HVP
High Voltage Products. High Voltage Experts.

Advanced Energy

ULTRAVOLT E SERIES

PRECISION HIGH VOLTAGE POWER SUPPLIES

The UltraVolt® E series of precision high voltage power supplies has very low ripple, excellent linearity, and very stable temperature characteristics. Models in this series are offered at two levels of performance; the best delivers 10 ppm characteristics. This series is ideal for applications where system performance is directly linked to high voltage power quality and performance.

PRODUCT HIGHLIGHTS

- Precision output voltage from 0 to 1 kV through 0 to 15 kV
- PPM level ripple, regulation, and stability
- As low as 10 ppm temperature coefficient and reference
- 0 to 4, 15/20, or 30 W of output power
- Maximum Iout capability down to 0 V
- Voltage and current regulation/limit capability
- Precision output voltage and current monitors

TYPICAL APPLICATIONS

- Bias supplies
- Mass spectrometry
- SEM/FIB
- Electron beams
- Ion beams

ELECTRICAL SPECIFICATIONS

Parameter	Conditions	Models									Units
Input		**All Types**									
Voltage Range	Full Power	+23 to 30									VDC
Current	Standby/Disable	< 50									mA
Current	No Load, Max Eout	< 325									mA
Current	Full Load, Max Eout	2.5									A
AC Ripple Current	Nominal Input, Full Load	< 10									mA pk to pk
Output		**1E**			**2E**			**4E**			
Voltage Range	Nominal Input	0 to 1000			0 to 2000			0 to 4000			VDC
Nominal Input Voltage/Model		24	24	24	24	24	24	24	24	24	VDC
Power	Nominal Input, Max Eout	4	20	30	4	20	30	4	20	30	Watts
Current	Iout Entire Output Voltage Range	4	20	30	2	10	15	1	5	7.5	mA
Voltage Monitor	Normal Operating Conditions	0 to 10 ±0.5%									VDC
Current Monitor	Normal Operating Conditions	0 to 10 ±0.5%									VDC
Ripple	Full Load, Max Eout	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	ppm
Line Regulation	Nom Input, Max Eout, Full Power	< 25 ppm or < 10 ppm									VDC
Static Load Regulation	No Load to Full Load, Max Eout	< 25 ppm or < 10 ppm									VDC
Stability	30 Min Warmup, Per 8 h, Per Day	< 25 ppm or < 10 ppm									VDC
Output		**6E**			**10E**			**15E**			
Voltage Range	Nominal Input	0 to 6000			0 to 10000			0 to 15000			VDC
Nominal Input Voltage/Model		24	24	24	24	24	24	24	24	24	VDC
Power	Nominal Input, Max Eout	4	20	30	4	15	30	4	15	30	Watts
Current	Iout Entire Output Voltage Range	0.67	3.3	5	0.4	1.5	3	0.26	1	2	mA
Voltage Monitor	Normal Operating Conditions	0 to 10 ±0.5%									VDC
Current Monitor	Normal Operating Conditions	0 to 10 ±0.5%									VDC
Ripple	Full Load, Max Eout	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	ppm
Line Regulation	Nom Input, Max Eout, Full Power	< 25 ppm or < 10 ppm									VDC
Static Load Regulation	No Load to Full Load, Max Eout	< 25 ppm or < 10 ppm									VDC
Stability	30 Min Warmup, Per 8 h, Per Day	< 25 ppm or < 10 ppm									VDC

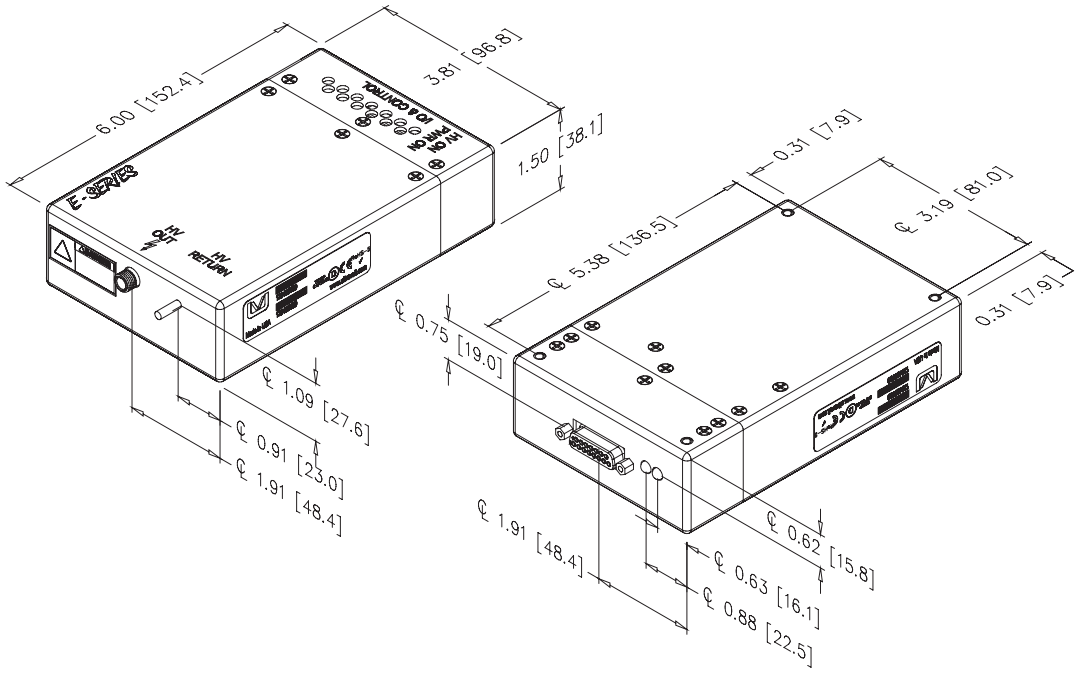
ELECTRICAL SPECIFICATIONS (CONTINUED)

