

HighLight FL-ARM Compact

High-Power Adjustable Ring Mode (ARM) Fiber Lasers

The HighLight™ FL-ARM Compact series of industrial, multi-kilowatt fiber lasers delivers 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.



FEATURES & BENEFITS

- Output power: 2,000 - 10,000 Watts
- Adjustable Ring Mode (ARM)
- Excellent stability over the entire power range (1% to 100%)
- Inherently back reflection safe
- HighLight SQD option for smart process monitoring
- Industry-leading closed loop power control for high process consistency
- Optimized power profile programming tool for welding processes
- CleanWeld™ technology to optimize welding results



APPLICATIONS

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

HighLight FL-ARM Compact Datasheet

SPECIFICATIONS	HighLight FL2000C-ARM	HighLight FL4000C-ARM	HighLight FL5000C-ARM
Nominal Power (W)	2000	4000	5000
Power Range (%)	1 - 100		
Laser Beam Quality (BPP) at Collimator (mm x mrad)	For 70/180 μm Center < 2.5, Ring < 10 For 50/140 μm Center < 2.5, Ring < 8		
Power Stability (%)	± 1		
Pulse Frequency Range (kHz)	CW - 5		
Wavelength (nm)	1070		
ELECTRICAL RATINGS			
Voltage	400/440/480 VAC +/- 10%		
Connected Load (kVA)	9.2	12.7	16.2
Effective Power at Nominal Power (kW)	9	12.5	16
Max. Current Consumption at 400 V (A)	12.5	18	25
Fuses Type NH (A)	32		
COOLING			
Recommended Cooling Capacity* (kW)	5.0	9.5	12
Flow Rate** (l/h)	3900	4200	
Temperature ($^{\circ}\text{C}$)	25		
Temperature Tolerance Range ($^{\circ}\text{C}$)	± 1		
Max. Pressure (hPa)	For laser 5000, for optics 4000		
Pressure Drop (hPa)	2000		
FIBER DELIVERY SYSTEM			
Interface	QBH/QD		
Diameter (μm)	Center D 70 μm , Ring OD 180 μm / Center D 50 μm , Ring OD 140 μm		
Type	Step index fiber incl. RSY safety system		
Length (m)	20 m standard, other lengths as option		
Accessories (options)	Optical components		
DIMENSIONS & WEIGHTS			
Laser Dimension (L x W x H) (mm) (without signal tower)	Midi: 794 x 809 x 831		
Laser Weight (kg)	< 335	< 350	
ENVIRONMENTAL CONDITIONS			
Ambient Temperature ($^{\circ}\text{C}$)	5 - 40		
Humidity ($^{\circ}\text{C}$)	Dewpoint < 24 for laser, for optics depending on cooling water temperature		
CUSTOMER INTERFACE			
Digital Signals (V DC)	5/12/24		
Power Control (V DC)	0 - 10 V		
Trigger Control (V)	5/12/24, rise/fall time < 30 μs		
Laser Operating Elements	Pilot laser / PC control		
OPTIONS LASER			
	Fieldbus interface, Customer-specific color		

* The recommended cooling capacity covers maximum power dissipation due to diode degradation and 100% laser power absorbed at an internal or external beam dump.

