BLOOM
LASERS FOR INDUSTRY

CAREX 50-515

High power nanosecond visible laser with programmable pulses for high speed and precision micromachining

CAREX, the flexible nanosecond visible fiber laser, delivers fully programmable pulses combining high power and high pulse repetition rates. It is especially designed for high precision micro-processing.

CAREX combines process agility and throughput for demanding applications such as multi-material stacks processing. It delivers pulses from 2.5 ns up to 10 ns with any arbitrary temporal shape and possible burst operation. The innovative fast electronic design enables instantaneous switching between 2 pulse patterns for optimized complex material processing.

The fiber technology combined with the simply efficient laser head architecture makes CAREX a robust, flexible, and cost-effective visible laser for most demanding industrial applications. Manufactured with field proven and qualified components, good practices and high-quality, CAREX is the right answer to 24/7 operations in extended production cycle environments.

Wavelength	515 nm
Power @10ns	50 W @ 100 kHz 33 W @ 200 kHz 23 W @ 300 kHz
Pulse Duration	2.5 ns - 10 ns fully adjustable Programmable pulses Burst mode
Pulse Energy	Up to 500 µJ
Beam quality	$M^2 < 1.2$

Advantages

- High power 50 W
- High Pulse Repetition Rate up to 800 kHz
- Adjustable pulse duration from 2.5 ns up to 10 ns
- Full pulse shaping (1 ns resolution)
- Excellent beam quality $M^2 < 1.2$ up to 800 kHz
- High peak power up to 50 kW
- Field proven technology
- HALT designed / HASS Certified
- True Pulse-On-Demand
- Instant Pulse Switching

Applications

- Solar Cells processing
- Glass processing
- PERC processing
- ITO patterning
- CFRP processing
- Battery processing
- Ceramic scribing, cutting and drilling

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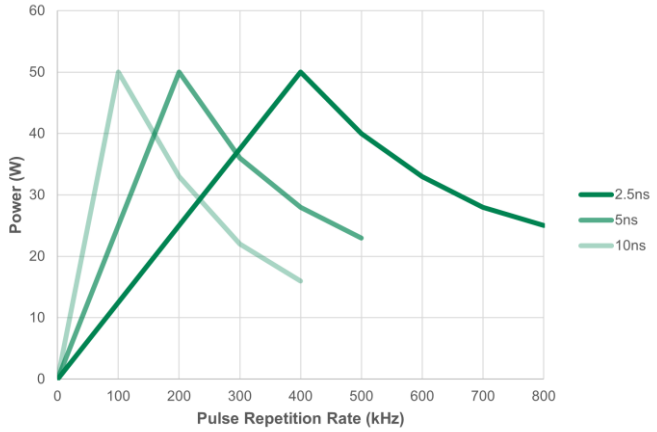
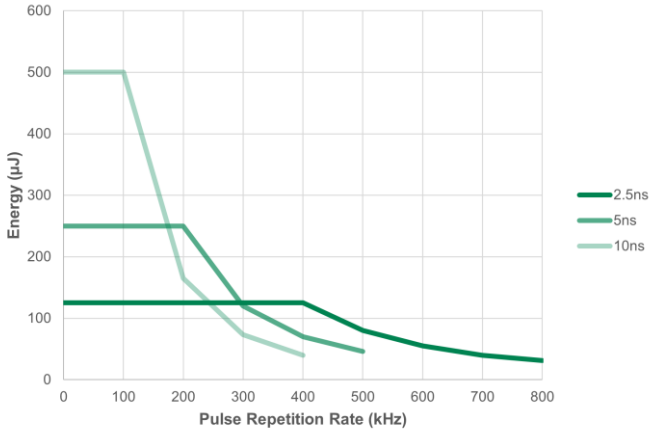
Typical performances

