Proven Reliability

C SERIES

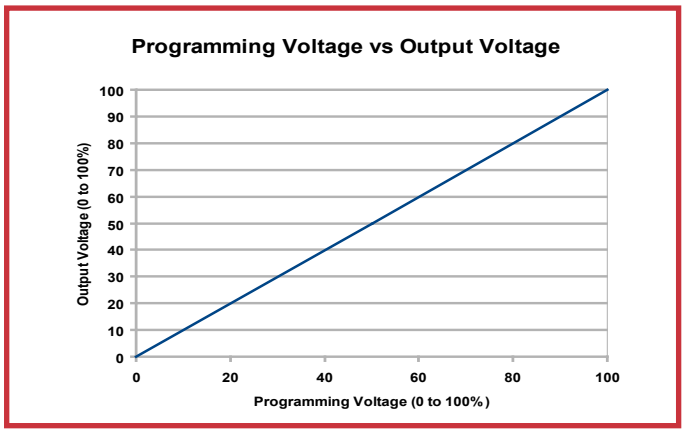
MINIATURE, REGULATED HIGH VOLTAGE DC TO DC CONVERTERS

100V to 8000VDC @1 Watt

NOW UL RECOGNIZED

PRODUCT DESCRIPTION

Miniature, well regulated high voltage power supplies provide clean and reliable high voltage in a shielded, pc mount package. Featuring precision 0 to 100% programmability and very low ripple and EMI/RFI, these cost-effective power supplies are ideal for integration into compact, sensitive equipment. For 10kV output, see the CB series.



APPLICATIONS

Photomultiplier Tubes
Solid State Detectors
Electrophoresis
Piezo Devices
Capacitor Charging
EO Lenses

OPTIONS

RoHS versions available (R suffix)
Low Out-gassing Epoxy (NASA approved per ASTM E-595-93)

PRODUCT SELECTION TABLE

MODEL	OUTPUT VOLTAGE	MAXIMUM OUTPUT CURRENT*1
C01	0 to 100 V	0 to 10 mA
C02	0 to 200 V	0 to 5 mA
C03	0 to 300 V	0 to 3.3 mA
C05	0 to 500 V	0 to 2 mA
C06	0 to 600 V	0 to 1.67 mA
C10	0 to 1,000 V	0 to 1 mA
C12	0 to 1,250 V	0 to 1 mA
C15	0 to 1,500 V	0 to 0.67 mA
C20	0 to 2,000V	0 to 0.5 mA
C25	0 to 2,500 V	0 to 0.4 mA
C30	0 to 3,000 V	0 to 0.33 mA
C40	0 to 4,000 V	0 to 0.25 mA
C50	0 to 5,000 V	0 to 0.2 mA
C60	0 to 6,000V	0 to 0.166 mA
C80	0 to 8,000V	0 to 0.125 mA

Complete List of Models on page 2

FEATURES

- Regulated
- Low Noise, Quasi-Sinewave Oscillator
- Miniature Size
- 0 to 100% Programmable Output
- High stability, <50ppm/°C (typical)
- Wide Input Voltage Range, 11.5 to 16VDC
- Very Low EMI/RFI
- High Reliability: MTBF >2.6 million hours per Bellcore TR-332 (model C10)
- Steel Case with Isolated Case Ground
- Sealed to withstand immersion cleaning process
- External gain adjust for calibration
- UL 94V-0 Listed Proprietary Encapsulant

ISO 9001:2008 CERTIFIED ISO 14001:2004 CERTIFIED RoHS COMPLIANT c UL us E344664 CE IPC Certified J-STD-001 Application Specialist

ELECTRICAL SPECIFICATIONS*2 C01 - C80 (100V to 8000V)

