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## High Voltage Power Supply EBM20N4/ series

# SAFETY AND INSTALLATION INSTRUCTIONS

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USA

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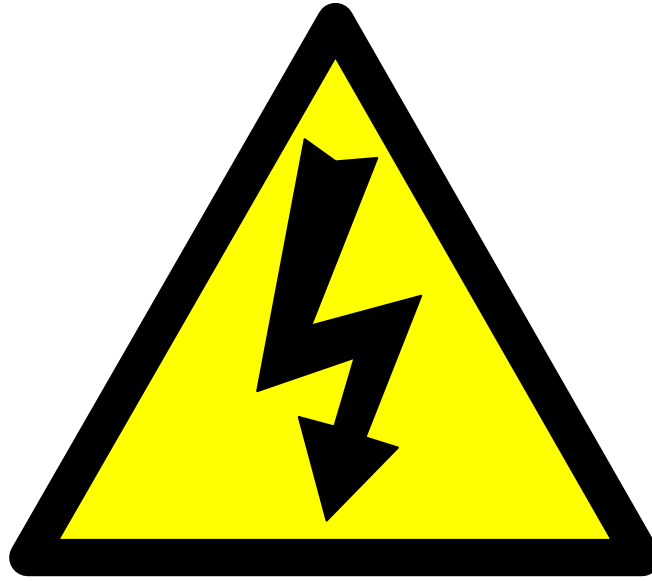
JAPAN

MEXICO

Change History

<b>Section</b>	<b>Reason for Change</b>	<b>Issue</b>
All	Original	1

# 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**

- ♦ **Maintenance may require removing the Instrument cover with the power on.**
- ♦ **Servicing should only be done by qualified personnel aware of the hazards.**
- ♦ **If in doubt, return to supplier for servicing**

## 1. Description

The EBM20N4/ series is a range of 20kV electron gun power supplies designed to drive a gun with a tungsten filament. It contains an accelerator power supply, filament supply and bias supply all independently controlled via an analog interface. Refer to appendix 1 for a block diagram of the unit. The unit is powered from a 24V supply, all input connections are via JST single in line connectors. The HV outputs are via a custom 3-pole output connector. A mating cable can be supplied as shown in appendix 2. The EBM20N4/ series consists of one chassis containing the high voltage power supply. The chassis is 270mm X 200mm X 60mm unit with the standard unit containing power supplies rated as follows:-

- Accelerator            20kV, 220 $\mu$ A (Note that voltages up to 24kV can be generated)
- Bias                    1.5kV, 150 $\mu$ A (referenced to Accelerator output)
- Filament              12W max into 1ohm (referenced to Accelerator output)

See specification 81267-1 for further details on the performance of the unit.

## 2. Safety

- The outputs are provided at a 3 pin custom connector. **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 the HV connector or removing the access panel.**

## 3. Installation

The EBM20N4 must be fitted in a unit and secured in position using the M4 mounting holes provided (see section 5 for details). A safety interlock should be used to prevent access to the unit when it is operating.

The EBM20N4 is designed for operation from a double insulated 24Vdc ( $\pm 5\%$ ) supply, the maximum continuous current requirement is 1.5A.

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

Consideration should be given to conduct the following tests with the power supply installed in the end product :

- a) Dielectric withstand test, between live parts of the power supply and the end product chassis.
- b) Permissible Limits Test with the power supply installed in the end product.
- c) Temperatures on power electronics components, transformer windings and accessible surfaces.

The input and output connectors are not intended as user 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.**

## 4. Connections

### 4.1 Input Power Connector, JHA2, type JST Model B 3PS-VH

Pin Number	Signal
1	+24V
2	0V
3	Case Ground

Pins 2 and 3 internally connected together

### 4.2 Signal I/O Connector, JHA3, type JST Model S10B-EH

Pin Number	Signal
1	Filament program
2	Filament program return
3	Bias program
4	Bias program return
5	Accelerator program
6	Accelerator program return
7	EMS
8	EMS GND
9,10	Unused

#### 4.2.1 Control inputs

All program inputs differential, clamped to a maximum nominal of +/-18V.

Accelerator Program Voltage 0 to 4.88V (corresponds to 0kV to -20kV output, program accuracy only guaranteed above 500V)

Bias Program Voltage 0 to 10V (corresponds to 0 to 1.5kV output)

Filament Program Voltage 0 to 10V (corresponds to 0 to 3.5V output)

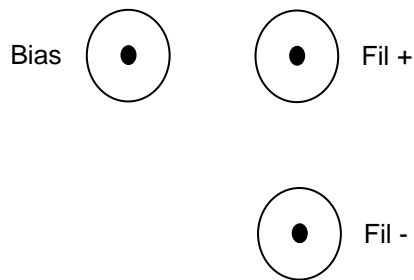
#### 4.2.2 Monitor outputs

Accelerator Current Monitor 0 to 7.65V  $\pm 3\%$  (corresponds to 0 to 255 $\mu$ A output current Including the feedback current). Limited to 12V maximum.

