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%

Ordering Information on Page 7

©2020 Advanced Energy Industries, Inc.

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%.

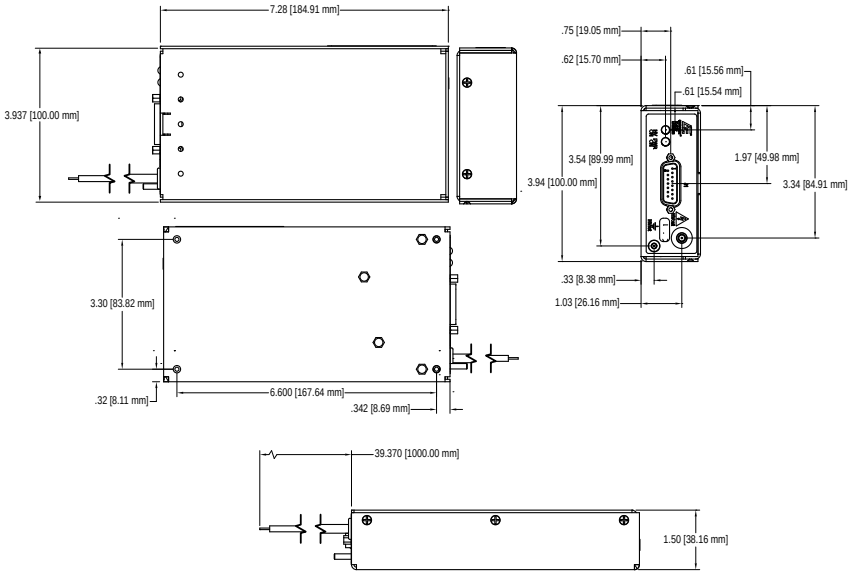
ELECTRICAL SPECIFICATIONS (CONTINUED)

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.

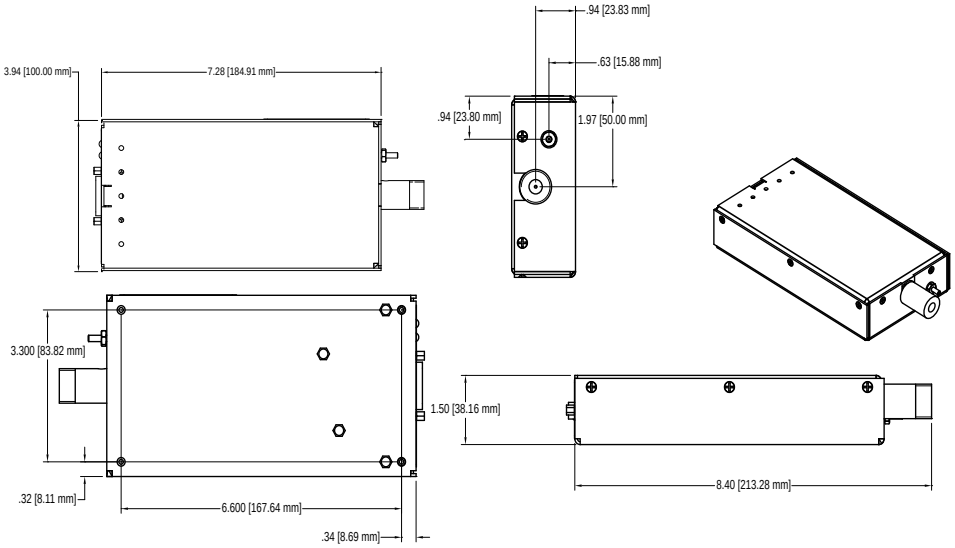
Environmental	
Operating Temperature Range	10 to 45°C (50 to 113°F) case temperature @ 100% HVout, 100% LOAD
Storage	-55 to 105°C (-67 to 222°F) case temperature
Humidity	0 to 95% RH, non-condensing
Altitude	Sea level to 2000 m (6562 ft)

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.

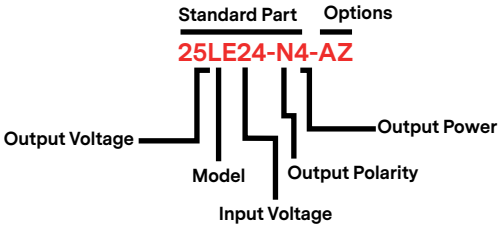
STANDARD OPTIONS

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



ABOUT ADVANCED ENERGY

Since 1981, Advanced Energy (AE) – and its family of products that now includes UltraVolt® – has perfected how power performs for its customers. For both end users and OEMs, AE's comprehensive portfolio of standard and custom high-voltage components precisely match system specifications to deliver unparalleled energy, quality, and performance. Through close customer collaboration, design expertise, application insight, and world-class support, AE creates successful partnerships and enables customers to push the boundaries of innovation and stay ahead of evolving market needs.

PRECISION | POWER | PERFORMANCE



CAUTION:
High Voltage

Read and understand all documentation before you install, operate, or maintain Advanced Energy high voltage power supplies. Follow all safety instructions and precautions to protect against property damage and serious or possibly fatal bodily injury. Never defeat safety interlocks or grounds.

Advanced Energy

For international contact information, visit advancedenergy.com.

uv-ca@aei.com
+1.970.221.0108

Specifications are subject to change without notice. Not responsible for errors or omissions. ©2020 Advanced Energy Industries, Inc. All rights reserved. Advanced Energy®, AE®, and UltraVolt® are U.S. trademarks of Advanced Energy Industries, Inc.

ENG-HV-LE-20-30-235-01 2.20