EBM20N5/24

OEM MODULE FOR SEM APPLICATIONS

- ***Triode Supply for Electron Beam Columns***
- ***High Precision, Low Noise, Ultra Stable***
- ***Over Current/Voltage Protection***
- ***Arc and Short Circuit Protection***
- ***OEM Customization Available***
- ***UL Certified, CE Marked and RoHS Compliant***

www.spellmanhv.com/manuals/EBM20N5-24

The EBM20N5/24 powers E-Beam Columns in Thermionic Scanning Electron Microscopes providing acceleration, bias and filament sources in a single compact package. Spellman's proprietary HV packaging and encapsulation technology gives dramatic improvements in size, cost and performance compared to other SEM power supply offerings. The EBM20N5/24 provides a highly regulated, low noise, ultra stable accelerator supply programmable from 0 to -20kV at 250uA. The EBM20N5/24 has floating bias and filament supplies referenced to the accelerator. Programming signals utilize differential analog inputs to minimize external noise and offset voltages effects. A ground referenced accelerator current monitor is provided. The EBM20N5/24 is arc and short circuit immune, along with over voltage and over current protection.

TYPICAL APPLICATIONS

Scanning Electron Microscope

SPECIFICATIONS

Input Voltage:

+24Vdc, ±5%, 1.5A maximum

High Voltage Outputs:

ACCELERATOR:

Voltage:
0V to -20kV full load with respect to ground

Current:
250µA maximum (including feedback current), continuous from -500V to -20kV

Current Trip Level:
275mA, ±10%. Trips off all outputs, reset by cycling input power

Accuracy (voltage program):
±1% from -500V to -20kV

Load Regulation:
<±100ppm, 20µA to 250µA load change

Line Regulation:
<±100ppm for 10% line change

Ripple:
<20ppm p-p at -20kV, 250µA, maximum bias and filament output

Temperature Coefficient:
<100ppm/°C

Stability:
30ppm/3 minutes at 100µA load current after 1 hour warm up

Rise Time (switch ON):
<3 seconds (0% to 90%) with no overshoot

Fall Time (switch OFF):
<100 seconds (to <50 volts)

BIAS:

(Referenced to Accelerator)

Voltage:
0 to +1.5kV (max allowable output limited to 2kV)

Current:
150µA maximum

Accuracy (voltage program):
±3% of full scale

Line Regulation:
<±0.1% for 10% line change

Ripple:
<0.1% p-p

Temperature Coefficient:
<1000ppm/°C

Stability:
1%/10 minutes

Rise Time (switch ON):
<3 seconds (0% to 90%) with no overshoot

Fall Time (switch OFF):
<100 seconds (to <50 volts)

FILAMENT:

(center voltage WRT accelerator output)

Power:
0 to 12W

Load Resistance:
1.33Ω ±5%

Accuracy:
±3% of FS

Load Regulation:
<1% for 10% change in load resistance

Line Regulation:
<1% for 10% line voltage change

Ripple:
<0.1% p-p max

Temperature Coefficient:
<300ppm/°C

Stability:
100ppm/10 minutes

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128145-001 REV. C

INTERFACE:

Input:
Analog control for accelerator, filament and bias

High Voltage Output:
Custom 3 pin receptacle and cable assembly

Temperature:
Operating: 5°C to +40°C
Storage: -20°C to +50°C

Humidity:
20% to 85% RH, non-condensing

Dimensions:
10.63˝H x 2.36˝W x 7.87˝D (270mm x 60mm x 200mm) excluding any mounting brackets

