x 135 mJ	2 x 200 mJ	2 x 50 mJ	2 x 50 mJ	2 x 100 mJ
Max Repetition rate per cavity	15 Hz	15 Hz	15 Hz	100 Hz	200 Hz	100 Hz
Beam diameter	4 mm	5 mm	6.5 mm	4 mm	4 mm	6.5 mm
Beam divergence	~2.5 mrad	~3 mrad	~3 mrad	~2 mrad	~3 mrad	~3 mrad
Pulse length at 1064 nm	6-8 ns	6-9 ns	6-9 ns	5-8 ns	10-12 ns (532 nm)	10-12 ns (532 nm)
Pulse to pulse stability	2%	2%	2%	2%	3%	3%
Polarisation	vertical	vertical	vertical	vertical	vertical	vertical
Pointing stability	< 100 µrad	< 100 µrad	< 100 µrad	< 100 µrad	< 70 µrad	< 70 µrad
Timing jitter	< 0.5 ns	< 0.5 ns	< 0.5 ns	< 0.5 ns	< 0.5 ns	< 0.5 ns
Resonator	Stable	Stable	Stable	Stable	Stable	Stable
Lamp life (pulses)	5x10E7	5x10E7	5x10E7	5x10E7	10E8	10E8
Voltage	90–250 VAC	90–250 VAC	90–250 VAC	200–250 VAC	220–250 VAC	220–250 VAC
Frequency	47–63 Hz	47–63 Hz	47–63 Hz	47–63 Hz	50–60 Hz	50–60 Hz
Power	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase
Ambient	5 °C–35 °C	5 °C–35 °C	5 °C–35 °C	5 °C–35 °C	5 °C–35 °C	5 °C–35 °C
Consumption	< 350 W	< 650 W	< 800 W	< 2.5 kW		
Power supply	LPU 450	LPU 550	LPU 550	2 x LPU1000	18U rack	18U rack

Additional information

For additional information please contact your Dantec Dynamics representative.

The specifications in this document are subject to change without notice.