

# Atlantic



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 60 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 **60 W** at **1064 nm** output power
- ▶ Up to **1 MHz** repetition rate
- ▶ Up to **200  $\mu$ 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
- ▶ Micromachining

SPECIFICATIONS <sup>1)</sup>

**Atlantic 20**

	Atlantic 20-1064	Atlantic 20-532	Atlantic 20-355
<b>GENERAL SPECIFICATIONS</b>			
Wavelength	1064 nm	532 nm <sup>2)</sup>	355 nm <sup>2)</sup>
Repetition rate <sup>3)</sup>	200 kHz to 1000 kHz (tunable within full range) 30 kHz to 1000 kHz (fixed at single frequency)		
Average output power at 200 kHz <sup>4)</sup>	> 20 W	> 12 W	> 6 W
Pulse energy at 200 kHz <sup>5)</sup>	> 100 µJ	> 60 µJ	> 30 µJ
Pulse energy contrast	> 100 : 1	> 500 : 1	> 1000 : 1
Power fluctuations over 8 h after warm-up (Std. dev.)	< 2.0 %	< 2.5 %	< 3.0 %
Pulse energy stability at 200 kHz (Std. dev.)	< 1.0 %	< 2.0 %	< 2.5 %
Pulse duration (FWHM) <sup>6)</sup>	10 ± 3 ps		
Polarization	linear, vertical 100 : 1		
M <sup>2</sup>	< 1.3		
Ellipticity	> 0.85		
Beam divergence (full angle)	< 1.5 mRad	< 1.0 mRad	< 1.0 mRad
Beam pointing stability (pk-to-pk) <sup>7)</sup>	< 50 µRad		
Beam diameter (1/e <sup>2</sup> ) at 50 cm distance from laser aperture	1.7 ± 0.3 mm	1.3 ± 0.3 mm	1.3 ± 0.3 mm
Triggering mode	internal / external		
Pulse output control	frequency divider (down to single shot), arbitrary pulse selection, power attenuation		
Control	keypad / USB		
<b>OPERATING REQUIREMENTS</b>			
Mains requirements	208/230 V AC selectable, single phase 50 or 60 Hz		
Power	< 2.8 kW		
Operating ambient temperature	18–27 °C		
Operating temperature stability within the operating temperature band	< ± 2 °C		
Relative humidity	10–80 % (non-condensing)		
Air contamination level	ISO 9 (room air) or better		
<b>PHYSICAL CHARACTERISTICS</b>			
Laser head size (W × H × L)	364 × 190 × 720 mm	364 × 190 × 891 mm	
Power supply unit size (W × H × L)	553 × 1019 × 867 mm		
Umbilical length	4 m		
<b>CLASSIFICATION</b>			
Classification according EN60825-1	CLASS 4 laser product		

<sup>1)</sup> 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.

<sup>2)</sup> Fundamental wavelength and lower harmonics are also available with full specifications. Automatically switched outputs.

<sup>3)</sup> Pulse repetition rate can be factory pre-set to single requested frequency or tunable in all specified range. Lower pulse repetition rates are available using pulse gating system (included in standard configuration).

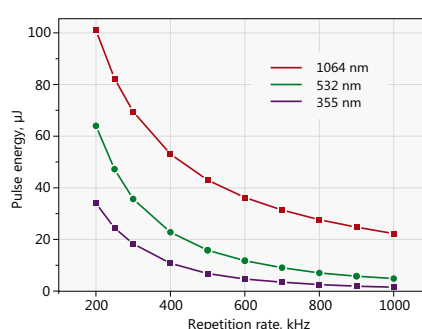
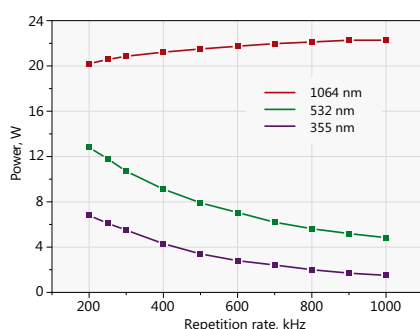
<sup>4)</sup> See typical power curve for other pulse repetition rates.

<sup>5)</sup> See typical energy curve for other pulse repetition rates. Maximal energies at lowest fixed pulse repetition rates are 200 µJ at 1064 nm, 120 µJ at 532 nm, 75 µJ at 355 nm.

<sup>6)</sup> Measured at 1064 nm fundamental wavelength.

<sup>7)</sup> Defined as short term < 2 min beam angular stability.

