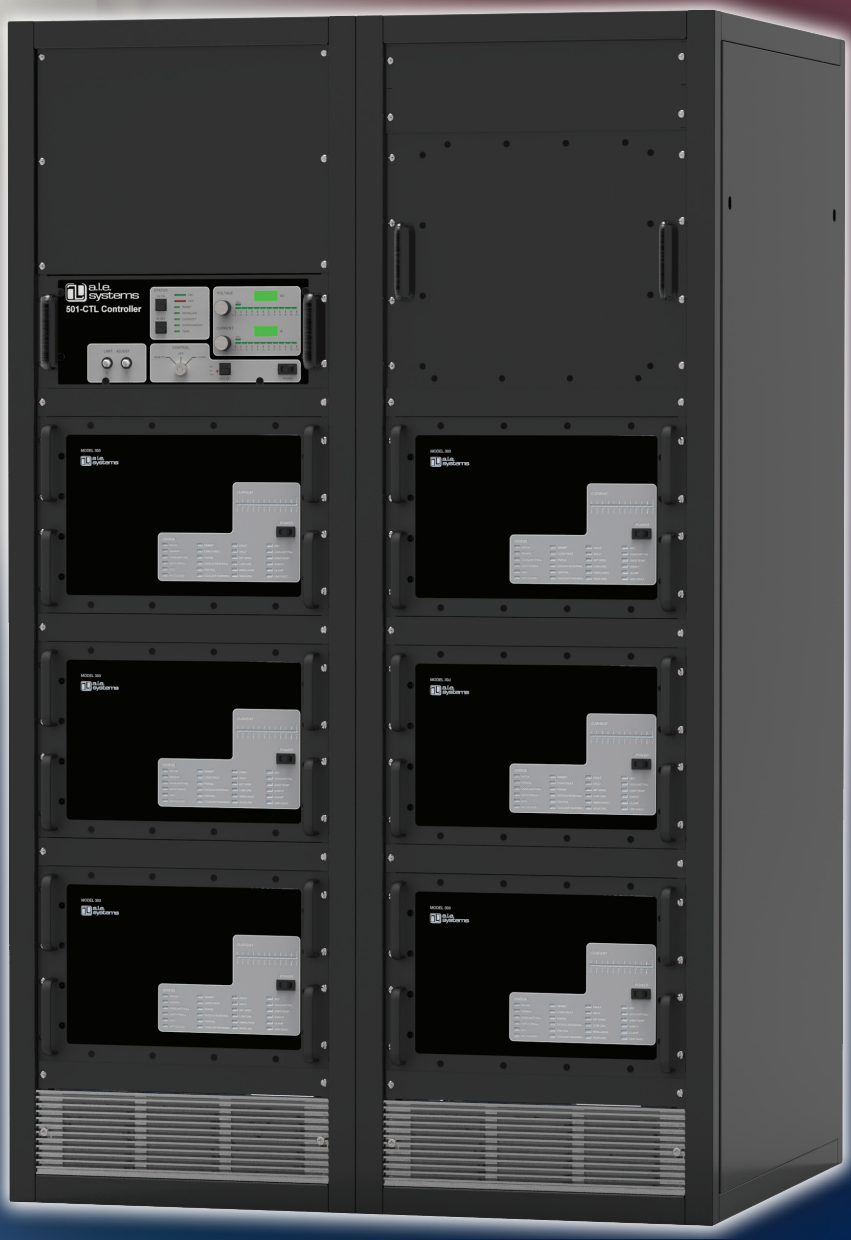
a.l.e. systems

Turn-key HV Power Solutions

Voltages from 5,000V to 50,000V
Power levels from 60kW to 1MW +
Ultra High Power Density
Full Local and Remote Controls
Modular/Scalable System Designs



TDK·Lambda

www.us.lambda.tdk.com

Turn-key High Voltage Power Solutions

ALE's Compact Turn-key High Voltage Power Systems, build on over 20 years of sucessfully designing and delivering multi-kilowatt DC power solutions to meet the demands of the most challenging applications. Extensive use of standard building blocks allows maximum system design flexibility and performance, while minimizing cost and delivery time.

Our modular and scalable design approach uses multiple standard ALE 303 series 50kW power modules to deliver raw high voltage DC power for the system. The outputs of each 303 power module are combined using a simple Junction box which can also accomodate any necessary output filtering and voltage/current feedback required. The complete system and individual power module outputs are centrally controlled by a Master Controller which offers both local and remote user interfaces.

The Master Controller generates all control signals required by each of the 303S power modules, and enables both local or remote user control of the system output voltage and current. The use of a multi-phase variable frequency control technique, results in low output voltage ripple without the need for large output energy storage filter capacitors. The controller interfaces to each 303 power module (or bank of 303 power modules), and to the Junction Box to provide system output voltage and current feedback, and operating status.

