



## LEXEL™ 85 / LEXEL™ 95 ION LASERS



### LEXEL™ Models:

- **LEXEL 85:** 1.0 Watts TEM<sub>00</sub> Argon
- **LEXEL 85-K:** 0.225 Watts TEM<sub>00</sub> Krypton
- **LEXEL 95:** 2-5 Watts TEM<sub>00</sub> Argon
- **LEXEL 95-K:** 0.75-1.5 Watts TEM<sub>00</sub> Krypton
- **LEXEL 95L:** 5-6 Watts TEM<sub>00</sub> Argon
- **LEXEL 95L-UV:** 0.15 Watts, UV TEM<sub>00</sub> Argon

### Standard Features:

- Solid Invar® Resonator
- Linear Low-noise Power Supply
- High Efficiency Solid Ceramic Plasma Tube
- Free-flow Gas Supply
- Temperature Compensated Wavelength Selector
- Current and Light Regulation
- Remote Turn-on Capability
- Automatic Starting
- Panel Mounted Power Meter
- 0-10 Volt External Modulation
- Fine Tuning Capability
- Sealed Intracavity Spaces
- Full CDHR Compliance
- Installation Kit
- 2 year / 2000 Hour Warranty
- Multiline Mirror Holder for all Lines Operation

### Applications:

- Spectroscopy
- Laser Doppler Velocimetry
- Flow Visualization
- Alignment
- Holography
- Non-destructive Testing
- Semiconductor Processing
- Information Processing
- Disc Mastering
- OEM Medical Applications
- Cytofluorescence



Polytec GmbH  
Tel: +49 (30) 63 92 51 40

Schwarzschildstr. 1  
Fax: +49 (30) 63 92 51 41

D – 12489 Berlin  
E-Mail: wl@polytec.de

GERMANY  
www.polytec.de



## **LEXEL™ 85/95 Ion Lasers**

---

The LEXEL 85 and LEXEL 95 ion lasers have a 38 year history of the highest quality and performance. Both models are used in a variety of applications including laser Doppler velocimetry, spectroscopy and non-destructive testing. These applications demand excellent performance in both laboratory and industrial environments.

The LEXEL 85/95 series is a basic laser system with superior performance characteristics in the 1-7 Watt TEM<sub>00</sub> argon power range. The front panel of the power supply contains all controls necessary to operate and fully monitor the laser system.

The laser head consists of an ultra-stable solid Invar® optical Resonator that holds the plasma tube and mirrors in precise alignment. The key to the LEXEL 85/95 reliability has been a simple and durable plasma tube design.

LEXEL's solid ceramic plasma tube design has been proven since 1972, while other ion laser manufacturers have gone through several design changes in an attempt to achieve the LEXEL stability and performance. In fact, a majority of the more than 11,000 plasma tubes sold by LEXEL still operate today, some with over 20,000 hours of use.

The LEXEL 85 and LEXEL 95 models continue to offer the best value in a small frame ion laser in the industry today.

## **LEXEL™ 85/95 Standard Features**

---

- **Current and light regulation**  
The LEXEL 85/95 can be operated in current or light control. Current regulation allows direct control of the current through the plasma tube. Light regulation provides the ultimate in laser output stabilization. A small portion of light is sampled within the laser and automatically adjusts the laser current to maintain a constant output. This feature also allows for the light level to be modulated externally with a 0-10V signal.
- **Temp. Compensated Prism Wavelength Selector**  
Stable single line operation is achieved by LEXEL ion lasers with the prism wavelength selector. A full Brewster prism is utilized to achieve good separation of even the closely spaced lines.
- **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 45 seconds after the power supply is turned on.
- **Panel Mounted Power Meter**  
This multi-range power meter continuously displays the output power of the laser.

- **Model 502 Multiline Mirror Holder**

This assembly holds the high reflector mirror to allow multiline operation. This feature may be substituted for the wavelength selector.

## **LEXEL™ 85/95 Options:**

---

- **Model 503 Etalon Assembly**

The extremely stable etalon assembly allows single longitudinal mode operation for the most demanding applications requiring long coherence length and vary narrow line width.

## **LEXEL™ 85/95 Accessories**

---

- **Model 510 Laser Power Meter**

The self powered and easy to use power meter can be used with argon, krypton, mixed gas and dye laser systems. Please see separate data sheet for details.

- **Model 508 Remote Power Monitor**

A power monitor operates in conjunction with the panel mounted power meter to allow continuous monitoring of the laser power at locations away from the power supply.

- **Model 530 Resonator Stabilizer**

This option facilitates warm-up to full power and stability specifications within 20 minutes.

- **Model LN<sub>2</sub> Nitrogen Generator**

The LEXEL LN<sub>2</sub> is the smallest, and most versatile Nitrogen Generator on the market. It's only 48 cm high and has a purity of up to 99.9995% at 200 cc / minute.

