JDS Uniphase

Product Bulletin

2210 Series Argon Lasers

Argon Laser Heads in Rectangular Package

JDS Uniphase is the world's leading manufacturer of air-cooled ion laser systems. With tens of thousands of units in the field, our argon lasers are the lasers of choice for complex, high-resolution OEM applications such as flow cytometry, DNA sequencing, graphic arts, and semiconductor inspection.

With the introduction of the 2210 Series lasers, the first commercial argon lasers to incorporate hard-sealed internal mirrors on a metal-ceramic discharge tube, JDS Uniphase established new industry standards for performance and reliability in air-cooled ion lasers. The discharge tubes, including the mirrors, now could be vacuum baked at very high temperature to eliminate all contamination. Today, laser life is measured in years, not weeks or months, and the need to clean optics in the field has been completely eliminated. Furthermore, JDS Uniphase argon ion lasers are extremely stable over the entire range of operating current and temperature.

In the Model 2211 laser head, the Model 2311 laser tube is packaged with a heat exchanger and start circuit in an industry-standard rectangular housing. The mounting of the plasma tube in the housing facilitates replacement and provides thermomechanical isolation. The base plate has a variety of hole patterns, enabling users to replace other manufacturers' products without modifying their systems.

Key Features

- Integral-Mirror, Metal-Ceramic Construction
- Hands-Off Operation
- Ultralow Noise
- Fast Warm-Up
- Rugged Construction
- Vibration Isolation
- Ultrastable Resonator and Beam Pointing
- Extended Lifetime
- 5,000-Hour Warranty

Applications

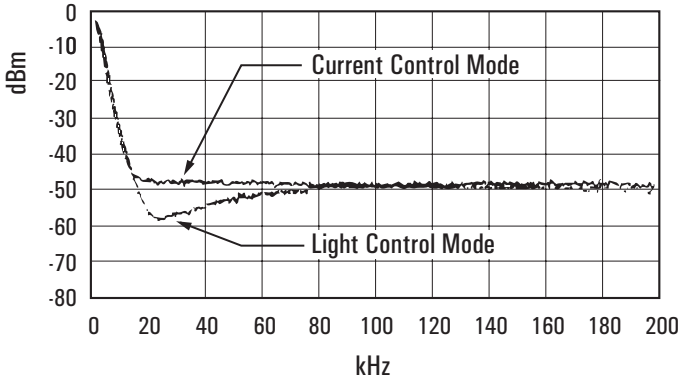
- DNA sequencing
- Flow cytometry
- Confocal microscopy
- Semiconductor inspection
- Hematology
- Highspeed printing
- Photo-processing

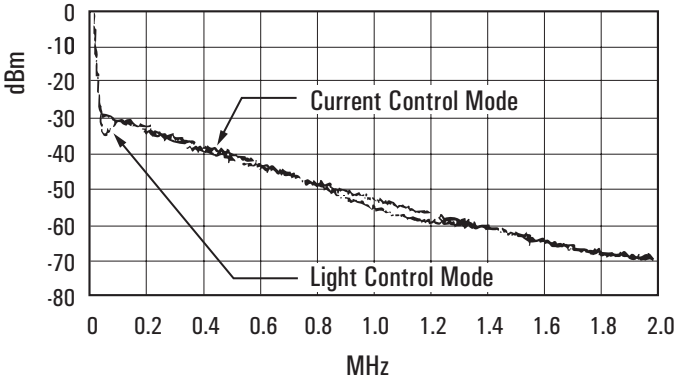
Compliance

- CE per specification EN 55011 and EN50082-2
- UL 1950 and 1262
- CDRH 21 CFR 1040.10
- CUL
- En 60825-1, -2
- EN 60950, IEC 950 or EN 61010

Noise Spectrum of Argon Ion Laser

The typical noise spectrum of an argon ion laser is shown in the graphs below. One trace is produced with the laser in current mode, and the second trace is produced in light mode. The traces in the upper graph illustrate the effectiveness of the light control loop canceling noise in the 20-Hz to 50-kHz range. The traces in the lower graph illustrate the noise spectrum from 20 Hz to 2 MHz.



