

Atlantic 5

Industrial Compact Air Cooled Picosecond Laser



MATERIALS

- ▶ Various metals
- ▶ Brittle materials, including glass, ceramics, sapphire and PCD
- ▶ Silicon
- ▶ PET, PP, PI
- ▶ Silicone
- ▶ PCB
- ▶ Solar cells

Atlantic 5 series air-cooled lasers are among the most compact picosecond industrial lasers. This series was designed as a versatile tool for a variety of industrial applications.

Having the capability to electronically switch IR, VIS and UV outputs as well as featuring 10 ps pulse duration, Atlantic 5 series lasers offer minimized thermal damage to different materials. This is beneficial for a variety of applications such as black marking, patterning, micromachining, PCB drilling and tracing, solar cell CIGS scribing and many others.

Atlantic 5 series lasers have a versatile synchronisation capability with external equipment, including PSO (position synchronized output) which makes integration with any laser beam control equipment seamless and easy.

Superior beam quality allows easy focusing of the laser beam into the smallest spot size at various working distances and enables processing of practically any material.

Atlantic 5 series lasers can also work in bursts, with 25 ns interval between pulses, within a burst. This is very beneficial for applications such as increasing material removal rate in laser ablation.

FEATURES

- ▶ Up to **5 W** at **1064 nm**
- ▶ Optional **532 nm** and **355 nm** wavelengths (could be all 3 electronically switchable wavelengths)
- ▶ Up to **1 MHz** repetition rate
- ▶ Up to **30 μJ** pulse energy
- ▶ Short pulse duration **10 ps**
- ▶ Excellent beam quality $M^2 < 1.3$
- ▶ Air cooled
- ▶ Burst mode
- ▶ Versatile laser control and synchronisation capabilities
- ▶ Smart triggering for synchronous operation with polygon scanner and PSO
- ▶ Compact, sealed and rugged design
- ▶ Low cost of ownership

APPLICATIONS

- ▶ Black marking, diffraction grating marking
- ▶ Patterning
- ▶ Micromachining
- ▶ Solar cells CIGS scribing
- ▶ PCB drilling and tracing
- ▶ Drilling
- ▶ Cutting
- ▶ Structuring
- ▶ Ablation
- ▶ Dicing

To increase reliability and assure long-term stable operation in industrial environments, the optical components are installed in a sealed, robust, precisely machined monolithic and compact aluminium block. Designed for robust, low maintenance operation, Atlantic 5 series lasers offer maximum reliability due to an

optimized and compact layout, PC controlled operation, a built-in self-diagnostic system and advanced status reporting.

The Atlantic 5 series lasers do not require installation to be performed by a qualified laser engineer and are designed to be a low lifetime ownership cost solution.

TYPICAL VIEW OF ATLANTIC 5 SERIES LASER HEADS



Typical view of Atlantic 5 laser head with a single 1064 nm output



Typical view of Atlantic 5 laser head with two and three outputs

SPECIFICATIONS ¹⁾

Model	Atlantic 5
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GENERAL SPECIFICATIONS

Central wavelength	
Fundamental	1064 nm
With second harmonics option	532 nm (optional 1064 nm output)
With third harmonics option	355 nm (optional 1064 nm and/or 532 nm outputs)
Laser pulse repetition rate (PRR _L) range ²⁾	100 – 1000 kHz
Pulse repetition rate after frequency divider	PRR = PRR _L / N, N=1, 2, 3, ... , 1025
Maximal average output power ³⁾	
at 1064 nm	5 W
at 532 nm	2 W
at 355 nm	1 W
Pulse energy at lowest PRR _L ³⁾	
at 1064 nm	30 μJ
at 532 nm	20 μJ
at 355 nm	10 μJ
Pulse contrast	
at 1064 nm	> 150 : 1
at 532 nm	> 500 : 1
at 355 nm	> 1000 : 1
Power long term stability over 8 h after warm-up (Std. dev.) ⁴⁾	< 1.0 %
Pulse energy stability (Std. dev.) ⁵⁾	
at 1064 nm	< 0.8 %
at 532 nm	< 1.5 %
at 355 nm	< 1.5 %
Pulse duration (FWHM) at 1064 nm	10 ± 3 ps
Polarization	linear, vertical 100 : 1
M ²	< 1.3
Beam circularity, far field	> 0.85
Beam divergence, full angle	
at 1064 nm	< 2.0 mRad
at 532 nm	< 1.5 mRad
at 355 nm	< 1.5 mRad
Beam pointing stability (pk-to-pk) ⁶⁾	< 50 μRad
Beam diameter (1/e ²) at 50 cm distance from laser aperture	
at 1064 nm	1.4 ± 0.2 mm
at 532 nm	1.2 ± 0.2 mm
at 355 nm	1.1 ± 0.2 mm
Triggering mode	internal / external
Pulse output control	frequency divider, pulse picker, instant amplitude control, burst mode, power attenuation
Control interfaces	keypad / USB / RS232 / LAN

