Příloha č. 1 - Technická specifikace

UTB – DNS laboratorní přístroje a měřící technika 66/2018 – Kompaktní vysokonapěťový zdroj

IDENTIFIKAČNÍ ÚDAJE ZADAVATELE	
Obchodní název:	**Univerzita Tomáše Bati ve Zlíně**
Sídlo:	nám. T. G. Masaryka 5555, 760 01 Zlín
IČO:	70883521
Rektor:	prof. Ing. Petr Sáha, CSc.

Předmět veřejné zakázky:
Předmětem veřejné zakázky je dodávka **kompaktního vysokonapěťového zdroje** pořizovaného pro potřeby Fakulty technologické Univerzity Tomáše Bati ve Zlíně.

Specifikace předmětu veřejné zakázky:

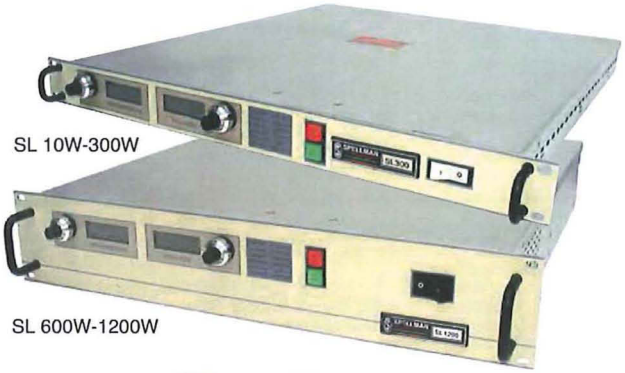
Kompaktní vysokonapěťový zdroj s reverzibilní polaritou výstupu. Přístroj musí splňovat všechny níže uvedené specifikace, nevyhovění kterékoliv položce specifikace je důvodem k vyřazení nabídky z výběrového řízení. Dodaný přístroj také musí pocházet z pravidelné produkce dostatečně kvalifikovaného výrobce – nesmí se jednat o ad-hoc sestavenou aparaturu (tj. nesmí jít o kusovou výrobu na zakázku).

Požadovaný počet: 1 ks

- vstupní napětí 220 Vac / 50 Hz
- regulovaný výstup s reverzibilní polaritou (+/-)
- výstupní napětí plynule regulovatelné v rozsahu alespoň 0 – 70 kV
- výstupní proud plynule regulovatelný v rozsahu alespoň 0 – 2,1 mA
- maximální výstupní výkon alespoň 150 W
- regulace napětí a proudu pomocí deseti-otáčkových potenciometrů s možností uzamykání otáčení
- přesnost regulace napětí stejná nebo lepší než 0,005 % maximálního napětí +500 mV (v celém rozsahu napětí)
- přesnost regulace proudu stejná nebo lepší než 0,01 % maximálního proudu ±100 μA (v celém rozsahu proudu)
- stabilita regulace napětí i proudu stejná nebo lepší než 100 ppm/60 minut po 30 minutách od zapnutí přístroje
- zobrazení hodnoty napětí a proudu na digitálních displejích s alespoň 3 ½ číslicemi
- rozměry (výška X šířka X hloubka) maximálně (tj. menší je lepší) 50 X 500 X 500 mm, uzpůsobeno pro montáž do racku
- hmotnost maximálně (tj. menší je lepší) 14 kg
- součástí dodávky musí být výstupní stíněný vysokonapěťový kabel, připojitelný k zadnímu panelu přístroje
- přístroj musí vyhovovat nařízením EEC EMC Directive, EEC Low Voltage Directive a RoHS
- záruka minimálně 6 měsíců

SL 10W to 1200W COMPACT HV POWER SOURCE

SPELLMAN HIGH VOLTAGE ELECTRONICS CORPORATION



NOW AVAILABLE: Spellman's Quick Delivery Program

- ***Very Compact and Lightweight***
- ***Voltage Range from 1kV to 130kV***
- ***Reversible Polarity Standard up to 8kV***
- ***Extensive Analog and Digital Interface***
- ***Optional VFD Front Panel/Ethernet Interface***
- ***Arc Quench/Arc Count/Arc Trip***
- ***OEM Customization Available***

www.spellmanhv.com/manuals/SL

Spellman's SL Series of high voltage power supplies are designed to meet uncompromising performance standards in a minimum of space. Their circuitry includes a resonant high frequency inverter with proprietary control which provides fault-free operation in extreme transient and arcing environments with greater than 85% efficiency. These full featured supplies are available in a wide range of outputs with many options.

