High-Power Fiber Lasers

Programmable beam quality for advanced metal processing

The nLIGHT® Corona™ CFX-5000 utilizes unique all-fiber beam tuning capability to give end users thin sheet cutting speeds characteristic of a 6-kW fiber laser, along with excellent thick metal edge quality similar to a CO_2 laser, without the need to change any optics. This increase in performance allows job shops to achieve the productivity benefits of a 6 kW with the lower cost of ownership a 5-kW laser provides. With a single fiber laser, fabricators can rapidly select from a high-intensity, small spot size to large, donut-shaped beams, and everything in between.

Features

- **5 kW with Cutting Speed of a 6 kW**
  Get the productivity benefits of a 6000 W laser with a lower cost of ownership.
- **Optimized Tuning of Beam Size and Shape**
  Maintains fiber laser performance, stability, efficiency, and reliability with beam diameters from 90 to 350 µm including top-hat and donut modes.
- **Rapid Beam Switching**
  Beam adjustments in less than 30 ms allows for real-time optimization of each process step while maintaining full power operation to maximize productivity.
- **Back-Reflection Protection**
  Hardware-based back-reflection protection allows processing of even the most reflective metals with no interruptions or damage to the laser.
- **Innovative All-Fiber Beam Shaping**
  All-fiber technology avoids complex, free-space optics, zoom process heads, and external fiber-to-fiber couplers providing reliable operation in all conditions.
- **Unparalleled Serviceability**
  Modular design simplifies repairs and maximizes uptime.

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nLIGHT CFX-5000 Corona Fiber Laser Specifications

Model	CFX-5000 (3-zone fiber)	CFX-5000 (2-zone fiber)
Optical		
Core Diameters (o.d.)	90 µm / 215 µm / 330 µm	90 µm / 330 µm
Beam Profiles	Programmable (see table below)	
Mode of Operation	CW/Modulated	
Maximum Average Power	5 kW	
Power Tunability	5 to 100%	
Power Variation, 8-Hour	≤ 1%	
Modulation Frequency	≤ 100 kHz	
Rise and Fall Times	≤ 5 µs	
Beam Profile Switching Time	< 30 ms	
Wavelength	1070 ± 10 nm	
Electrical		
Supply Voltage	380 to 480 VAC, 3P+PE, 50/60 Hz	
Standard Control Interfaces	External hardware control, analog power control, GUI	
Optional Fieldbus Interfaces	EtherCAT, EtherNet/IP, DeviceNet, Profinet, Profibus	
Mechanical		
Dimensions (W x D x H)	685 × 800 × 560 mm	
Optical Fiber [1]	20 m, QBH connector standard	
Cooling Method	Water	
Environmental		
Operating Temperature [2]	10 to 40 °C	
Storage Temperature	-10 to 60 °C	
Relative Humidity	10 to 80%	

[1] Additional configurations available on request
[2] Non-condensing or with use of CDA

nLIGHT CFX-5000 Corona Example Beam Characteristics

Index Setting	0	1	2	3	4
3-Zone Fiber BPP[3] or Power Ratio (core/ring/ring)	 2.9 mm-mrad	 20 / 70 / 10	 5 / 90 / 5	 0 / 40 / 60	 0 / 10 / 90
2-Zone Fiber BPP[3] or Power Ratio (core/ring)	 2.9 mm-mrad	 10 / 90	 0 / 100		

[3] Typical, measured using second-moment method

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