

Atlantic Series

Industrial Grade Picosecond Lasers

STANDARD PRODUCTS SPECIFICATIONS AT A GLANCE

Not all output specifications may be available simultaneously.
Please refer to the catalog page for exact specifications and available options.

Model	Wavelength	Pulse duration	Output power	Max. pulse energy	Repetition rate	Page
UV MODELS						
Atlantic UV1	355 nm	10 ± 3 ps	1 W	10 µJ	100 – 1000 kHz	4
Atlantic UV2HE	355 nm	10 ± 3 ps	2 W	75 µJ	30 kHz	4
Atlantic UV8	355 nm	10 ± 3 ps	8 W	40 µJ	200 – 1000 kHz	4
Atlantic UV18	355 nm	10 ± 3 ps	18 W	60 µJ	300 – 1000 kHz	4
Atlantic UV30	355 nm	10 ± 3 ps	30 W	75 µJ	400 – 1000 kHz	4
GREEN MODELS						
Atlantic GR2	532 nm	10 ± 3 ps	2 W	20 µJ	100 – 1000 kHz	6
Atlantic GR3HE	532 nm	10 ± 3 ps	3 W	100 µJ	30 kHz	6
Atlantic GR12	532 nm	10 ± 3 ps	12 W	60 µJ	200 – 1000 kHz	6
Atlantic GR25	532 nm	10 ± 3 ps	25 W	85 µJ	300 – 1000 kHz	6
Atlantic GR40	532 nm	10 ± 3 ps	40 W	100 µJ	400 – 1000 kHz	6
IR MODELS						
Atlantic IR5	1064 nm	10 ± 3 ps	5 W	30 µJ	100 – 1000 kHz	8
Atlantic IR6HE	1064 nm	10 ± 3 ps	6 W	200 µJ	30 kHz	8
Atlantic IR25	1064 nm	10 ± 3 ps	25 W	125 µJ	200 – 1000 kHz	8
Atlantic IR50	1064 nm	10 ± 3 ps	50 W	165 µJ	300 – 1000 kHz	8
Atlantic IR80	1064 nm	10 ± 3 ps	80 W	200 µJ	400 – 1000 kHz	8

Due to the constant product improvements, EKSPLA reserves its right to change specifications without advance notice.

For latest information visit www.ekspla.com.

Atlantic series



Atlantic series lasers have been designed as a versatile tool for a variety of industrial material processing applications. They are compact, OEM rugged, with up to 80 W output power at 1064 nm. Featuring short pulse duration Atlantic series lasers offers minimized thermal damage to the material, what is becoming more and more important in wide range of industries: photovoltaics, electronics, biomedicine, automotive.

Innovative design, employing fiber based oscillator ensured excellent output beam parameters: $M^2 < 1.3$ with pulse energy fluctuations $< 1\%$. All optical components are placed into sealed monolithic block thus ensuring reliable 24/7 operation.

High, up to 1 MHz repetition rate, combined with low maintenance requirements establishes this laser as good choice for industrial, high throughput material processing

systems, requiring speed and precision. Optical components are installed in a robust, precisely machined monolithic aluminum block, which could be used as a separate module for customized solutions. The system is sealed to provide long term stable operation in manufacturing environments. Designed for robust, low maintenance operation, the Atlantic offers maximum reliability due to an optimized layout, PC controlled operation, a built-in self-diagnostics system and advanced status reporting. 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.

The Atlantic series has been designed as a low-maintenance-costs solution. All replacement of consumables can be performed at user facilities by trained technicians.

Industrial High Power Picosecond Lasers

FEATURES

- ▶ Up to **80 W** at **1064 nm**
- ▶ **532 nm, 355 nm** outputs available
- ▶ Up to **1 MHz** repetition rate
- ▶ Up to **200 μ J** pulse energy
- ▶ Short pulse duration **10 ps**
- ▶ Excellent beam quality $M^2 < 1.3$
- ▶ Individual pulse control
- ▶ Smart triggering for synchronous operation with polygon scanner
- ▶ Compact, sealed and rugged design
- ▶ Low maintenance
- ▶ Single-phase powering
- ▶ No external cooling water

APPLICATIONS

- ▶ Drilling
- ▶ Cutting
- ▶ Patterning
- ▶ Structuring
- ▶ Ablation
- ▶ Dicing
- ▶ Black marking
- ▶ Micromachining

MATERIALS

- ▶ Various metals
- ▶ Brittle materials, including sapphire and PCD
- ▶ Silicon
- ▶ PET, PP
- ▶ Silicone
- ▶ PCB

Atlantic UV



Ekspla, the laser company, is introducing a new picosecond high power UV laser. The Atlantic UV30 industrial picosecond laser is capable of producing 30 W of output power at 355 nm.