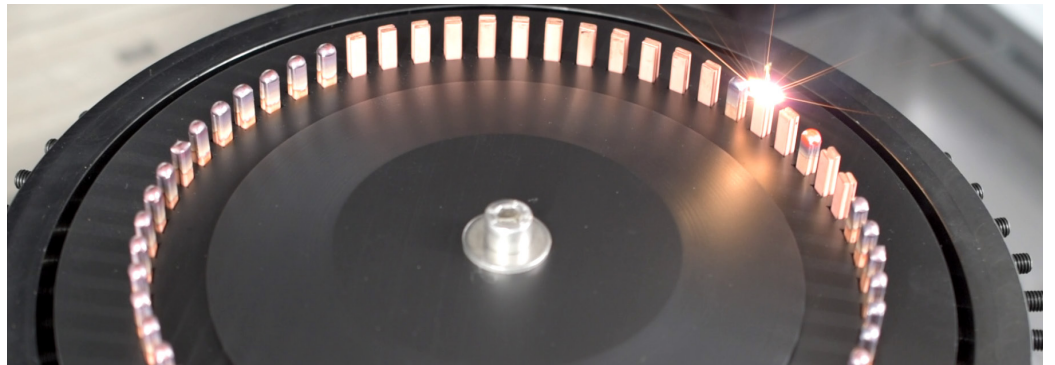
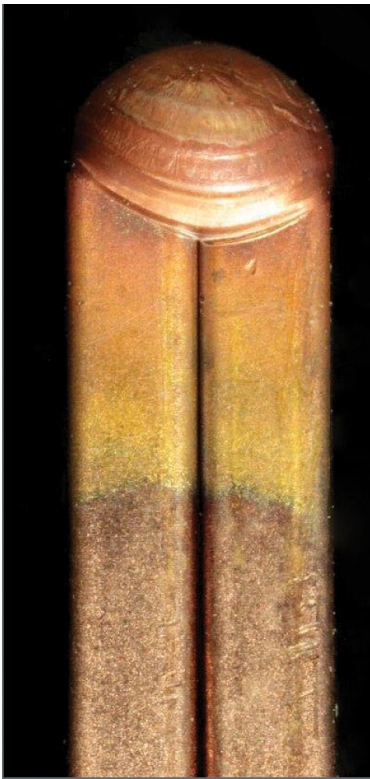
** An additional flow rate of 500l/h is recommended for the use of an external power meter.

HighLight FL-ARM Compact Datasheet

SPECIFICATIONS	HighLight FL6000C-ARM	HighLight FL7500C-ARM	HighLight FL8000C-ARM	HighLight FL10000C-ARM
Nominal Power (W)	6000	7500	8000	10000
Power Range (%)	1 - 100			
Laser Beam Quality (BPP) at Collimator (mm x mrad)	For 70/180 μm Center < 2.5, Ring < 10 For 50/140 μm Center < 2.5, Ring < 8			
Power Stability (%)	± 1			
Pulse Frequency Range (kHz)	CW - 5			
Wavelength (nm)	1070			
ELECTRICAL RATINGS				
Voltage	400/440/480 VAC +/- 10%			
Connected Load (kVA)	19.2	24.3	26.2	33.2
Effective Power at Nominal Power (kW)	19	24	26	33
Max. Current Consumption at 400 V (A)	27	35	36	46
Fuses Type NH (A)	63	63	63	63
COOLING				
Recommended Cooling Capacity* (kW)	14.5	18	20	24
Flow Rate** (l/h)	6000	7200		
Temperature ($^{\circ}\text{C}$)	25			
Temperature Tolerance Range ($^{\circ}\text{C}$)	± 1			
Max. Pressure (hPa)	For laser 5000, for optics 4000			
Pressure Drop (hPa)	2500			
FIBER DELIVERY SYSTEM				
Interface	QBH/QD			
Diameter (μm)	Center D 70 μm , Ring OD 180 μm / Center D 50 μm , Ring OD 140 μm			
Type	Step index fiber incl. RSY safety system			
Length (m)	10 m, 20 m standard, other lengths as option			
Accessories (options)	Optical components			
DIMENSIONS & WEIGHTS				
Laser Dimension (L x W x H) (mm) (without signal tower)	Maxi: 1320 mm x 954 mm x 1021 mm			
Laser Weight (kg)	< 430		< 460	
ENVIRONMENTAL CONDITIONS				
Ambient Temperature ($^{\circ}\text{C}$)	5 - 40			
Humidity ($^{\circ}\text{C}$)	Dewpoint < 24 for laser, for optics depending on cooling water temperature			
CUSTOMER INTERFACE				
Digital Signals (V DC)	5/12/24			
Power Control (V DC)	0 - 10 V			
Trigger Control (V)	5/12/24, rise/fall time < 30 μs			
Laser Operating Elements	Pilot laser / PC control			
OPTIONS LASER				
	Fieldbus interface, Customer-specific color			

