HighLight FL4000CSM-ARM Compact

Fiber Laser with Superior Brightness 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 fiber center core has the nominal diameter of 22 µm (with 15 m fiber length) producing a smaller spot size as compared to its multi-mode counterpart. 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)
- 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
- CleanWeld™ technology to optimize welding results

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

| Nominal Power (W)       | 4,000  
|-------------------------|-------- 
| Center                  | 1,500  
| Ring                    | 2,500  
| Power Range (%)         | 1 - 100 
| Laser Beam Quality (BPP) at Collimator (mm x mrad) | Center ≤ 0.6  
|                         | Ring ≤ 8  
| Power Stability (%)     | ± 1     
| Pulse Frequency Range (kHz) | CW - 5  
| Wavelength (nm)         | 1070 ± 10  

## ELECTRICAL RATINGS

| Voltage (VAC)           | 400/440/480 ± 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) | 70  
| Flow Rate QBH/QD (l/min) | 2  
| Temperature Laser (°C) | 25 ± 1  
| Temperature for QBH/QD (°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 (µm) | Center D 22, 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 (°C) | 5 - 40  
| Humidity (°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 µs  

## OPTIONS LASER

- Field bus (Ethernet/IP, Profinet, Proflbus, Devicenet, Ethercat), Scanner control interface, Multi station interface
MECHANICAL SPECIFICATIONS

Midi:
HighLight FL4000CSM-ARM

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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