In the industrial market, increased reliability and decreased cost of ownership of high power and UV components is critical. The Atlantic UV30 harmonic module optical layout was optimized for longevity and stable operation in UV range. As a result, 8000 hours UV optics lifetime is guaranteed, which is more than 11 months 24/7 service free operation.

Short, 10 ps pulse duration minimizes the heat-affected zone of processed material. Due to the high 75 μJ pulse energy and UV output, the laser can be adapted for tough processes, like OLED cutting, sapphire processing, ceramics micromachining.

Due to negligible output beam spatial characteristic change in wide output power range, the Atlantic UV30 delivers a cost saving flexibility to use the same system for employing numerous operation modes and processing of various materials.

High (up to 1 MHz) repetition rate enables this laser to be used in high throughput material processing systems requiring speed and precision.

To tailor laser performance for specific applications, advanced electronics enable important features like external synchronization and precise triggering with jitter of 7 ns (RMS), as well as analog AOM pulse control, which helps to change energy of pulses in real time with immediate response.

Ekspla employed all its 25 years of experience by building an advanced laser optical layout: long-life fiber master oscillator combination with amplification stages, placed in a sealed monolithic block, thus ensuring stability and resistance to possibly negative ambient conditions.

Each Atlantic UV30 laser produced at Ekspla passes strict quality control test and inspection procedures. Every single unit is checked for vibration resistance, operationally tested at different environment temperature and humidity, as well as subjected to high temperature (up to 70 °C) thermo-cycling. Prior to shipment, Ekspla performs extensive testing to verify multiple external and internal laser parameters to ensure the lasers are meeting their technical requirements.

High Power Picosecond UV Laser

FEATURES

- ▶ **30 W at 355 nm**
- ▶ **8000 h UV optics lifetime guaranteed**
- ▶ **75 μJ pulse energy**
- ▶ **Short pulse duration 10 ps**
- ▶ **400 – 1000 kHz pulse repetition rates**
- ▶ **Negligible output beam spatial characteristic change depending on output power**
- ▶ **External synchronization and precise triggering with jitter of 7 ns (RMS)**
- ▶ **Analog AOM pulse control, which helps to change energy of pulses in real time with immediate response**
- ▶ **Environment resistant design for 24/7 operation**
- ▶ **Individual pulse control**
- ▶ **Smart triggering for synchronous operation with polygon scanner**
- ▶ **Low maintenance**

APPLICATIONS

- ▶ **OLED cutting**
- ▶ **Sapphire structuring**
- ▶ **Ceramics micromachining**
- ▶ **PCD drilling**
- ▶ **Silicon scribing**
- ▶ **PET, PP, Silicone cutting and drilling**

SPECIFICATIONS ¹⁾

Model	Atlantic UV1	Atlantic UV2HE	Atlantic UV8	Atlantic UV18	Atlantic UV30
GENERAL SPECIFICATIONS					
Wavelength	355 nm (optional 1064 nm and/or 532 nm outputs) ²⁾				
Laser pulse repetition rate (PRR _L) range ³⁾	100 – 1000 kHz	30 kHz	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⁾	1 W	2 W	8 W	18 W	30 W
Pulse energy at lowest PRR _L ⁴⁾	10 μJ	75 μJ	40 μJ	60 μJ	75 μJ
Pulse contrast	> 1000 : 1				
Power long term stability over 8 h after warm-up (Std. dev.) ⁵⁾	< 1.0 %				
Pulse energy stability (Std. dev.) ⁶⁾	< 1.5 %	< 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	1.1 ± 0.2 mm	2.0 ± 0.3 mm			
Triggering mode	internal / external				
Pulse output control	frequency divider (down to single shot), arbitrary pulse selection, 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	< 2.8 kW	< 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	air	water			
Laser head size (W × H × L)	372 × 158 × 590 mm	396 × 173 × 1000 mm or 396 × 173 × 926 mm for 3 outputs version			
Power supply unit size (W × H × L)	471 × 153 × 511 mm	553 × 1019 × 852 mm			
Umbilical length	3 m	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. Unless stated otherwise, all specifications are measured at 355 nm.