TYPICAL APPLICATIONS

Analytical X-ray	Capacitor Charging
Electrostatics	Hipot Testing
E-Beam Systems	General Laboratory

OPTIONS

See page 5 for options and descriptions

SPECIFICATIONS

Status Indicators:
Voltage and Current Control Mode, Interlock Open and Closed, High Voltage Inhibit, Overcurrent and Overvoltage, Arc, Regulation Error, Overtemperature, Over Power (Optional).

Input:
115Vac or 220Vac±10%, 50/60Hz. Specify with order. 1200W model available in 200/220Vac only.

Output:
Models available from 1kV to 130kV. Each model is available in positive, negative or reversible polarity output.

Front Panel Controls:
Voltage and current are continuously adjustable by ten-turn potentiometers with lockable counting dials, ON/OFF circuit breaker/lamp, high voltage ON switch/indicator and high voltage OFF switch/indicator.

Voltage Regulation:
Load: 0.005% of maximum voltage +500mV for full load change.
Line: ±0.005% of full voltage +500mV over specified input range

Current Regulation:
Load: 0.01% of maximum current ±100µA for full voltage change.
Line: ±0.005% of maximum current for a ±10% input line change.

Ripple:
0.1% p-p +1Vrms.

Temperature Coefficient:
100ppm/°C voltage or current regulated. Higher stability is available on special order.

Environmental:
Temperature Range:
Operating: 0°C to 50°C.
Storage: -40°C to 85°C.
Humidity:
10 to 90% relative humidity, non-condensing

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

Metering:
Digital voltage and current meters, 3½ digit ±1 least significant digit.

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

AC Line Input Cable:
10 to 300W: IEC320 Cord Set, 6' (1.83m)
600 to 1200W: 3-conductor, 12AWG, 6' (1.83m) cable permanently attached to unit.

Dimensions:
10W – 300W: 1¾"H(1U) x 19"W x 19"D**
(4.45cm x 48.3cm x 48.3cm).
600W – 1200W: 3½"H(2U) x 19"W x 19"D**
(8.9cm x 48.3cm x 48.3cm).
**Depth becomes 24" (60.7cm) for 80 to 130kV ranges.

Weight:
17 to 30lbs (7.7 to 14kg) depending on model.

Regulatory Approvals:
Compliant to EEC EMC Directive and EEC Low Voltage Directive. RoHS Compliant.

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www.spellmanhv.com

128009-001 REV. AJ

Quick Delivery Program

In the selection tables to the right, SL models shown in RED are available via Spellman's Quick Delivery Program. Please contact Spellman sales for details.

How To Order:

Sample model number: SL80PN1200/NSS/DPM4

SL series unit, 80kV maximum output voltage, reversible polarity output, 1200 watts, no slow start, 4.5 digit panel meters

There may be some restrictions on multiple option combinations. Please contact our sales department for more details.

*Specify "P" for positive, "N" for negative, or "PN" for reversible polarity. Higher voltage models available on special order.

Electronic Component (Power Source)

SL series is intended for installation as a component of a system. It is designed to meet CE standards, with conditions of acceptance often being: customer provided enclosure mounting, EMC filtering, and appropriate protection, and isolation devices. The SL series is not intended to be operated by end users as a stand-alone device. The SL series power supply can only be fully assessed when installed within a system, and as a component part within that system.

