a.l.e. systems

402 Series Data Sheet

High Voltage Power Supply
Capacitor Charging and DC
Output Voltage from 1kV - 50kV
Output Power 4kJ/sec or 4kW
Full local and remote control

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402 Series Specification

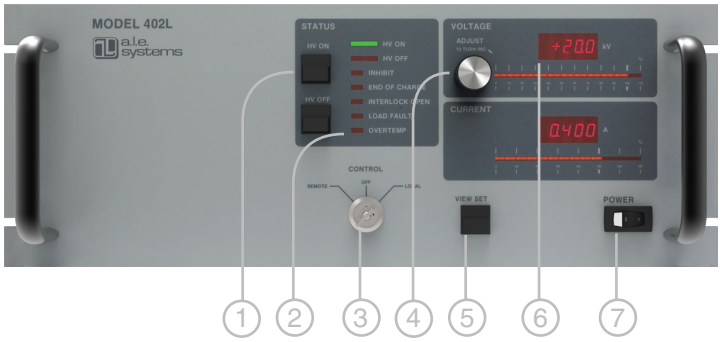
Industry standard rack mount capacitor charging and DC power supplies with 4kJ/sec rating for capacitor charging, or 4kW rating in continuous DC applications.

- **Power rating of 4kJ/sec, 5kJ/sec peak**
- **Output Voltages from 0-1kV to 0-50kV**
- **Compact air cooled rack mount package**
- **Efficient IGBT based resonant inverter**
- **Excellent pulse to pulse repeatability**
- **208 or 400VAC 3Ø input voltage**
- **Comprehensive remote control interface**
- **UL Approved AC line contactor (optional for OEM models)**
- **Ultra reliable and rugged industry standard design**
- **Passive PFC (pf = 0.85)**
- **Full local output voltage and HV On/Off controls (L version)**
- **Simple parallel operation for higher power**
- **Lab, Slave, or OEM front panel options**

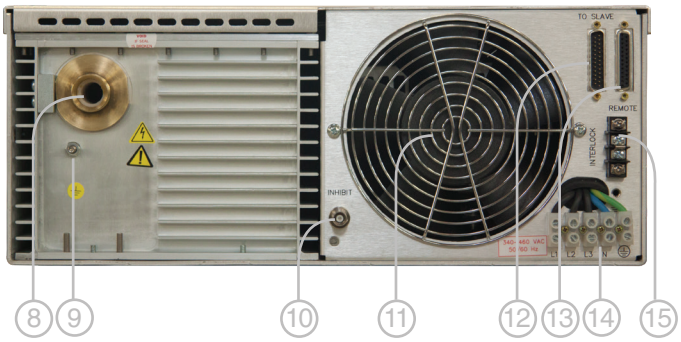
Average Capacitor Charging Power	4,000 Joules/sec ($\frac{1}{2}CV^2$ x Rep Rate)
Peak Capacitor Charging Power	5,000 Joules/sec ($\frac{1}{2}CV^2/t_{charge}$)
Average Continuous DC Power	4,000 Watts
Output Voltage Range	1, 2, 4, 5, 10, 15, 20, 30, 40, 50kV, variable from 10-100% of rated
Polarity	Available as fixed Positive or Negative. Please specify at time of ordering
HV Output Cable	1-39kV Models - DS2124 Coaxial cable with proprietary HV connector
	40-50kV Models - DS2214 Coaxial cable with proprietary HV connector
HV Insulating Medium	Shell Diala S2 or equivalent insulating oil
AC Input Voltage	208VAC (180-264), 3Ø - Suffix 3P208 or 400VAC (340-460), 3Ø + N - Suffix 3P400. Specify at time of ordering
AC Input Current	20A/15A
AC Connector	UL/CSA approved terminal block. 3Ø + ⏚ for 208VAC, 3Ø + N + ⏚ for 400VAC
AC Line Contactor	UL/CSA approved AC line contactor (standard on 402L and 402S, option for 402OEM)
Power Factor	Passive PFC pf = 0.85 at full load and nominal AC line
Efficiency	Better than 85% at full load
Front Panel	402L - Voltage Control, Voltage & Current Meters, Status Indicators
	402S - On/Off Switch, Status Indicators
	402-OEM - Blank front panel
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 1000Hz, consult factory for higher rep rates
Dimensions - inches (mm)	19 (483) W x 7 (178) H x 17 (432) D
Weight - lbs (kg)	65 (30)
Ambient Temperature	Storage: -40 to +85°C. Operating: -20 to +45°C
Altitude	Storage: 40,000ft (12,000m), Operating: 9,900ft (3,000m)
Humidity	10-90%, non-condensing
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, Vpeak
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
	CT - AC line contactor (option for 402OEM models only, standard on 402L and 402S)
	Double terminated HV cable, and mating bulkhead connector
Ordering Info	Model - XXkV - POS (or NEG) - 3PYYY - ZZ (options)
Ordering Examples	402L-10kV-POS-3P208, 402S-1kV-NEG-DC-3P208, 402-OEM-50kV-POS-3P400
All specifications subject to change without notice	

