

CO₂ LASER POWER SUPPLIES 125W TO 1500W

Operates without ballast resistor

A.L.E. Systems, Inc. pioneered the development of the "Ballastless" power supply for CO₂ lasers. As a result, the overall efficiency of the CO₂ laser system can be increased by 20%. Because of our advanced grounding design, A.L.E. power supplies are used in FDA-approved lasers for medical applications. A.L.E. engineers have applied their extensive background in laser technology to develop power supplies for lasers that are efficient, small in size, lightweight and very low in leakage current.

APPLICATIONS:

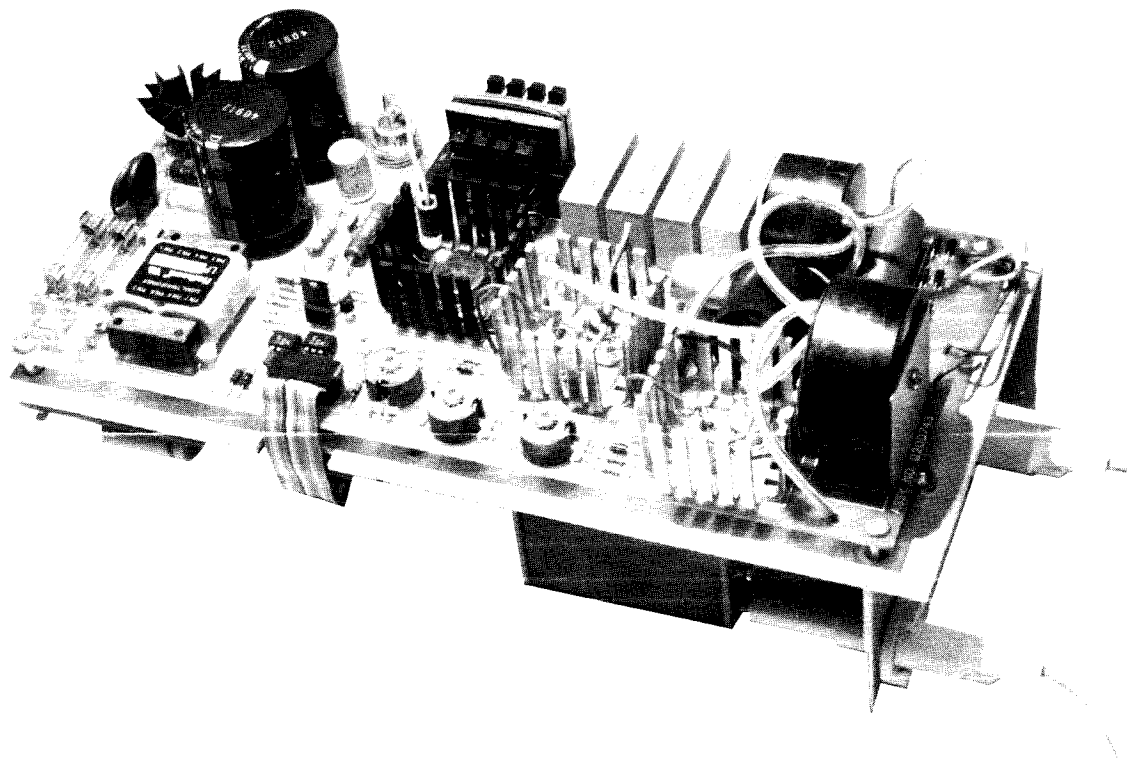
- CO₂ Lasers
- Output Power from 125W to 1500W
- Single or Dual Outputs for 2 or 3 Electrode Tubes
- 110/220 VAC \pm 15%, 50/60HZ, Single Phase Input
- Positive or Negative Output
- Allows Efficient Laser Design by Eliminating the Ballast Resistors
- Air Cooled

FEATURES:

- SCR Resonant Inverter Design
- Open & Short Circuit Proof
- Pulsable to 1KHZ Rep Rate

BENEFITS:

- No Ballast Resistor Required, Less Wasted Power
- Single or Dual Discharge
- Small & Light for Inter-head Laser Mounting
- Meets UL 544 Guidelines for Leakage Current
- No Isolation Transformer Needed



a.l.e. systems, inc.

150 Homer Avenue
Ashland, MA 01721
617-881-5252
TELEX 928207

GENERAL DESCRIPTION

The "BALLASTLESS" CO₂ laser power supply is a compact, open frame, lightweight power supply, designed to be incorporated into CO₂ Laser Systems. Its small size allows it to be designed into a laser head. Elimination of the traditional BALLAST resistor, which has typically been placed in series with the laser tube, makes this design unique.

The ballast resistor was previously required to stabilize the operation of older technology voltage source type power supplies, dissipating large amounts of wasted power as heat. A.L.E. Systems now provides a "ballastless" solution by incorporating proprietary feedback and control technology. This laser-powering breakthrough puts users a step ahead in cost, efficiency, and reliability.