²⁾ For optical specifications of the 1064 nm and 532 nm outputs please refer to the equivalent column at the Atlantic IR and Atlantic GR specification sheets respectively.

³⁾ When frequency divider is set to transmit every pulse.

⁴⁾ See typical power and energy curves for other pulse repetition rates.

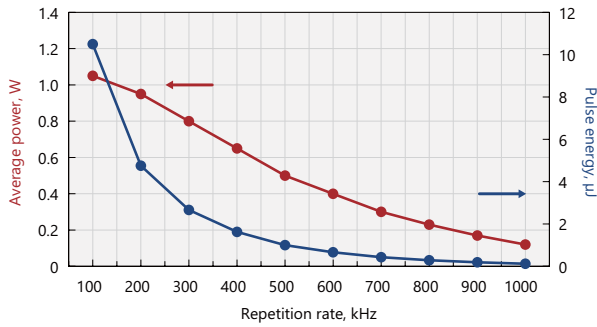
⁵⁾ At the lowest PRR_L after warm-up under constant environmental conditions.

⁶⁾ At the lowest PRR_L under constant environmental conditions.

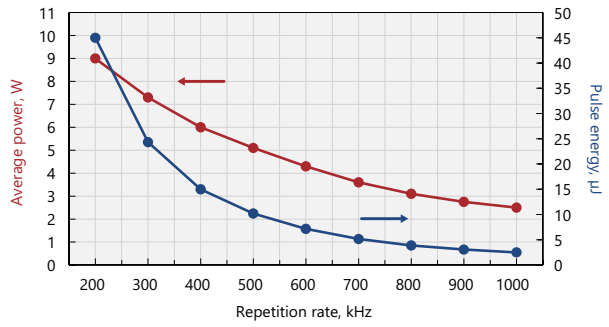
⁷⁾ Beam pointing stability is evaluated as a movement of the beam centroid in the focal plane of a focusing element.



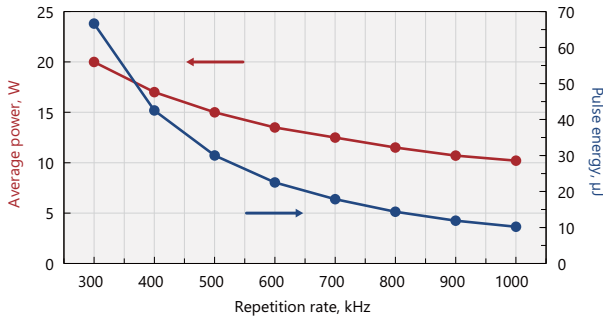
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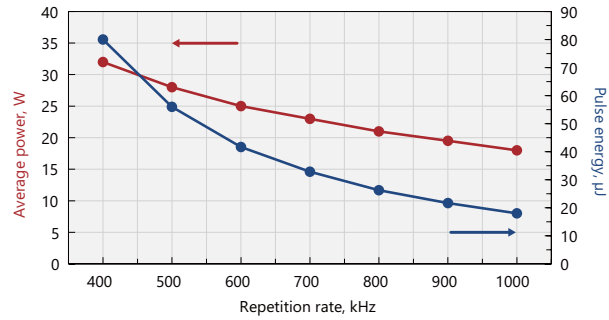
Typical output power and energy curves of Atlantic UV1



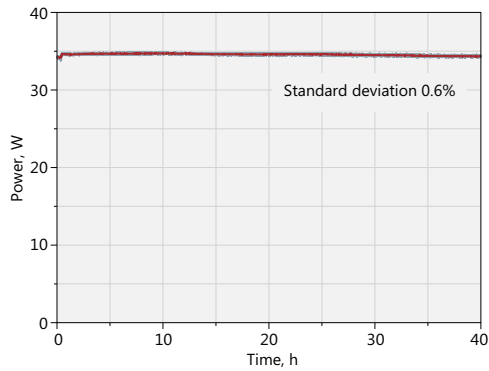
Typical output power and energy curves of Atlantic UV8



