ps Industrial Picosecond Lasers

Atlantic

Materials

/ Various metals

/ Brittle materials including glass, ceramics, sapphire and PCD

/ Silicon, Silicone

/ PET, PP, PI, PTFE, PCB

/ LCD, LED, OLED, microLED display panels

/ Solar cells

Applications

/ Drilling

/ Cutting

/ Patterning

/ Structuring

/ Ablation

/ Dicing

/ Micromachining

/ LCD, OLED cutting

/ Laser induced forward transfer

/ Sapphire structuring and dicing

/ Ceramics micromachining

/ PCD drilling and tracing

/ Silicon scribing

/ PET, PP, PTFE, Silicone cutting and drilling

Typical view of Atlantic 25-UV8, 50-UV18, 80-UV30 laser head with a single 355 nm output

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Rev. 20230321

Industrial High Power Picosecond Lasers

Atlantic

High-energy and high-power water-cooled Atlantic series picosecond lasers are designed for a variety of industrial applications.

Suitable for LCD or OLED display cutting and drilling, laser induced forward transfer (LIFT), glass and sapphire processing, micromachining of ultra-hard materials, ablation of metals, cutting and drilling of polymers, silicon scribing, solar cell scribing and many more.

Superior beam quality parameters, maximum available average power (80W@IR / 40W@VIS / 30W@UV), maximum available pulse energy (200µJ@IR / 100µJ@VIS / 75µJ@UV) and maximum pulse repetition rate (up to 1MHz) are beneficial where high processing quality and high throughput are required.

To tailor laser performance for specific industrial applications, advanced electronics enable external gating (including PSO), synchronization and precise laser triggering as well as instant signal amplitude control.

To maintain reliability and assure long-term stable operation in an industrial environment, optical components are installed in a sealed, robust, precisely machined monolithic aluminum block. Designed for robust, low maintenance operation, Atlantic series lasers offer maximum reliability due to an optimized layout, PC controlled operation, a built-in self-diagnostic system and advanced status reporting.

For industrial high-power UV laser applications, high reliability and low ownership cost of UV components is crucial. To meet these requirements, the optical layouts of Atlantic UV models are optimized for longevity and stable operation in the UV range, resulting in a UV optics lifetime of 8,000 hours.

A unique optional feature of Atlantic high-power lasers is that they can work in both picosecond and nanosecond modes. This 2-in-1 laser solution is beneficial for some materials processing (such as glass or ceramics), where both very high accuracy, low processed surface roughness and high throughput are required at low cost.

Features

- Up to **80 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 **200 µJ** pulse energy
- Short pulse duration **10 ps**
- **M^2<1.3**
- Versatile laser control and syncronisation capabilities
- Smart triggering for synchronous operation with polygon scanner and PSO
- Monolythic, sealed and rugged design
- Low ownership cost
- Nanosecond pulse duration mode (optional)

At 1030 nm	At 515 nm	At 355 nm
80 W 200 µJ	40 W 100 µJ	30 W 75 µJ

Learn more about Atlantic
www.ekspla.com

Specifications [1]

