

## HIGH POWER 8C-30C SERIES

## 8kV to 30kV High Voltage Cap-Charging Supplies

This High Power line of high-voltage regulated DC to DC converters is an extension of the C Series, directly addressing the high power density needs of >30 watt applications. High Power 8C - 30C units provide up to 60/125/250 watts. This high power density is especially suited to high-energy systems with large capacitances, fast repetition rates, or high continuous-DC-power requirements. See Application Note 10 for more changing information. Typical applications for the High Power 8C-30C Series include the following: laser, cap-charger, pulse generators, Q-switch, and TDR test equipment.

- 7 models from 0 to 8kV through 0 to 30kV
- 60, 125, or 250 watts of output power
- Maximum Iout capability down to 0 Volts
- Maximum Iout during charge/rise time
- Output short-circuit protection
- Very fast rise with very low overshoot



- High efficiency
- High power to volume density
- Very low profile
- Output current & voltage monitors
- >200,000 hour MTBF @65°C
- Fixed-frequency, low-stored-energy design
- UL/cUL Recognized Component; CE Mark (LVD & RoHS)

| PARAMETER                  |                                         | CONDITIONS                                                             | ALL TYPES |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        |             | UNITS |     |     |             |  |  |  |     |
|----------------------------|-----------------------------------------|------------------------------------------------------------------------|-----------|----------|----------|-------------|----------|----------|----------|-------------|----------|----------|---------|-------------|---------|---------|----------|-------------|--------|---------|--------|-------------|-------|-----|-----|-------------|--|--|--|-----|
| INPUT                      |                                         |                                                                        |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        |             |       |     |     |             |  |  |  |     |
| Voltage Range              | Full Power                              | + 23 to 30                                                             |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | VDC         |       |     |     |             |  |  |  |     |
| Voltage Range              | Derated Power Range                     | 60W, 125W: + 11 to 30, 250W: 15-30                                     |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | VDC         |       |     |     |             |  |  |  |     |
| Current                    | Standby / Disable                       | < 40                                                                   |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | mA          |       |     |     |             |  |  |  |     |
| Current                    | No Load, Max Eout                       | 8C to 15C < 500, 20C to 25C < 600                                      |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | mA          |       |     |     |             |  |  |  |     |
| Current                    | Max Load, Max Eout                      | 60W: 3.25, 125W: 6.5, 250W: 13                                         |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | A           |       |     |     |             |  |  |  |     |
| AC Ripple Current          | Nominal Input, Full Load                | < 50                                                                   |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | mA p-p      |       |     |     |             |  |  |  |     |
| OUTPUT                     |                                         | 8C                                                                     |           |          |          | 10C         |          |          |          | 12C         |          |          |         | 15C         |         |         |          | 20C         |        |         |        | 25C         |       |     |     | 30C         |  |  |  |     |
| Voltage Range              | Nominal Input                           | 0 to 8,000                                                             |           |          |          | 0 to 10,000 |          |          |          | 0 to 12,000 |          |          |         | 0 to 15,000 |         |         |          | 0 to 20,000 |        |         |        | 0 to 25,000 |       |     |     | 0 to 30,000 |  |  |  | VDC |
| Power                      | Nominal Input, Max Eout                 | 60                                                                     | 125       | 250      | 60       | 125         | 250      | 60       | 125      | 250         | 60       | 125      | 250     | 60          | 125     | 250     | 60       | 125         | 250    | 60      | 125    | 250         | 60    | 125 | 250 | Watts       |  |  |  |     |
| Current                    | Iout, Entire Output Voltage Range       | 7.5                                                                    | 15.5      | 31.2     | 6        | 12.5        | 25       | 5        | 10.5     | 20.8        | 4        | 8.3      | 16.7    | 3           | 6.25    | 12.5    | 2.4      | 5           | 10     | 2       | 4.17   | 8.33        |       |     |     | mA          |  |  |  |     |
| Current Scale Factor       | Full Load                               | 4.7                                                                    | 14.2      | 6.25     | 4.1      | 10.9        | 5        | 4.0      | 7.4      | 4.17        | 4.0      | 7.5      | 3.33    | .65         | .653    | 2.5     | .65      | .650        | 2      | .65     | .642   | 1.67        |       |     |     | mA/V        |  |  |  |     |
