

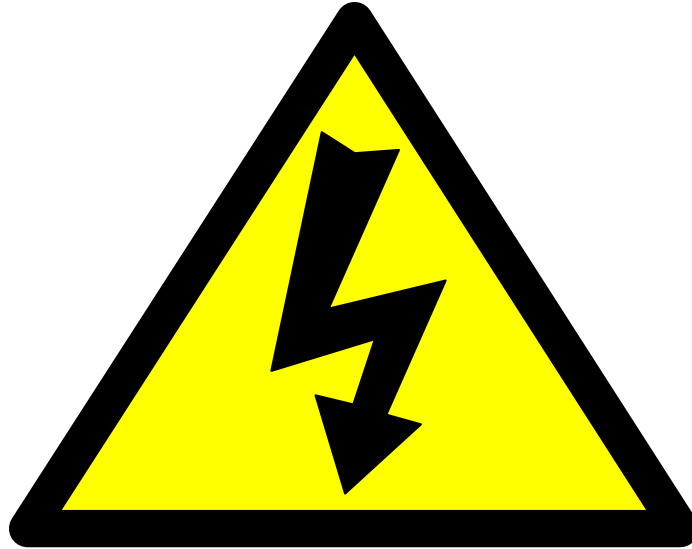
High Voltage Power Supply EBM30N/XXX

SAFETY AND INSTALLATION INSTRUCTIONS

Issue	2	3	4
Date	14/02/11	22/08/18	18/12/18
Issuing Authority	6408L	9433A	9512P
Engineering Approval			
Sales/Marketing Approval			



SAFETY



DANGER HIGH VOLTAGE RISK OF ELECTROCUTION

Observe extreme caution when working with this equipment

- High voltage power supplies must always be connected to protective earth
- Do not touch connections unless equipment is turned off and the capacitance of both the load and power supply are grounded
- Allow adequate time for discharge of internal capacitance of the power supply
- Do not ground yourself or work under wet or damp conditions

Servicing Safety

- No maintenance is required
- Servicing should only be done by qualified personnel aware of the hazards
- If in doubt, return to supplier for servicing

1. Description

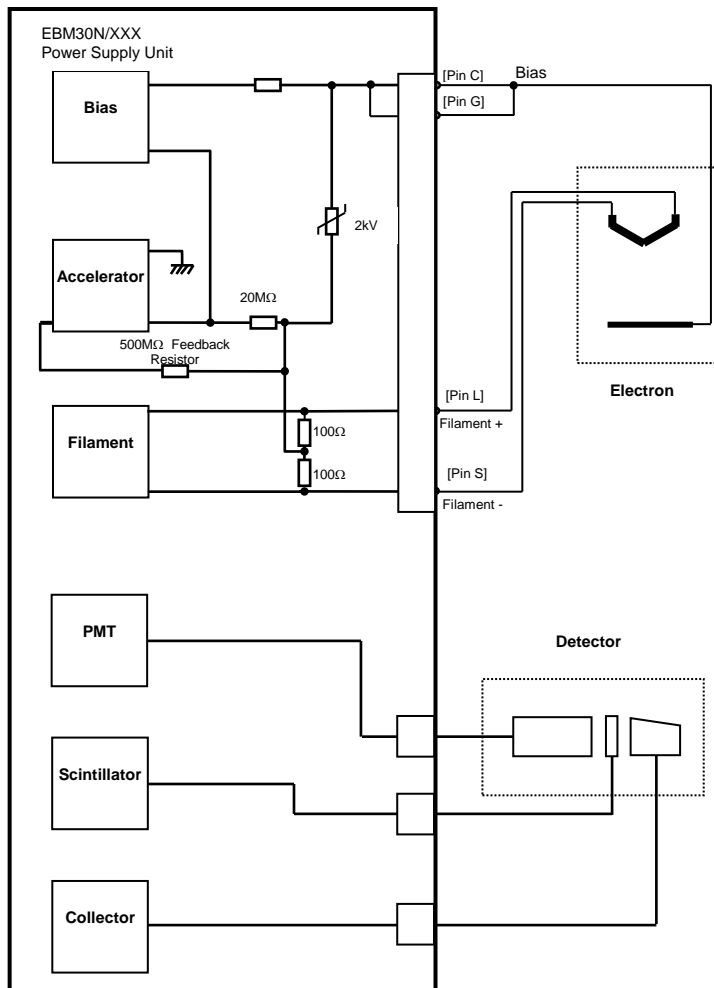
The EBM30N/XXX consists of one chassis containing a complete high voltage power supply to power the main components within a SEM.

The chassis is approximately 105mm x 190mm x 250mm unit containing power supplies rated as follows:

- Accelerator 30kV, 190 μ A (Note that voltages up to 32kV can be generated)
- Bias 3.5kV, 150 μ A (referenced to Accelerator output)
- Filament 15Wmax into 1ohm (referenced to Accelerator output)
- P.M.T. 1.3kV, 1mA
- Scintillator 11kV, 250 μ A
- Collector 500V, 5mA

All control and monitoring is by analogue signals.