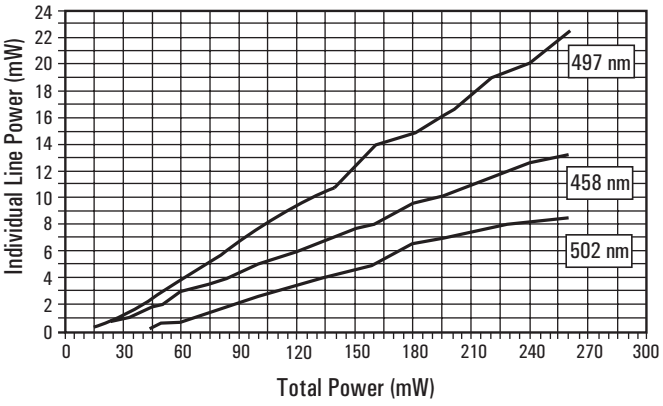


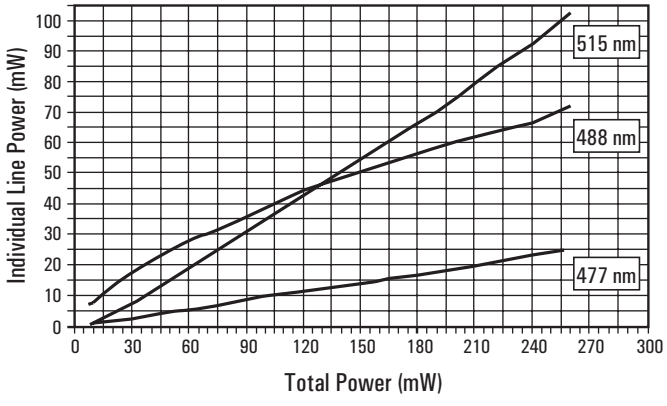
Output Power Specifications

Uniphase output power specifications are end-of-life specifications. Typically, when the laser is shipped from the factory, the output power is from1.5 to 2.5 times greater than the power specified in the table below–if the laser is operated in current control at maximum current. When the laser is operated in light control mode at the specified output power, the tube current initially will be very low. Gradually, as discharge losses increase due to gas depletion, the tube current will increase to compensate for the losses and to maintain stable output power. End of life is reached when the system can no longer maintain specified power at maximum tube current.

Output Power of the Individual Lines of a Multiline Laser

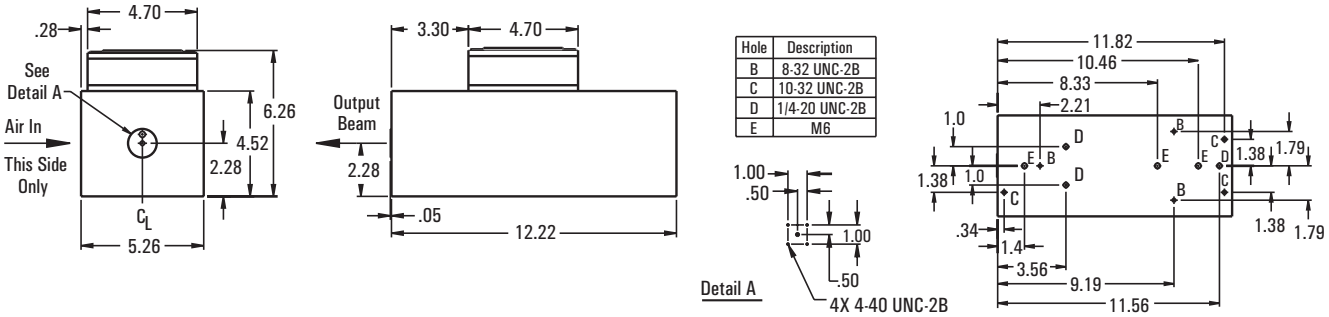
As many as six lines can lase simultaneously in a multiline laser. The graphs below display, on the vertical axes, the output power of the individual lines as a function of the total combined output power, shown on the horizontal axes.





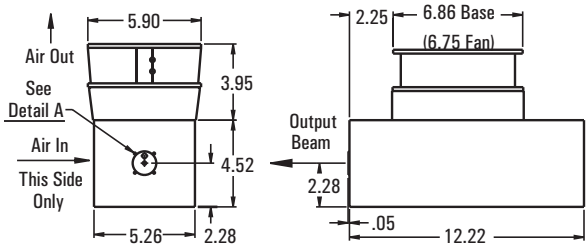
Common Environmental Specifications

	Operating	Non-operating
Temperature	4° C to 40° C	-30° C to 60° C
Altitude	0 to 10,000 feet	0 to 70,000 feet
Relative Humidity (no condensation)	0 to 90%	0 to 100%
Shock	25 g for 11 msec	25 g for 11 msec
Weight		
2211	14 lbs	



Dimensions above are for the following dash numbers:
30SL, 20GL, 30BL, 65ML, 100MLM, 6VL

Notes:
Dimensions in inches.
E-vector is located in the vertical plan. Beam is located within 0.02 inch of 2.28 inch dimension and parallel to centerline of the head within 5 milliradians.