| Voltage Monitor Scaling    |                                         | 60W & 125W Models - 1000:1 ± 2% into 10MΩ; 250W Models - 10,000:1 ± 2% |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | -           |       |     |     |             |  |  |  |     |
| Internal Capacitance       | Capacitance / 95% Decay (50Meg Load)    | 4400/659                                                               | 2200/330  | 1500/225 | 2933/439 | 1467/220    | 1500/225 | 2933/439 | 1467/220 | 750/112     | 2200/330 | 1100/165 | 750/112 | 1320/200    | 880/132 | 750/112 | 1100/165 | 733/110     | 500/75 | 825/125 | 550/85 | 500/75      |       |     |     | pF/mS       |  |  |  |     |
| Ripple                     | Full Load, Max Eout                     | < 1%                                                                   |           |          |          |             |          |          |          |             |          |          |         | < 1%        |         |         |          |             |        |         |        | V p-p       |       |     |     |             |  |  |  |     |
| Rise Time                  | Max Iout, Various C Loads & Eout        | Figure A                                                               |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | -           |       |     |     |             |  |  |  |     |
| Storage Capacitance        | Internal                                | 4400                                                                   | 2200      | 1500     | 2933     | 1467        | 1500     | 2933     | 1467     | 750         | 2200     | 1100     | 750     | 1320        | 880     | 750     | 1100     | 733         | 500    | 825     | 550    | 500         |       |     |     | pF          |  |  |  |     |
| Overshoot                  | C Load, 0 Eout to Full Eout             | < 1%                                                                   |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | V pk        |       |     |     |             |  |  |  |     |
| Line Regulation            | Nom. Input, Max Eout, Full Power        | < 0.01%                                                                |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | VDC         |       |     |     |             |  |  |  |     |
| Static Load Regulation     | No Load to Full Load, Max Eout          | < 0.01%                                                                |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | VDC         |       |     |     |             |  |  |  |     |
| Stability                  | 30 Min. warmup, per 8 hr/ per day       | < 0.01% / < 0.02%                                                      |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | VDC         |       |     |     |             |  |  |  |     |
| PROGRAMMING & CONTROLS     |                                         | ALL TYPES                                                              |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        |             |       |     |     |             |  |  |  |     |
| Input Impedance            | Nominal Input                           | + Output Models 1.1MΩ to GND, - Output Models 1.1MΩ to +5 Vref         |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | MΩ          |       |     |     |             |  |  |  |     |
| Adjust Resistance          | Typical Potentiometer Values            | 10K to 100K (Pot across Vref. & 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                                 | + 5.00VDC ± 1%, Zout = 464Ω ± 1%                                       |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | -           |       |     |     |             |  |  |  |     |
| Enable/Disable             |                                         | 0 to +0.8V Disable, +2.0 to 32 Enable (Default = Enable)               |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | VDC         |       |     |     |             |  |  |  |     |
| ENVIRONMENTAL              |                                         | ALL TYPES                                                              |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        |             |       |     |     |             |  |  |  |     |
| Operating                  | Full Load, Max E out, Case Temperature  | -40 to +65                                                             |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | °C          |       |     |     |             |  |  |  |     |
| Coefficient                | Over the Specified Temperature          | ±50 (±25 Optional)                                                     |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | 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 70,000                                               |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | ft          |       |     |     |             |  |  |  |     |
| Shock                      | Mil-Std-810, Method 516.5, Proc. IV     | 20                                                                     |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | G's         |       |     |     |             |  |  |  |     |
| Vibration                  | Mil-Std-810, Method 514.5, Fig.514.5C-3 | 10                                                                     |           |          |          |             |          |          |          |             |          |          |         |             |         |         |          |             |        |         |        | G's         |       |     |     |             |  |  |  |     |