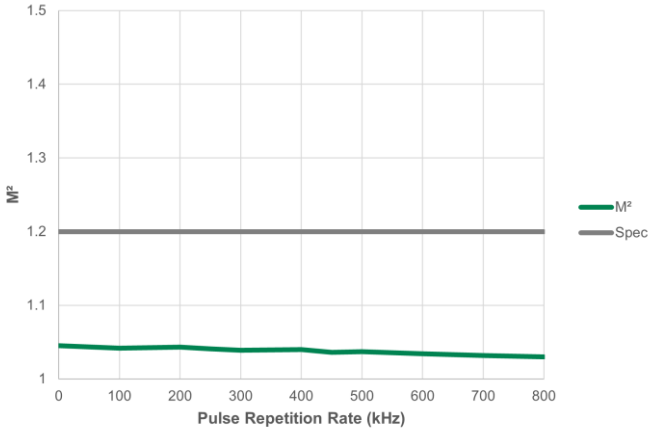
Power



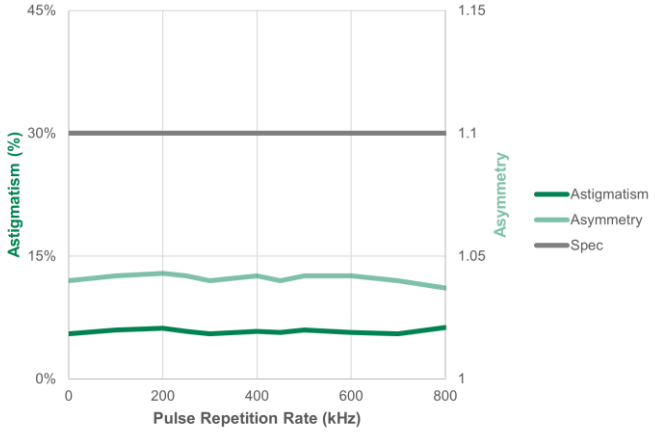
Pulse energy



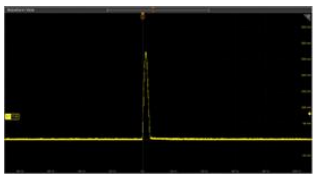
M^2



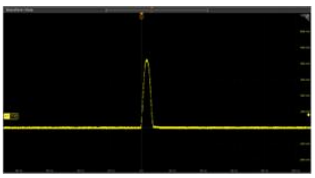
Astigmatism & asymmetry



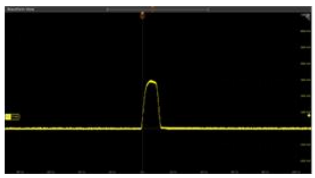
Programmable Pulses



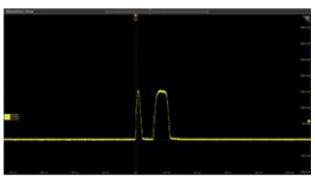
2 ns



5 ns



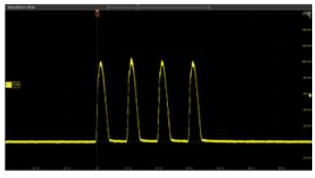
10 ns



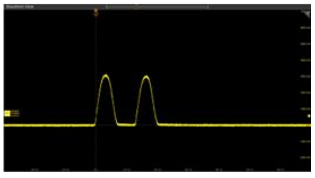
2 ns + 10 ns

2 x 2 ns ; Δ = 10 ns

3 x 2 ns ; Δ = 10 ns



4 x 2 ns ; Δ = 10 ns



2 x 5 ns ; Δ = 10 ns

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Specifications

Output Characteristics			
Central Wavelength	515 nm ± 0.5 nm		
Average Power	2.5 ns	5 ns	10 ns
	50 W @ 400 kHz 33 W @ 600 kHz 25 W @ 800 kHz	50 W @ 200 kHz 28 W @ 400 kHz 23 W @ 500 kHz	50 W @ 100 kHz 33 W @ 200 kHz 23 W @ 300 kHz
Pulse Width	Fully programmable from 2.5 ns to 10 ns		
Pulse Repetition Rates	Single-shot to 800 kHz		
Power Stability	< 2%, 2σ over 8 hours		
Pulse to Pulse Energy Stability	< 3% RMS		
Beam Characteristics			
Spatial Mode	TEM_{00}		
M^2	≤ 1.2		
Polarization Ratio	≥ 100:1 linear		
Polarization Direction	Vertical, ± 2°		
Beam Divergence (full-angle)	< 0.5 mrad		
4σ Beam Diameter @ exit (nominal)	3.5 mm ± 0.35 mm		
Astigmatism	≤ 30%		
Beam Circularity	≥ 90%		
Long Term Beam Pointing Stability, over 8 hours	≤ 25 µrad, full-angle		
Laser safety class (IEC 60825-1 : 2014)	Class IV		
Operating Conditions			
External Communications	Ethernet / RS-232 / USB		
Warm-up Time Cold Start Warm Start	 ≤ 30 minutes ≤ 2 minutes		
Electrical Requirements	100 – 240V AC		
Line Frequency	50 to 60 Hz		
Power Consumption	< 700 W		
Temperature Range	15°C to 35°C (59°F to 95°F)		
Humidity	10% to 95% RH, non-condensing		
