LC1202 12kJ/sec CAPACITOR CHARGING POWER SUPPLY

# LC1202 Series

## Features

- Patented parallel resonant inverter for low pulse to pulse repeatability
- Output voltages to 30kV
- Three phase selectable 208VAC or 400VAC input
- Passive power factor correction
- Compact water cooled package (12kW in 5U high chassis)
- Comprehensive remote control
- Simple parallel operation for higher power

## A History of Innovation and Leadership

The ALE High Voltage Products Division of Lambda Americas has been designing and manufacturing quality High Voltage DC and Capacitor Charging Power Supplies since 1982. ALE Systems Inc., was conceived and formed to fill the need for a quality supplier of switched mode power supplies for the laser market. In 1987, when ALE was acquired by Electronic Measurements, Inc., the company was already the world leader in its field.

## Applications

Lambda Americas puts great emphasis on full application support, both before you decide to buy and after you receive the product. You will find the most critical information on this data sheet. If you need more information, you can request or download any of our High Voltage APP NOTES. Of course for assistance in solving a problem at any time, you can call, fax or E-mail our team of Application Engineers for prompt and accurate service. Our supplies are used in such applications as:

-Excimer Lasers -$CO_2$ Lasers
-Modulators -Microwave Tubes
-Electron Beam -EUV light sources
-X-Ray -Accelerators

## Description

The LC1202 series are High Voltage Power Supplies that are designed to operate in two modes. In their most common format they are constant current Capacitor Charging Supplies which will reliably charge HV capacitors and Pulse Forming Networks (PFNs). They can also operate as constant voltage, continuous output DC power Supplies. The LC1202 is housed in a compact 5U high water cooled package that requires no external cooling air, and exports no additional heat to the equipment cabinet. Converting the line voltage from 208VAC to 400VAC or vice versa is simply a matter of changing a voltage select PCB, line fuses (both included with unit), and the auxiliary supply selector switches.

## Repeatability

Most commercially available High Voltage Capacitor Charging Units utilize a Series Resonant inverter topology which was the most efficient means for charging capacitive loads. However they are not the ideal source for maintaining extremely low pulse to pulse voltage variations with small load capacitors, as required by Excimer lasers. ALE's new patented Parallel Resonant Inverter provides repeatability better than 0.1% at repetition rates up to 300Hz with varying capacitance values eliminating the need for re-calibration of the supply.

## Paralleling Units

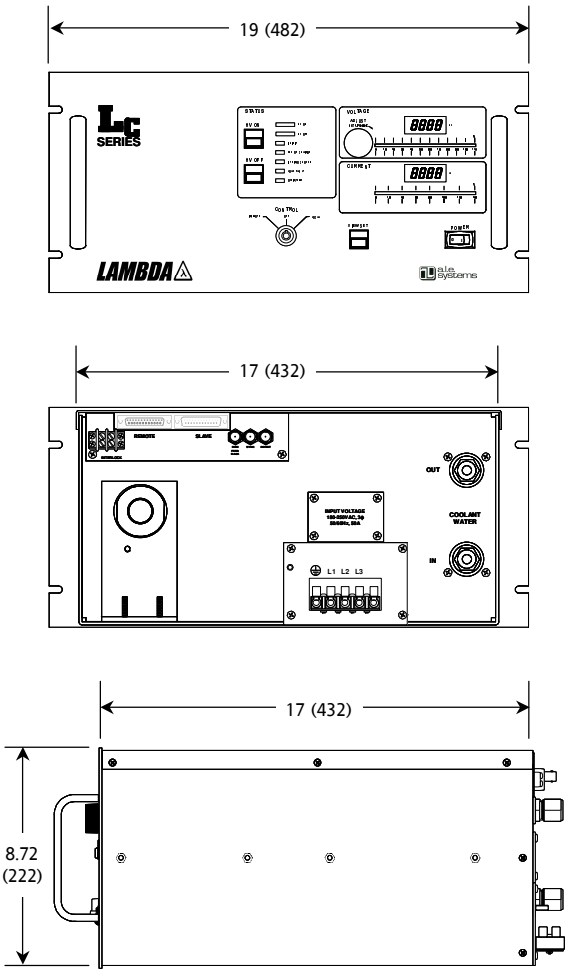
The LC1202 supply is designed for simple parallel operation. Input power and HV outputs connect directly together, and the remote control connectors can be 'daisy chained'. Each power supply will operate independently with the total charge rate equal to the sum of the two units. Only units with the same voltage rating should be connected in parallel. Consult the factory before operating units in parallel for continuous DC applications.

