

DIAMOND Ki-Series Specifications

	K-125i	K-225i
Output Power ¹ M ²	125W <1.3	225W <1.3
Power Range ¹	10-125W	10-225W
Pulse Frequency	0-100 kHz	0-100 kHz
Typical Performance		
Peak Effective Power	100-375W	200-650W
Pulse Energy Range	10-400 mJ	10-450 mJ
Pulse Rise & Fall Time	<25 μs/<40 μs	<25 μs/<40 μs
Power Stability ²	<±8%	<±8%
Beam-Pointing Stability ³	<200 μrad	<200 μrad
Beam Ellipticity	<1.2:1	<1.2:1
Beam Diameter (1/e ²)	0.27 ±0.02 in. 7.2 ±0.5 mm	0.27 ±0.02 in. 6.8 ±0.5 mm
Beam Divergence (Full Angle)	2.1 ±0.3 mrad	2.1 ±0.3 mrad
Wavelength	9.4 ±0.2 μm	9.4 ±0.2 μm
Polarization (Relative to Baseplate)	Linear >100:1	Linear >100:1
Average Power Range		10-225W
Modulation Pulse Width Range		2-1,000 μs
Facilities Requirements		
Electrical		
Electrical Input		
Voltage	208 VAC	208 VAC
Current	17A, 3-phase, with ground 50-60 Hz	17A, 3-phase, with ground 50-60 Hz
Or		
Voltage	380 VAC	380 VAC
Current	10A, 3-phase, with ground 50-60 Hz	10A, 3-phase, with ground 50-60 Hz
DC (For Basic & OEM)		
DC Power Supply	48 VDC ±1%	48 VDC ±1%
Max DC Current	84A rms	84A rms
Water		
Cooling-Water Flow Rate	1.5 gal/min 5.7 l/min	1.5 gal/min 5.7 l/min
Heat Load	4000W	4000W
Cooling-Water Temperature Range ⁴	50-95°F 10-35°C	50-95°F 10-35°C
Water Hardness (equiv. CaCO ₃)	<250 mg/l	<250 mg/l
Water Pressure	30-75 psi 210-520 kPa	30-75 psi 210-520 kPa
Environmental Conditions		
Ambient Temperature	41-104°F 5-40°C	41-104°F 5-40°C
Relative Humidity	<95%	<95%
Altitude	non-condensing <6,600 ft. <2000 m	non-condensing <6,600 ft. <2000 m
Weight		
Head	65 lb/30 kg	65 lb/30 kg
Power Module	140 lb/64 kg	140 lb/64 kg

DIAMOND Gi-Series Lasers. Need less power and a more compact package? Ask about DIAMOND Gi-Series lasers.



Coherent's DIAMOND Ki-Series Performance and Basis Packages are certified to comply with the Federal Regulations (21 CFR Subchapter J) as administered by Center for Devices and Radiological Health on all systems ordered for shipment after August 2, 1976.

Coherent's DIAMOND Ki-Series OEM Packages do not comply with the Federal Regulations (21 CFR Subchapter J) as administered by Center for Devices and Radiological Health. Purchaser acknowledges that his/her products must comply with these regulations before they can be sold to a customer.



Copyright 2000. All rights reserved.
MC-C05-2000-5M0400

K-125i

¹Guaranteed at 500 μs pulse width at 50% duty cycle with inlet cooling water temperature at 25°C. Allow a 1%/°C power derating for inlet cooling water temperature to a temperature of 35°C.

K-225i

¹Guaranteed at 600 μs pulse width at 50% duty cycle with inlet cooling water temperature at 25°C. Allow a 1%/°C power derating for inlet cooling water temperature to a temperature of 35°C.

Ki-Series

²Measured as $\pm(P_{max} - P_{min})/2P_{min}$ from cold start at 25°C.

³Full angle within a ±5°C water temperature change.

⁴Do not operate near dew point.