SL TERMINAL BLOCK 26 PIN

PIN	SIGNAL	SIGNAL PARAMETERS
1	Power Supply Common	Signal Ground
2	External Inhibit	Ground=Inhibit, Open=HV On
3	External Interlock	+15V at Open, <15mA at Closed
4	External Interlock Return	Return for Interlock
5	Current Monitor	0 to 10V=0 to 100% Rated Output
6	kV Test Point	0 to 10V=0 to 100% Rated Output
7	+10Vdc Reference	+10Vdc, 1mA Max
8	Remote Current Program In	0 to 10V=0 to 100% Rated Output
9	Local Current Program Out	Front Panel Program Voltage
10	Remote Voltage Program In	0 to 10V=0 to 100% Rated Output
11	Local Voltage Program Out	Front Panel Program Voltage
12	Power Monitor	0 to 10V=0 to 100% Rated Output
13	Remote Power Program In	(Optional)
14	Local HV Off Out	+15V at Open, <25mA at Closed
15	HV Off	Connect to HV OFF for FP Operation
16	Remote HV On	+15V, 10mA Max=HV Off
17	Remote HV Off Indicator	0=HV On, +15V, 10mA Max=HV Off
18	Remote HV On Indicator	0=HV Off, +15V, 10mA Max=HV On
19	Remote Voltage Mode	Open Collector 35V Max, 10mA Max
20	Remote Current Mode	On=Active
21	Remote Power Mode	
22	Remote PS Fault	0=Fault, +15V, 0.1mA Max=No Fault
23	+15V Output	+15V, 100mA Max
24	Power Supply Common	Signal Ground
25	Spare	Spare
26	Shield Return	Chassis Ground

SL SELECTION TABLE- 10W, 30W, 60W — 1.75" (1U)

kV	10 Watt mA	10 Watt Model	30 Watt mA	30 Watt Model	60 Watt mA	60 Watt Model
1	10	SL1PN10	30	SL1PN30	60	SL1PN60
2	5	SL2PN10	15	SL2PN30	30	SL2PN60
3	3.3	SL3PN10	10	SL3PN30	20	SL3PN60
6	1.7	SL6PN10	5	SL6PN30	10	SL6PN60
8	1.25	SL8PN10	3.75	SL8PN30	7.5	SL8PN60
10	1.0	SL10*10	3	SL10*30	6	SL10*60
15	0.67	SL15*10	2	SL15*30	4	SL15*60
20	0.50	SL20*10	1.5	SL20*30	3	SL20*60
30	0.33	SL30*10	1.0	SL30*30	2	SL30*60
40	0.25	SL40*10	0.75	SL40*30	1.5	SL40*60
50	0.20	SL50*10	0.60	SL50*30	1.2	SL50*60
60	0.17	SL60*10	0.50	SL60*30	1.0	SL60*60
70	0.14	SL70*10	0.43	SL70*30	0.85	SL70*60
80	0.13	SL80*10	0.38	SL80*30	0.75	SL80*60
100	0.10	SL100*10	0.30	SL100*30	0.60	SL100*60
120	0.10	SL120*10	0.25	SL120*30	0.50	SL120*60
130	0.10	SL130*10	0.25	SL130*30	0.46	SL130*60

SL SELECTION TABLE- 150W, 300W — 1.75" (1U)

kV	150 Watt mA	150 Watt Model	300 Watt mA	300 Watt Model
1	150	SL1PN150	300	SL1PN300
2	75	SL2PN150	150	SL2PN300
3	50	SL3PN150	100	SL3PN300
6	25	SL6PN150	50	SL6PN300
8	18.75	SL8PN150	37.5	SL8PN300
10	15	SL10*150	30	SL10*300
15	10	SL15*150	20	SL15*300
20	7.5	SL20*150	15	SL20*300
30	5.0	SL30*150	10	SL30*300
40	3.75	SL40*150	7.5	SL40*300
50	3.00	SL50*150	6.0	SL50*300
60	2.50	SL60*150	5.0	SL60*300
70	2.1	SL70*150	4.28	SL70*300
80	1.90	SL80*150	3.75	SL80*300
100	1.50	SL100*150	3.00	SL100*300
120	1.25	SL120*150	2.50	SL120*300
130	1.15	SL130*150	2.30	SL130*300

