DIAMOND J-3 Series

RF-Excited OEM Industrial CO_2 Laser

Coherent DIAMOND J-3 Series are sealed, pulsed CO_2 lasers offering average power greater than 250 Watts in a fully integrated and compact package. The unique pulsing characteristics derived from its slab discharge design enable the J-3 Series laser to reach peak powers well in excess of 750W in contrast to CW modulated lasers. The J-3 Series lasers are available in 10.6 µm, 10.2 µm, and 9.4 µm, 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 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.

The J-3 Series is part of the J-Series family spanning a power range from 150W to greater than 400W. The J-Series family is built on a common platform with common mechanical and electrical interfaces, common optical interfaces, common software and a common service and support strategy. All J-Series lasers offer proactive maintenance capability enabled by the integrated yet field replaceable RF power supply design and overall systems monitoring using Coherent's field proven full suite of on-board diagnostics.

FEATURES

- Wide operating power range
- High peak power >750W
- 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

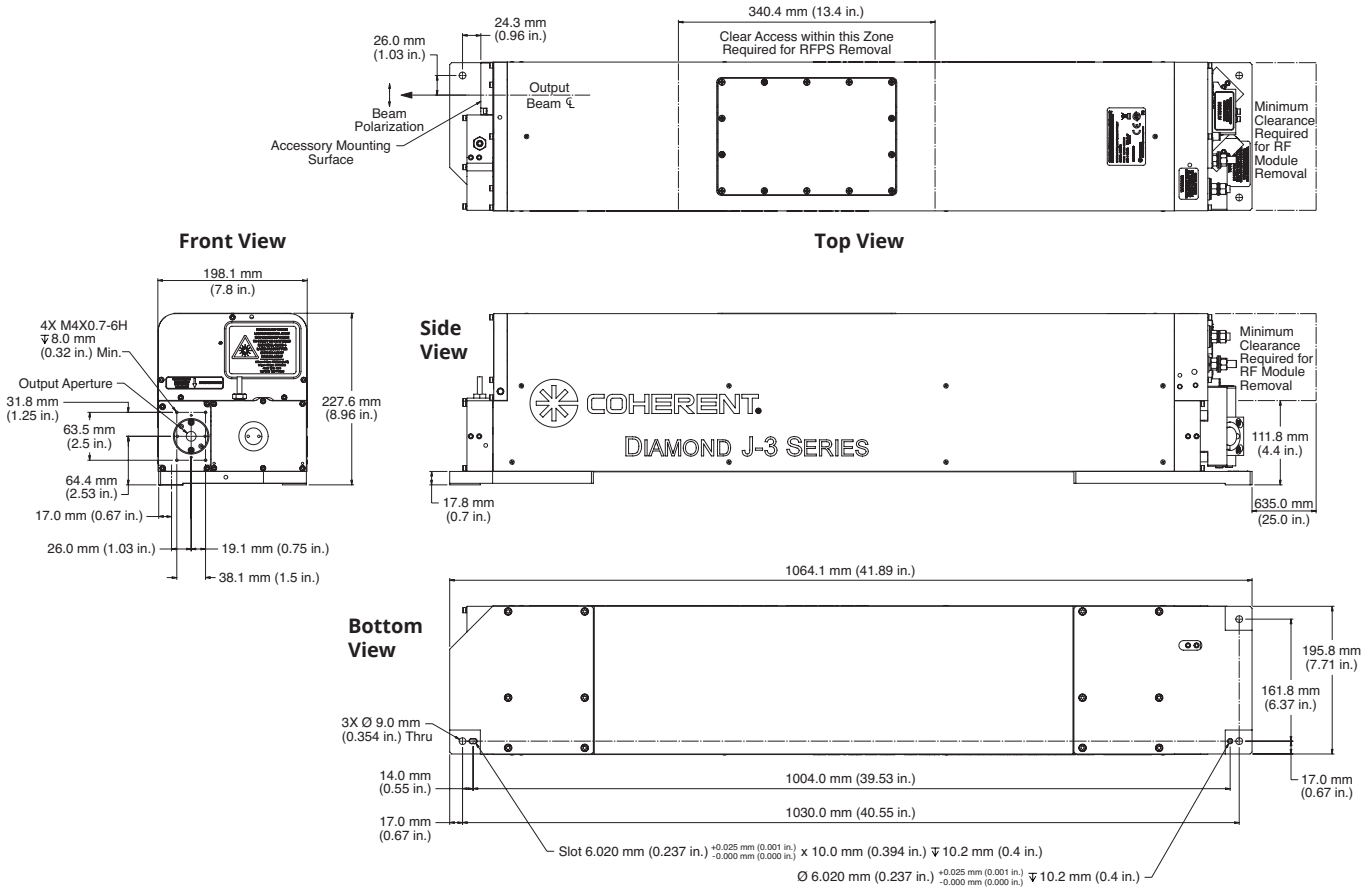
COHERENT®
Superior Reliability & Performance

SPECIFICATIONS	Diamond J-3-9.4	Diamond J-3-10.2	Diamond J-3-10.6
Wavelength (µm)	9.36 ±0.05	10.25 ±0.1	10.6 ±0.4
Output Power[2] (W)	≥250	≥225	≥250
Power Range[3] (W)	10 to 225	10 to 225	10 to 250
Nominal Peak Power[4] (W)	≥750		
Power Stability[2,5] (%)	±6		
Mode Quality (M^2)	<1.2		
Beam Waist Diameter[6,7] at $1/e^2$ (mm)	7.0 ±1.0	8.5 ±1.0	8.5 ±1.0
Full-Angle Beam Divergence[7] (mrad)	≤2.4	≤2.0	≤2.0
Polarization (parallel to baseplate)	Linear ≥100:1		
Beam Ellipticity[6,7]	≥0.83, ≤1.2		
Pulse Frequency (kHz)	Single-shot to 200		
RF Excitation Pulse Width Range (µsec)	2 to 1000		
Duty Cycle Limit (%)	≤60		
Fall Time[4] (µs)	≤60		
Weight	45 kg (99.2 lbs.)		
Dimensions (L x W x H)	1064.1 x 198.1 x 227.6 mm (41.89 x 7.8 x 8.96 in.)		
ELECTRICAL POWER REQUIREMENTS			
DC Input Voltage (VDC)	48 ±1.0%		
Continuous DC Current[8] (A)	≤90		
Peak Current (A)	≤200 for ≤6 ms		
COOLANT			
Heat Load (kW)	≤4.5		
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[9]	Anti-corrosion treated water		
Coolant Differential Pressure[10] (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[11] (non-condensing) (%)	≤95		
Altitude	≤2000 m (≤6500 ft.)		

1 All specifications apply when the product is operated in accordance with the guidelines defined in the operators manual.
2 Measured at 10 kHz PRF, 60% duty cycle.
3 Output stability specification may not be met at lowest power or at acoustic resonances.
4 Measured for a 100 µs pulse width at 1 kHz repetition frequency.
5 Measured as $\pm(P_{max}-P_{min})/2P_{max}$.
6 Measured at waist location ~1.0 m from the laser output.
7 Measured at 10 kHz PRF, 25% duty cycle.
8 At 10 kHz PRF, maximum duty cycle operation.
9 See manual for details.
10 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.
11 Do not operate at or below dew point.

MECHANICAL SPECIFICATIONS

Laser Head



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