OUTPUT VOLTAGE (POSITIVE OR NEGATIVE)	MODEL	MAXIMUM OUTPUT CURRENT*1	RIPPLE P-P FULL-LOAD*3	REGULATION		FREQUENCY*3
				LOAD 0 TO 100%*3	LINE 11.5 TO 16.0V*3	
0 to +100V	C01	0 to 10 mA	<0.75 %	<0.1%	<0.1 %	200 - 250 kHz
0 to +200V	C02	0 to 5 mA	<0.05 %	<0.1%	<0.1 %	250 - 350 kHz
0 to -200V	C02N	0 to 5 mA	<0.05 %	<0.1 %	<1 %	75 - 150 kHz
0 to +300V	C03	0 to 3.3 mA	<0.03 %	<0.1 %	<0.1 %	200 - 300 kHz
0 to +500V	C05	0 to 2.mA	<0.004 %	<0.07 %	<0.1 %	250 - 350 kHz
0 to -500V	C05N	0 to 2 mA	<0.005 %	<0.5 %	<0.5 %	200 - 350 kHz
0 to +600V	C06	0 to 1.67 mA	<0.003 %	<0.1 %	<0.1 %	250 - 300 kHz
0 to -600V	C06N	0 to 1.67 mA	<0.003 %	<0.75 %	<0.75 %	125 - 300 kHz
0 to +1,000V	C10	0 to 1 mA	<0.005 %	<0.3 %	<0.3 %	200 - 250 kHz
0 to -1,000V	C10N	0 to 1 mA	<0.002 %	<0.5 %	<0.3 %	100 - 125 kHz
0 to +1,250V	C12	0 to 1 mA	<0.004 %	<0.1 %	<0.1 %	200 - 250 kH
0 to -1,250V	C12N	0 to 1 mA	<0.003 %	<0.175 %	<0.1%	100 - 125 kH
0 to +1,500V	C15	0 to 0.67 mA	<0.002 %	<0.1 %	<0.1 %	100 - 125 kH
0 to -1,500V	C15N	0 to 0.67 mA	<0.002 %	<0.2 %	<0.2 %	75 - 100 kHz
0 to +2,000V	C20	0 to 0.5mA	<0.002 %	<0.15 %	<0.1 %	75 - 100 kHz
0 to -2,000V	C20N	0 to 0.5 mA	<0.002 %	<0.15%	<0.1 %	75 - 100 kHz
0 to +2,500V	C25	0 to 0.4 mA	<0.1 %	<0.3 %	<0.2 %	125 - 150kH
0 to -2,500V	C25N	0 to 0.4 mA	<0.2 %	<0.5 %	<0.2 %	125 - 150kH
0 to +3,000V	C30	0 to 0.33mA	<0.1 %	<0.3 %	<0.05 %	75 - 100kHz
0 to -3,000V	C30N	0 to 0.33 mA	<0.2 %	<0.3 %	<0.075 %	75 - 100kHz
0 to +4,000V	C40	0 to 0.25 mA	<0.1 %	<0.25 %	<0.2 %	50 - 125kHz
0 to -4,000V	C40N	0 to 0.25 mA	<0.1 %	<0.2 %	<0.1 %	75 - 150kHz
0 to +5,000V	C50	0 to 0.2 mA	<0.1%	<0.35%	<0.1%	75 - 150kHz
0 to -5,000V	C50N	0 to 0.20 mA	<0.1 %	<0.25%	<0.1%	125 - 175kHz
0 to +6,000V	C60	0 to 0.166 mA	<0.1 %	<0.25%	<0.1 %	125 - 175kHz
0 to -6,000V	C60N	0 to 0.166 mA	<0.1 %	<0.25%	<0.15 %	125 - 175kHz
0 to +8,000V	C80	0 to 0.125 mA	<0.2 %	<0.75%	<0.15 %	100 - 150kHz
0 to -8,000V	C80N	0 to 0.125 mA	<0.2 %	<0.75%	<0.25 %	100 - 150kHz

ELECTRICAL SPECIFICATIONS*2 C01 - C80 (100V to 8000V)

PARAMETER	VALUE
INPUT VOLTAGE	+11.5 to +16 VDC
INPUT CURRENT	<100 mA, No Load
	<250 mA, Full Load
INPUT CAPACITANCE	440 uF low ESR
PROGRAMMING VOLTAGE	0 to +5VDC, <100uA
RESPONSE TIME	<250msec (Full Load, full scale response)
SETPOINT ACCURACY*6	+/-1%
GAIN ADJUST*6	5 to 10%
LINEARITY*6	<1 % (15 % to 100% Vout)
STABILITY	<0.01 % / HOUR
TEMPCO	<50 ppm/°C*3
THERMAL SHOCK LIMIT	1°C /10 seconds
OPERATING TEMPERATURE	-10 to +60°C*5 (CASE)
STORAGE TEMPERATURE	-20 to +90°C

