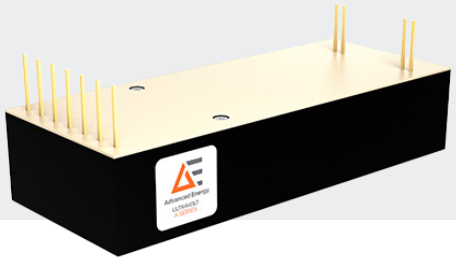
ULTRAVOLT A SERIES

HIGH VOLTAGE BIASING SUPPLY



The A Series consists of miniature, PCB-mount, high voltage, regulated DC-DC converters. Designed and built utilizing state-of-the-art power-conversion topology, these units feature surface-mount technology and encapsulation techniques that provide high reliability and performance.

PRODUCT HIGHLIGHTS

- Eight models from 0 to 62 V through 0 to 6 kV
- 4, 20, or 30 W of output power
- Maximum Iout capability down to 0 V
- Wide input voltage range
- Available with Ripple Stripper® filter (-F option)
- Indefinite output short-circuit protection
- Output current monitor
- Fixed-frequency, low-stored-energy design
- UL/cUL recognized component; CE Mark (LVD and RoHS)

TYPICAL APPLICATIONS

- Bias supplies
- Electrostatic detectors
- Mass spectrometers
- Photomultiplier tubes (PMTs)

AT A GLANCE

Output Voltage

Up to 6 kV DC

Output Power

4, 20, 30 W

Type

Single Output

Ripple

To 10 ppm

Control

Analog

Temperature Coefficient

25 ppm/°C

ELECTRICAL SPECIFICATIONS

Parameter	Conditions	Models												Units
Input		**12 V**						**24 V**						
Voltage Range	Full Power	+11 to 16						+23 to 30						VDC
Voltage Range	Derated Power Range	+9 to 32						+9 to 32						VDC
Current	Standby / Disable	< 30						< 30						mA
Current	No Load, Max Eout	< 100						< 90						mA
Current	Max Load, Max Eout	~ 400						~ 1350						mA
AC Ripple Current	Nominal Input, Full Load	< 80						< 80						mA p-p
Output		**1/16A**			**1/8A**			**1/4A**			**1/2A**			
Voltage Range	Nominal Input	0 to 62			0 to 125			0 to 250			0 to 500			VDC
High Voltage Output Accuracy		±2			±2			±2			±2			%Vout
Nominal Input Voltage		12	24	24	12	24	24	12	24	24	12	24	24	VDC
Power	Nominal Input, Max Eout	4	20	30	4	20	30	4	20	30	4	20	30	W
Current	Iout Entire Output Voltage Range	64	320	480	32	160	240	16	80	120	8	40	60	mA
Current Monitor Scaling	Full Load	0.985	3.90	7.40	438.4	1860.5	2891.5	213.3	1000	1481.5	438.4	1860.5	2891.5	mA/V
Voltage Monitor Scaling	With -Y5 option	10:1 ±2% into 10 MΩ						10:1 ±2% into 10 MΩ						-
Ripple	Full Load, Max Eout	0.02	0.03	0.05	0.013	0.015	0.016	0.01	0.04	0.048	0.001	0.02	0.017	%V p-p
Ripple with -F-M Option*	Full Load, Max Eout, 300 pF Bypass Cap	0.002	0.004	0.006	0.0048	0.0056	0.006	0.0052	0.0028	0.005	0.001	0.0138	0.0016	%V p-p
Dynamic Load Regulation	½ to Full Load, Max Eout per 0.1 mA	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12	< 0.20	< 0.20	< 0.20	< 0.50	< 0.50	< 0.50	V pk
Line Regulation	Nom. Input, Max Eout, Full Power	< 0.01 %						< 0.01 %						VDC
Static Load Regulation	No Load to Full Load, Max Eout	< 0.01%						< 0.01%						VDC
Stability	30 Min. warmup, per 8 hr/ Per Day	< 0.01%/< 0.02%						< 0.01%/< 0.02%						VDC

ELECTRICAL SPECIFICATIONS (CONTINUED)

