



AMERICAN HIGH VOLTAGE

MLSeries High Voltage Power Supply

MLSeries

General Description

The ML Series are perfect modules to use when small size but high power is required. A special patented switching topology is utilized that employs a dual resonant pulse width modulator allowing operation up to 200 kHz. The ML series is regulated to within 0.01% for both line and load changes and are short circuit protected with a unique "try again" circuit. Ideal for all electro-optic applications ML modules are lightweight and easy to mount. Hookup is by flying lead connection. All ML modules are adjustable from zero output and offer an enable control where the unit may be placed into a standby condition. They are encapsulated in a thermally conductive epoxy and offer efficiencies as high as 85% at full load.

Features

- Only 0.2 inches (5 mm) thick
- Regulated output
- Buffered Voltage monitor (depending on model)
- Current Monitor (depending on model)
- 100 VDC to 10,000 VDC models available
- Trimpot, Resistance or Voltage program



Connection Diagram



Typical Wire connections:

Black: DC Return
Red: DC Return
Orange: DC Return
Yellow: +Vin
Green: +Vin
Blue: +Vin
Violet: Analog Ground
Grey: Enable
White: Vcontrol

Heavy Red: HV Output



AMERICAN HIGH VOLTAGE

Electrical Characteristics

(at 25 degrees C unless otherwise specified)

ML Series

Parameter	Conditions	Value			Units
		Min	Typical	Max	
Supply Voltage*:	(12V input model)	10	12	14	
Input Current:	No Load (3W model 12Vin):	10	20	30	mA
	No Load (5W model 12Vin):	15	25	35	mA
	No Load (10W model 12Vin):	20	30	40	mA
	Full Load (3W model 12 Vin):	300	330	350	mA
	Full Load (5W model):	500	550	650	mA
	Full Load (10W model):	1100	1150	1200	mA
Output Ripple:	No Load (all models):	0.02%	0.03%	0.05%	Vpp
	Full Load (all models):	0.1%	0.1%	0.1%	Vpp
Load Regulation:	No Load to Full Load	0.01%	0.01%	0.01%	V _{NL} /V _L
Output Linearity	No Load		1%		ΔV_{OUT}
					ΔV_{OUT} (ideal)
Output Linearity	Full Load (all models):		1%		ΔV_{OUT}
					ΔV_{OUT} (ideal)
Short Circuit Current:	(I trip set at 130%)		try again		
Power Efficiency:	Full Load	70%	80%	85%	P _{OUT}
					P _{IN}
Reverse Input Polarity	Protected to 20 VDC		series diode		
Temperature Drift:	No Load			100	ppm/DegC
	Full Load			100	ppm/Deg C
Thermal Rise:	No Load (case)			15	degrees C
	Full Load (case) (10 Watt)			35	degrees C
Slew Rate (10% - 90%)	No Load			100	mS
	Full Load			120	mS
Slew Rate (90% - 10%)	No Load			200	mS
	Full Load			100	mS
Drain Out Time	No Load (5 TC)			150	mS
* Other input voltages available: 5VDC, 15VDC, 24VDC, 28VDC and 48VDC					



AMERICAN HIGH VOLTAGE

Physical Characteristics

(at 25 degrees C unless otherwise specified)

Parameter	Conditions	Value	Units
Dimensions (3,5 W)	MKS	60 W x 50 H x 5 T	mm
	English	2.36 W x 2 H x 0.2 T	inches
Dimensions (10 W)	MKS	77 W x 64 H x 5 T	mm
	English	3.03 W x 2.53 H x 0.2 T	inches
Volume: (3, 5 W)	MKS	15	cm ³
	English	0.95	inch ³
Volume: (10 W)	MKS	22.4	cm ³
	English	1.42	inch ³
Mass: (3, 5 W)	MKS	15	grams
	English	0.5	oz
Packaging:	Solid Epoxy Thermosetting		
Finish	Smooth Epoxy Case		
Terminations:	Rainbow wire input		
	HV wire flying lead output		

Environmental Characteristics

(at 25 degrees C unless otherwise specified)

