Versatile Fiber Lasers for Welding

Tunable beam shapes for flexible metal processing solutions

The nLIGHT® SFX series provides a tunable beam profile and divergence characteristics optimized for remote welding with galvo scanner systems. Versatile and dependable, this laser was designed for high-productivity welding solutions in the battery and electric vehicle markets. The beam profile consists of a central core and surrounding ring with tunable power in each region. Like all nLIGHT fiber lasers, the SFX series offers hardware-based back-reflection protection to enable uninterrupted processing of highly reflective materials as well as the industry's highest power tunability, stability, and modulation frequency. Building on two decades of high-power laser innovation and nLIGHT's pioneering Corona® all-fiber beam shaping platform, the SFX series fiber laser architecture features nLIGHT's industry-leading components with performance and reliability that enable exceptional processing range and consistent weld quality.

Features

- **4 to 15 kW Total Power**
  Wide range of power options to ensure the right solution for each application
- **Back-Reflection Protection**
  Hardware-based back-reflection protection allows uninterrupted processing of even the most reflective metals with no material restrictions, tool or process modifications, or damage to the laser
- **Beam Quality Compatibility**
  All-fiber architecture optimized for e-mobility applications and scanner-based welding
- **Unparalleled Serviceability**
  Modular design simplifies repairs to maximize uptime and productivity

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nLIGHT SFX Fiber Laser Specifications

Models	SFX-4000	SFX-6000	SFX-8000	SFX-10000	SFX-15000
Optical Specifications					
Mode of Operation	CW/Modulated				
Polarization	Random				
Combined Power	4 to 15 kW				
Core Power Configurations	Up to 5 kW				
Ring Power Configurations	Up to 10 kW				
Power Tunability	5 to 100%				
Power Variation, 8-Hour	≤ 0.5%				
Modulation Frequency	≤ 100 kHz				
Rise / Fall Times	≤ 5 µs				
Beam Quality[1]	50 µm core, 1.6 mm-mrad typical 180 µm ring, 6.8 mm-mrad typical				
Wavelength	1070 ± 10 nm				
Electrical Specifications					
Supply Voltage	400 to 480 VAC 3P+PE, 50/60 Hz				
Standard Control Interfaces	External hardware control, analog power control, analog monitors, GUI				
Optional Control Interfaces	EtherCAT, EtherNet/IP, DeviceNet, Profinet, Profibus				
Mechanical Specifications					
Dimensions (W x D x H)	1020 x 805 x 750 mm				
Optical Fiber[2]	10, 20, 30 m, QBH or QD connector				
Cooling Method	Water				
Environmental Specifications					
Operating Temperature[3]	10 to 40°C				
Storage Temperature	-10 to 60°C				
Relative Humidity	10 to 80%				

[1] 86.5% beam quality
[2] Fiber lengths are configuration dependent
[3] Non-condensing

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