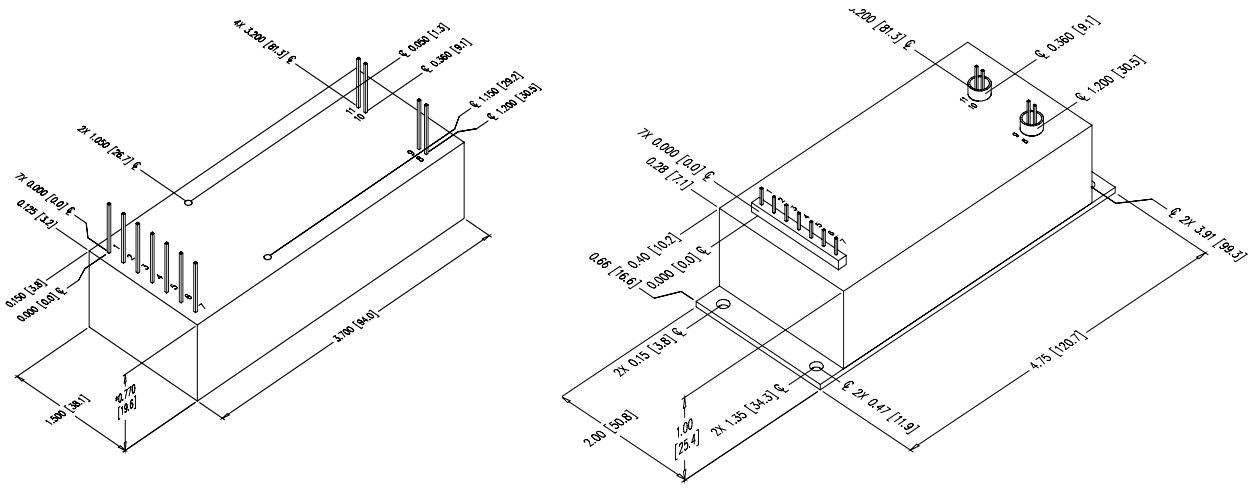
Parameter	Conditions	Models												Units
Output		**1A**			**2A**			**4A**			**6A**			
Voltage Range	Nominal Input	0 to 1000			0 to 2000			0 to 4000			0 to 6000			VDC
High Voltage Output Accuracy		±2			±2			±2			±2			%Vout
Nominal Input Voltage		12	24	24	12	24	24	12	24	24	12	24	24	VDC
Power	Nominal Input, Max Eout	4	20	30	4	20	30	4	20	30	4	20	30	W
Current	Iout Entire Output Voltage Range	4	20	30	2	10	15	1	5	7.5	0.67	3.3	5	mA
Current Monitor Scaling	Full Load	55.56	243.9	400	31.75	129.9	211.3	16.4	66.7	85.2	12.9	48.5	56.8	mA/V
Voltage Monitor Scaling	With -Y5 option	100:1 ±2% into 10 MΩ						100:1 ±2% into 10 MΩ						-
Ripple	Full Load, Max Eout	0.038	0.071	0.15	0.01	0.05	0.065	0.019	0.057	0.022	0.018	0.073	0.112	%V p-p
Ripple with -F-M Option*	Full Load, Max Eout, 300 pF Bypass Cap	0.001	0.008	0.002	0.007	0.0038	0.004	0.004	0.0088	0.0026	0.003	0.0012	0.004	%V p-p
Dynamic Load Regulation	½ to Full Load, Max Eout per 0.1 mA	< 1.0	< 1.0	< 1.0	< 2.0	< 2.0	< 2.0	< 4.0	< 4.0	< 4.0	< 6.0	< 6.0	< 6.0	V pk
Line Regulation	Nom. Input, Max Eout, Full Power	< 0.01 %						< 0.01 %						VDC
Static Load Regulation	No Load to Full Load, Max Eout	< 0.01%						< 0.01%						VDC
Stability	30 Min. warmup, per 8 hr/ Per Day	< 0.01%/< 0.02%						< 0.01%/< 0.02%						VDC
Programming & Controls		**All Types**												
Input Impedance	Nominal Input	+ output models 1.1 MΩ to GND, - output models 1.1 MΩ to +5 Vref												MΩ
Adjust Resistance	Typical Potentiometer Values	10 to 100 K (Pot. across Vref. and signal GND, wiper to adjust)												Ω
Adjust Logic	0 to +5 for +Out, +5 to 0 for - Out	+4.64 VDC for +output or +0.36 for -output = nominal Eout												-
Output Voltage & Impedance	T=+25°C	+ 5.00 VDC ± 2%, Zout = 464 Ω ± 1%												-
Enable/Disable		0 to +0.5 disable, +2.4 to 32 enable (default = enable)												VDC

