HVP
High Voltage Products. High Voltage Experts.

Advanced Energy

ULTRAVOLT 20LE TO 30LE SERIES

PRECISION, LOW RIPPLE DC TO HIGH VOLTAGE DC CONVERTERS

The UltraVolt® LE Series of regulated DC-to-DC converters offer excellent low ripple and stability suitable for precision high voltage applications.

PRODUCT HIGHLIGHTS

- Regulated high voltage outputs ranging from 20, 25 or 30 kV DC maximum
- Single output: positive and negative polarity models
- 4, 15 or 30 W of maximum output power
- 24 VDC input
- 0 to 10 VDC (full-scale) analog control interface with differential input
- Temperature coefficients 25 ppm/°C
- Control/monitoring of both output voltage and current setpoint levels
- Optional enhanced output stability option for operation down to 0 VDC (-AZ option, 4 W only)
- Chassis mount
- Front and rear panel high voltage output and return options
- UL/cUL recognized, CE mark (LVD and RoHS), IEC-62368-1

TYPICAL APPLICATIONS

- DC to high voltage DC bias supplies
- Mass spectrometry and electrophoresis
- Scanning electron microscopes (SEM/FIB)
- Electron and Ion Beams

AT A GLANCE

Maximum Output Voltage

20, 25 or 30 kV DC

Maximum Output Power

30 W

Type

Single Output

Control Interface

Analog

Temperature Coefficient

25 ppm/°C

Ripple

0.002%

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ELECTRICAL SPECIFICATIONS

Model[1]		20LE Series			25LE Series		
High Voltage Output Range (Adjustable Regulated, Positive or Negative Output)		0 to 20,000 VDC			0 to 25,000 VDC		
High Voltage Outputs		Single Unipolar			Single Unipolar		
Input Voltage (VDC, Nominal)		24 VDC			24 VDC		
Power Output (Watts, Nominal)		4 W	15 W	30 W	4 W	15 W	30 W
DC Input							
Vin (Input Voltage) Range	VDC	23 to 30			23 to 30		
Vin (Nominal)	VDC	24			24		
Iin (Input Current, Nominal)	A @ 100% HVout, 100% LOAD	0.5	1.1	1.8	0.5	1.1	1.8
	A @ 100% HVout, 0% LOAD	< 0.3			< 0.3		
	A @ disable/standby state	< 0.08			< 0.08		
DC Output							
HVout (Output Voltage)	VDC (Postive or Negative Polarity Models)	0 to 20,000			0 to 25,000		
Iout (Output Current)	mA (max) @ 0 to 100% HVout, Vin (nominal)	0.20	0.75	1.50	0.16	0.60	1.20
Pout (Output Power)	Watts (max)	4	15	30	4	15	30
Ripple[2]	%	<0.002			<0.002		

Model[1]		30LE Series		
High Voltage Output Range (Adjustable Regulated, Positive or Negative Output)		0 to 30,000 VDC		
High Voltage Outputs		Single Unipolar		
Input Voltage (VDC, Nominal)		24 VDC		
Power Output (Watts, Nominal)		4 W	15 W	30 W
DC Input				
Vin (Input Voltage) Range	VDC	23 to 30		
Vin (Nominal)	VDC	24		
Iin (Input Current, Nominal	A @ 100% HVout, 100% LOAD	0.5	1.1	1.8
	A @ 100% HVout, 0% LOAD	< 0.3		
	A @ disable/standby state	< 0.08		
DC Output				
HVout (Output Voltage)	VDC (Postive or Negative Polarity Models)	0 to 30,000		
Iout (Output Current)	mA (max) @ 0 to 100% HVout, Vin (nominal)	0.13	0.50	1.00
Pout (Output Power)	Watts (max)	4	15	30
Ripple[2]	%	<0.002		

1 Standard product specifications shown unless noted. Custom configurations are available.

2 Ripple applies when output is between 10% to 100%.

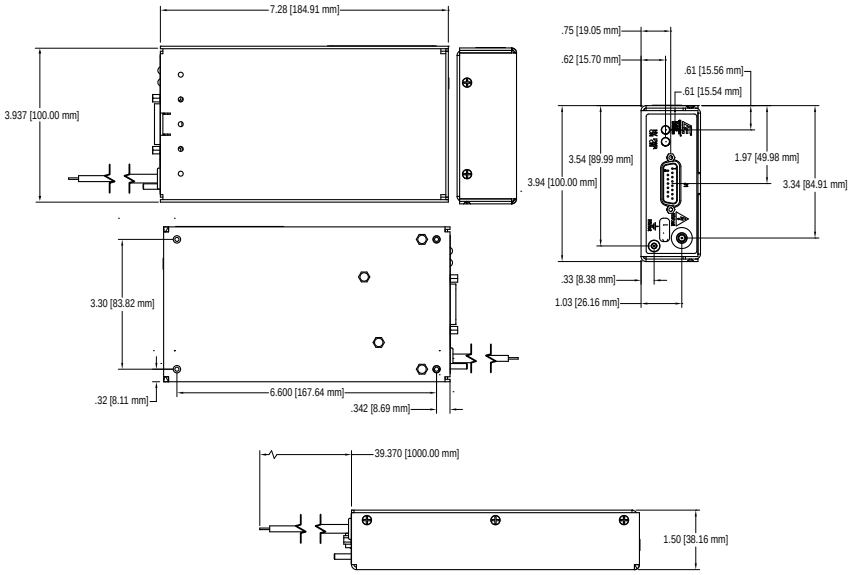
ELECTRICAL SPECIFICATIONS (CONTINUED)

Stability and Regulation	
Stability	0.01% (100 ppm) @ 100% HVout (per 8 h interval, after 30 min warmup)
Line Regulation	0.0025% (25 ppm) @ 100% HVout, 100% Pout
Static Load Regulation	0.0025% (25 ppm) @ 100% HVout, Load Step, 0 to 100%
Temperature Coefficient	25 ppm/°C (standard configuration over operating temperature range)
Power-On Rise Time	< 750 msec @ 100% LOAD
	Contact factory for other options.