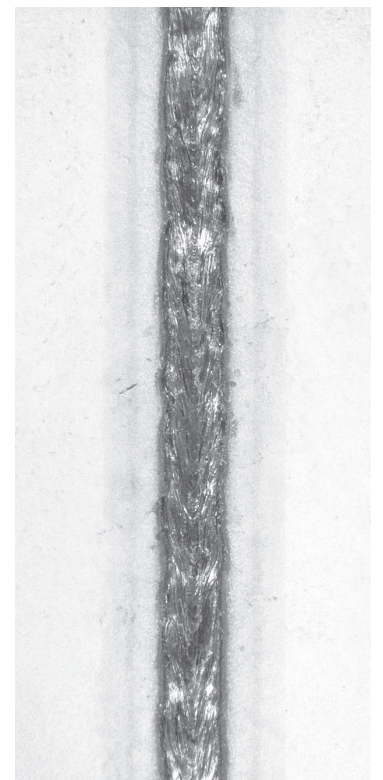
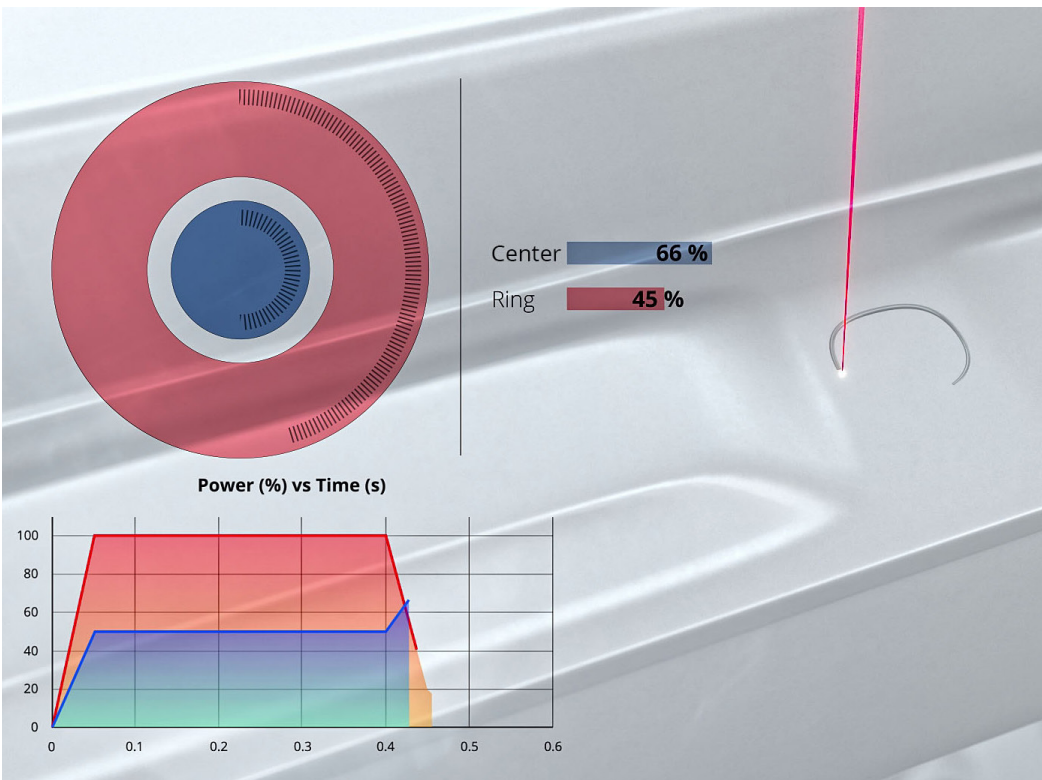
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