- ***Extremely Compact 10W High Performance Module***
- ***Multiple Control Interfaces: Differential Analog, RS-232 and RS-485***
- ***Voltage and Current Monitors***
- ***High Stability, Low TC***
- ***Ultra Low Ripple and Noise, Down to 1/f Band***
- ***Free GUI for Testing and Development Work***
- ***Digital Control Features: Multiple Units Operation, Current Control, Status Flags and Wobbler Function***

Spellman's MPD series is a family of high voltage, high performance 10 Watt modules with output voltages ranging from 1kV to 30kV.

Spellman's hybrid topology of linear and switch mode power conversion techniques delivers ultra-low noise, excellent ripple and stability performance all within its compact footprint.

The MPD series can be controlled via analog or digital interfaces, both provided via a standard 15-pin D-type connector.

In analog mode, the unit features a differential amplifier input for the voltage programming signal to improve immunity from external system noise and address any offset issues. In digital mode, RS-232 and RS-485 interfaces provide additional features: current control, status flags, multiple units operation (RS-485 only), and wobbler function.

Spellman's proprietary HV technology coupled with SMT circuitry results in an ultra-compact and lightweight module, available as either a positive or negative supply, that is ideal for OEM applications.

TYPICAL APPLICATIONS

Mass Spectrometry	Electrostatic Printing
Electrostatic Lenses	Scintillators
Automatic test equipment	Electron Multipliers
Capillary Electrophoresis	Electrospinning
Electron and Ion Beams	Electrostatic Chucks
Microchannel Plate Detectors	Photomultiplier Tubes

SPECIFICATIONS

Input Voltage:
+24 Vdc, ±2Vdc

Input Current:
≤1 amp maximum

Output Voltage:
7 models available from 1kV to 30kV

Output Polarity:
Positive or negative, specify at time of order

Power:
10 watts, maximum

Voltage Regulation:
Line: For a 1V line change 10ppm
Load: 0-100% load 10ppm

Current Limit:
110% of rated output current. In digital control mode, the current limit is settable from 0 to 110% of the rated output current.

Ripple:
See "drift, ripple and noise" table

Stability:
After one hour warm up period.
10ppm/hour
25ppm/8 hours
100ppm/1000 hours

Temperature Coefficient:
10ppm per degree C

Protection:
Arc and short circuit protected.
Not designed to withstand continuous arcing.
The unit monitors and reports faults through status flags (digital com). When a trip occurs, the output is disabled and the unit can be reset through enable, fault reset or power cycle.

Control Software:
A free GUI can be provided for customer testing and development work.

Main Features:
-Voltage control and enable inputs
-Voltage and current monitor outputs
-10V voltage reference output

Digital Features:
The following features are available when operating in digital control mode.
-Multiple units operation (RS-485 only)
-Current control
-Wobbler function: sine wave superimposed to voltage output (programmable amplitude 0-300V, period 0.1 to 2s)

Environmental:
Temperature Range:
Operating: 0˚C to 50˚C
Storage: -35˚C to 85˚C
Humidity:
20% to 85% RH, non-condensing

Cooling:
Convection cooled

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128142-001 REV. F
Spellman High Voltage is an ISO 9001 and ISO 14001 registered company

Dimensions:

1kV-10kV:
1.18″ H X 2.75″ W X 5.12″ D (30mm x 70mm x 130mm)
15kV-20kV:
1.18″ H X 2.75″ W X 6.50″ D (30mm x 70mm x 165mm)
30kV-20kV:
1.38″ H X 2.95″ W X 8.46″ D (35mm x 75mm x 215mm)

Weight:

1kV-10kV: 14.82 oz. (420g)
15kV-20kV: 22.93 oz. (650g)
30kV: 33.51 oz. (950g)

Interface Connector:

15 pin male D connector

Output Connector:

Captive 39.4″ (1 meter) long un-terminated and shielded HV cable:
1kV to 20kV units: HRG58
30kV units: LEMO 130666

Regulatory Approvals:

Compliant to EEC Low Voltage Directive. UK Conformity Assessed. UL/CUL recognized, File E354595. RoHS Compliant.
Note: for 1kV and 30kV units approvals, please inquire.

