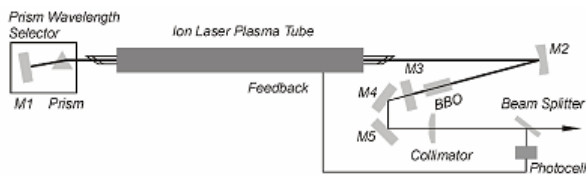


COMPACT DEEP UV GAS-ION LASER

The Lexel 85-SHG gas-ion laser provides continuous-wave deep ultraviolet coherent laser light with up to 90mW output. (If you need even more deep UV power, the larger [95-SHG](#) is available.) The 85-SHG is the first continuous-wave deep UV laser designed specifically for spectroscopic applications. Features include:

- **Small Size**
 - | Integrate deep UV easily into existing instrument configurations
 - | Lab-to-lab portability
- **Utility Friendly**
 - | Bring deep UV to virtually any lab
 - | Single phase 220 V power
 - | Cool with compact 4 kW chiller
- **Fundamental Stability Control**
 - | Spend time on your experiment, not on your laser
 - | Fast daily warm-up
 - | Hands-off deep UV power stability
 - | Ultra-stable deep UV beam pointing
- **Spectrum Isolation**
 - | Ensure any nearby laser lines are suppressed for improved Raman SNR
- **Excellent Deep UV Beam Profile**
 - | Focus easily to small spot with minimal pinhole loss
- **Versatility**
 - | Choose from multiple deep UV and visible lines



SECOND HARMONIC GENERATION - CAVITY CONFIGURATION

The 85-SHG laser is based on the proven [Lexel 85 series](#). It is an intracavity frequency-doubled system equipped with a nonlinear BBO crystal, to produce Second Harmonic Generation (SHG) deep UV coherent laser light. It uses the simplest, most stable three-mirror folded cavity design for frequency doubling. This provides two benefits:

- True hands-free laser operation in the ultraviolet.
- A high-quality TEM₀₀ beam that's suitable even for highly mode-sensitive applications.

Deep UV Applications

The 85-SHG is designed for long, stable life in a variety of scientific and industrial applications needing coherent deep UV laser light.

Scientific and industrial applications

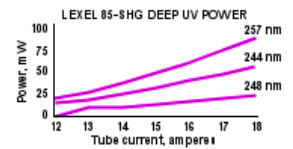
- UV Raman spectroscopy light source
- Capillary electrophoresis (CE)
- Detection of defects on semiconductor wafers
- Semiconductor surface Raman spectroscopy
- Protein spectroscopy
- Interferometric optics testing

Specifications

The BBO crystal (Beta Barium Borate: BaB₂O₄) is mounted on either a Manual Micrometer Stage or an optional Crystal Automatic Transition (CAT) Stage. The CAT stage provides true hands-free operation for industrial applications, by eliminating the need for BBO crystal tune-up.

A continuous supply of dry nitrogen is required when the system is operating.

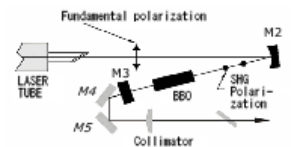
Custom laser wavelengths, other than the standard ones shown below, are available. Contact Cambridge



Actual measured deep UV power at 257 nm has gone up to 90 mW; at 244 nm reached 55 mW; and at 248 nm achieved 20 mW. (For even more power, see our [95-SHG](#) model.) [Click to see larger chart.](#)

Info on this page:

- [Deep UV Applications](#)
- [Specifications](#)
- [Power supply, head and tube](#)
- [Standard features](#)
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This shows the polarization parameters of the Lexel 85-SHG. [Click to see larger diagram.](#)



Lexel Model 85-SHG power supply and laser head. [Click any photo to see a larger version.](#)



"Cover-off" view of the Lexel 85-SHG laser head.



Close-up of the SHG cavity. Six adjustment knobs are provided for fine-tuning the output.

Lasers with your requirements.

LEXEL 85-SHG WAVELENGTH AND POWER			
Visible wavelength ¹	Output power, mW	SHG wavelength ²	Output power, mW
528.7 nm	130	264 nm	Inquire
514.5 nm	400	257 nm	50
501.7 nm	45	n/a	n/a
496.5 nm	100	248 nm	10
488.0 nm	350	244 nm	25
476.5 nm	100	n/a	n/a
457.9 nm	45	229 nm	Inquire

¹ Single line operation. Some wavelengths require special optics.
² One SHG wavelength per BBO crystal.