Model		Atlantic 25	Atlantic 50	Atlantic 80
General specifications				
Central wavelength	fundamental		1064 nm	
	with 2H option		532 nm (optional 1064 nm output) [2]	
	with 3H option		355 nm (optional 1064 nm and/or 532 nm outputs) [2]	
Laser pulse repetition rate (PRR_L) range [3]		200 – 1000 kHz	300 – 1000 kHz	400 – 1000 kHz
Pulse repetition rate after frequency divider			PRR = PRR_L / N, N=1, 2, 3, ... , 1025	
Maximal average output power [4]	at 1064 nm	25 W	50 W	80 W
	at 532 nm	12 W	25 W	40 W
	at 355 nm	8 W	18 W	30 W
Pulse energy at lowest PRR_L [4]	at 1064 nm	125 µJ	165 µJ	200 µJ
	at 532 nm	60 µJ	85 µJ	100 µJ
	at 355 nm	40 µJ	60 µJ	75 µJ
Pulse contrast	at 1064 nm		> 300 : 1	
	at 532 nm		> 500 : 1	
	at 355 nm		> 1000 : 1	
Power long term stability over 8 h (Std. dev.) [5]			< 1.0 %	
Pulse energy stability (Std. dev.) [6]	at 1064 nm		< 1.0 %	
	at 532 nm		< 2.0 %	
	at 355 nm		< 2.5 %	
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			< 1.5 mRad	
Beam pointing stability (pk-to-pk) [7]			< 50 µRad	
Beam diameter ($1/e^2$) at 50 cm distance from laser aperture	at 1064 nm		1.8 ± 0.3 mm	
	at 532 nm	2.2 ± 0.3 mm	1.8 ± 0.3 mm	2.2 ± 0.3 mm
	at 355 nm	2.0 ± 0.3 mm	1.8 ± 0.3 mm	2.0 ± 0.3 mm
Triggering mode			internal / external	
Pulse output control			frequency divider, pulse picker, instant amplitude control, power attenuation	
Control interfaces			keypad / USB / RS232 / LAN	
Operating requirements				
Mains requirements			100–240 V AC, single phase 47–63 Hz	
Maximal power consumption		< 2.8 kW	< 3.1 kW	< 3.5 kW
Operating ambient temperature			18–27 °C	
Relative humidity			10–80 % (non-condensing)	
Air contamination level			ISO 9 (room air) or better	
Physical characteristics				
Cooling			water	
Laser head size (W × H × L)	single output 1064 nm		396 × 173 × 755 mm	
	single output 355 nm		396 × 173 × 1000 mm	
	3 outputs 1064 / 532 / 355 nm		396 × 173 × 926 mm	
Power supply unit size (W × H × L)			553 × 1019 × 852 mm	
Umbilical length			4 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) Can be ordered either in a single output or in 2 or 3 separate harmonics outputs versions.
3) When frequency divider is set to transmit every pulse.
4) See typical power and energy curves for other pulse repetition rates.
5) At the lowest PRR_L after warm-up under constant environmental conditions.
6) At the lowest PRR_L under constant environmental conditions.
7) Beam pointing stability is evaluated as a movement of the beam centroid in the focal plane of a focusing element.

DANGER: VISIBLE AND/OR INVISIBLE LASER RADIATION AVOID EYE OR SKIN EXPOSURE TO DIRECT, REFLECTED OR SCATTERED RADIATION
CLASS 4 LASER PRODUCT