MPD SELECTION TABLE

Model	Output Voltage	Output Current
MPD1*10/24	1kV	10 mA
MPD2.5*10/24	2.5kV	4.00 mA
MPD5*10/24	5kV	2mA
MPD10*10/24	10kV	1mA
MPD15*10/24	15kV	0.66mA
MPD20*10/24	20kV	0.5mA
MPD30*10/24	30kV	0.33mA

*Specify “P” for positive polarity or “N” for negative polarity.
Custom units available.

MPD DRIFT, RIPPLE and NOISE

Model	3mHz-30mHz	30mHz-3Hz	3Hz-30Hz	30Hz-300Hz	300Hz-30kHz	30kHz-3MHz
MPD1	7mV	7mV	7mV	4mV	4mV	4mV
MPD2.5	10mV	10mV	10mV	5mV	5mV	5mV
MPD5	10mV	10mV	10mV	10mV	10mV	10mV
MPD10	20mV	20mV	20mV	20mV	20mV	20mV
MPD15	30mV	30mV	30mV	30mV	30mV	30mV
MPD20	40mV	40mV	40mV	40mV	40mV	40mV
MPD30	60mV	60mV	60mV	60mV	60mV	60mV

MPD EXTERNAL INTERFACE— 15 PIN MALE D CONNECTOR

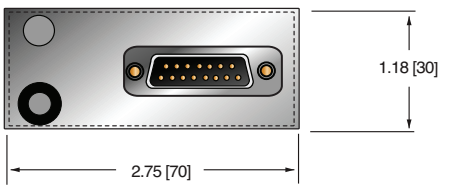
PIN	SIGNAL	SIGNAL PARAMETERS
1	Power Ground	Ground
2	+24Vdc Input	+24Vdc @ 1 amp maximum
3	Voltage Monitor Output	Voltage monitor 0 to 10Vdc for 0 to full scale output ±1% (wrt signal ground) Zout=10kΩ
4	Voltage Reference Output	10Vdc @ 10mA maximum
5	Voltage Program Input	0 to 10Vdc=0 to 100% rated output ±1%, Zin=10MΩ
6	Voltage Program Differential Amplifier Output	0 to 10Vdc=0 to 100% rated output, Zout =10kΩ
7	Voltage Program Differential Amplifier Input—Positive	0 to 10Vdc differential between pin 7 and pin 9 = 0 to 100% of rated output, diode clamped to ground, Zin =38kΩ
8	Current Monitor Output	Voltage monitor 0 to 10Vdc for 0 to full scale output ±1% (wrt signal ground) Zout=10kΩ
9	Voltage Program Differential Amplifier Input—Negative	0 to 10Vdc differential between pin 7 and pin 9 = 0 to 100% of rated output, diode clamped to ground, Zin =38kΩ
10	Voltage Program Digital Output	0 to 10Vdc = 0 to 100% rated output, Zout =10kΩ
11	Signal Ground	Signal ground for control and monitoring
12	Enable Input	Low = Enable, TTL, CMOS, open collector compliant
13	Digital Mode	RS-232 or RS-485 configuration Low = RS-485, Open circuit = RS-232
14	RS-232 TxD/RS-485 (-)	Transmit data (output) wrt pin 1 or RS-485 inverting
15	RS-232 RxD/RS-485 (+)	Receive data (input) wrt pin 1 or RS-485 non inverting

Digital Control – Connect pin 5 to pin 10
Analog Control – Connect pin 5 to pin 6

DIMENSIONS: in.[mm]

