STA 4kW POWER SUPPLY

SPELLMAN HIGH VOLTAGE ELECTRONICS CORPORATION

⚠ Intended to replace SA Series for new designs

- ***4KW'S IN SINGLE 3U (5.25") CHASSIS***
- ***MODELS FROM 1KV TO 70KV***
- ***REMOTE ANALOG AND REMOTE ETHERNET INTERFACE***
- ***ARC AND SHORT CIRCUIT PROTECTED***
- ***CUSTOMER CONFIGURABLE FEATURES VIA ETHERNET INTERFACE***
- ***OEM CUSTOMIZATION AVAILABLE***

Spellman's STA Series of 4kW high voltage power supplies are available in positive or negative polarities in 15 different models with outputs ranging from 1kV to 70kV. A full featured front panel allows easy local control, while an extensive analog interface provides comprehensive remote capability. The standard Ethernet and RS-232 digital interfaces simplify integrating the STA into your system design.

The STA's robust IGBT inverter is inherently fault tolerant and is ideal for demanding applications like semiconductor processing and vacuum deposition. Many operational features can be configured by the user to suit their particular requirements.

TYPICAL APPLICATIONS

Ion Beam Implantation
Semiconductor Processing
Electron Beam Welding
Capacitor Charging
High Power RF Transmitters
Electrostatic Precipitators
X-Ray Systems

HARDWARE BASED OPTIONS

BFP	Blank Front Panel
HS	High Stability
LL(X)	High Voltage Cable Length
1PH	180-264Vac, Single Phase Input

SOFTWARE CONFIGURABLE FEATURES

Adjustable Overload Trip
Arc Trip Count
Arc Quench Time
Arc Re-Ramp Time
Constant Power Control
Adjustable Power Trip
Slow Start Ramp Times

SPECIFICATIONS

Input Voltage:
Standard: 180-264Vac, 50/60Hz, three phase, 90% efficiency, 0.85 power factor
Optional: 180-264Vac 50/60Hz, single phase (1PH)

Input Current:
Standard: 180-264Vac, three phase 17 amps, maximum
Optional: 180-264Vac, single phase 38 amps, maximum

Output Voltage:
15 models from 1kV to 70kV. Each model is available with positive or negative outputs. 1kV to 8kV units are internally reversible.

Local Output Controls:
Voltage and current are continuously adjustable over entire range via ten-turn potentiometers with lockable counting dials.

Voltage Regulation:
Load: 0.05% of full voltage +500mV for full load change.
Line: 0.05%of full voltage +500mV over specified input range.

Current Regulation:
Load: 0.05% of full current ±100μA for any voltage change.
Line: 0.05% of full current over specified input range.

Ripple:
0.1% p-p +1Vrms

Stability:
0.02%hr. after 1 hour warm-up.

Temperature Coefficient:
100ppm/°C. Higher stability (50ppm/°C) available on special order via the HS option

Environmental:
Temperature Range:
Operating: 0˚C to 40˚C
Storage: -40˚C to 85˚C
Humidity:
10% to 90% RH, non-condensing.

Cooling:
Forced air; inlet through side panels, outlet at rear panel

Metering:
Digital voltage and current meters, accurate to within 1%

System Status Display:
"Dead Front" type indicators provide status of up to 12 system operations including voltage and current regulation, fault conditions and circuit control.

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128104-001 REV. A

Analog Interface Connector:
50 pin female D connector

High Voltage Output Cable:
A detachable 10' (3.05m) long shielded HV cable is provided

Dimensions:
1kV to 70kV:
5.25˝ (3U)H X 19˝ W X 21˝ D (133mm x 482mm x 533mm)

Weight:
1kV to 8kV: 46 lbs. (20.87kg)
10kV to 70kV: 58 lbs. (26.31kg)
Individual kV models may vary

Regulatory Approvals:
2004/108/EC, the EMC Directive and 2006/95/EC, the Low Voltage Directive, approval pending.

STA SELECTION TABLE

MAXIMUM RATING		MODEL NUMBER
kV	mA	
1	4,000	STA1*4
2	2,000	STA2*4
3	1,333	STA3*4
4	1,000	STA4*4
6	667	STA6*4
8	500	STA8*4
10	400	STA10*4
12	333	STA12*4
15	267	STA15*4
20	200	STA20*4
30	133	STA30*4
40	100	STA40*4
50	80	STA50*4
60	67	STA60*4
70	57	STA70*4

*Substitute "P" or positive polarity and "N" for negative polarity. Polarity must be specified at time of order.

1-8kV units are inherently reversible by design requiring an internal wiring change to swap polarities. Intermediate voltage units are available by special order.

Digital Interface

The STA features a standard RS-232 and Ethernet digital interface. Utilizing these standard digital interfaces can dramatically simplify power supply interfacing requirements saving the user both time and money, while enhancing functionality and overall capability. Spellman provides a GUI with the STA that allows the customer to both customize operational features of the STA while also providing basic power supply operational features. Details of the STA's digital interface capability are described in the STA manual, downloadable via the link on the first page of this data sheet.

Arc Intervention

Spellman's STA power supplies have an arc intervention feature that senses arc currents via a fast acting current sense transformer. The purpose of the arc intervention circuitry is to prevent power supply damage from continuous, long term arcing. The factory default configuration will trip off the unit with an Arc Fault if 4 arcs occur in a 10 second time period. Customers can change basic arc intervention parameters (Arc Count, Arc Quench, Reramp Time, and Window Time) within preset limits via the digital interface; customized units can be provided for unique arc prone environments, contact Spellman for details.