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Performance

1064 nm

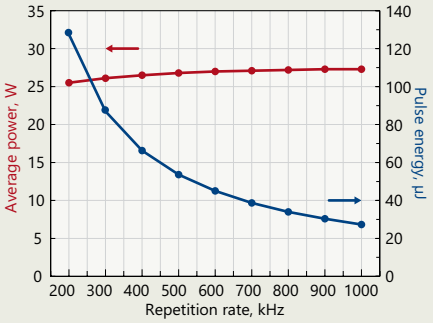


Fig 1. Typical output power and energy curves of Atlantic 25

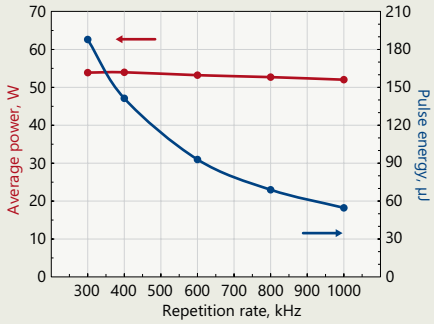


Fig 2. Typical output power and energy curves of Atlantic 50

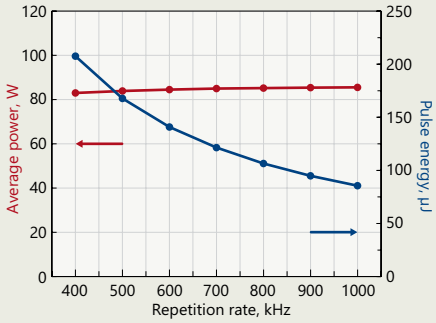


Fig 3. Typical output power and energy curves of Atlantic 80

532 nm

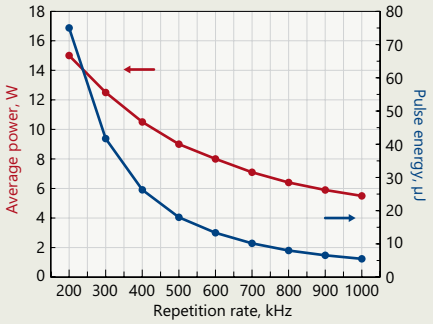


Fig 4. Typical output power and energy curves of Atlantic 25-GR12

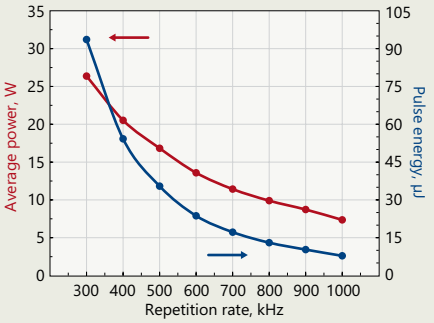


Fig 5. Typical output power and energy curves of Atlantic 50-GR25

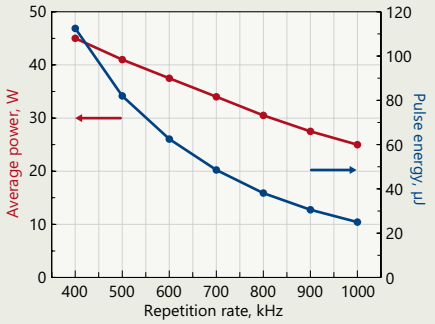


Fig 6. Typical output power and energy curves of Atlantic 80-GR40

355 nm

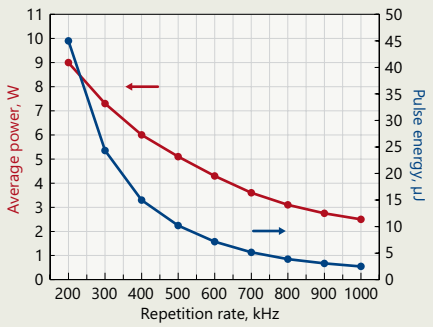


Fig 7. Typical output power and energy curves of Atlantic 25-UV8

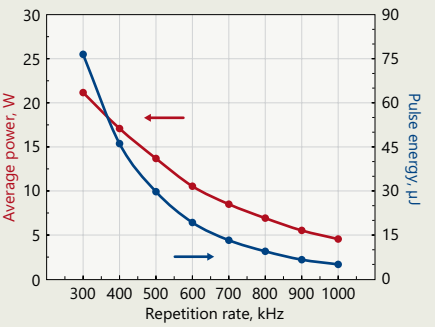


Fig 8. Typical output power and energy curves of Atlantic 50-UV18

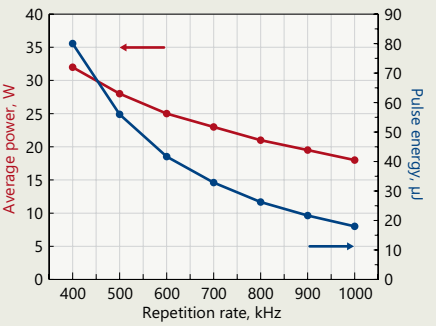


Fig 9. Typical output power and energy curves of Atlantic 80-UV30

Stability

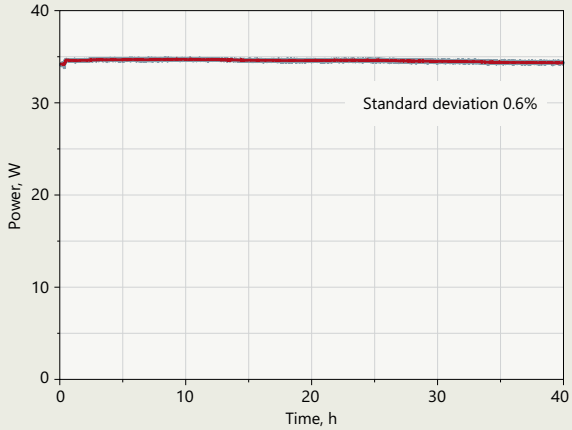


Fig 10. Typical long term 355 nm output average power stability of Atlantic 80-UV30 under constant environmental conditions