Without the ballast resistor, the power supply can be rated at lower power, which means it can be smaller, thus saving valuable systems space. Lower power rating means lower power supply cost on a \$/watt basis. This is often a critical decision factor in OEM requirements. A.L.E. Ballastless Power Supplies can be specified at the input power rating for the CO₂ laser, and not over specified to include the extra power loss from a ballast resistor.

To achieve the correct laser operation, A.L.E. CO₂ CW power supplies incorporate a proprietary feedback network. Therefore, they can successfully deliver power to a laser through the entire load characteristics, including positive and negative impedances.

CONFIGURATIONS

The CO₂ CW power supplies come in a configuration suitable for medical applications. The medical version meets the UL544 guideline for current leakage. This makes it ideal for medical laser applications.

The power supply may be specified for operation on 110V AC or 220V AC. Both 50 or 60 cycle power may be used.

Outputs may be specified for one or two discharge sections (2 or 3 electrodes respectively). In the three electrode arrangement the center electrode will be at higher potential and the other electrode near ground potential.

The unit is controlled via input lines which include an interlock, H.V. inhibit, and output current control.

Output current may be adjusted over the range to allow output powers up to those rated for the supply. It may be monitored by connecting a MA meter to the monitor terminals; power supply status is indicated on LED's that may be optionally connected to the monitor signal lines.

Each power supply comes with mating connectors for the high voltage terminals.

CO₂ LASER "BALLASTLESS" SWITCHING HIGH VOLTAGE POWER SUPPLIES

GENERAL SPECIFICATIONS:

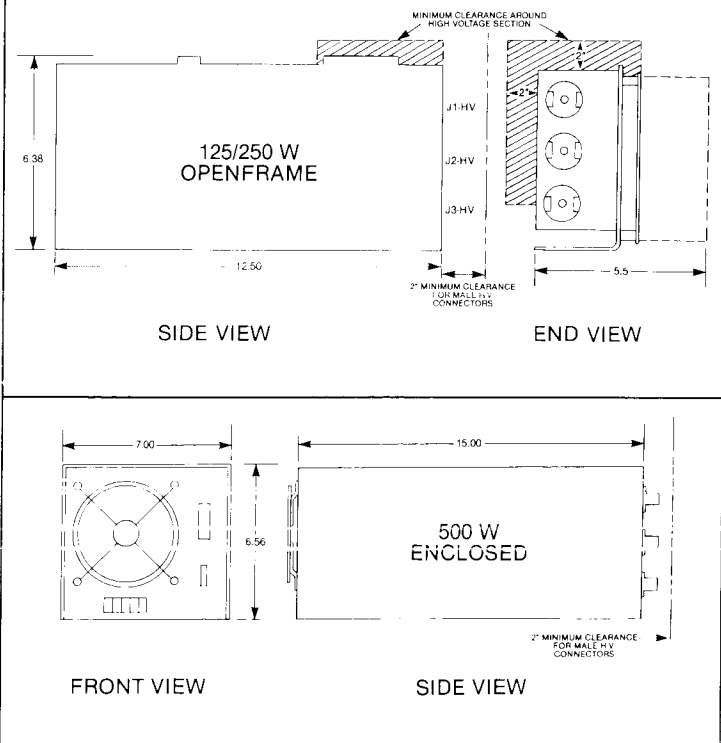
ELECTRICAL

Input Voltage Range:	110VAC \pm 15%, 220VAC \pm 15%
Efficiency:	85% Typical
Isolation From Power:	Medical or Industrial
Switching Frequency:	20KHZ (typ.)
Case Grounding:	Single phase input with ground lead tied to chassis

ENVIRONMENTAL

Operating Temperature Range:	- 25 °C to + 40 °C
Storage Temperature Range:	- 55 °C to + 80 °C
Air Cooled:	Convection, Unrestricted Air Flow for 125/250 W. Fan for 500 W.

