

# 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. Adjustable ring mode refers to the unique output beam from this laser, which consists of two independently controllable, co-axial beams from a single delivery fiber.

HighLight FL-ARM Compact lasers are available in two configurations. A multi-mode version (the center spot is multi-transverse mode), provides the ability to join parts having large or inconsistent gaps, while producing improved joint strength and a smaller heat affected zone (HAZ). It also delivers high speed and high throughput, spatter-free processing, and lowers overall production costs by largely eliminating the need for postprocessing. It is particularly useful for applications such as crack free welding of aluminum without filler wire, and zero-gap lap welding of zinc coated steel.

A superior brightness version of the laser (1.5 kW center + 2.5 kW ring) with the 25  $\mu\text{m}$  center core diameter and 15 m fiber length producing significantly smaller spot size, is also available.



### FEATURES

- Output power: 2000 to 10,000 Watts
- Adjustable Ring Mode (ARM)
- 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

## HighLight FL-ARM Compact

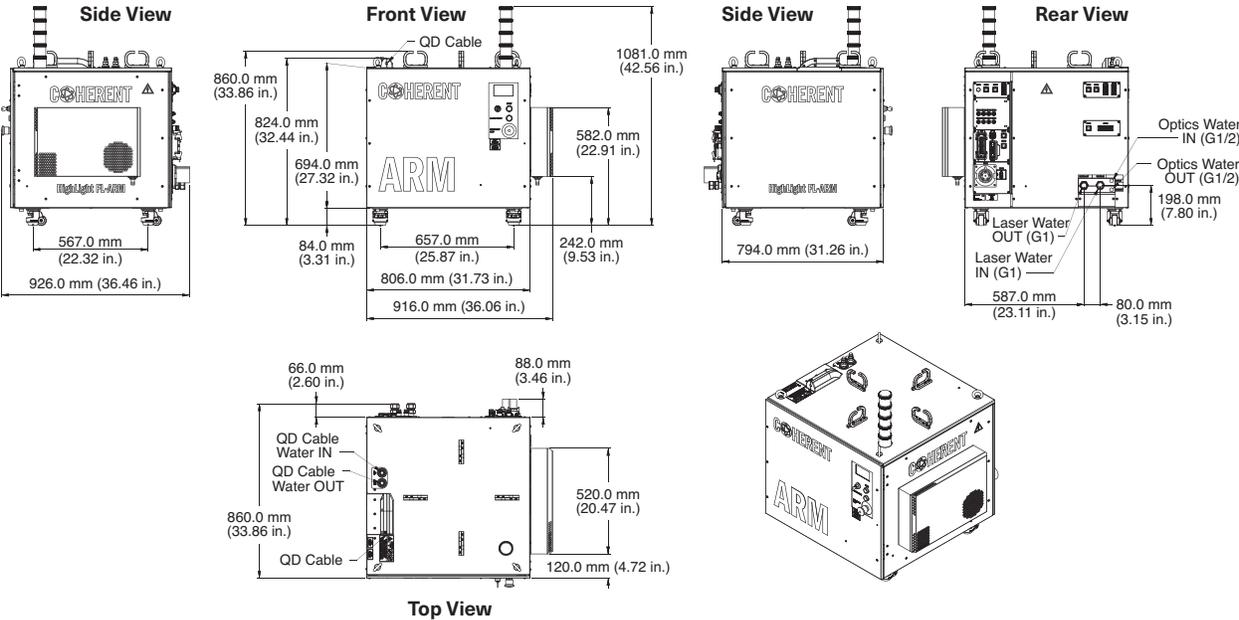
Specifications	HighLight FL2000C-ARM	HighLight FL4000C-ARM	HighLight FL5000C-ARM
Nominal Power (W)	2000	4000	5000
Power Range (%)	1 to 100		
Typical Laser Beam Quality (BPP) at Collimator (mm x mrad)	For 70/180 $\mu$ m Center <2.5, Ring <9 For 50/140 $\mu$ m Center <2.5, Ring <6.5		
Power Stability (%)	$\pm 1$		
Pulse Frequency Range (kHz)	CW - 10		
Wavelength	1070 $\pm 10$		
<b>Electrical Ratings</b>			
Voltage (VAC)	400/440/480 $\pm 10\%$		
Connected Load (kVA)	8.9	12.7	17.5
Effective Power at Nominal Power (kW)	8.7	12.5	17.3
Max. Current Consumption at 400 V (A)	12.5	18	25
Fuses Type NH (A)	32		
<b>Cooling</b>			
Recommended Cooling Capacity Laser and QHB/QD (kW)	4.4	8.9	11.1
Flow Rate Laser (l/min.)	43		
Flow Rate QHB/QD (l/min.)	2		
Temperature Laser ( $^{\circ}$ C)	25 $\pm 1$		
Temperature for QHB/QD ( $^{\circ}$ C)	24 to 45		
Max. Pressure Laser (MPa)	0.5		
Max. Pressure QBH/QD (Mpa)	0.4		
Typical Pressure Drop Laser (MPa)	0.25		
<b>Fiber Delivery System</b>			
Interface	QBH/QD		
Diameter ( $\mu$ m)	Center D 70 $\mu$ m, Ring OD 180 $\mu$ m / Center D 50 $\mu$ m, Ring OD 140 $\mu$ m		
Length (m)	20 m (other lengths on request)		
<b>Dimensions and Weights</b>			
Laser Dimension (L x W x H) (mm) without Signal Tower	Midi: 794 x 916 x 824		
Laser Weight (kg)	<350		
<b>Environmental Conditions</b>			
Ambient Temperature ( $^{\circ}$ C)	5 to 40		
Humidity ( $^{\circ}$ C)	Environmental conditions always below the dew point. Condensation to laser, QHB/QD and optics must be avoided during the operation, storage, and transport		
<b>Customer Interface</b>			
Digital Signals (V DC)	24		
Power Control (V DC)	0 to 10		
Gate Control (V DC)	24, rise/fall time <30 $\mu$ s		
<b>Options Laser</b>			
Ambient Temperature ( $^{\circ}$ C)	Field bus (Ethernet/IP, Profinet, Profibus, Devicenet, Ethercat), Scanner control interface, Multi station interface		

