

# DIAMOND J-2 Series

## RF-Excited OEM Industrial CO<sub>2</sub> Laser

The Coherent DIAMOND J-2 Series are sealed, pulsed CO<sub>2</sub> lasers offering average power greater than 150 Watts in a fully integrated and compact package. The unique pulsing characteristics derived from its slab discharge design enable the J-2 Series laser to reach peak powers well in excess of 450 W in contrast to CW modulated lasers. The J-2 Series lasers are available in 10.6  $\mu\text{m}$ , 10.2  $\mu\text{m}$ , and 9.4  $\mu\text{m}$ , and can be operated with pulsed repetition rates up to 200 kHz with fast pulse rise and fall times. This combination of wavelength selection, high peak power and fast rise and fall time times, together with power on demand and excellent beam quality makes the J-Series an ideal laser for a wide range of materials processing applications.

### FEATURES & BENEFITS

- Wide operating power range
- Peak power >450 W
- Pulse frequency from single-shot to 200 kHz
- Fast rise-and-fall time
- Outstanding beam quality
- Excellent power stability
- Low-cost OEM configuration
- Integrated but removable RF power supply
- Compact design
- Equipped with on-board internet-accessible diagnostics

### APPLICATIONS

- Converting
- Drilling
- Cutting
- Scribing
- Engraving
- Marking



SPECIFICATIONS <sup>1</sup>	DIAMOND J-2-9.4	DIAMOND J-2-10.2	DIAMOND J-2-10.6
Wavelength (μm)	9.36 ±0.4	10.25 ±0.1	10.6 ±0.4
Output Power <sup>2</sup> (W)	≥160	≥150	≥180
Power Range <sup>3</sup> (W)	15 to 160	15 to 150	15 to 180
Typical Peak Power <sup>4</sup> (W)	≥450	≥400	≥450
Power Stability <sup>2,5</sup> (%)	±6		
Mode Quality (M <sup>2</sup> )	<1.2		
Beam Waist Diameter <sup>6,7</sup> at 1/e <sup>2</sup> (mm)	7.0 ±1.0	8.5 ±1.0	8.5 ±1.0
Full-Angle Beam Divergence <sup>7</sup> (mrad)	≤2.4	≤2.0	≤2.0
Polarization (parallel to baseplate)	Linear ≥100:1		
Beam Ellipticity <sup>6,7</sup>	≥0.83, ≤1.2		
Pulse Frequency (kHz)	Single-shot to 200		
RF Excitation Pulse Width Range (μsec)	2 to 1000		
Duty Cycle Limit (%)	≤70		
Fall Time <sup>4</sup> (μs)	≤60		
Weight	35 kg (77.2 lbs.)		
Dimensions (L x W x H)	830.5 x 198.1 x 227.6 mm (32.7 x 7.8 x 8.96 in.)		
ELECTRICAL POWER REQUIREMENTS			
DC Input Voltage (VDC)	48 ±1.0%		
Continuous DC Current <sup>8</sup> (A)	≤60		
Peak Current (A)	≤120 for ≤6 ms		
COOLANT			
Heat Load (kW)	≤2.5		
Dynamic Coolant Flow Rate (l/min.)	≥5.7		
Coolant Setpoint Temperature Range	21 to 25°C (69.8 to 77°F)		
Coolant Temperature Stability (max.)	±1.0°C (±1.8°F)		
Coolant <sup>9</sup>	Anti-corrosion treated water		
Coolant Differential Pressure <sup>10</sup> (kPa)	103 (15 psi) at 5.7 l/min. (1.5 gpm)		
Coolant Maximum Static Pressure (kPa)	827 (120 psi)		
ENVIRONMENTAL CONDITIONS			
Ambient Temperature	5 to 45°C (41 to 113°F)		
Relative Humidity <sup>11</sup> (non-condensing) (%)	≤95		
Altitude	≤2000 m (≤6500 ft.)		

<sup>1</sup> All specifications apply when the product is operated in accordance with the guidelines defined in the operators manual.

<sup>2</sup> Measured at 10 kHz PRF, 70% duty cycle.

<sup>3</sup> Output stability specification may not be met at lowest power or at acoustic resonances.

<sup>4</sup> Measured for a 100 μs pulse width at 1 kHz repetition frequency.

<sup>5</sup> Measured as  $\pm(P_{\max}-P_{\min})/2P_{\max}$ .

<sup>6</sup> Measured at waist location -1.0 m from the laser output.

<sup>7</sup> Measured at 10 kHz PRF, 28% duty cycle.

<sup>8</sup> At 10 kHz PRF, maximum duty cycle operation.