A block diagram of the unit and its interconnection with the SEM is shown below.



2. Safety

- The unit is UL listed and CE marked to EN61010-1.
- **The following outputs are classed as hazardous, as defined by EN61010-1:**
 - Accelerator
 - Bias
 - Filament
 - Collector
- The 'source' outputs (accelerator, bias and filament) are provided at a Claymount mini 75 receptacle. **The unit must be terminated safely before operation.** Hazardous voltages will be exposed if the connector is removed whilst the unit is enabled. The Earth stud of the unit is a protective earth and must be connected to the earth of the system.
- **The unit must be switched off for at least one minute before disconnecting any of the connectors or removing the access panel.**
- The P.M.T. and Collector outputs are provided at BNC.HT connectors (Radiall R316 553)
- The Scintillator output is provided at a customer specific 'poke-home' receptacle.

3. Installation

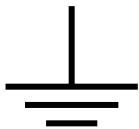
3.1. Explanation of Symbols



This symbol denotes "Caution, risk of danger and the installation manual should be consulted before proceeding."



This symbol denotes "Caution, risk of electric shock."

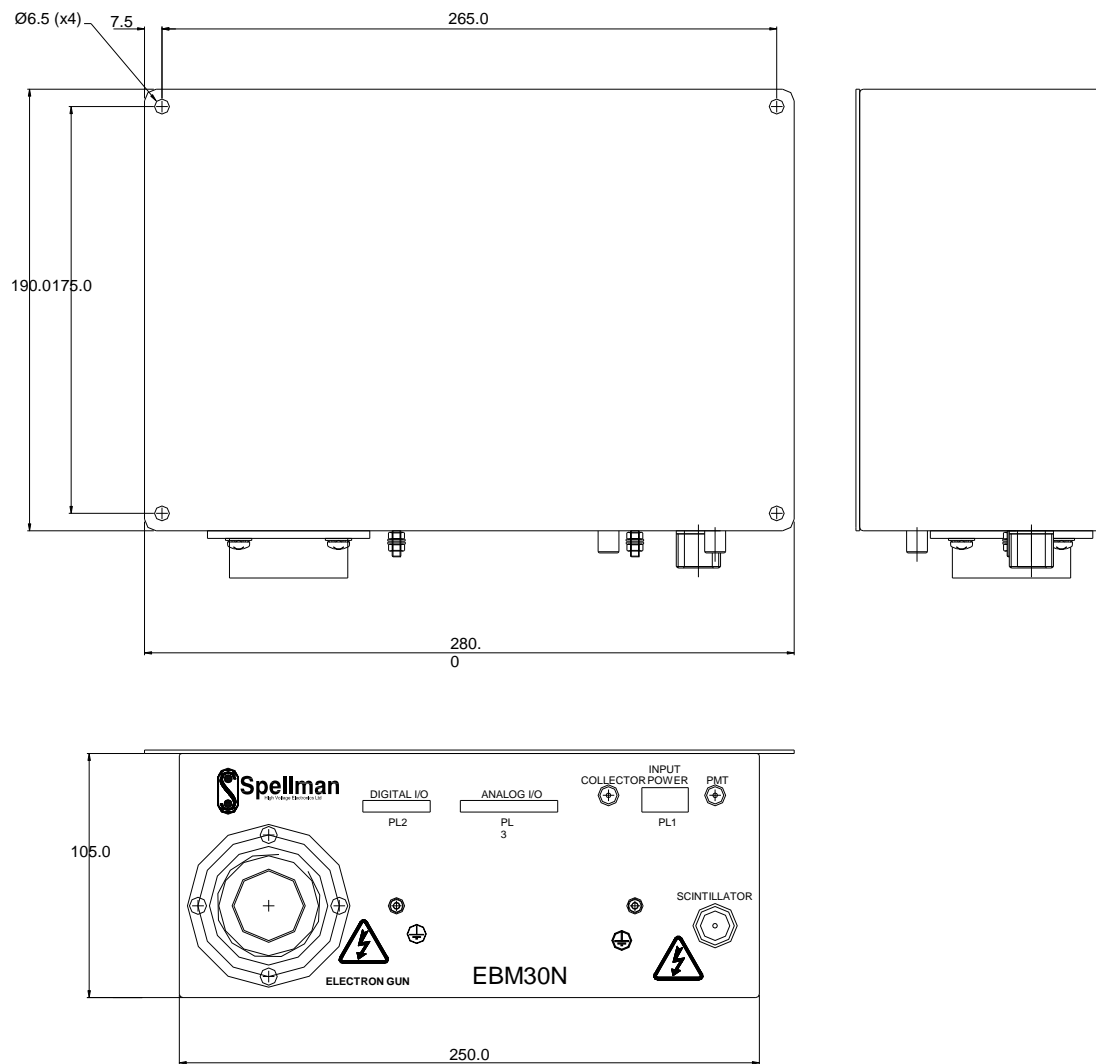


This symbol denotes the Functional Earth (ground) terminal.



