



HighLight FL4000CSM-ARM Compact

Fiber Laser with Single Mode Center Beam and Adjustable Ring Mode (ARM)

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.

The HighLight™ FL4000CSM-ARM is available with an output power of 4 kW (1.5 kW center + 2.5 kW ring). The center fiber produces single mode output which enables a small focused spot. This laser extends the welding application areas over the standard single-mode fiber lasers, enabling it to weld “challenging” materials that were difficult or impossible to process in the past. These include thin (some tenths of a mm) substrates which do not tolerate high total heat input (e.g. foil to tab welding), and mixed materials having significantly different thicknesses and melting points.



FEATURES

- Output power: 4,000 Watts
- Adjustable Ring Mode (ARM)
- Single mode center beam
- 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

BENEFITS

- Reliable and fast welding process with high efficiency
- Superior welding seam quality with minimal heat affected zones
- Highest part quality with minimum reject rates
- Minimized operating costs

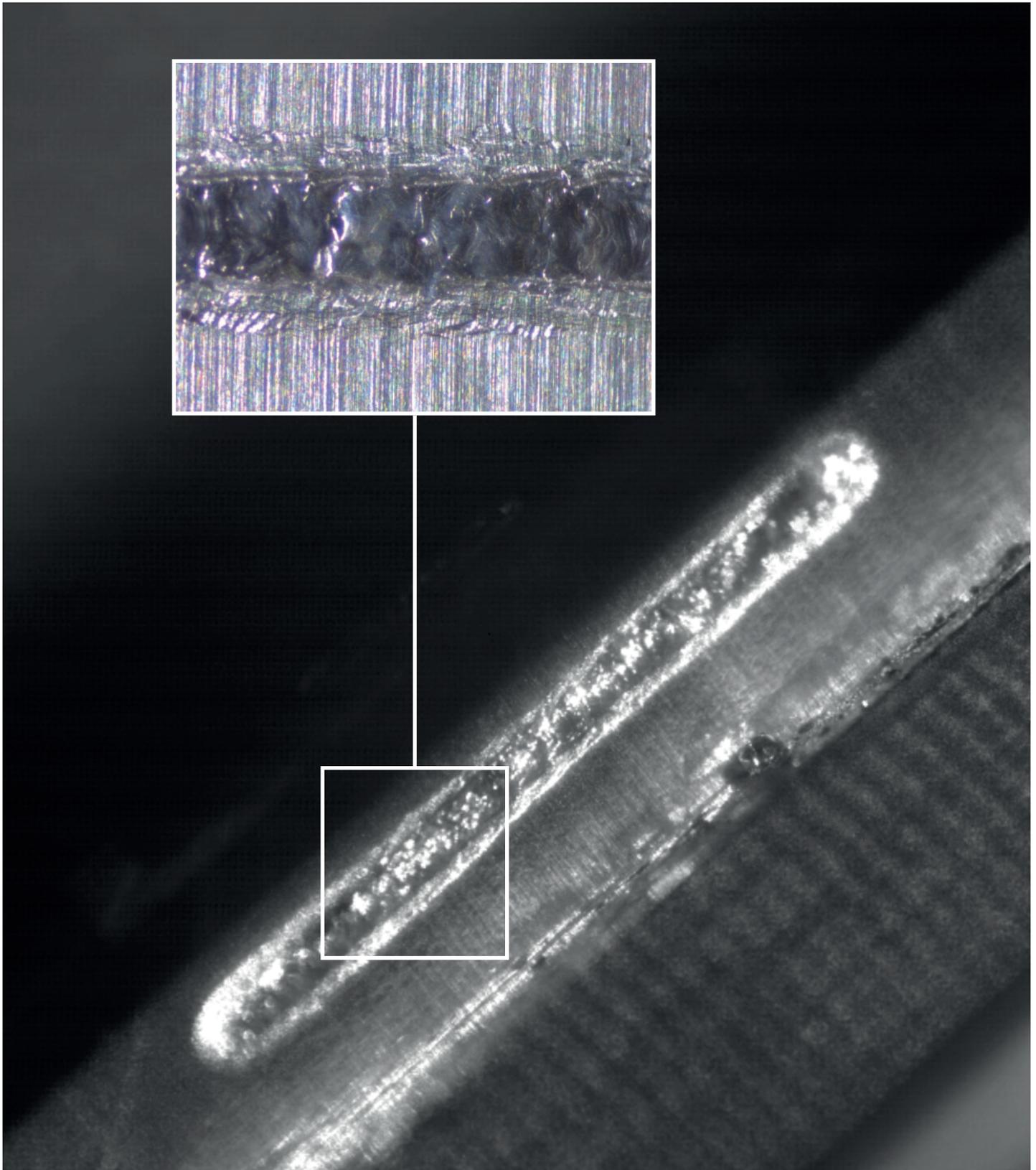
APPLICATIONS

- Welding of dissimilar materials such as copper and aluminum
- Welding of foil stacks with precise control
- Cutting