Parameter	Conditions	Value	Units
Temperature Range	case temperature	-40 degrees to + 71 degrees	Celsius
	case temperature	-40 degrees to + 160 degrees	Fahrenheit
Shock:	MIL-STD-810 Method 516	40 g's	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 g's	Curve E
Thermal Shock	MIL-STD-810 Method 504	-40 deg C to + 71 deg C	Class 2



AMERICAN HIGH VOLTAGE

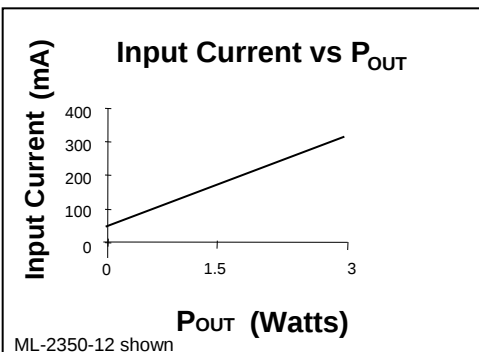
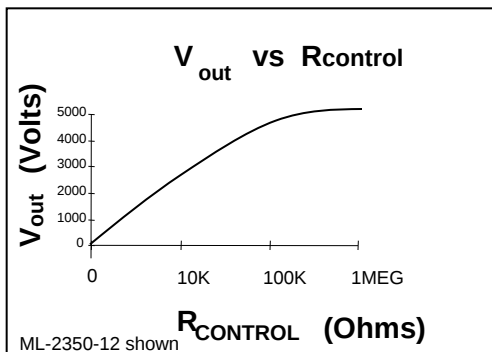
Models Available (as of September 2019):

(Vin = variable VDC)

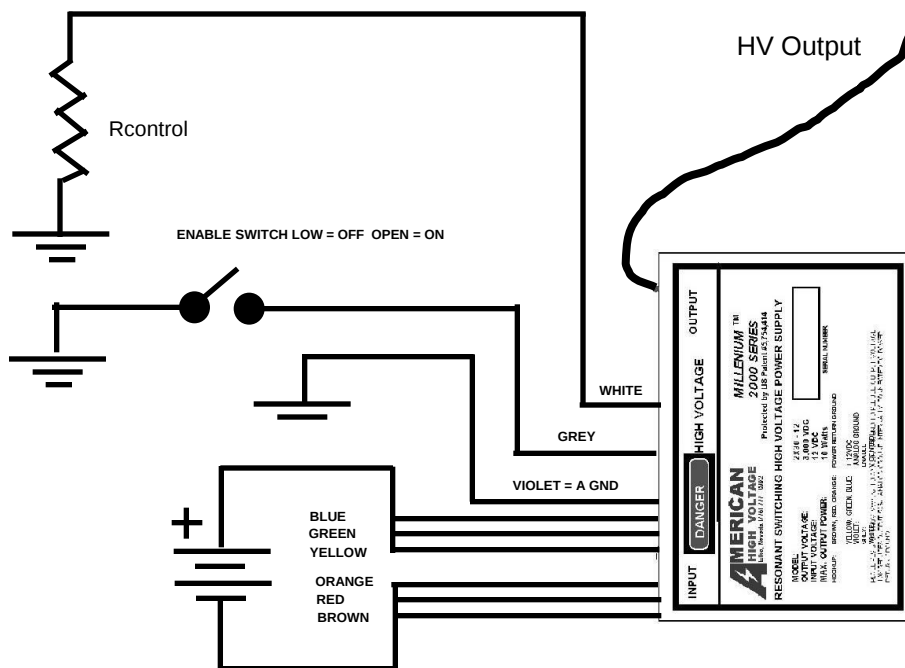
Model	Output Voltage Range	Power	Polarity	Input voltage
ML2310-12	0 – 1,000 VDC	3 Watts	Positive	12 VDC
ML2510-12	0 – 1,000 VDC	5 Watts	Positive	12 VDC
ML-2X30-12	0 – 3,000 VDC	10 Watts	Positive	12 VDC
ML-2550-15	0 – 5,000 VDC	5 Watts	Positive	15 VDC
ML2X30-5	0 – 3,000 VDC	10 Watts	Positive	5 VDC
ML2350-28	0 – 5,000 VDC	3 Watts	Positive	28 VDC
ML2550-15N	0 – 5,000 VDC	5 Watts	Negative	15 VDC
ML2380-5	0 – 8,000 VDC	3 Watts	Positive	5 VDC

