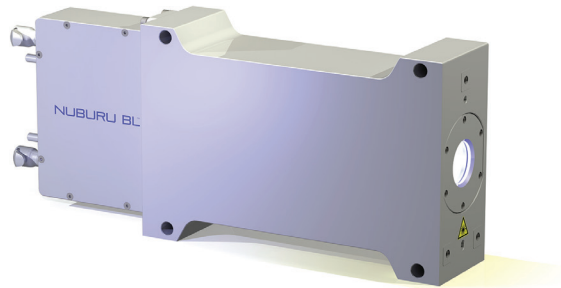


HIGH BRIGHTNESS, FREE SPACE OUTPUT BLUE LASERS FOR METALS PROCESSING



The **NUBURU BL™** series are high brightness, blue lasers that process metals better and more efficiently than IR or green lasers and integrate with standard scanning systems. This enables them to service a wide range of welding, additive manufacturing, and other materials processing applications in batteries, e-mobility and consumer electronics.

The high brightness of the **NUBURU BL** series, combined with scan head delivery, offers an ideal laser for metal processing due to the high absorption of blue light by metals: including 13x for copper and 3x for aluminum. Reducing the excess heat input compared to infrared lasers enables spatter-free and defect free welds with the highest possible mechanical and electrical performance.

With available output powers from 125W to 250W, these blue lasers can power mass production solutions for <500micron copper and aluminum welds which require a large process window and demand extremely high yields.

Key Benefits

- Compact footprint to simplify integration
- Capable of direct interface to standard scanners
- All semiconductor laser reliability and lifetime
- Lower cost of ownership than fiber and solid-state lasers
- Spatter and defect free conduction mode welds
- Higher weld joint densification

Applications

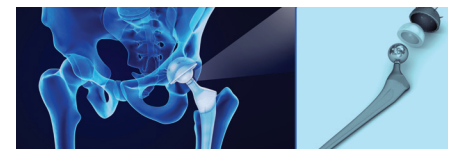
- Batteries for consumer electronics
- Consumer electronics
- Interconnects
- Electronics packaging
- Powder bed fusion 3D metal printing



Consumer Electronics



eMobility/Energy Storage



Healthcare



3D Printing

FREE SPACE DELIVERY BL SERIES

| Optical | Units | BL-125 | BL-250 |
|--|---------|--------------------------------------|--------------------------------|
| Wavelength | nm | | ~444 |
| Bandwidth | nm | | ±15 |
| Output Power | W | 125 | 250 |
| Power Adjustment | % | | 20-100 |
| Power Stability (8 hours) | % | | ±1.5 at full power |
| Collimator Aperture Diameter | mm | | 20 or 30 |
| Beam Parameter Product (10-90% enclosed power) | mm.mrad | | <5 |
| Electrical | | | |
| Operating Current | A | | <18 |
| Operating Voltage | V | | 180/264 (47-63Hz) 1 ph-3 wires |
| External Control Inputs | | | |
| Laser Enable (High on) | V | | +5/+24 |
| CW Analog Control | V | | 0 - 10 |
| Modulation | kHz | | 5 |
| Communications | | | Ethernet |
| Safety Interlocks | | | |
| Interlock Voltage (Laser Enable) | V | | 24 |
| Open Circuit (Laser Shut-down) | V | | 0 |
| Mechanical | | Driver/Head with Telescope | |
| Height, Width, Depth | mm | H: 178/170 - W: 443/100 - D: 635/410 | |
| Weight | Kg | 21/11.4 | |
| Power Supply | | 19" Rack | |
| IP Rating | | IP20/NEMA 1 | |
| Operating Conditions | | | |
| Temperature | Deg C | 15-25 | |
| Relative Humidity (non-condensing) | % | 0-90 | |
| Storage and Transport | | | |
| Temperature | Deg C | 0-40 | |
| Cooling | | | |
| Heat Load | kW/Rton | 3/0.85 | |
| Min Flow Rate | Lpm/gpm | 6/1.5 | |
| Supply Temperature | Deg C | 15-25 | |
| Max Pressure | bar/psi | 5.5/80 | |

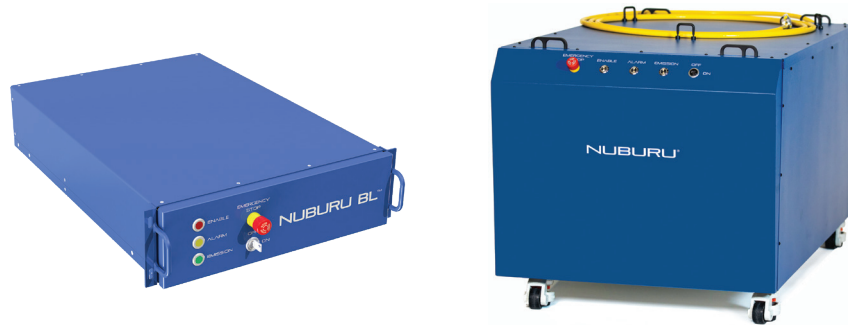


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NUBURU[®]
The Blue Laser Company[™]

