



- **Triode Supply for Thermionic Emission SEM**
- **High Precision, Low Noise, Ultra Stable**
- **Over Current/Voltage Protection**
- **Arc and Short Circuit Protection**
- **OEM Customization Available**
- **UL, CE and RoHS Compliant**

The EBM30N/TEG is an integral solution that provides the high voltage required by Thermionic Emission Scanning Electron Microscope (SEM). Spellman's proprietary packaging and encapsulation technology gives dramatic improvements in size, cost and performance compared to other SEM power supply offerings.

This unit provides a highly regulated, low noise, ultra-stable Accelerator supply programmable from 0 to -30kV at 170uA, together with Floating Filament and Bias supplies referenced to the Accelerator to control the beam. The unit also includes high voltage outputs to drive the Detector, comprising PMT, Scintillator and Collector grounded outputs.

Programming signals utilize differential analog inputs to minimize external noise and offset voltages effects. A ground referenced emission current monitor and a filament failure signal are provided.

SPECIFICATIONS

Input Voltage:

+24Vdc, ±5% @ 2.5A max.

High Voltage Outputs:

CA11 Mini 75 receptacle from Claymount. Spellman HV offers mating cable assemblies at different lengths (see HOW TO ORDER table below).

Scintillator Output:

Custom 'Poke home' receptacle manufactured by Spellman. For mating cables, see HOW TO ORDER information below.

PMT and Collector Outputs:

Industry standard BNC.HT receptacle: Radiall R316 553

Temperature:

Operating: 0°C to +45°C
Storage: -20°C to +75°C

Humidity:

0 to 85% RH, non-condensing

Dimensions:

4.13" H x 9.85" W x 7.48" D (105mm x 250mm x 190mm) excluding the top mounting bracket

Weight:

16.5 lbs. (7.5kg)

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 appropriate EMC precautions when designing the unit in and verify the overall system EMC performance against any relevant standards.)

OUTPUTS SPECIFICATIONS

Output	Accelerator (Internal Supply)	Bias Cancellation (Internal Supply)	Filament	PMT	Scintillator	Collector
Output Voltage	0 to -30kV, referenced to ground	0 to +3.5kV referenced to Accelerator*	-1.936 to +1.936V referenced to Accelerator	0 to -1300V referenced to ground	+8kV to +11kV referenced to ground	30V to 500V referenced to ground
Output current - max	170µA	150µA	3.87A	1mA (current trip level: 1.2mA)	250µA	5mA
Accuracy	±2% or ±20V (whichever is greater)	±10% or ±180V (whichever is greater)	0.1V	±2% or ±1V (whichever is greater)	±2%	±5%
Load Regulation	<100ppm for 0 to 170µA	N/A	<2% for 10% change in load resistance	<100ppm for 0 to 1mA	<500ppm for 0 to 250µA	<5% for 0 to 5 mA
Line Regulation for a ±5% line change	<100ppm	<0.1%	<1%	<100ppm	<500ppm	<5%
Ripple p-p at max output	<20ppm	<5ppm	<0.1%	<200mV	<0.1%	<0.2%
Temperature Coefficient	<100 ppm/°C	<1000 ppm/°C	<300 ppm/°C	<1000 ppm/°C	<100 ppm/°C	<1000 ppm/°C
Stability (1hr warm up)	8ppm/3min	1%/10min	100ppm/10min	200ppm/1h	500ppm/8h	<1500ppm/1h
Rise time (switch on)	1 to 3s (0 to 90%)	<1s (0 to 90%)	250ms (0 to 90%)	<1s (0 to 90%)	<1s (0 to 90%)	<1s (0 to 90%)
Fall time (switch off)	<100s (to < 50V)	<100s (to < 50V)	<0.5s (100% to 10%)	<10s (to < 50V)	<10s (to < 100V)	<10s (to < 50V)

*The positive Bias Cancellation voltage reduces the negative Bias output, allowing the Emission current to flow (see User Guide for more information).



PL1 INPUT POWER CONNECTOR JST MODEL B 5PS-VH

PIN	SIGNAL	I/O	SIGNAL PARAMETERS	REMARKS
1	+24V	I	DC24V Input	Pins connected internally
2	+24V	I	DC24V Input	
3	0V	I	DC24V Common	Pins connected internally
4	0V	I	DC24V Common	
5	FG	-	Case ground	Internally connected to 0V