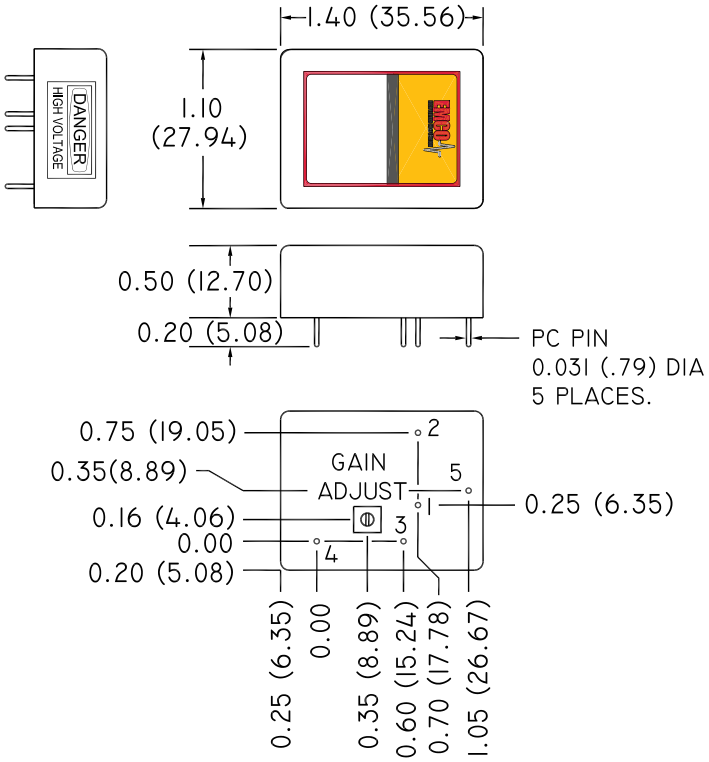
DETAILED PRODUCT DESCRIPTION

The C Series is a line of miniature, regulated high voltage power supplies. Each model is programmed from 0 to 100% of rated output via a 0 to +5 volt DAC compatible high impedance programming input voltage. Temperature drift is typically less than 50 PPM/°C. These modules exhibit very low ripple, noise, and EMI/RFI by utilizing a quasi-sinewave oscillator, shielded transformer, excellent filtering techniques and an isolated steel enclosure featuring a separate grounding pin. An externally accessible potentiometer provides adjustable gain trim allowing for individual calibration of units. A proprietary encapsulation process and custom 94V-0 listed, high performance formula are used to achieve excellent high voltage and thermal properties. Positive and negative outputs are standard, and delivery of small quantities is available from stock.

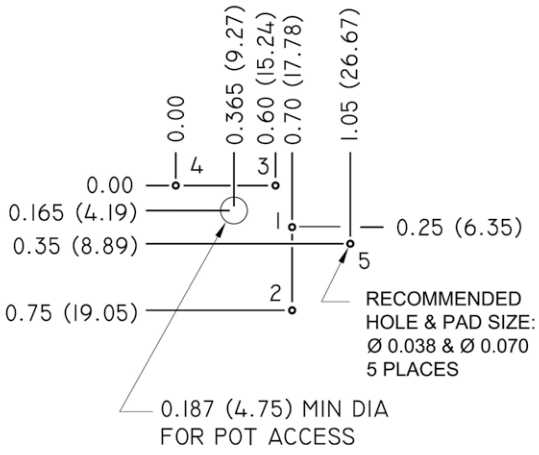
Also available with the C Series are the CM Series adapter kits. For more details, refer to pages 10 and 11.

Small quantities available from stock from our factory or our stocking distributor in Switzerland, Condatas AG. For large quantity requests please consult our factory or our stocking distributor in Switzerland, Condatas AG.

MECHANICAL SPECIFICATIONS C01 to C20 (100V to 2000V)



PCB LAYOUT
COMPONENT SIDE



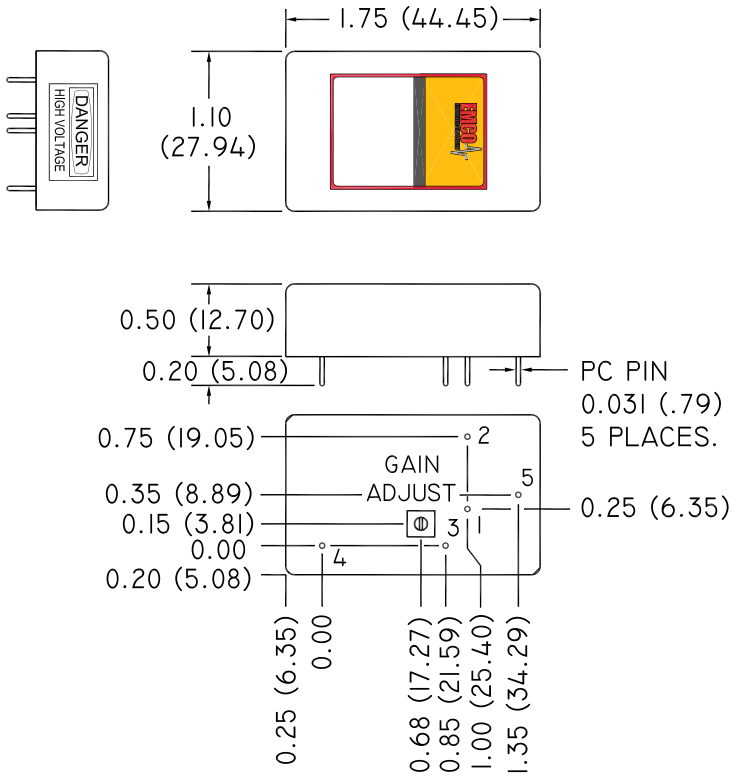
SEALED TO WITHSTAND IMMERSION CLEANING PROCESSES