ML Series

ML Series Performance Charts



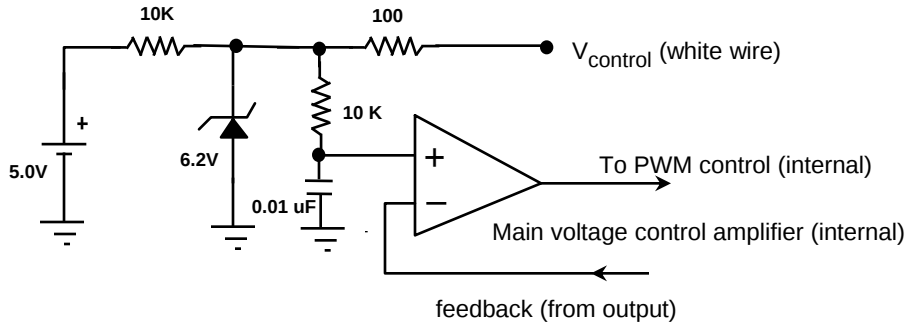
ML Series Hookup Diagram



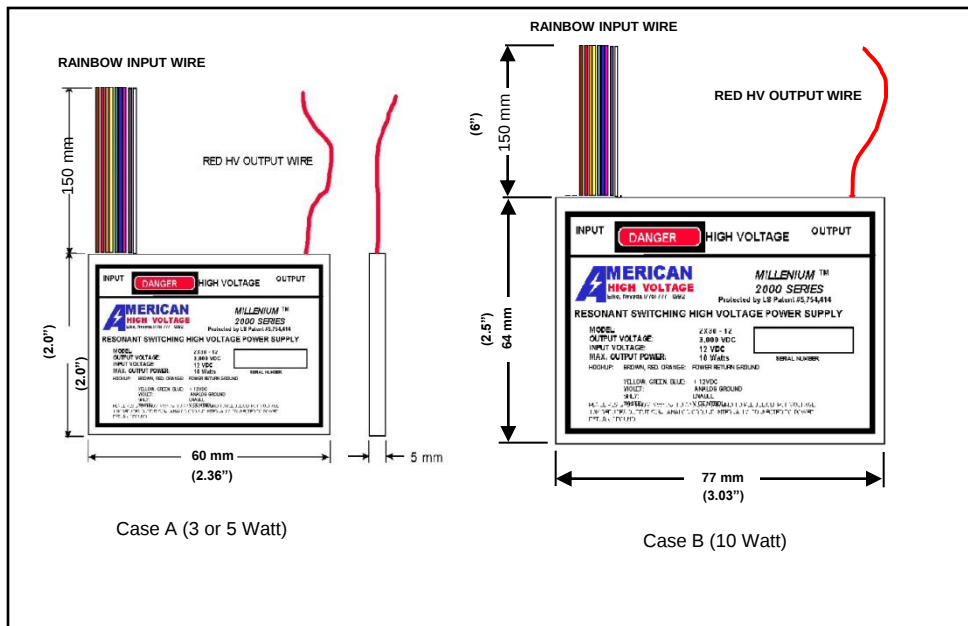


AMERICAN HIGH VOLTAGE

Equivalent ML Circuit Model



Outline Drawing: (millimeters) INCHES



Ordering Information:

ML – 2AB-C

Example:

ML – 2X30-12: Maximum output = 3,000 V 10 Watts 12 VDC input
ML – 2350-5: Maximum output = 5,000 V 3Watts 5VDC input

A: Wattage 3 = 3Watt, 5 = 5 Watt, X = 10 Watt
B: Output Voltage: 10 = 1kV, 20 = 2kV, 30 = 3kV etc.
C = Input Voltage: 5 = 5VDC, 12 = 12VDC, etc.

ML Series