Programming and Controls		All Types	
Input Impedance	Nominal Input	10	MΩ
Adjust Accuracy and Adjust Linearity	10 to 100%	±0.05%	%
Adjust Voltage	Differential	0 to +10	VDC
Output Voltage	T = +25°C, Initial Value	+10.00 ±0.05%	VDC
Max Source Current	T = +25°C	5	mA
Output Impedance	Normal Operating Conditions	Buffered, low impedance, 2 mA max for source/sink current	-
Enable/Disable		0 to +0.8 disable, +2.5 to 10 enable (default = disable)	VDC

Environmental		All Types	
Operating	Full Load, Max Eout, Case Temp.	+10 to +45	°C
Temperature Coefficient	Over the Specified Temperature	±25 or ±10	ppm/°C
Thermal Shock	Mil-Std-810, Method 504, Class 2	-40 to +65	°C
Storage	Non-Operating, Case Temp.	-55 to +105	°C
Humidity	All Conditions, Standard Package	0 to 95%, non-condensing	-
Altitude	Standard Package, All Conditions	Sea level through 10,000	ft
Shock	Mil-Std-810, Method 516, Proc. 4	20	Gs
Vibration	Mil-Std-810, Method 514, Fig. 514-3	10	Gs

MECHANICAL SPECIFICATIONS

Construction	
Material	Aluminum alloy 5052-H32
Finish	Anodize MIL-A-8625E blue
Size	
Volume	561.9 cc (34.29 in³)
Weight	1.1 kg (2.4 lb)
Tolerance	
Overall	±1.27 mm (0.030")
Pin to Pin	±0.38 mm (0.015")
Mounting Hole Location	±0.64 mm (0.025")
Connections	
D-Sub	15-pin, female
HV Connector	LGH1/2L
HV Return	#6-32 x 0.437 long threaded post



INTERFACE

E Series Input Connector Pinout and Function

Pin	Description	Function
1	Reference Voltage	(+)10.00 V precision reference
2	Voltage Programming -	0 to 10 v to program full output voltage Programming input is differential between pins 2 and 3
3	Voltage Programming +	0 to 10 v to program full output voltage Programming input is differential between pins 2 and 3
4	Voltage Monitor	0 to +10 v represents 0 to full output voltage
5	Voltage Mode Indicator	Open drain active low when in voltage control
6	Signal Ground	Reference all control signals here.
7	Input Power	+23 to +30 V
8	Input Power	+23 to +30 V
9	Power Ground	Input Power Return
10	Power Ground	Input Power Return
11	Enable	TTL high to enable, low to disable, default is OFF
12	Current Monitor	0 to +10 v represents 0 to full output current
13	Current Programming	0 to +10 v sets current from 0 to full rated output current
14	Current Mode Indicator	Open drain active low when in current control
15	Signal Ground	Reference all control signals here.

NOTE: Use stud next to high voltage output connector as HV return. A secure ground connection here is critical to safety and proper operation.

ORDERING INFORMATION

Ordering Information		
Type	0 to 1000 VDC Output	1E
	0 to 2000 VDC Output	2E
	0 to 4000 VDC Output	4E
	0 to 6000 VDC Output	6E
	0 to 10,000 VDC Output	10E
	0 to 15,000 VDC Output	15E
Input	24 V Input	24
Polarity	Positive Output	-P
	Negative Output	-N
Power	4 W Output	4
	15 W Output (10 and 15 kV only)	15
	20 W Output (1 to 6 kV only)	20
	30 W Output	30
Performance		
Level	10 ppm Line/Load Regulation, Stability, and Temp. Coefficient	-10 ppm
	25 ppm Line/Load Regulation, Stability, and Temp. Coefficient	-25 ppm
Connectors	LGH	(Standard)
	5 kV, SHV Type	-SHV-5 kV
	10 kV, BNC Type	-BNC-10 kV