Dimensions above are for the following dash numbers:
10SL, 20SL, 10GL, 15GL, 10BL, 20BL, 25ML, 40ML, 5VL

Warranty

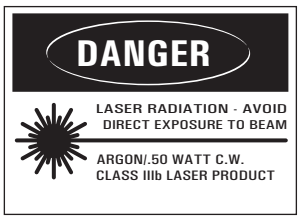
The 2311 plasma tube is warranted to be free from defects in materials and workmanship for 5,000 hours of operation at or below specified power or for 12 months from the date of shipment, whichever occurs first. All other components of the laser and power supply are warranted to be free from defects in materials and workmanship for 12 months from the date of shipment.

Model Number	Wavelength (nm)	Output Power (TEM_{00}) (mW)	Beam Diameter ($1/e^2$ points, ±5%) (multimode ±15%) (mm)	Beam Divergence (TEM_{00}, ±5%) (multimode ±15%) (mrad)	Min. Polarization Ratio	Beam Pointing Stability After Warm-Up (over 2 hrs, ±3° C) (µrad)
2211-10SL	488	10	0.67	0.95	250:1	< ±30
2211-20SL	488	20	0.67	0.95	250:1	< ±30
2211-30SL	488	30	0.67	0.95	250:1	< ±30
2211-10GL	515	10	0.67	0.95	250:1	< ±30
2211-15GL	515	15	0.67	0.95	250:1	< ±30
2211-20GL	515	20	0.67	0.95	250:1	< ±30
2211-4VL	458	4	0.67	0.95	250:1	< ±30
2211-5VL	458	5	0.67	0.95	250:1	< ±30
2211-10BL	*	10	0.67	0.95	250:1	< ±30
2211-20BL	*	20	0.67	0.95	250:1	< ±30
2211-30BL	*	30	0.67	0.95	250:1	< ±30
2211-25ML	**	25	0.67	0.95	250:1	< ±30
2211-40ML	**	40	0.67	0.95	250:1	< ±30
2211-65ML	**	65	0.67	0.95	250:1	< ±30
2211-100MLM	***	100	1.0	3.0	250:1	< ±30

Notes:
*BL (Blue Line) models: 458, 476, 488, and 497 nm, TEM_{00} (wavelength may not be present at 497 nm).
**ML (Multiline) models: 458, 476, 488, 497, 502, and 515 nm, TEM_{00} .
***MLM (Multiline, Multimode) models: 458, 476, 488, 497, 502, and 515 nm, multimode.

Ordering information

Indicate your requirements by selecting one option from each configuration table. For more information on this or other products and their availability, please contact your local JDS Uniphase sales representative or JDS Uniphase directly at 408 434-1800, or by fax 408 954-1177, or via email at sales.ca@us.jdsunph.com, or visit our Web site at www.jdsunph.com.



Europe - IEC

2214-100MLM

- M - multimode (no M - single mode)
- SL - single line operation at 488 nm
- GL - green line operation at 515 nm
- BL - blue line operation at 458, 476, 488, 497* nm
- ML - multiline operation at 458, 476, 488, 497, 502, 515 nm
- VL - violet line operation at 458 nm
- output power in mW (see Output Power specifications)
- model number of head
  - first digit 2 = argon
  - second digit 0 = system, 1= power supply, 2 = laser head
  - third digit 0 = last generation, 1= new generation
  - fourth digit 1 = medium power, rectangular package
    - 2 = low power, cylindrical package
    - 3 = high power, cylindrical package
    - 4 = medium power, cylindrical package

* wavelength may not be present

JDS Uniphase

JDS Uniphase Corporation
163 Baypointe Parkway
San Jose, California
95134 USA

Tel 408 434-1800
Fax 408 954-1177
sales.ca@us.jdsunph.com
www.jdsunph.com

2210 Rectangular Rev. A 02/00 Printed in USA