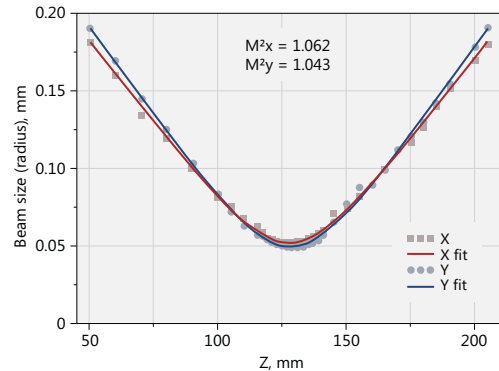
Typical output power and energy curves of Atlantic UV18



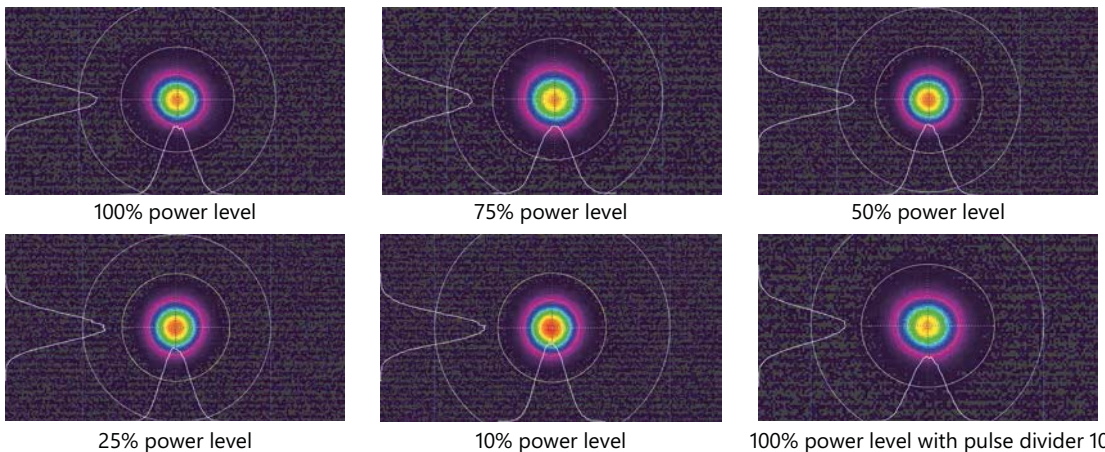
Typical output power and energy curves of Atlantic UV30



Typical long term 355 nm output average power stability of Atlantic UV30 under constant environmental conditions



M² measurement of 355 nm wavelength at 34 W average power, 400 kHz repetition rate (Atlantic UV30)



Beam profile of 355 nm in far field at 34 W max average power with different attenuation conditions

SPECIFICATIONS ¹⁾

Model	Atlantic GR2	Atlantic GR3HE	Atlantic GR12	Atlantic GR25	Atlantic GR40
GENERAL SPECIFICATIONS					
Wavelength	532 nm (optional 1064 nm output ²⁾)				
Laser pulse repetition rate (PRR _L) range ³⁾	100 – 1000 kHz	30 kHz	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⁾	2 W	3 W	12 W	25 W	40 W
Pulse energy at lowest PRR _L ⁴⁾	20 μJ	100 μJ	60 μJ	85 μJ	100 μJ
Pulse contrast	> 500 : 1				
Power long term stability over 8 h after warm-up (Std. dev.) ⁵⁾	< 1.0 %				
Pulse energy stability (Std. dev.) ⁶⁾	< 1.5 %	< 2.0 %			
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	1.2 ± 0.2 mm	2.2 ± 0.3 mm			
Triggering mode	internal / external				
Pulse output control	frequency divider (down to single shot), arbitrary pulse selection, 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	< 2.8 kW	< 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	air	water			
Laser head size (W × H × L)	372 × 158 × 590 mm	396 × 173 × 926 mm			
Power supply unit size (W × H × L)	471 × 153 × 511 mm	553 × 1019 × 852 mm			
Umbilical length	3 m	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. Unless stated otherwise, all specifications are measured at 532 nm.

²⁾ For optical specifications of the 1064 nm output please refer to the equivalent column at the Atlantic IR specification sheet.

³⁾ When frequency divider is set to transmit every pulse.

⁴⁾ See typical power and energy curves for other pulse repetition rates.