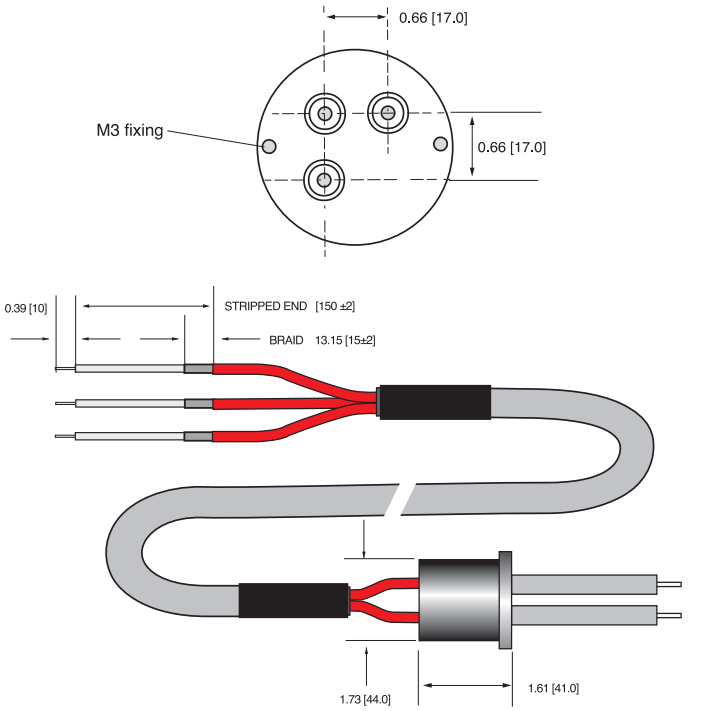
Weight:
<10 lbs. (4.5kg)

Regulatory Approvals:

UL recognized component (RC). File number E354595. Compliant to IEC/UL 61010-1 Safety requirements for electrical equipment for measurement, control and laboratory use; CAN/CSA-C22.2 No.61010-1. CE marked to EN 61010-1. UKCA marked to BS EN 61010-1. RoHS compliant.

As the unit is designed for incorporation within the users system it is not tested against any specific EMC standards. The user will need to take sensible EMC precautions when designing the unit in and verify the overall system EMC performance against any relevant standards.

HV CABLE ASSEMBLY DETAILS

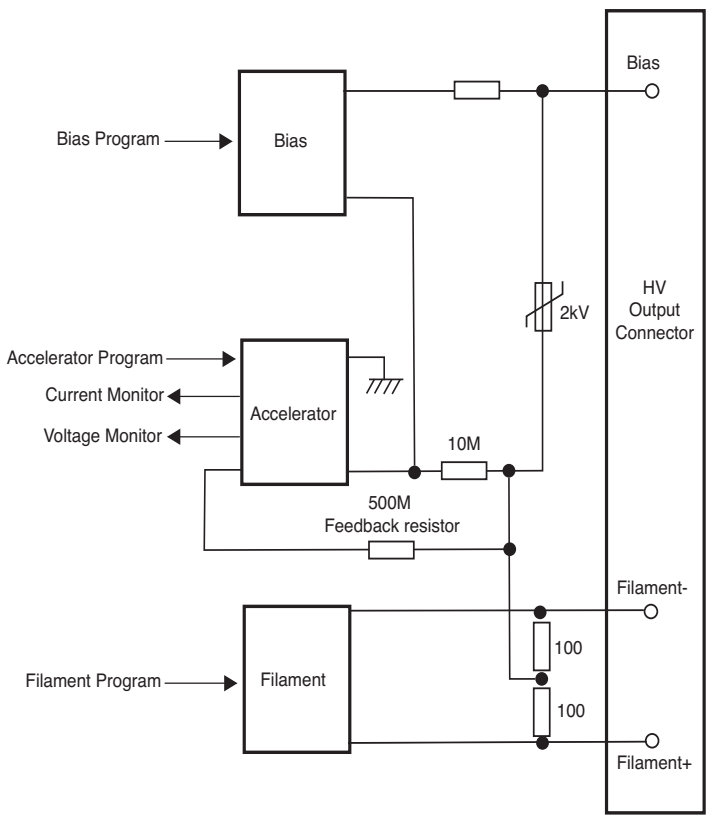


POWER INPUT CONNECTOR
JHA2 3 PIN JST MODEL B 3PS-VH

PIN	SIGNAL	PARAMETER
1	+24V High Voltage Power Input	+24Vdc Input
2	0V Input	+24Vdc Common
3	FG	Chassis Ground

