



## LS SERIES



LS Series of high voltage power supplies are designed to satisfy high performance standards in a minimum of space. The circuitry includes a power factor corrector, a high frequency inverter with proprietary control which provides full protections against over voltage, over current, and in extreme transient and arcing environments. These full featured supplies are available in a wide range of outputs.

### TYPICAL APPLICATION

Analytical X-ray  
Electrostatics  
E-Beam Systems

Capacitor Charging  
Hipot Testing  
General Laboratory

### FEATURES

**Arc Quench.** The HV output is inhibited for a short period after each load arc to help extinguish the arc.

**Arc Count.** Internal circuitry constantly senses and integrates arcs that occur over a given time. In the event a system or load arcing problem develops and exceeds factory-set parameters, the power supply will cycle off in an attempt to clear the fault and then automatically restart after a pre-set “off dwell time”.

**Pulse-Width Modulation.** Off-the-line pulse-width modulation provides high efficiency and a reduced parts count for improved reliability.

Embedded Microcontroller control. Front panel digital encoders provide high resolution local adjustment of voltage and current program. Integral RS-232, USB and optional ethernet communications provide remote control program and monitor.

Voltage and Current Control Mode, Interlock Open/Closed, High Voltage Inhibit, Overcurrent and Overvoltage, Arc, Regulation Error, Overtemperature, Over Power (optional).

Models available from 1kV to 160kV. Each model is available in positive or negative.

Voltage and current are continuously adjustable by rotary encoders, stand by button, high voltage ON/OFF switch/indicator.



## SPECIFICATIONS

### Status Indicators:

Voltage and Current Control Mode, Interlock Open/Closed, High Voltage Inhibit, Overcurrent and Overvoltage, Arc, Regulation Error, Overtemperature, Over Power (optional).

### Input:

For 600W and less, input voltage is from 100Vac to 240Vac, 50/60Hz. Specify with order. For input current see table on page 3.

### Output:

Models available from 1kV to 160kV. Each model is available in positive or negative.

### Front Panel Controls:

Voltage and current are continuously adjustable by rotary encoders, stand by button, high voltage ON/OFF switch/indicator.

### Voltage Regulation:

Load: 0.05% of maximum voltage +10V for full load change.

Line:  $\pm 0.05\%$  of full voltage +2V over specified input range

#### Current Regulation:

Load: 0.05% of maximum current  $\pm 100\mu\text{A}$  for full voltage change.

Line:  $\pm 0.05\%$  of maximum current for a  $\pm 10\%$  input line change.

### Ripple:

0.1% p-p +1Vrms.

### Temperature Coefficient:

100ppm/ $^{\circ}\text{C}$  voltage or current regulated.

### Voltage Rise/Decay Time Constant:

The voltage rise time constant is 300 ms typical for all models using either HV enable or remote programming control.

The voltage decay time constant is 300 ms with a 50% resistive load for 70 kV to 160 kV models and 200 ms with a 50% resistive load for 12 kV to 60 kV models and 50 ms with a 50% resistive load for 1 kV to 10 kV models.

### Slow Start:

Adjustable ramp time from 0.3 to 30 seconds. Output ramps from 0 V to programmed voltage level.

### Polarity:

Available with either positive, negative to chassis ground.

### Protection:

Automatic current regulation protects against all overloads, including arcs and short circuits. Thermal switches and RPM sensing fans protect against thermal overload. Fuses, surge-limiting resistors, and low energy components provide ultimate protection.

### Arc Count:

Internal circuitry senses the number of arcs caused by external load discharges. If the rate of consecutive arcs exceeds approximately one arc per second for five arcs, the supply will turn off.

### External Interlock:

Open = HV ON Disable,  
Closed = HV ON Enable.

### Stability:

100ppm/hour after 1/2 hour warm-up for both voltage and current regulation.



**Dimensions:**

1U: 1.75'H x 19'W x 19'D

(44.5mm x 482mm x 482mm).

2U: 3.5'H x 19'W x 19'D

(89mm x 482mm x 482mm).

Depth becomes 24'(607mm) for 70 to 130kV ranges.

4U: 7'H x 19'W x 24'D

(177.5mm x 482mm x 606mm).