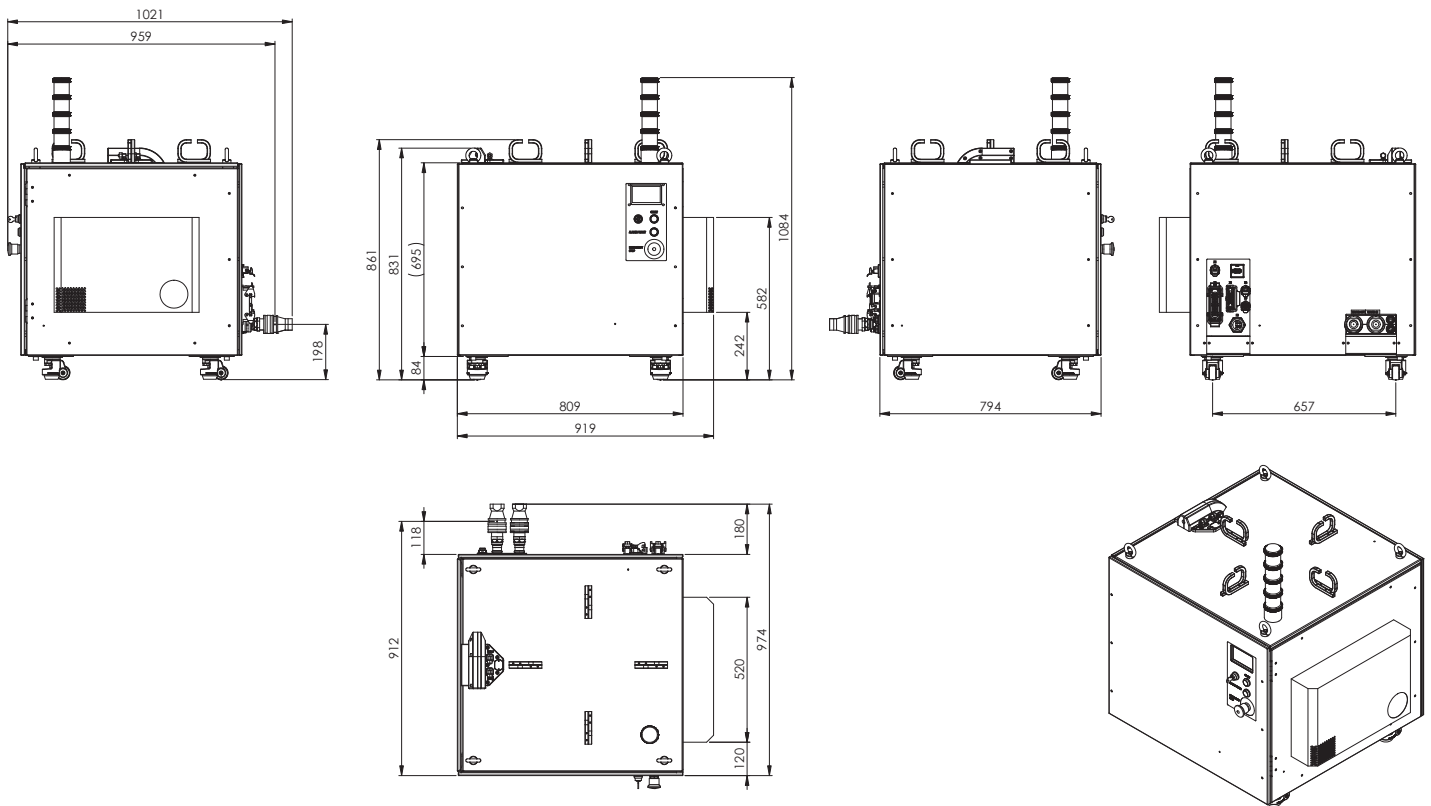
Adjustable Ring Mode (ARM) Laser Welding