DIMENSIONS ARE IN INCHES (METRIC EQUIVALENTS ARE IN PARENTHESIS)
DIMENSIONAL TOLERANCES: .XX = ± 0.02 (0.51), .XXX = ± 0.005 (0.127)

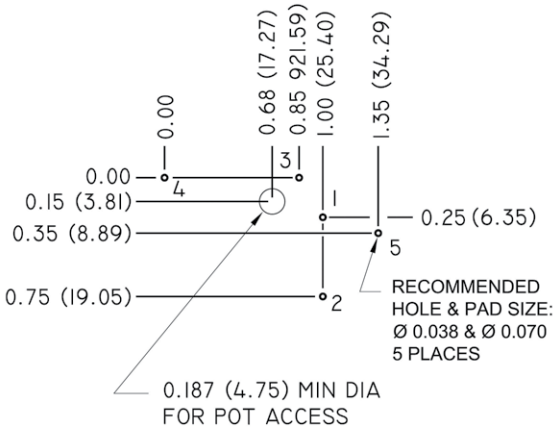
PARAMETER	VALUE
WEIGHT	1.1 OZ. (31.0 GRAMS)
VOLUME	0.77 CUBIC INCHES (12.62 CUBIC CENTIMETERS)
DIMENSIONS	1.40L (35.56L) x 1.10W (27.94W) x 0.50H (12.70H)
CASE MATERIAL	ZINC PLATED STEEL

PIN #	FUNCTION
1	(+) INPUT
2	GND
3	PROGRAMMING VOLTAGE
4	HV OUT
5	CASE GND*4

MECHANICAL SPECIFICATIONS C25 to C40 (2500V to 4000V)



PCB LAYOUT
COMPONENT SIDE



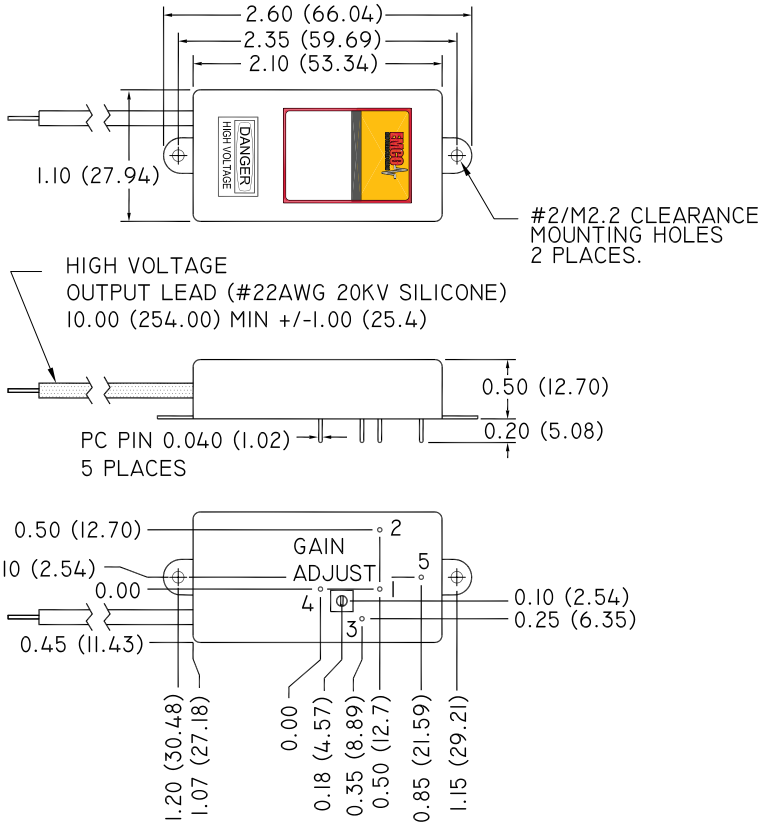
SEALED TO WITHSTAND IMMERSION CLEANING PROCESSES

DIMENSIONS ARE IN INCHES (METRIC EQUIVALENTS ARE IN PARENTHESIS)
DIMENSIONAL TOLERANCES: .XX = ± 0.02 (0.51), .XXX = ± 0.005 (0.127)

