

HighLight FL-ARM

High-Power Adjustable Ring Mode (ARM) Fiber Lasers with Beam Management

The HighLight™ FL-ARM series of industrial, multi-kilowatt fiber lasers includes beam management to deliver superior results in a variety of challenging welding tasks.

The ARM technology features two individually controllable, co-axial beams from a single fiber, providing a new level of flexibility for applications such as zero-gap welding of zinc-coated steel, as well as the ability to weld aluminum without filler wire, with minimal spatter, and no hot cracking. The power levels in both central spot and surrounding ring are independently adjustable. This results in high speed and high throughput spatter-free processing and lowers overall production costs by largely eliminating the need for post-processing.

To maximize operational flexibility, HighLight FL-ARM products are equipped with either a Fiber-Fiber-Switch (FFS) or Fiber-Fiber-Coupler (FFC).



FEATURES

- Output power: 2,000 - 10,000 Watts
- Adjustable Ring Mode (ARM)
- Fiber-Fiber-Switch (FFS) or Fiber-Fiber-Coupler (FFC)
- Excellent stability over the entire power range (1% to 100%)
- Inherently back reflection safe
- Industry-leading closed loop power control for high process consistency
- Optimized power profile programming tool for welding processes
- Reliable and fast welding process with high efficiency
- Superior welding seam quality with minimal heat affected zones
- Maximized freedom for welding geometries
- Highest welded part quality with minimum reject rates
- Minimized operating costs

APPLICATIONS

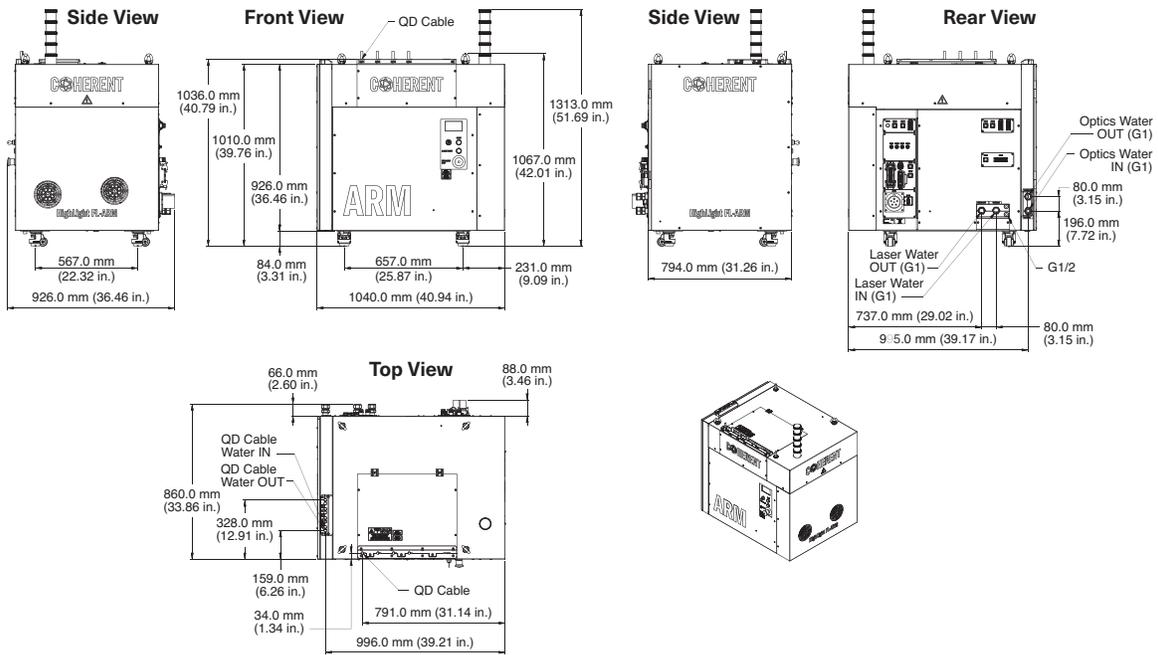
- High-quality welding of challenging materials like high-strength steel, aluminum, or copper
- Cutting