Storage Conditions Temperature Humidity	 0°C to 50°C (32°F to 122°F) 5% to 95% RH		
Altitude (non-operational)	Sea level to 11 000 meters		
Chiller Requirements			
Cooling Water Temperature	25°C ± 0,1°C		
Minimum Cooling Power	700 W		
Cooling Water Flow	5 L/min, 3.5 L/min minimum		
Physical Characteristics			
Dimensions (L x W x H)	Laser Head : 1146 x 250 x 169 mm (45.11 x 9.84 x 6.65 in) Control Unit : 506 x 483 x 177 mm (19.92 x 19.01 x 6.97 in)		
Weight	Laser Head : 50 kg (110 lbs) without water Control Unit : 25 kg (55 lbs)		
Features			
Extended Internal Power Monitoring	Power monitored at each stage of the laser		
Ultra Wide Operation Range	Constant pulse width and beam parameters over the whole pulse repetition rate range		
Industry Ready Data Logging	Long-term and short-term laser operation log, diagnosis, maintenance		
Alignment Beam	Low power mode for laser installation and alignment		
Sacrificial Window	Field Replaceable Unit		
Advanced Support	Industry 4.0 ready, remote control, remote support, >30 sensors in laser head		
Best Practices	Sealed laser head, multi-stage components cleaning and assembled in ISO 6 cleanroom (class 1000)		

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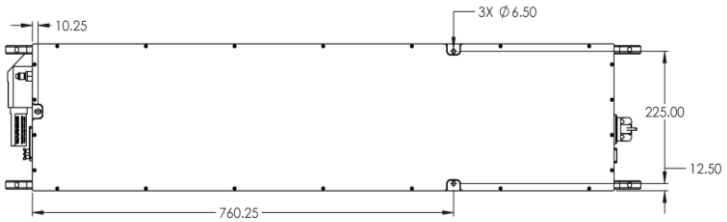
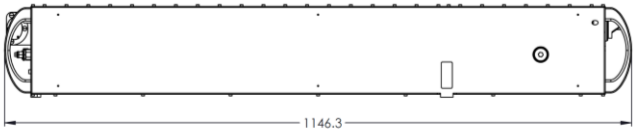
Drawings

Laser Head (in mm)

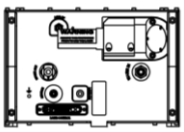


Bottom View

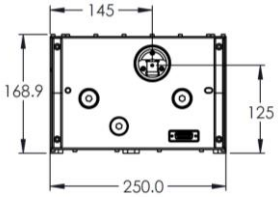
Top View



Side View

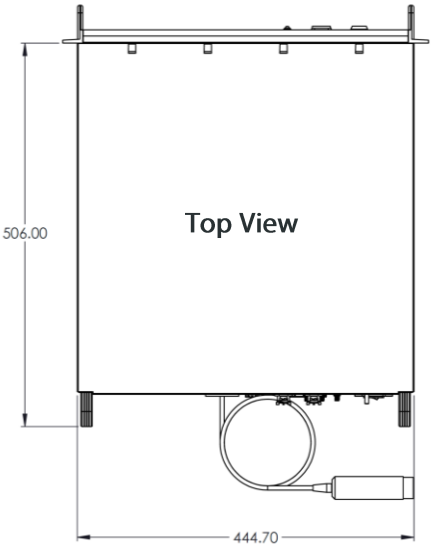


Rear View

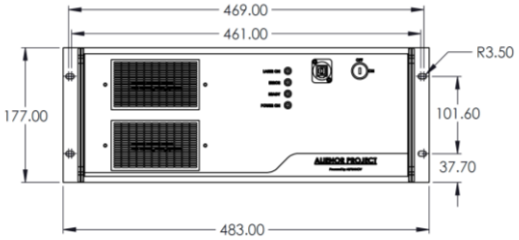


Front View

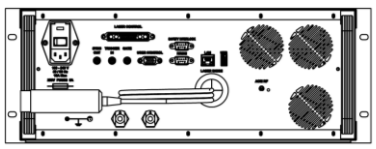
Power Supply (in mm)



Top View



Front View



Rear View

BLOOM Lasers
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