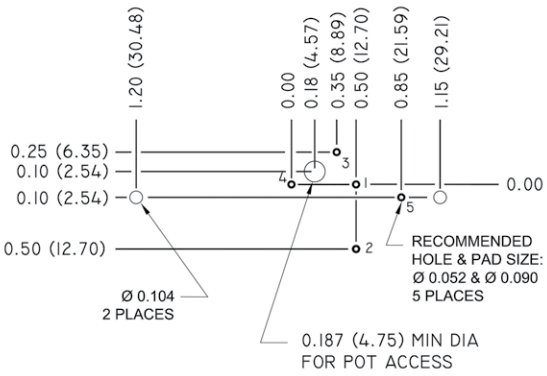
PARAMETER	VALUE
WEIGHT	1.3 OZ. (36.8 GRAMS)
VOLUME	0.96 CUBIC INCHES (15.77 CUBIC CENTIMETERS)
DIMENSIONS	1.75L (44..45L) x 1.10W (27.94W) x 0.50H (12.70H)
CASE MATERIAL	ZINC PLATED STEEL

PIN #	FUNCTION
1	(+) INPUT
2	GND
3	PROGRAMMING VOLTAGE
4	HV OUT
5	CASE GND*4

MECHANICAL SPECIFICATIONS C50 to C60 (5000V to 6000V)



PCB LAYOUT
COMPONENT SIDE



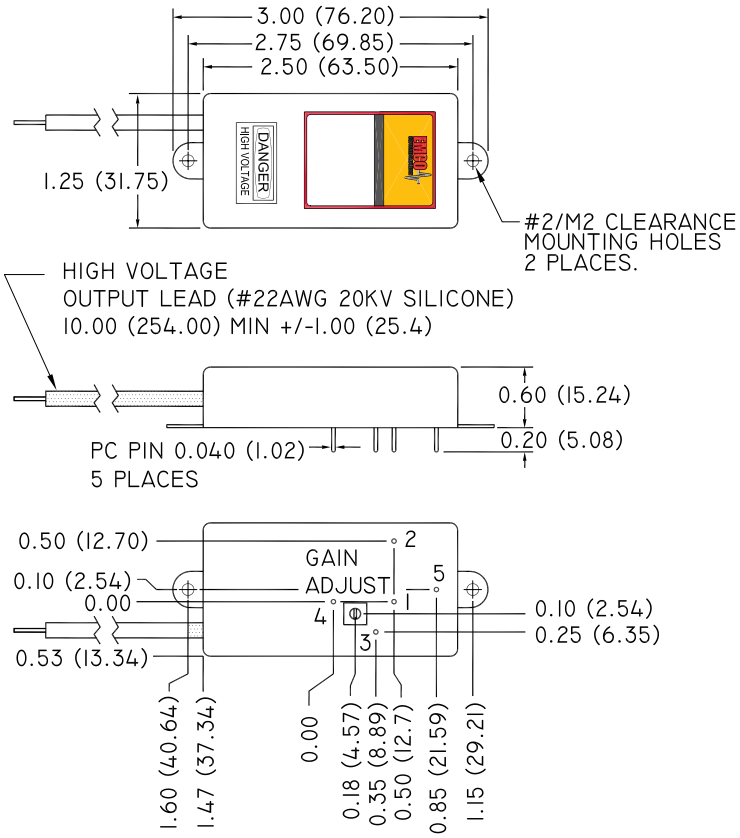
SEALED TO WITHSTAND IMMERSION CLEANING PROCESSES

DIMENSIONS ARE IN INCHES (METRIC EQUIVALENTS ARE IN PARENTHESIS)
DIMENSIONAL TOLERANCES: .XX = ± 0.02 (0.51), .XXX = ± 0.005 (0.127)

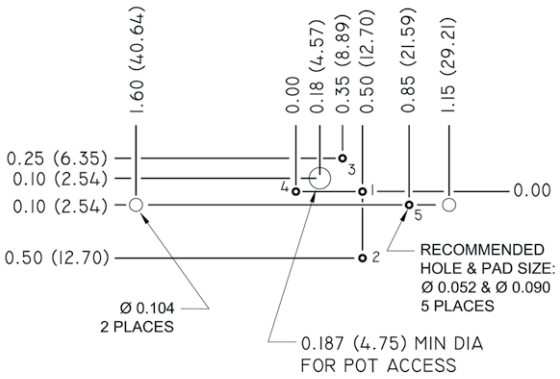
PARAMETER	VALUE
WEIGHT	1.8 OZ. (50.9 GRAMS)
VOLUME	1.16 CUBIC INCHES (18.93 CUBIC CENTIMETERS)
DIMENSIONS	2.10L (53.34L) x 1.10W (27.94W) x 0.50H (12.70H)
CASE MATERIAL	ZINC PLATED STEEL

PIN #	FUNCTION
1	(+) INPUT
2	GND
3	PROGRAMMING VOLTAGE
4	HV RTN
5	CASE GND
LEAD	HV OUT

MECHANICAL SPECIFICATIONS C80 (8000V)



