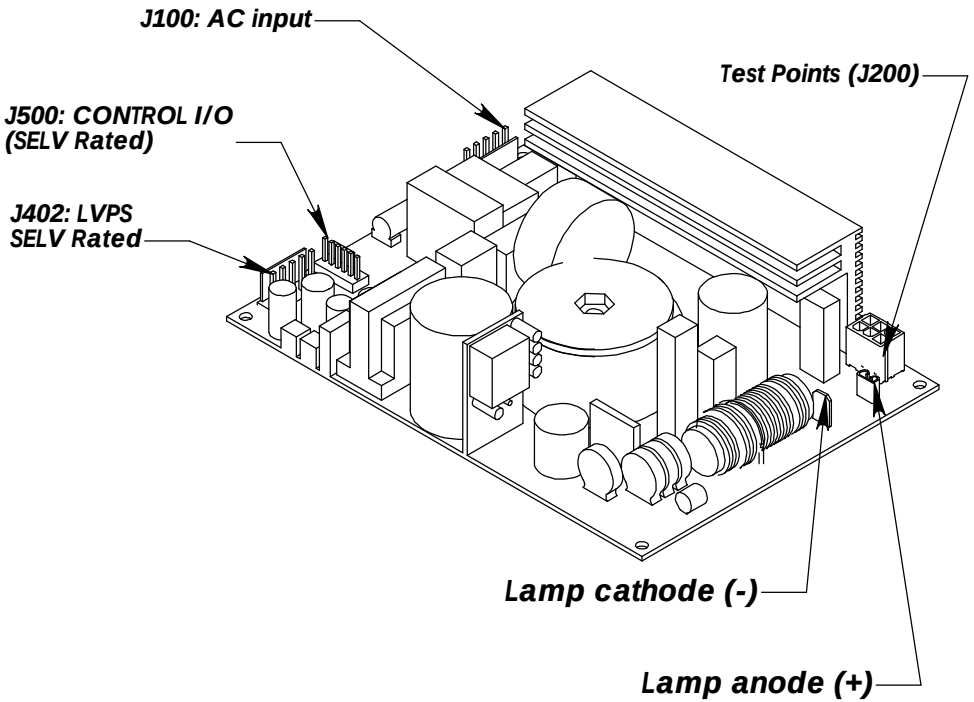
PART NO: **01056-00001**

MODEL NUMBERS:
CEP100***M***HG, CEP100***M***XE, CEP100***M***HX,
CEP050***M***HG, CEP050***M***XE, CEP050***M***HX,
where ***M*** is A, B, or C.

RATINGS:
Input: 100-240V ~ 50/60Hz 3.2Arms
Output: 16V ⎓ minimum, 30V ⎓ maximum
Maximum output power: 132 Watts
Maximum output current: 7.0A



*Use 0.250" Faston (R)
quick disconnect terminals.*

CONNECTOR PINOUTS

AC INPUT (J100)

p1	Line
p2	N.C.
p3	Neutral
p4	N.C.
p5	Earth

Use Molex 09-50-8051 terminal housing or equivalent.

LVPS (J402)

	OPTION 002	OPTION 001	OPTION 000	OPTION 101	OPTION 100
p1 *	+5 Return	+5 Return	N.C.	+5 Return	N.C.
p2 *	+5VDC, 4.0A	+5VDC, 4.0A	N.C.	+5VDC, 4.0A	N.C.
p3 *	-12VDC, 0.3A	N.C.	N.C.	N.C.	N.C.
p4	+/-12 Return	+12 Return	+12 Return	+24 Return	+24 Return
p5	+12VDC, 2.5A	+12VDC, 2.5A	+12VDC, 2.5A	+24VDC, 1.0A	+24VDC, 1.0A

** Optional outputs, see specification.*
Use Molex 09-50-8051 terminal housing or equivalent.

CONTROL I/O (J500)

p1	Lamp Lit Return
p2	Lamp Lit Signal
p3	Enable Return
p4	Enable Input
p5	Intensity Control Return
p6	Intensity Control

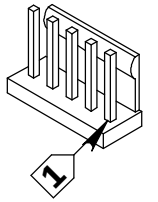
Use Molex 22-01-3067 terminal housing or equivalent.