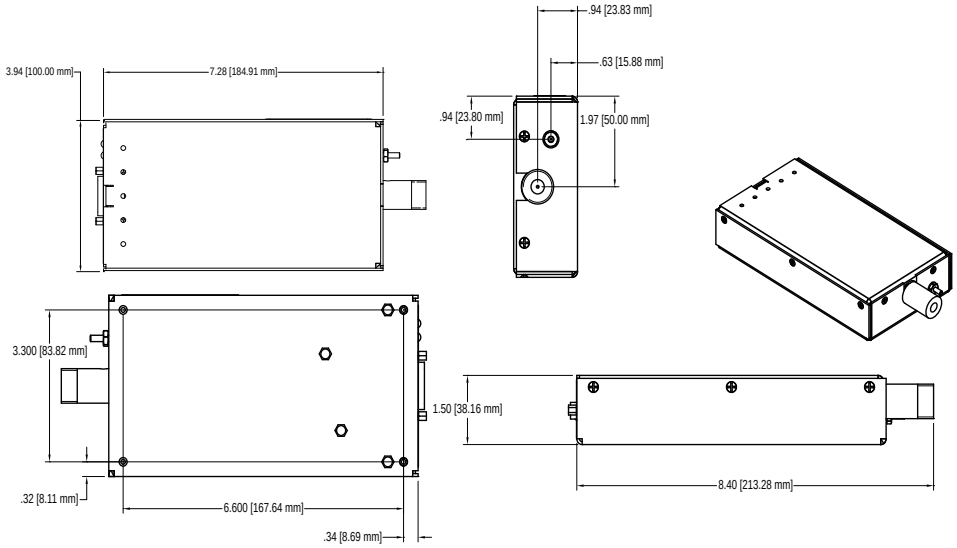
Environmental	
Operating Temperature Range	10 to 45°C (50 to 113°F) case temperature @ 100% HVout, 100% LOAD
Storage	-55 to 105°C (-67 to 222°F) case temperature
Humidity	0 to 95% RH, non-condensing
Altitude	Sea level to 2000 m (6562 ft)

Regulatory	
Certifications	UL/cUL recognized, IEC-62368-1, CE mark (LVD and RoHS)

MECHANICAL SPECIFICATIONS



LGH Connector



Construction	
Standard Case	Aluminum alloy
	Clear coat per MIL-DTL-5541, Type II, Cl 1A, Clear
Labels	Static-dissipative polyester
	Polycarbonate overlay
Cooling	Natural convection and conduction
Encapsulation	Silicone-based RTV
	Contact factory for other options

Volumes and Weights		
	cm^3	in^3
Volume[1]	705	43
	g	oz
Weight[2]	1322	46.6

1 Leads, posts, connectors, mounts excluded

2 Standard configuration, no options

INTERFACE

Standard Interface (DB15 Male Connector)	
Pin	**Description**
1	DC Input Power
2	DC Input Power
3	Signal Ground
4	Voltage Mode Indicator[3]
5	Voltage Monitor[2]
6	Set HV Voltage Level +Vprog[1]
7	Set HV Voltage Level -Vprog[1]
8	Control Reference Voltage (+10 VDC ±.05% @ 5 mA)
9	Signal Ground
10	Current Mode Indicator[3]
11	Set HVout Current Level
12	Current Monitor[2]
13	Enable HVout[4]
14	DC Input Power Ground
15	DC Input Power Ground
Post	High Voltage Return[5]
Flying Lead	High Voltage Output (non-terminated coaxial cable, 3 ft from case)
PWR ON	DC Input Power Present (Green LED = ON)
HV ON	High Voltage Output Enabled (Yellow LED = ON)

[1] 0 to 10 VDC (Full Scale) differential signal between Pin 6 and Pin 7.

[2] Voltage and current monitors will sink/source up to 2 mA.

[3] Active low, open drain will sink up to 25 mA.

[4] Signal Input LOW < +0.8 VDC, HIGH > +1.5 VDC (Default or NC = DISABLED = LOW).

[5] For proper operation and safety, always route HVret signal through HVret connection.

STANDARD OPTIONS

The LE series can be factory-configured with options that enhance its performance in your application. Customized model configurations to meet special performance needs are also available. Please contact factory for further details.

Option	Description
-AZ	Eliminates burst mode and enhances the stability of module high voltage output at set points below <10% HVout by optimizing performance. (Available only on 4 W models).
-LGH	Replaces standard front panel HVout flying lead and ground stud with rear panel mounted LGH3 connector and ground stud.

ORDERING INFORMATION

Type	0 to 20,000 VDC Output	20LE
	0 to 25,000 VDC Output	25LE
	0 to 30,000 VDC Output	30LE
Input	24 VDC Nominal	24
Polarity	Positive Output	-P
	Negative Output	-N
Power	4 W Output	4
	15 W Output	15
	30 W Output	30
Performance Options	Enhanced stability of HVout (4 W units only)	-AZ
Connection Options	LGH type 3 connector and ground stud	-LGH