- Independent power control of center and ring
- Zero-gap overlap welding of zinc-coated steel with no blowouts
- Defect-free welding with high repeatability of copper hairpins
- Up to 80% spatter reduction
- Minimal cracking and porosity, improved stability



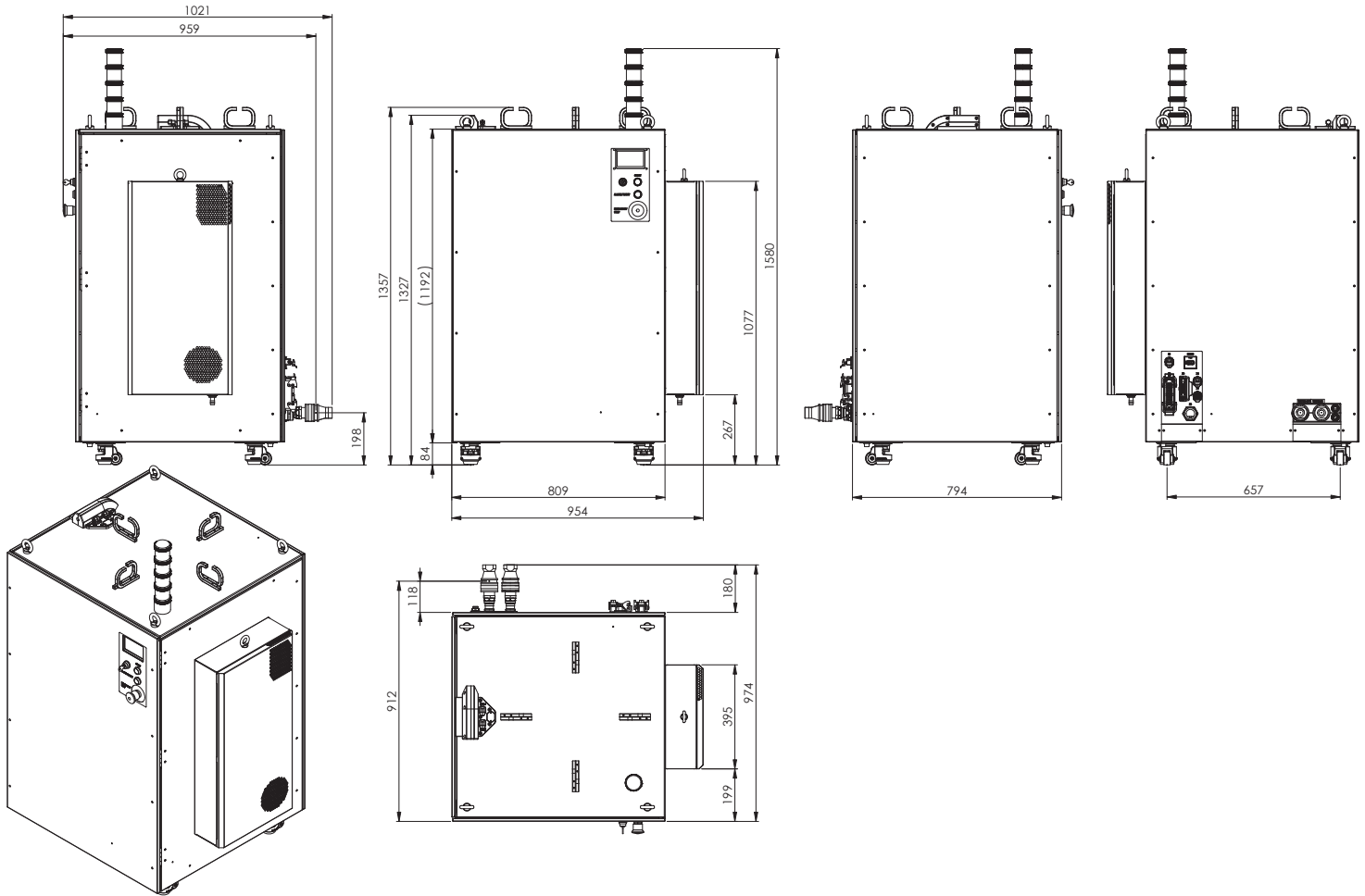
MECHANICAL SPECIFICATIONS

Midi:
HighLight FL2000C-ARM - FL5000C-ARM



MECHANICAL SPECIFICATIONS

**Maxi:
HighLight FL6000C-ARM - High FL10000C-ARM**



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Coherent follows a policy of continuous product improvement. Specifications are subject to change without notice.

Coherent offers a limited warranty for all HighLight Lasers. For full details of this warranty coverage, please refer to the Service section at www.Coherent.com or contact your local Sales or Service Representative.
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DANGER

VISIBLE AND/OR INVISIBLE LASER RADIATION
AVOID EYE OR SKIN EXPOSURE TO
DIRECT OR SCATTERED RADIATION

MODEL: HighLight FL V: FIBER LASER
MAXIMUM OUTPUT: 10000 WATTS CW
100 µSEC PULSE ∞ at wavelength in the range of 950 - 1150 nm
CLASS IV LASER PRODUCT

ALIGNMENT LASER DIODE INSTALLED
CLASS IIIa LASER RADIATION ALSO EMITTED
AVOID DIRECT EYE EXPOSURE
MAXIMUM OUTPUT: 5mW CW / WAVELENGTH: 633-670nm

CAUTION
INVISIBLE LASER RADIATION CLASS II
VISIBLE RADIATION CLASS II
INTERLOCK OPERATED
AVOID EYE OR SKIN EXPOSURE TO
DIRECT OR SCATTERED RADIATION

CAUTION
VISIBLE LASER RADIATION
CLASS IIIa
AVOID DIRECT EYE EXPOSURE

Coherent industrial lasers are designed in strict accordance with the respective safety regulations. We certify that each laser manufactured by our company complies with FDA Radiation Performance Standards, 21 CFR Subchapter J and with IEC 60825. Warning labels as shown in the figure appear on each Coherent laser to indicate the respective classification.