$CO_2$ Lasers

# Diamond J-6

## RF Excited OEM Industrial $CO_2$ Laser

The Coherent Diamond J-6 is a fully sealed, pulsed $CO_2$ laser offering average power greater than 500 Watts in a fully integrated and compact package. The unique pulsing characteristics derived from its slab discharge design enable the J-6 laser to deliver optimized pulsed and quasi-CW performance in contrast to regular CW modulated lasers.

The J-6 laser can be operated with pulse repetition rates up to 200 kHz at duty cycles up to 65%. This combination of high duty cycle at high pulse repetition frequency, together with power on demand and excellent beam quality makes the J-6 an ideal laser for applications benefitting from high power quasi-CW operation. These include galvo scanner based converting applications such as flexible packaging, folding cartons, perforation, and (label) kiss-cutting. Also included are textile patterning and engraving applications.

The J-6 laser is also optimized for other non-scanner based quasi-CW applications like flat panel display and automotive glass cutting, and reprographics.


## FEATURES

- Wide operating power range
- Pulse frequency from single-shot to 200 kHz
- Pulse duty cycle up to 65%
- Optimized pulsed and quasi-CW operation
- Outstanding beam quality
- Excellent power stability
- Low-cost OEM configuration
- Field serviceable RF power supply
- Compact design
- Onboard internet-accessible diagnostics

## APPLICATIONS

- Converting
- Textile Patterning
- Engraving
- Cutting
- Marking
- Reprographics