PCB LAYOUT
COMPONENT SIDE



SEALED TO WITHSTAND IMMERSION CLEANING PROCESSES

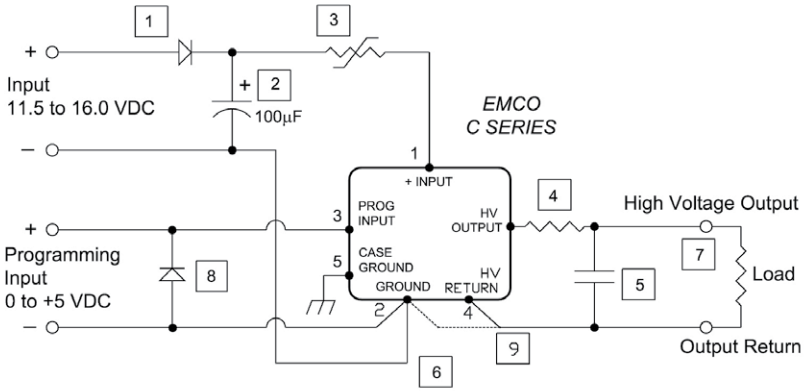
DIMENSIONS ARE IN INCHES (METRIC EQUIVALENTS ARE IN PARENTHESIS)
DIMENSIONAL TOLERANCES: .XX = ± 0.02 (0.51), .XXX = ± 0.005 (0.127)

PARAMETER	VALUE
WEIGHT	2.0 OZ. (56.6 GRAMS)
VOLUME	1.88 CUBIC INCHES (30.73 CUBIC CENTIMETERS)
DIMENSIONS	2.50L (63.50L) x 1.25W (31.75W) x 0.60H (15.24H)
CASE MATERIAL	ZINC PLATED STEEL

PIN #	FUNCTION
1	(+) INPUT
2	GND
3	PROGRAMMING VOLTAGE
4	HV RTN
5	CASE GND
LEAD	HV OUT

APPLICATION NOTES

Improved Performance and Protection



1 Diode provides reverse polarity protection.

2 Capacitor reduces ripple.

3 Resettable fuse (Raychem P/N RXE020,025 or 030) provides indefinite short circuit protection. *Selection depends on model used, load characteristics and operating temperature range.*

4 Series resistance increases arc protection and reduces ripple (when used with an output capacitor).

5 Capacitor reduces ripple.

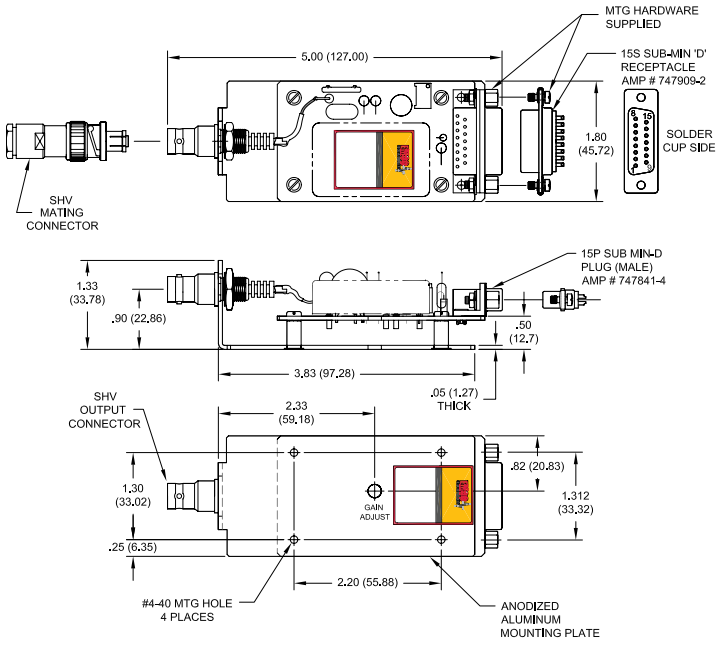
6 IMPORTANT: Keep Input, Programming and Output return paths separate to eliminate ground loop accuracy errors.