Specifications subject to change without notice.

C =  $\mu$ F  
V = Volts  
I = mA  
T = mS

$$T = \frac{C \times V}{I}$$

C =  $\mu$ F  
V = kV  
I = mA  
F = Hz

$$I = C \times V \times F$$

C =  $\mu$ F  
V = kV  
I = mA  
F = Hz

$$F = \frac{I}{C \times V}$$

$$\begin{aligned} C &= uF \\ E^2 &= kV \\ J &= Ws \end{aligned}$$

$$J = \frac{C \times E^2}{2}$$

Figure A - Rise Time Formulas

NOTES: Capacitance must include HVPS internal Capacitance.



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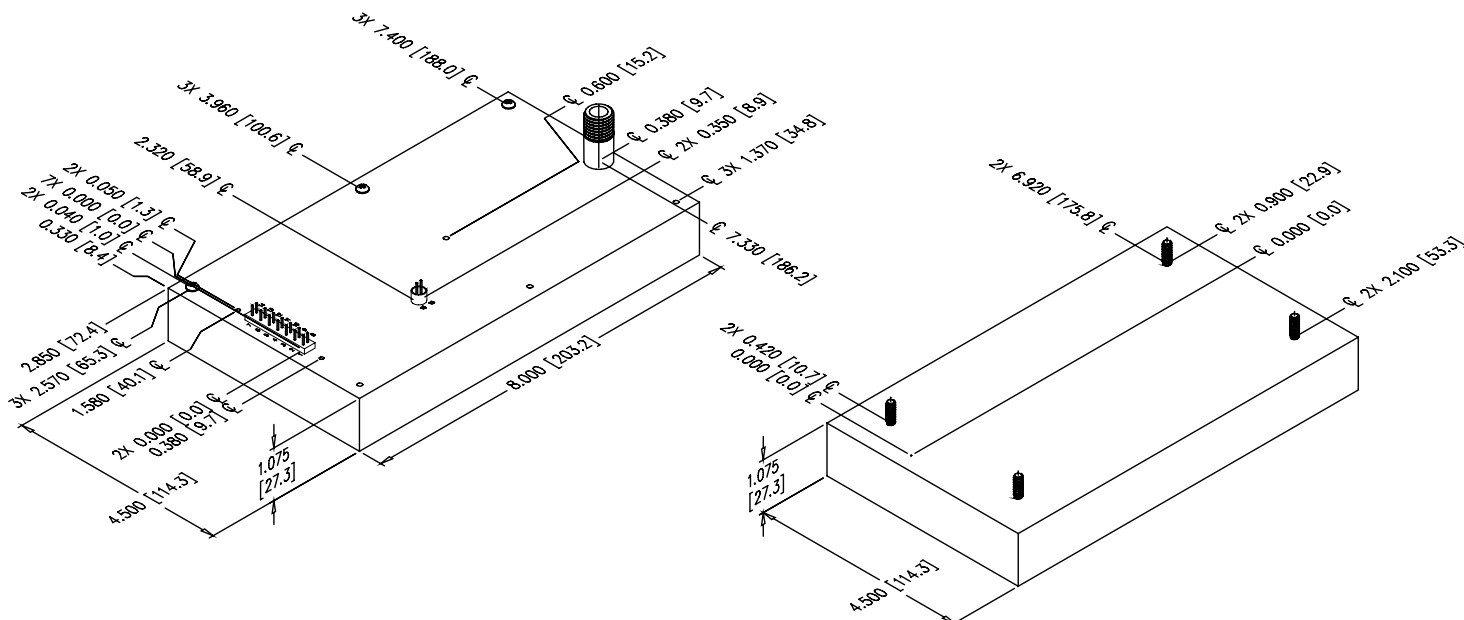
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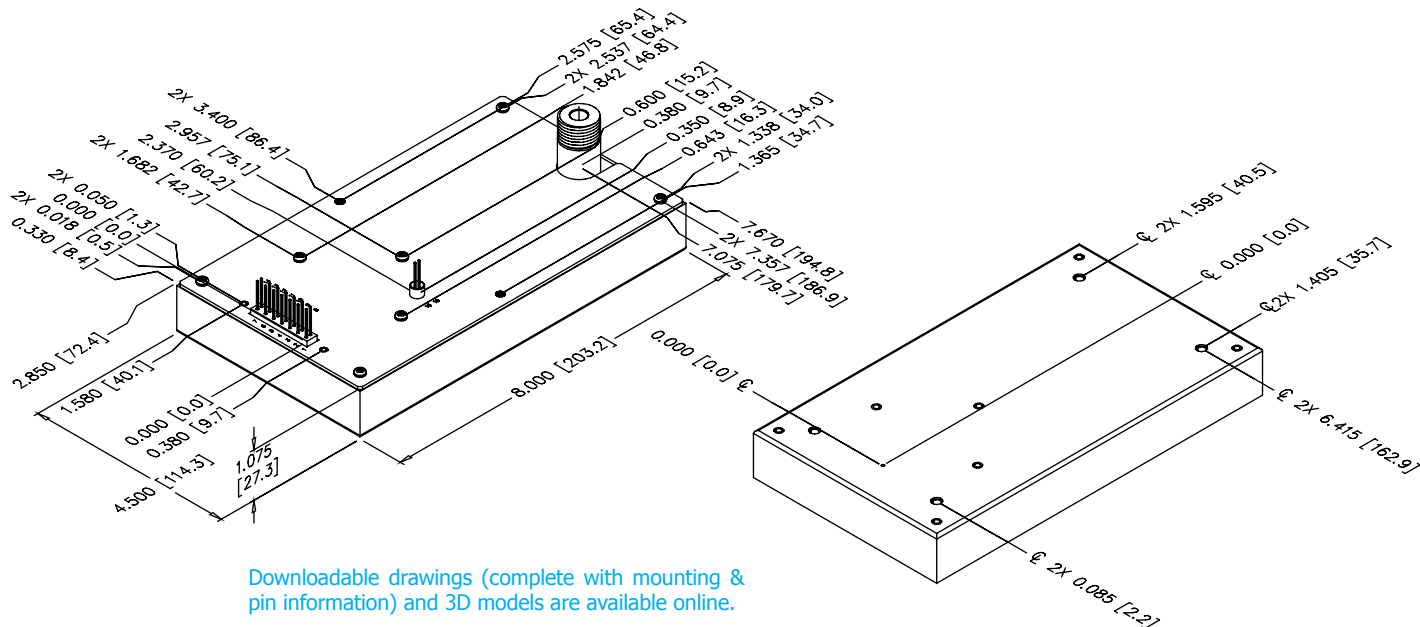
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8kV to 30kV High Voltage Cap-Charging Supplies

