EC SERIES

AMERICAN HIGH VOLTAGE

Outputs: 6.3V, 12.6V, 1kV, and 3kV available

EC-30-5W

- ***Output Proportional to Input***
- ***Encapsulated***
- ***Isolation to 20,000 VDC***
- ***5 Watts***
- ***Input Voltage 0-12V***

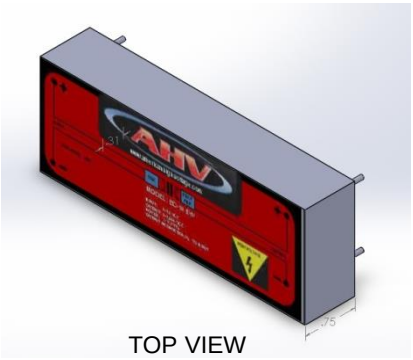
The EC Series are special DC to DC converters that can be used where very high voltage isolation is required. Although the SC, CT and SQ modules provide floating output up to 5kV, the EC series allows isolation voltages up to 20kV between input and output. Pins. The output voltage of the EC power supply is directly proportional to the input voltage. The power supply will start with input voltage as low as 2 volts, and will not be damaged by inputs as high as 18 VDC. Each EC supply has an internal bleeder on the output for safety..

CONNECTION DIAGRAM

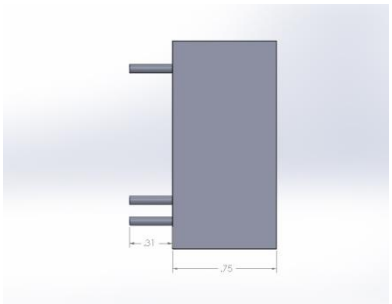
TOP VIEW

BOTTOM VIEW

Outline Drawing: inches (millimeters)



TOP VIEW



SIDE VIEW

BOTTOM VIEW

AHV AMERICAN HIGH VOLTAGE

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ELECTRICAL CHARACTERISTICS (at 25° C unless otherwise specified)

Parameter	Conditions		Value		Units
		Min	Typical	Max	
Supply Voltage*		1	12	18	VDC
Input Current	No load Full load (5 W)	20 700	230 750	240 850	mA mA
Output Ripple	No load (all models) Full load (all models)	0.7% 0.8%	0.7% 0.8%	1% 1%	Vpp Vpp
Load Regulation	No load to full load Half load to full load	25% 20%	30% 25%	35% 30%	V_{NL}/V_L V_{NL}/V_L
Output Linearity	No load		1%		ΔVout ---------- ΔVout (ideal)
Output Linearity	Full load (all models)		1%		ΔVout ---------- ΔVout (ideal)
Short Circuit Current			200	300	mA
Power Efficiency	Full load (20W)	55%	60%	70%	POUT -------- PIN
Reverse Input Polarity	Protected to 20 VDC				
Temperature Drift	No load			1,000	ppm/Deg C
	Full load			1,000	ppm/Deg C
Thermal Rise	No load (case)			5	Degrees C
	Full load (case)			15	Degrees C
Slew Rate (10%-90%)	No load Full load			100 120	mS mS
Slew Rate (90%-10%)	No load Full load			300 200	mS mS
Drain Out Time	No load (5 TC)			150	mS

* Other input voltages available: 5VDC, 15VDC, 24VDC, 28VDC and 48VDC

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ENVIRONMENTAL CHARACTERISTICS
(at 25° C unless otherwise specified)

Parameter	Conditions	Value	Units
Temperature Range	Case temperature	-40° to +71°	Celsius
	Case temperature	-40° to +160°	Fahrenheit
Shock	MIL-STD-810 Method 516	40 Gs	Proc IV
Altitude	Pins sealed against corona	-350 to +16,700	meters
	Pins sealed against corona	-1,000 to +55,000	feet
Vibrations	MIL-STD-810 Method 514	20 Gs	Curve E
Thermal Shock	MIL-STD-810 Method 504	-40° C to +71°C	Class 2

PHYSICAL CHARACTERISTICS
(at 25° C unless otherwise specified)

Parameter	Conditions	Value	Units
Dimensions	MKS	50.8W x 101.6L x 19H	mm
	English	1.5”W x 4.0”L x 0.75”H	inches
Volume	MKS	73	cm^3
	English	4.5	$inch^3$
Mass	MKS	192	grams
	English	6.9	ounces
Packaging	Solid Epoxy Thermosetting		
Finish	Smooth Dial-Phthalate Case		
Terminations	Gold Plated Brass Pins (4)		

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MODEL SELECTION TABLE

Model	Output Voltage Range	Power	Ripple (Max)
EC-0.063	0 – 6.3 VDC	5 Watts	0.05 Vpp
EC-0.126	0 - 12.6 VDC	5 Watts	0.1 Vpp
EC-10	0 – 1,000 VDC	5 Watts	10 Vpp
EC-30	0 - 3,000 VDC	5 Watts	30 Vpp