402 Series Mechanical Details

402L Front View



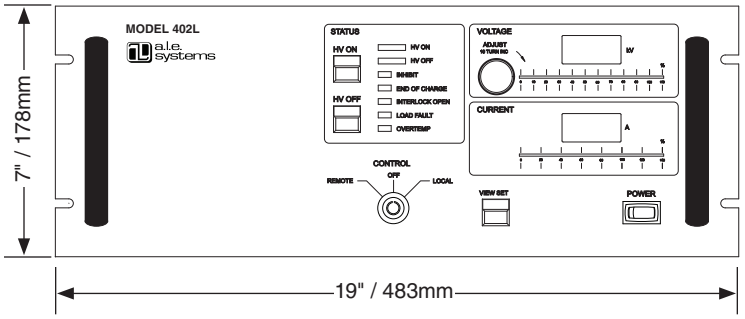
402L Rear View

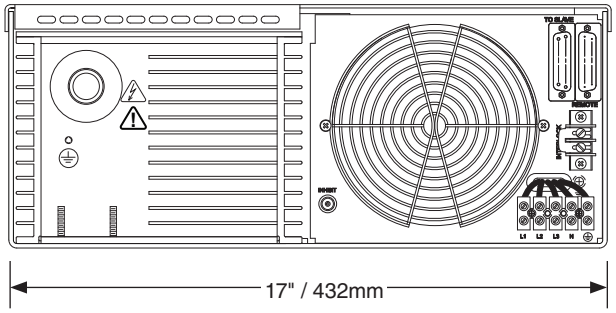


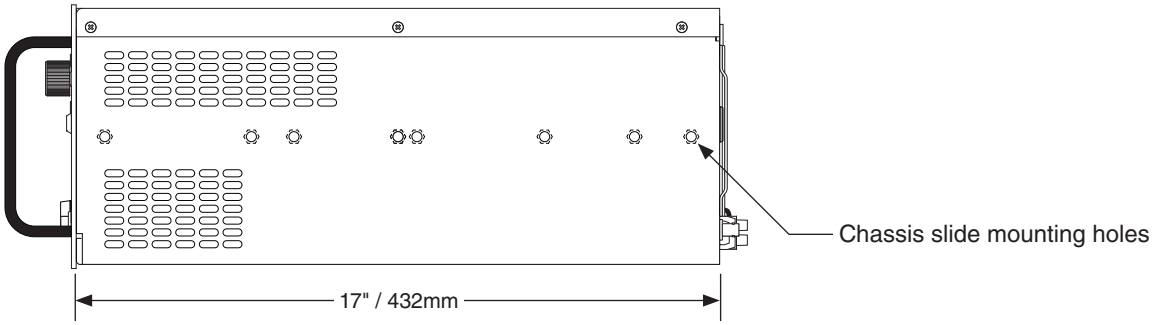
1 - HV On/Off Push Buttons (L model only)
2 - Status Indicator LEDs (L and S models only)
3 - Local/Remote Keyswitch (L model only)
4 - 10-Turn HV Output Control (L models only)
5 - View Set Push Button (L models only)
6 - Output Voltage and Current Displays (L models only)
7 - Power Switch (L and S models only)

8 - HV Output Connector
9 - Ground Stud
10 - Inhibit BNC (L models only)
11 - Cooling Fan
12 - Slave Supply Programming Connector (L models only)
13 - Remote Programming Connector
14 - AC Input Terminal Block
15 - Interlock Terminals

Outline Drawings







Notes:
1 - Chassis slide mounting pattern matches General Devices CT series or equivalent with 3.875" hole spacing.
2 - Cooling air enters rear of unit and exits at either side. Do not block air vents or cooling fan and allow several inches of clearance at rear of unit.
3 - Allow 6" bend radius at rear of unit for HV cable.

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