HIGH BRIGHTNESS, FIBER DELIVERED BLUE LASERS FOR METALS PROCESSING



The **NUBURU BL-F** series are high brightness, blue lasers that process metals better and more efficiently than IR or green lasers and integrate with standard scanning systems. This enables them to service a wide range of welding, additive manufacturing, and other materials processing applications in batteries, e-mobility and consumer electronics.

The high brightness of the **NUBURU BL-F** series, combined with scan head delivery, offers an ideal laser for metal processing due to the high absorption of blue light by metals: including 13x for copper and 3x for aluminum. Reducing the excess heat input compared to infrared lasers enables spatter-free and defect free welds with the highest possible mechanical and electrical performance.

With available output powers from 125W to 1kW, these blue lasers can power mass production solutions for <1mm copper and aluminum welds which require a large process window and demand extremely high yields.

Key Benefits

- Compatible with standard scanners
- All semiconductor laser reliability and lifetime
- Lower cost of ownership than fiber and solid-state lasers
- Spatter and defect free conduction mode welds
- Higher weld joint densification

Applications

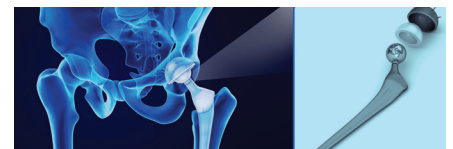
- Batteries and energy storage
- E-mobility
- Consumer electronics
- Interconnects
- Electronics packaging
- 3D metal printing (powder bed fusion and wire feed)



eMobility/Energy Storage



Consumer Electronics



Healthcare



3D Printing

FIBER DELIVERY BL SERIES

| Optical | Units | BL-125-F | BL-250-F | BL-500-F | BL-1000-F |
|--|---------|----------------------------------|----------------------|----------------------------------|-----------|
| Wavelength | nm | ~444 | | ~444 | |
| Bandwidth | nm | ±15 | | ±15 | |
| Output Power | W | 125 | 250 | 500 | 1000 |
| Power Adjustment | % | 20-100 | | 20-100 | |
| Power Stability (8 hours) | % | ±1.5 at full power | | ±1.5 at full power | |
| Fiber Diameter (Core) | micron | 100 | | 200 | |
| Fiber Numerical Aperture | N/A | 0.22 | | 0.22 | |
| Beam Parameter Product (10-90% enclosed power) | mm.mrad | 5 | | 15 | |
| Standard Fiber Length (Connector Type) | m | 5 (QBH). Options for 10 and (QD) | | 5 (QBH). Options for 10 and (QD) | |
| Electrical | | | | | |
| Operating Current | A | <18 | | <8 per phase | |
| Operating Voltage | V | 180/264 (47-63Hz) 1ph 3 wires | | 208-240 (50/16Hz, 3ph 4 wires) | |
| External Control Inputs | | | | | |
| Laser Enable (High on) | V | +5/+24 | | +5/+24 | |
| CW Analog Control | V | 0-10 | | 0-10 | |
| Modulation | kHz | 5 | | 5 | |
| Communications | | Ethernet | | Ethernet | |
| Safety Interlocks | | | | | |
| Interlock Voltage (Laser Enable) | V | 24 | | 24 | |
| Open Circuit (Laser Shut-down) | V | 0 | | 0 | |
| Mechanical | | Driver (19" Rack) | Driver (Stand Alone) | | |
| Height, Width, Depth | mm | 178 × 443 × 635 | | 641 × 671 × 1183 | |
| Weight | Kg | 21 | | ~160 ~180 | |
| IP Rating | | IP20/NEMA 1 | | IP52/NEMA 12 | |
| Operating Conditions | | | | | |
| Temperature | Deg C | 15-25 | | 15-25 | |
| Relative Humidity (non-condensing) | % | 0-90 | | 0-90 | |
| Storage and Transport | | | | | |
| Temperature | Deg C | 0-40 | | 0-40 | |
| Cooling | | | | | |
| Heat Load | kW/Rton | 3/0.85 | | 4/1.2 8/2.3 | |
| Min Flow Rate | Lpm/gpm | 6/1.5 | | 16.5/4.3 33/8.6 | |
| Supply Temperature | Deg C | 15-25 | | 20-24 | |
| Max Pressure | bar/psi | 5.5/80 | | 5.5/80 | |



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