8C TO 15C - 60/125W



20C TO 30C - 60/125W



Downloadable drawings (complete with mounting & pin information) and 3D models are available online.



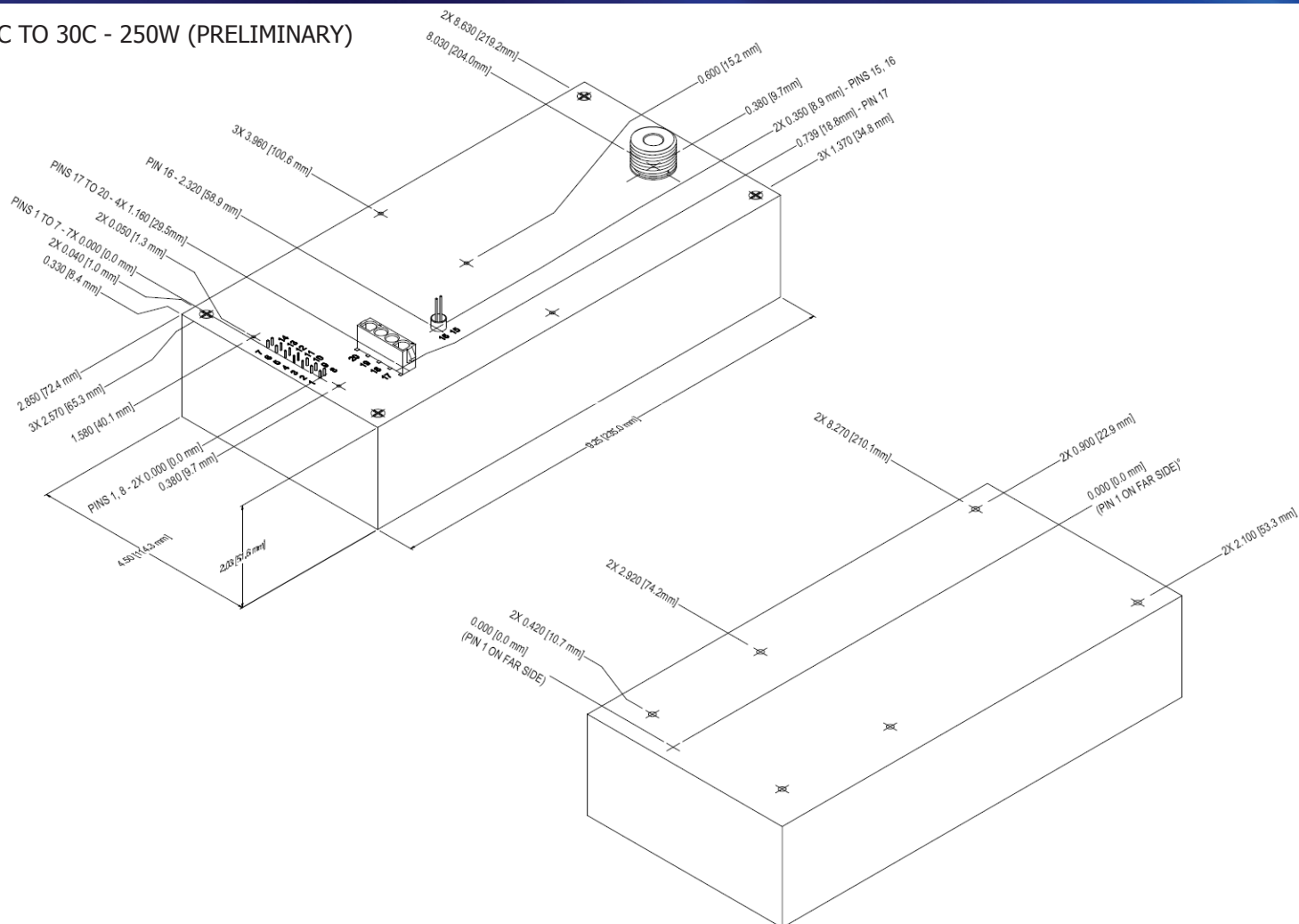
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# HIGH POWER 8C-30C SERIES