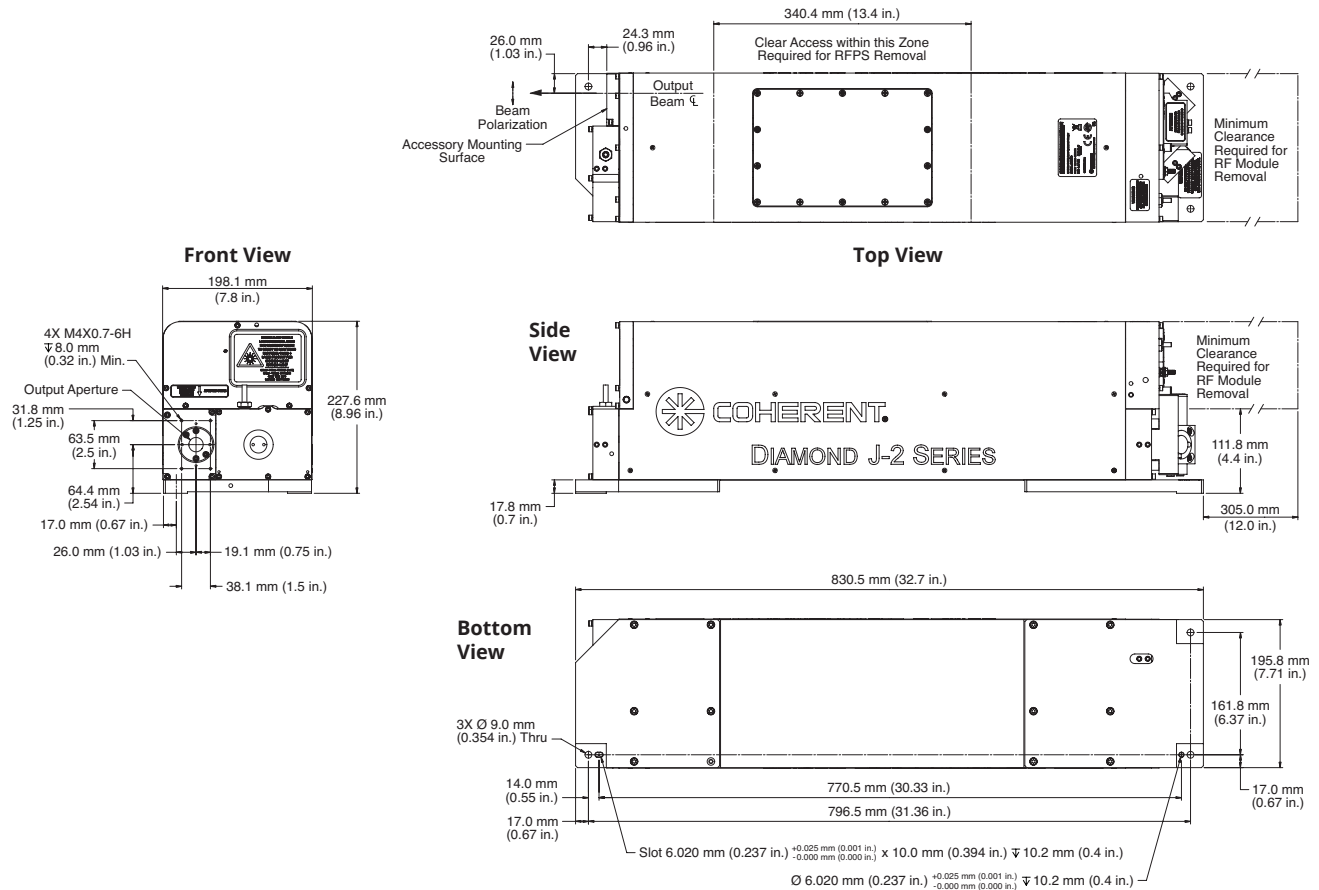
<sup>9</sup> See manual for details.

<sup>10</sup> This differential pressure is from system input to output and does not include the pressure drop from chiller fittings and the supply and return hose.

<sup>11</sup> Do not operate at or below dew point.

## MECHANICAL SPECIFICATIONS

### DIAMOND J-2



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All specifications subject to change without notice. Coherent, Inc. warrants to the original purchaser for a period of two years from the date of delivery that the DIAMOND J-2 Series product is free from defects in material and workmanship. The warranty does not apply to any unit damaged by accident, abuse or operation in a manner inconsistent with the procedures and specifications outlined in the manual supplied with the laser.

The DIAMOND J-2 CO<sub>2</sub> laser is a component that does not include all safety features as required by the FDA and the Center for Devices and Radiological Health (CDRH). It is sold solely to qualified manufacturers who in their end product will supply all interlocks and indicators, and will comply fully with CDRH regulations and/or local regulatory agencies. MC-015-14-0M0518Rev.D Copyright ©2018 Coherent, Inc.