This symbol denotes the protective earth terminal

3.2 Mechanical Details



The EBM30N must be fitted in a unit and secured in position using the mounting brackets provided. A safety interlock should be used to prevent access to the unit when it is operating.

Weight 7.5Kg

3.3 General

The EBM30N is designed for operation from a double insulated 24Vdc ($\pm 5\%$) supply, the maximum continuous current requirement is 2.5A.

The unit should only be used in a Pollution Degree 2 Installation Category II environment.

The input and output connectors are not intended for field connections and should only be connected to internal wiring in the end use equipment.

The unit is intended for use as a component and no surface of the unit should be accessible in the end product.

Note: Failure to comply with the above could compromise the safe operation of the unit and invalidate the warranty.

3.4 Operating Environment

- 3.4.1. Operating Temperature 10°C to +45°C for normal operation, however the unit will operate from 0°C but with an extended warm up period.
- 3.4.2 Storage Temperature -20°C to +75°C
- 3.4.3 Humidity 0% to 85% RH (non-condensing)

4. Connections

4.1. Input Power Connector

Table 1 Input Power Connector pin connections

Manufacturer JST		Model B 5PS-VH		
pin#	Signal	I/O	Description	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 earth	Internally connected to 0V

4.2. Control Input Connectors

Table 2 Signal In/Out Connector

Manufacturer JST		Model S15B-EH		
pin#	Signal	I/O	Description	Remarks
1	Fil Prog(+)	I	Filament Program (+)	Differential-input
2	Fil Prog(-)	I	Filament Program (-)	
3	Bias Prog(+)	I	Bias Program (+)	Differential-input
4	Bias Prog(-)	I	Bias Program (-)	
5	Acc Prog(+)	I	Acc Voltage Program (+)	Differential-input
6	Acc Prog(-)	I	Acc Voltage Program (-)	
7	EMS	O	Emission Current Mon Out	
8	EMS 0V	O	Emission Current Gnd (0V)	
9	PMT Prog(+)	I	PMT Voltage Program (+)	Differential-input
10	PMT Prog(-)	I	PMT Voltage Program (-)	
11	Scintillator Prog (+)	I	Scintillator Voltage Program (+)	Differential-input
12	Scintillator Prog (-)	I	Scintillator Voltage Program (-)	
13	Collector Prog	I		
14	Collector Prog 0V	I		
15	-	-	Not Used	

Table 3 Remote Signal Connector

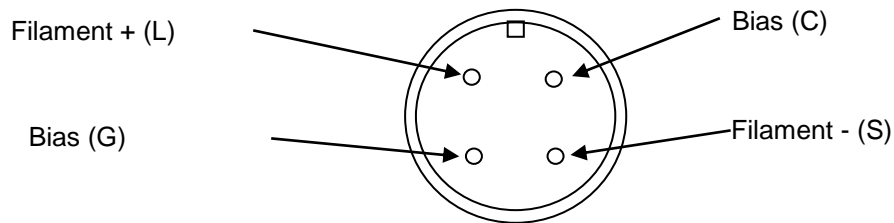
Manufacturer JST Model S10B-EH				
pin#	Signal	I/O	Description	Remarks
1	Remote on/off	I	Outputs 1,2 and 3 remote on/off	High = off
2	Remote 4 on/off	I	Output 4 remote on/off	High = off
3	Remote 5 on/off	I	Output 5 remote on/off	High = off
4	Remote 6 on/off	I	Output 6 remote on/off	High = off
5	Remote signal gnd	-	0V connection for remote controls	
6	Filament open cct	O		High = failed
7	Filament OC return	-	0V	
8	-	-	Not Used	
9	-	-	Not Used	
10	-	-	Not Used	

4.3. High Voltage Output

The unit uses a “standard” high voltage receptacle from Claymount the CA11 (mini 75). Claymount (www.claymount.com) can also provide mating cable assemblies terminated with mini75 high voltage plug.

A typical cable assembly is part number HVC30/3S/LL2000 made to Spellman drawing No. 13658-3. Which is a cable assembly with a length of 2m ±100mm terminated one end in the mini 75 and the other end open.

HV Cable Assembly Connector



Viewed on mating end of pins of connector on HVC30/3S/LL2000
 Note: Pins G + C are internally connected

4.4. Scintillator Output

'Poke home' receptacle 9mm thread, 39mm deep.

4.5. PMT Output

BNC.HT connector (i.e. Radiall R316 553)

4.6. Collector Output

BNC.HT connector (i.e. Radiall R316 553)

Note: An accessory kit is available which contains the mating housings and crimps for the low voltage connectors and a 2m scintillator cable. Please contact Spellman HV for details.

CHANGE HISTORY

Section	Reason for Change	Issue
All	First Draft	1
All	Changed into generic EBM30 manual	2
All	Update UL requirements.	3
All	Update UL requirements.	4