PL2 DIGITAL I/O CONNECTOR JST MODEL S10B-EH

PIN	SIGNAL	I/O	SIGNAL PARAMETERS
1	Remote on/off	I	Outputs 1,2 and 3 (Acc., Bias, Fil.) remote on/off. High = off
2	Remote 4 on/off	I	P.M.T remote on/off. High = off
3	Remote 5 on/off	I	Scintillator remote on/off. High = off
4	Remote 6 on/off	I	Collector remote on/off. High = off
5	Remote signal gnd	I	0V connection for remote controls
6	Filament open cct	O	High = failed
7	Filament OC return	O	0V
8	N/C	-	N/C
9	N/C	-	N/C
10	N/C	-	N/C

PL3 ANALOG I/O CONNECTOR JST MODEL S15B-EH

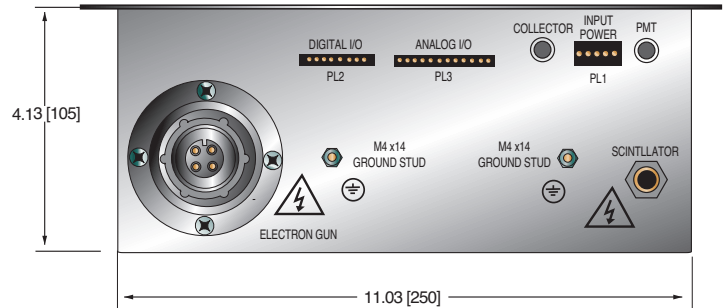
PIN	SIGNAL	I/O	SIGNAL PARAMETERS
1	Fil Prog (+)	I	0 to 4V differential input = 0 to 4V Filament output
2	Fil Prog (-)	I	
3	Bias Cancel Prog (+)	I	0 to 3.5V differential input = 0 to 3.5kV Bias Cancellation output
4	Bias Cancel Prog (-)	I	
5	Acc Prog (+)	I	0 to 6V differential input = 0 to -30kV Accelerator output
6	Acc Prog (-)	I	
7	EMS Monitor	O	Emission Current Monitor Output. 0 to 10V = 0 to 200µA Limited to 12V max. ±3% or 0.1V, whichever is greater
8	EMS Mon 0V	O	
9	PMT Prog (+)	I	0 to 6.5V differential input = 0 to 1300V P.M.T output
10	PMT Prog (-)	I	
11	Scintillator Prog (+)	I	0 to 5.5V differential input = 0kV to 11kV Scintillator output
12	Scintillator Prog (-)	I	
13	Collector Prog	I	0 to 5V differential input = 0 to 500V Collector output
14	Collector Prog 0V	I	
15	N/C	-	N/C

HOW TO ORDER

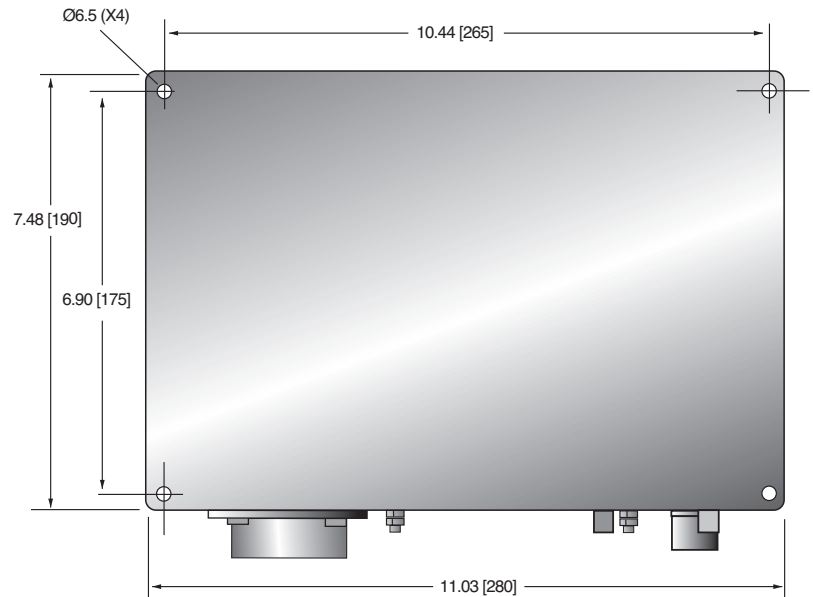
Description	Part Number
EBM-TEG	EBM30N/TEG
Low voltage mating connectors accessory Kit	13802-27
HV Out Cable - 2 meters	HVC30/3SO/1317
HV Out Cable - 3 meters	HVC30/3SO/1314
HV Out Cable - 5 meters	HVC30/3SO/1315
Scintillator Cable - 1 meter	HVC11/1SO/1320
Scintillator Cable - 2 meters	HVC11/1SO/1316

DIMENSIONS: in.[mm]

FRONT VIEW



TOP VIEW



SIDE VIEW



Note: An accessory kit which contains the mating housings and crimps for the low voltage connectors is available to order free of charge. See HOW TO ORDER table.