SL SELECTION TABLE- 600W, 1200W — 3.50" (2U)

kV	600 Watt mA	600 Watt Model	1200 Watt mA	1200 Watt Model
1	600	SL1PN600	1200	SL1PN1200
2	300	SL2PN600	600	SL2PN1200
3	200	SL3PN600	400	SL3PN1200
6	100	SL6PN600	200	SL6PN1200
8	75	SL8PN600	150	SL8PN1200
10	60	SL10*600	120	SL10*1200
15	40	SL15*600	80	SL15*1200
20	30	SL20*600	60	SL20*1200
30	20	SL30*600	40	SL30*1200
40	15	SL40*600	30	SL40*1200
50	12	SL50*600	24	SL50*1200
60	10	SL60*600	20	SL60*1200
70	8.6	SL70*600	17	SL70*1200
80	7.5	SL80*600	15	SL80*1200
100	6.0	SL100*600	12	SL100*1200
120	5.0	SL120*600	10	SL120*1200
130	4.6	SL130*600	9.2	SL130*1200

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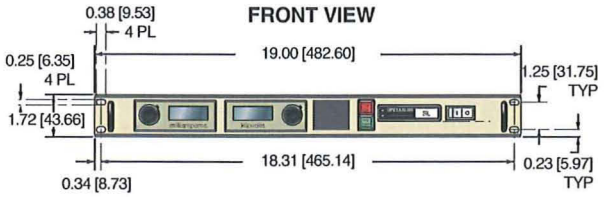
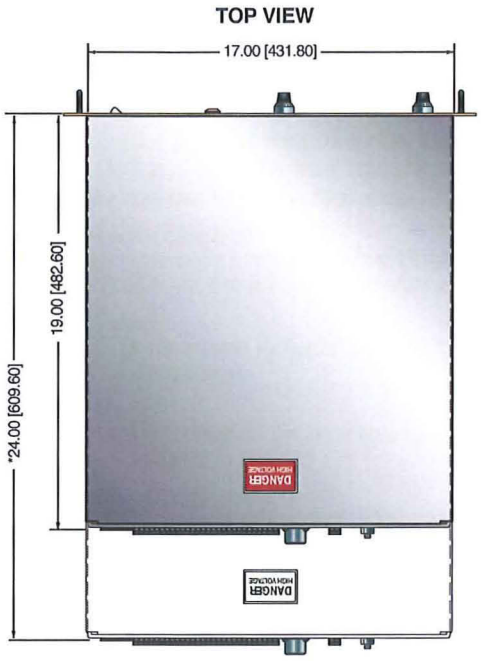
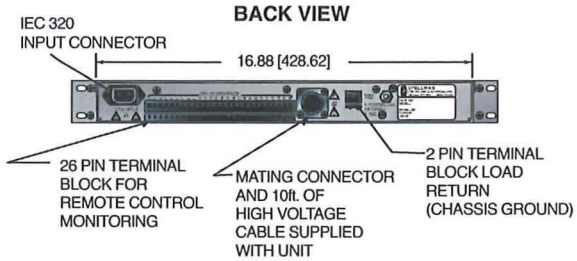
DIMENSIONS: in.[mm]

