Diamond J-1000

Liquid-Cooled, RF-Excited OEM Industrial CO_2 Laser

Diamond J-1000 Series are sealed, pulsed CO_2 lasers offering maximum powers up to 1 kW in a fully integrated and compact package. By incorporating the RF power supply within the laser head the J-Series completely eliminates the RF umbilical increasing laser reliability and simplifying integration into a workstation or robotic tool.

Available at both 10.6 µm and 9.4 µm wavelengths, the unique J-1000 Series design packs a host of high performance features making it uniquely suited for use in space-sensitive applications involving converting, cutting, engraving, perforating and drilling of paper, plastic films, plastics, glass, carbon composites, textiles, wood and even thin metals. The RF power module is field serviceable with no soldering. A full suite of on-board diagnostics (accessible via the Internet) enables proactive service management.

FEATURES

- Wide operating power range
- Typical peak power >3 kW
- Pulse frequency from single-shot to 200 kHz
- Fast rise/fall time
- Outstanding beam quality
- Excellent power stability
- Low-cost OEM configuration
- Integrated but detachable RF power supply
- Compact design
- Equipped with on-board internetaccessible diagnostics

APPLICATIONS

- High Speed Digital Converting
- Through-cutting, Kiss-cutting, and Perforation
- Engraving
- Die Board Cutting
- Glass Cutting and Thermal Processing
- Ceramic Drilling and Scribing
- Automotive: Interiors and Airbag Cutting, E-Mobility processes
- 3D Printing
- Semiconductor Processing