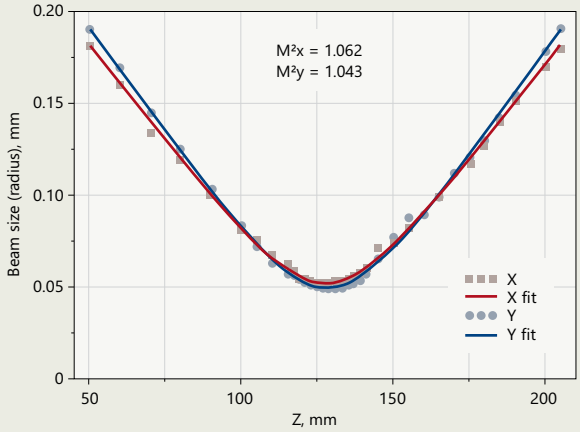
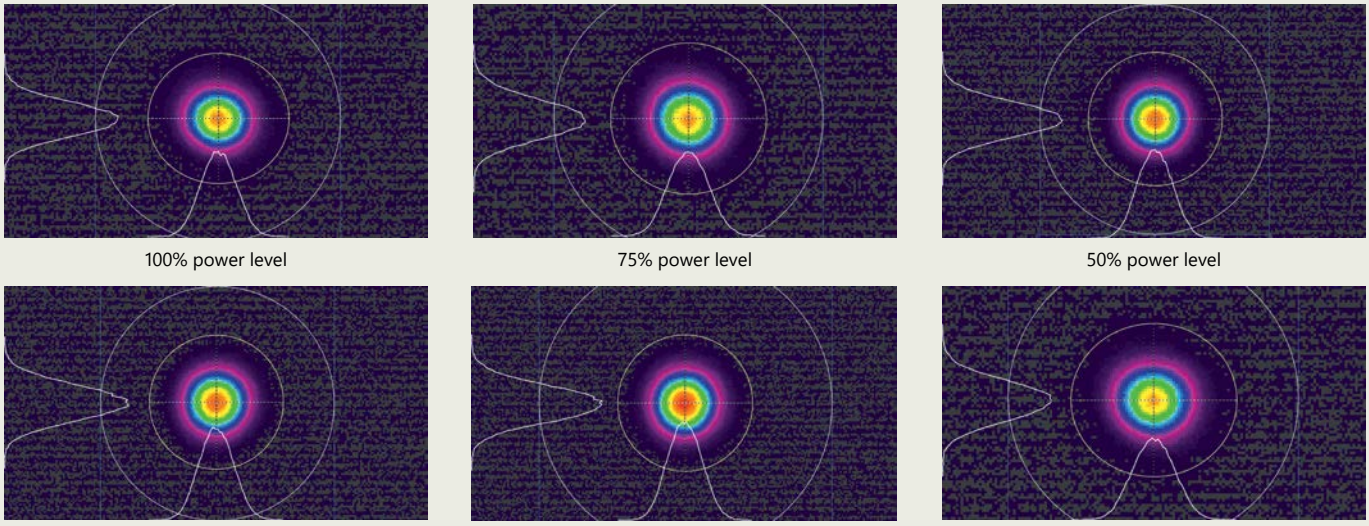


Fig 11. Typical M^2 measurement of 355 nm wavelength at 34 W average power, 400 kHz repetition rate (Atlantic 80-UV30)



100% power level | 75% power level | 50% power level

25% power level | 10% power level | 100% power level with pulse divider 10

Fig 12. Typical beam profile of 355 nm in far field at 34 W max average power with different attenuation conditions

Images

Typical view of Atlantic 25, 50, 80 laser head with a single 1064 nm output

Typical view of Atlantic 25, 50, 80 laser head with two and three outputs

Typical view of Atlantic 25-UV8, 50-UV18, 80-UV30 laser head with a single 355 nm output