HighLight FL4000CSM-ARM Compact Datasheet

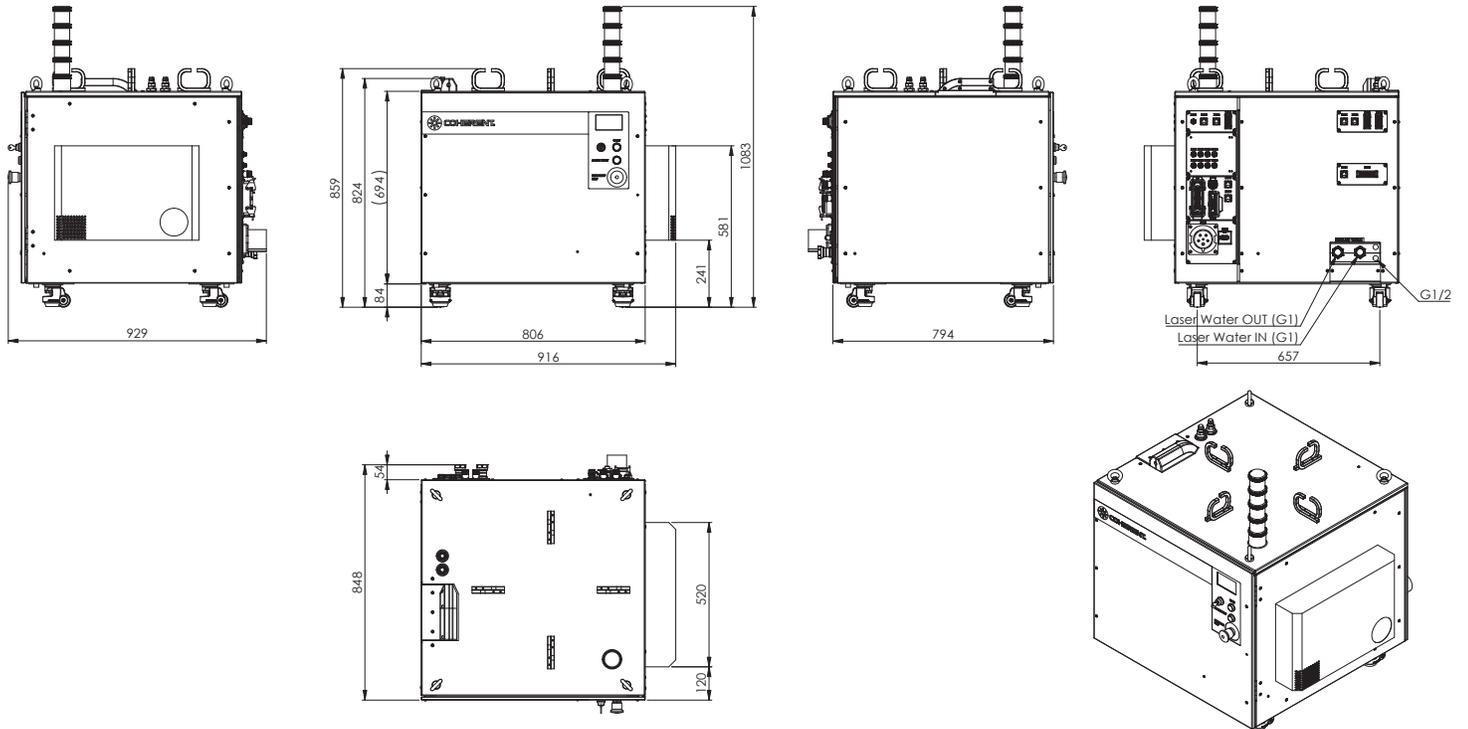
SPECIFICATIONS	HighLight FL4000CSM-ARM
Nominal Power (W)	4,000 Center 1,500 / Ring 2,500
Power Range (%)	1 - 100
Typical Laser Beam Quality (BPP) at Collimator (mm x mrad)	Center ≤ 0.6 Ring ≤ 8
Power Stability (%)	± 1
Pulse Frequency Range (kHz)	CW - 10
Wavelength (nm)	1070 \pm 10
ELECTRICAL RATINGS	
Voltage (VAC)	400/440/480 \pm 10%
Connected Load (kVA)	12.7
Effective Power at Nominal Power (kW)	12.5
Max. Current Consumption at 400 V (A)	18
Fuses Type NH (A)	32
COOLING	
Recommended Cooling Capacity Laser & QBH/QD (kW)	8.9
Flow Rate Laser (l/min)	43
Flow Rate QBH/QD (l/min)	2
Temperature Laser ($^{\circ}$ C)	25 \pm 1
Temperature for QBH/QD ($^{\circ}$ C)	24 - 45
Max. Pressure Laser (MPa)	0.5
Max. Pressure QBH/QD (MPa)	0.4
Typical Pressure Drop Laser (MPa)	0.25
FIBER DELIVERY SYSTEM	
Interface	QBH/QD
Diameter (μ m)	Center D 25, Ring OD 170
Length (m)	15
DIMENSIONS & WEIGHTS	
Laser Dimension L x W x H (mm) without signal tower	Midi: 794 x 916 x 824
Laser Weight (kg)	< 350
ENVIRONMENTAL CONDITIONS	
Ambient Temperature ($^{\circ}$ C)	5 - 40
Humidity ($^{\circ}$ C)	Environmental conditions always below the dew point. Condensation to laser, QBH/QD and optics must be avoided during the operation, storage, and transport.
CUSTOMER INTERFACE	
Digital Signals (V DC)	24
Power Control (V DC)	0 - 10
Gate Control (V DC)	24, rise/fall time < 30 μ s
OPTIONS LASER	
	Field bus (Ethernet/IP, Profinet, Profibus, Devicenet, Ethercat), Scanner control interface, Multi station interface



Picture: Welding of a aluminum (0.2 mm) to a copper tab (1.5 mm) with highest electrical conductivity and mechanical strength

MECHANICAL SPECIFICATIONS

**Midi:
HighLight FL4000CSM-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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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.