MODEL 302 CAPACITOR CHARGING POWER SUPPLIES

A.L.E. Systems series 302 high voltage switching power supplies offer 5 different models and 8 different output voltage ranges from 1KV to 40KV with output powers up to 4000 joules per second in only 7″ of rack space. These models will reliably meet the needs of the laser and pulsed power research community at an affordable price. The standard front panel offers a lockable selection of remote or local operation by use of a removable-key switch, user friendly panel layout, control switches, status indicators and meters. The unit is highly reliable and short circuit proof.

APPLICATIONS:

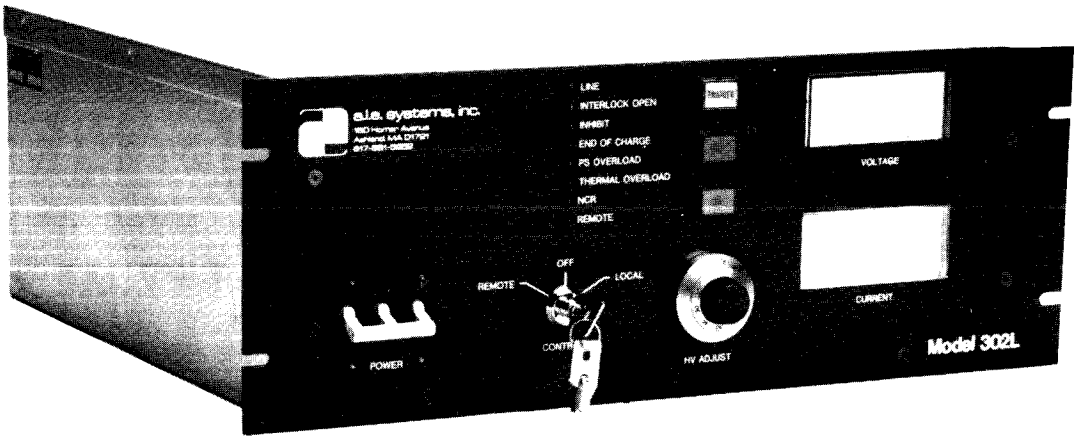
- Charge Capacitor Banks
- Powers Pulse Forming Networks
- Used on Eximer, CO_2 TEA, Metal Vapor, Nd:YAG, Glass, Ruby, and Alexandrite Lasers

FEATURES:

- Local or Remote Control Operation from Rear Panel Connector
- May be Paralleled for more than 15K Joules/Sec.
- Metered Output, Adjustable by 10 Turn Pot., Status Indicators & Push Button Control
- Full Power Over Top 25% of Output Voltage Range

BENEFITS:

- Will Operate to 200Hz Rep. Rate While Maintaining ±0.5% Regulation and Ripple. For Regulation at Higher Rep Rates See "Regulation vs. Rep Rate." Inhanced Regulation at High Rep Rates is Available as an Option.
- Small and Lightweight Due to Series Resonant High Frequency Switch Mode Design
- Air Cooled
- 7″ by 19″ Rack Mount



a.l.e. systems, inc.
150 Homer Avenue
Ashland, MA 01721
617-881-5252
TELEX 928207

MODEL DEFINITIONS:

MODEL

302L Fully instrumented with meters for voltage and current, status indicators, circuit breaker, key switch for off, local or remote operation, on/off push button switches, and counting dial knob for voltage adjustment.

302S Remote control only — front panel has status indicators and circuit breaker. The 302S is used when desiring to parallel multiple units with the 302L as the master controller to achieve higher output power levels.

302OEM Remote only operation — user provides circuit breaker and controls via connectors on rear of unit. Front panel is blank and unpainted (custom paint colors available) and mounts into a standard 19″ rack.

152L Identical to the 302L with an output power of 1500 J/Sec.