Drawings

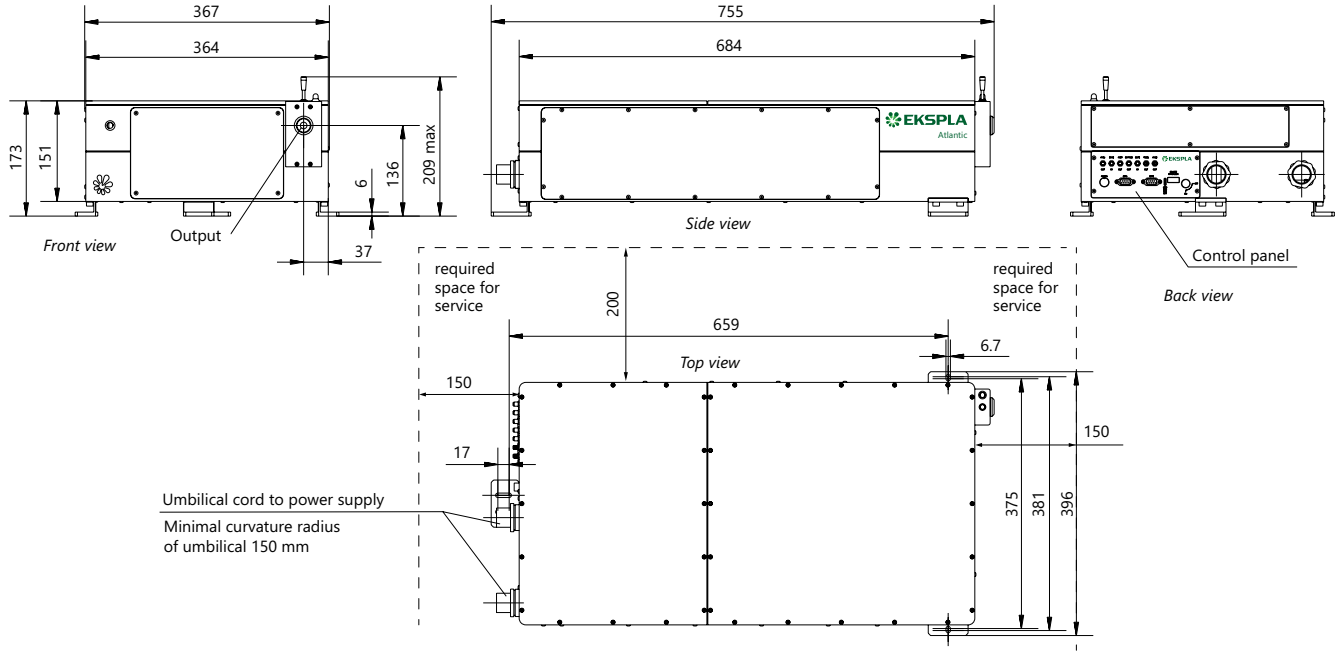


Fig 13. Outline drawings of Atlantic 25, 50, 80 laser head with a single 1064 nm output (dimensions in mm)