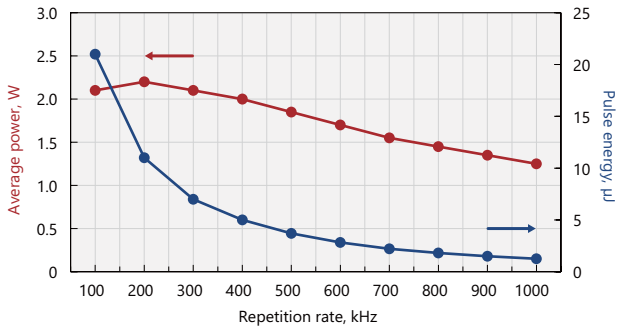
⁵⁾ At the lowest PRR_L after warm-up under constant environmental conditions.

⁶⁾ At the lowest PRR_L under constant environmental conditions.

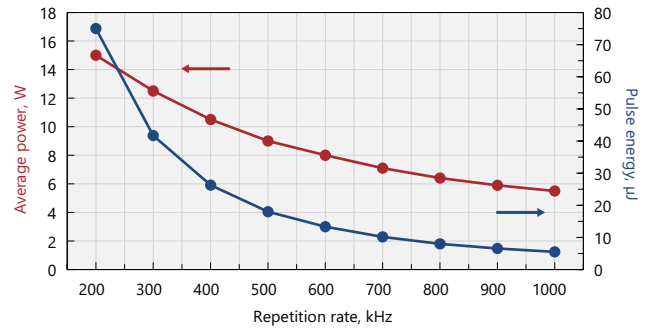
⁷⁾ Beam pointing stability is evaluated as a movement of the beam centroid in the focal plane of a focusing element.



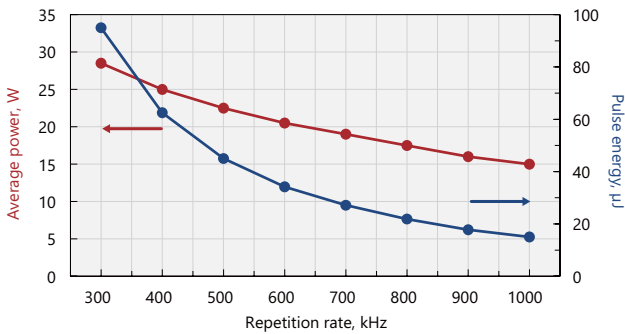
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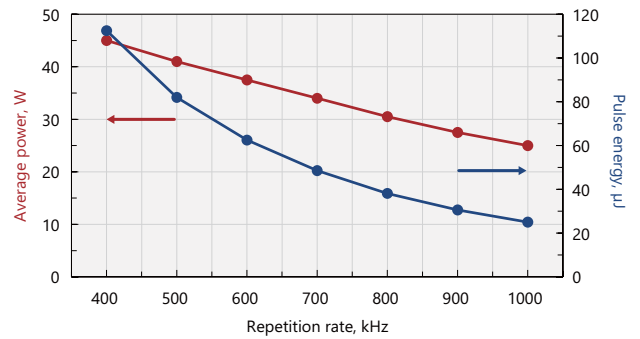
Typical output power and energy curves of Atlantic GR2



Typical output power and energy curves of Atlantic GR12



Typical output power and energy curves of Atlantic GR25



Typical output power and energy curves of Atlantic GR40

SPECIFICATIONS ¹⁾

Model	Atlantic IR5	Atlantic IR6HE	Atlantic IR25	Atlantic IR50	Atlantic IR80
GENERAL SPECIFICATIONS					
Wavelength	1064 nm				
Laser pulse repetition rate (PRR _L) range ²⁾	100 – 1000 kHz	30 kHz	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 ³⁾	5 W	6 W	25 W	50 W	80 W
Pulse energy at lowest PRR _L ³⁾	30 µJ	200 µJ	125 µJ	165 µJ	200 µJ
Pulse contrast	> 150 : 1	> 300 : 1			
Power long term stability over 8 h after warm-up (Std. dev.) ⁴⁾	< 1.0 %				
Pulse energy stability (Std. dev.) ⁵⁾	< 0.8 %	< 1.0 %			
Pulse duration (FWHM)	10 ± 3 ps				
Polarization	linear, vertical 100 : 1				
M ²	< 1.3				
Beam circularity, far field	> 0.85				
Beam divergence, full angle	< 2.0 mRad	< 1.5 mRad			
Beam pointing stability (pk-to-pk) ⁶⁾	< 50 µRad				
Beam diameter (1/e ²) at 50 cm distance from laser aperture	1.4 ± 0.2 mm	1.8 ± 0.3 mm			
Triggering mode	internal / external				
Pulse output control	frequency divider (down to single shot), arbitrary pulse selection, 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	< 2.8 kW	< 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	air	water			
Laser head size (W × H × L)	372 × 158 × 423 mm	396 × 173 × 755 mm			
Power supply unit size (W × H × L)	471 × 153 × 511 mm	553 × 1019 × 852 mm			
Umbilical length	3 m	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. Unless stated otherwise, all specifications are measured at 1064 nm.