REMOTE CONTROL

Available at the 25 pin rear panel connector are:

1. Status Signals for
   - Thermal Overload
   - Interlock Open
   - End of Charge
   - Inhibit
   - Overload
   - On/Off
2. Controls
   - Inhibit
   - On/Off
   - Interlock
   - High Voltage Adjust
3. Output Monitors
   - H.V. Meter Connections
   - Ammeter
   - Analog Charging Waveform

302 SERIES CAPACITOR CHARGING POWER SUPPLIES

GENERAL SPECIFICATIONS:

OUTPUT VOLTAGE AND POWER

OUTPUT VOLTAGE	AVERAGE POWER	PEAK POWER
1KV	4000J/S	5000J/S
2KV	4000J/S	5000J/S
4KV	4000J/S	5000J/S
5KV	4000J/S	5000J/S
10KV	3000J/S	4000J/S
20KV	3000J/S	4000J/S
30KV	3000J/S	4000J/S
40KV	3000J/S	4000J/S

INPUT VOLTAGE: 240 VAC ± 10%, 1 Phase 50/60 Hz or 208 VAC ± 10%, 3 Phase 50/60 Hz

REGULATION: ± 0.5% Output Voltage, 0.5% Ripple RMS (for 200 Hz Repetition Rate or Less)

EFFICIENCY: 85% or Better

COOLING: Forced Air (fan included)

OUTPUT CABLE: 10′ Coaxial Cable (other cable lengths optional)

H.V. INHIBIT: Via a BNC Connector on Rear Panel (302L and 152L models only)

OUTPUT POLARITY: Positive or Negative (Customer Specified)

REMOTE CONTROL: Via a 25 Pin Connector Located on Rear Panel

WEIGHT: 65 lbs. (29.5 kg)

SIZE: 7″ High - 17″ Deep - 19″ Rack Mountable

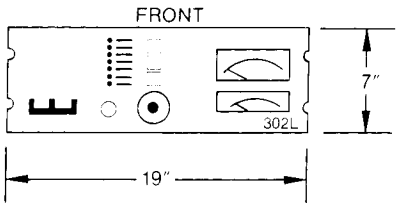
WARRANTY: 1 Year, Parts and Labor

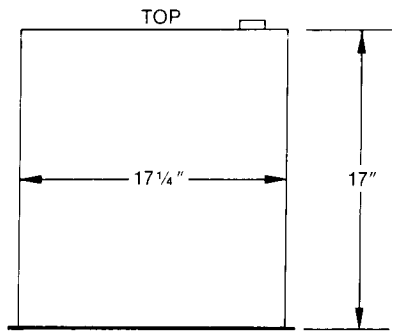
LOAD CAPACITANCE: 1 nf, Minimum

REGULATION vs. REP RATE: $\pm \%\ \text{Reg} = \frac{\text{Pulsed Rep Rate}}{3.6 \times 10{,}000} \times 100\%$

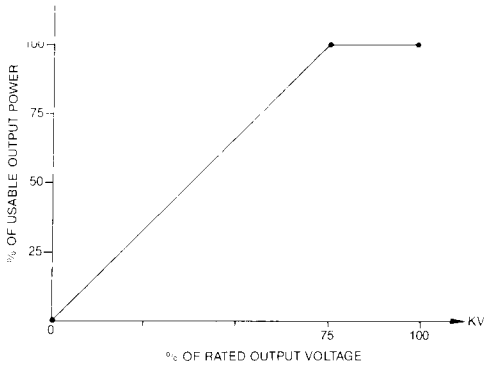
OPERATING TEMPERATURE RANGE: −25 °C to 40 °C