| Specifications | HighLight FL2000-ARM | HighLight FL4000-ARM |
|--|---|-------------------------|
| Nominal Power (W) | 2000 | 4000 |
| Power Range (%) | 1 to 100 | |
| Typical Laser Beam Quality (BPP) at Collimator (mm x mrad) | For 100/290 μm + FFC/FFS: Center ≤ 4 , Ring ≤ 14 For low NA 100/290 μm + FFC: Center ≤ 2.5 , Ring ≤ 12 For 50/200 μm + FFC: Center 2.5, Ring ≤ 10 | |
| Power Stability (%) | ± 1 | |
| Pulse Frequency Range (kHz) | CW - 10 | |
| Wavelength | 1070 ± 10 | |
| Electrical Ratings | | |
| Voltage (VAC) | 400/440/480 $\pm 10\%$ | |
| Connected Load (kVA) | 9.8 | 13.9 |
| Effective Power at Nominal Power (kW) | 9.6 | 13.7 |
| Max. Current Consumption at 400 V (A) | 13.8 | 19.8 |
| Fuses Type NH (A) | 32 | |
| Cooling | | |
| Recommended Cooling Capacity Laser (kW) | 4.4 | 8.9 |
| Recommended Cooling Capacity FFC/FFS and QHB/QD (kW) | FFS2: 1.0 FFC: 1.0 | |
| Flow Rate Laser (l/min.) | 43 | |
| Flow Rate for FFS/FFC and QHB/QD (l/min.) | FFS2: 8.0 FFC: 6.0 | |
| Temperature Laser ($^{\circ}\text{C}$) | 25 ± 1 | |
| Temperature for FFS/FFC and QHB/QD ($^{\circ}\text{C}$) | For 100/290 μm + FFC/FFS: 24 to 40 For 50/200 μm + FFC: 24 to 35 | |
| Max. Pressure Laser (MPa) | 0.5 | |
| Max. Pressure FFS/FFC and QHB/QD (Mpa) | 0.4 | |
| Typical Pressure Drop Laser (MPa) | 0.25 | |
| Fiber Delivery System | | |
| Interface | QBH/QD | |
| Diameter (μm) | Center D 100, Ring OD 290 or Center D 50, Ring OD 200 | |
| Length (m) | 20, 30 (other lengths on request) | |
| Dimensions and Weights | | |
| Laser Dimension (L x W x H) (mm) without Signal Tower | Midi: 794 x 1040 x 1067 | |
| Laser Weight (kg) | FFC: <460, FFS: <520 | |
| Environmental Conditions | | |
| Ambient Temperature ($^{\circ}\text{C}$) | 5 to 40 | |
| Humidity ($^{\circ}\text{C}$) | Environmental conditions always below the dew point. Condensation to laser, QHB/QD and optics must be avoided during the operation, storage and transport. | |
| Customer Interface | | |
| Digital Signals (V DC) | 24 | |
| Power Control (V DC) | 0 to 10 | |
| Gate Control (V DC) | 24, rise/fall time <30 μs | |
| Options Laser | | |
| Ambient Temperature ($^{\circ}\text{C}$) | Field bus (Ethernet/IP, Profinet, Profibus, Devicenet, Ethercat), Scanner control interface, Multi station interface | |

| Specifications | HighLight FL6000-ARM | HighLight FL7500-ARM | HighLight FL8000-ARM | HighLight FL10000-ARM |
|--|---|-------------------------|-------------------------|--------------------------|
| Nominal Power (W) | 6000 | 7500 | 8000 | 10,000 |
| Power Range (%) | 1 to 100 | | | |
| Typical Laser Beam Quality (BPP) at Collimator (mm x mrad) | For 100/290 μm + FFC/FFS: Center ≤ 4 , Ring ≤ 14 For low NA 100/290 μm + FFC: Center ≤ 2.5 , Ring ≤ 12 For 50/200 μm + FFC: Center ≤ 2.5 , Ring ≤ 10 | | | |
| Power Stability (%) | ± 1 | | | |
| Pulse Frequency Range (kHz) | CW - 10 | | | |
| Wavelength | 1070 ± 10 | | | |
| Electrical Ratings | | | | |
| Voltage (VAC) | 400/440/480 $\pm 10\%$ | | | |
| Connected Load (kVA) | 20.8 | 24.4 | 27.6 | 36.2 |
| Effective Power at Nominal Power (kW) | 20.6 | 24.2 | 27.4 | 36 |
| Max. Current Consumption at 400 V (A) | 29.7 | 35 | 39.6 | 52 |
| Fuses Type NH (A) | 63 | | | |
| Cooling | | | | |
| Recommended Cooling Capacity Laser (kW) | 13.3 | 16.7 | 17.8 | 22.2 |
| Recommended Cooling Capacity FFC/FFS and QHB/QD (kW) | FFS2: 1.0 FFC: 1.0 | | | |
| Flow Rate Laser (l/min.) | 65 | | 84 | |
| Flow Rate for FFS/FFC and QBH/QD (l/min.) | FFS2: 8.0 FFC: 6.0 | | | |
| Temperature Laser ($^{\circ}\text{C}$) | 25 ± 1 | | | |
| Temperature for FFS/FFC and QBH/QD ($^{\circ}\text{C}$) | For 100/290 μm + FFC/FFS: 24 to 40 For 50/200 μm + FFC: 24 to 35 | | | |
| Max. Pressure Laser (MPa) | 0.5 | | | |
| Max. Pressure FFS/FFC and QBH/QD (Mpa) | 0.4 | | | |
| Typical Pressure Drop Laser (MPa) | 0.25 | | | |
| Fiber Delivery System | | | | |
| Interface | QBH/QD | | | |
| Diameter (μm) | Center D 100, Ring OD 290 or Center D 50, Ring OD 200 | | | |
| Length (m) | 20, 30 (other lengths on request) | | | |
| Dimensions and Weights | | | | |
| Laser Dimension (L x W x H) (mm) without Signal Tower | Maxi: 794 x 1040 x 1565 | | | |
| Laser Weight (kg) | FFC: <530, FFS: <590 | FFC: <560, FFS: <620 | | |
| Environmental Conditions | | | | |
| Ambient Temperature ($^{\circ}\text{C}$) | 5 to 40 | | | |
| Humidity ($^{\circ}\text{C}$) | Environmental conditions always below the dew point. Condensation to laser, QHB/QD and optics must be avoided during the operation, storage and transport. | | | |
| Customer Interface | | | | |
| Digital Signals (V DC) | 24 | | | |
| Power Control (V DC) | 0 to 10 | | | |
| Gate Control (V DC) | 24, rise/fall time <30 μs | | | |
| Options Laser | | | | |
| Ambient Temperature ($^{\circ}\text{C}$) | Field bus (Ethernet/IP, Profinet, Profibus, Devicenet, Ethercat), Scanner control interface, Multi station interface | | | |

Mechanical Specifications

Midi: HighLight FL2000-ARM - FL4000-ARM



Maxi: HighLight FL6000-ARM - High FL10000-ARM