## HighLight FL-ARM Compact

Specifications	HighLight FL6000C-ARM	HighLight FL7500C-ARM	HighLight FL8000C-ARM	HighLight FL10000C-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 70/180 μm Center <2.5, Ring <9 For 50/140 μm Center <2.5, Ring <6.5			
Power Stability (%)	±1			
Pulse Frequency Range (kHz)	CW - 10			
Wavelength	1070 ±10			
<b>Electrical Ratings</b>				
Voltage (VAC)	400/440/480 ±10%			
Connected Load (kVA)	18.9	24.4	25.1	34.8
Effective Power at Nominal Power (kW)	18.7	24.2	24.9	34.6
Max. Current Consumption at 400 V (A)	27	35	36	50
Fuses Type NH (A)	63			
<b>Cooling</b>				
Recommended Cooling Capacity Laser and QHB/QD (kW)	13.3	16.7	17.8	22.2
Flow Rate Laser (l/min.)	65		84	
Flow Rate QHB/QD (l/min.)	2			
Temperature Laser (°C)	25 ±1			
Temperature for QHB/QD (°C)	24 to 45			
Max. Pressure Laser (MPa)	0.5			
Max. Pressure QBH/QD (Mpa)	0.4			
Typical Pressure Drop Laser (MPa)	0.25			
<b>Fiber Delivery System</b>				
Interface	QBH/QD			
Diameter (μm)	Center D 70 μm, Ring OD 180 μm / Center D 50 μm, Ring OD 140 μm			
Length (m)	20 m (other lengths on request)			
<b>Dimensions and Weights</b>				
Laser Dimension (L x W x H) (mm) without Signal Tower	Maxi: 794 x 916 x 1322			
Laser Weight (kg)	<490		<540	
<b>Environmental Conditions</b>				
Ambient Temperature (°C)	5 to 40			
Humidity (°C)	Environmental conditions always below the dew point. Condensation to laser, QHB/QD and optics must be avoided during the operation, storage, and transport			
<b>Customer Interface</b>				
Digital Signals (V DC)	24			
Power Control (V DC)	0 to 10			
Gate Control (V DC)	24, rise/fall time <30 μs			
<b>Options Laser</b>				
Ambient Temperature (°C)	Field bus (Ethernet/IP, Profinet, Profibus, Devicenet, Ethercat), Scanner control interface, Multi station interface			

## Mechanical Specifications

Midi: HighLight FL2000C-ARM - FL5000C-ARM



Maxi: HighLight FL6000C-ARM - High FL10000C-ARM