FOR SYSTEM INTEGRATION

The OEM versions of Coherent's DIAMOND Ki-Series Lasers are sold for use in OEM equipment. The OEM is responsible for compliance with all applicable safety regulations. For assistance in system integration, please contact our technical support group at (800) 367-7890.

WARRANTY

Coherent offers a limited, one-year warranty for DIAMOND Ki-Series Laser Systems. Please refer to the latest version of the Coherent, Inc., Laser Group Price List for full details of this warranty coverage.

Coherent, Inc. Laser Group

5100 Patrick Henry Drive
Santa Clara, CA 95054
Phone: 1-800-527-3786
1-408-764-4983

Fax: 1-800-362-1170
1-408-988-6838

E-mail: tech_sales@cohr.com
Web: http://www.cohr.com

Local Offices

Phone:
Japan +81 (3) 5635 8700
Benelux +31 (30) 280 6060
France +33 (1) 6985 5145
Germany +49 (6071) 9680
Italy +39 (02) 34 530 214
UK +44 (1353) 658 800

K-125i, K-225i Series



Coherent's DIAMOND™ Ki-Series CO₂ lasers are designed to deliver a beam at a wavelength of 9.4 microns with the same excellent field-proven performance and reliability as our standard K-Series lasers. Many materials exhibit higher absorption at 9.4 microns than 10.6 microns wavelength and can be processed with better quality and faster speed. The Ki-Series CO₂ lasers are specifically designed to address these materials.

Available in two models, the K-125i and the K-225i lasers feature the same high-quality beam characteristics termed as *Brilliance*—mode quality, fast pulse rise and fall time, and peak power. *Brilliance* allows the Ki-Series to perform the same tasks as traditional lasers with two to three times more CW output.

Characteristics of Brilliance™

The mode quality of the K-125i and K-225i is excellent, with an M² of less than 1.3. Coupled with this excellent mode quality is the DIAMOND's fast pulse rise and fall time—less than 40 microseconds. The faster the optical rise time, the lower the heat affected zone (HAZ). The remaining characteristic is the peak power, which is defined as instantaneous power available from the laser. For example, although the average power of a K-225i is 225 watts, its peak power is 650 watts—greater than 2X!

The K-225i and the K-125i lasers are based on the same diffusion-cooled, slab technology that allows the DIAMOND CO₂ laser product line to be compact, sealed, and scalable within a single resonator. The

slab technology is also maintenance-free and requires no consumables.

Processing Polyimide

Figure 1 shows the absorption spectrum of Kapton™ over the far-infrared wavelengths, showing the increased absorption at 9.4 microns over 10.6 microns. This difference in the light-material interaction means better processing quality.

Overall, the DIAMOND laser's faster and more efficient processing leads to higher-

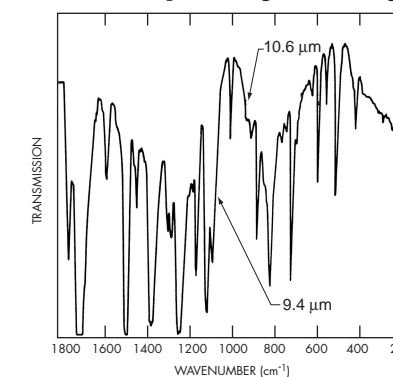


Figure 1. Conventional infrared absorption spectrum of polyimide. Thickness—5.3 μm.

quality results. DIAMOND lasers also give you excellent mode quality, fast optical rise time, and high peak power. Now, with the DIAMOND Ki-Series lasers, all these characteristics are available at 9.4 microns. Compared with any other lasers in their class, the Ki-Series let you do more work with less energy.

KEY FEATURES

- Ki-Series models available in 125W, and 225W average output power at 9.4 μm wavelength
- Compact, 'no maintenance,' single resonator design.
- Solid-start pre-ionization, which eliminates the need for tickle pulses or UV lamps.