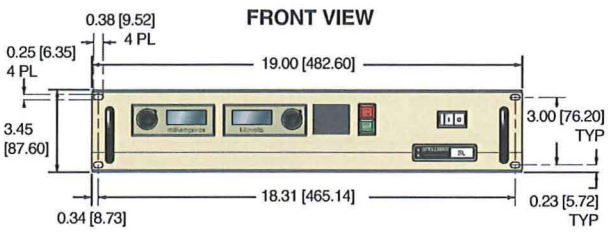
10W-300W

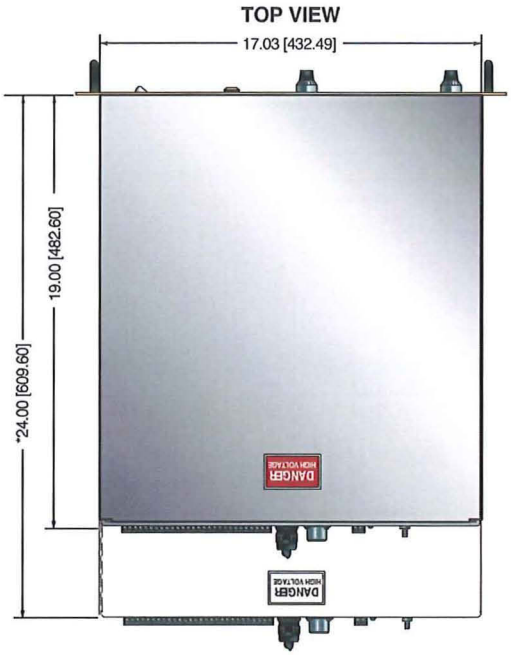


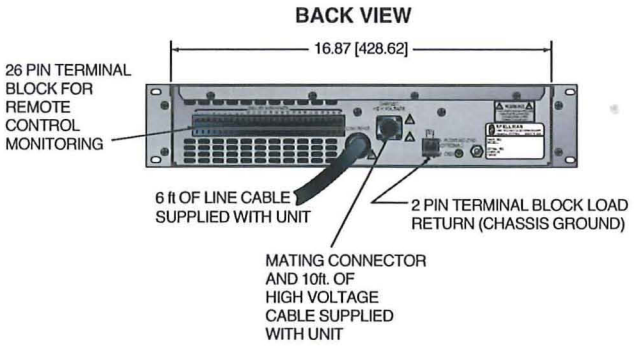




600W-1200W







*** Depth becomes 24" [609.60] for 80kV to 130kV range.**

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eSL OPTION

The eSL Option provides a vacuum fluorescent front panel display and Ethernet connectivity. Both the 1U (1.75") and 2U (3.5") SL product offerings are available with the eSL Option. Using the front panel local controls the main menu has the following features:

Local/Remote Control
Allows operation from either the local front panel or remotely via the Ethernet Category 5 connector.

Features Menu
Allows control over Adjustable Overload Trip and Slow Start features.

Tutorial Menu
Provides information on how to use the local front panel interface.

Diagnostics Menu
Provides information on the revisions of the hard ware, firmware and IP address. Additionally the Diagnostics Menu provides information on the status of the internal low voltage housekeeping power supply voltages.

eSL Option power supplies can still be fully controlled via the SL's comprehensive remote analog interface, so these units are fully backwards compatible with standard SL power supplies.

Typical Front Panel Screens

Model Number

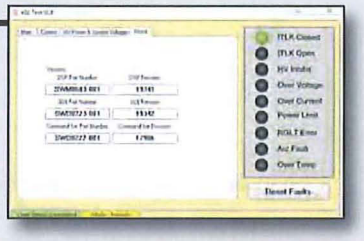
Standby

HV ON

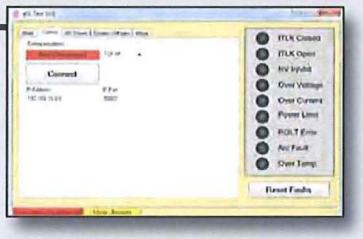
Digital Interface

A front panel accessible Category 5 connector provides Ethernet connectivity. Spellman provides a basic demo GUI for convenience of the user, but most customers implement their own software.

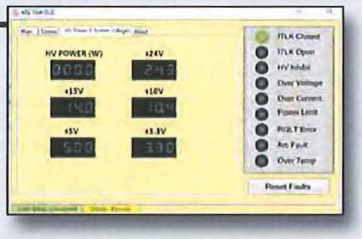
About Screen
DSP part number, DSP revision, GUI part number, GUI revision, Command set part number, Command set revision



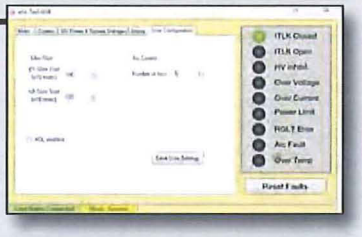
Coms Screen
Communications, IP address, IP port



HV Power and System Voltages Screen
HV power (watts) +24V, +15V, +10V, +5V, +3.3V



User Configuration Screen
Slow Start – kV, Slow Start – mA, Adjustable Over Load (AOL), Arc Control, Fault Indicators



Main Screen
kV Setpoint, kV Readback, mA Setpoint, mA Readback, HV OFF Button, HV ON Button, Arc Counter, System Diagnostics, Reset Faults Button

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SL SERIES OPTIONS

AOL* *Adjustable Overload Trip*
A control board jumper is moved to make the power supply shut down if it ever operates in current mode. This allows the user to set the current programming level as a trip point that will turn the power supply off with an Over Current fault if it ever tries to operate in Current Mode.