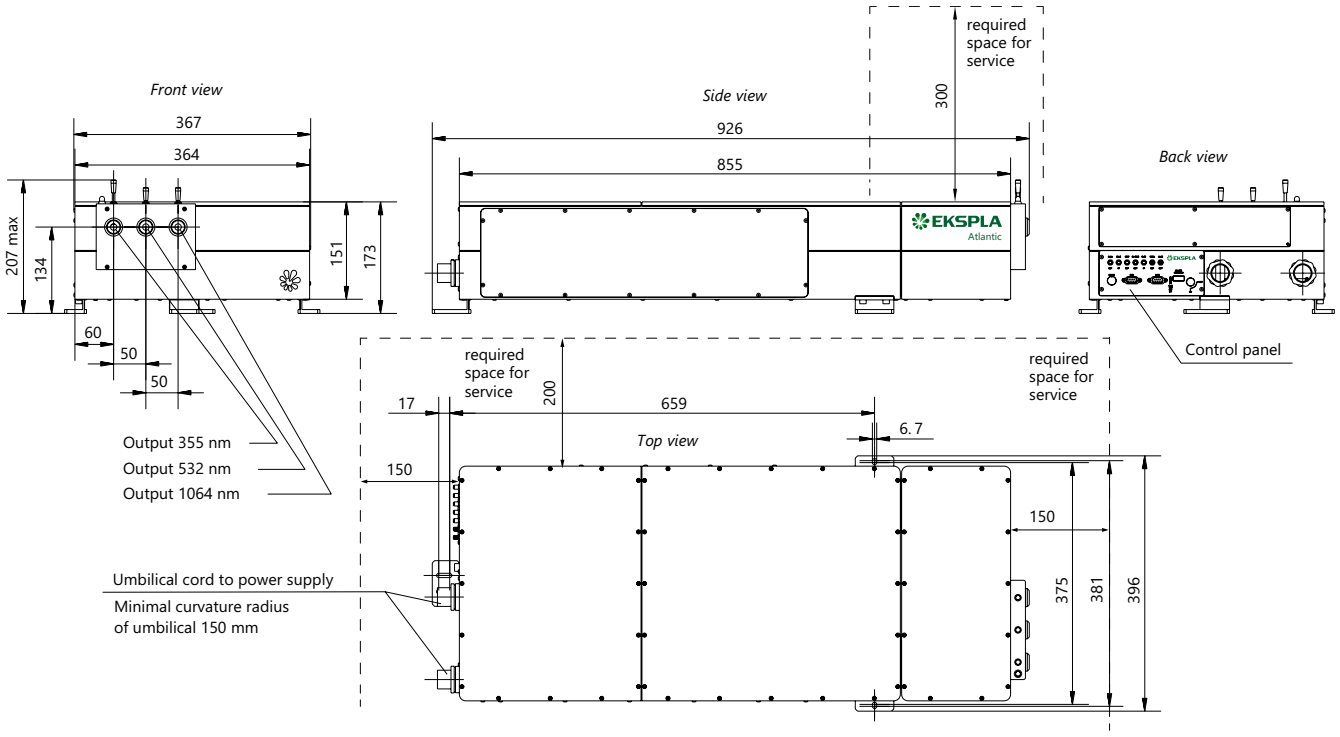


Fig 14. Outline drawings of Atlantic 25, 50, 80 laser head with two and three outputs (dimensions in mm)

