



303 Series Data Sheet
High Voltage Power Supply
Capacitor Charging and DC
Output Voltage from 1kV - 50kV
Output Power 30kJ/sec or 50kW
Ultra-Compact - 50kW in 7U
Unique Water-Cooled Design



TDK-Lambda

www.us.lambda.tdk.com

303 Series Specification

High Power Ultra-Compact water-cooled capacitor charging and DC power supplies available in 30kJ/sec for capacitor charging, or 50kW⁽¹⁾ in continuous DC applications.

- Power rating of 30kJ/sec, 37.5kJ/sec peak⁽¹⁾
- Output Voltages from 0-1kV to 0-50kV
- Unique evaporative cooling/insulation
- Efficient IGBT based resonant inverter
- Excellent pulse to pulse repeatability
- 400 or 480VAC 3Ø input voltage⁽¹⁾
- Ultra compact water cooled rack mount design
- Full remote control interface
- Passive PFC (pf = 0.9)
- Full local output voltage and HV On/Off controls (L version)
- Simple parallel operation for higher power
- Lab, or Slave front panel options

Average Capacitor Charging Power	30,000 Joules/sec ⁽¹⁾ ($\frac{1}{2}CV^2 \times \text{Rep Rate}$)
Peak Capacitor Charging Power	37,500 Joules/sec ⁽¹⁾ ($\frac{1}{2}CV^2/t_{\text{charge}}$)
Average Continuous DC Power	50,000 Watts ⁽¹⁾
Output Voltage Range	1, 2, 4, 5, 10, 15, 20, 30, 40, 50kV, variable from 10-100% of rated
Polarity	Available as fixed Positive or Negative. Please specify at time of ordering
HV Output Cable	1-29kV Models DS2214 Coaxial cable with proprietary HV connector 30-50kV Models DS2212 Coaxial cable with proprietary HV connector
AC Input Voltage, Current	3P480 - 480VAC (432-528) 3Ø, 53A max or 3P400 - 400VAC (360-440) 3Ø, 68A ⁽²⁾ max - specify at time of ordering
AC Connector	UL/CSA approved terminal block. 3Ø + $\frac{1}{2}$ "
AC Line Contactor	UL/CSA approved AC line contactor
Power Factor	Passive PFC pf = 0.9 at full load and nominal AC line
Efficiency	Better than 85% at full load
Front Panel	303L - Output Voltage Control, Voltage & Current Meters, Status Indicators 303S - On/Off Switch, Current Bar Graph, Status Indicators
Stability	±0.2% per hour after 1 hour warmup
Temperature Coefficient	100ppm per °C typical
Stored Energy	Less than 0.3J all models
Pulse to Pulse Repeatability	±2% to 100Hz std, consult factory for higher rep rates
Dimensions - inches (mm)	19 (483) W x 12.25 (311) H x 22.5 (571) D
Weight - lbs (kg)	220 (100)
Ambient Temperature	Storage: -40 to +70°C. Operating: 0 to +55°C
Altitude	Storage: 40,000ft (12,000m), Operating: 9,900ft (3,000m)
Humidity	10-90%, non-condensing
Cooling	Flowed water at 2US GPM (7.6 L/min) with max inlet temp 35°C and min inlet of 15°C. All water paths are copper or brass. Connections are ¼NPT male pipe.
Protection	Open/Short Circuits, Overloads, Arcs, Overtemp, Overvoltage, Safety Interlock
Remote Control (all models)	Via 25-pin D-sub connector on rear of unit, Signals include, Vprogram (0-10V), HV Enable/Reset, Inhibit, Summary Fault, Load Fault, Vanalog
Accessories	10ft HV cable, operating manual
Options	EN - Low Enable. Replaces standard high enable 5V - 0-5V Analog programming. Replaces standard 0-10V programming LP - Latching Overload Protection, requires HV reset after overload fault DC - Continuous DC operation CP - 10 turn C urrent P rogramming pot and/or 0-10V remote input for DC units only RS - Remote load voltage sense replaces local sense Double terminated HV cable, and mating bulkhead connector
Ordering Info	Model - XXkV - POS (or NEG) - 3PYYY - ZZ (options)
Ordering Examples	303L-10kV-POS-3P480, 303S-50kV-NEG-DC-3P480, 303L-30kV-POS-3P400

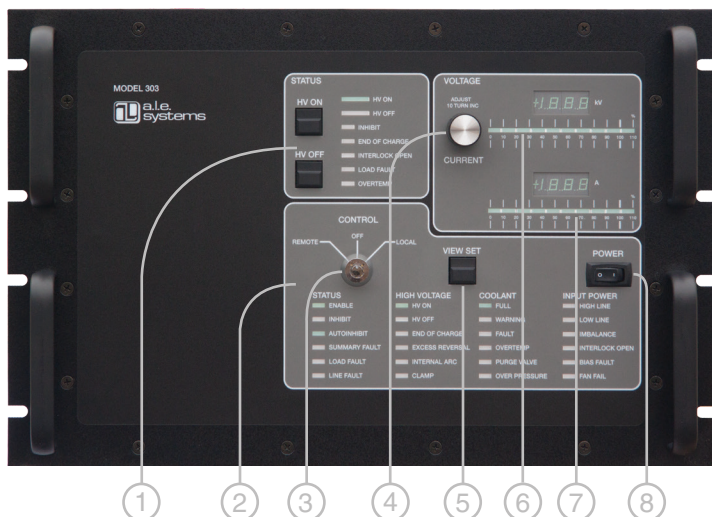
(1) Power de-rated to 25,000J/sec average, 32,500J/sec peak or 40,000W DC with 400VAC input

(2) AC line current for capacitor charging operation. For DC operation use formula in online App Note 502.