- **Safety Compliance Accessories**

We have a highly experienced, and trained, staff to help you with selecting laser safety glasses, goggles, barriers & curtains, viewing windows, or any other laser safety products you might need.

- **Other Optical Accessories**

LEXEL can provide or recommend a number of other optical accessories for use with ion lasers. Accessories such as beam expanders, spatial filters, cavity dumpers, mode-lockers or dye lasers are commonly used with LEXEL lasers. Contact us if these or any other special accessories are required.

- **Rack Mounted Power Supply**

All LEXEL 85/95 power supplies can be equipped with a rack mounting panel for installation in a standard 19" (483mm) wide equipment cabinet.

- **Inter Connection Cable Extension, 20 Foot**

Available on both the LEXEL 85 and LEXEL 95

- **Inter Connection Cable Extension, 40 Foot**

Available only on the LEXEL 95

## LEXEL™ 85/95 PERFORMANCE SPECIFICATIONS<sup>1</sup>

	Model 85 Series	Model 95 Series
<b>Beam diameter<sup>2</sup> (@ 1/e<sup>2</sup> points)</b>		
514.5 nm TEM <sub>00</sub> (Argon)	1.1 mm	≤ 1.3 mm / ≤ 1.5 mm <sup>5</sup>
647.1 nm TEM <sub>00</sub> (Krypton)	1.2	≤ 1.3 mm / ≤ 1.5 mm <sup>5</sup>
<b>Beam divergence<sup>2</sup> (full angle)</b>		
514.5 nm TEM <sub>00</sub> (Argon)	0.7 mrad	0.6 mrad
647.1 nm TEM <sub>00</sub> (Krypton)	0.9	0.9
<b>Beam polarization ratio</b> > 100:1 E-Vector Vertical		
<b>Cavity length<sup>3</sup> (L)</b>		
With prism wavelength selector	0.80 m	1.0m / 124 m <sup>5</sup>
With multiline mirror holder	0.76	0.96 / 1.20 m <sup>5</sup>
<b>Longitudinal mode spacing<sup>3</sup> (C/2L)</b>		
With prism wavelength selector	188 MHz	150 MHz / 122 MHz <sup>5</sup>
With multiline mirror holder	197	156 MHz / 126 MHz <sup>5</sup>
<b>Optical resonator</b> Solid Invar® rod structure		
<b>Amplitude power stability</b> (1 hour period after 30 min. warm-up)		
In light control	≤ ± 0.2%	≤ ± 0.2%
In current control	≤ ± 2%	≤ ± 3
<b>Optical noise</b> (10Hz to 2 MHz)		
Light control	≤ 0.5% rms	≤ 0.2% rms
Current control	≤ 1.5	≤ 1.0
<b>Electrical service requirements</b>		
	220 VAC single phase, 30A, 50/60 Hz	208 VAC, 3 phase WYE or DELTA, 35A/50A <sup>5</sup> , 50/60 Hz
<b>Input voltage range<sup>4</sup></b>		
	190-245 Volts	190-235 Volts
<b>Cooling water requirements<sup>7</sup></b>		
	1.5 gpm at 15 psi (5.6 liters/min at 1 Atm)	2.0 gpm at 20 psi (7.5 liters/min at 1.4 Atm)

### Notes:

- The listed specifications represent the general performance of standard models. Unless otherwise indicated, performance is with laser operating at full rated power on 514.5 nm. Contact LEXEL for performance under other conditions and at other wavelengths. Stated specifications of performance are based upon engineering and quality control procedures and testing protocols established by LEXEL. Reference is made to those statements of which are available from LEXEL upon request.
- Beam diameter and beam divergence increase slightly with increasing wavelength. If the mirror configuration is not changed, values at other wavelengths will be  $d = d_0 \sqrt{\lambda / \lambda_0}$ , where d is diameter (or divergence) at wavelength  $\lambda$ ,  $d_0$  is listed diameter (or divergence) at listed wavelength  $\lambda_0$ .
- Cavity length is the optical distance between the two mirrors making up the optical cavity. Due to the normal travel of the mirror tuning screws, this length can vary by ± 2mm. The resulting change in longitudinal mode spacing can be calculated from  $\Delta f = \pm c/L$  (0.001) where c is  $3 \times 10^8$  m/sec and L is the listed cavity length.
- Krypton models have 5% lower input voltage range than that listed for the argon models.
- Applies to 95-5, 95-6 and 95L-4UV, 95L-6UV.
- Filtered tap water. Max water temperature 35°C. Maximum static pressure 70 psi (4.8 Atm).

## LEXEL™ 85/95 Accessories (cont.)

### • Intracavity Work Space

Any LEXEL model can be supplied with an extended resonator which has a longer intracavity space at the output end of the laser. This extra space may be used for various intracavity experiments or for mounting acousto-optic devices such as cavity dumpers.

### • Optional Wavelengths

LEXEL 85/95 series ion lasers guarantee performance at 514.5 nm and 488.0 nm on all argon lasers, and 676.4 nm and 647.1 nm on all krypton lasers. Power and performance guarantees are available for other wavelengths upon request at the time of purchase of a new laser or replacement tube.



