FemtoLux 30

Femtosecond Industrial Lasers

FEATURES

- ***30 W*** *typical max output power*
- ***> 90 µJ*** *max pulse energy*
- ***> 250 µJ*** *in a burst mode*
- ***< 350 fs*** *– 1 ps*
- ***Single shot to 4 MHz*** *(AOM controlled)*
- *<0.5% RMS power long term stability over 100 hours*
- *Zero maintenance*
- *Dry cooling (no water used)*
- *Robust and sealed laser head*
- *PSU and cooling unit integrated into single 4U rack housing*
- *Easy and quick installation*
- *Versatile laser control using REST API commands via RS232 and LAN*
- *Compatible with galvo and Polygon scanners as well as PSO controllers*
- *2 years of total warranty*

APPLICATIONS

- *LCD, LED, OLED drilling, cutting and repair*
- *Microelectronics manufacturing*
- *Glass, sapphire and ceramics micro processing*
- *Glass intra volume structuring*
- *Micro processing of different polymers*
- *Micro processing of different metals*

INNOVATIVE COOLING SYSTEM

FemtoLux 30 laser employs an innovative cooling system and sets new reliability standards among industrial femtosecond lasers. Other lasers of similar optical power use water for cooling, which means an additional bulky and heavy water chiller is needed. The chiller requires periodical maintenance – cooling system draining and rinsing and water and particle filter replacement. Moreover, in the unfortunate event of water leakage, not only the laser head but also more expensive equipment could be damaged. Instead of using water for transferring heat from a laser head, the FemtoLux 30 uses an innovative Direct Refrigerant Cooling method. This means that no water is being used for cooling. Direct Refrigerant Cooling provides the highest heat transfer rates, high temperature stability, small size and low weight. A refrigerant agent, after a compressor, is being delivered to the cooling plate using flexible armored hoses. The entire refrigerant circulation system is completely sealed. The cooling plate is detachable from the laser head to make laser installation more convenient inside any laser processing equipment.

Unlike water – cooled systems, a Direct Refrigerant Cooling system does not require any periodic maintenance. The laser cooling equipment is integrated with the laser power supply unit into a single 4U rack-mounted housing with a total weight of just 15 kg.

PERFECT AND VERSATILE TOOL FOR MICROMACHINING

The FemtoLux 30 femtosecond laser has a tunable pulse duration from <350 fs to 1 ps and can operate in a broad AOM controlled range of pulse repetition rates from a single shot to 4 MHz. While the maximum energy of >250 µJ, achieved while operating in burst mode, would ensure higher ablation rates and processing throughput for different materials.

The FemtoLux 30 laser is the perfect tool for display and microelectronics manufacturing, micro processing and marking of brittle materials, such as glass, sapphire, or ceramics, as well as for the highest quality micro processing of different metals and polymers.

Innovative laser control electronics ensure easy control of the FemtoLux 30 laser, thus reducing the time and human resources required for integrating this laser into other laser equipment.

High laser reliability and zero maintenance requirement of the FemtoLux 30 laser will ensure uninterrupted laser operation, fast ROI, and low ownership cost to the end-user.

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SPECIFICATIONS [1]

Model	FemtoLux 30
MAIN SPECIFICATIONS	
Wavelength	1030 nm
Pulse Repetition Rate (PRR) [2]	200 kHz – 4 MHz
Pulse repetition frequency (PRF) after frequency divider	PRF = PRR / N, N=1, 2, 3, … , 65000; single shot
Maximal average output power	> 27 W (typical 30 W)
Maximal pulse energy	> 90 µJ
Maximal total energy in a burst mode [3]	> 250 µJ
Power long term stability (Std. dev.) [4]	< 0.5 %
Pulse energy stability (Std. dev.) [5]	< 1 %
Pulse duration (FWHM)	Tunable, < 350 fs [6] – 1 ps
Beam quality	M^2 < 1.2 (typical < 1.1)
Beam circularity, far field	> 0.85
Beam divergence (full angle)	< 1 mrad
Beam pointing thermal stability	< 20 µrad/°C
Triggering mode	internal / external
Pulse output control	frequency divider, pulse picker, burst mode, packet triggering, power attenuation
Control interfaces	USB / RS232 / LAN
Length of the umbilical cord	3 m, detachable
Laser head cooling type	dry (direct refrigerant cooling through detachable cooling plate)
PHYSICAL CHARACTERISTICS	
Laser head (W × L × H)	430 × 569 × 135 mm
OPERATING REQUIREMENTS	
Mains requirements	100 – 240 V AC, single phase, 50/60 Hz
Operating ambient temperature	18 – 27 °C
Relative humidity	10–80 % (non-condensing)
Air contamination level	ISO 9 (room air) or better

[1] Due to continuous improvement, all specifications are subject to change without notice. Parameters marked typical are not specifications. They are indications of typical performance and will vary with each unit we manufacture. All parameters are specified for a shortest pulse duration.

[2] When frequency divider is set to transmit every pulse. Fully controllable by integrated AOM.

[3] When number of pulses within a burst is set to 10 and PRR is set to a minimum value. Separation between pulses within a burst - ~20 ns.

[4] Over 100 h after warm-up under constant environmental conditions.

[5] Under constant environmental conditions.

[6] At PRR > 500 kHz. At PRR < 500 kHz shortest pulse duration is < 400 fs.

OUTLINE DRAWINGS