TEST POINTS (J200)

1	Current Sense (100mV/A)
2	Signal Ground (V/I sense)
3	Voltage Sense (19.6mV/V)
4	Gate drive ground
5	Gate drive (PWM OUTPUT)
6	N.C.

Use Molex 39-01-2060 terminal housing or equivalent.

CONNECTOR PIN ASSIGNMENT



J200 (TOP VIEW)

ECO #	Description	Date	REV.

ENGINEERING CHANGE RECORD

UNLESS OTHERWISE SPECIFIED
Dimension are in inches.
TOLERANCES ARE:
DECIMALS: .XX: +/- .010, .XXX: +/- .005
ANGLES: .XX: +/- 0.5 deg

MATERIAL: --

FINISH: --

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APPROVALS		DATE
MODELED	del Cid	11-27-2002
DRAWN	del Cid	11-27-2002
CHECKED	del Cid	--
RESP ENG	Danvers	11-27-2002
QUAL ENG	Bocast	--

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Lakewood, CO 80214
303-237-9608, Fax: 303-237-0757

**CEP100
POWER SUPPLY**

SIZE A | DWG. NO. 93556-00001 | REV. B

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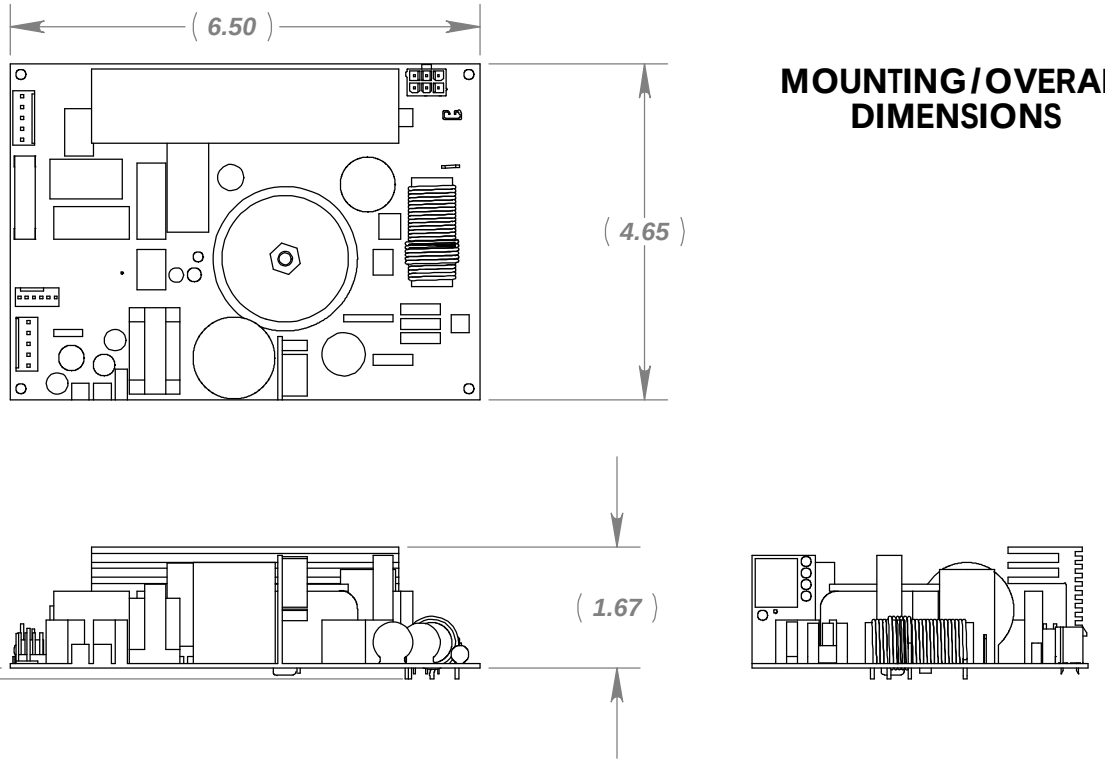
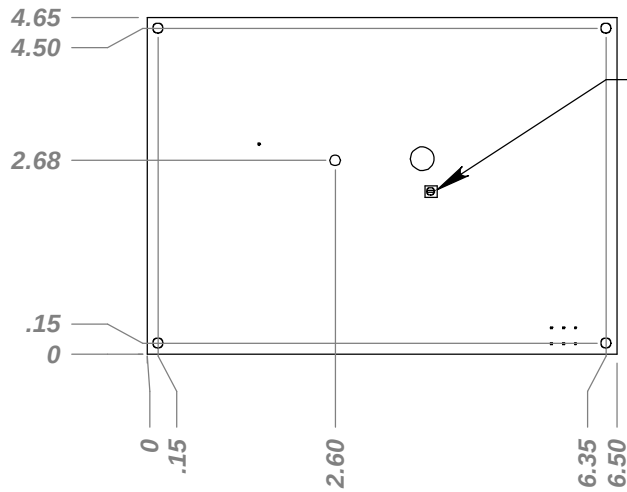
92100-04001 A.slddrt