KEY APPLICATIONS

- Metal Cutting
- Plastic Cutting
- Welding
- Drilling
- Engraving
- Marking
- Converting
- Scribing



K-125i, K-225i LASERS

PERFORMANCE PACKAGE

The DIAMOND Performance Package includes everything you need to start using your laser immediately. Simply connect the DIAMOND to the water supply and the electrical utilities. The laser is now ready to operate, with all controls accessible from the remote-control unit.

PERFORMANCE PACKAGE

- Laser head w/enclosure
- DC and RF power supplies
- Electronic shutter
- Visible aiming beam
- Computer-control interface
- Remote-control module
- 1-year warranty
- Cleaning and maintenance kit
- Universal voltage input
- User-installable
- CE mark compliant



BASIC PACKAGE

The DIAMOND Basic Package provides integrators with a modular structure for simplified system integration. The DIAMOND Basic includes the laser head with a manual shutter; the DIAMOND Digital Interface (DDI) and an RF amplifier. As an option, you can add a 48-volt DC power supply, which can be configured to operate at common worldwide input voltages.

BASIC PACKAGE

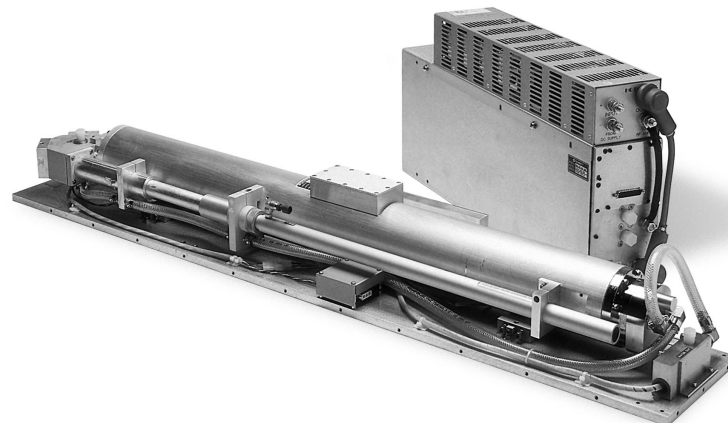
- Laser head w/enclosure
- RF power supply
- Mechanical shutter
- Computer-control interface
- 1-year warranty
- Cleaning and maintenance kit
- User-installable
- CE mark compliant

OEM PACKAGE

We designed the DIAMOND OEM Package for laser system manufacturers. This OEM unit provides the greatest flexibility and the best cost compatibility for the OEM environment. All DIAMOND OEM amplifiers feature the same control interface and provide access to RF diagnostics and pulse control. K-Series RF amplifier also provide a self-test mode, which allows the system supplier to test the laser from an internal clock.

OEM PACKAGE

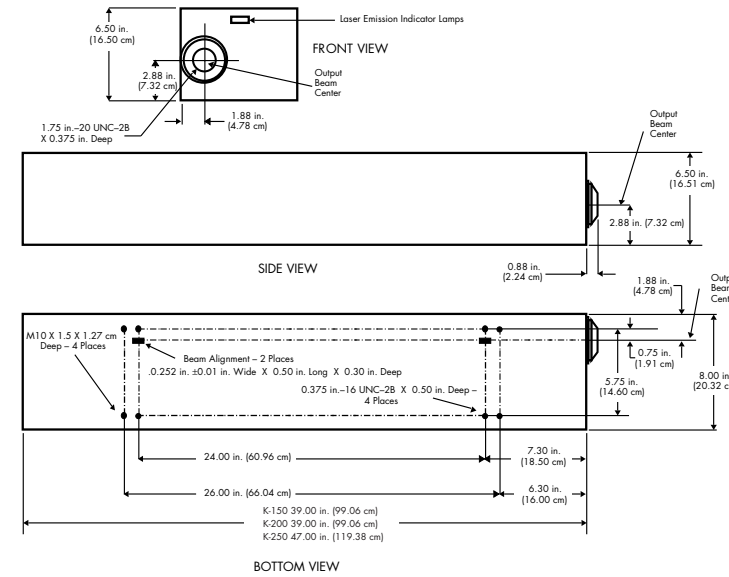
- Laser head
- RF power supply
- 10' RF cable
- 1-year warranty
- Conforms to EMC standards