LEXEL 85-SHG BEAM PARAMETERS		
	514nm wavelength	257nm wavelength
Mode	TEM ₀₀	TEM ₀₀
Beam diameter ³	≤ 1.1 mm	1.0 x 1.2 mm
Beam divergence (full angle)	≤ 0.7 mrad	.6 x .6 mrad
Beam polarization Click here for polarization drawing 1 and drawing 2	Horizontal	Vertical
Power stability ⁴ (light control)	±0.2%	±1.0 %

³ Beam diameter measured at the front of output coupler
⁴ After 15 minute warm-up

LEXEL 85-SHG OPERATIONAL AND DIMENSIONAL	
Electrical service requirements	220VAC, single phase 35A, 50/60 Hz
Cooling water flow	1.5 gpm at 15-70 psi (5.6 liter/min at 1.0-4.9 Kg/cm ²)
Cooling water source	Filtered tap water
Incoming water temperature	50-90° F (10-35° C) Non-condensing environment
N2 flow rate	0.5-1.0 liter/min; 0.3 - 0.5 psi
Laser head, L x W x H Click here for dimensional drawing	41.5 x 7.2 x 6.1 inches (105.4 x 18.3 x 15.5 cm)
Power supply, depth x W x H	18.4 x 16.6 x 8.0 inches (46.7 x 42.2 x 20.3 inches)
Laser head, weight	Uncrated: 62 lbs (28 kg) Crated: 103 lbs (47 kg)
Power supply, weight	Uncrated: 82 lbs (37 kg) Crated: 104 lbs (47 kg)

Specifications as of 2/2004. Subject to change without notice.

Power supply, head and tube

The Lexel 85-SHG laser is CDRH-certified with all safety features. It comes with a two-year/2,000 hour warranty on the system (excluding the BBO crystal). The BBO crystal for a CAT stage is warranted for 1 year or 1000 hours, whichever comes first; for a manual stage crystal, the warranty is 90 days.

Power supply

The [power supply](#) front panel contains all controls necessary to operate and fully monitor the laser system.

- Linear low noise power supply
- Current and light regulation
- 0-10V external modulation
- Panel mounted power meter
- Automatic starting
- Remote turn-on capability

Laser head

Within the [laser head](#), an ultra-stable solid Invar[®] [optical resonator](#) holds the plasma tube and mirrors in precise alignment to produce deep UV coherent laser light.

- Solid Invar[®] resonator
- Temperature-compensated prism wavelength selector
- Fine tuning capability
- Multiline mirror holder for all lines operation

Laser tube

A simple and reliable [plasma tube](#) design. Lexel's solid ceramic plasma tube design has been proven since 1972, while other ion laser manufacturers have tried and abandoned several designs in an attempt to match Lexel's stability and performance. In fact, a majority of the more than 18,000 Lexel plasma tubes still operate today, some with 20,000 hours use.

- Sealed intracavity spaces
- Free-flow gas supply
- High-efficiency solid ceramic plasma tube

Standard features

Current and light regulation

The Lexel 85-SHG laser can be operated in current or UV light control:

- *Current regulation* allows direct control of the current through the plasma tube via an external source.
- *UV light regulation* provides the ultimate in deep UV laser output stabilization. A small portion of the deep UV light is sampled within the laser and compared to a reference signal in a differential circuit that automatically adjust the laser current to maintain a constant output.
This feature also allows for the deep UV light level to be modulated externally with a ± 10 volt signal.

Fine tuning

The laser is aligned accurately with the use of fine tuning knobs.

Remote turn on

This feature permits the laser power supply to be turned on and off and the plasma tube to be started remotely.

Automatic starting

This circuit automatically starts the plasma tube approximately 20 seconds after the power supply is turned on.

Panel-mounted power meter

This multirange power meter continuously displays the output power of the laser.

Optional features

Resonator Cavity Stabilization System

Spectrum isolation for enhanced Raman SNR

UV fiber delivery

Crystal Automatic Translation (CAT)

[Model 503-S Temperature Controlled Etalon Assembly](#)

The extremely stable 503-S etalon assembly allows single longitudinal mode operation, for applications requiring long coherence length and very narrow line width. The output power is typically in the range of 50% of the original output.

Initial Installation and Hands-On Training

One-day on-site installation and hands-on training for 85-SHG series within the U.S. and Canada.

Accessories

Model BBO-85-"x" BBO Crystal with Housing

This replacement BBO crystal with special coating is optimized at "x", which is [257](#), [244](#), or [248 nanometers](#). Each crystal is assembled with a temperature-controlled housing unit and is ready for installation into a 85-SHG series system.

N2 Nitrogen Generator

This custom-designed nitrogen generator can produce nitrogen at 98.5% purity. This is particularly useful

for uninterrupted, unattended operation of 85-SHG with CAT feature. The amount of nitrogen can be adjusted between 0.1-1.5 liter/min for optimal performance. The complete system includes a built-in automatic on/off compressor and an inlet air filter.

Model 507 Adapter

An adapter threads into the 3/4"-32 optical thread at the output aperture of the laser converting it to a 1-32 female thread for mounting optical accessories with this larger size thread.

Model 508 Remote Power Monitor

A power monitor operates in conjunction with the option 7507 panel-mounted power meter to allow continuous monitoring of the laser power at locations away from the power supply. *This is strongly recommended for a Manual Micrometer Stage system.*

Model 7504 Rack-Mounted Power Supply

All Lexel 85-series power supplies can be equipped with a rack mounting panel for mounting in a standard 19"(438mm) equipment cabinet.

Pricing

For pricing and availability, call Cambridge Lasers Laboratories.

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