SL2KW 2000W COMPACT HV POWER SUPPLY

- ***Very Compact and Lightweight***
- ***Low EMI and RFI***
- ***Voltage Range from 500V to 50kV***
- ***Reversible Polarity Standard up to 8kV***
- ***Optional VFD Front Panel/Ethernet Interface***
- ***Extensive Analog and Digital Interface***
- ***Arc Quench/Arc Count/Arc Trip***
- ***OEM Customization Available***

Spellman's SL2KW Series of 2kW 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

Semiconductor Manufacturing	CPT/CRT Testing
Electrostatics	Hipot Testing
E-Beam Systems	General Laboratory
Capacitor Charging	CW Lasers

OPTIONS

See page 4 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.

Input:
Standard: 208Vac ±10%, 50/60Hz @ 8.5A/phase, three phase
Optional: 220Vac ±10%, 50/60Hz @ 19.75A, single phase

Output:
Models available from 0.5kV to 50kV. 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, three phase line input
0.3% p-p +1Vrms, single phase line input

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, $3^1/_2$ digit ±1 least significant digit.

Interface Connector:
25 pin male D connector

Output Cable:
10' (3.3m) of shielded high voltage cable removable at the rear panel.

AC Line Input Cable:
A 6 foot (1.83m) cable is permanently attached to the unit. Single phase units use 3 conductor 12AWG cable, three phase units use 4 conductor 16AWG cable.

Dimensions:
3.5˝H(2U) x 19˝W x 19˝D
(8.9cm x 48.3cm x 48.3cm)

Weight:
17 to 26lbs (7.7 to 11.8kg) depending on model.

Regulatory Approvals:
Compliant to EEC EMC Directive for 3 phase units, conducted and radiated emission only for single phase units. Compliant to EEC Low Voltage Directive.
RoHS Compliant.

Electronic Component (Power Source)

SL2KW 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 SL2KW series is not intended to be operated by end users as a stand-alone device. The SL2KW series power supply can only be fully assessed when installed within a system, and as a component part within that system.

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128071-001 REV. R

eSL OPTION

The eSL Option provides a vacuum fluorescent front panel display and Ethernet connectivity. 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 SL2KW's comprehensive remote analog interface, so these units are fully backwards compatible with standard SL2KW power supplies.

Typical Front Panel Screens

Model Number

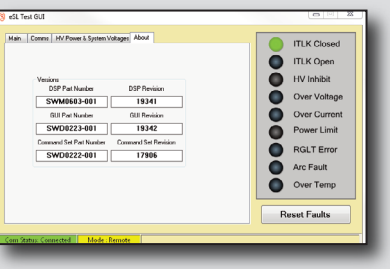
Standby

HV ON

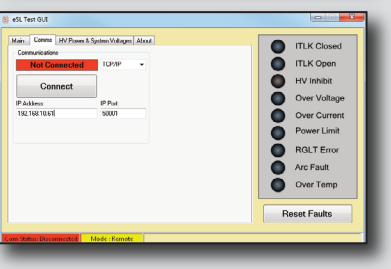
Digital Interface

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.

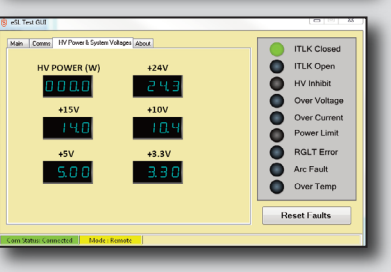
About Screen
DSP part number, DSP revision, GUI part number, GUI revision, Command set part number, Command set revision



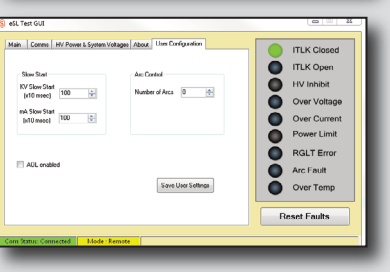
Coms Screen
Communications, IP address, IP port



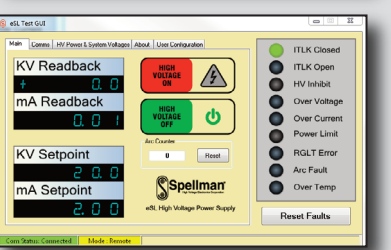
HV Power and System Voltages Screen
HV power (watts) +24V, +15V, +10V, +5V, +3.3V



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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SL2KW SELECTION TABLE

MAXIMUM RATING kV	MAXIMUM RATING mA	MODEL NUMBER
0.5	4000	SL0.5PN2000
1	2000	SL1PN2000
2	1000	SL2PN2000
3	666	SL3PN2000
6	333	SL6PN2000
8	250	SL8PN2000
10	200	SL10*2000
15	133	SL15*2000
20	100	SL20*2000
30	66.6	SL30*2000
40	50	SL40*2000
50	40	SL50*2000

*Specify "P" for positive polarity or "N" for negative polarity or "PN" for reversible polarity

SL2KW 25 PIN D CONNECTOR

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	EFR Common	Optional External Fault Relay
13	EFR-NC/EFR-NO	30V @ 2A Maximum
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, On=Active
20	Remote Current Mode	
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	Shield Return	Chassis Ground

How To Order:

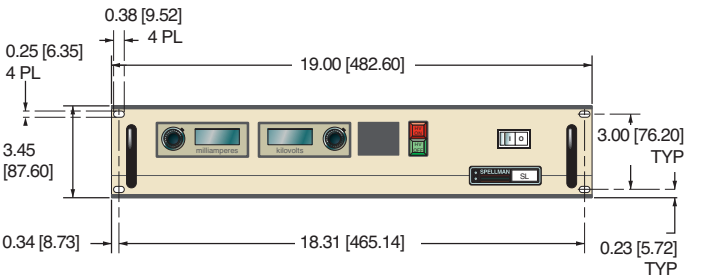
Sample model number: SL20PN2000/NSS/DPM4

SL2KW Series unit, 20kV maximum output voltage, reversible polarity output, 2000 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.

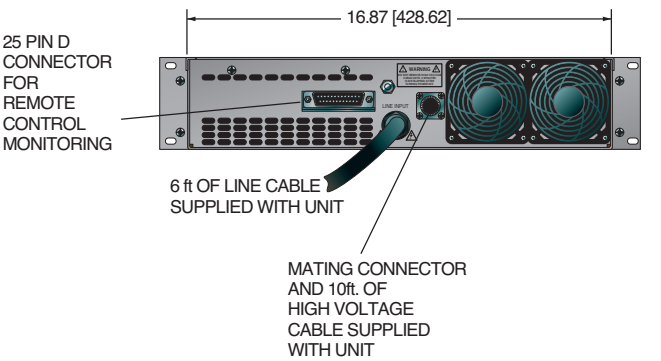
DIMENSIONS: in.[mm]

FRONT VIEW



TOP VIEW

BACK VIEW



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SL2KW 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.

ARC *Arc Sense*
A signal is provided on a spare pin (TB1-21) that changes state whenever the power supply detects an arc.

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.

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.

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. Non standard lengths can be custom ordered.

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 50kV) 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.

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