

# 152A Series

## Features

- ▶ Patented parallel resonant inverter for low pulse to pulse repeatability
- ▶ Output voltages to 40kV
- ▶ Single phase 220VAC input
- ▶ Optional active electronic power factor correction
- ▶ Compact air cooled package
- ▶ Comprehensive remote control
- ▶ Simple parallel operation for higher power
- ▶ EN60601-1/IEC601-1 Safety approved

## 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:

- Lasers
- NMR
- Modulators
- Lithotrippers
- Electron Beam
- Ion Implantation
- X-Ray
- Sputtering

## Description

The 152A 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.

## 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 0.2% at repetition rates up to 300Hz with varying capacitance values eliminating the need for re-calibration of the supply.

## Paralleling Units

The 152A supply is designed for simple parallel operation. Input power and HV output 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. Parallel operation is not recommended in continuous DC applications.

**LAMBDA** 

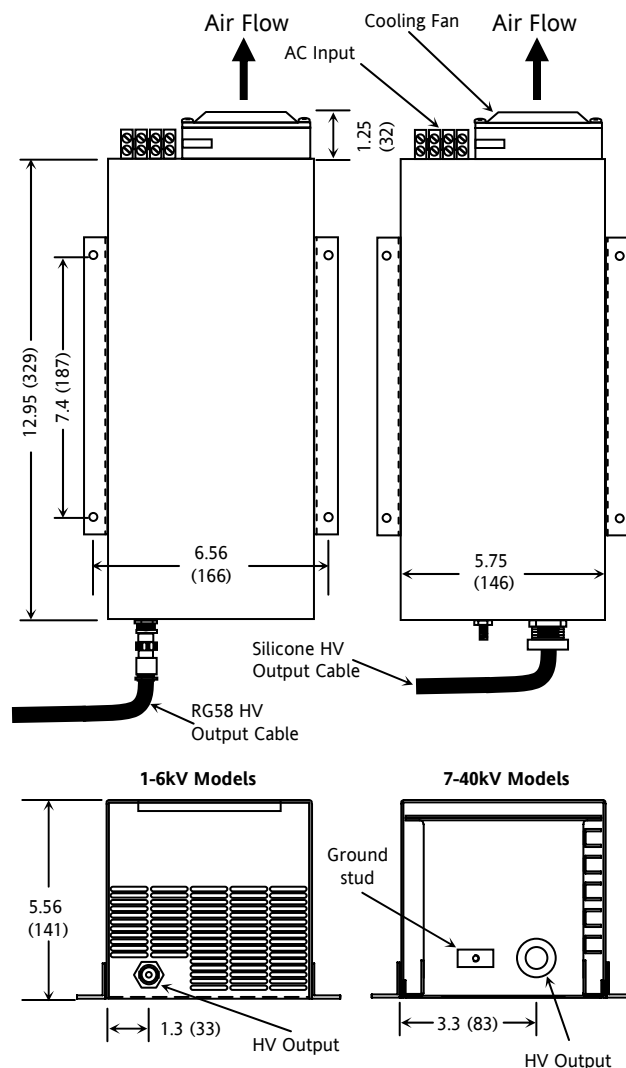


## Continuous Output DC Operation

The 152A 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.*

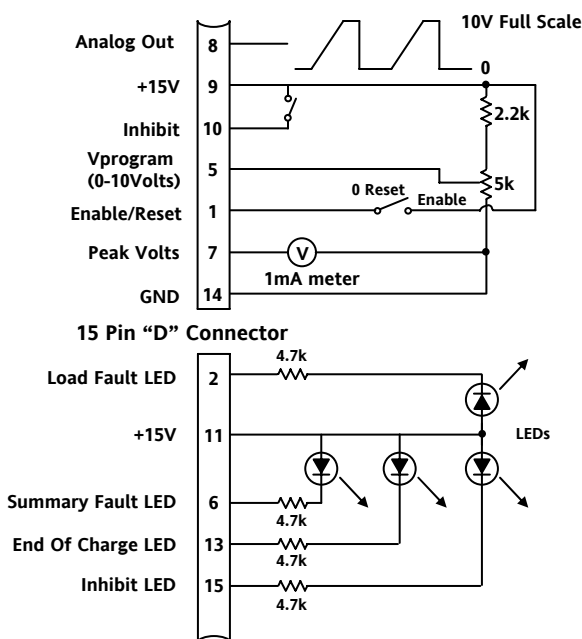
## Mechanical Outline

Dimensions shown in inches (metric dimensions in parenthesis)





## Remote Interface



## 152A Series Specifications

### Average Charging Rate

1.5k/s at 100% of rated Output Voltage

### Peak Charging Rate

1.65k/s at 100% of rated Output Voltage

### DC Power Rating

1.5kW (for DC operation an external filter capacitor is required)

### Standard Voltage Ranges

1kV, 1.5kV, 2kV, 3kV, 4kV, 5kV, 6kV, 10kV, 15kV, 20kV, 30kV, 40 kV.  
All models continuously variable from 0 to 100% of rated voltage.  
Linear to within 1% of full scale. Accuracy 1% of rated.

### Polarity

Available as fixed Positive or Negative. Please specify at time of ordering

### High Voltage Assembly

1 to 6kV Air insulated, RG58 coaxial output cable  
7 to 40kV Oil insulated, 12AWG HV Silicone Insulated

### Input Connector

Via VDE, UL, CSA approved terminal block. Connections are live, neutral, and ground.

### Input Voltage

180-250VAC single phase, 14.5A max (non PFC), 10A max (PFC)  
AC Input voltage selected by terminal block position.  
AC Input Current figures are valid for repetition rates above 10Hz.

### Inrush

Limited to below full power operating current

### Power factor

0.98 (with active PFC option), 0.65 for non PFC

### Efficiency

Greater than 85% at full power and nominal AC line

### Stored energy

Less than 0.3 J in output stage

### Stability

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

### Pulse to Pulse repeatability

+/-0.2% to 300Hz – standard, for higher rates contact factory

### Temperature Coefficient

100ppm per °C

### Ambient Temperature

Storage: -40 to +85°C, Operating: -20 to +45°C

### 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

5.56in (141mm) H x 5.75in (146mm) W x 14.2in (361mm) D  
Mounting Brackets supplied (see sketch over)

### Agency Approvals

Certified to meet UL2601.1, CSA C22.1 IEC601-1, EN60601.1

### Accessories

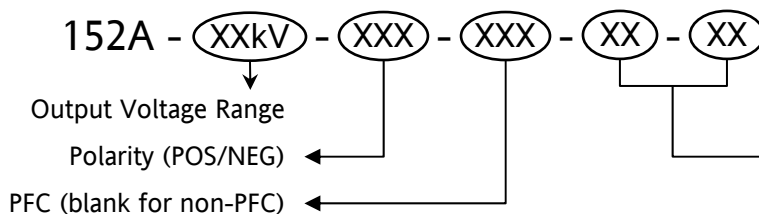
Detachable 8ft HV output cable  
15 pin D-type mating control connector  
Operating manual  
Mounting brackets

### 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



| Options                      |        |
|------------------------------|--------|
| Feature                      | Suffix |
| Continuous operation         | DC     |
| Low Inhibit                  | LH     |
| Low Enable                   | EN     |
| 0-5V Programming             | 5V     |
| Latching overload protection | LP     |