APT *Adjustable Power Trip*
A third control loop is installed in the power supply, a power loop. This power loop uses an analog multiplier chip to multiply the voltage and current feedback signals to create a power feedback signal. Programming and feedback scaling is 0-10Vdc = 0-100% of rated power. The circuit is configured to trip the power supply off with an Over Power fault if the power loop ever tries to regulate.

AT* *Arc Trip*
A control board jumper is moved such that the first arc sensed will shut the power supply off with an ARC fault.

BPM *Bipolar Master*

BPS *Bipolar Slave*
This option configures two identical but opposite polarity units to function as a single tracking bipolar supply. The voltage feedback of the master (positive unit) is provided to the voltage programming input of the slave (negative unit).

CMS *Current Mode Select*
A front panel switch is provided to allow the power supply to either regulate in current mode or create an over current fault when operated in current mode, which will shut down the supply. This is basically a switch selectable AOL option.

CPC *Constant Power Control*
Identical to the APT Option with the exception the power supply will run and regulate when the power loop becomes active.

DPM4 *Digital Panel Meter, 4.5 digits*
The standard 3.5 digit front panel meters are replaced with 4.5 digit panel meters.

EFR *External Fault Relay*
A set of relay contacts are provided via the rear panel interface that will change state if the power supply shuts down due to a fault condition.

eSL *Ethernet Connectivity/VFD Front Panel*
The eSL Option provides a vacuum fluorescent front panel display, Ethernet connectivity and comprehensive front panel controls.

FCV *Fine Control Voltage*
This option adds a second potentiometer to the front panel of the unit. This allows for a finer local adjustment of the output voltage setting.

FG *Floating Ground*
All the analog returns inside the power supply are isolated from chassis and brought to one point on the rear panel. Any current that flows out of the power supply via the HV cable/connecter on the high side must return back to the multiplier via the load return on the low side. With only one path to flow through on the low side, a current meter can be inserted in series and a safe ground referenced measurement can be made of the actual high voltage output current.

FGLL *Floating Ground Low Leakage*
Identical functionality as the FG Option but a shield is placed around the high voltage multiplier to capture any leakage current inside the power supply and return it to the top of the current sense resistor. This negates any internal leakage currents from effecting measurements being made.

IO* *Instant On*
A jumper is placed between TB1-15 and TB1-16 on the rear panel, causing the power supply to automatically toggle into HV ON when ever the line voltage is applied.

LL(X) *Lead Length*
Extra long high voltage output cable. 20, 40, 60 and 100 feet are standard lengths.

LR *Low Ripple*
Done on a case by case basis, the standard unit is evaluated and modifications are done to improve the output ripple to 0.05% peak to peak. The operating frequency might be increased, or additional filtering may be added to the HV multiplier.

NAD* *No Arc Detect*
This option removes the arc intervention circuitry from the power supply. Care must be exercised when using this option as damage to the HV multiplier could occur.

NSS *No Slow Start*
The standard 6 second long linear ramp of output voltage is removed allowing the high voltage to "step" to its set point when enabled.

PN *Positive/Negative*
Reversible polarity option. Units that are not inherently reversible by design (10kV to 130kV) can have their output polarity reversed by the process of exchanging the high voltage multiplier section.

RFR *Remote Fault Reset*
This option provides the ability to reset any power supply faults that might occur via toggling a signal on the rear panel interface.

ROV *Remote Over Voltage*
The programming signal for the over voltage comparator circuit is made available to the customer remotely, allowing the power supply to be set to trip the OVP circuit anywhere from 0 -110% of rated output voltage.

SL *Slides*
Industry standard rack mounted slides are installed on the power supply.

SS(X) *Slow Start(X)*
The standard slow start is modified to provide a time of (X) seconds. Time frames of 0.1 seconds to 120 seconds can be accommodated.

There may be some restrictions on multiple option combinations. Please contact our Sales department for more details.

* Option available with the Quick Delivery program

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