* For additional information on the reduced ripple option, see -F Option datasheet.

ELECTRICAL SPECIFICATIONS (CONTINUED)

Environmental		Standard	-25PPM Option	
Operating	Full Load, Max Eout, Case Temp.	-40 to +65	+10 to +45	°C
Coefficient	Over the Specified Temperature	±50	+25	PPM/°C
Thermal Shock	Mil-Std 810, Method 503-4, Proc. II	-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 vacuum (Vacuum may require -P2 option. Contact factory for details.)		-
Shock	Mil-Std-810, Method 516.5, Proc. IV	20 (standard), 40 (-C option)		Gs
Vibration	Mil-Std-810, Method 514.5, Fig.14.5C-3	10 (standard), 20 (-C option)		Gs

MECHANICAL SPECIFICATIONS FOR STANDARD MODEL



Volumes and Weights			w/-C Option	
	cm³	in³	cm³	in³
Volume	70.5	4.30	131.1	8.00
	g	oz	g	oz
Weight	142	5.0	284	10.0

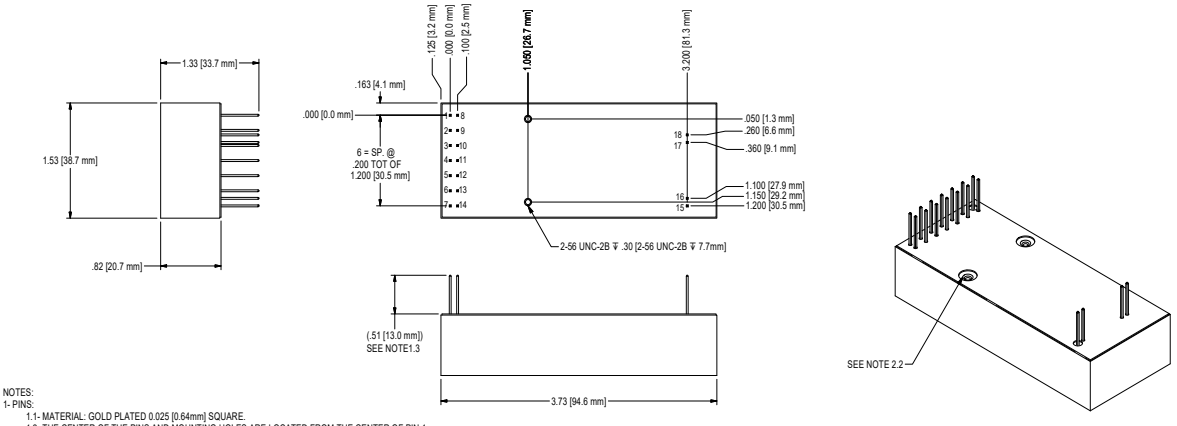
20 W and 30 W versions are an additional 1.57 mm (0.062") in height.
-M equipped units are an additional 0.76 mm (0.030") for each dimension.
Contact AE for drawings of models equipped with -E or -H options.

Construction	
Case	Epoxy-filled DAP box certified to ASTM-D-5948 with -C Option:
	Aluminum Alloy 5052-H32, Finish: MIL-A-8625 Type II (Anodizing)

Pin Assignment for Standard Model	
Pin	Function
1	Input Power Ground Return
2	Positive Power Input
3	Iout Monitor
4	Enable/Disable
5	Signal Ground Return
6	Remote Adjust Input
7	+5 VDC Reference Output
8	HV Ground Return
9	HV Ground Return or Eout Monitor (-Y5)
10 & 11	HV Output

All grounds joined internally. Power-supply mounting points isolated from internal grounds by > 100 kΩ, 0.01 µF/50 V (Max) on all models except -M (20 W and above), -M-E, -M-C, and -M-H configurations which are 0 Ω. Popular accessories ordered with this product include CONN-KIT and BR-1 mounting bracket kit.