**Input Current**

MODEL	110Vac	220Vac
≤300 watt	6A	3A
≤600 watt	12A	6A
≤1000 watt	n/a	10A
≤1600 watt	n/a	16A

**Electrical interfaces and functions**

**Front Panel Elements.**

**Output Voltage & Current Display:**

3.5 Digit digital meters.

**Indicators:** AC Power, Current Mode, Voltage Mode, Pol +, Pol -, Fault, Fine Adjustment, Preset, Control Lock, Remote Enable, Remote Program, HV On.

**AC Power:** Rocker switch

**Switches (momentary):** HV On,SS Slope, Standby, Remote Enable, Remote Program, Preset, Fine Adjust, Control Lock.

**Rotary Encoders:** Voltage Adjust, Current Adjust.

**Rear Panel Elements.**

AC power entry connector, ground stud, HV output connector, remote interface connector and interlock studs. Integral RS-232, USB and optional ethernet communications provide remote control program and monitor.

**Output Cable:**

10' (3.05m) of shielded high voltage cable removable at the rear panel.

**Weight:**

8.8 to 103.4lbs (4 to 47kg) depending on model.

**Regulatory Approvals:**

Compliant to EEC EMC Directive and EEC Low Voltage

**RS232/USB/Ethernet Programming and Monitor Accuracy:**

**Resolution:** 0.025% of full scale for both the voltage and the current programs. 0.1% of full scale for both the voltage and the current monitors

**Remote setting accuracy:** Voltage setting accuracy is better than 0.5% of setting + 0.2% of rated.

**Remote reading accuracy:** Voltage reading accuracy is 0.5% of reading + 0.2% of rated. Current reading accuracy is 1% of reading + 0.1% of rated.

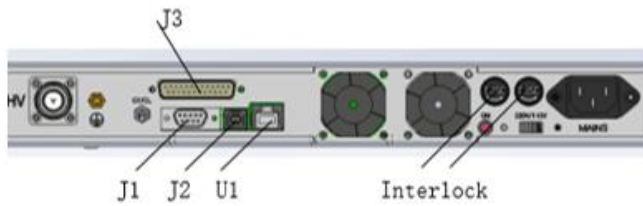
The signals provided on the remote interface connector are as follows:

**Inputs:** Safety interlock, output voltage and current program signals, high voltage enable and remote HV on.

**Outputs:** Output voltage and current monitor signals, HV status, fault status, I/V mode status and a +5 V reference source.



## Rear panel communication interface definition



**1U/2U chassis communication interface**



**4U chassis communication interface**

J1 RS232		J2 USB		J3 DB25	
2 TX1		1 VCC		2 GND	12 Ref +5V
3 RX1		2 DM		3 Interlock	15 Remote Switch
5 GND		3 DP		4 PLC Fault1	16 Remote Switch
		4 GND		5 PLC GND	17 PLC 24V
		5 GND		6 Voltage Program	18 PLC Fault2
		6 GND		7 Current Program	20 HV ON
				8 GND	21 HV Status
				9 Voltage Monitor	22 Fault Status
				10 Current Monitor	23 CT/CL
				11 GND	24 Spark