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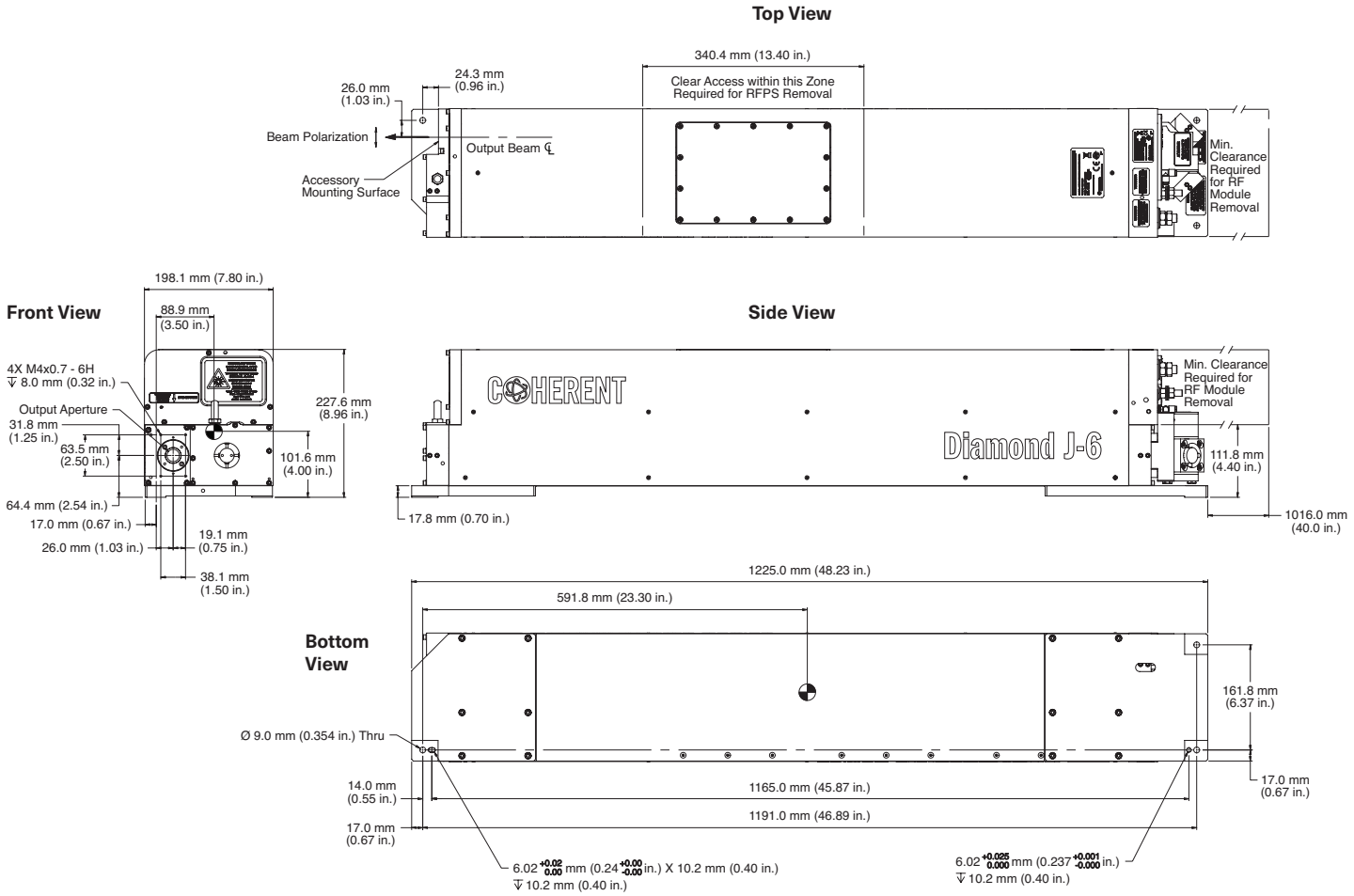
| Specifications[1] | Diamond J-6-10.6 |
|---|---|
| Wavelength (µm) | 10.6 ±0.4 |
| Output Power[2,3] (W) | ≥500 |
| Typical Output Power (W) | 650 |
| Power Range[4] (W) | 50 to 500 |
| Typical Peak Power[5] (W) | 1200 |
| Power Stability[2,6] (%) | ≤±6 |
| Power Stability with CL option[7] (%) | ≤±2 |
| Beam Diameter[8,9] (mm) | 8.5 ±1.0 |
| Beam Waist Diameter[8,10] at $1/e^2$ (mm) | 8.0 ±1.0 |
| Full-Angle Beam Divergence[8] (mrad) | ≤2.0 |
| Beam Elipticity[8,10] | ≥0.83, ≤1.2 |
| Typical Polarization (parallel to baseplate) | Linear ≥100:1 |
| RF Exictation Pulse Width Range (µs) | 2 to 130 |
| Pulse Repetition Frequency Range (kHz) | Single-Shot to 200 |
| Duty Cycle Limit[11] (%) | ≤65 |
| Fall Time[5] (µs) | ≤50 |
| Weight | 58 kg (127 lbs.) |
| Dimensions (L x W x H) | 1225 x 198.1 x 227.6 mm (48.23 x 7.8 x 8.96 in.) |
| **Electrical Power Requirements** | |
| DC Input Voltage (VDC) | 48 ±1% |
| Continous DC Input Current[12] (A) | ≤190 |
| Peak Current (A) | ≤380 for ≤6 ms |
| **Coolant** | |
| Heat Load[13] (kW) | ≤9 |
| Dynamic Coolant Flow Rate[13] (l/min.) | ≥9.5 |
| Coolant Setpoint Temperature Range | 21 to 25°C (69.8 to 77°F) |
| Coolant Temperature Stability (max.) | ±1.0C (±0.18°F) |
| Coolant[14] | Anti-Corrosion Treated Water |
| Coolant Differential Pressure[15] | 241 (35 psi) at 9.5 l/min. (2.5 gpm) |
| Coolant Maximum Static Pressure (kPa) | 827 (120 psi) |
| **Environmental Conditions** | |
| Ambient Temperature | 5°C to 45°C (41 to 113°F) |
| Relative Humidity[16] (non-condensing) (%) | ≤95 |
| 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 10 kHz, max. duty cycle after a 30 second warm-up from cold start.
3. Guaranteed in warranty period.
4. Output stability specification may not be met at lowest power or at acoustic resonances.
5. Measured for a 100 µs pulse width at 1 kHz repetition frequency.
6. Measured as (Pmax-Pmin)/(2*Pmax).
7. See J-series Closed Loop (CL) option for full specifications.
8. Measured at 10 kHz PRF, 30% duty cycle.
9. Measured at ~1.4 m from the laser output.
10. Measured at typical waist location ~3-4 m from the laser output.
11. For PRF <5 kHz duty cycle will be limited by 130 µs max pulse width.
12. At 10 kHz PRF, maximum duty cycle operation.
13. Laser only. Does not include margin for water cooled DCPS.
14. See manual for details.
15. Differential pressure is from laser input to output and does not include pressure drop from chiller fittings and supply and return hose.
16. Do not operate at or below dew point.

## Mechanical Specifications

Diamond J-6






For more information
www.coherent.com