## Continuous Output DC Operation

The LC1202 supply can be used as a constant voltage supply by the addition of an external filter capacitor or CLC network for low ripple, low stored energy. The value of this capacitor will determine the ripple voltage on the DC output. *Please consult our Applications Department if this type of operation is required.*

## Mechanical Outline (LC1202L shown)

Dimensions shown in inches (metric dimensions in parenthesis)

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# LC1202 Series

LAMBDA

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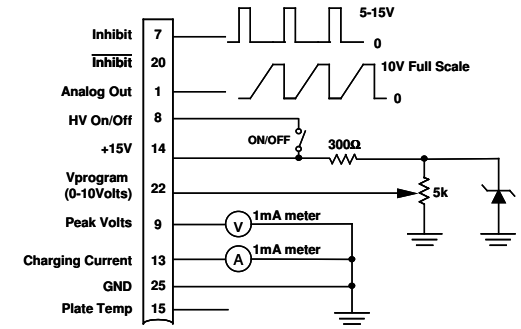
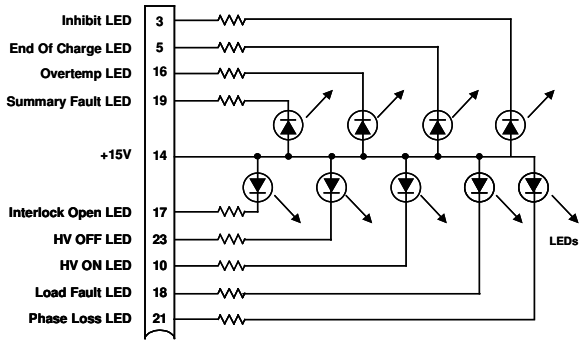
## Remote Interface




## LC1202 Series Specifications

**Average Charging Rate**
12kJ/s at 100% of rated Output Voltage

**Peak Charging Rate**
13.5kJ/s at 100% of rated Output Voltage

**DC Power Rating**
15kW (for DC operation an external filter capacitor is required)

**Standard Voltage Ranges**
1kV, 2kV, 4kV, 5kV, 10kV, 20kV, 30kV.
All models continuously variable from 0 to 100% of rated voltage.
Linear to within 1% of full scale. Accuracy 1% of rating.

**Polarity**
Available as fixed Positive or Negative.
Please specify at time of order

**High Voltage Assembly**
1 to 30kV Oil insulated (DOW561)
15AWG shielded, EPR insulated HV output cable

**Input Connector**
Via VDE, UL, CSA approved terminal block.
Connections are $\phi 1$, $\phi 2$, $\phi 3$, and ground.

**Input Voltage**
180-250VAC three phase 50A max, or 340-460VAC three phase 25A max, contact factory for 480VAC. Unit includes field conversion kit for 208 to 400VAC or 400 to 208VAC.

**Inrush**
Limited to below full power operating current

**Power factor**
Passive PFC>0.85 at full power and nominal AC line

**Efficiency**
Greater than 85% at full power and nominal AC line

**Stored energy**
Less than 0.5 J in output stage

**Stability**
< +/-0.2%/hr after 1 hr warmup

**Pulse to Pulse repeatability**
+/-0.1% to 300Hz, +/-0.3% to 1000Hz – standard, for higher rates contact factory

**Temperature Coefficient**
100ppm per °C

**Ambient Temperature**
Storage: -40 to +85°C, Operating: +5 to +45°C

**Cooling**
Water cooling at 2US GPM with max inlet temperature of 35°C. All water paths are at ground potential and are copper or brass.

**Humidity**
90%, non-condensing

**Protection Features**
Output short circuit and HV arc-to-ground during operation
Open circuit at turn–on will not damage supply
Shutdown on overtemp, overvoltage, and open interlock

**Physical Dimensions**
5U, 8.72in (222mm) H x 17in (432mm) D x 19in rack mount

**Agency Approvals**
Designed to meet UL60950, approvals pending

**Accessories**
Detachable 10ft shielded HV output cable
Operating manual

**Application Notes**
APP Note 500 Charging Rates
APP Note 502 Calculating AC Line Currents
APP Note 505 Charging Units in Continuous DC Applications
APP Note 507 Charging Large Load Capacitors
APP Note 509 What is Regulation and Repeatability
APP Note 513 Power Factor Correction
APP Note 517 Protection Against Voltage Reversal

**Note**: All specifications are subject to change without notice.

## How to order

LC1202 (XXX) - (XXkV) - (XXX) - (XX) - (XXX) VAC

- XXX: Front panel (L/S/OEM)
- XXkV: Output Voltage Range
- XXX: Polarity (POS/NEG)
- XXX: 400 FOR 400VAC, blank for 208VAC

| Options | |
|---|---|
| Feature | Suffix |
| Continuous operation | DC |
| 0-5V programming | 5V |
| Latching overload protection | LP |
| AC Contactor (standard on L/S) | CT |

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