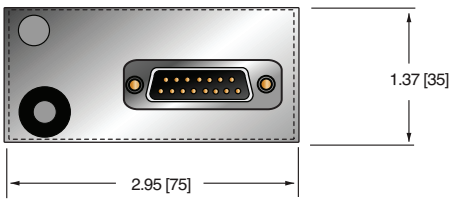
1kV-20kV

FRONT VIEW

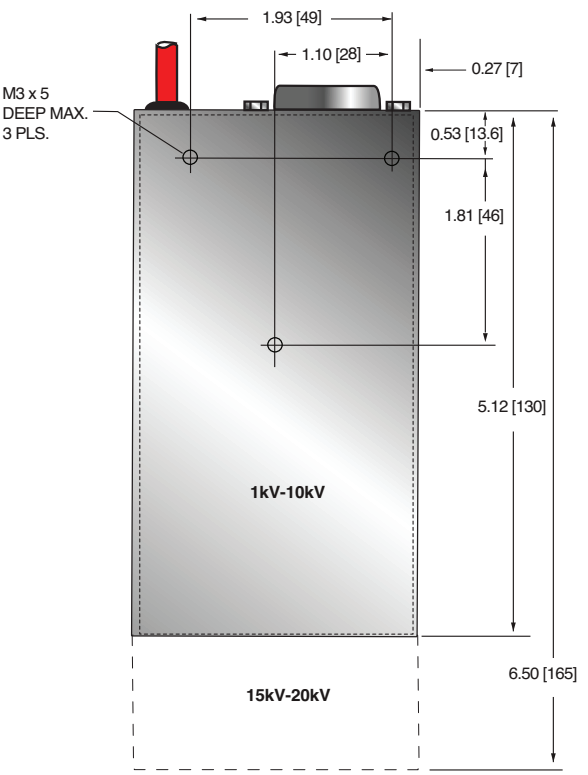


30kV

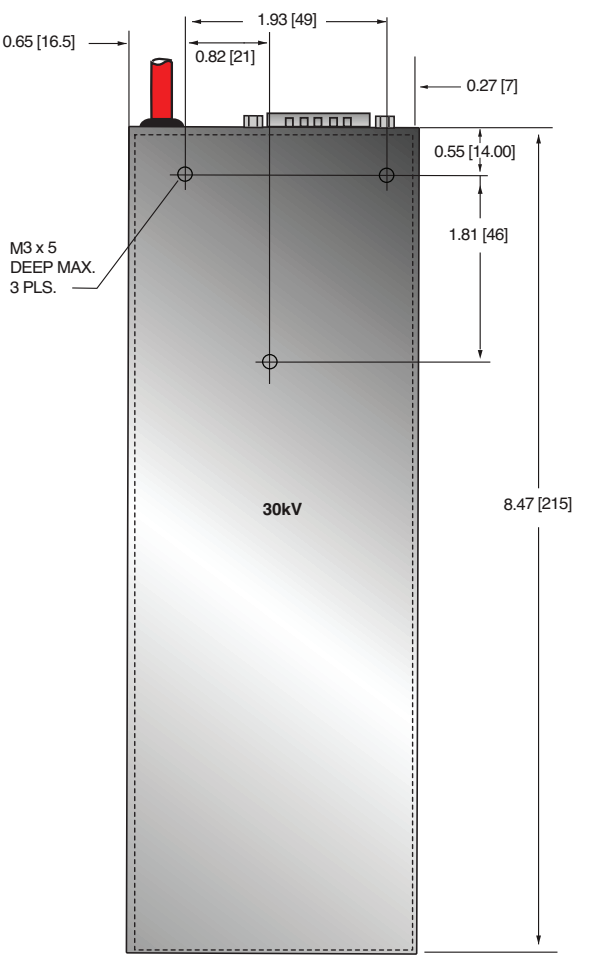
FRONT VIEW



BOTTOM VIEW



BOTTOM VIEW



SIDE VIEW

SIDE VIEW

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