**PERFORMANCE**



SPECIFICATIONS <sup>1)</sup>

**Atlantic 40**

	Atlantic 40-1064	Atlantic 40-532	Atlantic 40-355
<b>GENERAL SPECIFICATIONS</b>			
Wavelength	1064 nm	532 nm <sup>2)</sup>	355 nm <sup>2)</sup>
Repetition rate <sup>3)</sup>	300 kHz to 1000 kHz (tunable within full range) 200 kHz to 1000 kHz (fixed at single frequency)		
Average output power at 300 kHz <sup>4)</sup>	> 40 W	> 20 W	> 12 W
Pulse energy at 300 kHz <sup>5)</sup>	> 130 µJ	> 70 µJ	> 40 µJ
Pulse energy contrast	> 100 : 1	> 500 : 1	> 1000 : 1
Power fluctuations over 8 h after warm-up (Std. dev.)	< 2.0 %	< 2.5 %	< 3.0 %
Pulse energy stability at 300 kHz (Std. dev.)	< 1.0 %	< 2.0 %	< 2.5 %
Pulse duration (FWHM) <sup>6)</sup>	10 ± 3 ps		
Polarization	linear, vertical 100 : 1		
M <sup>2</sup>	< 1.3		
Ellipticity	> 0.85		
Beam divergence (full angle)	< 1.5 mRad	< 1.0 mRad	< 1.0 mRad
Beam pointing stability (pk-to-pk) <sup>7)</sup>	< 50 µRad		
Beam diameter (1/e <sup>2</sup> ) at 50 cm distance from laser aperture	1.7 ± 0.3 mm	1.4 ± 0.3 mm	1.4 ± 0.3 mm
Triggering mode	internal / external		
Pulse output control	frequency divider (down to single shot), arbitrary pulse selection, power attenuation		
Control	keypad / USB		
<b>OPERATING REQUIREMENTS</b>			
Mains requirements	208/230 V AC selectable, single phase 50 or 60 Hz		
Power	< 3.1 kW		
Operating ambient temperature	18–27 °C		
Operating temperature stability within the operating temperature band	< ± 2 °C		
Relative humidity	10–80 % (non-condensing)		
Air contamination level	ISO 9 (room air) or better		
<b>PHYSICAL CHARACTERISTICS</b>			
Laser head size (W × H × L)	364 × 190 × 720 mm	364 × 190 × 891 mm	
Power supply unit size (W × H × L)	553 × 1019 × 867 mm		
Umbilical length	4 m		
<b>CLASSIFICATION</b>			
Classification according EN60825-1	CLASS 4 laser product		

<sup>1)</sup> 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.

<sup>2)</sup> Fundamental wavelength and lower harmonics are also available with full specifications. Automatically switched outputs.

<sup>3)</sup> Pulse repetition rate can be factory pre-set to single requested frequency or tunable in all specified range. Lower pulse repetition rates are available using pulse gating system (included in standard configuration).

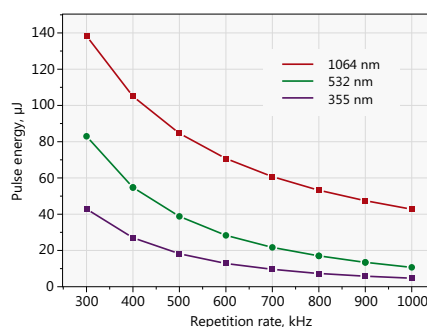
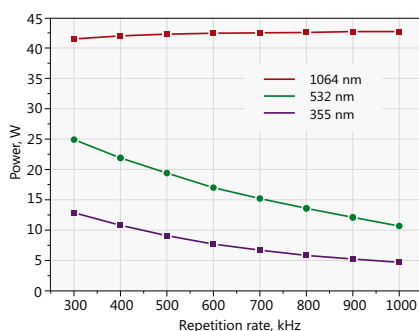
<sup>4)</sup> See typical power curve for other pulse repetition rates.

<sup>5)</sup> See typical energy curve for other pulse repetition rates. Maximal energies at lowest fixed pulse repetition rates are 200 µJ at 1064 nm, 100 µJ at 532 nm, 60 µJ at 355 nm.

<sup>6)</sup> Measured at 1064 nm fundamental wavelength.

<sup>7)</sup> Defined as short term < 2 min. beam angular stability.