### 4.3 High Voltage Output

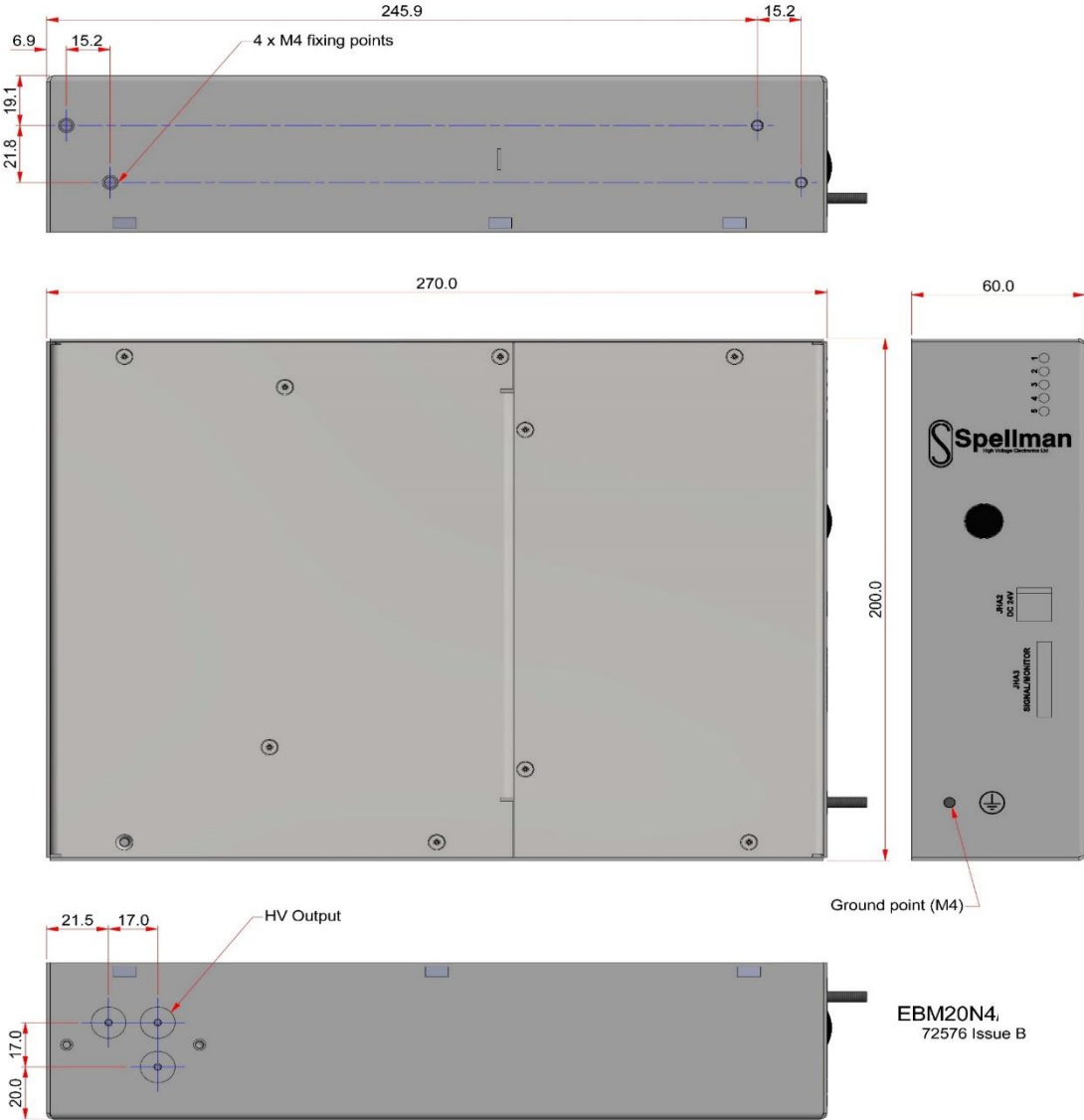
HV Cable Assembly Connector is a custom 3 pin receptacle which mates with a custom cable assembly. Refer to appendix 2 for cable details