PART NO: **01056-00001**

MOUNTING/OVERALL DIMENSIONS





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ENGINEERING CHANGE RECORD

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MATERIAL --

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APPROVALS	DATE
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RESP ENG	
QUAL ENG	

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CEP100 POWER SUPPLY

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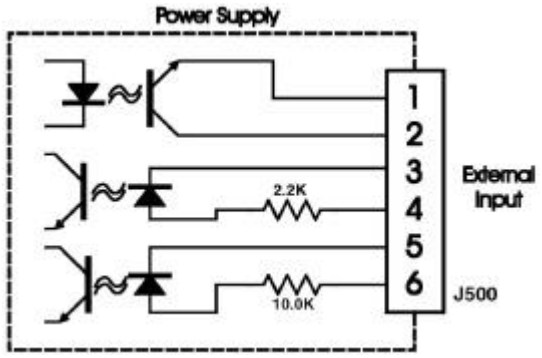
PART NO: **01056-00001**

Using TheCONTROl I/O:

The Control I/O Connector consists of two inputs and one output, each of which is optically isolated.
The inputs are designed to be driven by a 5-12V source.



PINS 1 and 2:
The Lamp Lit output is a transistor that is on when current is flowing to the lamp. The collector current will be greater than 3.0 mA when the lamp is on. A 2.2K ohm resistor pull-up will create a TTL-compatible signal. The delay from light output from the lamp to the Lamp Lit output being asserted is less than 10 ms.

PINS 3 and 4:
The Enable input turns the lamp on and off. A high input (5-12VDC) to the Enable pin turns on the lamp.
The source used must have a low impedance and be capable of supplying 2.0 mA into the circuit.
The electrical delay of the enable input is less than 10 ms.
To turn on the lamp, the delay of the Enable input must be added to the time to ignite the lamp, which is approximately 100 ms, for a total of 110 ms. Turning off the lamp takes only 10 ms.
The auxiliary +12 V supply runs all the time, regardless of the state of the Enable input.

PINS 5 and 6:
See "Using the Lamp Intensity Control Input on the CEP100 Power Supply" (page 4).

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PART NO: **01056-00001**

Using the Lamp Intensity Control Input on the CEP100 Power Supply

The Carsan Engineering power supply drives xenon lamps with a constant power or constant current. The supply provides an external input for controlling the power to the lamp. This paper provides the information needed by the system designer to take advantage of the Lamp Intensity Control input.

The power stage of the supply can be modeled as a high-gain amplifier with current and voltage feedbackfrom the lamp. The power to the lamp is controlled by a user adjustable potentiometer that adjust the feedback from the multiplier. This determines the quiescent power to the lamp.