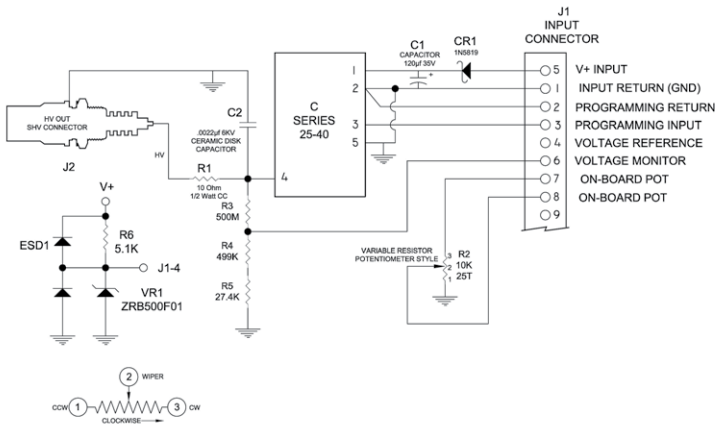
7 Conformal coating recommended on all exposed high voltage conductors.

8 Diode provides protection against negative programming voltage or negative transient spike.

9 Output Circuit return to HV return (pin 4) on C50 - C80. On C01-C40, output circuit return to ground (pin 2).

CM3: MODELS C25, C25N, C30, C30N, C40 and C40N





PRODUCT DESCRIPTION

These adapters provide convenient proto-typing and evaluation during system development and integration, and allow these modules to be mounted to a chassis instead of designed in to a pc board.

Extra filtering on the input and output improves performance. A schottky diode on the input provides reverse polarity protection. Input connector is via a 15P SUB MIN-D plug (mate supplied) and output is via an SHV style coaxial connector (mate supplied).

ORDERING INFORMATION:

Please note when ordering an CM3 the C Series is not included and must be ordered separately.

PROGRAMMING OPTIONS / INSTRUCTIONS

- **Onboard Potentiometer:** connect pins 7 to 4 and 8 to 3, turn potentiometer to adjust high voltage.

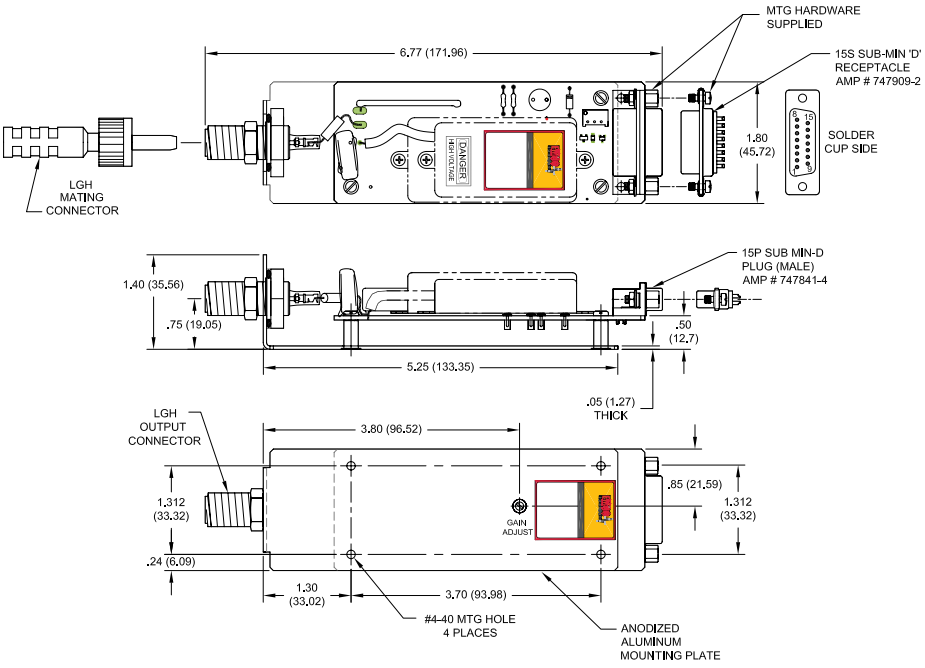
OR

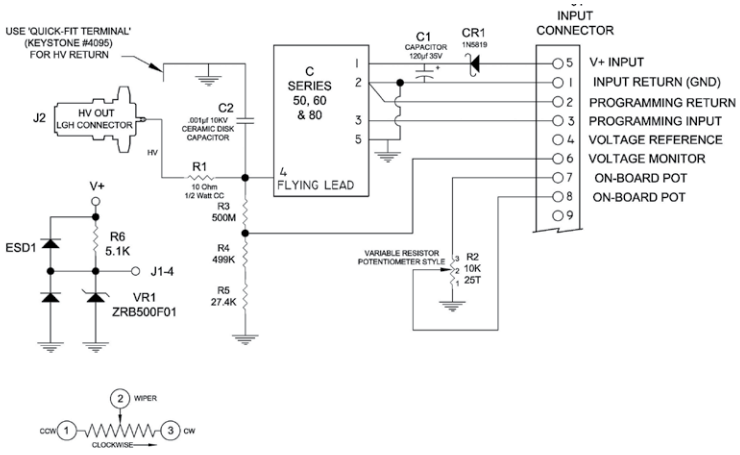
- **Remote Potentiometer:** connect wiper arm to pin 3, other sides to pins 4 and 2.