U1 ETHERNET	
1 TX+	6 RX-
2 TX-	9 ACT LED+
3 RX+	10 ACT LED-
4 CT	11 LINK LED-
5 CT	12 LINK LED+

### DB25 Defination

**Red font: input signal**    **Blue font: output signal**

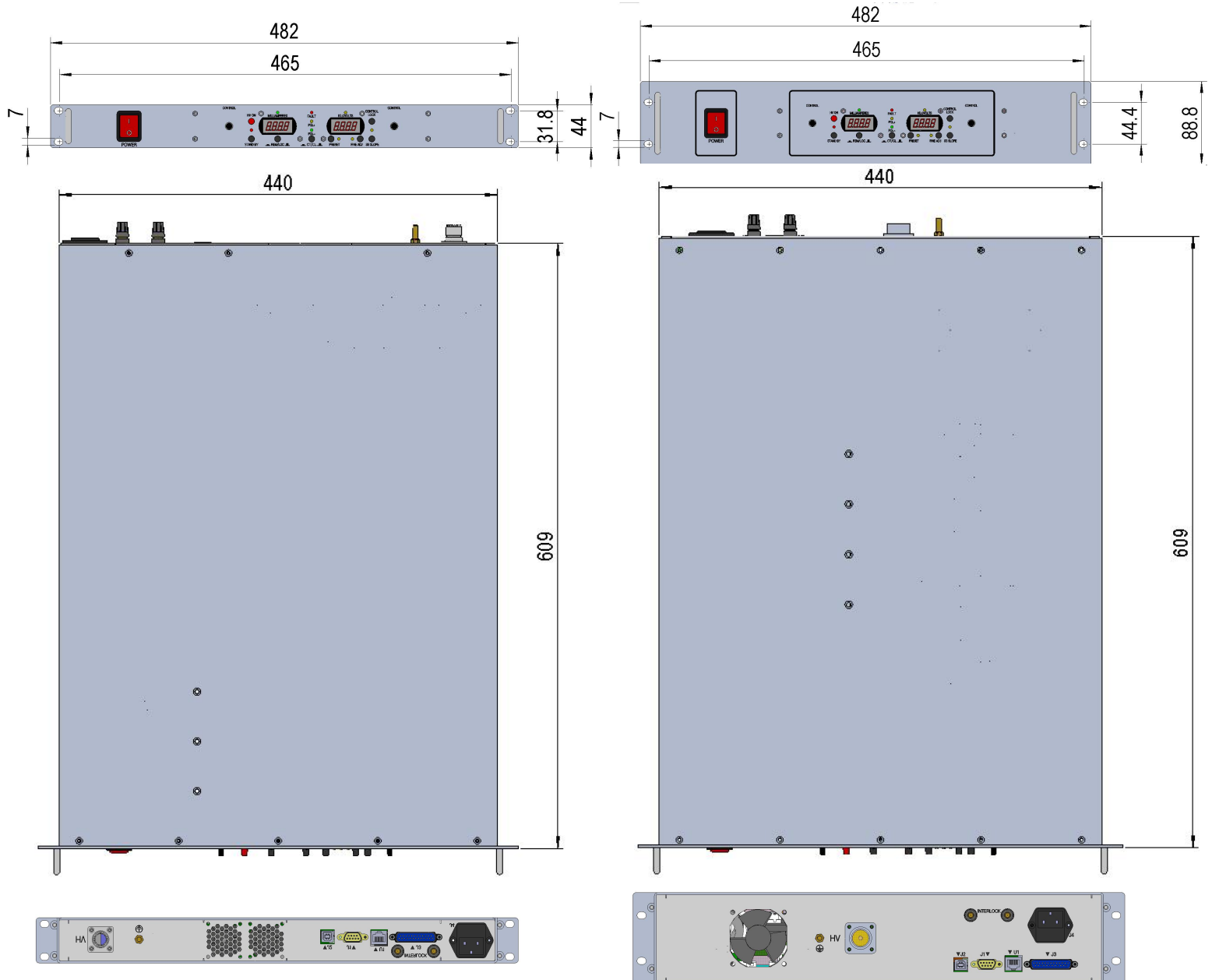
PIN	SIGNAL	SIGNAL PARAMETERS
1,13,14, 19,25	NC	No connect
2,8,11	GND	Signal Ground
3	Interlock	Connect to GND=Interlock, Open=Uninterlock
4	PLC FAULT1	See DB25 diagram, 0V=Fault (Output fault), +5V=No Fault (Normal)
5	PLC GND	GND of PLC
6	Voltage Program	0 to 5V=0 to 100% Rated Output
7	Current Program	0 to 5V=0 to 100% Rated Output
9	Voltage Monitor	0 to 5V=0 to 100% Rated Output
10	Current Monitor	0 to 5V=0 to 100% Rated Output
12	+5Vdc Reference	+5Vdc, 1mA Max
15,16	Remote Switch	Connect to +5V=BD25 Control, Open or Connect to GND=PC Control
17	PLC 24V	+24V voltage from PLC
18	PLC FAULT2	See DB25 diagram, 0V=Fault (over Temp), +5V=No Fault (Normal),
20	HV ON	+5V=HV ON, OPEN=HV OFF
21	HV Status	See DB25 diagram, 0V=HV ON Status, +5V=HV OFF Status
22	Fault Status	See DB25 diagram, 0V=Fault, +5V=No Fault
23	CT/CL	Connect to GND=Current Trip, Open=Current Limit
24	Spark	0V=Spark, +5V=No Spark