## LEXEL™ 85/95 SERIES - WAVELENGTH AND POWER SPECIFICATIONS<sup>1-4</sup>

Guaranteed fundamental mode power, using standard TEM<sub>00</sub> reflectors unless otherwise indicated

Version	Argon Lasers								Krypton Lasers <sup>3</sup>		
	85	95			95L (longer)				85	95	95L
85/95 Model	85-1	95-2	95-3	95-4	95L-4UV	95L-5	95L-6	95L-6UV	85-K	95-K	95-K <sup>3</sup>
<b>Multiline Operation, power in watts</b> - Simultaneous operation of 514.5 through 476.5 and 457.9nm lines using											
All lines	1	2	3	4	4	5	6	6	0.225	0.75	1.5
<b>Single Line Operation, power in milliwatts</b> - Using Model 500 Prism Wavelength Selector											
1090 nm <sup>1</sup>	35	60	100	150							
528.7 nm <sup>1</sup>	130	200	250	350		375	420				
514.5 nm	400	800	1200	1700	1700	2100	2400	2100			
501.7 nm	45	100	200	300	300	450	480	450			
496.5 nm	100	300	400	600	600	700	750	700			
488.0 nm	350	700	1000	1300	1300	1600	1800	1600			
476.5 nm	100	300	400	600	600	650	720	650			
472.7 nm <sup>2</sup>	20	60	140	100	100	200	240	200			
465.8 nm <sup>2</sup>	10	30	70	70	70	150	180	150			
457.9 nm	45	150	200	300	300	350	420	350			
454.5 nm <sup>2</sup>			5	10		120	140				
351-363.8 nm					100			100			
351.1 nm					50			50			
85/95 Model	85-1	95-2	95-3	95-4	95L-4UV	95L-5	95L-6		85-K	95-K	95-K <sup>3</sup>
799.3 nm <sup>1</sup>										30	45
752.5 nm <sup>1</sup>									25	100	200
676.4 nm									50	150	300
647.1 nm <sup>4</sup>									100	500	1000
568.2 nm											225
530.9 nm											275
520.8 nm											125
482.5 nm											50
476.2 nm											75

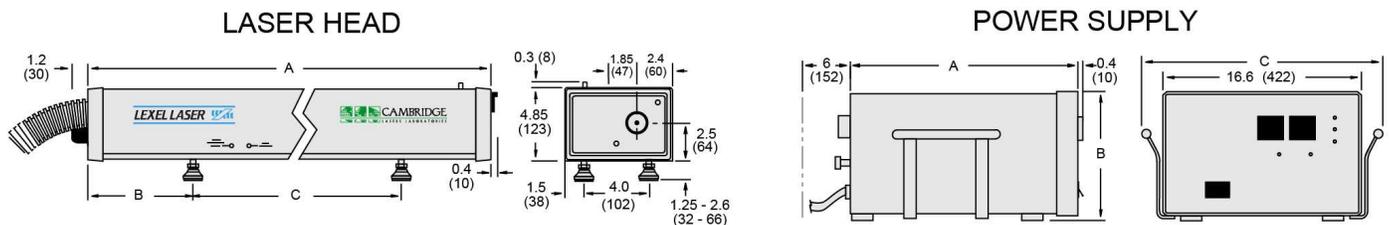
<sup>1</sup> The 1090, 799.3, 752.5 and 528.7 nm lines each require a special set of mirrors. 1090, 799.3 and 752.2 nm use Model 502 Multiline Mirror Holder.

<sup>2</sup> The 472.7, 465.8 and 454.5 nm wavelengths may require special mirrors to achieve the indicated power.

<sup>3</sup> Krypton lasers are optimized for the listed red lines. Contact LEXEL™ / Cambridge Lasers Laboratories, Inc. for performance at 568.2 through 456.2 nm.

<sup>4</sup> Single line 647.1nm may be obtained by using the Prism Wavelength Selector or by using the Model 502 Multiline Mirror Holder and reflectors that select 647.1nm only.

### DIMENSIONAL DRAWINGS



LASER HEAD	DIMENSIONS (inches/mm)			WEIGHT (lbs/kg)
	A	B	C	
95L	50.0 (1270)	8.25 (210)	25.75 (654)	77 (35)
95	41.5 (1054)	8.25 (210)	24.5 (623)	62 (28)
85	34.3 (872)	11.25 (286)	17.3 (440)	50 (23)

POWER SUPPLY	DIMENSIONS (inches/mm)			WEIGHTS (lbs/kg)
	A	B	C	
95	19.3 (489)	10.8 (274)	20.1 (511)	125 (57)
85	18.3 (465)	8.0 (203)	NO HANDLES	90 (41)

Cambridge Lasers Laboratories pursues a policy of continuous product improvement. Specifications are therefore subject to change.