CONTROL AND MONITORING CONNECTOR
JHA3 10 PIN JST MODEL S10B-EH

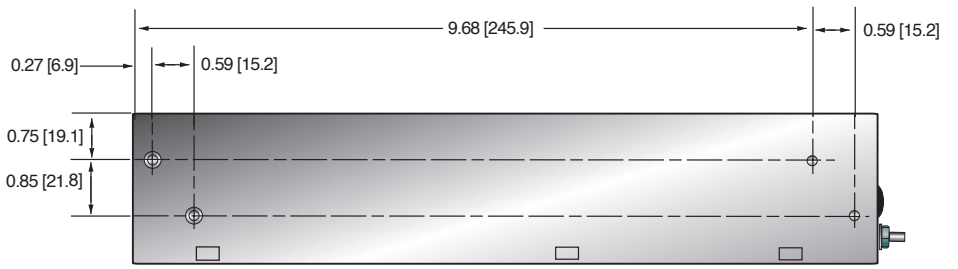
PIN	SIGNAL	PARAMETER
1	FIL PROG (+)	Filament Program (+) Input
2	GND	Ground
3	BIAS (+)	Bias (+) Input
4	GND	Ground
5	ACC PROG (+)	Acc Voltage Program (+) Input
6	GND	Ground
7	EMS	Emission Current Monitor Output
8	GND	Ground
9	ACC MON	ACC Voltage Monitor Output
10	GND	Ground



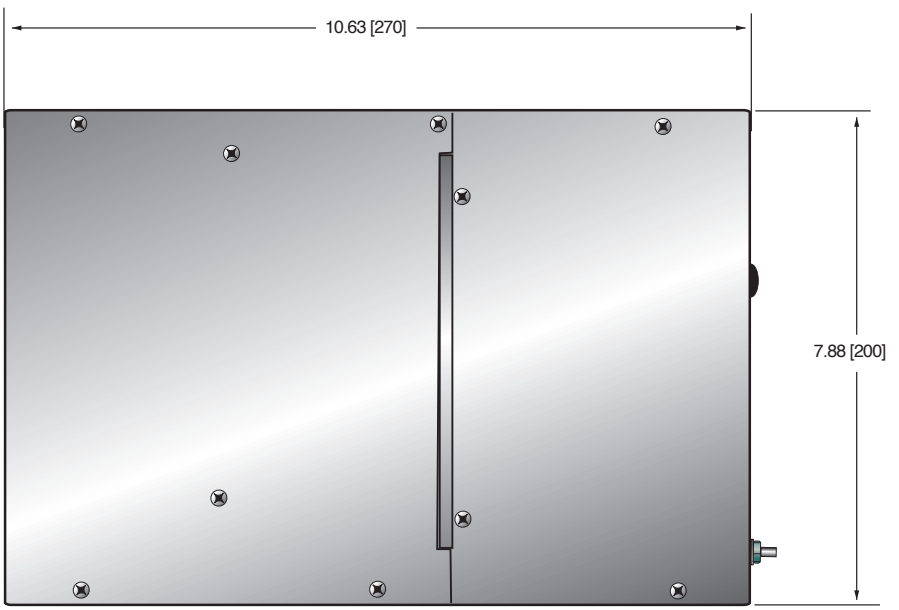
How to Order:
Standard: PART NO.:EBM20N5/24
HV Cable: PART NO.:HVC30/3IS/LL1650 (1.65m Cable)

DIMENSIONS: in.[mm]

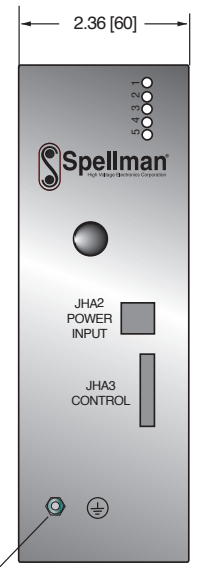
SIDE VIEW



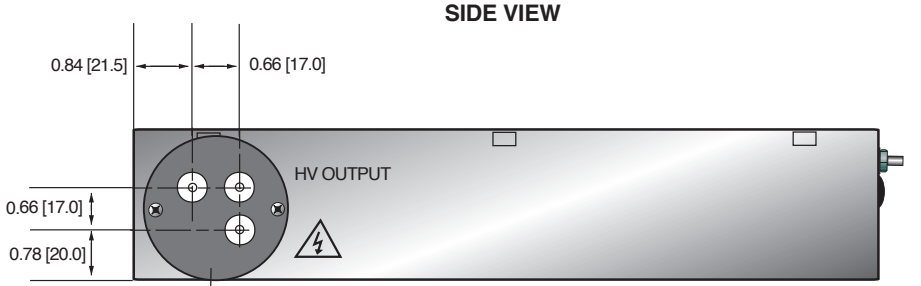
TOP VIEW



FRONT VIEW



SIDE VIEW



PIN OUT DETAIL