MECHANICAL SPECIFICATIONS FOR -I5/I10 MODEL



NOTES:
1- PINS:
1.1- MATERIAL: GOLD PLATED 0.025 [0.64mm] SQUARE.
1.2- THE CENTER OF THE PINS AND MOUNTING HOLES ARE LOCATED FROM THE CENTER OF PIN 1.
1.3- PINS 1 THRU 7 AND 8 THRU 14 SPACING 0.200 [5.08mm] ON CENTER, HEIGHT FROM COVER 0.47 [11.9mm] MIN.
1.4- PINS 15,16,17 & 18 SPACING 0.100 [2.54mm] ON CENTER, HEIGHT FROM COVER 0.47 [11.9mm] MIN.
2- MOUNTING:
2.1- #2-56 X 0.30 [7.62mm] DP UNC-2B THD 2 PLACES.
2.2- THREADS MAY NOT BE FLUSH TO COVER.
3- CONSTRUCTION:
ENCAPSULANT FILLED DAP BOX CERTIFIED TO ASTM-D-5948.
4- TOLERANCE:
4.1- OVERALL +/-0.050 [1.27mm].
4.2- PIN TO PIN +/-0.015 [0.38mm].
4.3- MOUNTING HOLE LOCATION +/- 0.025 [0.64mm].
*5- 20 & 30 WATT VERSIONS ARE AN ADDITIONAL 0.062 [1.57mm] IN HEIGHT.

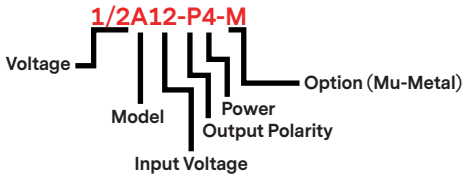
Pin Assignment for -I5/I10 Model

Pin	Function
1 & 8	Input Power Ground Return
2 & 9	Positive Power Input
3	Iout Monitor
4	Enable/Disable
5	Signal Ground Return
6	Voltage Programming
7	Reference Output
10	No Connection
11	Current Mode Indicator
12	Voltage Mode Indicator
13	Current Programming
14	Vout Monitor
15 & 16	HV Ground Return
17 & 18	HV Output

ORDERING INFORMATION

Type	0 to 62 VDC Output	1/16A
	0 to 125 VDC Output	1/8A
	0 to 250 VDC Output	1/4A
	0 to 500 VDC Output	1/2A
	0 to 1000 VDC Output	1A
	0 to 2000 VDC Output	2A
	0 to 4000 VDC Output	4A
	0 to 6000 VDC Output	6A
Input	12 VDC Nominal	12
	24 VDC Nominal	24
Polarity	Positive Output	-P
	Negative Output	-N
Power	Watts Output (12 V Only)	4
	Watts Output (24 V Only)	20
	Watts Output (24 V Only)	30
Case	Plastic Case - Diallyl Phthalate	(Standard)
	'Eared' Chassis Mounting Plate	-E
	RF-Tight Aluminum Case	-C
Heat Sink	0.400" High (Sized to Fit Case)	-H
Ripple Stripper®	Integral Output Filter*	-F
Shield	Six-Sided Mu-Metal Shield	-M
Voltage Monitor	Optional Eout Monitor	-Y5
Iout Monitor Boost	Boosted Iout Monitor Signal Level	-Y10
Temp. Coefficient	25 PPM Temperature Coefficient	-25PPM
Enhanced Interface	5 V Control and Monitors	-I5
	10 V Control and Monitors (24 Vin only)	-I10
Option	Flying Lead for HV Output	-W
	Shielded Flying Lead for HV Output	-WS

* For additional information on the reduced ripple option, see -F Option datasheet.



ABOUT ADVANCED ENERGY

Since 1981, UltraVolt® — now part of the Advanced Energy (AE) family — 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 | TRUST

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

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