OPERATING REQUIREMENTS

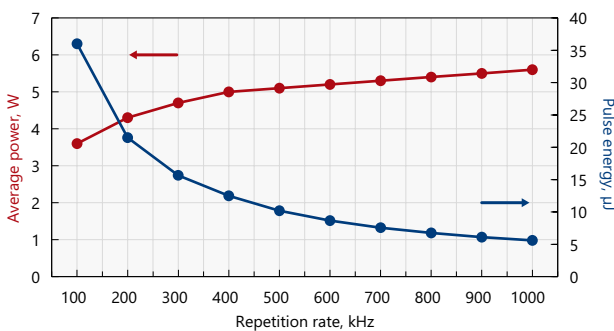
Mains requirements	100–240 V AC, single phase 47–63 Hz
Maximal power consumption	< 0.5 kW
Operating ambient temperature	18–27 °C
Relative humidity	10–80 % (non-condensing)
Air contamination level	ISO 9 (room air) or better

Model		Atlantic 5
PHYSICAL CHARACTERISTICS		
Cooling	air	
Laser head size (W × H × L)		
at 1064 nm	372 × 158 × 423 mm	
at 532 nm	372 × 158 × 590 mm	
at 355 nm		
Power supply unit size (W × H × L)	471 × 153 × 511 mm	
Umbilical length	3 m	
CLASSIFICATION		
Classification according EN60825-1	CLASS 4 laser product	

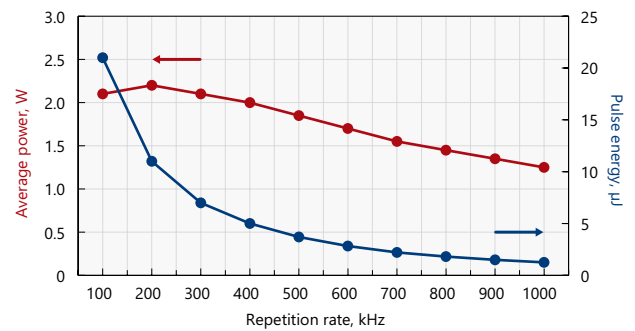
- ¹⁾ Due to continuous improvement, all specifications are subject to change without notice. Parameters marked typical are not specifications. They are indications of typical performance and will vary with each unit we manufacture.
- ²⁾ When frequency divider is set to transmit every pulse.
- ³⁾ See typical power and energy curves for other pulse repetition rates.
- ⁴⁾ At the lowest PRR, after warm-up under constant environmental conditions.
- ⁵⁾ At the lowest PRR, under constant environmental conditions.
- ⁶⁾ Beam pointing stability is evaluated as a movement of the beam centroid in the focal plane of a focusing element.