**PERFORMANCE**



SPECIFICATIONS <sup>1)</sup>

**Atlantic 60**

	Atlantic 60-1064	Atlantic 60-532	Atlantic 60-355
<b>GENERAL SPECIFICATIONS</b>			
Wavelength	1064 nm	532 nm <sup>2)</sup>	355 nm <sup>2)</sup>
Repetition rate <sup>3)</sup>	400 kHz to 1000 kHz (tunable within full range) 300 kHz to 1000 kHz (fixed at single frequency)		
Average output power at 400 kHz <sup>4)</sup>	> 60 W	> 35 W	> 20 W
Pulse energy at 400 kHz <sup>5)</sup>	> 150 µJ	> 85 µJ	> 50 µJ
Pulse energy contrast	> 100 : 1	> 500 : 1	> 1000 : 1
Power fluctuations over 8 h after warm-up (Std. dev.)	< 2.0 %	< 2.5 %	< 3.0 %
Pulse energy stability at 400 kHz (Std. dev.)	< 1.0 %	< 2.0 %	< 2.5 %
Pulse duration (FWHM) <sup>6)</sup>	10 ± 3 ps		
Polarization	linear, vertical 100 : 1		
M <sup>2</sup>	< 1.3		
Ellipticity	> 0.85		
Beam divergence (full angle)	< 1.5 mRad	< 1.0 mRad	< 1.0 mRad
Beam pointing stability (pk-to-pk) <sup>7)</sup>	< 50 µRad		
Beam diameter (1/e <sup>2</sup> ) at 50 cm distance from laser aperture	1.7 ± 0.3 mm	1.5 ± 0.3 mm	1.5 ± 0.3 mm
Triggering mode	internal / external		
Pulse output control	frequency divider (down to single shot), arbitrary pulse selection, power attenuation		
Control	keypad / USB		
<b>OPERATING REQUIREMENTS</b>			
Mains requirements	208/230 V AC selectable, single phase 50 or 60 Hz		
Power	< 3.5 kW		
Operating ambient temperature	18–27 °C		
Operating temperature stability within the operating temperature band	< ± 2 °C		
Relative humidity	10–80 % (non-condensing)		
Air contamination level	ISO 9 (room air) or better		
<b>PHYSICAL CHARACTERISTICS</b>			
Laser head size (W × H × L)	364 × 190 × 720 mm	364 × 190 × 891 mm	
Power supply unit size (W × H × L)	553 × 1019 × 867 mm		
Umbilical length	4 m		
<b>CLASSIFICATION</b>			
Classification according EN60825-1	CLASS 4 laser product		

<sup>1)</sup> 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.

<sup>2)</sup> Fundamental wavelength and lower harmonics are also available with full specifications. Automatically switched outputs.

<sup>3)</sup> Pulse repetition rate can be factory pre-set to single requested frequency or tunable in all specified range. Lower pulse repetition rates are available using pulse gating system (included in standard configuration).

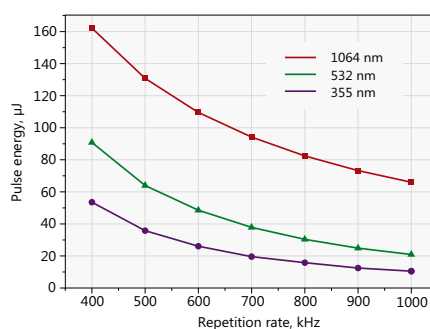
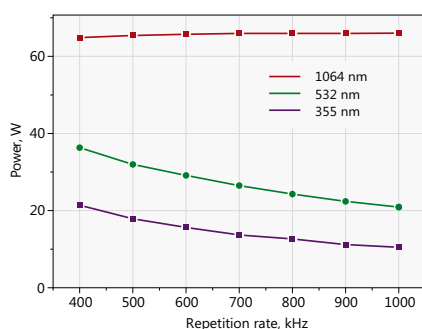
<sup>4)</sup> See typical power curve for other pulse repetition rates.

<sup>5)</sup> See typical energy curve for other pulse repetition rates. Maximal energies at lowest fixed pulse repetition rates are 200 µJ at 1064 nm, 120 µJ at 532 nm, 75 µJ at 355 nm.

<sup>6)</sup> Measured at 1064 nm fundamental wavelength.

<sup>7)</sup> Defined as short term < 2 min. beam angular stability.