DIMENSIONS: mm

300W 1U

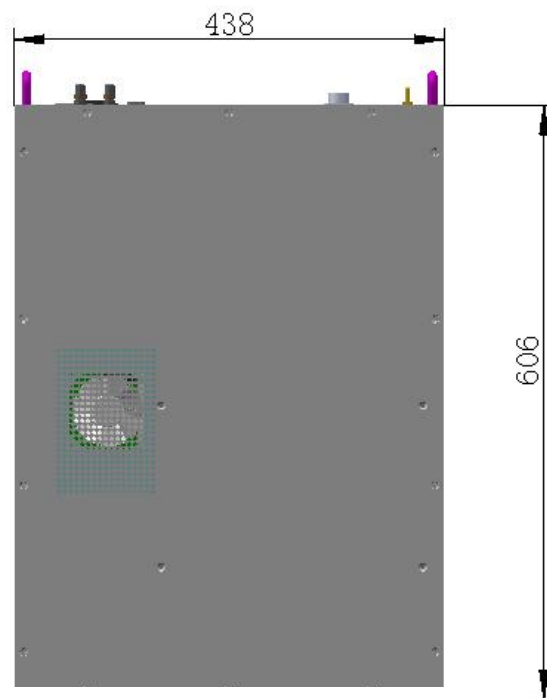
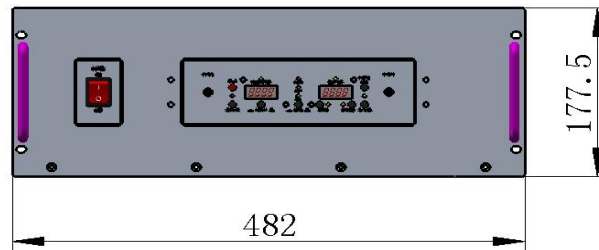
600W 2U





DIMENSIONS: mm

1600W 4U





**LS1U SELECTION TABLE-300W**

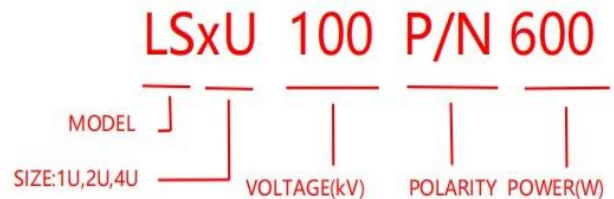
300 Watt		
kV	mA	Model
1	30	LS1U1P/N300
2	15	LS1U2P/N300
3	10	LS1U3P/N300
6	5	LS1U6P/N300
8	3.75	LS1U8P/N300
10	3	LS1U10P/N300
15	2	LS1U15P/N300
20	1.5	LS1U20P/N300
30	1.0	LS1U30P/N300
40	0.75	LS1U40P/N300
50	0.60	LS1U50P/N300
60	0.50	LS1U60P/N300

**LS2U SELECTION TABLE-600W**

600 Watt		
kV	mA	Model
1	600	LS2U1P/N600
2	300	LS2U2P/N600
3	200	LS2U3P/N600
6	100	LS2U6P/N600
8	75	LS2U8P/N600
10	60	LS2U10P/N600
15	40	LS2U15P/N600
20	30	LS2U20P/N600
30	20	LS2U30P/N600
40	15	LS2U40P/N600
50	12	LS2U50P/N600
60	10	LS2U60P/N600
70	8.5	LS2U70P/N600
80	7.5	LS2U80P/N600
100	6	LS2U100P/N600
120	5	LS2U120P/N600
130	4.5	LS2U130P/N600

**LS4U SELECTION TABLE-1600W**

1600 Watt		
kV	mA	Model
140	4	LS4U140P/N560
150	4	LS4U150P/N600
160	4	LS4U160P/N640
140	10	LS4U160P/N1400
150	10	LS4U160P/N1500
160	10	LS4U160P/N1600



# Genvolt

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