8kV to 30kV High Voltage Cap-Charging Supplies

8C TO 30C - 250W (PRELIMINARY)



## CONSTRUCTION

Epoxy-filled Aluminum Box  
Chem film per MIL-A-8625 Type II (Anodizing)

## SIZE - 60 & 125W MODELS

Volume 38.7 in<sup>3</sup> (634cc)  
Weight 2.6 lbs. (1.18kg)

## SIZE - 250W MODELS

Volume 84.5 in<sup>3</sup> (1386cc)  
Weight 5.6 lbs. (2.54kg)

## TOLERANCE

Overall  $\pm 0.025"$  (0.64)  
Pin to Pin  $\pm 0.015"$  (0.38)  
Hole to hole location  $\pm 0.025"$  (0.64)

## PINS

Gold-plated 0.025 (0.64) sq.

The center of the pins and mounting holes are located from the center of pin 1

Pins 1 thru 14 spacing 0.100 (2.54) x 0.200 (5.08) on center, height from cover 0.280 (7.11) min

Pins 15 and 16 spacing 0.100 (2.54) on center, height from cover 0.450 (11.43) min

## HV OUTPUT CONNECTION

Unit requires an LGH flying lead connector for proper operation:

8C to 15C (60W & 125W Models) = CA-20KV-1000

20C to 30C (60W & 125W Models) = CA-40KV-1000

8C to 30C (250W Models) = CA-40KV-1000



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# HIGH POWER 8C-30C SERIES

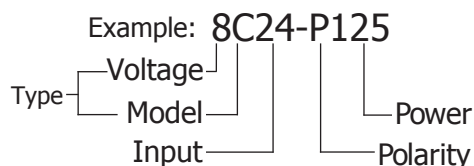
8kV to 30kV High Voltage Cap-Charging Supplies

| CONNECTIONS  |                            |
|--------------|----------------------------|
| PIN          | FUNCTION                   |
| 1 & 8        | Input-Power Ground Return  |
| 2 & 9        | Positive Power Input       |
| 3            | Iout Monitor               |
| 4            | Enable/Disable             |
| 5            | Signal Ground Return       |
| 6            | Remote Adjust Input        |
| 7            | +5VDC Reference Output     |
| 10           | N/C (or Arc Detect option) |
| 11, 12, & 13 | N/C                        |
| 14           | Eout Monitor               |
| 15 & 16      | HV Ground Return           |

All grounds joined internally. Power-supply mounting points isolated from internal grounds by >100kΩ, .01uF / 500V (Max).

| ORDERING INFORMATION |                                   |        |
|----------------------|-----------------------------------|--------|
| Type                 | 0 to 8,000 VDC Output             | 8C     |
|                      | 0 to 10,000 VDC Output            | 10C    |
|                      | 0 to 12,000 VDC Output            | 12C    |
|                      | 0 to 15,000 VDC Output            | 15C    |
|                      | 0 to 20,000 VDC Output            | 20C    |
|                      | 0 to 25,000 VDC Output            | 25C    |
|                      | 0 to 30,000 VDC Output            | 30C    |
| Input                | 24VDC Nominal                     | 24     |
| Polarity             | Positive Output                   | -P     |
|                      | Negative Output                   | -N     |
| Power                | 60 Watts Output                   | 60     |
|                      | 125 Watts Output                  | 125    |
|                      | 250 Watts Output                  | 250    |
| Heat Sink            | .400" High (sized to fit case)    | -H     |
| PCB Support          | (5) 0.187" standoffs on top cover | -Z11   |
| Enhanced Interface   | 5V Controls and Monitors          | -I5    |
|                      | 10V Control and Monitors          | -I10   |
| Options              | Arc Detect                        | -AD    |
|                      | Arc Quench                        | -AQ    |
|                      | 25PPM Temperature Coefficient     | -25PPM |

Note: For more information on the enhanced interface options, download the [I5/I10 Option datasheet](#).



Popular accessories ordered with this product include CONN-KIT-HP, BR-7 and BR-8 mounting bracket kits and our full range of high voltage output connectors (see Accessories & Connectors datasheet).



Non-RoHS compliant units are available. Please contact the factory for more information.

Manufactured in USA



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