See diagram below for connection details

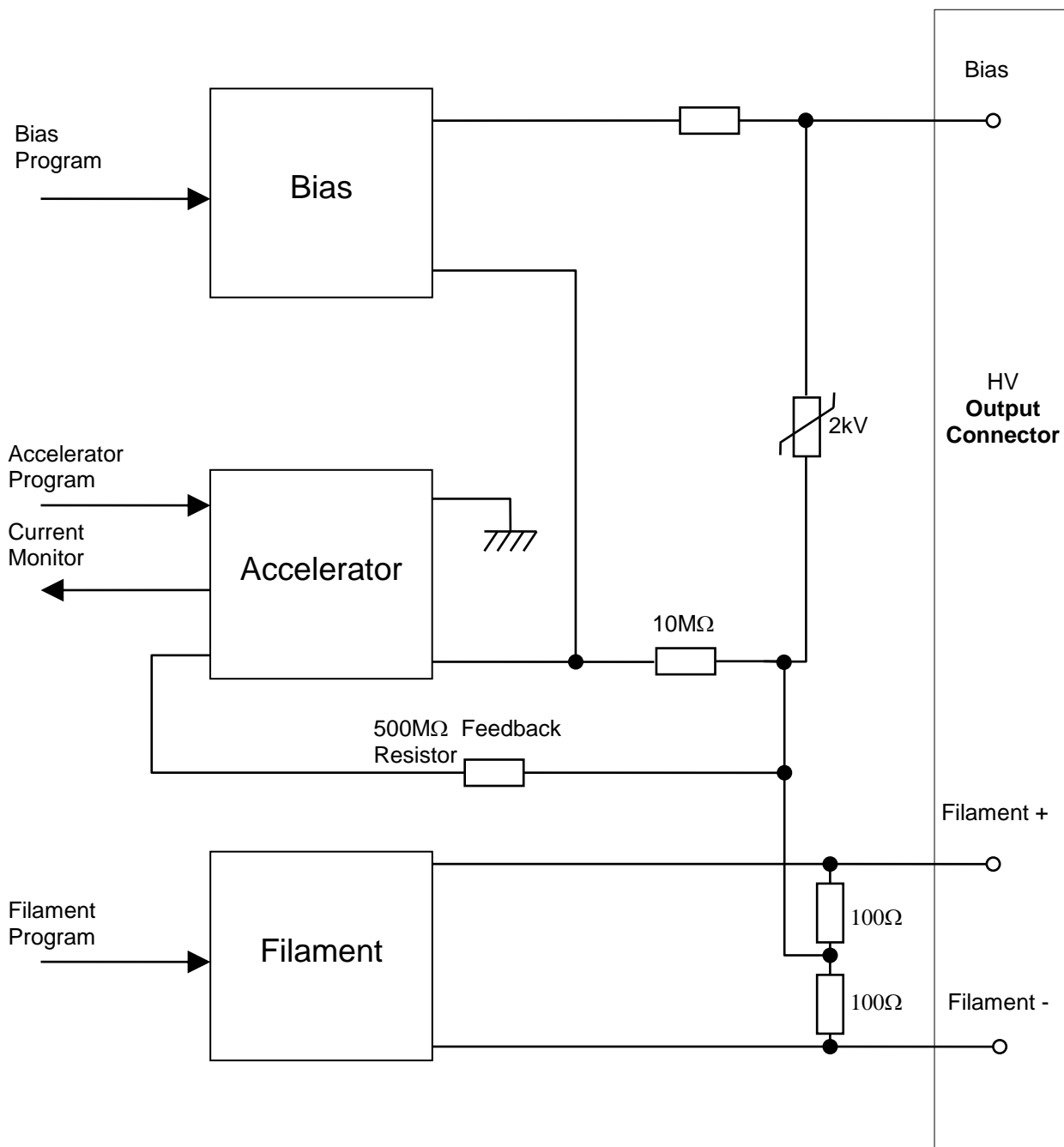


View looking into receptacles

5. Mechanical Outline

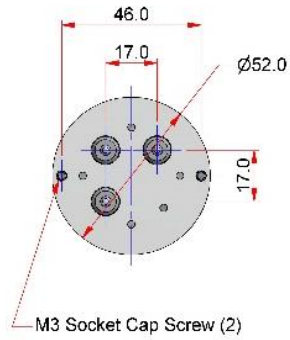
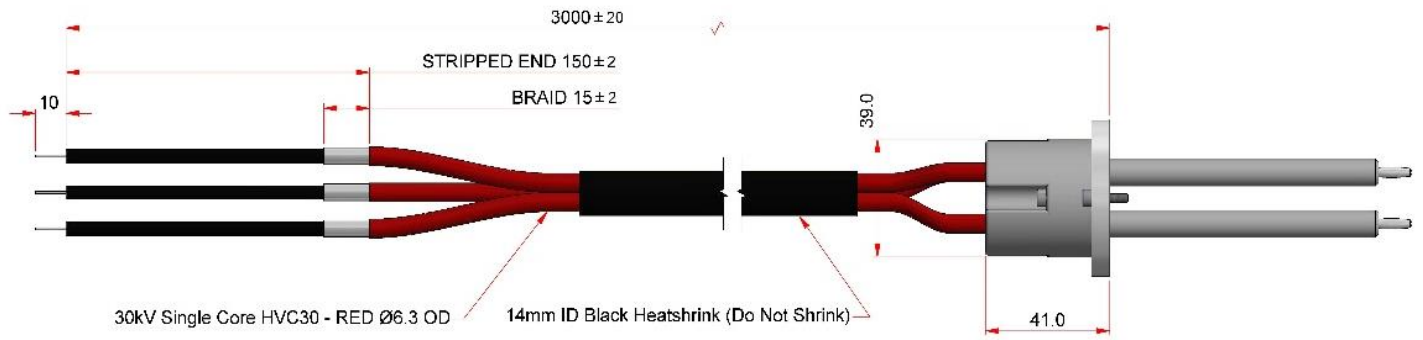


# Appendix 1: Unit Block Diagram





## Appendix 2 : HV cable assembly details



EBM20N4