**PERFORMANCE**

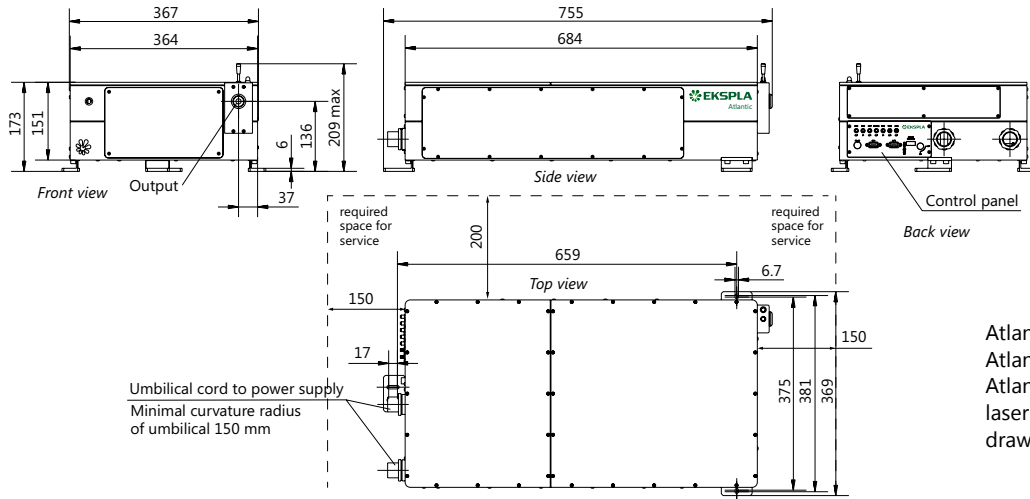


LASER HEAD IMAGE

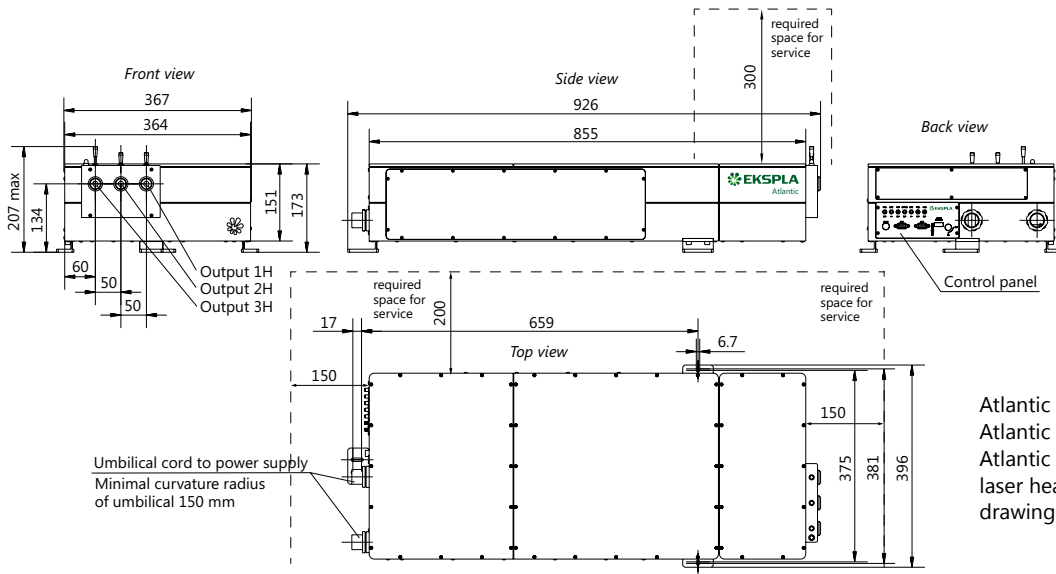


Typical view of Atlantic 20-1064, Atlantic 40-1064, Atlantic 60-1064

LASER HEAD OUTLINE DRAWINGS

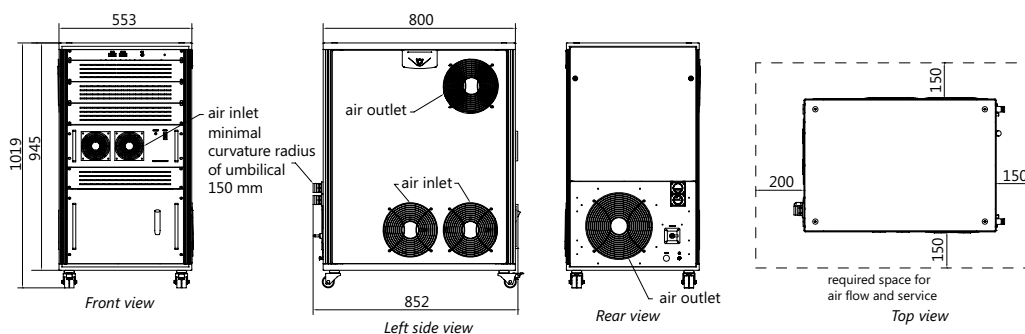


Atlantic 20-1064, Atlantic 40-1064, Atlantic 60-1064 laser head outline drawings



Atlantic 20-532/355, Atlantic 40-532/355, Atlantic 60-532/355 laser head outline drawings

POWER SUPPLY OUTLINE DRAWINGS



Atlantic 20-1064/532/355, Atlantic 40-1064/532/355, Atlantic 60-1064/532/355 power supply outline drawings