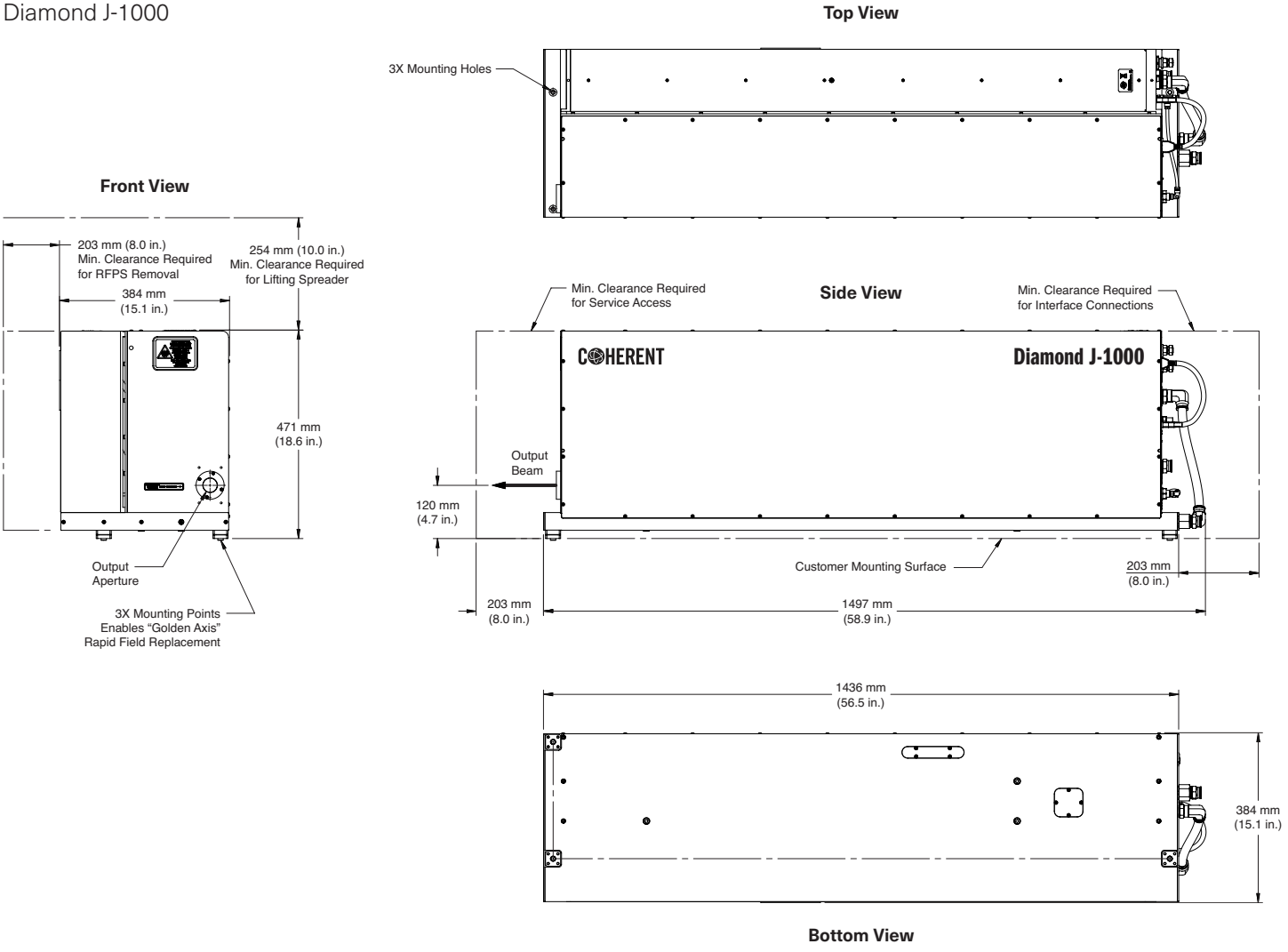
COHERENT

Specifications[1]	DIAMOND J-1000-10.6	DIAMOND J-1000-9.4
Wavelength (µm)	10.2 to 10.8	9.1 to 9.5
Output Power[2] (W)	≥1000	
Power Range[3] (W)	100 to 1000	
Peak Effective Power[4] (W)	>2800	
Power Stability[5] (%)	±5	
Mode Quality (M^2)	<1.2	
Near Field Beam Diameter [6,7] at $1/e^2$ (mm)	12 ±1.5	
Beam Waist Diameter[7,8] at $1/e^2$ (mm)	10 ±1.5	
Full-Angle Beam Divergence[7] (mrad)	1.6 typical, 2.0 max.	
Polarization (perpendicular to baseplate)	Linear >100:1	
Beam Ellipticity[7]	>0.83, <1.20	
Pulse Frequency (kHz)	Single-shot to 200	
RF Excitation Pulse Width Range (µsec)	2 to 1000	
Duty Cycle Limit (%)	≤60	
Fall Time[4] (µs)	<55	
Weight	173 kg (381 lbs.)	
Dimensions (L x W x H)	1497 x 384 x 471 mm (58.9 x 15.1 x 18.6 in.)	
Electrical Power Requirements		
CC Input Voltage (VDC)	48 ±1.0%	
Continuous DC Current (A)	≤425	
Peak Current (A)	<628 for up to 1 ms	
Coolant		
Heat Load (kW)	<22	
Dynamic Coolant Flow Rate (l/min.)	>25 (6.5 gpm) Coolant	
Coolant Temperature Stability (max.)	±1.0°C (±1.8°F)	
Coolant Setpoint Temperature Range	21 to 25°C (69.8 to 77°F)	
Coolant[9]	Anti-corrosion treated water	
Coolant Differential Pressure[10] (kPa)	344 (50 psi) at 25 l/min. (6.5 gpm)	
Coolant Maximum Static Pressure (kPa)	827 (120 psi)	
Environmental Conditions		
Ambient Temperature	5 to 45°C (41 to 113°F)	
Relative Humidity[11] (%)	<95 (non-condensing)	
Altitude	<2000 m (<6500 ft.)	

Notes:
1. All specifications apply when the product is operated in accordance with the guidelines defined in the operators manual.
2. Measured at 60% duty cycle and 10 kHz PRF.
3. Output stability specification may not be met at lowest power or at acoustic resonances.
4. Measured at 10% duty cycle and 1 kHz PRF.
5. Measured as $\pm(P_{max} - P_{min})/2P_{max}$.
6. Measured at approximately 0.4 m from the laser output.
7. Measured at 25% duty cycle and 10 kHz PRF.
8. Beam diameter at the waist location, located at approximately 5 m from the laser output.
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

Diamond J-1000



For more information
www.coherent.com