MECHANICAL DIAGRAMS

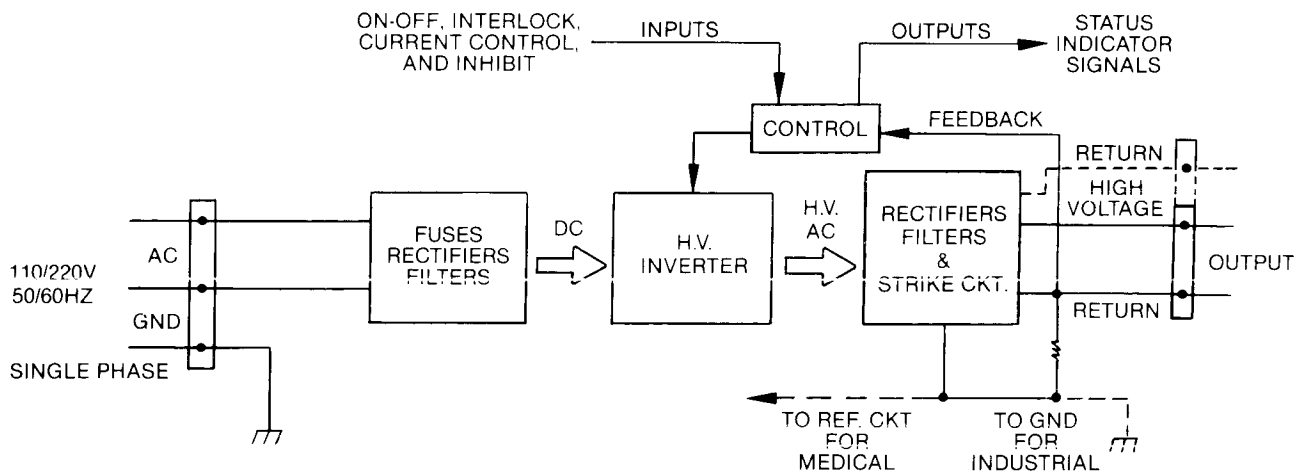


OUTPUT POWER	125 WATTS	250 WATTS	500 WATTS	1000 WATTS	1500 WATTS
SIZE	12½ x 5½ x 6½ or 18 x 2¼ x 6**	12½ x 5½ x 6½ or 18 x 2¼ x 6**	16 x 7 x 6½	500W x 2	500W x 3
WEIGHT	7 lbs.	7 lbs.	10 lbs.		
* STRIKE VOLTAGE	15KV	30KV	30KV	30KV	30KV
* TOTAL OPERATING VOLTAGE	5KV - 10KV	10KV - 20KV	10KV - 20KV	10KV - 20KV	10KV - 20KV
MAX. OPERATING CURRENT	14mA	25mA	35mA	66mA	100mA
REGULATION & RIPPLE WITHIN	2%	2%	2%	2%	2%

*The value of strike and operating voltages are approximately ½ per each discharge section. The output current remains the same from each output in a dual output configuration. The total operating voltage is approximate and will depend on the specific load characteristics.

**Optional Configuration on special quote only. Prices may vary.

CO₂ POWER SUPPLY BLOCK DIAGRAM



CONFIGURATION GUIDE FOR CO₂ CW POWER SUPPLIES

MODEL

SPECIFICATION: **CO₂** **500W** **30kV** **BFG**

1. STANDARD CW

Power Supply with Continuous Operation for Flowing or Sealed Off CO₂ Laser

2. SPECIFY POWER

check one

- ☐ 125W Off-the-shelf
- ☐ 250W Off-the-shelf
- ☐ 500W Off-the-shelf
- ☐ 1000W Two 500W Modules
- ☐ 1500W Three 500W Modules

3. SPECIFY STRIKE VOLTAGE

check one

- ☐ 15kV Strike (5-10kV Operate)
- ☐ 30kV Strike (10-20kV Operate)

4. OUTPUT CONFIGURATION

OUTPUT TERMINALS	FIRST LETTER	OUTPUT POLARITY	
	CHECK BOX	POS	NEG
	SINGLE ELECTRODE DISCHARGE (2 TERM)	<input type="checkbox"/> A	<input type="checkbox"/> B
	DUAL ELECTRODE DISCHARGE (3 TERM)	<input type="checkbox"/> C	<input type="checkbox"/> D

P.S. GROUNDING

check one

- ☐ E - Medical Standard (Low Leakage)
- ☐ F - Industrial Standard

INPUT 50-60HZ SINGLE PHASE

check one

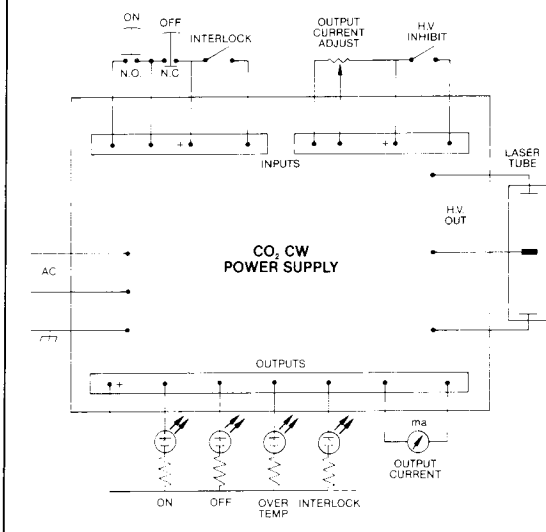
- ☐ G = 110V AC
- ☐ H = 220V AC

HOW TO ORDER

The A.L.E. "Ballastless" CO₂ Laser Power Supply may be ordered from A.L.E. Systems, Inc. in Ashland, MA 01721 in single or multiple unit quantities. Quantity discounts are available to OEMs. To order use our standard configuration guide to the left or for custom design please specify:

1. Power output required
2. Input voltage for operation
3. Positive or negative output
4. Single or dual discharge
5. Quantity & delivery requirements
6. Strike voltage required

USER SUPPLIED INPUT/OUTPUT CIRCUITS



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