EC SERIES APPLICATION NOTES

The EC Series high voltage power supplies are driven by an input voltage of from 1 to 12 VDC. The input current and output voltage as a function of input is shown in the above graphs. There are NO internal connections between the input and output pins and this allows for its high voltage isolation ability. As can be seen from the above, the output voltage is approximately linear with respect to input except near the lower input voltage region. Here, the output drops off rapidly as the input voltage approaches zero with the absolute minimum input voltage needed for reliable starting being 0.9 VDC. As shown in Figure 1 below, the simple connection of a EC unit to a DC source of voltage will provide an output voltage. Some EC units may be utilized to power filaments. The input AC bypass capacitor C1 is optional and is utilized to prevent switching spikes from riding back on the input power lines. Values of 0.1 uF to 10 uF are commonly used.

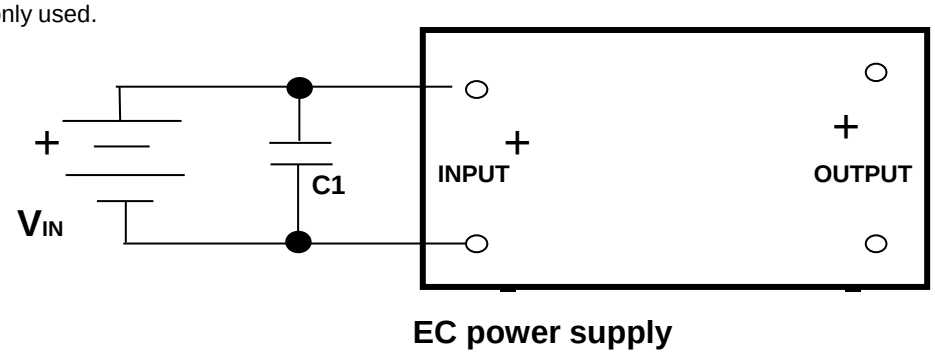
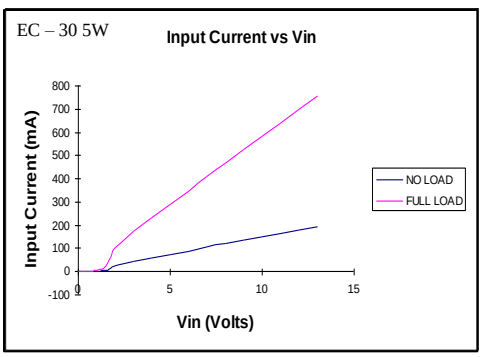
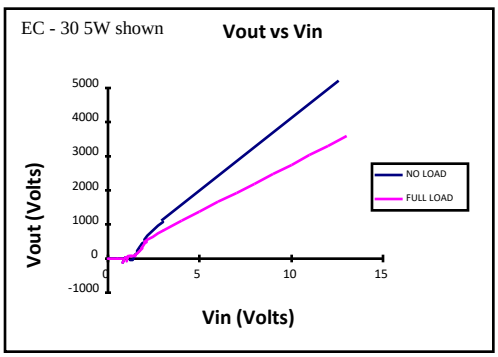


Figure 1: Basic EC hookup schematic **(top view of EC shown)**

EC SERIES PERFORMANCE CHARTS





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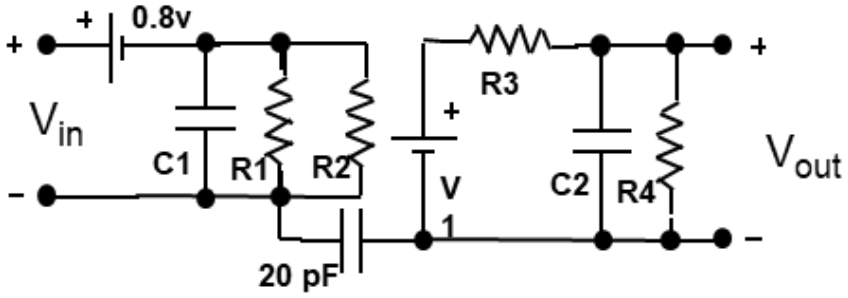
EQUIVALENT EC SERIES CIRCUIT MODEL



Equivalent EC High Voltage Power Supply Model

R1 = (60) *Ohms*
R2 = (100 / Pout) *Ohms*
R3 = (0.6 **x** $Vout_{max}$ / $Iout_{max}$) *Ohms*
R4 = (10 **x** $Vout_{max}^{2}$) *Ohms*

C1 = (10 x 10^{-6}) *Farads*
C2 = (0.005 **x** $Iout_{max}$ / $Vout_{max}$) *Farads*
V1 = (V**R2** **x** $Vout_{max}$ / 12) *Volts*

For example, for an EC - 30 5W

$Vout_{max}$ = 3,000 V

$Iout_{max}$ = 0.0016 A

$Pout_{max}$ = 5 W

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