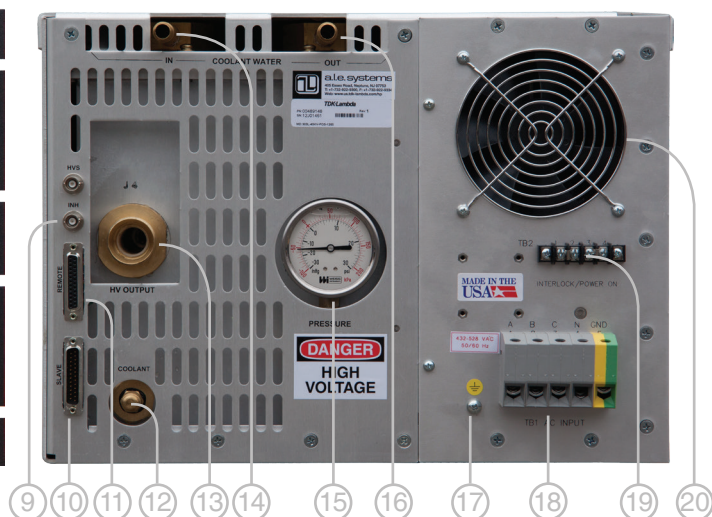
All specifications subject to change without notice

303 Series Mechanical Details

303L Front View



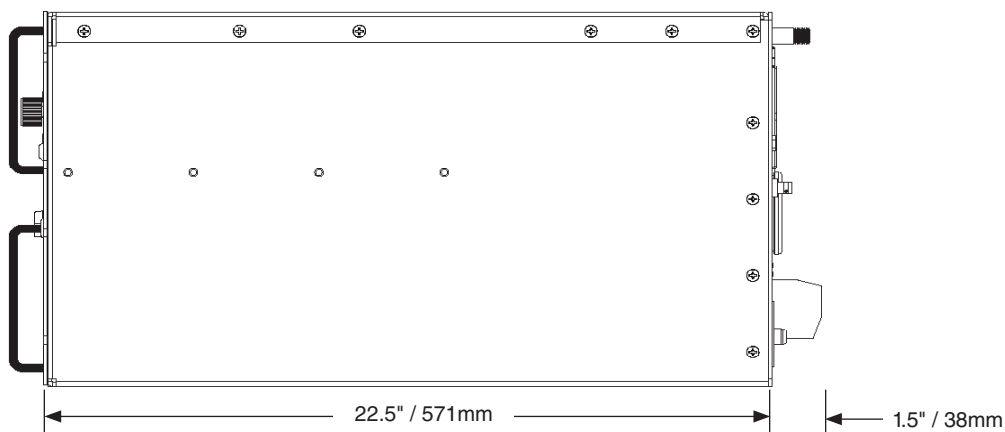
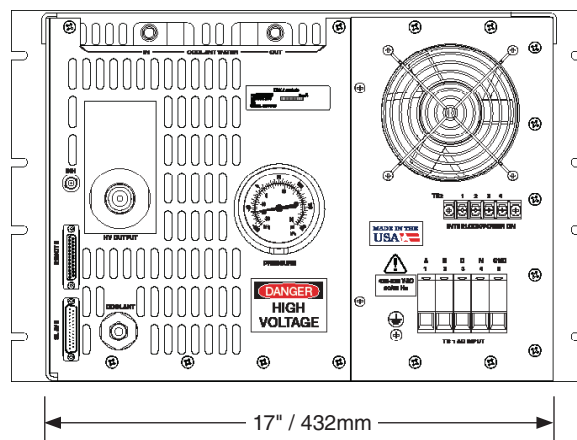
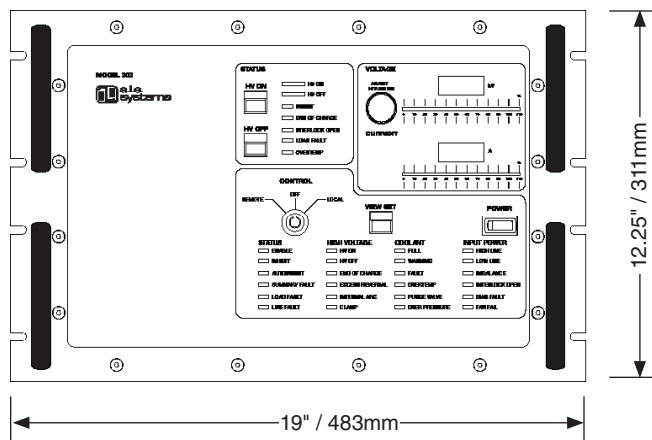
303L Rear View



- 1 - HV ON/OFF Push Buttons/Status LEDs (L models only)
- 2 - Detail Operating Status LEDs
- 3 - Local/Remote Keyswitch (L model only)
- 4 - 10-Turn HV Output Control (L models only)
- 5 - View Set Push Button (L model only)
- 6 - Voltage Display and Bar Graph (L models only)
- 7 - Current Display and Bar Graph (L models only)
- 8 - Power Switch
- 9 - Inhibit BNC (L models only)
- 10 - Slave Supply Programming Connector (L models only)

- 11 - Remote Programming Connector
- 12 - Coolant Refill connection
- 13 - HV Output Connector
- 14 - Cooling Water Inlet
- 15 - HV Tank Pressure Gauge
- 16 - Cooling Water Outlet
- 17 - Ground Stud
- 18 - AC Input Connector
- 19 - Interlock/Remote Power On Terminals
- 20 - Cooling Fan

Outline Drawings



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