OR

- **Remote Analog Signal:** apply programming voltage to pin 3, return to pin 2.

CM4: MODELS C50, C50N, C60, C60N, C80 and C80N





PRODUCT DESCRIPTION

These adapters provide convenient proto-typing and evaluation during system development and integration, and allow these modules to be mounted to a chassis instead of designed in to a pc board.

Extra filtering on the input and output improves performance. A schottky diode on the input provides reverse polarity protection. Input connector is via a 15P SUB MIN-D plug (mate supplied) and output is via an LGH style coaxial connector (mate supplied).

ORDERING INFORMATION:

Please note when ordering an CM4 the C Series is not included and must be ordered separately.

PROGRAMMING OPTIONS / INSTRUCTIONS

- **Onboard Potentiometer:** connect pins 7 to 4 and 8 to 3, turn potentiometer to adjust high voltage.

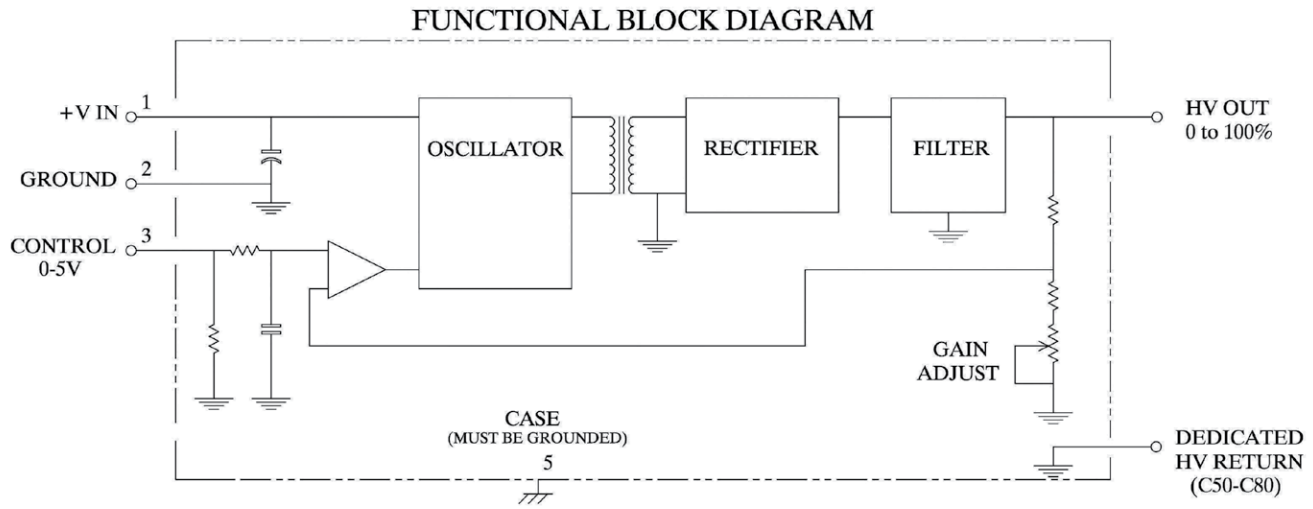
OR

- **Remote Potentiometer:** connect wiper arm to pin 3, other sides to pins 4 and 2.

OR

- **Remote Analog Signal:** apply programming voltage to pin 3, return to pin 2.

BLOCK DIAGRAM



HOW TO ORDER

PART NUMBER SELECTOR:

Model Number:

C 10 N R

Model

Output Voltage (See table)

RoHS (optional)

Polarity Designator (**Blank or N**)

EXAMPLE: **C10NR** (**C**-Series, **10** - Output Voltage, **N** - Negative, **R** - RoHS (optional))

* Notes:

1. At Maximum Rated Output Voltage.
2. Specifications after 1 hour warm-up, full load, at 25oC unless other wise indicated.
3. Typical Performance
4. All grounds internally connected, except case. There should not be more than 50 volts potential between the case ground (pin 5) and the circuit ground (pins 3 and 8). Isolated case assists low noise design efforts. Case pin must be connected to ground for proper operation.
5. Proper thermal management techniques are required to maintain safe case temperature at maximum power output.
6. SET POINT ACCURACY refers to the ability of the unit to accurately deliver the voltage intended by the applied programming. The resultant output voltage will be within +/-1% of that programmed. GAIN ADJUSTMENT refers to the ability to alter the gain of the circuit to bring the resultant output voltage to the programmed set point. This is intended to allow compensation for set point accuracy error. LINEARITY refers to how much the transfer function can deviate from a straight line in the absence of any set point error.