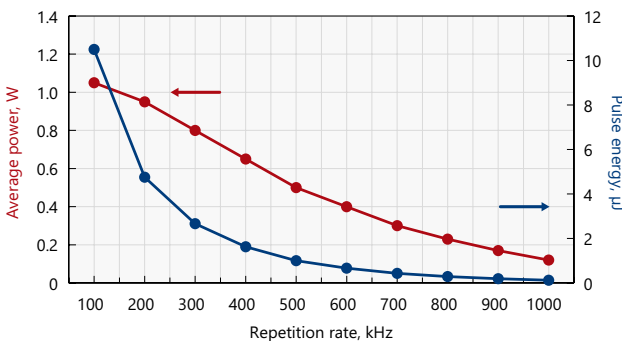
PERFORMANCE



Typical output power and energy curves of Atlantic 5

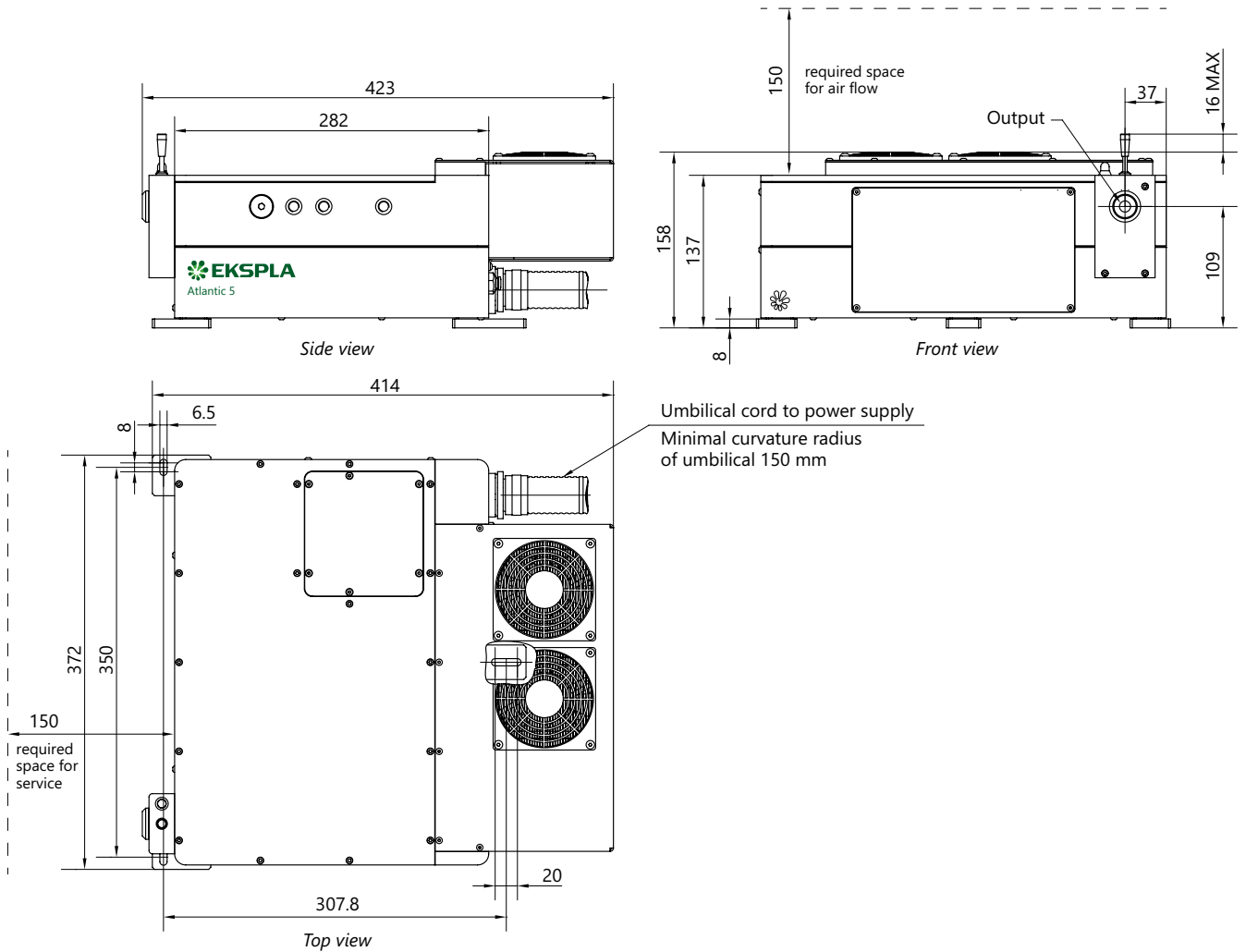


Typical output power and energy curves of Atlantic 5-GR2

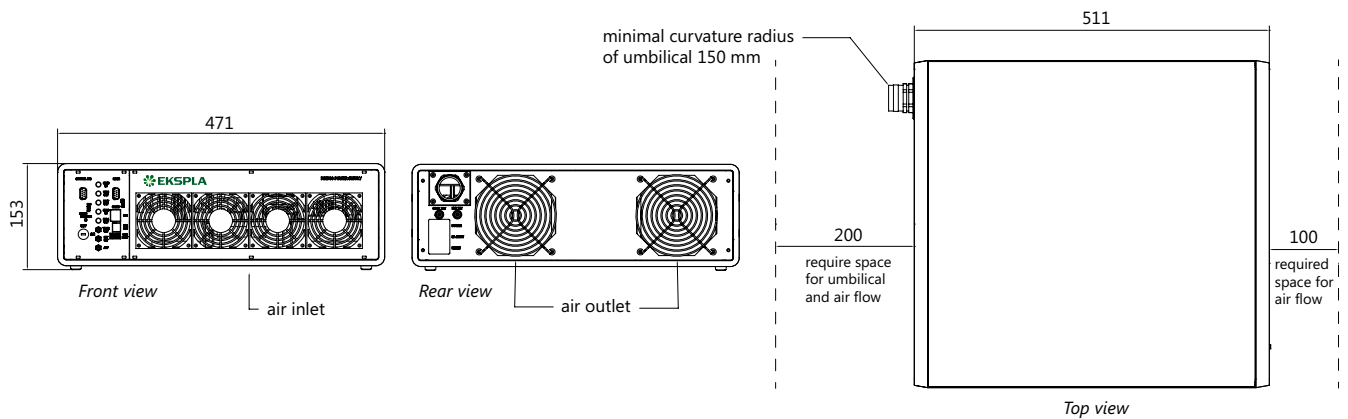


Typical output power and energy curves of Atlantic 5-UV1

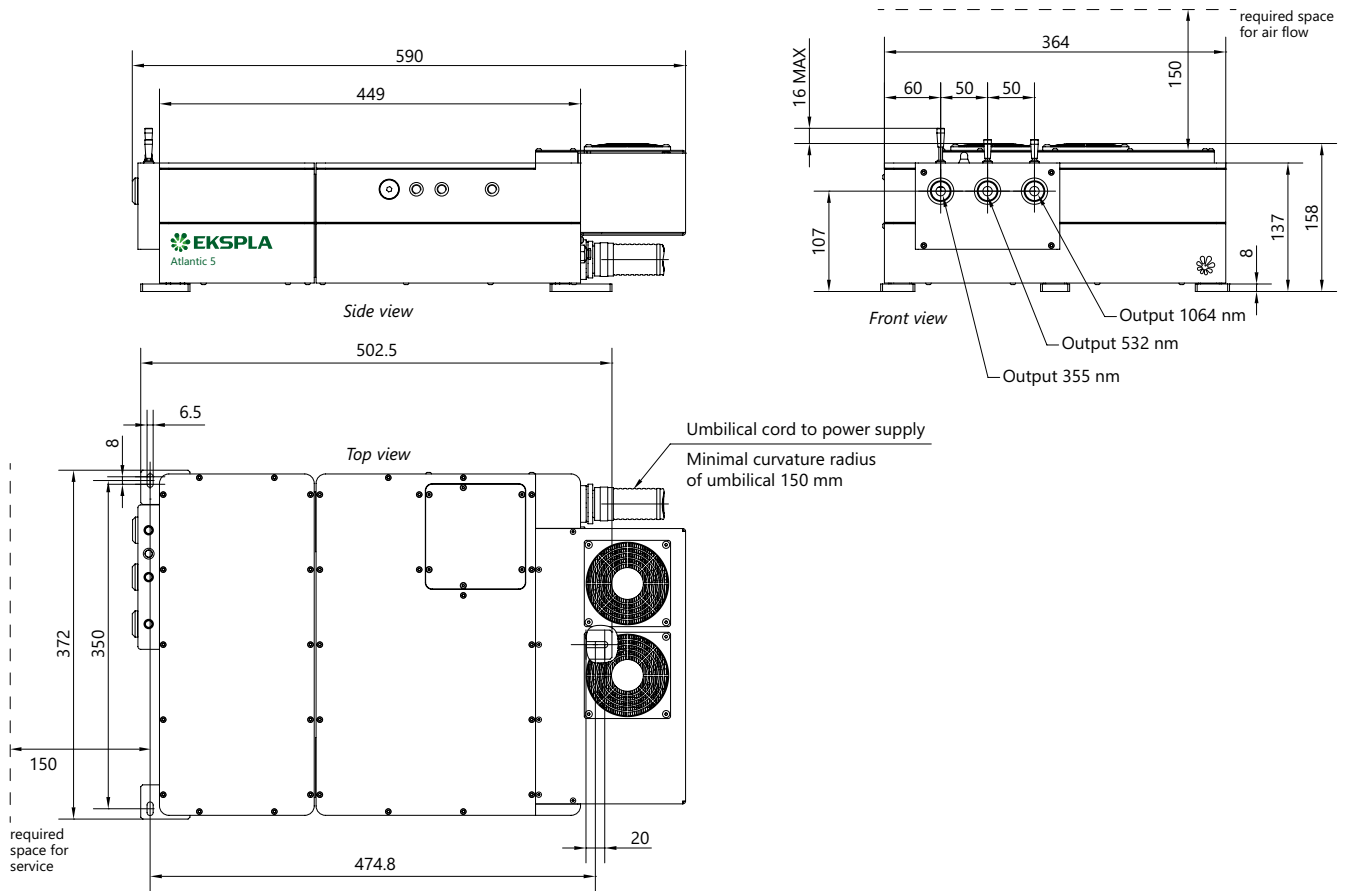
OUTLINE DRAWINGS



Outline drawings of Atlantic 5 laser head with a single 1064 nm output (dimensions in mm)



Outline drawings of Atlantic 5 power supply unit (dimensions in mm)



Outline drawings of Atlantic 5 laser head with two and three outputs (dimensions in mm)

ORDERING INFORMATION

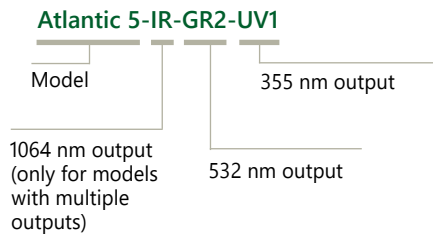


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