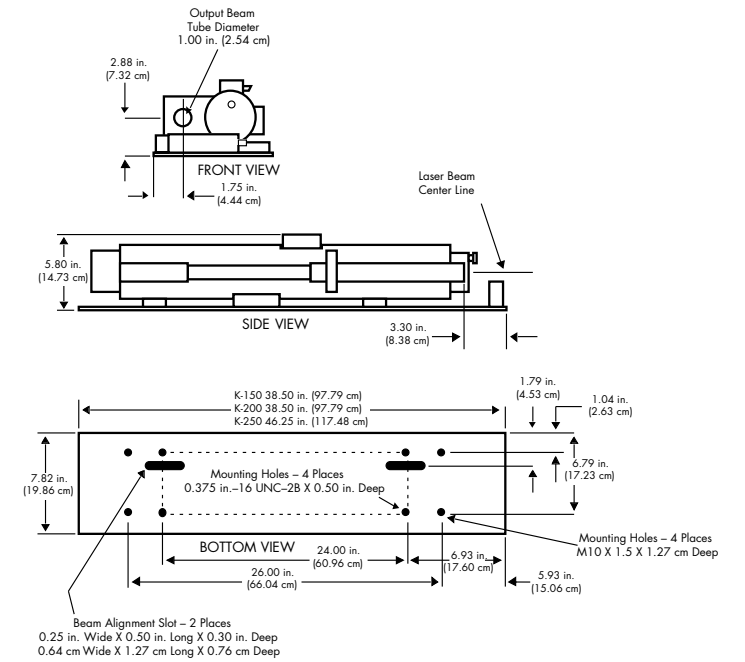
K-125i, K-225i DIMENSIONS

LASER HEAD

BASIC AND PERFORMANCE PACKAGES

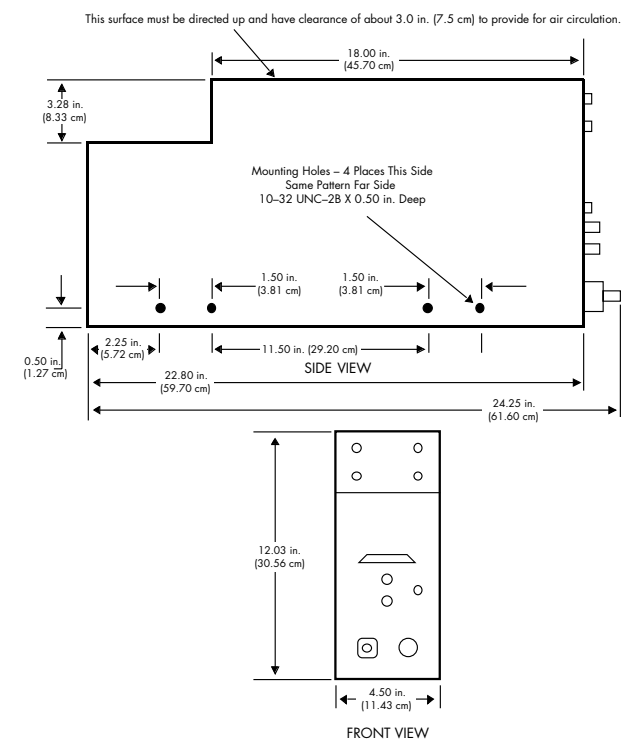


OEM PACKAGE



RF POWER SUPPLY

BASIC AND OEM PACKAGES



PERFORMANCE PACKAGE