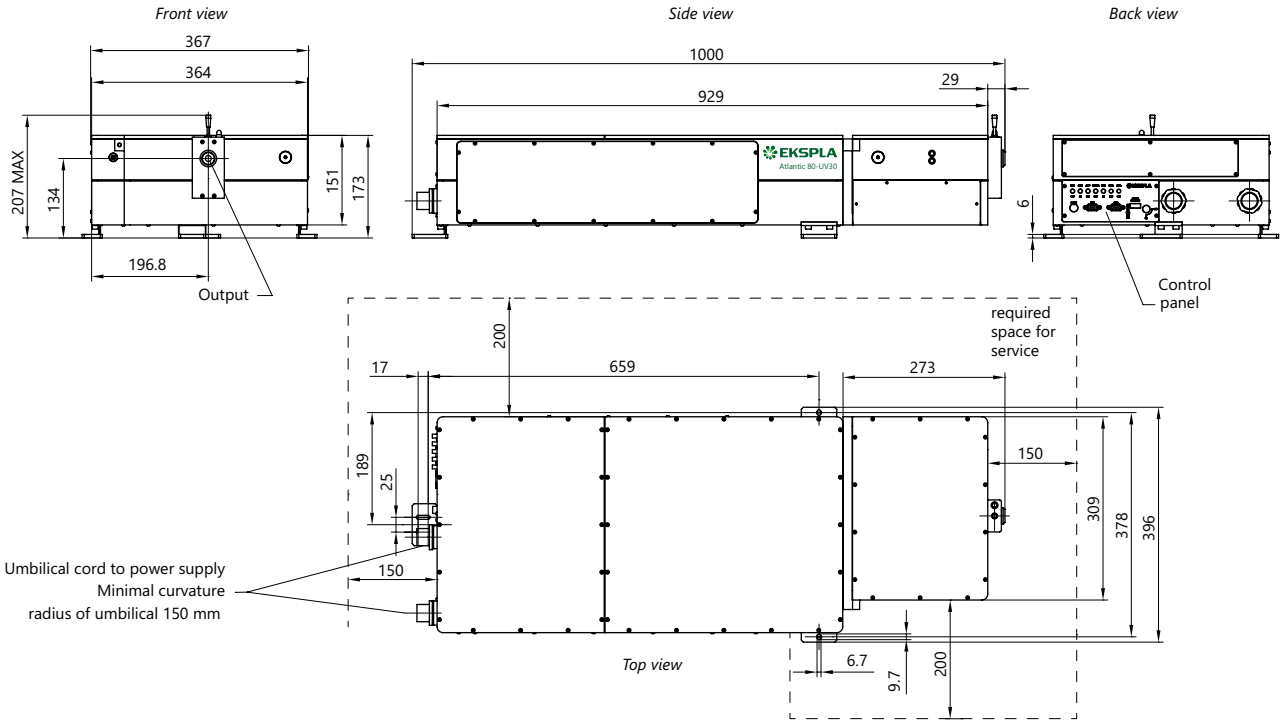


Fig 15. Outline drawings of Atlantic 25-UV8, 50-UV18, 80-UV30 laser head with a single 355 nm output (dimensions in mm)

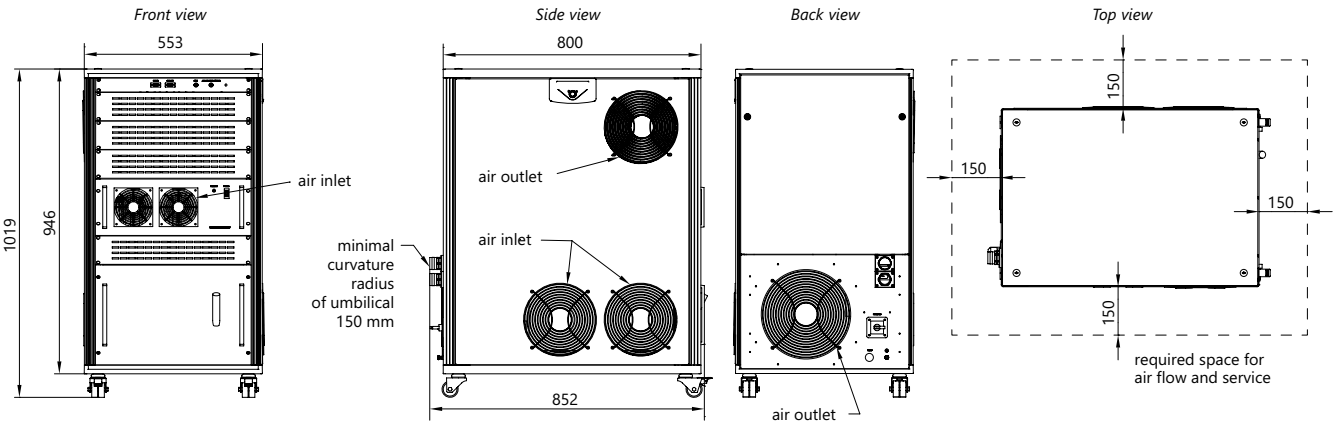


Fig 16. Outline drawings of Atlantic 25, 50, 80 power supply unit (dimensions in mm)

Ordering information

Atlantic 25-IR-GR12-UV8

Model

Fundamental wavelength max power:
25 → 25 W
50 → 50 W
80 → 80 W

1064 nm output (only for models with multiple outputs)

355 nm output max power:
UV8 → 8 W
UV18 → 18 W
UV30 → 30 W

532 nm output max power:
GR12 → 12 W
GR25 → 25 W
GR40 → 40 W