Each power module comprises a single model 303S water-cooled power supply. The 303S is a proven 50kW rated DC power supply which can be offered with any output voltage between 5kV and 50kV. The total number of 303S modules required in the system is determined by the overall power requirements, with one module for every 50kW of power (one per 40kW with 400VAC input). Since the overall design is 100% scalable, there is no theoretical limit to the number of 303 supplies that can be connected in parallel, and hence very high power ultra compact systems can be built using standard modules.

A Junction Box is used to combine the high voltage outputs from the individual power modules, and also serves to provide precision voltage and current feedback signals to the Master Controller. The Junction Box can also be used to house any filter or output protection components required. Filters can be as simple as a ripple reduction capacitor, or more complex multi-stage LC filter when ultra-low stored energy and ripple are required.

The modular and scalable design approach described enables TDK-Lambda to offer Compact Turn-key power solutions with average output powers from as little as 60kW, to over 1MW using the same basic proven building blocks. Call our High Voltage Product Manager, Andy Tydeman at +1-732-795-4149 to discuss your specific power requirements, or to learn more.

Features

- **Power levels from 60kW to 1MW and higher**
- **Voltages from 5,000V to 50,000V**
- **Turn-key Fully Integrated Systems**
- **100% Modular/Scalable Design**
- **Ultra Compact Mechanical Layout**
- **Low Ripple**
- **Low Stored Energy**
- **No requirement for crowbar load protection**
- **High Efficiency**
- **Excellent Power Factor**
- **Water-cooled with zero oil**
- **Local & Remote Controls**
- **Complete System or bare bones versions**

Applications

- **Cyclotrons**
- **Microwave Tube Beam Power**
  - **Gyroton**
  - **Klystron**
  - **Magnetron**
  - **TWT**
  - **IOT**
- **Radar Systems**
- **Raw HVDC Power**
- **High Power Amplifiers**
- **Precipitators**

Specification

Average Continuous DC Power	Available from 60kW to 1MW+
Output Voltage Range	Models available from 5kV to 50kV, variable from 10-100% of rated voltage
Output Current	Variable from 10-100% of rated current
AC Input Voltage	480VAC 3Ø standard, 400VAC 3Ø + N optional
Polarity	Available as fixed Positive or Negative. Optional floating return.
Power Factor	Passive PFC better than 0.92 at full load and nominal AC line
Efficiency	Better than 85% at full load and nominal AC line
Accuracy	1% standard, 0.1% optional
Stability	100ppm per °C standard, 10ppm per °C optional
Stored Energy	Less than 50J, 10J optional
Ripple	1% of rated voltage peak to peak, 0.01% optional
Line/Load Regulation	Better than 0.1%, 0.01% optional
Cooling	Water cooled, 2US GPM flow per 50kW module, Min. temp 15°C, Max. Temp 35°C
Ambient Temperature	Storage: -40 to +85°C. Operating: +5 to +45°C
Humidity	10-90%, non-condensing
Protection	Open/short circuits, Overloads, Arcs, Overvoltage, Overcurrent
Load ARC Response	Output current shut down in less than 50μs
Local Control/Indicators	Power ON/OFF switch HV ON/OFF push buttons Local/Remote keyswitch View Set push button 10-Turn Output voltage potentiometer 10-Turn Output current potentiometer Adjustable Overvoltage trip point Adjustable Overcurrent trip point Digital voltage and current displays LED status indicators
Remote Control	Fully isolated analog voltage and current programming and readback Isolated digital HV ON/OFF & Inhibit inputs Isolated digital status readback/monitoring
Options	Fully integrated turn-key rack mounted system with all cooling and control cables Bare bones system for customer installation/integration High stability output (10ppm/°C) High accuracy (0.1% or 0.01%) Low Output stored energy (10J or less) Low Ripple (0.01% or better) Custom LC output filter Load/Line regulation better than 0.001% Custom HV connectors Floating HV return
Mechanical - Master Controller (1 per system) - Power Module (1 per 50kW) - Junction Box (1 per system)	 4U (178mm) high, 19” (483mm) wide, 17” (432mm) deep, Weight: 25lbs (11kg) 7U (311mm) high, 19” (483mm) wide, 24” (610mm) deep, Weight: 300lbs (136kg) Approx 8U (356mm) high, 19” (483mm) wide, 24” (610mm) deep, Weight: 50lbs (23kg). Size is dependant on system power and performance, data given is typical. Example 300kW 20kV system dimensions - 68” (1727mm) high including casters, 44.25” (1124mm) wide, 38.5” (978mm) deep. Weight: Approx 2500lbs (1140kg)
All specifications subject to change without notice	

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