The Control I/O Connector provides an optoisolated input for controlling lamp power. When a voltage is applied to the Lamp Intensity input (pins 5 & 6), current flows in the diode of the optoisolator. A corresponding current flows in the coupled transistor, which injects a current into the output reference. This lowers the reference, hence reducing the power. Notice that the external input is only capable of decreasing lamp power. This is a safety feature; the lamp power can never exceed the value set by the potentiometer. The typical relationship between the external applied voltage and the lamp output is shown in Figure 1. Note that although the output power is capable of going to zero, many lamps become unstable when run at less than 30% to 50% of their rated power.

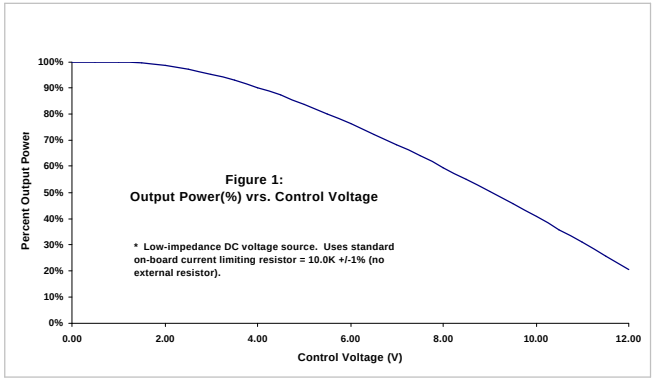

Figure 1:
Output Power(%) vrs. Control Voltage

* Low-impedance DC voltage source. Uses standard on-board current limiting resistor = 10.0K +/-1% (no external resistor).

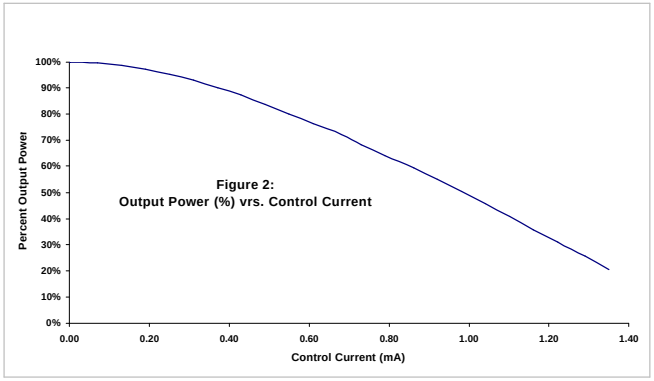

Figure 2:
Output Power (%) vrs. Control Current

The transfer function from the external applied voltage to transistor current is not linear. This is often not a problem for closed loop feedback systems. If the feedback loop is a first order loop, or has low open-loop gain, then it may be desirable to linearize the transfer function of the optoisolator. This can be done if the input is driven with a constant current source. The transistor current will be equal to the diode current. For most applications this will require a 12V supply in order to give the driving current source enough compliance. The typical relationship between the control current and the lamp output is shown in Figure 2. The current transfer ratio (CTR) of the optoisolator is specified to stay between 100% and 200% over time and temperature.

The lamp intensity control must be disabled during ignition. Attempting to ignite the lamp with a signal present on the intensity control input may result in:

1. Failure to ignite the lamp.
2. Malfunctioning of the PWM due to uncharacteristic startup conditions, potentially causing failure of the power semiconductors.

It is recommended to use the lamp lit signal to enable any intensity control circuitry.

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MATERIAL --

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QUAL ENG	

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CEP100 POWER SUPPLY

SIZE A | DWG. NO. 93556-00001 | REV. B

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PART NO: **01056-00001**

CONDITIONS OF ACCEPTABILITY

When installed in the end-user equipment, the following are among the considerations to be made:

1. This product has been judged on the basis of the required spacings in the IEC 60601-1 standard which covers the end-use product for which the component is designed.
2. The component shall be installed in compliance with the enclosure, mounting, spacing, casualty markings, creepage, clearance and segregation requirements of the end-use application.
3. Consideration should be given to measuring the temperature on power electronic components and transformers windings when the power supply is installed in the end-use equipment.
4. The input/output connectors are not acceptable for field connections, they are only intended for connection to mating connectors of internal wiring inside the end-use application.
5. The output circuits have not been evaluated for direct patient connection.
6. The component should be properly bonded to ground in end-use application.
7. Leakage current testing should be repeated in the end-use application.
8. The power supply was evaluated as Reinforced Isolation between primary and Auxiliary outputs, basic insulation between primary to ground (chassis), and no insulation between primary and lamp output.
9. This power supply has been evaluated as Class I, continuous operation, ordinary equipment and has not been evaluated for use in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxyde.
10. Fusing in the end product shall be considered since primary fusing of both sides on the mains supply line was not provided (6.3A fuse provided on input line side).
11. Isolation barriers for the 25kV ignition pulse are not within this component. These barriers shall be provided in the end-application. The manufacturer of the final device shall follow the requirements of the IEC 60950 or IEC 60601-1 3Ed concerning these barriers.

EXPLANATION OF SYMBOLS


Alternating Current


Direct Current


Protective Earth


Attention, Consult Accompanying Documents


Attention, Dangerous Voltages

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CEP100
POWER SUPPLY

SIZE A | DWG. NO. 93556-00001 | REV. B

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PART NO: **01056-00001**

CERTIFICATION: All models are Certified to be in compliance with the applicable requirements of IEC 601-1 (1988), EN 60601-1: 1990.

CLASSIFICATION: (In accordance with sub-clause 5 of IEC 601-1)
(5.1) Protection against electric shock = Class I
(5.2) Degree of protection against electric shock = To be determined by end-use equipment.
(5.3) Protection against harmful ingress of water = Ordinary (no protection)
(5.5) Have not been evaluated for use in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxide.
This evaluation is to be made on the end equipment by the OEM.
(5.6) Mode of operation = Continuous.

GROUNDING: The ground connection must be attached to ground in the end application meet the specified EMC requirements.
A separate dedicated grounding point should be used for safety grounding of the end equipment.

OUTPUTS:

Lamp output: Output is not isolated and shall not be connected to Protective Earth in the end application.
Auxiliary Outputs (LVPS): Auxiliary outputs provide reinforced isolation and may be connected to protective earth in the end application.
The output is intended for Protectively Earthed Signal Output and Intermediate Circuits only.
The output is not acceptable for patient connection without additional isolation. The DC output is SELV under normal and single fault conditions.

INPUTS:

Control I/O: Control I/O provides reinforced isolation and may be connected to protective earth in the end application.
The Control I/O is intended for Protectively Earthed Signal Output and Intermediate Circuits only.
The Control I/O is not acceptable for patient connection without additional isolation. The Control I/O is SELV under normal and single fault conditions.

ISOLATION: The creepage distance between primary and earth ground is 4 mm minimum; between primary and secondary circuits is 8 mm minimum. Secondary to ground creepage is not defined or controlled.
The required creepage and clearance distances from primary circuits to ground and secondary circuits must be maintained after installation to preserve the intended safety.

CAUTION: When performing Dielectric Strength Tests, catastrophic failure of the unit may result if a Dielectric Strength test voltage greater than 1800 V ac is applied between primary and secondary circuits.

TEMPERATURES: The maximum operating temperatures of certain safety components, as defined in the applicable safety standards, must not be exceeded after installation to preserve the intended safety. The output power, ambient air temperature and the availability, amount, direction and/or restriction of airflow influence the temperatures of these components.

OVERCURRENT PROTECTION: The internal fuse is located in the phase lead only. EN 60601-1 requires that both supply leads (phase and neutral) be protected against over-current. Complete over-current protection must be provided in the end application. Fuse ratings must not exceed that specified for the internal fuse, must meet the requirements of EN 60601-1, and be acceptable for the country in which the end-use application is to be installed.

WARNING! RISK OF FIRE! A blown internal fuse is an indication of catastrophic failure of circuit components. Refer to fuse marking on the supply for rating.
Repair must be performed by Carsan Engineering authorized personnel.

WARNING! SHOCK HAZARD! Dangerous voltages are present on some components, PCB traces and heat sinks.

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ANGLES .XX: +/- 0.5 deg

MATERIAL --

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QUAL ENG	

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CEP100
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