302L, S, OEM STANDARD 17″ WIDE RACK CONFIGURATION

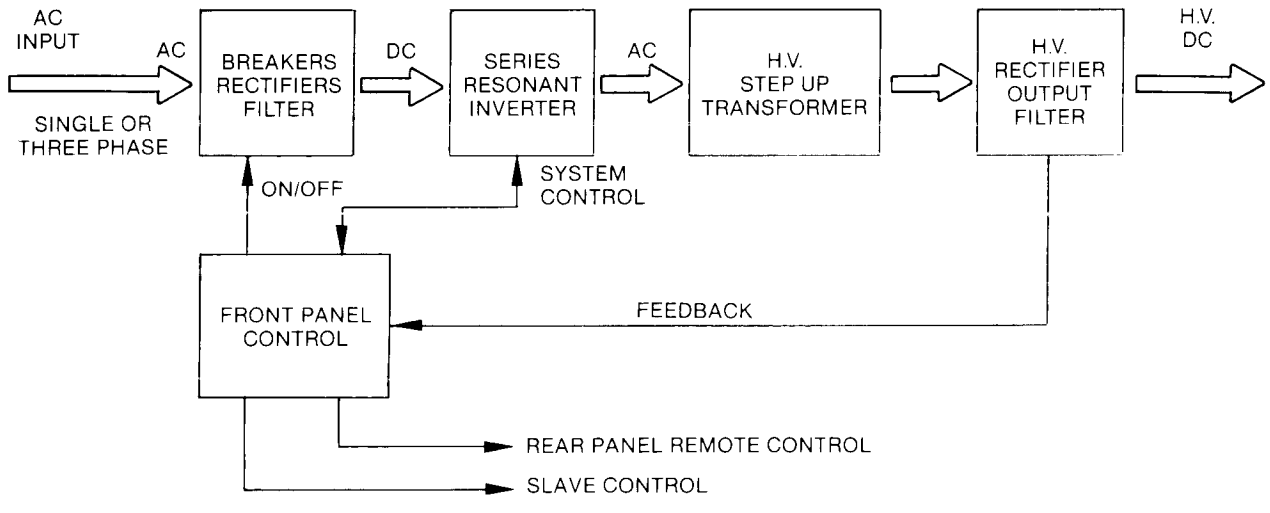




USABLE OUTPUT POWER VS. PROGRAMMED OUTPUT VOLTAGE



302L BASIC BLOCK DIAGRAM



CONFIGURATION GUIDE

MODEL SPECIFICATION: 302 L 30kV P

1. **CAPACITOR CHARGING POWER SUPPLY**

check one

- ☐ 302 = 4000 Joules/Sec. Between 1kV & 5kV
- ☐ 302 = 3000 Joules/Sec. Between 10kV & 40kV Output
- ☐ 152 = 1500 Joules/Sec. All Voltage Ranges

2. **CONFIGURATION**

check one

- ☐ L — Standard, Standalone, Fully Instrumented Master
- ☐ S — Slave, Remote Control Only, Used to Parallel with 302L
- ☐ OEM — Remote Only, and Slave for 302OEM

3. **OUTPUT VOLTAGE AND POWER**

check one	Output Voltage Range kV	Avg. Output Power J/S
☐	0 - 1	4000
☐	0 - 2	4000
☐	0 - 4	4000
☐	0 - 5	4000
☐	0 - 10	3000
☐	0 - 20	3000
☐	0 - 30	3000
☐	0 - 40	3000

4. **OUTPUT POLARITY**

check one

- ☐ Positive
- ☐ Negative

5. **ADDITIONAL DATA**

Rep Rate = _____ Hz

Capacitor to be Charged _____ uf/pf

Type of Laser _____

HOW TO ORDER

The A.L.E. 302 power supply may be ordered as a single stand alone unit or master unit as the 302L. The 302S is a slave unit for the 302L when used in a master/slave configuration. The 302OEM is a blank front panel configuration that can be used when a system controller will operate the supply through the remote connector. Quantity discounts are available. To order use the standard configuration guide to the left. For custom requirements, please specify:

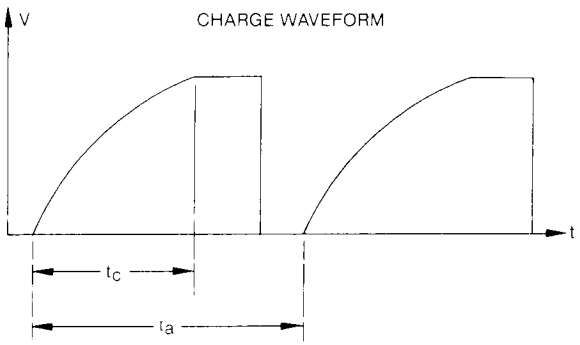
1. Charging voltage
2. Capacitor to be charged
3. Charge rate
4. Pulse rep rate
5. Output polarity
6. Quantity and delivery requirements

POWER DEFINITIONS

$$P_{AVG} = \frac{Cx\ (0.75\ Vmax)^2}{2\ (t_a)}$$

$$P_{PEAK} = \frac{Cx\ (0.75\ Vmax)^2}{2\ (t_c)}$$

where Vmax = MAX. OUTPUT VOLTAGE



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