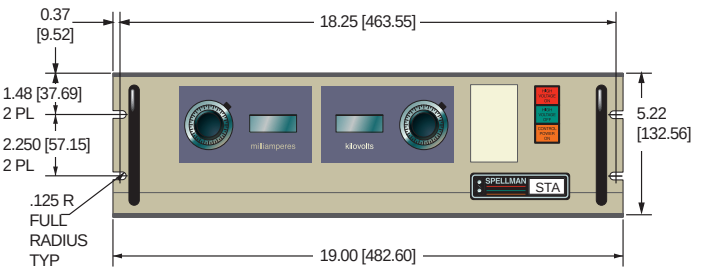
STA rear panel shown with local operation plug installed in 50 pin D connector

JB1 STA ANALOG INTERFACE— 50 PIN FEMALE D CONNECTOR

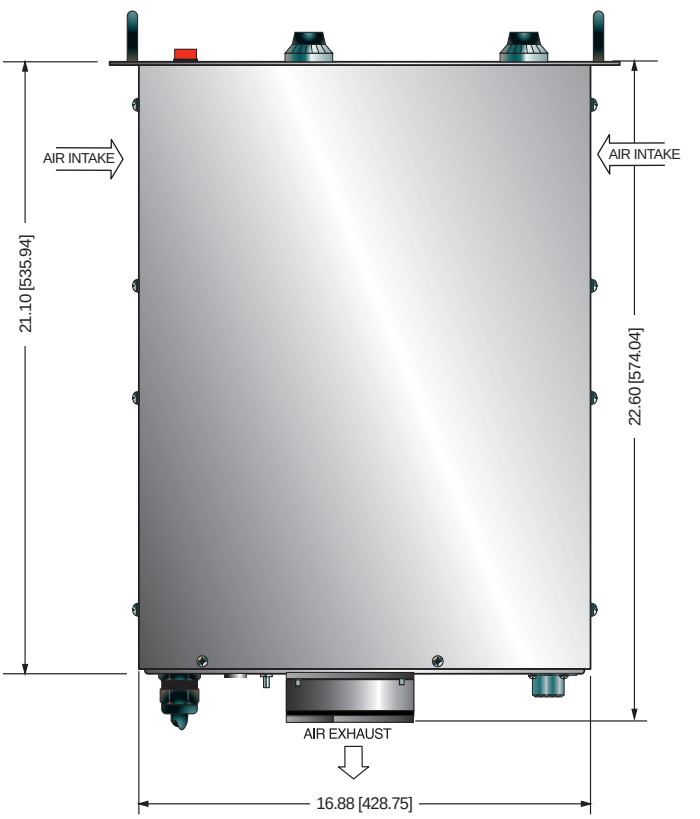
PIN	SIGNAL	PARAMETERS
1	Power Supply Common	Power Supply Ground
2	Reset/HV Inhibit	Normally open, Low = Reset/Inhibit
3	External Interlock	+24Vdc @ open, <25mA @ closed
4	External Interlock Return	Return for External Interlock
5	mA Test Point	0-10Vdc = 0-100% rated output, Zout= 1KΩ, 1%
6	kV Test Point	0-10Vdc = 0-100% rated output, Zout= 1KΩ, 1%
7	+10Vdc Reference Output	+10Vdc @ 1mA
8	mA Program Input	0-10Vdc = 0-100% rated output, Zin>10MΩ
9	Local mA Program Output	0-10Vdc = 0-100% rated output, front panel pot
10	kV Program Input	0-10Vdc = 0-100% rated output, Zin>10MΩ
11	Local kV Program Output	0-10Vdc = 0-100% rated output, front panel pot
12	Remote Power On Output	+24Vdc @ open, <25mA @ closed
13	Remote Power On Return	Return for Remote Power On
14	Remote HV Off	+24Vdc @ open, <25mA @ closed, connect to pin15 for front panel operation
15	Remote HV Off/On Common	HV On/Off Common
16	Remote HV On	+24Vdc @ open, <25mA @ closed, momentarily connect to pin 15 enable high voltage
17	HV Off Indicator	+24Vdc @ 25mA = HV Off
18	HV On Indicator	+24Vdc @ 25mA = HV On
19	Power Supply Common	Supply Ground
20	+24Vdc Output	+24Vdc @ 100mA, maximum
21	Voltage Mode Status	Open Collector, Low = Active
22	Current Mode Status	Open Collector, Low = Active
23	Power Mode Status	Open Collector, Low = Active
24	Interlock Closed Status	Open Collector, Low = Active
25	Power Test Point	0-10Vdc = 0-100% rated output, Zout= 5KΩ, 1%
26	Spare	
27	Spare	
28	Remote Overvoltage Adjust	0-10Vdc = 0-100% rated output
29	Over Power Fault	Open Collector, Low = Active
30	Over Voltage Fault	Open Collector, Low = Active
31	Over Current Fault	Open Collector, Low = Active
32	System Fault	Open Collector, Low = Active
33	RGLT Error Fault	Open Collector, Low = Active
34	Arc	Open Collector, Low = Active
35	Over Temp Fault	Open Collector, Low = Active
36	AC Fault	Open Collector, Low = Active
37	Spare	
38	Spare	
39	Spare	
40	Spare	
41	Spare	
42	Remote Power Program Input	0-10Vdc = 0-100% rated output, Zin>10MΩ
43	Local Power Program Output	0-10Vdc = 0-100% rated output, internal pot
44	+5Vdc Output	+5Vdc @ 100mA, maximum
45	+15Vdc Output	+15Vdc @ 100mA, maximum
46	-15Vdc Output	-15Vdc @ 10mA, maximum
47	RS232 Tx	
48	RS232 Rx	
49	RS232 GND	
50	Power Supply Common	Power Supply Ground

DIMENSIONS: in.[mm]

FRONT VIEW



TOP VIEW



BACK VIEW