²⁾ When frequency divider is set to transmit every pulse.

³⁾ See typical power and energy curves for other pulse repetition rates.

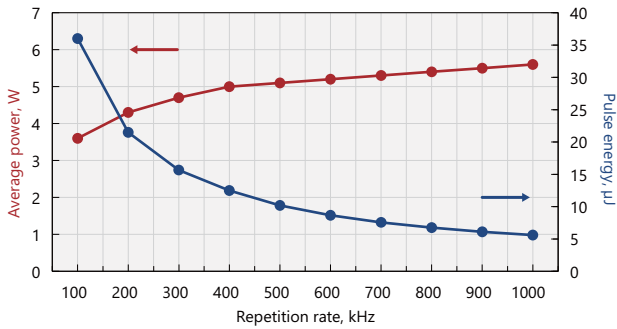
⁴⁾ At the lowest PRR_L after warm-up under constant environmental conditions.

⁵⁾ At the lowest PRR_L under constant environmental conditions.

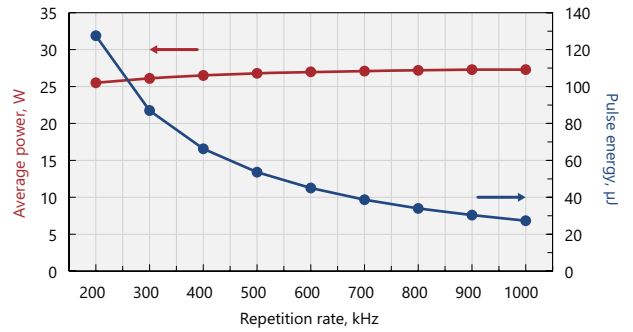
⁶⁾ Beam pointing stability is evaluated as a movement of the beam centroid in the focal plane of a focusing element.



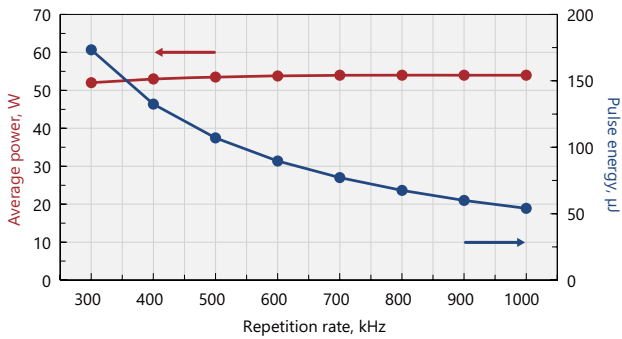
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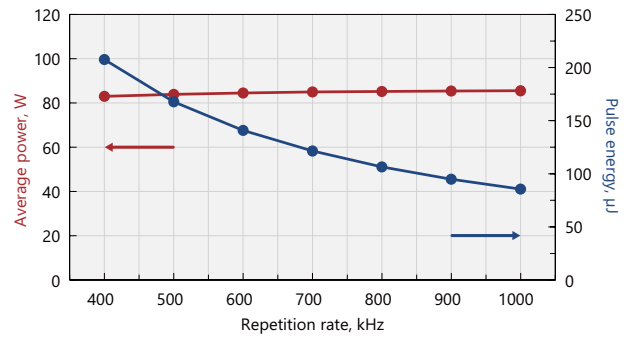
Typical output power and energy curves of Atlantic IR5



Typical output power and energy curves of Atlantic IR25



Typical output power and energy curves of Atlantic IR50



Typical output power and energy curves of Atlantic IR80